

Report of the Anthropometric Committee, consisting of Dr. FARR, Dr. BEDDOE, Mr. BRABROOK (*Secretary*), Sir GEORGE CAMPBELL, Mr. F. P. FELLOWS, Major-General A. L. F. PITT-RIVERS, Mr. F. GALTON, Mr. J. PARK HARRISON, Mr. JAMES HEYWOOD, Mr. P. HALLETT, Professor LEONE LEVI, Dr. F. A. MAHOMED, Dr. MUIRHEAD, Sir RAWSON RAWSON, Mr. CHARLES ROBERTS, *and* Professor ROLLESTON.

[PLATES IV., V., AND VI.]

THE appointment of this Committee was renewed at the Sheffield meeting 'for the Purpose of Continuing the Collection of Observations on the Systematic Examination of Heights, Weights, &c., of Human Beings in the British Empire, and the Publication of Photographs of the Typical Races of the Empire.' Since their first appointment at the Bristol meeting, in 1875, the Committee have had the advantage of being presided over by Dr. Farr, who has taken the deepest interest in their labours, and has placed without reserve at their service his unrivalled skill and long experience in the collection and arrangement of statistics. That advantage, they regret to say, they will be deprived of in future, Dr. Farr having intimated a desire to retire from the office of Chairman on the ground of ill-health: a desire to which the Committee felt compelled to accede, while returning him their hearty thanks for his past services. Should the Committee be reappointed, Mr. F. Galton, F.R.S., has been good enough to consent to be nominated Chairman in the place of Dr. Farr.

It may be recollected that the Committee reported, in the year 1878, that their work up to that point had been rather tentative and experimental, and gave details of the forms and instruments which, after much consideration, had been adopted by them to secure both accuracy and uniformity.

The instruments are:—

1. A weighing machine.
2. A simple apparatus for measuring height.
3. A Coxeter's spirometer.
4. A spring balance for testing strength of arm.

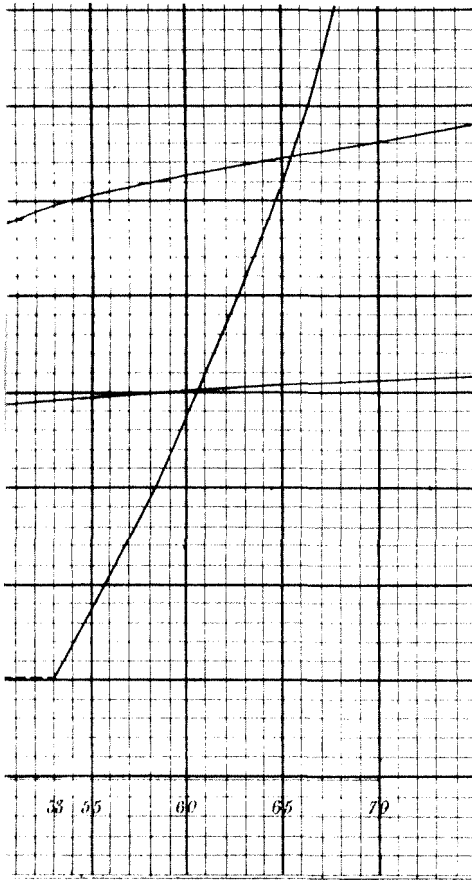
In the Report of last year they were able to state that they had collected 12,000 original observations on weight and height, supplemented in many cases by observations of chest-girth, colour of hair and eyes, strength, and eyesight, and to furnish a number of tables, based on selected portions of these returns, indicating the results to be obtained from them. In the present year they have the satisfaction of reporting a considerable addition to the materials at their command, the new observations of the year being nearly equal in number to all those collected in previous years. These are shown in Tables I. and II.

The Committee submit that they are carrying on a work of no mean value to social statistics, supplementary to that of the National Census; one that could not be performed except through voluntary association, such as they are exerting themselves successfully to obtain.

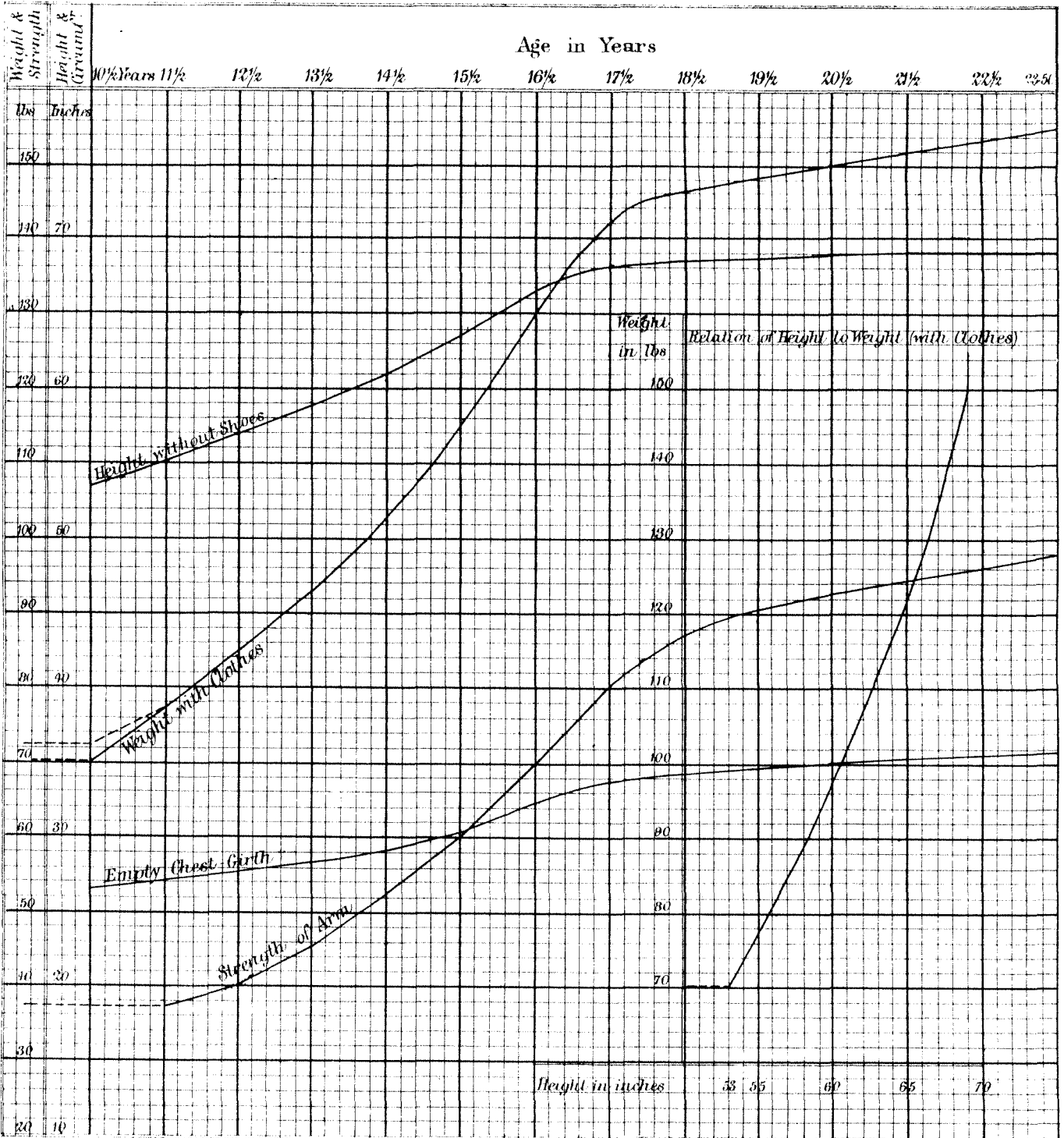
They feel it a duty to return hearty thanks to the numerous observers, whose names are mentioned in these tables (I. and II.), and who have rendered their zealous and obliging services at great sacrifice of time. They have also to thank the Registrar-General, and Mr. W. Clode and Mr. J. T. Hammick, of the General Register Office, for courteous and kind assistance.

Diagram N° III.

Tracings of the Annual Growth in height of 13 Girls



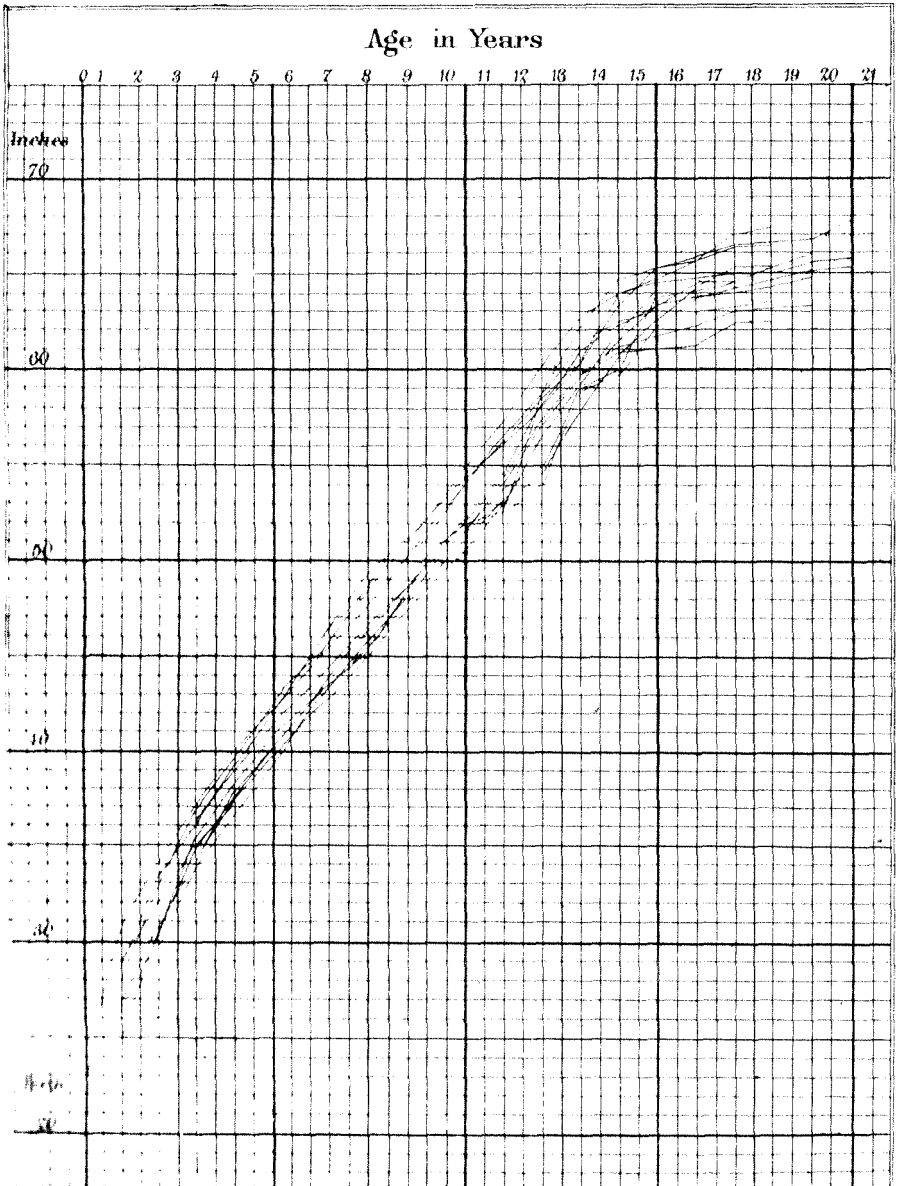
given in Tables from A to A and the relation of the Weight to the Height



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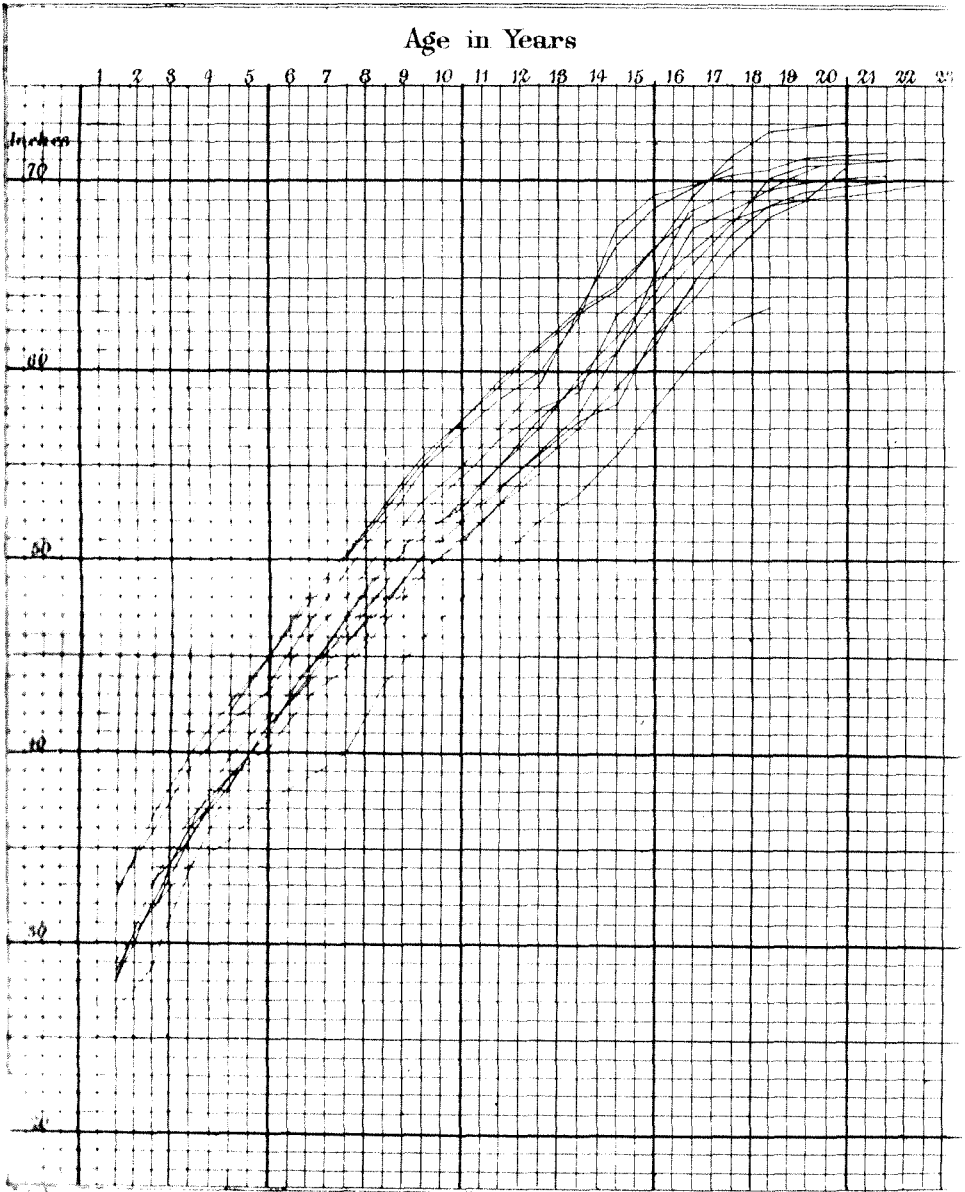


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Illustrating the Report of the Anthropometric Committee

Diagram N^o. II.

Tracings of the Annual Growth in height of 12 Boys



H. 1872

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Illustrating the Report of the Anthropometric Committee

I. *As to Classification of Returns.*

In deciding upon the arrangement for practical purposes of returns so various in their origin, and yet consisting in so large a proportion of information derived from special sources, the first consideration has been to establish a classification of the returns. In this the Committee have had material assistance from their colleague, Mr. Roberts, who has prepared the subjoined scheme of classification (Table III.), which the Committee have adopted. It is based on the principle of collecting into a standard class as large a number of cases as possible which imply the most favourable conditions of existence in respect to fresh air, exercise, and wholesome and sufficient food—in one word, nurture—and specialising into classes which may be compared with this standard, those which depart more or less from the most favourable condition. By this means, in respect to social condition, the influence of mental and manual work; in respect to nurture, the influence of food, clothing, &c., on development; in respect to occupation, the influence of physical conditions; and in respect to climate and sanitary conditions, the influence of town and country life may, as sufficient materials accumulate under the hands of observers, be determined.

The classification has been constructed on the physiological and hygienic laws which are familiar to the students of sanitary science, and on a careful comparison of the measurements of different classes of the people, and especially of school children of the age of from eleven to twelve years. This age has been selected by Mr. Roberts as particularly suited to the study of the *media*, or conditions of life, which influence the development of the human body, as it is subject to all the wide and more powerful agencies which surround and divide class from class, but is yet free from the disturbing elements of puberty and the numerous minor modifying influences, such as occupation, personal habits, &c., which in a measure shape the physique of the adult. Table IV. contains some of the data on which the classification has been based. The most obvious fact which it discloses, apart from the check which growth receives as we descend lower and lower in the social scale, is, that a difference of five inches exists between the average statures of the best and the worst nurtured classes of the community. When it is remembered that at birth children are of the same average size in all classes, it is evident that the conditions of life, combined with heredity, exert a most potent influence on the physique of the population of this country, and it will be seen that the labours of the Committee are directed to the elucidation of a subject which is of great national importance as well as of scientific interest.

II. *Results of Returns relating to Class I. (Standard No. I.)*

Tables V.—X.¹ and the accompanying diagram give the results of the returns which the Committee have obtained relating to individuals coming under the Standard Class (Class I.)

¹ It is necessary to call attention to the difference in the meaning of the terms *average* and *mean* which in common language are synonymous—when used in this report. An *average* is obtained by dividing the sum of the values observed by the number of observations, while a *mean* is the value at which the largest number of observations occur. An *average* includes and is influenced by exceptional cases, while a *mean* excludes exceptional cases, and is consequently uninfluenced by them.

TABLE I.—List of Observations furnished up to the end of the year 1879.

Sources of Information	By whom Furnished	Number of Observations (Males)					
		Birth-place, Origin, and Sex	Age, Height, and Weight	Colour of Hair and Eyes	Girth of Chest	Strength of Arm	Eyesight
1. Cadets Royal Military College, Sandhurst	General Napier and Col. F. Middleton .	300	300	300	300	300	300
2. Boys at Westminster School	Dr. Scott	200	200	200	—	200	—
3. Students at Aberystwith	Professor Rudler	40	40	40	40	40	40
4. Boys at Christ's Hospital	Major Brackenbury	—	1936	—	846	—	—
5. Medical Students	Dr. Norman Chevers	46	46	46	46	46	41
6. Felstead Grammar School	Mr. E. Shedd, M.R.C.S.	62	62	62	62	62	—
7. Men in Mr. Whiteley's employment	Mr. Whiteley	242	242	—	—	242	—
8. Letter Sorters	Dr. Waller Lewis	—	1980	—	1180	—	—
9. Metropolitan Police	Lient.-Col. Sir E. W. Henderson	205	205	205	205	205	205
10. City Police (first instalment)	Col. Fraser	60	60	60	60	60	60
11. Metropolitan Fire Brigade	Capt. Shaw	80	80	80	80	80	80
12. Jews	} Drs. Davis and Eskell {	140	140	140	140	—	—
13. „ (another source)		20	20	20	20	—	—
14. Industrial and other Classes	Drs. Bain and Massey	82	82	42	42	—	6
15. Workmen of Messrs. Howard	Messrs. Howard	67	67	66	65	62	19
16. Workmen, &c.	Dr. Bain	28	28	28	28	28	—
17. Scotland, various occupations	Mr. J. Whitney	20	20	20	20	—	—
18. Weavers, Holmfirth	Dr. Morehouse	120	120	—	120	120	—
<i>Rifle Volunteers.</i>							
19. Northumberland	Capt. Clark and Sergt. Treble	200	200	200	200	—	—
20. Cumberland	Dr. Syme	40	40	40	40	—	—
21. Cornwall	Cpts. Smith, Sharp, and Williams	110	110	110	110	—	—

22.	Somerset	Dr. Hunt and Keenan	155	155	155	155	—	—
23.	Essex	Capt. Humphreys and Mr. Shedd	89	89	89	89	13	14
24.	Suffolk	Major Crowfoot	135	135	135	135	—	—
25.	Kent	Capt. Brown	90	90	—	—	90	—
26.	Royal Surrey Militia	General Lane Fox	459	459	459	459	459	459
27.	Volunteers and Militia, Surrey	Ditto	124	124	124	124	124	124
28.	Recruits		100	100	100	100	—	—
29.	"		32	32	—	32	—	—
30.	"		79	79	62	79	—	—
31.	"		190	190	—	190	—	—
32.	"		100	100	—	100	—	—
33.	"	Inspector-General Lawson, Dr. Skipton, and Dr. Fraser	218	218	88	218	—	—
34.	"		128	128	108	128	—	20
35.	"		260	356	—	96	—	—
36.	"		200	200	200	200	—	—
37.	"		199	199	199	199	—	—
38.	Soldiers		20	20	20	20	—	—
39.	H.M.S. <i>Fisguard</i>	Dr. Fisher	59	59	59	59	—	—
<i>Industrial Schools.</i>								
40.	Newcastle	Mr. R. Willoughby	150	150	150	150	—	—
41.	Birmingham	Mr. C. F. Vinalf	84	84	84	84	—	—
42.	Greenock	Mr. Alexander Thomson	100	100	100	100	—	—
43.	Park Row (Bristol)	} Dr. Beddoe }	70	70	70	—	—	—
44.	St. James (Bristol)		70	70	70	—	—	—
45.	Sale, near Manchester (Girls)	Miss Pettit	80	80	80	—	—	—
46.	Criminals	Mr. Francis Galton, F.R.S.	—	2480	—	—	—	—
			5254	11745	4011	6321	2131	1368

To these are to be added the very extensive observations (50,000 individuals) collected by Mr. Charles Roberts.

TABLE II.—List of Observations received during the present Year (1880).

Sources of Information	By whom Furnished	Number of Observations (Males)						
		Birth-place, Origin, and Sex	Age, Height, and Weight	Colour of Hair and Eyes	Girth of Chest	Strength of Arm	Eyesight	
1. Oxford Undergraduates	Mr. H. Symonds, M.B.C.S.	17	17	17	17	17	—	
2. Marlborough College	The Rev. T. A. Preston	—	1900	—	1900	460	—	
3. Radley School	The Warden	20	20	20	20	—	20	
4. Uppingham School	Mr. Besiégel	300	300	300	300	—	—	
5. Blind School for Gentlemen, Worcester }	Mr. S. Forster	30	30	30	30	30	—	
6. Bristol, Upper Middle Class	Dr. Beddoe	40	40	40	—	—	—	
7. City Police (2nd instalment)	Col. Fraser	140	140	140	140	140	140	
8. Telegraph Messengers, &c.	Mr. Steet, F.R.C.S.	—	4412	—	—	—	—	
9. Candidates for Civil Service Appointments, Warders, &c. }	Dr. Power, H.M. Convict Prison, Portsmouth }	—	660	660	660	—	—	
10. Printers	Messrs. Spottiswoode & Co.	45	45	—	45	45	—	
<i>Rifle Volunteers.</i>								
11. Cornwall	{ Captain Baker and Drs. Rean and Thompson }	85	85	85	85	20	—	
12. Cumberland	Dr. Wotherspoon	51	51	51	51	51	—	
13. Devonshire	Dr. Rouse	45	45	45	45	45	45	
14. Kent	Capt. Drury	10	10	10	10	10	—	

15.	Essex	Mr. E. Shedd, M.R.C.S.	—	70	70	70	20	—
16.	Lancashire	Capt. Woodcock and Mr. Shaughnessy	154	154	154	154	54	—
17.	Norfolk	Capt. Forester	65	65	65	65	—	65
18.	Oxford	Mr. Hussey	—	100	—	100	—	—
19.	Northumberland	{ Capt. Clark, Lieut. Clark, and Mr. A. Carter }	63	63	63	63	40	40
20.	Somerset	{ Capts. Moger and Bennett, Dr. Fowler, and Lieut. Robinson }	226	226	226	226	163	172
21.	Westmoreland	Capt. Harrison	67	67	67	67	—	—
22.	Flintshire	Capt. Frost and Mr. Leggatt	87	87	87	87	—	87
23.	Glamorganshire	Drs. Evan Jones and D. Davies.	191	191	191	191	91	191
24.	Recruits	{ Inspector-General Lawson and Mr. Myers, M.R.C.S. (Coldstream Guards) }	590	590	590	590	200	200
25.	Soldiers	Inspector-General Lawson	—	358	—	—	—	—
<i>Training Ships.</i>								
26.	H.M.S. <i>Britannia</i> (Cadets)	Mr. W. Telfer, L.R.C.S.	—	150	—	150	—	—
27.	H.M.S. <i>Ganges</i>	Mr. P. Keelan, L.R.C.S.	40	40	40	40	—	—
28.	H.M.S. <i>Implacable</i>	Dr. Campbell	380	380	—	360	—	—
29.	H.M.S. <i>Impregnable</i>	Mr. Hadlow, M.R.C.S.	260	260	260	—	—	—
30.	Industrial School, Swinton, near Manchester	Mr. R. Sutton	300	300	300	300	300	300
31.	Criminals	Dr. Beddoe	—	1100	—	—	—	—
			3206	11956	3511	5766	1686	1260

Some further observations have also been placed at the disposal of the Committee by Dr. Beddoe, which have not yet been enumerated.

TABLE III.—Classification of the British Population according to *Media*, or the conditions of life.

Social Condition.*—Non-labouring Classes		Labouring Classes.				Selected Classes
Nurture.†—Very Good		Good	Imperfect	Bad		
Professional Classes ‡ (Upper and Upper Middle Classes) 4·46 per cent.		Commercial Class (Lower Mid. Classes) 10·30 per cent.	Labourers 47·46 per cent.	Artisans 26·82 per cent.	Industrial Classes (Sedentary Trades) 10·90 per cent.	
Out-door Country §	In-door Towns	In-door Towns	Out-door Country	In-door Towns	In-door Towns	
<p>CLASS I.</p> <p>Country-gentlemen. Gentlemen-farmers. Officers of Army and Navy. Auxiliary Forces. Clergymen. Lawyers. Doctors. Civil Engineers. Architects. Dentists. Civil Servants. Authors. Artists. Teachers. Musicians. Actors. Bankers. Merchants (Wholesale).</p>		<p>CLASS II.</p> <p>Teachers in Elementary Schools. Clerks. Shopkeepers. Shopmen. Dealers in .. Drugs. .. Books. .. Wool. .. Silk. .. Cotton. .. Foods. .. Drinks. .. Furniture. .. Metals. .. Glass. .. Earthen-ware. .. Fuel, &c.</p>	<p>CLASS III.</p> <p>Labourers and Workers on Agriculture. .. Gardens. .. Roads. .. Railways. .. Quarries. Navvies. Porters. Guards. Woodmen. Brickmakers. Labourers, &c., on Water. .. Sailors. .. Fishermen. .. Watermen. Labourers, &c., in Mines. .. Coal. .. Minerals.</p>	<p>CLASS IV.</p> <p>Workers in .. Wood. .. Metal. .. Stone. .. Leather. .. Paper. .. &c. Engravers. Photographers. Printers. .. &c.</p>	<p>CLASS V.</p> <p>Factory Operatives. Tailors. Shoemakers. .. &c.</p>	<p>CLASS VI.</p> <p>Policemen. Fire Brigade. Soldiers. Recruits. Messengers ? Industrial-Schools. Criminals. Idiots Lunatics.</p>

* Social Condition; (influences of leisure, mental and manual labour).

† Nurture; (influences of food, clothing, nursing, domestic surroundings, &c.)

‡ Occupation; (influences of external physical conditions, exercise, &c.) Percentage of male population, including male children (Census of 1871).

§ Climatic and sanitary surroundings.

TABLE IV.—Table showing the Relative Statures of Boys of the age of 11 to 12 years, under different social and physical conditions of life. The zig-zag line running through the means shows the degradation of stature as the boys are further and further removed from the most favourable conditions of growth. (C. Roberts.)

Height in inches	Total No. of Obs.	Public Schools		Middle-class Schools		Elementary Schools				Military Asylums	Pauper Schools ?	Industrial Schools	Total percentages									
		Country	Towns	Upper Towns	Lower Towns	Agricultr. Labourers Country	Artisans Towns	Factories and Workshops														
								Country	Towns													
60 to 61	6	2	1			3	1							2								
59-	16	2	1		3	1	5	1	2	1	2	1		5								
58-	35	9	6		9	3	8	2	5	1	0	1	2	1	15							
57-	66	11	8		17	6	13	4	4	2	5	1	5	1	25							
56-	118	21	14		23	8	27	7	14	4	10	3	3	1	42							
55-	230	28	19		35	12	57	14	32	10	15	8	13	6	78							
54-	329	33	22		53	18	68	17	47	16	24	13	36	12	113							
53-	361	15	10		55	19	58	15	47	16	26	15	34	13	115							
52-	441	14	9		37	12	61	15	58	19	36	20	52	17	132							
51-	370	6	5		25	9	40	10	38	12	28	15	45	16	113							
50-	367	7	4		23	7	27	7	32	10	17	10	46	15	106							
49-	252	2	1		8	3	20	5	14	5	12	6	31	10	74							
48-	132				3	1	1	1	7	2	4	3	11	4	41							
47-	102				3	1	4	1	5	1	7	3	5	1	28							
46-	22								1	1	1	1	3	1	10							
45-	12										3	1	7	1	3							
44-	1										1	1	10	1	3							
43-	1										0		1	1	1							
42 to 43	1										0		1	1	1							
Total	2862	150	100		294	100	392	100	304	100	181	100	293	100	341	100	840	100		66	100	90
Average height	52.60	54.98			53.85		53.70		53.01		52.60		52.17		51.56		51.20			50.02		
Mean height	52.5	55.0	54.5		54.0		53.5		53.0		52.5		52.0		51.5		51.0			50.5		50.0

CLASS I. (Standard). TABLE V.—Showing the actual, average, and mean HEIGHT of 10,651 Boys and Men between the Ages of 10 and 50 Years.

Height in inches	Age last Birthday													Centimètres.	
	10 years	11-	12-	13-	14-	15-	16-	17-	18-	19-	20-	21-	22-		23 to 50
77-78	—	—	—	—	—	—	—	—	1	1	—	—	—	—	195·5
76-	—	—	—	—	—	—	—	2	2	—	2	1	—	—	193·0
75-	—	—	—	—	—	1	—	4	3	1	3	3	1	1	190·5
74-	—	—	—	—	—	—	2	7	7	9	5	2	2	2	187·9
73-	—	—	—	—	—	—	—	10	30	21	12	13	6	10	185·4
72-	—	—	—	—	1	2	19	49	58	48	37	18	12	11	182·8
71-	—	—	—	1	—	4	16	124	121	72	42	31	27	27	180·3
70-	—	—	1	—	—	10	50	181	214	104	61	58	31	44	177·8
69-	—	—	—	—	8	25	83	227	298	158	82	49	40	47	175·2
68-	—	—	—	2	10	33	129	292	283	169	71	56	45	44	172·7
67-	—	1	—	4	20	77	176	277	250	129	49	52	34	41	170·1
66-	—	—	—	6	45	85	186	263	216	101	41	48	28	32	167·6
65-	—	—	—	10	55	95	149	173	117	65	31	21	19	15	165·1
64-	—	—	1	17	57	130	134	118	94	40	17	8	10	14	162·5
63-	—	—	5	35	95	108	68	78	63	19	6	3	6	2	160·0
62-	—	1	9	50	103	108	56	31	14	9	1	1	1	—	157·4
61-	—	1	19	76	110	86	31	11	8	4	—	—	—	2	154·9
60-	—	6	37	112	120	80	19	6	3	1	—	—	—	—	152·4
59-	—	3	45	124	107	46	18	1	2	—	—	—	—	—	149·8
58-	—	14	62	124	95	36	6	1	—	—	1	—	—	—	147·3
57-	4	30	76	109	61	25	6	1	—	—	—	—	—	—	144·7
56-	7	27	73	77	23	12	2	1	—	—	—	—	—	—	142·2
55-	16	46	80	59	25	4	—	—	—	—	—	—	—	—	139·7
54-	16	47	36	37	18	4	1	—	—	—	—	—	—	—	137·1
53-	23	25	19	15	4	1	1	—	—	—	—	—	—	—	134·6
52-	17	18	16	6	4	1	—	—	—	—	—	—	—	—	132·0
51-	11	11	2	2	4	—	—	—	—	—	—	—	—	—	129·5
50-	3	7	1	2	1	—	—	—	—	—	—	—	—	—	127·0
49-	2	4	1	1	—	1	—	—	—	—	—	—	—	—	124·4
From 48 to 49	2	1	1	—	—	—	—	—	—	—	—	—	—	—	121·9
Total . . .	101	242	490	869	966	974	1102	1852	1724	951	461	361	263	292	—
Mean Height .	53·5	55·0	57·0	59·0	61·0	63·5	66·5	68·0	68·5	68·75	69·0	69·0	69·0	69·0	—
Average Height	53·69	55·23	57·29	59·08	61·29	63·61	66·23	67·81	68·26	68·58	69·08	68·70	68·75	68·84	—

NOTE.—This Table contains statistics derived from the following sources:—*Public Schools*—Clifton, Eton, Felstead, Haileybury, Marlborough, Magdalen, Radley, Wellington, Westminster, and Uppingham. *Military and Naval Colleges*—Britannia, Sandhurst, and Woolwich; the Universities of Oxford and Cambridge and Medical Schools, and the professional classes included in the returns from all other sources.

CLASS I. (Standard). TABLE VI.—Showing the actual, average, and mean WEIGHT (including Clothes) of 9090 Boys and Men between the Ages of 10 and 50 Years.

Weight in lbs.	Age last Birthday													Kilo-grammes	
	10 years	11-	12-	13-	14-	15-	16-	17-	18-	19-	20-	21-	22-		23 to 50
259	—	—	—	—	—	—	—	—	—	—	—	—	—	—	117-58
245-	—	—	—	—	—	—	—	—	—	—	—	—	—	1	111-23
231-	—	—	—	—	—	—	—	—	—	—	—	—	—	—	104-87
217-	—	—	—	—	—	—	—	—	—	—	—	—	—	3	98-51
203-	—	—	—	—	—	—	—	—	4	2	—	2	—	—	92-16
189-	—	—	—	—	—	—	—	8	12	6	2	4	2	5	85-80
175-	—	—	—	—	—	1	4	23	48	34	30	17	10	23	79-45
168-	—	—	—	—	—	1	5	48	69	56	25	29	15	22	76-27
165-	—	—	—	—	—	1	5	30	42	24	20	16	13	8	74-91
160-	—	—	—	—	1	4	12	88	119	70	48	41	24	35	72-64
155-	—	—	—	—	1	2	19	125	143	83	58	46	36	25	70-37
150-	—	—	—	—	—	5	31	155	193	122	65	53	27	40	68-10
145-	—	—	—	—	2	12	64	213	221	132	65	44	20	27	65-83
140-	—	—	—	1	4	18	89	211	226	131	57	35	25	34	63-56
135-	—	—	—	—	10	38	79	221	194	118	36	30	20	16	61-29
130-	—	—	—	1	17	41	110	189	124	84	17	29	12	13	59-02
125-	—	—	—	7	30	62	98	167	118	40	19	11	4	13	56-75
120-	—	—	—	5	42	58	93	102	68	21	6	6	4	3	54-48
115-	—	—	2	12	39	67	77	65	33	11	2	2	3	6	52-21
110-	—	—	1	20	70	66	44	26	20	3	—	—	—	1	49-94
105-	—	—	9	29	65	69	36	17	2	3	—	—	—	—	47-67
100-	—	3	17	64	85	65	30	7	1	—	—	—	—	—	45-40
95-	—	7	29	86	119	47	18	4	—	—	—	—	—	—	43-13
90-	1	8	49	95	106	47	9	3	—	—	1	—	—	—	40-86
85-	2	20	62	108	83	22	6	—	1	—	—	—	—	—	38-59
80-	14	36	81	93	29	14	2	—	—	—	—	—	—	—	36-32
75-	23	47	66	57	33	6	3	—	—	—	—	—	—	—	34-05
70-	30	42	31	31	9	6	—	—	—	—	—	—	—	—	31-78
65-	12	13	15	8	1	—	—	—	—	—	—	—	—	—	29-51
60-	8	6	6	3	2	—	—	—	—	—	—	—	—	—	27-24
From 55 to 60	2	3	1	1	—	—	—	—	—	—	—	—	—	—	24-97
Total . . .	92	185	369	621	748	652	834	1705	1638	940	451	365	215	275	—
Mean Weight.	72-5	77-5	85-0	92-5	102-5	115-0	130-0	142-5	145-0	147-5	150-0	152-5	155-0	155-0	—
Average Weight	73-97	78-72	84-91	91-57	102-15	114-32	129-48	141-66	146-44	148-46	152-36	152-72	152-75	154-59	—

NOTE.— This table contains statistics derived from the following sources:—*Public Schools*—Eton, Felstead, Marlborough, Magdalen, Radley, Wellington, Westminster, Uppingham; *Military and Naval Colleges*—Britannia, Sandhurst, Woolwich, Midshipmen; the Universities of Oxford and Cambridge and Medical Schools, and the Professional Classes included in the returns from all other sources.

CLASS I. (Standard). TABLE VII.—Showing the actual, average, and mean CHEST-GIRTH of 8566 Boys and Men between the Ages of 10 and 50 Years.

Chest-girth in Inches.	Age last Birthday														Centi-metres
	10 Years	11-	12-	13-	14-	15-	16-	17-	18-	19-	20-	21-	22-	23-50	
44-45	—	—	—	—	—	—	—	—	—	—	—	—	—	2	111·7
43-	—	—	—	—	—	—	—	—	—	—	—	—	—	—	109·2
42-	—	—	—	—	—	—	—	—	—	—	—	—	—	3	106·6
41-	—	—	—	—	—	—	—	—	1	2	1	—	—	3	104·1
40-	—	—	—	—	—	—	—	2	2	6	7	4	1	5	101·6
39-	—	—	—	—	—	—	—	9	18	8	8	4	9	13	99·0
38-	—	—	—	—	—	—	7	30	45	28	15	18	12	19	96·5
37-	—	—	—	—	2	—	11	66	98	41	48	36	24	27	93·9
36-	—	—	—	—	—	2	24	151	147	96	69	72	37	43	91·4
35-	—	—	—	—	—	2	9	33	213	245	168	85	69	33	88·9
34-	—	—	—	1	5	13	88	315	338	227	106	72	54	37	86·3
33-	—	—	—	1	8	37	140	347	310	175	69	46	31	33	83·8
32-	—	—	—	2	14	52	146	318	229	123	34	34	18	18	81·2
31-	—	1	1	21	57	104	120	177	127	58	16	11	7	8	78·7
30-	—	2	6	48	89	115	101	78	46	13	3	3	2	4	76·2
29-	—	10	36	82	135	94	47	25	9	4	2	—	—	—	73·6
28-	6	18	57	135	115	86	37	12	—	—	1	—	—	—	71·1
27-	3	23	92	143	81	47	11	6	1	—	—	—	—	—	68·5
26-	11	28	64	79	43	20	7	—	1	—	—	—	—	—	66·0
25-	5	14	31	39	16	6	2	—	—	—	—	—	—	—	63·5
24-	2	2	5	12	6	1	—	1	—	—	—	—	—	—	60·9
23-	—	1	3	3	1	1	1	—	—	—	—	—	—	—	58·4
22-	—	—	—	—	1	—	—	—	—	—	—	—	—	—	55·8
From 21 to 22	1	1	1	—	—	—	—	—	—	—	—	—	—	—	53·3
Total	28	100	297	557	575	587	775	1750	1618	949	464	370	228	268	—
Mean Chest-girth	26·5	27·0	27·5	28·0	29·0	30·25	32·25	33·5	34·25	34·5	35·0	35·25	35·5	35·75	—
Average Chest-girth	26·54	27·26	27·47	28·15	29·18	30·33	32·34	33·82	34·53	34·52	35·15	35·27	35·30	35·79	—

NOTE.—This table contains statistics derived from the following sources:—*Public Schools*—Eton, Felstead, Marlborough, Magdalen, Radley, Wellington, Westminster, Uppingham; *Military and Naval Colleges*—Britannia, Midshipmen, Sandhurst, Woolwich; the Universities of Oxford and Cambridge and Medical Schools and the Professional Classes, included in the returns from all other sources.

CLASS I. (Standard). TABLE VIII.—Showing the actual, average, and mean STRENGTH of 1098 Boys and Men between the Ages of 10 and 50 Years.

Strength, Drawing Power of Arm in Lbs.	Age last Birthday.														Kilo- grammes	
	10 years	11-	12-	13-	14-	15-	16-	17-	18-	19-	20-	21-	22-	23 and under 50		
190	—	—	—	—	—	—	—	1*	1*	—	—	—	—	—	—	—
160	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
155	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
150	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
145	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
140	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2
135	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
130	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
125	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
120	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
115	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
110	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
105	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
90	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
85	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
80	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
75	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
65	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
60	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
55	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
45	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
40	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
From 25 to 30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total . . .	2	25	38	89	174	159	125	98	130	112	49	19	19	59	—	—
Mean Strength	—	37.5	40.0	45.0	50.0	60.0	70.0	80.0	87.5	90.0	92.5	—	95.0	97.5	—	—
Average Strength	—	37.70	39.47	45.81	52.87	60.51	69.42	80.44	86.48	90.00	93.93	88.29	92.76	97.49	—	—

NOTE.—This table includes statistics derived from the following sources:—Public Schools.—Felstead, Marlborough, Westminster; Sandhurst College and Medical Schools; and the Professional Classes included in the general returns from all other sources.

* Not included in the average.

CLASS I. (Standard). TABLE IX.—Showing the average Height, Weight, Chest-girth, and Strength of Arm, and their relation to each other.

Age last Birthday	Averages				Ratios of average height, weight, chest-girth, and strength						Average annual increase				Ratios of average annual increase of height, weight, chest-girth, and strength					
	Height in inches	Weight in lbs. including clothes	Chest-girth in inches	Strength of arm in lbs.	Pounds of weight to one inch of height	Pounds of weight to one inch of chest-girth	Inches of chest-girth to one inch of height	Pounds of strength to one inch of height	Pounds of strength to one inch of chest-girth	Pounds of strength to one pound of weight	Height in inches	Weight in lbs.	Chest-girth in inches	Strength of arm in lbs.	Pounds of weight to one inch of height	Pounds of weight to one inch of chest-girth	Inches of chest-girth to one inch of height	Pounds of strength to one inch of height	Pounds of strength to one inch of chest-girth	Pounds of strength to one pound of weight
10 years	53-69	73-97	26-54	—	1-38	2-03	4-94	—	—	—	—	—	—	—	—	—	—	—	—	—
11-	55-23	78-72	27-26	37-70	1-42	2-89	4-93	68	1-38	48	1-54	4-75	72	—	3-08	6-60	468	—	—	—
12-	57-29	84-91	27-47	39-47	1-48	3-09	4-79	69	1-44	46	2-06	6-19	21	1-77	3-00	29-48	102	86	8-43	29
13-	59-08	91-57	28-15	45-81	1-55	3-25	4-76	78	1-63	50	1-79	6-66	68	6-34	3-72	9-79	380	3-54	9-32	95
14-	61-29	102-15	29-18	52-87	1-67	3-50	4-76	86	1-81	52	2-21	10-58	103	7-06	4-79	10-27	466	3-19	6-85	67
15-	63-61	114-32	30-33	60-51	1-79	3-77	4-77	95	2-00	53	2-32	12-17	1-15	7-64	5-24	10-58	496	3-29	6-64	63
16-	66-23	129-48	32-34	69-42	1-95	4-00	4-88	1-05	2-15	54	2-62	15-16	2-01	8-91	5-79	7-54	767	3-40	4-43	59
17-	67-81	141-66	33-82	80-44	2-09	4-31	4-99	1-19	2-37	57	1-58	12-18	1-48	11-02	7-71	8-23	937	6-97	7-45	91
18-	68-26	146-44	34-33	86-48	2-15	4-27	5-03	1-27	2-52	59	0-45	4-78	0-51	6-04	10-62	9-37	1-133	13-42	11-84	1-26
19-	68-58	148-46	34-52	90-00	2-16	4-30	5-03	1-31	2-61	61	0-32	2-02	0-19	2-04	6-31	10-63	594	6-38	10-74	1-01
20-	69-08	152-36	35-15	93-93	2-20	4-33	5-09	1-36	2-67	62	0-50	3-90	0-63	3-33	7-80	6-19	1-260	7-86	6-24	1-01
21-	68-70	152-72	35-27	88-29	2-22	4-33	5-13	1-29	2-50	58	—	0-36	0-12	—	3-00	—	—	—	—	—
22-	68-75	152-75	35-30	92-76	2-22	4-33	5-13	1-35	2-63	61	0-05	0-03	0-03	4-47	60	1-00	0-600	89-40	149-00	149-00
23-50	68-84	154-59	35-79	97-49	2-25	4-32	5-20	1-42	2-72	63	0-09	1-84	0-49	4-73	20-44	3-76	5-444	52-55	9-65	2-57

CLASS I. (Standard). TABLE X.—Showing the Mean Growth.

Age	Percentage Actual Growth				Percentage Relative Growth (Difference compared with previous year)			
	Height	Weight	Chest-girth	Strength	Height	Weight	Chest-girth	Strength
At 11	2.8	6.9	1.8	—	—	—	—	—
12	3.6	9.7	1.8	6.6	+28.5	+40.6	—	—
13	3.5	8.8	1.8	12.5	-2.7	-9.3	—	+89.4
14	3.4	10.8	3.6	11.1	-2.8	+22.7	+100	-11.2
15	4.1	12.2	4.3	20	+20.6	+12.9	+19.4	+80
16	4.7	13	6.5	16.6	+14.6	+6.5	+51.1	-17.1
17	2.2	9.6	3.8	14.3	-53.2	-26.1	-41.5	+19.1
18	.7	1.7	2.2	9.3	-68.2	-82.0	-40.5	-34.9
19	.3	1.7	.7	2.8	-57.1	—	-68.1	-70
20	.3	1.7	.7	2.7	—	—	—	-3.5
21	.0	1.6	{ .7 }	2.7	—	5.8	—	0
22	.0							
23-50	.0	1.9	.7	2.6	—	+18.7	—	-3.7

The first part of this table (X.) shows the actual percentage growth in each year under each of the four heads. The second part shows the percentage growth of each year, compared with its immediate predecessor, and thus indicates how far the changes under the several heads are similar and contemporaneous, or otherwise.

It will be seen in the first part that there is a constant, but more or less uneven, growth under each head throughout the whole period, increasing annually up to 16 or 17, and then rapidly diminishing.

The data at 10 are not sufficiently reliable for purposes of comparison, because they represent selected boys, who were nearly 11 years old; and those above 20 are imperfect in both numbers and variety. For the first reason it may not be safe to compare the percentage growth at 12 with that at 11, which depends upon the data at 10. On the remainder of the table the following observations may be made:

Between 11 and 14 the rate of growth in height is almost uniform. At 15 it begins to advance more rapidly. At 16 it takes a further advance. But at 17 it falls off by more than one-half, and after that year decreases rapidly.

The same features are observable in the column of weight, except that the increase in the rate begins a year earlier, viz. at 14.

The growth of chest-girth is uniform up to 13, when it becomes double, and then follows nearly the same course as those of height and weight, except that it continues higher at 17 and 18.

The growth of strength follows a more capricious course—doubling itself at 13, making no advance at 14, but making a great stride at 15—continuing longer, and diminishing more slowly than the other heads. The number of observations are at present too few to be fully relied on.

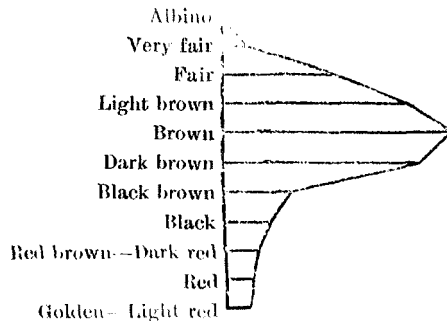
At 14, while the rate of growth in height remains unchanged, there is a large increase in those of weight and chest-girth.

In the second part of the table it will be seen, by comparing the signs + and - at the ages from 15 to 19, and allowing for the irregularity already noticed in the column of strength, the rate of growth in-

creases and decreases at the same period, and with great uniformity of ratio, under all four heads.

III. As to Colour of Eyes and Hair of Class I.

In 1027 observations belonging to the standard or first class, the colour of eyes and hair has been recorded. As to the importance and utility of this branch of the inquiry the Committee may refer to Dr. Pruner-Bey's papers, translated in the 'Journal' of the Anthropological Institute, vol. vi. pp. 71-92; to the 'Manual for Anthropologists,' prepared by the lamented Dr. Paul Broca; and to the 'Notes and Queries on Anthropology,' issued by this Association. It may be useful also to direct attention to the valuable practical remarks of Mr. D. Kaltbrunner, in his 'Mannel du Voyageur' (Zurich, 1879), pp. 504, 505. The types for colour of hair are the ten lithographed pages issued by the Committee in 1877 (see Report for that year). Those for colour of eyes were directed to be: grey, light blue, blue, dark blue, light brown, brown, dark brown, green, black—the colour to be viewed at such a distance that minor variations may blend into one general hue and tint. In the subjoined Table the order of the colours is altered for the reasons given below. The extent to which each colour of hair prevails is shown by the following diagram:—



It is to be regretted that the observations are not sufficiently numerous to distinguish young people from adults, as the darkening of hair goes on with advancing age. Dr. Beddoe has found a decided difference between women of 18-23 and women over 25 years, but has observed the greatest change to take place somewhere about 20-23 in men and earlier in women. He states that the associations generally of hair and eye colours shown by the table agree with his own observations; that green eyes do not occur with black hair; nor so-called black eyes with the blackest hair—this last often accompanying dark grey eyes; and that dark blue eyes are rare with reddish hair, but often accompany dark or even black hair, usually in persons of Irish or Scottish Highland extraction. Other interesting associations may be readily traced in Table XI.

Mr. Roberts (by whom Table XI. was prepared) has contributed the following remarks on the colours of hair and eyes:—

'In the instructions issued by the Committee, the colours of the eyes and hair are arranged in a crescendo scale from fair to black, but I have thought it desirable to classify them according to their anatomical and

CLASS I.—PROFESSIONAL CLASSES.—Table XI., showing the Colour of Hair and Eyes, and their relation to each other, of 1027 Men and Boys from ages 10 to about 50 years.

Colour of Hair		Colour of Eyes									Total	Percentages		
		Light			Mixed		Dark							
		Dark blue	Blue	Light blue	Grey	Green	Light brown	Brown	Dark brown	Black				
Light	Very fair	1	9	4	6	1	5				26	25.3		
	Fair	2	37	24	44	1	4	5	3		120		11.68	
	Light brown	3	49	27	74	14	13	15	1		196			19.08
Dark	Brown	8	37	30	67	23	11	54	13	2	245	23.86		
	Dark brown	9	30	16	59	20	12	41	25	3	215		20.93	
	Black-brown	1	5	3	21	6	14	16	11		77			7.50
Red	Black	3	5	2	8		7	14	15	1	55	5.36		
	Red-brown		5	3	18	4	4	4			38		3.70	
	Red		7	1	11	2	4	3			28			2.73
	Golden		6	6	9	3	2	1			27			
Total		27	190	116	317	74	76	153	68	6	1027	100		
Percentages		2.62	18.50	11.30	30.87	7.20	7.40	14.90	6.62	.59	100			
			32.42		38.07			29.51						

physiological relations to each other. The iris, on which the colour of the eye depends, is a thin membranous structure composed of unstriped muscular fibres, nerves, and blood-vessels, held together by a delicate network of fibrous tissue. On the inner surface of this membrane there is a layer of dark purple pigment called the *wea* (from its resemblance to the colour of a ripe grape), and in brown eyes there is an additional layer of yellow (and perhaps brown-red) pigment on its outer surface also, and in some instances there is a deposit of pigment amongst the fibrous structures. In the albino, where the pigment is entirely absent from both surfaces of the iris, the bright red blood is seen through the semitransparent fibrous tissues of a pink colour; and in blue eyes, where the outer layer of pigment is wanting, the various shades are due to the dark inner layer of pigment—the *wea*—showing through fibrous structures of different densities or degrees of opacity. The eyes of new-born infants of both white and black races (and I believe the new-born young of all the lower animals) are dark blue, in consequence of the greater delicacy and transparency of the fibrous portion of the iris; and as these tissues become thickened by use, and by advancing age, the lighter shades of blue, and finally grey are produced; the grey, indeed, being chiefly due to the colour of the fibrous tissues themselves. In grey eyes, moreover, we see the first appearance of the superficial layer of yellow pigment in the form of isolated patches situated around the margin of the pupil, or in rays

running across the iris. In the various shades of green eyes the yellow pigment is more uniformly diffused over the surface of the iris, and the green colour is due to the blending of the superficial yellow pigment with the blue and grey of the deeper structures. In the hazel and brown eyes the *uvea* and the fibrous tissues are hidden by increasing deposits of yellow and brown pigment on the anterior surface of the iris, and when this is very dense black eyes are the result. It is very doubtful, however, whether the iris is ever so dark-coloured in the inhabitants of this country as to justify the term black being applied to it, and the popular use of the expression has reference to the widely dilated pupil common in persons with dark brown eyes. The nearest approach to a black eye among us is the dark blue or violet eye associated with black hair in some Irish adults; here the colour is probably not entirely due, as in infants, to the greater transparency of the fibrous structures, but to interstitial deposit of black pigment, or to a layer situated on the anterior surface of the iris.

'As the observations included in the above table were made by many different persons without specific directions or colour-tests, and as the shades are not well-defined and are too numerous for easy analysis, I have combined them into three large groups—the light, including the shades of blue; the mixed, including the grey and green; and the dark, including the brown and so-called black eyes, in order to correct some obvious errors of observation. Green eyes are more common than the table indicates, and no doubt many cases of green eyes have been recorded as grey, and probably a few as light brown. On the other hand the number of grey eyes appears to be out of proportion to the rest, and this column probably includes a number of light blue as well as grey and green eyes.

'Mr. H. C. Sorby, F.R.S., has examined the colouring matter of the hair,' and has separated three pigments which he describes as brown-red, yellow, and black; and he attributes the different shades of the colour of hair to one of these pigments, or to their combination in different proportions. Thus, fair and brown hairs owe their colours chiefly to yellow and black pigment; and the shades of red hair to red and black pigments, the brightest red having the least black or yellow. Acting on these investigations, and bearing in mind that amongst black-haired races red (and not yellow) hair frequently occurs, and is generally associated with black hair in this country, I have interposed the black between the yellow and red shades in the table. This arrangement has the advantage of separating the browns and the reds, and of showing how the black overshadows these colours as the hair darkens by advancing age; and it is useful in distinguishing the chief racial elements of our population. The diagram shows the quantity of hair of each colour, and the relation which the colours bear to each other above the age of 10 years. If the observations commenced at birth, and were grouped in periods of four or five years, the curve would change with advancing age, and the apex would move gradually from the fairer to the darker shades. By grouping the whole of the observations into fair, dark, and red, as I have done in the table, we see the prevailing complexion of the higher and professional classes in this country.'

IV. *As to Town and Country Origin of Class I.*

Though the statistics as yet obtained are not sufficient to show conclusively the different tendencies of town and country life, an attempt has

¹ *Jour. Anthropol. Inst.*, vol. viii.

been made to elicit from the returns of height and weight relatively to age some particulars as to the effect of town and country origin respectively on growth of this class. The means for this is given by the following extract from the General Instructions issued by the Committee with the Forms of Schedule:—

‘ORIGIN.—If the individual has lived habitually in the country he should be noted as “country folk.” This, however, is not to include residence in large country towns (more than 5000 inhabitants), unless the individual so residing is habitually occupied in country pursuits. If both father and mother are also country folk in the sense above defined the entry should be “pure country folk.” In cases where the history of all four grandparents is known, and they or the majority of them were all country folk, the entry should have the word “very” prefixed; thus, “very pure country folk.” If he is of country birth, but has lived in a town since he was a boy, the entry should be “c birth, t since boy.” This form admits of all required variations by writing “p e” or “v p e” instead of “c,” and “child,” “youth,” or “manhood” instead of “boy.” As regards other cases, too numerous to attempt to define, in which a doubt may exist as to the proper entry, leave a blank.

‘Similar instructions to be observed as regards townfolk.’

The returns of cadets at Sandhurst, scholars at Westminster, students at Aberystwith, medical students at London Hospital, and scholars at Felstead, afford the means of making this distinction, at ages from ten to thirty, in the following number of cases:—

Country	263	} Total of country origin	379
Pure country	40		
Very pure country	50		
Country birth, town since	26	} Total of town origin	250
Town	210		
Pure town	17		
Very pure town	5	} Total observed	629
Town birth, country since	18		

The observations give a slight advantage in both height and weight relatively to age to country origin over town origin. Taking the two years of age, eighteen and nineteen, in which there are the largest number of observations in each class to afford an average, the 161 country lads have an average height of 68·2 inches and weight of 141 lbs., while the seventy-nine town lads have an average height of 68·0 inches and weight of 139·5 lbs. The distinction is not so easily followed through the grades of purity in consequence of the small number of observations in some of them, but it seems to prevail, the averages at the two ages named being—

	Height	Weight		Height	Weight
Country	68·1	142	Town	67·9	139
Pure	67·4	138	Pure	67·5	136
Very pure	68·8	142	Very pure	71	[2 cases only.] 155
Country birth, } town since }	68·2	139	Town birth, } country since }	68·2	142

These observations being deduced from the standard class present less difference than may be expected from a comparison derived from the peasants and artisans, as persons of this class rarely spend their lives exclusively either in the country or in towns.

The following are full details:—

TABLE XII.—Table showing the Average Height in Inches at each of the undermentioned Ages of Persons of the different grades of Country Origin.

Age	Country Origin										
	Country		Pure Country		Very Pure Country		Country Birth, Town since Boy or Child		All the Grades of Country Origin		
	Number of Observations	Average Height in Inches	Number of Observations	Average Height in Inches	Number of Observations	Average Height in Inches	Number of Observations	Average Height in Inches	Number of Observations	Average Height in Inches	
10-	1	53.5	—	—	—	—	—	—	—	1	53.5
11-	4	57.0	—	—	—	—	—	—	—	4	57.0
12-	8	57.5	—	—	—	—	—	—	—	8	57.5
13-	9	59.5	1	58.5	—	—	—	—	—	10	59.4
14-	23	62.7	5	62.1	—	—	—	—	—	28	62.6
15-	23	65.5	4	66.3	2	67.5	—	—	—	29	65.7
16-	25	66.9	3	67.2	3	66.8	—	—	—	31	67.0
17-	25	68.1	1	64.8	2	69.5	2	68.5	—	33	67.8
18-	59	67.4	10	67.9	18	68.4	4	66.8	—	91	67.7
19-	38	68.8	6	66.8	15	69.2	11	68.6	—	70	68.7
20-	20	69.1	2	67.0	6	69.1	4	71.0	—	32	69.2
21-	7	68.6	2	66.0	2	68.5	2	69.0	—	13	68.3
22-	13	69.1	1	68.5	1	65.5	2	69.0	—	17	68.9
23-	6	67.7	1	70.5	—	—	1	72.5	—	8	68.6
24-	1	70.5	1	67.5	1	68.5	1	68.5	—	4	68.8
25-30	3	70.2	1	66.5	—	—	1	71.5	—	5	69.7
Total	265	—	41	—	50	—	28	—	384	—	—

TABLE XIII.—Table showing the Average Height in Inches at each specified Age of Persons of different grades of Town Origin.

Age	Town Origin										
	Town		Pure Town		Very Pure Town		Town Birth, Country since Boy or Child		All the Grades of Town Origin		
	Number of Observations	Average Height in Inches	Number of Observations	Average Height in Inches	Number of Observations	Average Height in Inches	Number of Observations	Average Height in Inches	Number of Observations	Average Height in Inches	
10-	1	52.5	—	—	—	—	—	—	—	1	52.5
11-	3	53.5	—	—	—	—	—	—	—	3	53.5
12-	6	58.7	1	55.5	—	—	—	—	—	7	58.2
13-	12	59.9	—	—	—	—	—	—	—	12	59.9
14-	29	61.2	—	—	1	62.5	—	—	—	30	61.2
15-	25	64.9	5	64.5	—	—	—	—	—	30	64.8
16-	25	66.3	—	—	1	66.5	—	—	—	26	66.3
17-	23	67.5	1	69.5	1	66.5	3	66.5	—	28	67.4
18-	23	68.0	5	67.1	—	—	5	69.3	—	33	68.1
19-	35	67.9	4	68.0	2	71.0	5	67.1	—	46	67.9
20-	13	67.8	—	—	—	—	1	69.5	—	14	67.9
21-	5	66.7	1	69.5	—	—	2	68.0	—	8	67.4
22-	4	66.3	—	—	—	—	1	71.5	—	5	67.3
23-	3	66.5	—	—	—	—	1	67.5	—	4	66.8
24-	—	—	—	—	—	—	—	—	—	—	—
25-30	3	68.2	—	—	—	—	—	—	—	3	68.2
Total	210	—	17	—	5	—	18	—	250	—	—

TABLE XIV.—Table showing the Average Weight in Pounds at each of the undermentioned Ages of Persons of different grades of Country Origin.

Age	Country Origin									
	Country		Pure Country		Very Pure Country		Country Birth, Town since Boy or Child		All the Grades of Country Origin	
	Number of Observations	Average Weight in Pounds	Number of Observations	Average Weight in Pounds	Number of Observations	Average Weight in Pounds	Number of Observations	Average Weight in Pounds	Number of Observations	Average Weight in Pounds
10-11	1	72.5	—	—	—	—	—	—	1	72.5
11	1	72.5	—	—	—	—	—	—	4	72.5
12	8	77.5	—	—	—	—	—	—	8	77.5
13	9	90.3	1	92.5	—	—	—	—	10	90.5
14	23	103.6	5	102.5	—	—	—	—	28	103.4
15	23	114.7	4	116.3	2	112.5	—	—	29	114.7
16	25	125.5	3	130.8	2	127.5	—	—	30	126.2
17	24	136.0	4	115.0	2	142.5	2	142.5	32	134.2
18	59	135.0	10	140.0	18	142.5	4	135.0	91	137.1
19	39	148.4	6	135.8	15	142.2	9	143.6	69	145.3
20	20	147.8	2	142.5	6	147.5	4	168.7	32	150.0
21	7	147.5	2	142.5	2	152.5	2	150.0	13	147.9
22	11	154.8	1	147.5	1	132.5	2	155.0	15	152.8
23	6	149.2	1	162.5	—	—	1	152.5	8	151.3
24	1	147.5	1	162.5	1	157.5	1	162.5	4	157.5
25-30	3	167.5	—	—	1	132.5	1	177.5	5	162.5
Total	263	—	10	—	50	—	26	—	379	—

TABLE XV.—Table showing the Average Weight in Pounds at each specified Age of Persons of different grades of Town Origin.

Age	Town Origin									
	Town		Pure Town		Very Pure Town		Town Birth, Country since Boy or Child		All the Grades of Town Origin	
	Number of Observations	Average Weight in Pounds	Number of Observations	Average Weight in Pounds	Number of Observations	Average Weight in Pounds	Number of Observations	Average Weight in Pounds	Number of Observations	Average Weight in Pounds
10-	1	67.5	—	—	—	—	—	—	1	67.5
11	3	60.8	—	—	—	—	—	—	3	60.8
12	6	78.3	1	77.5	—	—	—	—	7	78.2
13	14	85.4	—	—	—	—	—	—	14	85.4
14	29	94.2	—	—	1	107.5	—	—	30	94.7
15	26	114.6	4	116.3	—	—	—	—	30	114.8
16	25	123.5	—	—	1	132.5	—	—	26	123.8
17	23	133.4	1	132.5	1	117.5	3	120.8	28	131.4
18	23	136.4	5	133.5	—	—	5	145.5	33	137.3
19	34	141.6	4	138.8	2	155.0	5	138.5	45	141.6
20	10	147.5	—	—	—	—	1	147.5	11	147.5
21	5	144.5	1	152.5	—	—	2	152.5	8	147.5
22	4	135.0	—	—	—	—	1	162.5	5	140.5
23	3	135.8	—	—	—	—	1	142.5	4	137.5
24-	—	—	—	—	—	—	—	—	—	—
25-30	5	134.5	—	—	—	—	—	—	5	134.5
Total	211	—	16	—	5	—	18	—	250	—

TABLE XVI.—Table showing the Average Height and Weight at each Age of Persons of all grades of Country Origin, of all grades of Town Origin, and of all grades of Town and of Country Origin.

Age	All the Grades of Country Origin			All the Grades of Town Origin			Total of all Grades		
	No. Obs.	Height Inches	Weight Pounds	No. Obs.	Height Inches	Weight Pounds	No. Obs.	Height Inches	Weight Pounds
10-	1	53.5	72.5	1	52.5	67.5	2	53.0	70.0
11-	4	57.0	72.5	3	53.5	60.8	7	55.4	67.5
12-	8	57.5	77.5	7	58.2	78.2	15	57.8	77.8
13-	10	59.4	90.5	14	59.9	85.4	24	59.7	87.5
14-	28	62.6	103.4	30	61.2	94.7	58	61.9	98.9
15-	29	65.7	114.7	30	64.8	114.8	59	65.2	114.8
16-	30	67.0	126.2	26	66.3	123.8	56	66.7	125.1
17-	32	67.8	134.2	28	67.4	131.4	60	67.6	132.9
18-	91	67.7	137.1	33	68.1	137.3	124	67.8	137.1
19-	69	68.7	145.3	45	67.9	141.6	178	68.4	143.9
20-	32	69.2	150.0	11	67.9	147.5	43	68.8	149.4
21-	13	68.3	147.9	8	67.4	147.5	21	67.9	147.7
22-	15	68.9	152.8	5	67.3	140.5	20	68.5	149.8
23-	8	68.6	151.3	4	66.8	137.5	12	68.0	146.7
24-	4	68.8	157.5	—	—	—	4	68.8	157.5
25-30	5	69.7	162.5	5	68.2	131.5	10	69.1	148.5
10 and under	13	57.0	75.6	11	56.4	72.5	24	56.8	74.2
13 "	16	67	106.4	74	62.5	101.1	141	63.0	103.6
16 "	19	153	131.3	87	67.4	131.4	240	67.5	133.3
19 "	22	114	146.9	64	67.9	143.4	178	68.4	145.6
22 "	25	27	153.1	9	67.1	139.2	36	68.4	149.6
25 "	30	5	162.5	5	68.2	131.5	10	69.1	148.5

MEM.—Comparing the two columns headed 'All Grades of Country Origin' and 'All Grades of Town Origin,' it will be observed that those of country origin have in nearly every case an advantage in height and weight over those of town origin; and on referring to the table at foot, where the results are given in periods of three years, this will be still more noticeable.

V. As to Growth.

One very interesting branch of the inquiry with which your Committee is charged is the annual development of young people of both sexes; but the opportunity of obtaining such information continued over a considerable number of years is very rare, and the Committee have as yet been able to procure only one return of this nature. It relates to the yearly growth of a small number of children of American parents, presented by Dr. Bowditch, Professor of Physiology in Harvard Medical School. But they are of opinion that the publication of it, and of some results which have been deduced from it by the Committee, may be useful in suggesting to persons who are in possession of similar observations, however few in number, and limited in period of record, to communicate them to the Committee. Many parents take the height of their children periodically; a few perhaps take their weight also. An examination of Tables XVII. and XVIII., and the remarks thereon, will show to what good account a collocation and comparison of such facts may be turned.

Table XVII. is a comparative statement abstracted by Sir Rawson Rawson from Dr. Bowditch's original table, of which Table XVIII. is a copy.

TABLE XVII.—Comparative Statement of the Annual Growth of a certain number of American Boys and Girls (12 boys and 13 girls) as far as recorded, from birth to 22 years of age, abstracted from the following Table.

Years	Number of Cases		Average Height in Inches		Annual Growth in Inches						
	Males	Females	Males	Females	Males			Females			
					Max.	Min.	Average	Average	Max.	Min.	
From birth to 1 year	8	1	—	23	—	—	—	—	8.1	—	—
" 1 year " 2 years	8	7	29.1	27.8	5	2.5	3.72	4.13	5.3	2.8	
" 2 years " 3 "	8	8	32.3	31.6	5.3	2.5	3.52	3.74	5.1	2.7	
" 3 " 4 "	8	9	36.3	35.6	4.4	1.4	2.78	2.97	3.7	2.1	
" 4 " 5 "	9	10	39.5	38.3	3.3	1.5	2.42	2.52	2.9	1.9	
" 5 " 6 "	10	10	42.1	40.9	3.1	1.1	2.50	2.41	3.1	1.7	
" 6 " 7 "	10	11	44.6	43.5	2.9	1.3	2.26	2.42	2.9	1.7	
" 7 " 8 "	12	11	46.6	45.8	3.6	2.1	2.61	2.34	2.8	2	
" 8 " 9 "	12	12	49.3	48.5	4	1.4	2.33	2.23	3	1.3	
" 9 " 10 "	12	12	51.6	50.6	2.3	1.4	1.84	2.11	2.8	1.4	
" 10 " 11 "	12	12	53.5	52.7	2.2	1.5	1.91	2.18	2.6	1.4	
" 11 " 12 "	12	13	55.5	54.8	2.5	1.2	1.88	2.70	6.1a	1.4	
" 12 " 13 "	11	13	57.3	57	3.9	.9	2.04	3.07	4.9b	2.3	
" 13 " 14 "	11	13	59.5	60.3	4.7	1.1	2.52	1.95	3.3	.9b	
" 14 " 15 "	11	13	62	62.2	3.9	1.7	2.36	1.29	3.5	.1	
" 15 " 16 "	11	12	64.2	63.5	3.8	.5	2.31	.76	1.3	.0	
" 16 " 17 "	10	12	66.4	63.8	2.5	.5	1.45	.61	1.4	.1	
" 17 " 18 "	9	11	68.3	64.7	2.3	.1	.98	.21	.7	.0	
" 18 " 19 "	8	6	69	64.9	1.8	.1	.76	.49	.7	.15	
" 19 " 20 "	7	3	70.5	65.2	1.0	Nil	.26	.43	.9	.2	
" 20 " 21 "	5	7	70.7	66.2	.45	.05	.25	—	—	—	
" 21 " 22 "	3	—	70.9	—	.15	.05	.27	—	—	—	

a. The same girl.

b. The same (another) girl.

The accompanying charts, Nos. II. and III. (Plates V. and VI.), show tracings of Prof. Bowditch's observations on the successive growth in stature of twelve boys and thirteen girls nearly related in blood and of the professional class. The tracings for each individual cannot be followed throughout on account of the intersections and overlapping which occur, but they are sufficiently distinct to show the relative course which each and all have run. A marked feature in the charts when compared together is the greater regularity and parallelism of the growth of girls, especially at the earlier periods of life. From this it is obvious that the physical development of boys is subject to more powerful modifying agencies than that of girls, which is attributable to the more varied lives boys lead, and to the lower degree of viability which they possess even from the period of birth. Some of the irregularities shown by the tracings are probably due to slight errors of observation, but the deviations in direction are clearly due to external causes; if the tracings had been made at the time the measurements were taken, and the apparent causes of the deviations had been recorded, we should possess some very interesting charts of the physical history of each individual, and many useful facts illustrating the influence of *media* on the growth of the human body.

TABLE XVIII.—Table showing the Height and Annual Growth (in feet, inches, Bowditch, Professor of Physiology

Females	Age last										
	Birth	1	2	3	4	5	6	7	8	9	10
Lillie . . .	—	—	—	—	—	—	—	—	—	—	—
Mary . . .	—	—	—	—	—	—	—	—	4-0-0	4-2-3	4-4-
Alice . . .	—	2-5-	2-7-8	2-11-	3-1-1	3-3-7	3-6-5	3-8-7	3-10-8	—	4-3-
Charlotte . . .	—	2-4-	2-9-	3-0-8	3-3-9	3-6-8	3-8-9	3-11-6	4-2-1	4-3-4	4-6-
Lucy . . .	—	2-4-5	2-9-3	3-0-7	3-3-7	3-6-6	3-8-8	3-10-6	4-1-1	4-3-7	4-6-
Lily . . .	1-11-	2-7-1	2-10-	3-1-2	3-4-1	3-6-4	3-9-2	3-11-6	4-2-0	4-4-3	4-6-2
Livy . . .	—	—	—	—	3-1-8	3-4-2	3-6-8	3-8-5	3-11-0	4-2-0	4-4-1
Fanny . . .	—	—	—	—	—	—	3-9-4	4-0-3	4-2-5	4-4-1	4-6-9
Esther . . .	—	—	—	3-0-4	3-3-1	3-5-6	3-7-3	3-9-5	3-11-5	4-1-8	4-4-3
Susan . . .	—	—	2-5-6	2-9-8	3-0-8	3-3-2	3-6-3	3-8-7	3-11-1	4-1-7	4-3-6
Arria . . .	—	2-1-	2-6-3	2-11-4	3-2-3	3-4-8	3-6-7	3-9-6	—	4-1-9	4-3-8
Mary . . .	—	2-2-6	2-6-5	—	3-1-4	3-4-2	3-6-4	3-8-7	—	4-2-3	4-3-7
Annie . . .	—	2-2-8	2-6-3	2-10-6	3-1-4	3-3-3	3-6-0	3-8-1	3-10-3	4-0-6	4-2-8
Average Height } . . .	—	2-3-8	2-7-6	2-11-7	3-2-4	3-4-9	3-7-5	3-9-8	4-0-5	4-2-6	4-4-7
Annual Increase } . . .	—	—	3-8	4-1	2-7	2-5	2-6	2-3	2-7	2-1	2-1
Males											
Frank . . .	—	—	—	—	—	3-7-8	3-10-7	4-1-4	4-4-4	4-7-	4-8-8
Wewy . . .	—	—	—	—	—	—	—	3-8-4	3-10-9	4-1-3	4-3-2
Charles . . .	—	—	—	—	3-6-2	3-9-0	4-0-	4-2-3	4-4-9	4-7-5	4-9-4
Alfred . . .	—	2-8-3	3-0-6	3-3-8	3-6-7	3-9-0	3-11-8	4-2-2	4-4-7	4-7-3	4-9-3
Nat . . .	—	—	—	—	—	—	—	3-11-	4-1-7	4-3-2	4-5-
Ned . . .	—	2-4-3	2-9-	3-0-	3-2-3	3-5-6	3-7-7	3-9-8	4-0-	4-2-3	4-4-2
Vin . . .	—	2-8-2	3-0-	3-3-2	3-5-6	3-7-3	3-10-0	4-0-3	4-2-7	4-5-4	4-7-0
James . . .	—	2-2-2	2-4-7	2-10-	3-2-4	3-5-5	3-7-8	3-10-7	4-0-8	4-4-8	4-6-6
Ernest . . .	—	2-4-	2-9-	2-11-9	3-3-8	3-5-9	3-8-2	3-11-	4-1-7	4-3-4	4-4-8
John . . .	—	2-4-	2-8-	3-0-3	3-2-5	3-5-3	3-8-4	3-10-3	4-0-6	4-2-0	4-4-3
Arthur . . .	—	2-5-	2-7-5	2-10-	2-11-4	3-1-6	3-2-7	3-4-	3-7-6	3-10-	4-0-
Basil . . .	—	2-5-	2-8-	2-11-8	3-2-5	3-4-0	3-6-7	3-8-6	3-11-4	4-1-4	4-3-1
Average Height } . . .	—	2-5-1	2-9-5	3-0-3	3-3-5	3-6-1	3-8-6	3-10-6	4-1-3	4-3-6	4-5-5
Annual Increase } . . .	—	—	4-4	2-8	3-2	2-6	2-5	2-0	2-7	2-3	1-9

NOTE.—The measurements were all taken annually during the last 25 years, and the 1872, and The Growth of Children, 'Eighth Ann.

and tenths) from year to year of 25 children of both sexes. By Dr. H. P. at Harvard Medical School.

Birthday												
11	12	13	14	15	16	17	18	19	20	21	22	
4-4.6	4-6.1	4-11	4-11.9	5-2.3	5-3.6	5-4.2	5-4.7	5-5.1	5-5.3	—	—	
4-4.7	4-10.8	5-1.4	5-2.6	5-3	5-3	5-3.3	5-3.6	—	—	—	—	
4-5.3	4-8.4	4-11.5	—	5-3.4	5-4.5	5-4.6	—	5-5.3	5-6	—	—	
4-8.5	4-10.8	5-2.1	5-4.6	—	—	5-6.3	—	5-6.9	5-7.8	—	—	
4-8.3	4-10.5	5-0.9	5-4	5-4.7	5-5.6	5-7	5-7.3	—	—	—	—	
4-8.2	4-10	5-0.4	5-3.7	5-5.1	5-5.6	5-6.4	5-6.6	—	—	—	—	
4-6.7	4-10.3	5-0.8	5-2.3	5-3.2	5-3.9	—	5-4.2	5-4.9	—	—	—	
4-9.3	5-0.2	5-2.7	5-4	5-4.7	—	5-5	5-5	5-5.7	5-5.9	—	—	
4-6.5	4-9.5	4-11.8	5-0.9	—	5-1.1	5-2.3	5-2.4	—	—	—	—	
4-6.2	4-9.5	4-11.8	5-1.3	5-1.8	5-1.2	5-3	—	5-3.3	—	—	—	
4-6.3	4-8.5	—	5-2.1	5-4.2	—	—	—	—	—	—	—	
4-5.6	4-7	4-11	5-0	5-3.5	5-4.4	5-4.6	—	—	—	—	—	
4-5	4-6.9	4-10	5-1.2	5-2.8	5-4.2	5-5.2	5-5.2	—	—	—	—	
4-6.8	4-9	5-0.3	5-2.2	5-3.5	5-3.8	5-4.7	5-4.9	5-5.2	5-6.2	—	—	feet & inches
2.1	2.4	3.3	1.9	1.3	0.3	0.9	0.2	0.3	1.0	—	—	inches
4-10.8	5-0	5-2.9	5-7.6	5-9.3	5-9.8	5-10.4	5-10.5	5-11.3	5-11.4	5-11.6	—	
4-5.0	4-7.2	4-9	4-11	5-1.4	5-4.7	5-7.2	5-8.8	5-9.5	5-9.8	5-10	—	
4-11.2	5-1.1	5-3	5-4.4	5-6.3	5-9.2	5-11.3	6-0.8	6-0.9	6-1	—	—	
4-11.4	5-1.2	5-2.8	5-4.5	—	5-8.4	—	—	—	—	—	—	
4-7	4-9.5	4-11.3	5-1	5-3.2	5-5.6	5-7.7	5-10	5-10.8	5-10.9	5-11	5-11.3	
4-5.8	4-7.9	4-9.9	5-1	5-4.9	5-8.7	5-9.2	5-9.4	5-10	5-10	—	5-10.1	
4-9.2	4-11.3	5-3.2	5-6.8	5-8.8	—	5-10.5	—	—	—	—	—	
4-8.5	4-10	4-10.9	5-2.9	5-4.7	—	5-8	5-8.7	5-9	5-9.2	—	5-9.9	
4-7.0	4-9.2	4-11.5	5-1.7	5-4.2	5-7.5	—	5-9.6	5-10.6	—	—	—	
—	4-7.4	4-9.2	4-10.3	5-1.4	5-3.7	—	5-8	5-9.8	5-10.8	—	—	
4-2.1	4-4.0	4-5.4	4-7.6	4-10.1	5-0.6	5-2.6	5-3.4	—	—	—	—	
4-5	4-6.8	—	—	—	—	—	—	—	—	—	—	
4-7.5	4-9.3	4-11.5	5-2	5-4.2	5-6.4	5-8.3	5-9	5-10.5	5-10.7	5-10.9	5-10.4	feet & inches
2.0	1.8	2.2	2.5	2.2	2.2	1.9	0.7	1.5	0.2	0.2	—	inches

individuals were all nearly related to each other. See 'Boston Med. & Surgical Journal,' Dec. Rep. of the State Board of Health of Mass., 1877.

					Boys	Girls
From 1 to 3	they are equal, viz.:				5.2	5.2 inches
" 3 "	5 a slight excess among boys, averaging annually	3.8	to	3.3	"	"
" 5 "	7 exactly equal .				3.0	3.0 "
" 7 "	9 an excess among boys .				3.8	2.9 "
" 9 "	11 " " girls .				2.2	2.7 "

At 11 to 13 there are in this table two cases of unusual growth among the girls, viz., 6.1 and 4.9 inches in one year respectively; and it is remarkable that in the first case the girl grew only 0.7 inch in the preceding year, and in the second case the girl (a different one) grew only 0.9 inch in the succeeding year. No such remarkable case occurred among the boys. After eliminating these two cases, the excess in this period remains in favour of the girls, but after 13 it preponderates greatly among the boys:—

					Boys	Girls
From 11 to 13	the excess among the girls, averaging annually	3.2	to	4.1	inches	
" 13 "	17 " " boys, " " "				3.7	2.4 "
" 17 "	20 " " " " " " "				1.7	0.8 "

7° Treating the minima in the same way, those of the boys are uniformly lower than those of the girls up to the age of 7, viz. :—

					Boys	Girls
From 1 to 7	the excess among the girls, averaging annually	1.7	to	2.1	inches	
" 7 "	11 " " boys, " " "				1.6	1.3 "

At 11 to 13 the minima of the girls are, like their maxima, exceptional; showing that in these two years the growth of girls is not only exceptionally, but at both ends of the scale usually, in excess of that of boys.

					Boys	Girls
From 11 to 13	the excess among the girls, averaging annually	1.0	to	1.8	inches	
" 13 "	19 " " boys, " " "				0.7	0.2 "

8° The following table would be of considerable interest if it were based on a larger number of cases. As far as it goes, it shows that in both sexes a rapid annual growth, of 3 inches or more, occurs chiefly between the ages of 1 to 3 and 11 to 16, the proportion being greater among girls at the latter age, while it is greater among boys between 4 and 11.

Number of Cases of Rapid Growth at Different Ages.

Ages	Boys			GIRLS			
	3 to 4 inches	4 to 5 inches	5 to 6 inches	3 to 4 inches	4 to 5 inches	5 to 6 inches	Above 6 inches
At 1	2	3	1	1	1	2	0
" 2	4	1	1	3	2	1	0
" 3	2	1	0	3	0	0	0
" 4	1	0	0	0	0	0	0
" 5	2	0	0	1	0	0	0
" 6	1	0	0	0	0	0	0
" 7	1	0	0	0	0	0	0
" 8	0	1	0	1	0	0	0
" 9	0	0	0	0	0	0	0
" 10	0	0	0	0	0	0	0
" 11	0	0	0	5	0	0	1
" 12	1	0	0	1	3	0	0
" 13	2	2	0	3	0	0	0
" 14	2	0	0	1	0	0	0
" 15	2	0	0	0	0	0	0
" 16	1	0	0	0	0	0	0

Percentage Proportion of above in Three Periods.

		Boys	Girls
From 1 to 3	.	48.4	44.8
" 4 " 10	.	19.4	6.9
" 11 " 16	.	32.2	48.3
Total		100	100

The importance of the period between 11 and 13 among girls is again illustrated by the above comparison.

9° Of continuous rapid growth the instances were not numerous, but they were more striking among the girls, and chiefly at an early age.

Boys in 3 years from	1 to 3	}	1	grew 10.5 inches
			1	" 11.8 "
			1	" 12.2 "
" 2 "	12 " 14	}	1	" 7.5 "
			1	" 7.7 "
" 2 "	14 " 16	}	1	" 10.6 "
			1	" 10.8 "
Girls in 3 "	1 " 3	}	1	" 11.2 "
			1	" 11.9 "
			1	" 10.4 "
" 2 "	1 " 3	1	" 8.7 "	
" 2 "	11 " 13	1	" 8.1 "	
" 2 "	12 " 14	1	" 8.1 "	

10° The following table would be of much value if the observations were more numerous. The periods have been divided according to evident changes in the average growth of one or both sexes. It will not escape remark that the average growth of both sexes between 3 and 9 was exactly equal.

From 1 to 3	average annual growth	Boys	Girls
3 " 9	" "	3.61	3.87 inches
" 9 " 11	" "	2.48	2.48 "
" 11 " 13	" "	1.87	2.14 "
" 13 " 17	" "	1.97	2.88 "
" 17 " 20	" "	2.16	1.15 "
		0.66	0.38 "

The more general, but not less valuable, remarks of Professor Bowditch on his original table, published in the 'Boston Medical and Surgical Journal' of December 19, 1872, are as follows:—

'The measurements were all taken annually during the last twenty-five years, and the individuals were all nearly related to each other. An examination of the curves shows the following facts:—

'1. Growth is most rapid during the earliest years of life.

'2. During the first twelve years boys are from one to two inches taller than girls of the same age.

'3. At about twelve and a half years of age girls begin to grow faster than boys, and, during the fourteenth year, are about one inch taller than boys of the same age.

'4. At fourteen and a half years of age boys again become the taller, girls having, at this period, very nearly completed their growth, while boys continue to grow rapidly till 19 years of age.'

The Committee adds the following table illustrative of the greater weight as well as height of girls during a critical period of life, abstracted from Mr. Roberts's paper on 'Factory Children' (1876).

TABLE XIX.—Table showing the relative HEIGHT and WEIGHT of Boys and Girls in England at the age of 13-14 years. (C. Roberts.)

Class of Children	Height.					
	Boys		Girls		Difference	
	No.	Inches	No.	Inches	Boys	Girls
Stanway, 1833, Factory Children	45	54.48	63	55.64	—	1.16
„ 1833, Non-factory „	22	54.98	18	55.07	—	0.09
Ferguson, 1871-3, Factory „	—	—	—	—	—	—
Roberts, 1873, Non-factory „	24	55.21	14	56.08	—	0.87

Class of Children	Weight					
	Boys		Girls		Difference	
	No.	lbs.	No.	lbs.	Boys	Girls
Stanway, 1833, Factory Children	45	72.11	63	73.25	—	1.14
„ 1833, Non-factory „	22	75.36	18	72.72	2.63	—
Ferguson, 1871-3, Factory „	494	68.72	542	70.25	—	1.53
Roberts, 1873, Non-factory „	35	76.48	27	77.58	—	1.10

VI. Marlborough College Statistics.

Though it does not in any degree enter into the contemplation of the Committee to discuss the returns of any particular college or establishment in detail, and indeed it would be foreign to their purpose to furnish the means of comparison that might be invidious between one institution and another, the series of 1850 observations made during several years by Dr. Ferguson on boys in Marlborough College, and communicated to the Committee by the Rev. T. A. Preston, have been thought by the Committee to constitute an exception, and it has been considered advisable to prepare abstracts of them as affording an excellent example of the usefulness of systematic records. These have been prepared by Sir Rawson W. Rawson for each quarter of a year of age, in the same manner as those of the boys at Christ's Hospital, contained in the Committee's last Report. See Tables XX. to XXIII., to which are added tables of head-girth, arm-girth, and leg-girth (XXIV.-XXVI.) prepared by Mr. Roberts.

TABLE XX.—Statement of the HEIGHT, without shoes, of Boys in Marlborough College, showing the average, maximum, and minimum at each year and quarter of a year of age, between 9 and 20. (Taken in 1874–78.)

Age in Quarters of Years	No. of Observations	Height in Inches and Decimals				
		Quarterly			Yearly	
		Average	Maximum	Minimum	No. of Observations	Average
9	1	51	—	—	6	53·7
9 $\frac{1}{4}$	—	—	—			
9 $\frac{1}{2}$	2	54	54·2	53·6		
9 $\frac{3}{4}$	3	56·2	57·2	54·6		
		Average of Quarterly Averages		55·6	54·2	
10	4	54·7	55·4	54·0	25	54·4
10 $\frac{1}{4}$	6	53·8	56·4	51·6		
10 $\frac{1}{2}$	8	55·4	57·6	52·0		
10 $\frac{3}{4}$	7	53·8	57·2	49·4		
		Average of Quarterly Averages		56·6	51·6	
11	18	54·7	62·4	49·4	84	56·0
11 $\frac{1}{4}$	16	56·3	67·0	51·2		
11 $\frac{1}{2}$	26	56·7	61·2	52·2		
11 $\frac{3}{4}$	24	56·5	60·4	48·2		
		Average of Quarterly Averages		62·6	50·2	
12	37	57·0	62·2	52·0	208	57·3
12 $\frac{1}{4}$	54	57·3	70·0	53·6		
12 $\frac{1}{2}$	50	57·9	61·6	52·6		
12 $\frac{3}{4}$	67	57·2	64·0	52·4		
		Average of Quarterly Averages		64·4	52·6	
13	80	57·4	65·0	51·6	333	58·7
13 $\frac{1}{4}$	77	59·3	68·2	54·4		
13 $\frac{1}{2}$	96	59·0	71·2	54·6		
13 $\frac{3}{4}$	80	59·2	67·4	49·6		
		Average of Quarterly Averages		68·0	52·5	
14	110	60·8	68·2	54·2	367	61·4
14 $\frac{1}{4}$	79	61·4	68·0	54·0		
14 $\frac{1}{2}$	97	61·2	69·0	51·2		
14 $\frac{3}{4}$	81	62·2	68·4	56·0		
		Average of Quarterly Averages		68·3	53·7	

TABLE XX.—STATEMENT OF THE HEIGHT, &c.—*continued.*

Age in Quarters of Years	No. of Observations	Height in Inches and Decimals				
		Quarterly			Yearly	
		Average	Maximum	Minimum	No. of Observations	Average
15	85	62.4	69.6	55.4	315	63.4
15 $\frac{1}{4}$	78	62.7	70.0	54.0		
15 $\frac{1}{2}$	69	64.1	70.0	57.2		
15 $\frac{3}{4}$	83	64.4	73.5	55.0		
	Average of Quarterly Averages		70.6	55.3		
16	77	65.1	70.6	57.7	283	65.6
16 $\frac{1}{4}$	75	65.6	72.0	59.4		
16 $\frac{1}{2}$	73	65.1	70.4	54.6		
16 $\frac{3}{4}$	58	66.8	72.2	60.0		
	Average of Quarterly Averages		71.3	58.8		
17	46	67.4	72.6	60.3	148	67.5
17 $\frac{1}{4}$	46	67.0	73.0	57.4		
17 $\frac{1}{2}$	26	67.7	71.4	62.4		
17 $\frac{3}{4}$	30	68.0	76.4	62.4		
	Average of Quarterly Averages		73.3	60.7		
18	27	67.7	71.0	63.4	59	68.5
18 $\frac{1}{4}$	16	69.7	72.4	64.7		
18 $\frac{1}{2}$	9	67.5	70.2	63.4		
18 $\frac{3}{4}$	7	69.3	71.2	65.2		
	Average of Quarterly Averages		71.2	64.0		
19	9	67.9	73.4	63.0	20	67.4
19 $\frac{1}{4}$	5	66.3	66.6	66.0		
19 $\frac{1}{2}$	5	67.5	68.4	65.4		
19 $\frac{3}{4}$	1	68.0	—	—		
	Average of Quarterly Averages		69.3	63.5		
20	2	62.7	67.0	58.4	2	62.7

TABLE XXI.—Statement of the WEIGHT of Boys in Marlborough College, showing the average, maximum, and minimum at each year and quarter of a year of age, between 9 and 20. (Taken in 1874-78.)

Age in Quarters of Years	No. of Observations	Weight in lbs. and Decimals				No. of Observations	Average
		Quarterly			Yearly		
		Average	Maximum	Minimum			
9	1	75.0	—	—	6	77.0	
9 $\frac{1}{4}$	—	—	—				
9 $\frac{1}{2}$	2	76.5	79.0	74.0			
9 $\frac{3}{4}$	3	79.3	82.0	75.0			
Average of Quarterly Averages			80.5	74.5			
10	4	74.2	81.0	68.0	25	73.3	
10 $\frac{1}{4}$	6	71.5	79.0	69.0			
10 $\frac{1}{2}$	8	76.2	91.0	63.0			
10 $\frac{3}{4}$	7	71.5	79.0	63.0			
Average of Quarterly Averages			82.5	65.7			
11	18	76.3	98	56	84	79.4	
11 $\frac{1}{4}$	16	77.0	88	63			
11 $\frac{1}{2}$	26	85.0	102	71			
11 $\frac{3}{4}$	24	79.3	104	67			
Average of Quarterly Averages			98.0	63.7			
12	37	83.9	103	65	208	84.7	
12 $\frac{1}{4}$	54	83.6	109	62			
12 $\frac{1}{2}$	50	86.3	108	69			
12 $\frac{3}{4}$	67	85.6	115	58			
Average of Quarterly Averages			108.7	63.5			
13	80	90.9	133	64	333	92.3	
13 $\frac{1}{4}$	77	92.3	144	74			
13 $\frac{1}{2}$	96	93.7	125	70			
13 $\frac{3}{4}$	80	92.4	127	58			
Average of Quarterly Averages			132.2	66.5			
14	110	98.2	163	74	367	101.5	
14 $\frac{1}{4}$	79	100.5	141	75			
14 $\frac{1}{2}$	97	102.7	140	64			
14 $\frac{3}{4}$	81	104.7	146	75			
Average of Quarterly Averages			147.5	72.0			

TABLE XXI.—STATEMENT OF THE WEIGHT, &c.—*continued*.

Age in Quarters of Years	No. of Observations	Weight in lbs. and Decimals				
		Quarterly			Yearly	
		Average	Maximum	Minimum	No. of Observations	Average
15	85	108·9	142	84	315	113·2
15 $\frac{1}{4}$	78	110·2	168	73		
15 $\frac{1}{2}$	69	117·2	151	86		
15 $\frac{3}{4}$	83	116·7	186	74		
	Average of Quarterly Averages		161·7	79·2		
16	77	122·7	161	88	283	127·0
16 $\frac{1}{4}$	75	126·2	173	91		
16 $\frac{1}{2}$	73	128·0	179	76		
16 $\frac{3}{4}$	58	131·4	174	100		
	Average of Quarterly Averages		171·7	88·7		
17	46	132·0	173	94	148	136·3
17 $\frac{1}{4}$	46	133·9	164	95		
17 $\frac{1}{2}$	26	142·5	201	116		
17 $\frac{3}{4}$	30	136·9	175	106		
	Average of Quarterly Averages		178·2	102·7		
18	27	140·6	158	104	59	144·1
18 $\frac{1}{4}$	16	145·8	179	124		
18 $\frac{1}{2}$	9	150·7	210	127		
18 $\frac{3}{4}$	7	139·3	157	118		
	Average of Quarterly Averages		176·0	120·7		
19	9	141·0	160	121	20	140·0
19 $\frac{1}{4}$	5	134·8	144	126		
19 $\frac{1}{2}$	5	140·0	149	134		
19 $\frac{3}{4}$	1	144·0	—	—		
	Average of Quarterly Averages		151·0	127·0		
20	2	116	139	93	2	116·0

TABLE XXII.—Statement of the CHEST-GIRTH of Boys in Marlborough College, showing the average, maximum, and minimum at each year and quarter of a year of age, between 9 and 20. (Taken in 1874-78.)

Age in Quarters of Years	No. of Observations	Chest-girth in Inches and Decimals				
		Average	Quarterly		Yearly	
			Maximum	Minimum	No. of Observations	Average
9	1	29	—	—	6	27.4
9 $\frac{1}{4}$	—	—	—	—		
9 $\frac{1}{2}$	2	26.2	26.7	26.0		
9 $\frac{3}{4}$	3	27.0	29.0	26.2		
Average of Quarterly Averages			27.8	26.1		
10	4	26.5	27.6	26.0	25	26.1
10 $\frac{1}{4}$	6	26.6	27.0	24.4		
10 $\frac{1}{2}$	8	26.3	28.2	25.0		
10 $\frac{3}{4}$	7	25.1	26.4	21.2		
Average of Quarterly Averages			27.3	24.1		
11	18	26.5	30.0	21.4	84	27.0
11 $\frac{1}{4}$	16	27.0	29.0	25.0		
11 $\frac{1}{2}$	26	27.3	31.0	25.0		
11 $\frac{3}{4}$	24	27.1	30.0	25.0		
Average of Quarterly Averages			30.0	24.1		
12	37	26.6	29.6	25.0	208	27.0
12 $\frac{1}{4}$	54	27.0	29.4	25.0		
12 $\frac{1}{2}$	50	27.3	30.0	25.4		
12 $\frac{3}{4}$	67	27.1	31.4	25.0		
Average of Quarterly Averages			30.1	25.1		
13	80	28.0	32.4	25.2	333	28.0
13 $\frac{1}{4}$	77	28.0	34.2	24.0		
13 $\frac{1}{2}$	96	28.2	32.4	25.0		
13 $\frac{3}{4}$	80	27.9	31.4	24.6		
Average of Quarterly Averages			32.3	24.7		
14	110	27.0	37.0	25.2	367	28.3
14 $\frac{1}{4}$	79	28.7	34.0	25.0		
14 $\frac{1}{2}$	97	28.1	34.4	25.4		
14 $\frac{3}{4}$	81	29.4	35.1	25.4		
Average of Quarterly Averages			35.1	25.2		

TABLE XXII.—STATEMENT OF THE CHEST-GIRTH, &C.—*continued.*

Age in Quarters of years	No. of Observations	Chest-girth in Inches and Decimals				
		Quarterly			Yearly	
		Average	Maximum	Minimum	No. of Observations	Average
15	85	30.2	33.4	26.0	315	30.3
15 $\frac{1}{4}$	78	30.1	35.4	26.2		
15 $\frac{1}{2}$	69	30.4	36.0	26.4		
15 $\frac{3}{4}$	83	30.7	35.4	27.0		
	Average of Quarterly Averages		35.0	26.4		
16	77	32.2	34.2	26.6	283	32.0
16 $\frac{1}{4}$	75	31.7	36.0	28.0		
16 $\frac{1}{2}$	73	31.9	38.0	27.0		
16 $\frac{3}{4}$	58	32.2	38.0	27.0		
	Average of Quarterly Averages		36.5	27.1		
17	46	32.3	36.0	28.6	148	32.3
17 $\frac{1}{4}$	46	32.0	36.0	27.2		
17 $\frac{1}{2}$	26	32.4	35.1	30.0		
17 $\frac{3}{4}$	30	32.5	36.6	29.0		
	Average of Quarterly Averages		35.9	28.7		
18	27	32.8	35.4	29.6	59	34.0
18 $\frac{1}{4}$	16	34.0	37.0	30.4		
18 $\frac{1}{2}$	9	34.5	40.0	33.0		
18 $\frac{3}{4}$	7	33.5	36.0	30.4		
	Average of Quarterly Averages		37.1	30.8		
19	9	33.2	35.4	31.0	20	32.9
19 $\frac{1}{4}$	5	32.7	33.4	32.0		
19 $\frac{1}{2}$	5	32.7	33.4	32.2		
19 $\frac{3}{4}$	1	33.0	—	—		
	Average of Quarterly Averages		33.8	31.6		
20	2	29.7	31.4	28.0	2	29.7

TABLE XXIII.—Abstract of the HEIGHT, WEIGHT, and CHEST-GIRTH of the Boys in Marlborough College, observed at each year of age, with the actual and proportional rate of annual increase.

Age	Height in Inches and Decimals							
	Number of Observations	Average	Maximum	Minimum	Average of Quarterly Maxima	Average of Quarterly Minima	Annual Increase in Inches	Percentage Proportion of Increase at each age
From 9 to 10	6	53.7	57.2	51.0	55.6	54.2		
10 .. 11	25	54.4	57.6	49.4	56.6	51.6	0.7	1.30
11 .. 12	84	56.0	67.0	48.2	62.4	50.2	1.6	2.94
12 .. 13	208	57.3	70.0	52.0	64.4	52.6	1.3	2.27
13 .. 14	333	58.7	71.2	49.6	68.0	52.5	1.5	2.62
14 .. 15	367	61.4	69.0	51.2	68.3	53.7	2.7	4.60
15 .. 16	315	63.4	73.5	51.0	70.6	55.3	2.0	3.25
16 .. 17	283	65.6	72.2	54.6	71.3	58.8	2.2	3.35
17 .. 18	148	67.5	76.4	57.4	73.3	60.7	2.0	3.07
18 .. 19	59	68.5	72.4	63.4	71.2	64.0	1.0	1.48
19 .. 20	20	67.4	73.4	63.0	69.3	63.5	Decrease 1.1	Decrease 1.60
20	2	62.7	67.0	58.4				
Total ..	1850							
Age	Weight in lbs. and Decimals							
	Number of Observations	Average	Maximum	Minimum	Average of Quarterly Maxima	Average of Quarterly Minima	Annual Increase in lbs.	Percentage Proportion of Increase at each age
From 9 to 10	6	77.0	82.0	74.0	80.5	74.5		
10 .. 11	25	73.3	91.0	63.0	82.5	65.7	Decrease 3.7	— 5.05
11 .. 12	84	79.4	104.0	56.0	98.0	63.7	+ 0.9	+ 1.14
12 .. 13	208	84.7	115.0	58.0	108.7	63.5	+ 5.3	+ 6.67
13 .. 14	333	92.3	144.0	58.0	132.2	66.5	+ 7.6	+ 8.99
14 .. 15	367	101.5	163.0	64.0	147.5	72.0	+ 9.2	+ 9.96
15 .. 16	315	113.2	186.0	73.0	161.7	79.2	+ 11.7	+ 11.50
16 .. 17	283	127.0	179.0	76.0	171.7	88.7	+ 14.0	+ 12.36
17 .. 18	148	136.3	201.0	94.0	178.2	102.7	+ 9.3	+ 7.32
18 .. 19	59	144.1	210.0	104.0	176.0	120.7	+ 7.8	+ 5.72
19 .. 20	20	140.0	160.0	121.0	151.0	127.0	Decrease 6.4	Decrease 2.77
20	2	116.0	139.0	93.0	139.0	93.0	Exceptional	—
Total ..	1850							
Age	Chest-girth in Inches and Decimals.							
	Number of Observations	Average	Maximum	Minimum	Average of Quarterly Maxima	Average of Quarterly Minima	Annual Increase in Inches	Percentage Proportion of Increase at each age
From 9 to 10	6	27.4	29.0	26.0	27.8	26.1		
10 .. 11	25	26.1	28.2	21.2	27.3	24.1	— 1.3	— 4.74
11 .. 12	84	27.0	31.0	21.4	30.0	24.1	+ 0.9	+ 3.44
12 .. 13	208	27.0	31.4	21.4	30.1	25.1	—	+ nil
13 .. 14	333	28.0	34.2	24.0	32.3	24.7	+ 1.0	+ 3.70
14 .. 15	367	28.3	37.0	25.0	35.1	25.2	+ 0.3	+ 9.10
15 .. 16	315	30.3	36.0	26.0	35.0	26.4	+ 2.0	+ 7.06
16 .. 17	283	32.0	38.0	26.6	36.5	27.1	+ 1.7	+ 5.61
17 .. 18	148	32.3	36.6	27.2	35.9	28.7	+ 0.3	+ 0.09
18 .. 19	59	34.0	40.0	29.6	37.1	30.8	+ 1.7	+ 5.26
19 .. 20	20	32.9	35.4	31.0	33.8	31.6	— 1.1	— 3.23
20	2	29.7	31.4	28.0	31.4	28.0	Exceptional	—
Total ..	1850							

TABLE XXIV.—HEAD-GIRTH of Boys at Marlborough College. 'Measured on a line passing above the occipital protuberances and above the frontal eminence.'

Head-girth in Inches	Age last Birthday										
	9	10	11	12	13	14	15	16	17	18	19
24.5	—	—	—	—	—	—	—	1	—	—	—
24	—	—	—	—	—	—	—	—	2	—	—
23.5	—	—	—	—	—	1	2	3	2	2	—
23	—	—	—	—	1	2	6	8	14	7	2
22.5	—	—	—	1	14	29	44	63	42	22	10
22	1	1	3	20	60	60	94	84	45	14	8
21.5	3	4	13	65	124	137	106	81	30	12	2
21	—	12	23	85	85	91	52	36	15	3	—
20.5	—	7	31	34	43	39	16	6	—	1	—
20	—	2	17	10	6	10	2	2	—	—	—
19.5	—	—	2	1	—	1	—	—	—	—	—
Total Observations	4	26	89	219	333	370	320	282	150	61	22
Average Head-girth	21.62	20.96	21.03	21.23	21.44	21.48	21.77	21.95	22.18	22.23	22.36

NOTE.—The Committee recommend that the head-girth should be taken on a line passing just above the frontal eminence (or eyebrows), including the occipital protuberance. This and all other girths should be taken with a plain tape, and the length afterwards read off on a rule, divided into inches and tenths of inches.

TABLE XXV.—ARM-GIRTH of Boys at Marlborough College. 'The arm was held in a loosely-flexed state, the muscles being at rest and flaccid; the measurement being made round the thickest part of the biceps muscle.'

Arm-girth in Inches	Age last Birthday										
	9	10	11	12	13	14	15	16	17	18	19
13	—	—	—	—	—	—	—	—	—	1	—
12.5	—	—	—	—	—	—	—	—	—	—	—
12	—	—	—	—	—	—	—	3	2	2	2
11.5	—	—	—	—	—	—	1	4	3	6	1
11	—	—	—	—	—	5	6	17	11	5	2
10.5	—	—	—	—	2	2	4	24	24	13	1
10	—	—	—	1	1	13	39	47	45	16	9
9.5	—	—	—	1	12	23	43	71	28	10	4
9	—	—	4	11	34	76	74	66	21	7	3
8.5	—	1	11	33	75	87	86	30	12	1	—
8	2	3	22	70	114	107	50	15	4	—	—
7.5	1	12	31	71	79	48	12	4	—	—	—
7	1	9	17	28	15	8	5	1	—	—	—
6.5	—	1	3	4	1	—	—	—	—	—	—
6	—	—	1	—	—	—	—	—	—	—	—
Total Observations	4	26	89	219	333	370	320	282	150	61	22
Average Arm-girth	7.50	7.26	7.55	7.71	8.01	8.34	8.76	9.36	9.70	10.12	10.04

NOTE.—The arm-girth should be taken when the arm is extended horizontally at the thickest part of the biceps muscle. In right-handed persons the right arm, and in left-handed persons the left arm, should be measured.

TABLE XXVI.—LEG-GIRTH of Boys at Marlborough College. 'Measured at the thickest part of the calf, the muscles being at rest.'

Leg-girth in Inches	Age last Birthday										
	9	10	11	12	13	14	15	16	17	18	19
16.5	—	—	—	—	—	—	—	—	1	1	—
16	—	—	—	—	—	—	—	—	—	1	—
15.5	—	—	—	—	—	—	—	—	1	—	—
15	—	—	—	—	—	1	4	5	5	5	1
14.5	—	—	—	—	1	2	7	19	15	7	3
14	—	—	—	—	1	10	28	35	27	20	8
13.5	—	—	—	—	8	27	38	49	37	13	5
13	—	—	1	8	23	53	76	89	38	10	2
12.5	—	—	5	15	37	54	59	42	10	4	2
12	—	2	7	43	78	109	58	27	12	—	1
11.5	1	4	16	52	95	68	35	9	3	—	—
11	1	8	34	68	62	32	10	2	1	—	—
10.5	1	5	18	19	23	9	3	1	—	—	—
10	1	6	7	12	4	5	—	—	—	—	—
9.5	—	1	—	2	1	—	—	—	—	—	—
9	—	—	1	—	—	—	—	—	—	—	—
Total Observations	4	26	89	219	333	370	320	282	150	61	22
Average Leg-girth	10.75	10.70	11.00	11.31	11.63	12.09	12.62	12.99	13.32	13.90	13.61

NOTE.—The leg-girth should be taken in the standing position at the thickest part of the calf. The right leg in right-legged persons, and the left leg in left-legged persons, should be measured.

VII. *Telegraph Messengers.*

Mr. G. Carrick Steet has published, in the 'St. George's Hospital Reports' (1874-6), a paper on the development and growth of boys between 13 and 20 years of age, from which Table XXVII. is extracted.

This table shows the average weight, chest-girth, and *lifting* strength of boys of the same stature, but of different ages, and elicits the interesting fact that there is, with increasing age, an increase in the weight, girth, and strength, even when the height remains stationary. Mr. Steet constructed the table to form standards of the average physical proportions of candidates for the postal, telegraph, and similar branches of the Civil Service throughout the country—a purpose for which they are well fitted. The figures in black type indicate the stature of the boys which should be selected.

VIII. *Females.*

Hitherto the Committee has been engaged in obtaining statistics relating only to males, but they have received from Mrs. Bovell-Sturge, M.D. (Paris), observations on 100 girls, by the consent and co-operation of Miss Buss, of the North London Collegiate School. These will be dealt with in future reports.

IX. *Extensions of the Inquiry.*

It has been urged upon the Committee by Major-General A. L. Fox Pitt-Rivers that they ought not to neglect any of the more important measurements used by anthropologists, the utility of which is well established. 'The facts which it is the object of the Committee to deduce concern the influence on race; first, of heredity, and, secondly, of external causes. Anthropometry may be divided under the three heads: size, form, and colour. Of these, the Committee have as yet taken cognizance only of size and colour, except so far as the collection of photographs may be regarded as bearing on form; but as the study of physiognomy is not yet reduced to a system, no statistics can be derived from these. Of the three headings, size, form, and colour, as tests of race, colour is generally allowed by anthropologists to be the most important because the most persistent, form the next, and size the least important, because all animals are able to increase in bulk through good living, whereas this cause has less influence on colour and form. Of the various measurements relating to form, head form, especially the cephalic index, seems the most important, for the following reasons:—it is universally employed, easily obtained, ample data for comparison already exist, it can be obtained from living subjects as well as skulls, it is useful not only as a test of race, but also in its bearing upon intellect.' General Pitt-Rivers therefore proposed that the greatest length and greatest breadth of head should be added to the subjects inquired for by the Committee. The Committee propose that this should be done in future years.

The Committee have had before them also a paper by Dr. Mahomed relating to useful extensions of the inquiry to medical subjects in cases where the observers are duly qualified medical men. Upon these suggestions they propose also to act hereafter.

X. *Photographs.*

The collection for publication of photographs of the typical races of the Empire has been again entrusted to a sub-Committee, of which Mr. Park Harrison has been so good as to act as convener. Their report, prepared by him, is subjoined.

'During the past year about 400 photographs have been received by the Committee, mostly from Wales, the Shetland Isles, Morayshire, North and South Arran, Cornwall, East Norfolk, Worcestershire, and the more remote parts of Kent and Sussex. A certain number have been arranged on sheets of cardboard for more ready comparison.

'The photographs from Shetland, taken in full face and profile for the Committee at the expense of Mr. Bruce, the owner of Unst Island, are of considerable value. They comprise the portraits of fourteen individuals belonging to families who have inhabited the islands as long as there are any records; and they still, in several cases, retain their original Scandinavian names.

'The portraits from Moray and Arran, with others from different parts of Scotland, were presented by Dr. Muirhead.

'The Welsh photographs, obtained by Mr. Harrison, represent the darker race in the Principality, and assist in the recognition of kindred types which appear to exist, with more or less mixture, in various districts in England; for example, at Brandon, in Norfolk. Several portraits

from that locality have been mistaken by competent judges of physiognomy for Welsh. The inhabitants contrast strongly in colour of hair and eyes with the population of other parts of the county.¹

'In several other counties there appear to be populations differing essentially in features; but a larger number of portraits, taken on a uniform system, in profile and full face, would be required, together with head-measurements, to enable the Committee to define racial characteristics.

'The Committee have been furnished with a fine series of photographs of eleven typical inhabitants of the district around Bradford, Yorkshire, taken and presented by Messrs. Appleton & Co., photographers, of Bradford, and selected and described by Mr. Thomas Tate, F.G.S., to whom the Committee are much indebted.

'Owing to the funds at the disposal of the Committee being required for the reduction of the mass of observations that have been acquired, no other original photographs have been taken this year under their direction. Few consequently of those that have been obtained are of value for strict scientific examination; and by far the greater part of England, and Scotland, and the whole of Ireland, the Channel Islands, and the Isle of Man are unrepresented at present by any photographs.'²

The Committee would therefore press on the consideration of the Committee of Recommendations the advisability of an extra grant for the acquisition of photographs.

XI. Conclusion.

The Committee request that they may be reappointed, and suggest that the reference should be in the more general terms 'for the purpose of continuing the collection of anthropometric observations and of photographs of the typical races of the Empire.'

They have received most efficient services in abstracting the returns and otherwise from their assistant secretary, Mr. J. Henry Young.

Report of the Committee, consisting of Dr. PYE-SMITH, Professor M. FOSTER, and Professor BURDON SANDERSON (Secretary), appointed for the purpose of investigating the Influence of Bodily Exercise on the Elimination of Nitrogen (the experiments conducted by Mr. NORTH).

DURING the past year four series of preliminary experiments, each of several weeks' duration, have been made by the Committee on the subject, the expenses of which have been met from other funds. In the course of these experiments unexpected difficulties have been encountered relating to method. The most serious of these difficulties having now been for the most part overcome, we are in a position to proceed with our inquiries next winter, and have therefore to request that the sum of 50l., previously granted to us, may again be placed at our disposal.

¹ Out of eighty recruits who joined the West Norfolk Militia this spring, there were only three with black or very dark hair and eyes.

² Since the last meeting of the sub-committee several portraits of natives of Heligoland have been received as a gift from the divisional officer of the Coast Guard connected with the island.