

will soon be afforded of judging how far the new machinery is likely to go towards providing a satisfactory scheme of medical inspection of school children. The Dental Society has also arranged for the examination of teeth at some of the larger schools, and over 1000 children have already been inspected. Free treatment is given where the parents are not in a position to pay for it.

8. *Tasmania*.—The credit of being the first State in the Commonwealth to provide for the medical inspection of schools and school children in a systematic way rests with Tasmania, where, under the direction of the Chief Health Officer and the Director of Education, about 1200 children attending schools in Hobart were inspected in 1906. The general examination was based upon that of the Royal Commission on Physical Training (Scotland) of 1903, but considerable modifications and adaptations were found necessary in order to fit it to immediate requirements. No attempt was made to secure anthropometric observations beyond those of unquestionable medical value, and in only one case (colour of eyes) were any purely anthropological data collected. The sociological data obtained (parental occupation, etc.) were found of much service, and produced some interesting comparative results.

Medical inspection of school children as now existing in Tasmania is carried out by three medical officers, each controlling respectively one of three areas, which for medical inspection purposes are known as Hobart District, Launceston District, and the Country Districts of the State. Additional assistants in the persons of two school nurses have been appointed to follow up the work of the Medical Inspectors. Reports on the physical condition of the children are furnished, and parents advised when medical attention is considered necessary, and in the case of parents unable to pay for such attention, orders are given for free treatment at the hospital. From March, 1907, to 31st December, 1910, the total number of children examined in State schools was 20,961, of which 11,869 were examined in country schools, 5870 in Hobart and 3222 in Launceston. During 1910, 2963 children were examined by Drs. Clark and Ormiston, 1774 by the latter, who found adenoids affecting 35 per cent., defective sight 19.3 per cent., and defective hearing 9 per cent. of the children; while Dr. Clark out of 1189 children found that 242, or 20.35 per cent., were suffering from various defects to an extent requiring medical treatment in order to fit them for their educational studies. Of these 242 children 95 had severe eye defects, and 95 were suffering from advanced adenoids. Out of the 1774 children examined by Dr. Ormiston 14 were found to be mentally deficient in the true sense of the term, while 16 others, though regarded as practically bordering on that condition, were set down as dull or backward, many of this latter group shewing the stigmata of congenital syphilis. With regard to dental condition, all the Medical Inspectors agree that the teeth of the children of Tasmania seem to be uniformly bad.

9. *Comparisons of School Children in Australia and other Countries*.—In 1909 a medical officer was appointed by the South Australian Government to carry out an inspection of 1000 school-going children residing in different districts of the State. Inspection was commenced in August 1909, and the results were embodied in a report issued in September, 1910.* The matter therein dealt with may conveniently be subdivided into the following sections, viz. :—(i.) height, (ii.) weight, (iii.) chest measurement, (iv.) teeth, (v.) vision, (vi.) hearing, (vii.) nose and throat, (viii.) deformities, (ix.) diseases, (x) "dullards" and their physical defects.

(i.) *Height*. Comparative returns were available for all the States except Victoria and Queensland. In New South Wales and Western Australia the system of age-grouping was different to that adopted in Tasmania and in South Australia. In the former the last birthday was assumed to be the child's age, while in the latter the nearest birthday was adopted. Consequently, some slight allowance must be made for this difference in classification. The following table shews the comparative heights of school children (boys and girls) in Australian States, England and Scotland :—

* Report of R. S. Rogers, M.A., M.D., Hon. Consulting Physician to Adelaide Hospital, etc.

MEDICAL INSPECTION OF SCHOOL CHILDREN.—COMPARATIVE HEIGHTS IN AUSTRALIA, ENGLAND, AND SCOTLAND.

Ages.	HEIGHT IN INCHES.					
	South Aus.	* N.S.W.	† Tasmania.	‡ West Aus.	§ England.	Scotland (Glasgow).
BOYS.						
7	46.02	46.10	47.19	—	45.97	43.70
8	48.20	48.22	49.00	49.10	47.05	45.80
9	49.58	49.98	51.25	50.50	49.70	47.70
10	51.73	51.97	52.65	52.10	51.84	49.60
11	53.18	53.53	54.35	53.80	53.50	51.30
12	55.31	55.20	56.30	56.10	54.99	53.00
13	56.86	57.16	57.80	58.80	56.91	54.60
14	59.53	60.07	60.78	60.10	59.33	56.30
GIRLS.						
7	45.60	45.72	47.80	—	44.45	43.40
8	47.96	47.70	48.40	48.90	46.60	45.20
9	49.51	49.68	50.50	49.80	48.73	47.20
10	51.53	51.67	52.43	52.40	51.05	49.00
11	53.22	53.59	54.59	53.50	53.10	50.80
12	55.62	55.99	56.50	55.80	55.66	52.90
13	57.50	58.41	58.10	57.20	57.77	55.10
14	60.00	60.23	61.28	59.30	59.80	57.10

* Last birthday assumed to be the age of the child. † Elkington and Clarke. ‡ Blackburne. Last birthday assumed to be the age of the child. § Statistics of Anthropometric Committee. Last birthday assumed to be the age of the child; the boots of the children were not removed. || Mackenzie and Foster. Last birthday assumed to be the age of the child.

It appears from these tables that the Tasmanian children are exceptionally tall, being in advance of the other States at almost all ages. Western Australia stands next to Tasmania in this respect, while South Australian children approximate very closely to those of New South Wales in stature, the latter State having a very slight advantage. It may be seen that the heights of boys examined in Tasmania and Western Australia are greater than those examined in New South Wales and South Australia at every age, and that the New South Wales boys are consistently slightly in advance of South Australian boys, age for age. In the case of the girls, the Tasmanian girl is the tallest at all ages, except 8, when she is surpassed by Western Australia, and at 13 when New South Wales takes the lead. The stature of Western Australian girls, which exceeds that in any of the other States at the age of 8, approximates to that of South Australia at the age of 12, and is lowest of all the States at 13 and 14. As in the case of the boys, the stature of South Australian girls is very nearly the same as that of New South Wales, except at the age of 13, at which the older State has a very distinct advantage.

Comparison of the average heights of the South Australian with those of the English child tell decidedly in favour of the former at all ages. In the case of the boy, England would appear to have a slight advantage at the ages of 9, 11, and 13, but this apparent advantage disappears when it is remembered that the English children were measured in their shoes, whereas South Australian children were measured without their shoes. South Australian girls seem to have a still greater advantage in height over their English sisters than appears in the case of the boys. Only at the ages of 12 and 13 do the latter (English) seem slightly taller, but this superiority at once disappears when the boots are taken into consideration. The disparity in height is most noticeable during the first three years of school life.

(ii.) *Weight.* In comparing South Australian children with those of other States it is obvious from the tables given below that the Tasmanian children lead in weight as they were seen to do in height. The weight of South Australian children closely approximates to that of New South Wales. Among the boys, Tasmania leads at all ages except the age of 13, when the South Australian boy stands first amongst the States. The latter falls a trifle behind the New South Wales boy during his 14th year, and still more behind the Tasmanian at that age, but maintains a marked superiority over the Western Australian lad at the two higher ages. The boy in South Australia weighs nearly the same as the boy in New South Wales at the ages of 7, 8, and 14, falls a trifle behind him at 9 and 10, loses a pound in favour of the older State at 11, regains it at 12, and pushes his advantage over his rival to the extent of nearly 2½ pounds at 13. The Western Australian lad weighs high during his junior years at school, closely approximating to Tasmania at the ages of 8 and 9. He is considerably ahead of South Australia and New South Wales at 10, 11, and 12, but loses ground at 13, and falls into the rear of all the States at 14.

In the case of girls, Tasmania is in advance of the other States at all ages, and greatly so at the two higher ages. Western Australia is a good second at the junior ages, 8, 9, and 10. The girls from that State weigh nearly the same as those in South Australia and New South Wales at 11 and 12, almost the same as the mother State at 13, but fall behind her at 14. As in the case of the boys so also with the girls, the weights in South Australia closely approximate to those in New South Wales, at some ages being slightly in advance of the latter, at others slightly behind, the most noticeable differences being observable at the two higher ages, when the South Australian girl falls rather more than 1½ pounds behind in her average. One of the most interesting features is the remarkable average weight of the Tasmanian girl at 14, when she exceeds the next highest State average by upwards of 4 pounds.

South Australian boys compare favourably with average English boys in point of weight at the lowest and the two highest school-going ages, but fall very considerably behind the latter in the middle ages; *e.g.* at the ages of 10 and 11 there is an average difference of about 5 pounds in favour of the English lad, whereas at 13 and 14 the South Australian is slightly ahead in weight.

The following table shows the comparative weights of school children (boys and girls) in Australian States, England and Scotland:—

**MEDICAL INSPECTION OF SCHOOL CHILDREN.—COMPARATIVE WEIGHTS OF
CHILDREN IN AUSTRALIA, ENGLAND, AND SCOTLAND.**

Ages.	Weight in Pounds.					
	South Australia.	N.S.W.	† Tasmania.	‡ West. Aust.	 England.	== Scotland (Glasgow).
BOYS.						
7	49.00	48.90	51.30	—	49.7	45.3
8	53.24	53.26	55.30	55.10	54.9	49.3
9	57.11	57.83	59.80	59.20	60.4	53.6
10	62.48	62.78	66.10	65.20	67.5	58.3
11	67.11	68.18	70.60	69.50	72.0	63.1
12	75.01	73.93	79.40	76.60	76.7	68.1
13	83.75	81.32	82.30	81.10	82.6	73.5
14	92.41	92.98	93.70	88.70	92.0	79.3

MEDICAL INSPECTION OF SCHOOL CHILDREN.—COMPARATIVE WEIGHTS OF CHILDREN IN AUSTRALIA, ENGLAND AND SCOTLAND—(continued.)

Ages.	Weight in Pounds.					
	South Australia.	* N.S.W.	† Tasmania.	‡ West. Aust.	§ England.	Scotland (Glasgow).
GIRLS.						
7	47.92	47.63	48.80	—	47.5	43.9
8	52.88	51.98	53.50	53.40	52.1	47.5
9	56.89	56.59	58.90	58.50	55.5	51.9
10	61.82	62.31	64.70	63.20	62.0	56.1
11	68.78	68.15	72.20	69.00	68.1	61.1
12	76.76	76.65	77.20	76.60	76.4	67.2
13	85.61	87.21	91.40	87.70	87.2	75.1
14	94.36	96.08	100.20	95.20	96.7	82.9

* Last birthday assumed to be the age of the child. † Elkington and Clarke. ‡ Blackburne. Last birthday assumed to be the age of the child. § Statistics of Anthropometric Committee. Last birthday assumed to be the age of the child; the boots of the children were not removed. || Mackenzie and Foster. Last birthday assumed to be the age of the child.

(iii.) *Chest Measurement.* Owing to the variety of methods in obtaining such measurements, comparatively few reliable statistics are available. In South Australia measurements were taken at the level of the nipple next the bare skin with the arms hanging loosely at the sides. Measurements at "full inspiration" and at "forced expiration" were taken, as also the "mean" between these two, but for the purposes of comparison with other places for which similar figures are available "mean" figures only are dealt with. The following table compares the mean chest measurements of Australian boys with those in certain other parts of the world:—

MEDICAL INSPECTION OF SCHOOL CHILDREN.—COMPARATIVE CHEST MEASUREMENT OF BOYS IN AUSTRALIA AND IN OTHER PARTS OF THE WORLD.

Age.	South Australia.	New South Wales (Sydney).	* Great Britain.	† United States.	‡ Poland.
7	23.26	23.6	—	—	21.8
8	23.89	23.9	—	—	22.8
9	24.66	24.5	—	23.48	23.7
10	25.31	25.1	26.10	24.30	24.4
11	25.99	25.9	26.53	25.34	25.1
12	27.04	26.7	27.20	26.28	25.6
13	28.07	27.7	28.03	27.28	27.2
14	29.28	28.9	28.46	28.55	—

* Anthropometric Committee. † Kline. ‡ Landsberger.

The following table shewing the average degree of expansion in inches amongst boys of two Australian States is very striking, the marked superiority of the South Australian boy at any age being suggestive of more careful training in breathing exercises than in the Mother State:—

MEDICAL INSPECTION OF SCHOOL CHILDREN.—COMPARATIVE DEGREE OF CHEST EXPANSION BETWEEN SCHOOLBOYS IN SOUTH AUSTRALIA AND N. S. WALES.

Age	7	8	9	10	11	12	13	14
Average degree of expansion in inches (S. Australia)	2.50	2.47	2.81	2.82	2.71	3.0	2.98	3.11
(N. S. Wales)	1.8	1.8	1.9	1.9	2.2	2.5	2.4	2.5

(iv.) *Teeth.* With regard to teeth the proportion of decayed teeth in South Australia was found to be 2.73 teeth per child as against 4.2 in Hobart, and 4.6 in Sydney, in which latter place, however, only ages between 7 and 14 inclusive were dealt with. An examination of 10,500 English and Scottish children averaging the age of 12 shewed a percentage of 3.5 decayed teeth per child as against 1.8 per South Australian child of same age, while Sydney shewed 4.8, New South Wales Country Districts 3.5, and Hobart 3.3 for same age. It is somewhat difficult, however, to obtain reliable data upon this matter, as it is not always made clear whether the averages given refer to second teeth only or to both sets. Out of the whole number of 1007 children examined in South Australia only 70 were found to possess perfect sets of teeth.

(v.) *Vision.* Keeness of vision was tested with the ordinary Snellen's type read at six metres. The various tests made disclosed that the vision of South Australian children is by no means ideal, 15 per cent. of them being unable to read (under normal test conditions) with both eyes separately. The percentage of those possessing normal keeness of vision (6/6) amounted to 54.8. Defective vision in school children appears to be worse in other parts of the Commonwealth, the percentage for New South Wales being 27.7; Hobart, 44.2; Western Australia, 38.3, for children between the ages of 8 and 16 inclusive. In Edinburgh and Aberdeen similar tests revealed percentages of 31.7 and 18.5 respectively. In analysing defects in vision amongst South Australian children, 6/6 was taken as representing "normal" vision; 6/9 "fair"; 6/12 "medium"; and less than 6/12 "bad" vision. For explanation and significance of these figures see footnote attached to second table of sub-section 5 (Queensland) on page 1131 hereof.

Any attempt to record errors of refraction without the aid of retinoscopy being necessarily more or less unsatisfactory, and as the conditions under which these South Australian children were examined absolutely precluded the use of retinoscopy, only such tests as experience and circumstances rendered practicable were adopted. The tests used included, amongst others, a series of striped balls, striped letters, and a series of radiating lines. (a) *Astigmatism.*—The percentage of astigmatism for children (of both sexes) in South Australia between the ages of 8 and 14 inclusive, was found to be 36.8, but many of the ailments were of low degree, the children possessing "full vision" (6/6). No definite relation seems to exist between this trouble and the age of the child, and probably ought not to, astigmatism being a congenital defect. (b) *Hypermetropia.*—Owing to the impossibility of applying the retinoscopic test the examination for hypermetropic errors has not been satisfactory, and must be greatly underestimated, as only the "manifest" cases were recorded. Long sight (hypermetropia) among children is a congenital defect which is present in a very large number of children in the early school-going ages. Later on it may be replaced by normal or even by short sight. The unusual power which a child has, by straining the eye, of bringing it to a correct focus enables it in a great many instances to hide the defect, so that it only becomes "manifest" at a later period of life. The percentage of "manifest" cases among children examined was only 5.6, which is undoubtedly greatly below the extent which would have been revealed by a mirror examination. (c) *Myopia, or Short Sight.*—The general percentage of myopia was found to be 5.9. In the north a few schools were examined in which a large number of short-sighted children were found, and these have considerably raised the percentage throughout the State. In the metropolitan area the percentage was 3.5; in the southern areas 2.7, and in the northern areas 9.8.

Medical Inspection of School Children. The following table shews the percentage of astigmatism, manifest hypermetropia, and myopia in South Australian boys and girls at various ages:—

TABLE SHEWING PERCENTAGES OF ASTIGMATISM, MANIFEST HYPERMETROPIA, AND MYOPIA IN SOUTH AUSTRALIAN BOYS AND GIRLS AT VARIOUS AGES.

Ages.	Boys.			GIRLS.		
	Astigmatism.	Hypermetropia.	Myopia.	Astigmatism.	Hypermetropia.	Myopia.
7 ...	38.5	3.8	—	40.5	7.8	1.8
8 ...	31.8	9.0	—	40.6	6.5	3.2
9 ...	38.2	4.4	3.9	44.7	5.6	5.6
10 ...	37.1	1.5	5.1	43.2	5.8	4.4
11 ...	38.2	4.4	8.9	40.9	6.2	6.2
12 ...	40.8	5.4	9.0	31.1	8.7	7.8
13 ...	28.8	4.4	9.3	40.9	3.0	10.9
14 ...	22.2	5.7	10.1	31.4	7.3	7.8
Average at all ages ...	34.4	4.8	5.8	39.1	6.4	6.0

The above table shews the proportion of myopia to be almost the same in boys and girls. It also shows a marked tendency for the defect to increase with the school age. This corresponds with observations made elsewhere. Myopia, unlike the two other errors of refraction (astigmatism and hypermetropia) already dealt with, is generally an acquired defect, and is usually the result of eye-strain. Faulty position, or lighting, and other school defects are often contributing causes. It must be remembered that once a child acquires short sight the trouble is likely to be a progressive one unless checked by suitable glasses.

The number of errors of refraction found throughout the State, even when they did not reduce the visual acuteness, are, nevertheless, potential causes of future eye troubles. The children with apparently perfect vision formed only a small majority; and it is questionable whether they would have been in the majority had it been possible to correctly estimate the proportion of hypermetropia.

(vi.) *Hearing.* For this defect each ear was tested separately, the test employed being a whisper at the distance of eighteen feet, and of the 1007 children examined, in 34 cases or 3.3 per cent. deafness was observed, 16 of them being affected in only one ear. Similar statistics show a percentage of 12.1 for Hobart, while the percentages for West Australian children range from 4 to 15 in the different schools. In Edinburgh the percentage for distinctly defective children was 6.7; of defective 35.2. In Aberdeen the results were exceptionally good, only 5 children being distinctly defective, while the proportion of children set down as possessing slightly defective hearing was 13 per cent. Low percentages of deaf children in metropolitan areas may be greatly due to the facilities which exist for removing adenoid growths.

(vii.) *Nose and Throat.* Examination shewed that 17 per cent. were mouth breathers and that nearly 61 per cent. of the children were suffering from enlarged tonsils, a percentage sufficiently high to be regarded as a somewhat serious matter, when the amount of ill health directly or indirectly arising from such a condition is considered. South Australia seems to possess unenviable prominence in this respect, the percentage of the other places being New South Wales, 49; Hobart, 38; Western Australia, 20-40; Edinburgh, 52; and Aberdeen 30 per cent.

(viii.) *Deformities.* Twenty-four cases of pigeon-breast were noted, and it was observed with satisfaction that cases of curvature of the spine were exceedingly rare, only

0.6 per cent. of spinal deformities being found amongst South Australian children, as against 8 per cent. for Hobart, and 5 per cent. in Western Australia. The New South Wales Report for 1910 states that spinal curvature amongst school children is infrequent, only 15 cases out of several thousand children having been noted.

(ix.) *Diseases.* This section deals with various ailments, such as skin troubles, diseases of the glandular system, the bones and joints, and nervous disorders, but discloses nothing sufficiently important to warrant any special reference here.

(x.) *Dullards.* The report presents many features of significant import, which emphasise the urgent necessity for medical inspection of school children, but none more so than the information contained in the section bearing upon "Dullards and their physical defects." Concerning these and their condition the examiner remarks that "no number of arguments could be more overwhelmingly convincing for this necessity [*i.e.*, medical inspection], and to expect such children, suffering as they are from many remediable troubles, to keep pace with their better-equipped schoolfellows, is highly unreasonable." Of the 1007 examined, 111 children, or 11 per cent., were marked "dull" by the teacher. Fifty-seven of these were boys, equal to 11.4 per cent.; 54 were girls, equal to 10.6 per cent. An analysis of these cases revealed the following conditions:—Twenty suffered from very serious defects of vision; 21 were bad "mouth-breathers" (affected with adenoids); 7 were mentally defective in a very marked degree; 7 were very deaf; 3 had speech defects; 2 had heart disease; 1 was strumous; 1 had a large abdominal tumour; 1 suffered from anæmia and general debility; 1 had chronic bronchitis. These conditions will readily account for 57.6 per cent. of the "dull" children. Of the remainder, three were quadrons of less than average intelligence, and nearly all the other "dullards" suffered from some minor visual defect, enlarged tonsils, or some trouble calculated to handicap them in their school work.