

a tendon sheath at the ankle: recovery followed removal of the osteochondromata and excision of the bursa.

I wish to acknowledge my indebtedness to Messrs. A. H. Baird, who carried out the photography.

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A STUDY IN VISUAL DEFECTS IN YOUNG CHILDREN

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It is evident from the annual returns of the school health service that amblyopia and strabismus form a large proportion of cases of defective vision. It is the purpose of this paper to describe a simple method whereby gross errors of refraction in children under the age of 5 can be ascertained. We demonstrate that this method is accurate enough to be used on a wide scale, that a large number of children in the age group discussed suffer from gross errors of refraction, and that it is important from a preventive aspect that they should be detected and treated as early as possible in order to achieve good results and prevent deterioration and the development of other conditions. Except in cases of suspected strabismus, hypermetropia under 2D and astigmatism under 0.75D was not corrected; in all other cases correction was made, the conditions being referred to as gross errors of refraction.

We are not concerned here with the finer analysis of the degrees of the errors of refraction and their age distribution; this is of secondary importance to this investigation.

The sight of children is usually examined when they are 7 to 8 years old by the Snellen type test in the course of routine medical inspections. Before this age treatment may be sought only when attention is drawn to the child's eyes by the occurrence of squint or because defective vision is thought to exist. A squint of the ordinary concomitant type associated with hypermetropia is usually manifest between the ages of 18 months and 5 years. At the age of 12 months a child should have acquired the power of fixation. Now, if something prevents that being acquired, nystagmus will occur, but during the next few years the full visual

acuity will have to be developed. In cases of a high degree of astigmatism a distinct image is not formed on the retina and full visual acuity cannot be developed. Also with anisometropia the child will not focus the ametropic eye and the same will follow.

It is therefore of great importance that such conditions should be recognized as soon as possible, since by correcting such errors at the earliest opportunity the final result will be much better. After the age of 8, if no correction has been carried out, there will be in these cases a considerable degree of amblyopia, which may be difficult or impossible to overcome. Furthermore, by correcting high degrees of hypermetropia many cases of potential squint may be forestalled. Experience has also shown that if one child in a family has a gross error of refraction it is likely that some of the other children will also have errors requiring correction, and it is the custom of one of us (T.W.L.) to inquire into family histories and to examine all the children of a family in which one child is found to have a gross error of refraction.

The number of cases of amblyopia discovered in school entrants indicates that a far more intensive investigation should be made of the eyesight of the pre-school child. Some special test, easily applied and quickly performed, is required to ascertain those children who are suffering from grosser errors of refraction. One of us (P.A.T.) undertook the retinoscopy examination of all children present in the day nurseries, nursery schools, and classes in the borough.*

Method and Scope of Eye Investigation

Retinoscopy was performed with a plane mirror without using a mydriatic. The children were examined in a darkened room seated on a chair at arm's length. First the movement of the red reflex was noted in vertical and horizontal meridians. Movement against the mirror in any meridian in either eye was noted as "myopia" and referred to one of us (T.W.L.) for further examination. If movement occurred with the mirror then the procedure was repeated using a +2D lens held in turn immediately in front of the child's eyes, movement in any meridian in either eye being noted as "hypermetropia" and referred for further examination. It was found that having the children attend in batches of ten alleviated anxiety and that it was possible to examine 60 children in the course of an hour.

The upper age limit was taken as the age of 5 in January, 1949. Accommodation for 567 children exists in the day nurseries, nursery schools, and classes. Owing to illness and other reasons 87 were absent at the time of the survey and 10 became too emotionally disturbed to be examined. Of the 470 children examined, 10 were excluded from the final results, eight being over the age of 5 and two who were ascertained to have defects failing to keep several appointments for further examination. The results of the remaining 460 examinations are considered here.

Results

Table I shows the analysis by sex and age of the examinations made. The numbers in the age groups are considered too small for further analysis. The 460 children comprised 247 boys and 213 girls, and in each case 19

*We wish to acknowledge our indebtedness to Dr. G. Hamilton Hogben, to the borough education officer, and to the head teachers and matrons of the nursery schools and classes and day nurseries in Tottenham for their invaluable assistance.

TABLE I.—Analysis of Results by Age and Sex

Age Groups (Years and Months)	Boys							Girls							Totals for Both Sexes							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	No. with No Defects by Retinoscopy	No. with Uncorrected Defects by Retinoscopy	No. Confirmed by Specialist as Having Uncorrected Defects	No. with Refractions Corrected at Time of Survey	Total with Defects (Columns 3 + 4)	Total with No Defects	Total No. Examined	No. with No Defects by Retinoscopy	No. with Uncorrected Defects by Retinoscopy	No. Confirmed by Specialist as Having Uncorrected Defects	No. with Refractions Corrected at Time of Survey	Total with Defects (Columns 10 + 11)	Total with No Defects	Total No. Examined	Total with No Defects by Retinoscopy	Total with Uncorrected Defects by Retinoscopy	Total Confirmed by Specialist as Having Uncorrected Defects	Total with Refractions Corrected at Time of Survey	Total with Defects (Columns 17 + 18)	Total with No Defects	Total Examined	Percentage in Each Age Group with Defects
18 m.—2-0	18	1	1	0	1	18	19	7	1	1	0	1	7	8	25	2	2	0	2	25	27	7.4
2-1-2-6	19	0	1	1	1	19	20	12	1	1	0	1	12	13	31	1	1	2	31	31	33	6.0
2-7-3-0	12	0	1	0	1	12	13	10	1	1	0	1	10	12	22	3	3	2	22	25	25	12.0
3-1-3-6	12	1	1	1	1	23	24	27	1	1	0	1	27	30	60	3	3	4	60	64	64	6.25
3-7-4-0	31	1	1	1	2	31	33	33	1	1	1	1	33	40	64	4	4	5	66	71	71	7.0
4-1-4-6	28	5	4	2	2	39	58	43	2	2	2	2	43	38	101	10	10	12	103	115	115	10.0
4-7-5-0	64	8	6	1	7	66	73	49	2	2	1	3	49	52	113	10	8	2	110	125	125	8.0
Totals	225	17	14	5	19	228	247	191	16	13	6	19	194	213	416	33	27	11	38	422	460	8.26

visual defects were discovered—i.e., 7.7% and 8.9% respectively, with an overall percentage of 8.26. The number of children who were already receiving treatment for defective vision at the time of the investigation was 11 (five boys and six girls), or 2.39%. A further 33 cases were revealed by the survey; of these, 27 were later confirmed—i.e., 5.87%.

Table II provides an analysis of the defects found.

TABLE II.—Analysis of Defects

Conditions	No. of Uncorrected Cases	No. of Corrected Cases
Compound hypermetropic astigmatism	13	4
Convergent strabismus; compound hypermetropic astigmatism	4	7
Low hypermetropia	5	0
Myopia	2	0
Mixed astigmatism	2	0
Simple hypermetropia	1	0
No significant error	6	0
Totals	33	11

Conclusion

The results of this investigation are to be regarded as a "pilot" survey. Children attending nurseries may not be representative of the whole child population in the age groups examined. Further, a retinoscopy examination without the use of a mydriatic cannot give entirely accurate information about the state of the ocular mechanism. The method employed was devised and used as a simple and speedy technique to discover grosser errors of refraction. Despite its limitations it is contended that the method is justified and suitable for use on a wide scale in the annual examination of children of pre-school age.

Dr. Leonard Scheele, Surgeon-General of the U.S. Public Health Service, is reported to have stated recently that 1949 will be the worst year for infantile paralysis in the history of the United States, with cases reaching a total of 40,000 to 45,000. This will be a 50% increase over the infantile paralysis cases reported last year, and he feared that figures may be even higher next year and in the years to come. In the 10 years before 1943 there was only a moderate incidence of infantile paralysis in the U.S.A., but since then there has been a marked upward trend.

ACUTE ADRENAL INSUFFICIENCY AFTER ADRENALECTOMY FOR PRE-PUBERTAL VIRILISM

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The following case is reported because it must represent closely the results of total extirpation of the adrenals in man.

Case Report

A girl aged 6 was found to be suffering from typical pre-pubertal virilism when first seen on November 8, 1944. The urinary 17-ketosteroid excretion was 12.3 mg. a day. Laparotomy was performed; this confirmed her sex and showed both adrenals to be much enlarged. Left adrenalectomy was carried out and the ketosteroids fell to 8.3 mg. a day. Her physical condition, however, did not improve, and her psychological condition became so difficult that her parents found it impossible to manage her. She was therefore readmitted at the age of 9½ for further treatment.

Although her general appearance was that of a normal girl of this age there was marked enlargement of the clitoris, and the vagina was rudimentary. A heavy growth of pubic hair was present. Her mental ability was only that of a child two years younger, and she behaved in an excessively rowdy way. Her voice was unusually deep. The urinary 17-ketosteroids were now 26 mg. a day.

The right adrenal gland was explored on February 20, 1948, and found to be about five times the normal size. A portion 1½ by 1 in. (3.75 by 2.5 cm.), representing just under half the gland, was resected with the diathermy needle and the cut edge of the remainder of the gland oversewn with catgut. The wound was closed without drainage. A small wound was accidentally made in the pleura; it was immediately closed. An intravenous glucose-saline drip was started.

Ten hours after operation her condition was quite satisfactory and the intravenous drip was discontinued. But the pulse and respiration rates began to rise during that night, and by 24 hours after operation the blood pressure had fallen to 75/45, her pulse was weak and rapid, and she was drowsy but rational. She was sweating slightly and her skin felt warm. It was now noticed that generalized pigmentation of the skin was developing. As the day went on she became noisy and restless, and her temperature rose to 103° F. (39.4° C.). A right-sided