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DEVELOPMENT OF VISUAL ACUITY

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Has anything new been discovered about the actual visual acuity of the infant? It was decided to find out what has been written recently on this subject.

The optokinetic drum has been used to produce nystagmus to evaluate vision. Optokinetic nystagmus is a visuo-motor reflex which can be elicited in normal circumstances at an even earlier age than the light fixation and following reflexes. However, until very recently an accurately graded drum could not be bought. To quantify the response it is necessary to have the black and white stripes so graded as to be equivalent to the Snellen's test chart. It is also important that the drum should rotate at a given speed.

Now two ophthalmologists have improved this instrument. Their version has six circular targets, of values equivalent to Snellen type. A motor rotates the drum. It is held 60cms from the baby and is a quick and easy test to assess visual acuity. Using their improved drum, Catford and Oliver (1973) did a survey on adults whose vision was known. The drum proved very accurate. Encouraged by this they did a survey of children under the age of one year. They found that babies fixate from two weeks of age, but optokinetic nystagmus could not be induced until six weeks. Acuity increases to 6/18 at five months, to 6/12 at 18 months, to 6/9 at two years and to 6/6 at three years.

Thus they have proved that the infant sees better than other authorities believed. Many of our text books state that vision is much lower in babies under one year. Their estimates were based on deduction. The work of Catford and Oliver has proved the better vision objectively.

It is interesting to realise that a three year old child already has normal adult vision for distance and near. The ciliary muscle is fully developed at this age and so the child is capable of good, prolonged accommodation.

Perhaps therefore we should not insist that toys and picture books should be large. The only reason to give a learner large print to read is that it enables him to consider a few letters at a time, a question of comprehension rather than vision.

Other authors including Ruskell (1967) agree that there is a high level of visual acuity at birth. Yet in the general literature it is stated that the fovea and macula are

not developed in the neonate. Mann (1928) showed that the macula continues to differentiate for more than four months after birth. Modern research has shown that the fine structure of the foveal cone is present in the neonate, which supports the belief that the infant is capable of good vision.

It has also been stated in many text books that the neonate is hypermetropic. However some surveys have been done recently.

In U.S.A. Cook and Glasscock (1951) found 25% were myopic.

In Japan Miyake and others (1962) found 5% were myopic.

In India Mehre and others (1965) found 20% were myopic.

In U.K. Graham and Gray (1963) found 5% were myopic.

These figures appear to disagree, but they do indicate that many children (rather than isolated cases) have congenital myopia. It would be interesting to follow up these cases. Does the myopia diminish or increase with age?

Until the motorized optokinetic drum is available in Australia, orthoptists should know the following typical stages in the development of visual acuity.

- | | |
|------------------|---|
| At 2/52 | The child is capable of fixing a light,
He will turn his face towards a light source.
Some convergence is elicited
Doll's head phenomenon is present. |
| At 5/52 - 6/52 | He stares at large objects. Versions with fixation and refixation are possible, i.e. eyes follow movement. |
| At 2/12 | Eyes follow person or large toy. The near-spherical lens of the infant has a fixed focus of about 12 inches, which gradually changes as accommodation develops.
Convergence is good and well maintained
The child may be able to overcome a 20 ^Δ base out prism. |
| At 3/12 | Eyes follow small toy; the head is moved as well. |
| At 4/12 | The child holds head up. Inspects his own hand, reaches towards object, can overcome 20 ^Δ base out. |
| At 6/12 | The body follows head and eyes to the extent of sitting up. |
| At 12/12 - 18/12 | Child is able to pick up small sweets such as jelly beans or smarties. |
| At 1½ - 2½ yrs. | Child is able to pick up small cake decorations such as "hundreds and thousands". |

The orthoptist is also aided in the assessment of visual acuity by the comparison of behaviour when one eye is covered. If one eye, but not the other, can be covered without fuss, then vision is not equal. Again, if small sweets or cake decorations can be picked up with one eye covered, but not with the other eye covered, this too indicates inequality.

The assessment of visual acuity is always difficult in the pre-school child, but it is even more difficult in those under the age of 3½ years. The orthoptist needs patience, experience, and keen observation.

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THE EDUCATION OF ORTHOPTISTS IN NEW SOUTH WALES

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Recent events, which have brought about startling changes in the education of orthoptists in the State of New South Wales, make it desirable to review the education of orthoptists in the past and to consider how far such education should be extended in the future.

In the early 1930's when orthoptics commenced in this country, the training of orthoptists was conducted on a very personal, rather amateurish but highly ethical basis. The first orthoptists were trained by a small number of very enthusiastic young ophthalmologists who had worked with orthoptists in the United Kingdom. These men were helped and encouraged by some of their older colleagues whose interest in the treatment of Strabismus had been aroused by their experience in practice. Orthoptic clinics were established and many of the early difficulties were overcome by very close co-operation between orthoptists and ophthalmologists. As these pioneer orthoptists gained in confidence and experience they were encouraged to pass on this knowledge to others and so the numbers of practising orthoptists gradually increased.

At the request of the Hospitals Commission of New South Wales, the Ophthalmological Society of New South Wales in 1938 appointed a sub-committee, known as the Orthoptic Council of New South Wales, to regulate the training and registration of orthoptists in this State. This committee drew up a syllabus based on that of the British Orthoptic Board, and in 1939 two students were accepted for the first regular course in orthoptics. In this and the next two courses conducted in 1941 and 1943 each student was assigned to one orthoptist for her whole training, so there was typical master-apprentice relationship. A few lectures in ocular anatomy, physiology and optics were given by ophthalmologists. Students were required to study these subjects from post-graduate texts.

In 1947 on the advice of all practising orthoptists in Sydney, the Orthoptic Council appointed a part-time orthoptic tutor and course co-ordinator (Patricia Lance) to assist the students. At this time orthoptists worked only a few sessions per week at any hospital, so most students had to travel with the clinical orthoptist to different hospitals during the week. With no one hospital for the training centre, the tutor orthoptist had to move her lecture room from place to place, and had no permanent office for many years. As the need for more intensive training of orthoptists became apparent the course increased from twelve months to eighteen months, and then to two years in 1956. Annual intake of students commenced in 1953 and an average of six new students per year were accepted by 1958 and the Sydney Eye Hospital became the headquarters for the training.

In 1938 the newly-formed Ophthalmological Society of Australia appointed a sub-committee, the Orthoptic Board of Australia, to co-ordinate the training and registration of all orthoptists in Australia, and in 1947 reciprocity was granted by the British Orthoptic Board. Revision of the syllabus was made from time to time and joint examinations between the Schools in Melbourne and Sydney were held from 1962. Meanwhile, the Orthop-