

## Detection and Treatment of Defects of Children's Eyes.\*

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[Abridged.]

No one can regard the subject of the Detection and Treatment of Defects of Children's Eyes with indifference, least of all an ophthalmic surgeon, attending a general hospital, like myself, who is habitually overwhelmed three afternoons a week by a flood of school children with defective vision.

Vision is to us who have normal eyes, so easy and natural a function that it is hard to realise how complicated a mechanism, both nervous and muscular, is involved in the performance. For normal vision it is not enough that the eye should be so curved and constructed that an image is formed on the retina, but the muscles both within and without the eye must exercise just so much force as is required to focus the object looked at, and to adjust the relative positions of the visual axes till both cross on the object fixed.

Further, when the eyes are rotated in the vertical or horizontal plane they are both moved equally, and the amount of movement is unconsciously noted and measured by the brain.

The adjustment of the eyes is effected by six pairs of muscles, governed by three pairs of nerves, and for many movements all are concerned at one and the same time. Yet, in spite of this, the brain knows all that has taken place, and registers it unconsciously.

When we look at an object at one side without turning the head we know instinctively through what angle the eye had rotated, and make mental judgments of our relative position accordingly.

How dependent on these mental judgments we are is at once apparent if one of the muscles acts faultily; at once our judgment is suspended, and instead of passing safely all external bodies, our course is a series of collisions from defective orientation.

Practically, what we have to consider tonight are what are generally grouped under the term errors of refraction, though this is not an exact description, since we must also include the abnormalities of the internal and external muscles.

The subject, then, divides itself into two main parts, the variations of the refractive media and of the muscles. The groups over-

lap, since it is not possible to interfere with one function without disturbing another.

The eye may be compared to a camera. The normal media of a normal eye, at rest, refract the rays of entering light so that a clear image of the distant outside world is formed on the retina. If the sensitive plate, the retina, is not at the right position, it will be either too near or too far from the optical centre; there will be no clear image on the retina, but a blur more or less approaching clearness as the variation in position is less or more.

Of these conditions, that when the optical axis is too short, is called hypermetropia, the other is myopia.

The latter at once declares itself since no clear vision at a distance is possible; the former can be masked by accommodative effort.

A third form of refractive error, astigmatism, is caused by irregular curvature of the cornea.

It is one of the most serious charges that can be brought against the present school system that so many children break down more or less completely under it; a very large fraction, probably a majority of these failures, are due to some weakness of the eyes.

"Weak eyes" are one of the bugbears of the schoolmaster, who fears that his most promising pupils will break down under the strain of examination work.

It is surprising, even to the ophthalmic surgeon, what a large number of children suffer from red eyes, pain, and headache if the hours of lessons are at all prolonged. The most usual cause of this is ametropia, usually hypermetropic astigmatism.

The County Council are now fairly awake to the importance of vision testing, and warn the parents of the necessity of taking their children to hospitals, but the parents find excuses for delay, even with the best intentions, and the examination is not completed.

Much that is usually put down to stupidity has a cause in some affection of the senses—sight or hearing. This is to some extent recognised, and children are no longer regarded as necessarily obstinate or disobedient because they complain that they cannot learn their lessons: a visit to the specialist will often improve their mental and physical powers.

Every surgeon has seen a dull, heavy child converted into a bright and happy one, by the removal of adenoid growths from the naso-pharynx; every ophthalmologist has seen a stupid (so-called) child become clever, when the defect of his eyes was corrected.

But not all such difficulties depend on the defective sense-organs, though such defects account for a great majority of cases. In

\* A Lecture delivered before the Childhood Society.

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