A NEW DEVICE FOR TRAINING AND TESTING BINOCULAR VISION

BY

T. H. WHITTINGTON, M.D.(Lond.),
M.R.C.P.(Lond)., D.O.M.S.

ALL ophthalmologists who have used stereoscopic pictures in the treatment of concomitant strabismus will know the many difficulties in the practice of this method. Chief among these may be mentioned:—

1. The difficulty with young children of knowing what is happening, that is to say, we can tell frequently if the child is seeing with both eyes at once, but it is often difficult or impossible to know if fusion is actually or nearly taking place. A mother will often say, "Yes, I think he sees them alright, but it is difficult to tell."

2. The difficulty of keeping up (or even inducing) the child's interest in the exercises, especially with young children.

3. Because of 1 and 2, the difficulty of getting the parent (or nurse) to continue the exercises, both parties tending to get bored.

The principle of training binocular vision, and later fusion, by co-ordination of eye and hand is made use of in a drawing stereoscope. In my method wax tablets are used. A style is used to draw with, over a piece of transparent celluloid. Beneath this is the picture on tissue paper, and when the tissue paper is pressed by the style against the wax, marks are visible. These can be made invisible in the fraction of a second by sliding the tablet out of its holder. Thus, innumerable drawings can be made on one tablet. This device incorporated in the drawing stereoscope gets over the above difficulties in those cases of squint in which the method is particularly applicable. Thus:—

1. No questions are asked—it will be apparent from what the child draws as to how far there is binocular vision and fusion.

2. Small children like drawing, especially tracing and drawing over pictures, and in doing this they will make an effort and will concentrate on what they are doing. They see the results of their efforts, which often lead to much amusement.

3. Parent or nurse sees what is happening, and by simple ingenuity the pictures can be varied easily, *e.g.*, a pipe put in the mouth of the clown, smoke made to come out of the chimney, candles on the Christmas tree, etc.

This ability to vary and to make one's own pictures is one of the principal attractions of the device, and serves to keep up the interest

of both parent and child. Also, children are greatly interested in the "mystery disappearance" of the pictures, and like to continue the game for this reason. It is also possible for Noughts and Crosses to be played, the lines of the Noughts and Crosses "board" being the "lock." The child puts his cross on one side, and the nurse puts her nought on the other, and the game is properly seen only while binocular vision is kept up.

The method can also be used as a test for the presence of binocular vision and of fusion. This is often useful in the case of small children who have had a squint and appear to be improving well with glasses. We can judge of the presence of binocular vision easily by observing how they draw, and accordingly vary our prognosis as to the rapidity and permanency of the cure of the squint.

The tablets are made in two series, Junior and Senior (ten in each). Messrs. Theodore Hamblin sell them, and they can be used in any holder that takes their stereoscopic pictures, but it is better to use the drawing board stereoscope which Messrs. Hamblin have made for me, as this gives a firmer support on which to draw. The Junior series is for quite young children, and consists of pictures such as young children draw and without any complicated detail. It is possible for parent or nurse to make additions or variations to them all, to keep up the interest. The Senior set contains more detail, making it harder to draw the pictures correctly, and needing more sustained effort for each picture. Some have a definite "lock," and others no "lock," *i.e.*, no part common to both sides. In those with no "lock" fusion depends on the effort of the patient to see the picture as he knows it should be seen, *e.g.*, the sentry *inside* the sentry box. The patient appreciates his mistakes when he sees how he has drawn the sentry, and the teacher can vary the position of the picture according to the sort of mistake the patient makes. To begin with, for convergent squint, as Dr. Maddox has pointed out, the pictures will probably need to be placed as far away as possible (conversely in the case of divergence the drawing tablet is placed close up). As binocular vision improves, they should be brought up closer, making fusion more difficult in the case of convergence, and farther away for divergent squints. The pictures at present are all arranged so that the two halves are six centimetres apart. A mixed set containing pictures from both series is advised for the use of the ophthalmic surgeon, and he will find certain of these (*e.g.*, feather on clown's nose), particularly useful for a quick test at all ages, and for showing the child and nurse how to play the game.

The method is not meant for cases where there is severe amblyopia in one eye, nor for cases where there is constant and marked squint. It is most useful where there is fair vision in both eyes, and where the eyes become straight at times or almost so with

glasses, or where the eye wanders in when the glasses are removed. It is more particularly applicable to those cases where the left eye is the one tending to squint (which form the majority) so that the patient draws on the right side, and has to superimpose on the right the image seen with the left eye. However, many small children can trace over quite simple outlines with either hand.

This method is useful in the training of older children after operation, and such children can make their own variations and pictures.

The method of carrying out the exercise is as follows:— Suppose we have a child whose left eye tends to squint without glasses. The tablet is taken out of the stereoscope, and the teacher draws over the whole picture on the left side, say the ball on top of the seal's nose, and then continues down drawing over the seal. The child watches, and is told to do just the same in the stereoscope. The ball, which is on each side, acts as a "lock," and if fusion is good, the child draws the seal on the right side directly under the ball (see illustration). The distance of the drawing tablet is varied by noticing where the patient draws—if on the left, there is over convergence, if on the right, divergence. The position is varied accordingly. Various attempts can be made, until the child has got it right or nearly so, and this distance will be the one at which to commence when drawing the pictures, and can be marked

with a pencil on the bar on which the picture holder slides. The nurse can then draw additions, *e.g.*, pipe in the seal's mouth, bun, etc., to keep up interest in the game.

It is not wished to claim too much for this method, but it is suggested that it will be found an amusing, and therefore most useful device, in many cases where binocular vision and fusion need training, and that it is also a convenient and rapid method of testing binocular vision and fusion in patients of all ages. It is also useful as an exercise for children who have trouble with their lessons owing to weak convergence at reading distance.

Messrs. Theodore Hamblin, of 15, Wigmore Street, W.1, supply the tablets with the pictures, and also the drawing board stereoscope. They are not expensive.

ANNOTATION

Certification of Blindness and Ascertainment of the Causes of Blindness

The report of the Prevention of Blindness Committee of the Union of Counties Associations for the Blind has just been issued, and is a most valuable piece of work. The Union of Counties Associations for the Blind set up a Standing Committee, with power to co-opt, on November 20, 1930, to study the problems of prevention of blindness. The Committee now consists of the following: Chairman, Mr. P. M. Evans, whose work on behalf of the blind is so well known as to need no further particularization from us; elected members, Canon Bolam, Mr. Bernard Cridland, Dr. A. Eicholz, Dr. J. Ferguson and Mr. G. F. Mowatt; co-opted members, Mr. J. D. M. Cardell, Mr. T. H. Cresswell, Mr. W. McG. Eagar, Mr. Herbert Fisher, Mr. Lawford and Dr. J. Tate. Dr. J. C. Bridge, of the Factory Department of the Home Office, Mr. F. R. Lovett, of the Ministry of Health, and Dr. J. E. A. Underwood, of the Board of Education, have sat on the Committee, but, in view of their official positions, have not signed the report. The first fact to strike the members of the Committee was the lack of scientific data as to the prevalence of the defects of the eyes determining blindness and the various causes of these defects. They hold that "systematic recording of defects and causes over a term of years and of a large number of cases would provide exact data on a scale never before