Stereoscopic treatment of squint / by A. Freeland Fergus.

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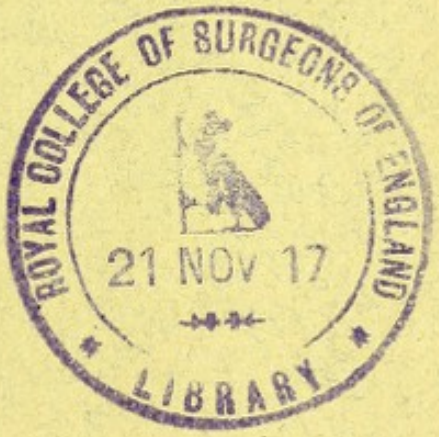
A. FREELAND FERGUS, GLASGOW.



SHERRATT & HUGHES
LONDON AND MANCHESTER
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STEREOSCOPIC TREATMENT OF SQUINT.

By A. Freeland Fergus, Glasgow.

The subject of binocular vision cannot but be of great interest to the physiologist; moreover, it is of great practical importance to the ophthalmic surgeon. On the intuitive development of binocular vision in the infant depends the prevention of squint and the retention of useful vision in both eyes. The careful training of this function is very important in dealing with many cases of concomitant squint, and is also of value in the treatment of paresis of ocular muscles and of the various forms of heterophoria.

In his excellent monograph which appeared about eighteen months ago Mr. Worth laid great stress on functional training. Prior to his time authors have called attention to the value of stereoscopic exercises, and stereoscopes have been employed by ophthalmic surgeons for a period of at least twenty or thirty years. The best and fullest description, however, of the functional treatment of squint with which I am acquainted is undoubtedly that of Mr. Worth.

Concomitant convergent squint may begin in very early childhood, but on the other hand may not be present till after the lapse of some years. In the first group of cases the amblyopia of the squinting eye is usually very profound, but as a rule when the squint has not developed till a later period of life then, generally speaking, both eyes have fair vision. A young child, say of about two years of age, begins to squint. At first the affection may be alternating, *i.e.*, at one time one eye is obviously the squinting eye, at another the other; but before long the affection is manifested only by one eye. Under such circumstances the little patient may be taken to a medical man who to its guardians' satisfaction, if not to his own,

associates the condition with teething or with some gastric disturbance, and assures the relatives that the child will outgrow it. At this early period such a course of action as a rule seals the doom of the eye, and in after life when the patient comes to have the deformity removed it will be found that the eye which was thus neglected when the cortical functions were being established is hopelessly and considerably amblyopic. No training of any kind in such circumstances is of much avail, and the most that can be done is to attempt to remove by operation an unsightly deformity. Had proper steps been taken when the strabismus first appeared then the patient almost certainly would have had two useful eyes instead of one. It is beyond the limit of the present communication to discuss the treatment recommended by Mr. Worth; suffice it to say that it chiefly consists in educating the form sense in both eyes. We have tried it now for a period of fully a year, and when intelligently carried out by the patient's guardians we have found it to be entirely satisfactory. In the treatment of such cases at so early a period of life the use of stereoscopes or of Mr. Worth's ingenious amblyoscope can in the nature of things play little or no part. It is to be remarked, however, that certain of Mr. Worth's figures, particularly the cage and the bird, are quite available for children of about three or four years of age. Mr. Worth also finds that his figures consisting of circles can be used with advantage. When these are viewed through his instrument the observer has the idea that he is looking either at the outside or inside of a tube, and Mr. Worth's experience is that even a very young child with binocular vision can indicate which of the two he is looking at.

Coming now to speak of persons at a more advanced period of life, one curious fact is to be noted, viz., that it is possible for a person to have two excellent eyes and,

although there be no squint, still have not binocular vision in so far as he has no perception of the third dimension. This probably explains an interesting observation which I have occasionally made. Suppose we are testing a patient's form sense by means of Snellen's distance types. Let us further suppose that we are testing the right eye and that a blinder is in front of the left. The patient may be able to see all the letters with the right eye. It sometimes happens that on removing the covering and placing it in front of the eye which has just been examined the patient forthwith states that he is unable to see any of the letters and that his right eye is now quite blind. He is once more able to read the letters on his attention being called to the fact that he can do so with his left eye. This will happen notwithstanding that the left eye is open and that its vision is excellent as measured by Snellen's scale. In other words, some persons seem to have the power of being conscious of impressions coming from one eye. They appear to have the power, where both eyes are good, of disassociating the vision due to one from that of the other. The truth is that cases of this kind undoubtedly occur in which there is no squint; probably they are to be explained by the absence or diminution of the power or fusion and by a parallel anatomical position of rest.

Patients who are improved by stereoscopic exercises are, firstly, all young children who are capable of recognising such test objects as are supplied with the amblyoscope. Careful exercises with the proper use of a bandage, so far as my experience goes, invariably put such cases right. Should the squint be alternating then each eye must be alternately excluded from the act of vision for a space of about three or four hours daily. If, however, it has already been established in one eye, then the eye which is habitually used for fixation should be carefully bandaged for several hours each day. Secondly, the stereoscope is of great use

where the squint has not appeared till a rather later age. I am not sure that here it gives such brilliant results as it does in early childhood, but still it has a marked effect. It certainly is of great use as an adjunct to operative interference, although for that purpose I prefer the plastograms to be described presently. Lastly, the stereoscopic exercises are of immense value in treating the various forms of lateral heterophoria. It seems to me that it is much to be desired that we had a stereoscope for vertical heterophorias.

The stereoscopes which I have hitherto employed have been the convenient forms of Doyne and Landolt, and more recently I have made use of Mr. Worth's amblyoscope. They are all serviceable implements and have this feature in common that the two half images, one belonging to each eye, are combined to form one whole. Most of the exercises with these instruments show only a flat surface, which is a very different thing from stereoscopic vision. Some of Mr. Worth's figures, however, as already indicated, afford admirable examples of stereoscopic vision.

The ordinary picture stereoscope is not available, because when the patient looks through it the examiner has no guarantee that the patient has the sense of perspective and distance. I have found those coloured pictures called plastograms to be superior to anything else as a test of binocular vision and as a training in stereoscopic exercises. The plastogram is constructed as follows:—Two nearly similar pictures are printed on the same piece of paper with only a slight space intervening between them. One of the pictures is of a reddish and the other of a greenish colour. A piece of red glass is put in front of one eye and a piece of green glass in front of the other. If a person have binocular vision the two pictures are at once combined into one and a stereoscopic effect is obtained. If a person who has binocular vision, and has got on trial this

stereoscopic impression, then moves his head or his body from side to side, he will at once find that the objects in the foreground of the picture also move from side to side relatively to those in the background. If the movement be present the patient has binocular vision, if it be absent he has not. An ordinary stereoscope shows somewhat similar movements, but the advantage of the colour stereoscope is that it enables us at once to ascertain which eye the patient habitually employs for purposes of fixation. I have for several months back in my practice used this simple and cheap instrument in cases both of divergent squint and of convergent squint and of heterophoria, and that with the most satisfactory results. The patients are directed to use the apparatus for a period of twenty minutes at least twice daily.

In viewing any of the plastograms which are hitherto seen, stereoscopic effect is only obtained when the red glass is held in front of the right eye and the green before the left. The views may be obtained from Mr. Bauermeister, Gordon Street, Glasgow, and are also on sale in many "fancy goods" shops.