submit, therefore, that it deserves a trial, either at the outset, or when other means have proved a failure.

REFERENCES

1. Collins and Mayou.—Pathology of the Eye.
2. Fuchs.—Textbook of Ophthalmology.
3. Parsons.—Pathology of the Eye.
4. Soelberg Wells.—Textbook of Diseases of the Eye.
5. Terrien, F.—Chirurgie de l'Oeil.
6. Transactions Ophthalmological Society.—Vol. XXXII.

 BLUE CATARACT

BY

R. P. RATNAKER, D.Ch.O.(Liverpool)

LATE RESIDENT SURGICAL OFFICER, MANCHESTER ROYAL EYE HOSPITAL

SINCE Koyanagi reported his three cases of blue cataract in the March number of the *Nippon Ganki Zasshi* of 1917, I have come across two such cases at the Royal Eye Hospital, Manchester, which I consider worth while reporting, as this form of cataract is likely to be overlooked in a large ophthalmic clinic unless each and every eye is carefully examined by oblique illumination.

This form of cataract shows no black spots against the red background of the fundus; on the other hand the opacities do not at all interfere with a clear view of the fundus, either by direct or by indirect ophthalmoscopic examination. But by oblique illumination fine greenish blue dots are seen scattered all over in the lens according to the stage of the disease, except at the extreme periphery.

Hess⁽¹⁾ explains the appearance of blue colour in this form of cataract by the observation of Lord Rayleigh who found that in an opalescent medium containing innumerable fine particles of a different refractive index, the dispersion of light is inversely proportional to the fourth power of its wave length. Hence the parts of the crystalline lens presenting such irregularities of refractive index caused the dispersion chiefly of short wave light, green, blue, and purple. By such diffuse light, they are rendered visible, blending into blue the colour of such spots as seen by daylight, or green as seen by yellow artificial light.

It is of practical importance to know that this form of partial cataract generally appears early in life, or, according to some, is congenital, interferes comparatively little with vision and progresses very slowly. It is capable of being removed in toto, and is particularly fitted for extraction with round pupil.⁽²⁾

The following are the notes of the cases :—

CASE I. Alfred M., printer, aet. 40, came to Dr. J. G. Clegg

as an out-patient in May, 1918, for glasses; eyes weak since birth, no pain either in the eyes or forehead; the movements of the eye-balls, the conjunctiva, cornea, and iris were all normal. Pupils regular, active and medium in size. R.V.=6/0 c. -8 sph. with -1 cyl. ax. horizontal=6/36. L.V.=6/60 c. -3.5 sph. with -1.5 cyl. ax. 40° down and out=6/24 pt. Both eyes together=6/18 pt.

The diminished vision in this case was chiefly due to refractive error.

On focal illumination a few bluish dots were seen in the lens in the pupillary region; on dilatation of the pupils many more of these dots were brought into view. The fundus could easily be seen with indirect ophthalmoscopic examination, and except a crescent of the disc nothing abnormal was seen in either eye. There were brown patches of pigment in the irides which were of congenital origin. Besides the innumerable bluish punctate dots, some of which were conglomerated together in the centre in a Y-shaped or triangular patch (R. eye), which could be resolved into fine dots by the loupe, there were a few greyish dots nearer the periphery, which were larger in size than the blue ones. It presented a very pretty picture.

The patient had no albumin or sugar in the urine; fields of vision normal.

The patient came for re-examination after three months; no change in the eye condition or in sight was found. A third examination three months later showed no change either.

CASE II. Mrs. Maud C., munition worker, aet. 28, came to Dr. H. H. McNabb as an out-patient in August, 1918, for a foreign body in her right eye. On oblique illumination blue dots were seen in both the lenses. She did not complain of dimness of vision, but said that her eyes were slightly weak and she did not want any glasses. The eyes were perfectly normal externally, and the fundi were also normal.

R.V.=6/12 pt. c. +2 sph. with +0.5 cyl. 30° down and out =6/6 ptly. and J. 2.

L.V.=6/18 c. +2.5 sph. with +0.5 cyl. 30° down and out =6/12 ptly. and J. 4.

After dilatation of the pupils a larger number of blue dots were exposed, but the periphery of the lenses was quite clear. There were no greyish dots at the periphery in this case as in the first one. The fundus could easily be seen both by direct and indirect ophthalmoscopic examination, and was found to be normal. The dots in this case also had a tendency to coalesce in the pupillary region. No sugar or albumin in the urine. Unfortunately the patient having changed her address could not be traced, and so no re-examination was made.

I am greatly indebted to Drs. J. Gray Clegg and H. H. McNabb for permission to publish these cases.

REFERENCES

1. *Amer. Jl. Ophthal.*, Series 3, Vol. I, No. 5.
2. Roemer.—Text-book of Ophthalmology. Translated by Dr. M. L. Foster.
"Cataracta Punctata," Vol. I, p. 213.

THE THIRD DIMENSION IN MONOCULAR VISION

BY

C. H. BRYANT, F.R.C.S.

HOVE

OWING to the fact that the retina is a cupped surface, every part of which is approximately at the focus of the lens, a fairly clear picture is obtained of all objects in the field surrounding the small part of it falling on the macula from the object which is used for fixation. There is thus formed a series of images at different planes on the retinal cup improving in definition as they approach the point of fixation. The depth of the landscape viewed is then estimated by the comparison of these images in the light of past experience. An experimental proof of this is readily made by viewing the landscape through a series of opaque tubes of increasing calibre. In proportion as the field viewed is made more extensive and more objects are seen in it so does the sense of depth become more evident. In this way animals possessing only monocular vision must be able to see objects in relief and not flat, as the depth of the picture can be estimated almost as well with one eye as with two.

I have often observed with interest the movements of a friend who has lost one eye from glaucoma and, although he has normal visual acuity in the remaining eye, has an extremely limited field of vision. He obviously has no idea of the relative position of objects, and has to grope his way about. This is, of course, due to the limitation of the field and not to the fact that there is only one eye. We are all familiar with the fact that persons who have only one eye can play a good game of tennis, cricket, or billiards, and are excellent game shots, in all of which sports an accurate knowledge of the relative position of objects is essential.

Binocular, or rather stereoscopic, vision can be of little or no use at a distance of more than a few yards in the estimation of the relative position of objects, since the rays of light entering the eyes are then practically parallel. The muscular sense of focussing is also of little use. Parallax movement is of the greatest value in giving the idea of depth. Birds may be noticed to make use of this as they move their heads from side to side and even up and down when looking intently at an object.