The variation between some of the glasses will serve to show the importance of testing each sample before use with at least a comparative spectroscope. Efficient goggles are made of soft leather, and it is important that side protection should be ensured.

If possible the glass should be as far away as possible from the face to prevent condensed vapour being frozen on it in low temperatures.

Hemisine or adrenalin chloride 1:1000 dropped into the affected eye was found to be the best treatment so far employed.

IDIOPATHIC DETACHMENT OF THE RETINA*

BY

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IDIOPATHIC detachment of the retina as distinguished from that definitely due to trauma, new growth, or general disease is a *bête noire* of the ophthalmic surgeon and for this reason our thoughts should be constantly directed to the subject, especially in view of any new inquiry which may throw light upon it. Accordingly, in this paper I have largely followed Dr. Gonin, of Lausanne, in his recent full and careful description of the pathology and pathological anatomy of the disease.

We may take as a more or less typical case the following:

"Mr. W., age 41, clerk, first consulted me on October 27, 1920, complaining of slight failure of sight in the right eye. On examination a few vitreous opacities were noted, and it was only after careful search that I was able to make out two detachments, one above and to the inner side of the globe, and the other, smaller, below and to the outer side. No retinal tear could be seen. Vision of the right eye with glasses, $\frac{-6.00}{-2.00 \text{ ax. hor.}}$, was 6/24. The left eye appeared to be healthy although of only moderate visual acuity, 6/24 with glasses, $\frac{-3.00}{+5.00 \text{ ax. vert.}}$. I recommended complete

rest and made arrangements to take him into hospital the following day. The very next morning he returned with a huge detachment in the superior region and his vision was reduced to counting fingers. Treatment consisted of complete rest with atropin drops and pressure bandage; the eye was examined ophthalmoscopically every second day. Firm pressure was not tolerated

* Read before the North of England Ophthalmological Society, Bradford, December 8, 1920.

and a corneal ulcer developed which speedily disappeared, however, on substituting a light pad. After a few days it was noticed that the retina had gone back and after a fortnight he was allowed up with 6/36 vision. Relapse occurred in a few days and he again returned to bed, with the result that the retina once more resumed its normal position. I now cauterized the sclera as far back and as near to the site of the detachment as possible. For reasons of health, he was again permitted to get up after a week's rest, but in spite of taking things very easily, relapse occurred in a day or two; vision sank to counting fingers, and when last seen he had an extensive detachment in the old position. The optic disc was clear, myopic fundus changes were not marked, and the media were not particularly hazy."

Diagrams from Gonin's "Rapport" in *Bull. et Mém. de la Soc. française d'Ophthal.*, 1920.

FIG. 1.

Shows detachment of solid part of vitreous and its separation into stroma and liquid.

It is for this type of case, and for this only, that the term "idiopathic," in default of a better term, should be reserved, though even here there may have been a predisposing cause in some slight injury, remote in time, and then the detachment precipitated by some slight shock or strain, and it may therefore, strictly speaking, be really traumatic.

The chief clinical characteristic in such cases as the above is the fact that it is the superior part of the eye which is nearly always first affected, and central vision may speedily become gravely affected by involvement of the macula. Indeed, we have all seen cases where the disc has been partly or even wholly obscured by a

fold of the retina falling in front of it. In another type of case, however, it is the inferior part of the globe which is first affected. The following two cases may be quoted in this connection:

"Miss S., age 48, consulted Dr. Little in 1918. She had previously been under Dr. Bronner's care, who had kept her in bed for two months and performed an operation upon the eye of the nature of which she was ignorant. Dr. Little's notes state: "Left eye blind from cataract and bad projection, right eye detachment over the lower half of the field, error of refraction $\begin{array}{r} -5.00 \\ -3.00 \text{ ax. hor.} \end{array}$."

No note of the vision was unfortunately made at that time, and no special treatment was given. I first saw her on August 25, 1920, and noted vision 3/60; a retinal tear can be seen to the lower and

FIG. 2.

Shows adhesion of vitreous to the retina above.

outer side, and the retina is extensively detached in the inferior region. She stated that she was not much worse than she was two years previously, and was able to get along fairly well.

Here then is a detachment in the inferior region which involves the macula, it is true, but which is compatible with a fairly useful amount of sight.

The second case is that of "J.M., age 25, who came to the hospital on October 23, 1920, the history being that he could see black lines in front of the left eye. Vision of the right eye 6/6, left with + 2.00 6/18. Some fine vitreous opacities noticed. On examination, the left retina is detached well forward below, and somewhat to the inner side, grey in colour, no tear to be seen. The lesion

appears to be stationary, and no treatment was considered necessary. Two years previously the patient had attended hospital for a foreign body on the left cornea, which was removed. As the vision was taken, and was the same as at present, it seems likely that the detachment already existed, but there is no note on the case paper of the fundus having been examined."

Here is another example, then, of a detachment existing for a long time quite compatible with good vision, but in this case there may possibly be a traumatic element.

Probably the most important factors in actually bringing about the disaster are primarily an adhesion of vitreous to retina, and secondarily a perforation of the latter due to traction. Gonin's analysis of his own material shows that retinal tears occur in four-fifths of

FIG. 3.

Shows the consequences of such adhesion.

the recent cases. He describes three varieties. The majority are valve-like in form, shaped like a circumflex or crescent, with apex or convex border directed towards the disc, and base towards the periphery. Now and then a piece may actually be punched out of the retina, and be seen floating in the vitreous. The third kind is found at the ora serrata, and is therefore difficult to see with the ophthalmoscope. The last-named tend to be multiple, and to form a sort of festoon arrangement.

Whatever the type of rupture it is here in all probability that the detachment has started. As a general rule rapid development in the superior region is associated with a perforation of the valve-like or punched out type; a more chronic onset, on the other hand, involves the lower part of the eye, and if a perforation is present it will be

found to be of the festoon type. Small patches of old choroiditis may often be made out in the neighbourhood of the tears.

The attraction theory enunciated by Leber and supported by Gonin in his recent work assumes that a change occurs in the character of the vitreous. This change consists of a shrinking of the stroma and extrusion of its fluid contents. The stroma or pulp has a greater density than the fluid and tends to gravitate downwards (Fig. 1). If, then, there is a retino-vitreous adhesion secondary to a patch of choroido-retinitis it will be influenced by this change of density according to its situation above or below (Fig. 2). If placed in the superior position the weight of the stroma and the movements of the eyeball will exert a traction on the adhesion and will tend to produce a detachment by first causing a tear (Fig. 3). (I take the liberty of reproducing Gonin's diagrams which schematically show how this occurs). In the inferior region, however, there is a somewhat different state of things; here the relations of vitreous and retina will, on account of the force of gravity, be much more intimate. Close contact will promote extensive adhesion and if the membrane becomes detached it will tend to be raised as a whole rather than a tear be produced.

In the rare cases where the superior portion becomes re-attached it must be assumed that the adhesions break or slacken owing to the retina being raised below. On the other hand, a primary detachment below would tend to remain stationary and not to extend, as my second and third cases prove.

The examination of the material at Gonin's disposal demonstrates the fact that the pre- and post-retinal fluids are identical and derived from the vitreous, except in very late stages where glaucomatous changes have supervened, in which case the subretinal fluid comes from an entirely different source, namely from the choroid, and is coagulated by the fixing agent.

The degenerative changes in the vitreous must be attributed to defective nutrition of the uvea, more especially of the ciliary body which undergoes atrophy with proliferation of its epithelium. The epithelial cells wander through the fissures in the vitreous and form bands which still further strengthen the existing adhesions. As atrophy of the ciliary body is not uncommon in myopia, we have here an explanation of the important part which this defect plays in idiopathic detachment. Short sight is not, however, the only factor, though probably the most important one. Gonin's 80 cases were made up of 18 high myopes, 19 moderate (6-10 D.), 16 slight (1-5 D.), 20 emmetropes and 7 hypermetropes. Four patients without any refractive error had double detachment. Again out of the 85 cases of authenticated cure collected by the Ophthalmological Society in 1915-16, fifty-one were myopes.

So long as the vitreous body is healthy, detachment of the

"idiopathic" variety does not occur. In those cases of traumatic choroido-retinitis proliferans with which we are all so painfully familiar, exhibiting, as many of them do, the most profound changes in retina and choroid, detachment, as Wallace has shown, only happens with extreme rarity, twice only in his series, one of which went back after a fortnight's rest. Again we have all met with escape of vitreous after cataract extraction, especially in our less experienced days, but we know that it seldom leads to an untoward result in spite of the fact that the vitreous body is incapable of regeneration; the usual result after a large loss is expulsive haemorrhage. There can be no doubt then that so long as the vitreous is healthy retinal detachment is extremely rare, and the cases I have quoted as occurring in my own practice seem to indicate that Leber's theory has a certain degree of probability, and if so, it must follow that the chance of a spontaneous cure, or of one brought about by remedial measures, must be very meagre, more particularly if the lesion commences in the superior region.

If, however, detachment, has been brought about by choroidal effusion as in cases of trauma, albuminuria, and other diseases, the prognosis need not be so guarded, as the following case shows:

Mrs. T., age 60, admitted to hospital on October 2, 1920, with subacute glaucoma of both eyes, vision of right eye 6/36 and left eye nil. Corneo-scleral trephining was performed on both eyes two days later. On October 19, the notes record—Fundus reflex clear except to outer side where retina appears to be detached far forward and bulges inward, vision 6/60. Left eye retina detached to outer side and below, well forward, media clear.

I saw the above patient again on November 20, 1920: vision, right 6/60, left nil. Every trace of detachment had cleared away in both eyes. I can recall a second patient some years ago, who was under my care at the Kent County Ophthalmic Hospital, who suffered from recurrent attacks of detachment after cataract extraction; he had diabetes, and, I think, albuminuria as well. Rest in bed for a week or two was always successful in bringing about a complete, although temporary, cure.

Consequently it is important that such cases should be carefully discriminated from the idiopathic variety, as the pathology is different, and the statistics of authenticated cure above alluded to are not so valuable as they might be, including as they do 11 of traumatic origin, 6 of albuminuric, one occurring in pregnancy, and two after cataract extraction, out of a total of 85 altogether.

The question, as it seems to me, is largely one of prophylaxis. The improvement that follows careful supervision in the Bradford Myopia School has been recorded by Mortimer in a recent paper, and more will probably be done in this direction in the future. How to maintain the ciliary body and uveal tract in their highest

state of efficiency is a problem that must be solved if we wish to guard any predisposed patient against the awful calamity of idiopathic detachment. With regard to the curative treatment I do not think any rational method has yet been suggested, and we still await the solution of how to restore and keep in proper position a retina which has become detached as a result of secondary changes in the vitreous body.

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EYE DISEASE RESULTING FROM MALNUTRITION

BY

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AFTER the Armistice I was stationed on the Franco-Belgian frontier, in a district where the civilians had endured continuous hardships and misery under the German régime since the commencement of the war in 1914.

During the final German retreat, they had been forcibly evacuated from their homes by the enemy, being sent off long distances by road or by canal into Belgium and Holland. The winter was coming on, the nights were freezing, the civilians were insufficiently clad and insufficiently nourished, and many of them were debilitated in consequence of the epidemic influenza with which they had been affected. When driven off by the Germans no arrangement seems to have been made to provide the refugees with any food.

After the Armistice they came straggling back to their old homes, returning to a district denuded of food, with the railways destroyed and the canals broken down, and with craters blown in the cross-roads. The feeding of this civilian population was undertaken temporarily by the Army authorities until the French could organize their own *ravitaillement*; and in the First Army area even transport animals were killed, cut up, and distributed as food. In the more rural districts there was a small quantity of root crops and green vegetables remaining, and the people consumed what seed potatoes they had been able to conceal, for the 1918 harvest and potato crop