last seen three months after the operation, at which time he was very comfortable and no recurrence had taken place.

I have to thank Sub-Assistant Surgeon Rangonath Rao for the photograph of the patient.

The micro-photographs were taken from the tumour removed from the right side.

THE HUNTERIAN LECTURES ON THE INDIAN OPERATION OF COUCHING FOR CATARACT

*Delivered at the Royal College of Surgeons of England on
February 19th and 21st, 1917*

A Summary

BY

LIEUT.-COL. ROBERT HENRY ELLIOT, I.M.S. (retd.)
LONDON.

THE operation of couching for cataract was practised and described by Celsus at the very beginning of the Christian era, and many contributions to the literature of the subject have since been made. It is probable that it was introduced into Europe from the East, and it was certainly known and practised in the Orient for many hundreds of years before its first whisper in the annals of Western surgery. From the time of the advent of the British surgeon to India, couching attracted much notice, but it was not until the work of Lister began to bear fruit that the crude and filthy methods of the coucher excited a due amount of horror in the minds of the exponents of modern surgery. The lecturer has studied the methods of these men for over twenty years, and has collected and carefully compiled records of 780 cases of couching; in addition, he has been able to obtain 54 globes on which the operation had been performed. This latter collection he has now presented to the Museum of the Royal College of Surgeons of England.

There are two distinct operations performed, *viz.*, the anterior, in which the lens is attacked through the cornea or limbus from the front, and the posterior, in which the incision is placed behind the ciliary body, well back in the sclera. The latter is by far the more scientific procedure, two instruments being used, and a deliberate attempt being made to break down the suspensory ligament of the lens before its dislocation is attempted. Owing to the dirty methods of its exponents, and to the crude instruments used, the results of couching are very bad indeed, only 21·64 per cent. of operations yielding a visual result equivalent to 1/10 or better. It

is estimated that the coucher loses 60 per cent. of eyes which might reasonably be saved by better and cleaner methods of operating for cataract. The principal causes of failure are, in order of frequency, irido-cyclitis, glaucoma, and imperfect dislocation. In a few cases these men mistake other conditions, such as glaucoma, optic atrophy, and retinitis, for cataract, and operate on them. The lecturer dealt with the pathological side of the question and took up a number of subjects in turn.

The various directions in which the cataractous lens may be displaced

Dislocation forward was found only four times in the 54 globes examined. In one, the lens lay impacted in the angle of the chamber; in one, it was fixed between the ciliary body and the sclera, having reached that position by way of the broken-down pectinate ligament; in one, the capsule of a Morgagnian cataract, blocking the angle of the chamber over a wide area, was the only evidence of the lens remains; its nucleus and the contained fluid had escaped. *Dislocation backward* was the rule. For convenience sake, all such dislocations are classified into a number of groups according to the position of the lens and the greater or less amount of fixation it displayed in its new position: (1) The lens was found floating freely in the vitreous, which was little altered in structure, although presenting slight filmy evidences of inflammatory infiltration. (2) The lens was entangled in a more or less consistent exudate, which occupied the anterior portion of the vitreous chamber, and which distinctly limited its movements. (3) The lens was fixed to the back of the iris and ciliary body, or to some neighbouring part, by definitely organised inflammatory tissue, which represented a further stage of the process sketched in the previous class. The degree of organisation present in the shrunken cone of vitreous, which was usually in continuity with the inflammatory tissue fixing the lens, varied very greatly in different cases. In some, definite fibrous tissue was abundantly in evidence. (4) The lens was matted in a dense mass of cicatricial tissue, lying between the inflamed iris and ciliary body in front, and the completely detached retina behind; the detachment of the retina had been produced by the shrinkage of the inflammatory exudate poured into the vitreous cavity. In these cases the septic infection had clearly been of an intense character, and the inflammation set up had been correspondingly severe. (5) The lens, although dislocated backward, lay in front of the anterior hyaloid membrane, and therefore outside the vitreous chamber. The septic infection also appears to have been less intense. These two factors distinguish the globes of this group from those just previously considered, with which, in other respects, they have distinct

affinities. (6) The peripheral cortical remains of the lens lie *in situ* imprisoned in the capsule, and are all that is left of the cataract; they correspond to the after-cataracts met with after extraction. (7) In two cases the lens was thrust in its capsule through the retina, and lay between that membrane and the choroid coat.

Accidental injuries to structures other than the lens during couching

Although the object of the coucher is to dislocate the lens, he may accidentally injure any of the other structures of the eye. These are now taken in turn:

The Cornea.—Opaque scars on the cornea are frequently met with clinically, but are difficult to recognise in formalin-hardened specimens. In one case a fistula of the cornea was present; it had been associated with anterior staphyloma, which had burst along the track of the original injury, leaving a permanent drain behind. In another case there was a capsular-corneal synechia, and in a third a retino-corneal synechia.

The Sclera.—Injuries of this coat are common, as the incision is made through it in the posterior operation, but they are hard to discover, and there is an element of chance in their detection. They are best recognised by the pigmentation that follows disturbance of the underlying uveal coat. In one case, a scleral fistula persisted as a result of the operation, and gave rise to a filtering cicatrix on its surface. In another, the scleral wound had closed firmly by cicatricial tissue, in which the ciliary body was impacted. Lastly, there was an instance of a wound through the limbus, in which the scar could be followed throughout its course in microscopic sections of the part.

The Uveal Tract.—Injuries to the iris are commonly seen clinically, and are also to be found in evidence in the series of globes before us, either in the form of tears, which widely alter the outline of the pupil, or in that of atrophic scars. In one case, already referred to, the ciliary body is extensively detached from the sclera by traumatism, and in a number of others a similar detachment is due to the shrinkage of the inflammatory exudates within the eye. Wounds of the ciliary body itself are common; some of these lie across the front of the ciliary processes, or at their junction with the iris; others cut right through the processes themselves; whilst yet others lie in the orbicularis ciliaris. Nor does even this mark the posterior limit of the scars made by the coucher's incisions, for there are globes which show these lying on the equator of the eye, and even well behind it. Not the least interesting of these is one in which a strictly localised inflammation within the tunics of the eye marks the spot at which the copper tip of a coucher's probe had probably been broken off during the operation.

Uveitis.—The type of inflammation of the uvea found in these specimens was, with one exception, plastic, and was mostly confined to the iris and ciliary body. The intensity of the septic infection varied greatly in different specimens, and this was faithfully reflected in the severity of the inflammatory process found in different globes. In some, the latter was extremely slight, whilst in others it led to severe matting of the parts, which wholly obscured the normal anatomical arrangements. All intermediate stages between the very slight and the very severe inflammations could be readily traced. The lenses involved in the inflammatory changes showed phagocytosis, liquefaction, or calcification, as the case might be. In only one instance has any evidence of proliferative uveitis come to light, and in this one the nodule in the iris consisted of mononuclear leucocytes; epithelioid and giant cells were conspicuous by their absence. The interest of this observation lies in the evidence it affords that the danger of sympathetic mischief in the second eye is not great after the operation of couching. The lecturer's clinical experience bears out the correctness of this view.

The Chambers of the Eye

The anterior chamber was found very shallow in a large percentage of cases; in several of these "*iris bombé*" was present. A rare condition was the complete obliteration of the cavity by adhesion of the iritic exudate to the posterior surface of the cornea. Abnormal contents were found in a number of cases; these consisted of pus, of blood, of a mixture of pus and blood, of vitreous, of lens matter, and of structureless albuminous exudate.

The vitreous chamber.—In the great majority of the eyeballs, the vitreous body had become infiltrated with inflammatory material, which tended to undergo organization, to contract adhesions to the retina and to the iris and ciliary body, and, finally, to shrink and become detached, dragging the retina away from its bed in the process. The steps would appear to be:—(1) an infection of the vitreous body and of the structures surrounding it by septic matter during the operation; (2) the outpouring of an inflammatory exudate into the vitreous, partly as a result of inflammation of the uveal tract and of the retina, and partly in consequence of the chemotactic attraction exerted by the infected hyaloid body; (3) the organization of these products and the contraction of adhesions between them and the retina; and (4) their contraction resulting in retinal detachment. The organization of the exudate was most marked in the neighbourhood of the optic nerve and in that of the ciliary body. In some cases a definite cone of exudate was present; in others, the effusion was represented by a mass occupying the anterior portion of the chamber. This latter appearance is due

simply to an artefact, the apex of the cone of exudate being broken across, either in the preparation of the specimen, or in the subsequent handling. This has been proved in a number of ways. These cones of exudate are intimately connected with, and frequently form part of, the inflammatory material which has been described in a previous section as fixing the dislocated cataract immovably in its abnormal position.

The Retina

Detachment of the retina occurred in over 70 per cent. of the globes. All stages were represented from very slight and partial detachments up to absolutely complete ones, and to those in which the retina was rolled up in the shape of a stick. In the immense majority of the cases, the cause of detachment was contraction of the exudate which occupied the vitreous cavity. The following three other causes were operative in a very limited number of cases.—(1) Direct trauma from the push of the operator's knife; (2) displacement due to the lens being thrust through and under the retinal coat; and (3) the pouring out of blood between the retina and the choroid as a result of the wounding of the vessels of these coats.

Dots on the retina.—A striking feature of a large number of the globes of this series is the presence of numerous dots on the retina. These varied greatly in size, in colour (from white to grey, or glistening), and in number; but in one form or another they could be recognised in more than 50 per cent. of all the eyes examined. Some of the specimens show them so prominently that it would be hard to overlook them, whilst in others a careful search with a lens was required to reveal their presence. Most of the cases were of very long-standing, indicating that probably the phenomenon is a degenerative one; but, on the other hand, it is to be remembered that although the histories given showed it was many years since the couching, the actual loss of sight had not infrequently been due to a comparatively recent intercurrent inflammation. Considerable difficulty has attended our search for the anatomical cause of these dots, and the investigation is not yet complete, but three appearances have been found which seem likely to be sufficient to account for the dots in different cases; it is quite certain that the cause is not the same in all. These three phenomena are: (1) localised proliferation of cells along the course of some of the retinal vessels; (2) collections of mononuclear cells on the surface of the retina lying external to the limiting membrane; and (3) small cysts developed in the walls of the retina, as the result of the coalescence of œdematous spaces therein formed. Of the latter process, there is abundant evidence in quite a number of the specimens.

Glaucoma

If due allowance be made for the fact that a number of the globes had undergone late changes which were calculated to hide the evidence of a previous glaucoma, we find that 19 out of the 30 left had suffered from high tension. In 3 of these the angle of the chamber was freely open, and in 16 it was closed. Of the 3, one showed a free communication between the aqueous and vitreous chamber; in the second a bulky Morgagnian lens closed a large part of the angle of the chamber; and in the third there was good reason to think that the glaucoma had existed before the operation was undertaken. Taking the remaining 16 cases, together with certain others in which the presence of glaucoma could no longer be established, the following conditions found present afford reasonable explanations of the causes of the raised intra-ocular pressure. In one there was a corneal fistula following a corneal staphyloma; in one there was a capsulo-corneal synechia; in one a retino-corneal synechia; in 5, the ciliary body was involved in the scar; in 6, the dislocated lens pressed extensively on the iris base; in 3, the lenses were tilted at right angles to their normal position; in 5, the pupil was blocked, and in 3 of these *iris bombé* was present; in 2, the interior layer of the hyaloid was much thickened by inflammatory exudate; in one, there was a dense after-cataract; and in one, glaucoma had evidently been present before the operation.

ABSTRACTS

I.—THE RETINITIS OF ARTERIO-SCLEROSIS

Moore, R. Foster (London).—The retinitis of arterio-sclerosis and its relation to renal retinitis and to cerebral vascular disease *Quarterly Jl. of Medicine*, Vol. X, Nos. 37 and 38.

Foster Moore has contributed an article of interest, the outcome of painstaking and accurate observation. The subject is considered under three heads:

1. The evidence of arterio-sclerosis revealed by the ophthalmoscope.
2. An endeavour to show that a condition of retinitis may be engrafted on this—a condition with distinctive characteristics differing markedly from those of renal retinitis and therefore deserving of separate recognition, and
3. A consideration from a study of cases of the extent to which