

**Methods of operating for cataract and secondary impairments of vision :
with the results of five hundred cases / by G.H. Fink.**

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METHODS
OF
OPERATING FOR CATARACT

SURGEON-CAPTAIN G. H. FINK

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METHODS OF OPERATING
FOR
CATARACT AND SECONDARY IMPAIRMENTS
OF VISION

WITH THE RESULTS OF FIVE HUNDRED CASES

D. G. Crawford

8th February 1895

METHODS
OF
OPERATING FOR CATARACT
AND
SECONDARY IMPAIRMENTS OF
VISION

WITH THE RESULTS OF FIVE HUNDRED CASES

BY
SURGEON-CAPTAIN G. H. FINK
HER MAJESTY'S INDIAN MEDICAL SERVICE.

WITH ILLUSTRATIONS

LONDON
J. & A. CHURCHILL
11, NEW BURLINGTON STREET
1894

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PREFACE

HAVING received every kindness and help through the noble example of my Professors at University College and Hospital during my collegiate and medical course, I have been anxious to bring back some of the reflected lustre of the West from the East, however imperfect and minute be the rays. At any rate, it is a gratification to me to know, by the experience of over 1000 cataract operations performed out in India by myself, that a small percentage of my patients had sight immediately restored by a very simple operation, viz. laceration of the hyaloid membrane for secondary impairment of vision, after a successful operation for cataract had been undertaken. It was by the method of testing sight, immediately after the operation for cataract was completed, that I discovered this peculiar condition of absence of vision for objects, although there apparently seemed to be slight perception of light only.

These cases have been assigned, I feel sure, to the

category of deep nervous or other mischief of the inner tunics of the eye; but in many cases, after the operation the results have astonished me in the small number of patients in whom it has occurred, who otherwise would have been given up as almost hopeless cases. Listerian principles have marvelously lessened the dangers of operations of all kinds which once were regarded as very serious. The escape of vitreous by the opening of the vitreous chamber in cataract operations is spoken of as a serious accident, but I must say that I have not met with grave results in the majority of my cases, and now have taken to opening the vitreous chamber intentionally in a certain class of cases, which are described in these pages, with successful results as regards vision.

YORK HOUSE,
119, GOWER STREET,
LONDON, W.C.

PART I

METHODS OF OPERATING

FOR

CATARACT AND SECONDARY IMPAIRMENTS
OF VISION

THE condition of the eye known as cataract, is an opacity of the capsule of the lens, or lens itself, which is met with in a great variety of forms at various periods of life, from infancy to old age, due to numerous causes during intra-uterine life, at birth, and in advanced age. Cataract presents a diversity of forms, colour, consistence, and density, and therefore its treatment varies in skilful hands.

My paper is meant to deal only with those forms of cataract which are observed in advancing age, and not with the forms of congenital life. I am desirous to illustrate my operations by a tabular statement of 500 operations performed by myself in India with

iridectomy, and then to treat later on of cases in which non-iridectomy operations have been performed in suitable cases, in which I have considered iridectomy an unnecessary mutilation of the eye, since signs and symptoms have presented themselves to justify my adopting an eclectic method of operation.

I am convinced that, by the adoption of antiseptic measures, and of cleanliness, together with eclectic methods of operation, our percentage of successes in the treatment of such cases must vastly improve.

Cataract-pricking was known to the ancient Hindus even before the ancient Greeks. Neither in Plato, Aristotle, nor Hippocratic writings do we find it mentioned. Celsus, Galen, and Paulus describe it. The Arabs in the Middle Ages copied the Greek operation. Europe gained knowledge from the Arabs, and only during the first half of the eighteenth century was extraction performed, and Daviel showed its superiority over the operation of subluxation of the lens. Beer then copied Daviel's method with his own triangular knife, then followed Jacobson, and later on von Graefe, who handed down to us the more scientific method by linear extraction; and since then, although there have been minor improvements in the invention of various instruments and modes, yet the general principles have practically remained. But to the great Lister is due the high honour and praise of the laws of strict cleanliness and aseptic surgery,

which has done so much towards saving life and limb and organ ; and with the present materials we possess for ensuring cleanliness, the fine instruments for gaining precision, and the high standard of success which ophthalmic surgery has attained in the hands of Europeans, the Indian surgeon, by copying his *confrères* who have done so much towards this particular branch, is able to undertake cataract operations with as grand results.

In no class of operations is there required as great neatness, care, cleanliness, and other minute details as in operations on the eye.

The operator must not trust to his assistant to carry out the details, but must rely entirely upon himself if he be sanguine of the highest success which his art can achieve. Where an assistant is called in to help him, he must see that he has thoroughly washed and disinfected his hands, so that, in handing him instruments and dressings, he is sure that they reach him as clean and sweet as can be. In the measure in which these details are carried out, so will be his success as an operator.

As to the methods of operating which I adopt in India, where cataract cases in some parts of the country are numerous, they are the following.

The instruments.—They require daily attention in India, owing to rust eating into steel so very rapidly. After an operation I always wash the instruments in

boiling water, carefully dry and wipe them, and then put them out in the sun for half an hour or so, to dry thoroughly. Just before using them I again dip them into boiling water, and then place them in a bath with carbolic solution (1 in 40) to just cover them. But in the present day sterilisers have come into use, and no doubt they prove an additional advantage in eye surgery—

The solutions are kept in china gallipots—

- (a) Contains warm water.
- (b) Warm solution of bichloride of mercury (1 in 2,000)
- (c) " " " (1 in 5,000)
- (d) " " " (1 in 10,000)

—by your side, and renewed after each operation.

Eye-drops :—(a) Atropine solution 4 per cent.

(b) Cocain solution 4 per cent.

(c) Eserine solution 2 per cent.

Dressings and other Necessaries

(a) Dossils of lint soaked in 1 in 2000 bichloride of mercury solution in a glass-stoppered bottle.

Use.—To absorb and wipe away discharges and blood from the folds of the conjunctiva, before, during, and after the operation.

(b) Antiseptic plaster composed of blue or green silk which is washed in mercury lotion (1 in 5000), then dipped into a hot solution of gum-arabic and

mercury (1 in 5000), stretched over a clean board and dried in the sun, and cut into the following shape as an after-dressing for the eye, with two slits for discharges to drain away at either canthus.

(c) Sal-alembroth.

(d) Soft muslin bandages.

(e) Two clean towels washed in mercury lotion (1 in 10,000) and dried.

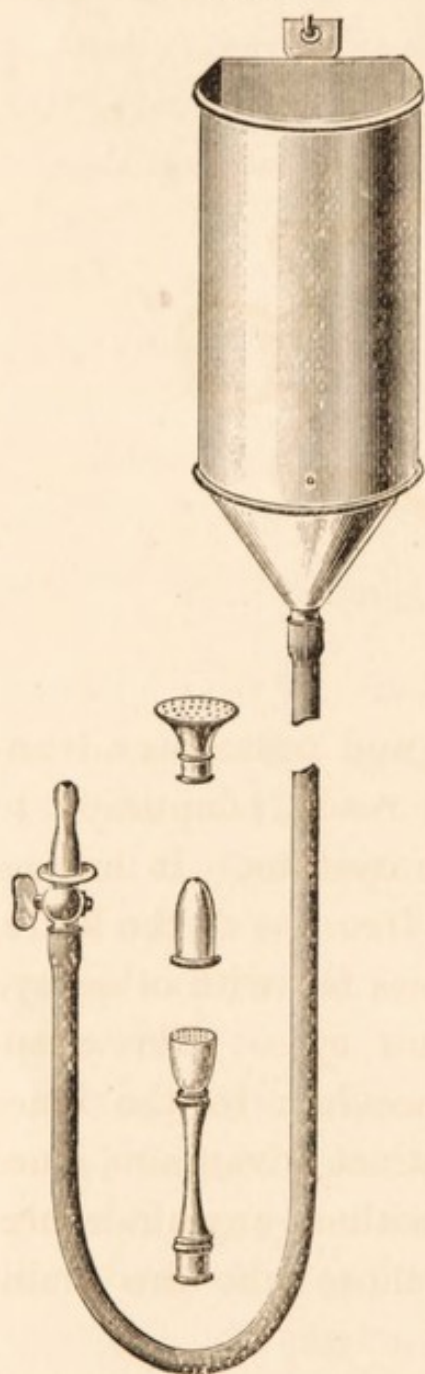
(f) Irrigator for (1 in 10,000) mercury lotion.

The Patient and Operator

The operator and his assistant having cleaned their hands thoroughly with soap and water, and disinfected them with mercury lotion (1 in 10,000), the patient is placed on the operation table (atropine having been instilled previously) and covered over from his feet to his shoulders with a clean sheet, before a good light. A clean towel is enveloped around the patient's head to prevent dirt and pediculi from sticking to your apron. The patient's eyes and their neighbourhood around are thoroughly cleansed with soap and water, and then washed with a 1 in 10,000 bichloride solution from the irrigator (Fig. 1), and two drops of the cocain eye-drops are instilled into the eye at the inner canthus.

The eyelashes are cut short to prevent discharges adhering to them, and every stray piece of hair or

FIG. 1.



discharge is picked out carefully with a clot forceps (Fig. 2).

The conjunctiva of the eye and its folds are now syringed out carefully with a 1 in 5000 bichloride solution.

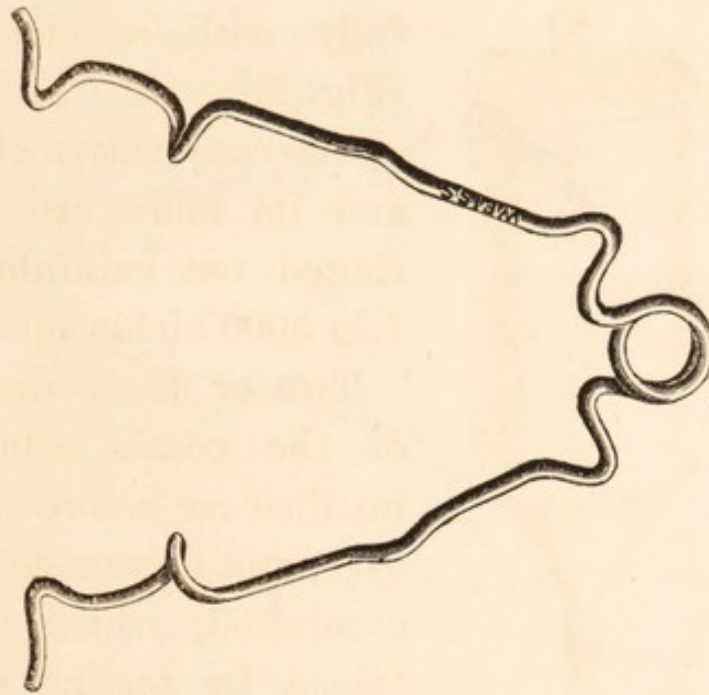
Two or three drops more of the cocain solution are instilled as before into both eyes, and as soon as they are cocainised, which is ascertained by testing sensation with a pair of forceps to pinch up a fold of conjunctiva gently, and if the patient wince under it, one or two drops more of cocain are instilled into the eyes.

The eye being now cocainised, I apply a Bowman's spring speculum to the eye at the inner canthus. Bowman's speculum (Fig. 3) is about the

FIG. 2.



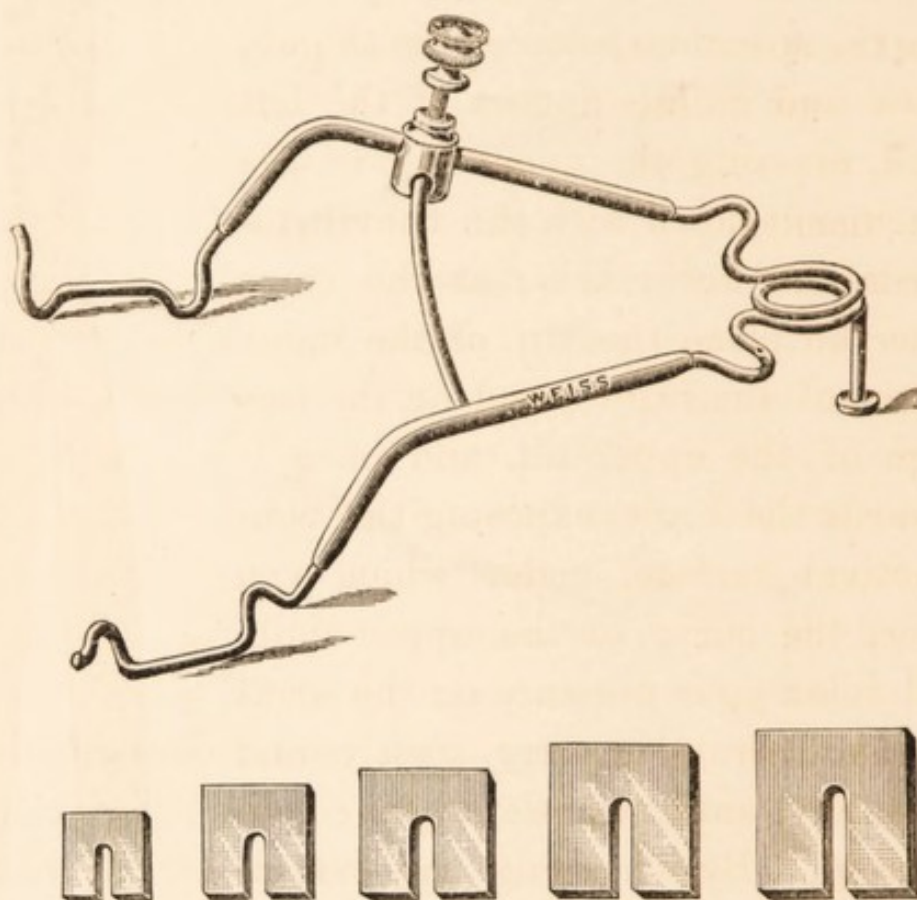
FIG. 3.



simplest form of eye speculum, and possesses advantages over other forms by its ready adaptation to the eye at the inner or outer canthus. It has no stops and screws to hinder the free use of the knife, which inconvenience is sometimes felt with other eye specula in operating on shallow eyes. The adaptation of Bowman's spring speculum to the inner canthus of the eye is a very distinct advantage, since it allows you to use your knife without any hindrance, and is a special advantage to those who are ambidextrous.

There is another form of eye speculum which is represented in the diagram below (Fig. 4), and this particular pattern is my own, which Messrs. Weiss and Sons of Oxford Street have made for me. The

FIG. 4.



advantages I claim for it are the small weights which can be attached to the perpendicular bar, to overcome the weight and contractile power of the eyelids in various people, and which at the same time takes all pressure off the eyeball when applied to the inner angle of the eye instead of the outer. This form of speculum will be found suitable for either shallow or deep orbits.

Having adjusted the lower arm of the speculum gently beneath the lower lid, by drawing the lower lid on to the cheek with the right hand for the right

eye, and the left for the left eye, you take the speculum between the thumb, index and middle fingers of the left hand, pressing the upper arm of the instrument down with the thumb towards the lower arm; at the same time you place the tip of the index finger of the right hand on the free edge of the upper lid, and raise it towards the brow, exposing the conjunctival surface, under which you insert the curve of the upper limb, and relax your pressure on the arms of the instrument very gently and gradually, until you release your hold entirely. By so doing the instrument springs well under the lids and separates them. Attaching one of the small weights by passing the perpendicular bar into the slot in the weight, you lever up the limbs of the speculum, and so take off all pressure from the eyeball.

The instruments next required are the fixation forceps (Fig. 5) and

FIG. 5.

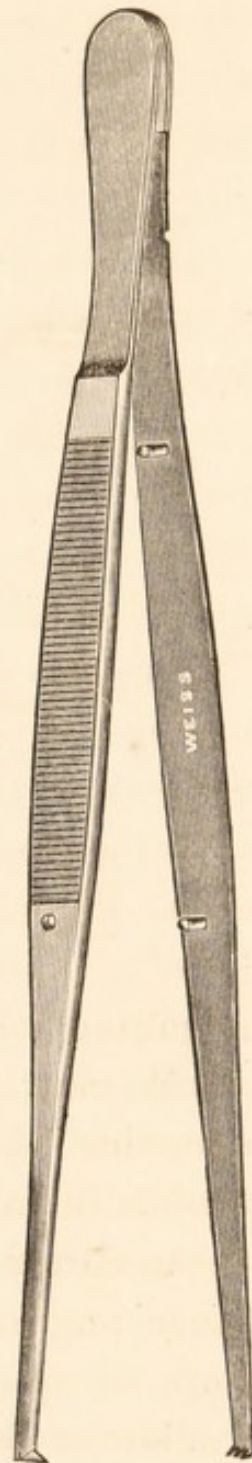


FIG. 6.



Graefe's cataract knife (Fig. 6) as given below. Both these require to be in perfect order, and the knife, particularly, should have a clean and sharp cutting edge.

(1) With the fixation forceps you firmly yet gently seize the conjunctiva and subconjunctival tissues at the lower part of the cornea, under the termination of the vertical axis, with the serrated point of the forceps, and draw the eyeball downwards towards the cheek ; but taking care at the same time not to exert any pressure on the eyeball whatever. This procedure can be easily managed in the following manner, supposing you are operating on the right eye:—Pass the left hand round the chin of your patient, with the flexor surface of the wrist resting against the inferior border of the right side of the body of the inferior maxilla, while the thumb, index and middle fingers of the same hand hold the fixation forceps firmly, grasp the tissues at the point above mentioned, and draw the eyeball downwards and somewhat forwards, taking care to make gentle traction in the line of the vertical axis of the cornea, and not to one side, which will make a difference in the next step, viz. the linear incision.

You now hold the knife between the fingers of your right hand, in the same manner as you hold a pen. The point having been tested in the usual manner, you apply it at the junction of the upper with the

middle third of the cornea at the corneo-sclerotic junction on the temporal side, and with a sharp yet gentle thrust the point penetrates the corneal tissues and enters the anterior chamber, when it is directed obliquely downwards across the anterior chamber towards the lower and inner nasal portion, and at the same time you depress the handle of the knife, which brings the point to the opposite side of the corneo-sclerotic junction in a line with the first puncture, the knife being held nearly horizontal, and with its sharp cutting edge looking upwards and slightly inclined forwards. You now, with a smart yet gentle thrust, make a counter-puncture at the opposite point (nasal), which is really a transfixion of the cornea at its upper segment. The knife must follow the curve of the cornea at the corneo-sclerotic junction, making a clean-cut edge, and not jagged. This is accomplished with as little see-saw motion as possible, and if the knife be driven by a series of rapid horizontal cuts from the temporal to the nasal side, taking care that the point of the knife does not prick the inner canthus, and at the same time keeping the edge inclined a little forward, you succeed in having two clean-cut edges which coapt perfectly, and heal more readily than a jagged edge. You finish your incision at the upper extremity of the vertical axis of the cornea.

In some cases it is advisable to make your incision

at the lower segment of the cornea instead of the upper, especially if there be a slight tendency to pannus, and the vessels around the upper segment be injected.

(2) The question of iridectomy is one regarding which a great deal of controversy exists at the present day among British surgeons; but that it is necessary in some cases is indisputable, whilst in others, where there are no indications for its performance, it might be regarded as an unnecessary step.

The special and immediate reasons which I take into consideration for its performance or otherwise are the following :

(a) *The nature of the cataract.*—The large nuclear, some striated and black cataracts are generally difficult to extract without iridectomy, because the lens is large and hard, and in extraction the pressure and strain on the iris is too great, whilst the sudden relief of tension from behind ruptures the hyaloid membrane, and vitreous escapes. In cortical and fluid cataracts no iridectomy is required.

(b) *The condition of the cornea.*—If there be the slightest indication of haziness or irritability around the edge of the cornea, iridectomy is performed.

(c) Glaucomatous tendency in the eye operated on, or in the other eye.

(d) When the iris is accidentally presented in front

of the knife, and cannot be moved out of the way, and has therefore to be boldly cut through.

The instruments required for this stage of the operation are as given in the diagrams below. I prefer the curved iris scissors (Fig. 7) and forceps (Fig. 8) to the straight ones, since there is less chance of wounding the tissues of the eyeball.

I also make it a point to drop one or two drops of cocain solution on the cut edges of the corneal incision already made, since iridectomy is a painful operation, and the instillation of cocain drops lessens pain considerably. It is always well to warn your patient that he will feel some pain at this stage, but to make up his mind to bear it. It is sometimes very aggravating when you have a highly nervous patient, which you occasionally meet with.

You pass the iris forceps very gently between the fingers of your left hand, and insert the closed points between the lips of the incision, either at the inner or outer extremity, and slide them gradually to the centre until you see the point clearly projecting under the cornea, and make sure that you have not inverted the lips of the incision. You gradually insert the forceps towards the centre of the free pupillary margin at its upper segment, and lightly depress the closed points till they rest on the edge of the pupil. By now relaxing your grasp on the body of the iris forceps the points

FIG. 7.

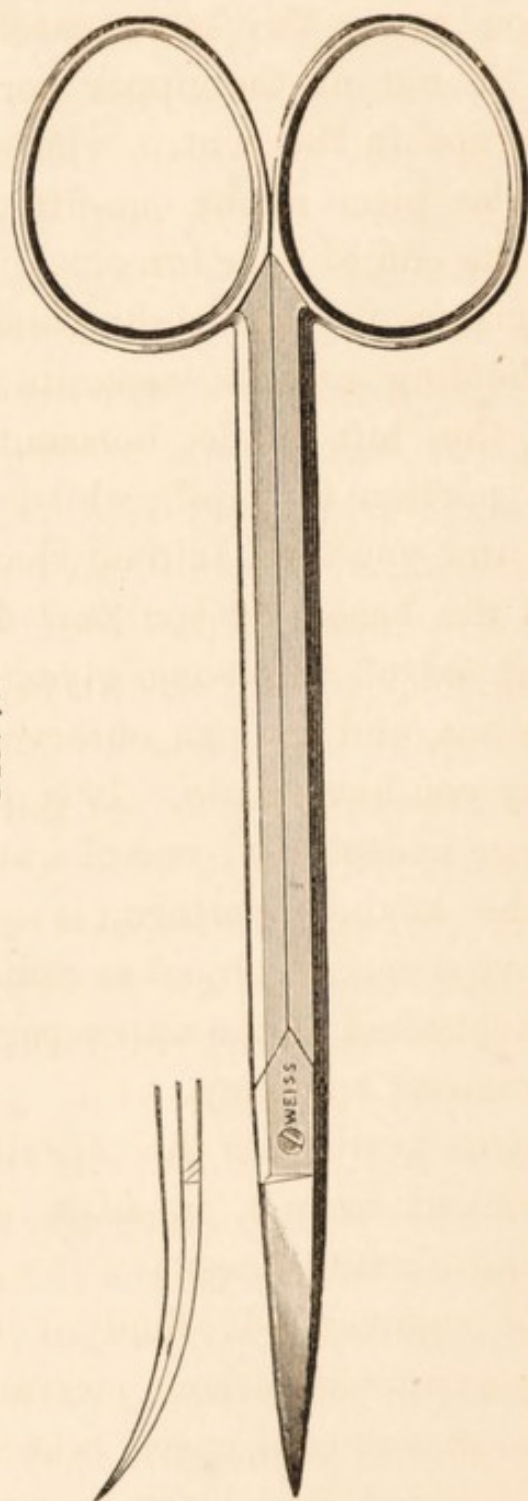
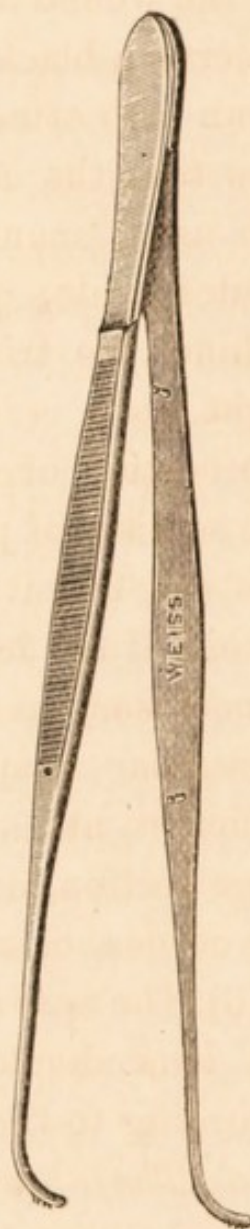


FIG. 8.



separate a little, and the edge of the pupil comes between them, and you grasp the same carefully and firmly, and draw it out at the upper portion of the wound in the cornea in the centre, when you observe a black triangular piece about one-fifteenth of an inch attached to the end of your forceps. You now take the curved scissors in your right hand, in the usual manner of holding scissors, separate the blades wide, passing the left blade horizontally behind the triangular portion of pupil, whilst the right blade is in front, and you then snip off sharply the section of pupil at the base. If you now drop the section of pupil snipped off into some glycerine, you will find it spreads out, and you can observe the extent of the iridectomy you have made. It is quite unnecessary to do a large iridectomy; one of a small triangular shape, or the keyhole pattern, is quite sufficient, unless you have a special object in doing a large section, namely, a leucoma at the upper part of the cornea, or a glaucomatous tendency.

(3) The next question, as to whether the capsule of the lens should be pricked or not, is dealt with according to the following circumstances:

(a) *The nature of the cataract.*—If fluid or soft cortical, it can be easily extracted without lacerating the capsule. There are exceptional cases, where I have extracted nuclear, striated, and black cataracts without pricking the capsule. It is always worth

your while trying to do so without lacerating the capsule, and if it come away easily, well and good; if not, you prick it with the cystotome (Fig. 9), and the immediate effect of this if done according to Tweedy's method (laceration at the periphery) is to produce an increased dilatation of the pupil, through

FIG. 10.

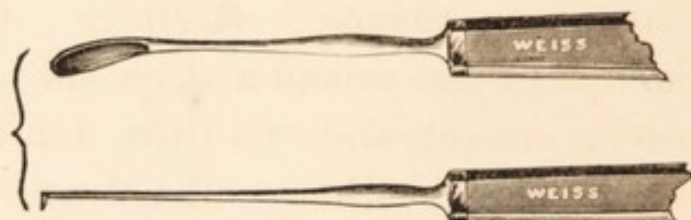


FIG. 9.

which the lens gains an easy exit. This has led me in several cases to decide upon iridectomy, no matter if the cataract be large and hard, when the lens comes away very easily by gentle coaxing, with that degree of pressure with the curette (Fig. 10) which is necessary, and which only the experienced hand can appreciate by a kind of muscular sense. The chief object is to have a perfect pupil, which responds to light in the act of accommodation far more advantageously than a pupil with iridectomy.

(4) The last stage of the operation is one which requires great care, gentleness, and precision during the course of exit of the lens. At this stage I gently remove the speculum, and allow the eyelid to close

for a few seconds, which relieves the patient. I then place the tip of the index finger of the left hand over the centre of the free edge of the upper lid, which I draw upwards towards the edge of the orbit.

I now fill a medicine-dropper with some (1 in 10,000) bichloride solution, and syringe out the surface of the eye and the anterior chamber, until all clots have been removed carefully. The clots between the lips of the wound and on the surface of the conjunctiva are removed with the fine drossils of lint steeped in mercury lotion, whilst stray hairs, &c., which might be lurking in the folds of the conjunctiva are carefully sought after and removed. If there are any clots in the anterior chamber, which I have seldom found at this stage, they are easily removed by placing the nozzle of the medicine-dropper against the outer extremity of the corneal incision, and a jet of the bichloride solution is made to enter the anterior chamber with a slight degree of force, directing the stream towards the bottom of the same along the curve of the cornea; the effect being to cause a flow round the inner concavity of the corneal surface to the bottom of the anterior chamber, and back through the posterior wall and out of the wound, washing out all clots or stray pieces of tissue or hair which might have accidentally gained entrance. I once again close the upper

lid for a few seconds, and then evert the same, keeping my left index finger upon the centre of the palpebral conjunctiva, and fix the lid against the orbit to widen the palpebral fissure, and taking the curette in the right hand between the fingers, its curved surface is laid under the lower lid, and pressure is applied by a sliding motion, gentle and yet firm, upwards and backwards against the eyeball, below the cornea. The object of the pressure is to cause the upper segment of the lens to present, first, through the opening of the pupil by rotation on its horizontal axis, and having gradually presented at the orifice of the iris, the lens now revolves on its horizontal axis in just the reverse direction as when it entered the anterior chamber. Once again it makes a similar rotation, as in the first instance, in passing through the lips of the corneal incision, and no sooner it has gained an exit the upper lid is released, and the effect of this is that the lens drops with a slide over the anterior surface of the cornea on to the cheek of the patient, when it is seized with a piece of sal-alembroth, and dropped into a cup of water for examination, if desired.

No sooner the upper portion of the lens has passed the lips of the cornea, the pressure ought to be immediately relaxed, otherwise the rotation of the lens, instead of being a fourth of the circle round its horizontal axis, will be fully half a circle, and the

result is an awkward dislocation of the lens, necessitating the use of the scoop or spoon.

FIG. 11.



The use of the scoop or spoon (Fig. 11) is to be avoided as much as possible, and under very exceptional circumstances only ought it to be employed.

(a) In dislocations of the lenses when it is difficult to extract a cataract otherwise.

(b) In cases of partial posterior synechia when the lens refuses to be detached from the pupil's edge. The scoop should be of small size in its ensnaring portion. It should be very gently inserted behind the upper segment of the lens, following its curve all the while, until it can be felt to grasp it, and can be brought forward against the iris by gentle traction forwards and upwards, so as to cause the same manner of presentation as above described in the operation of extraction. Some scoops are fenestrated

FIG. 12.



(Fig. 12), and are certainly very useful in this respect, as the lens can be grasped in the fenestrum and does

not slip away. A dislocated lens ought never to be left behind, and there is nothing so useful as a fenestrated scoop for the purpose.

Accidents during the Operation

(a) The sharp edge of the cataract knife has sometimes been directed downwards instead of upwards, and when discovered, it should be rapidly withdrawn and reinserted through the same opening with the edge upwards.

(b) The point of the knife, instead of piercing through the corneal tissues and being in the anterior chamber, is found to be travelling in the layers of the cornea. In such cases the knife meets with greater resistance, and is also seen to be covered with a thin cloudy film, instead of having the lustre it usually presents if in the anterior chamber. Withdraw your knife quickly, and reinsert it through the cornea, until it arrives in the anterior chamber, when it will be clearly seen.

(c) Another disagreeable accident is, when your knife is in the anterior chamber and has transfixed the cornea, being ready to cut through, a rapid escape of aqueous humour occurs, and the iris falls over the edge of the knife, overlapping it. In such cases you should try to dislodge the iris from this position as best you can, by gentle pressure with the tortoise-

shell curette along the flat surface of your knife which faces you. Another procedure I have found useful is to make a small opening at the corneo-sclerotic junction at the upper part with a triangular knife (Jaeger's, Fig. 13), and insert a fine Bowman's or Tyrrell's hook (Fig. 14) and draw away the iris from the knife. If you fail to accomplish your object, then the only thing to be done is to boldly cut through the iris with your knife.

(d) *Hæmorrhage into the anterior chamber after iridectomy.*—Try and get the blood away by pressure with the curette on its flat surface ; if not, you insert the curette into the opening of the wound with the grooved surface upwards, while you press the sclerotic somewhat firmly downwards and backwards with the lower surface of the instrument, which makes the opening gape a bit, and you then, by means of the strabismus hook (Fig. 15), or tortoiseshell curette, press along, with a gliding motion from below upwards, the anterior surface of the cornea,—the object being to drive the blood through the opening of the incision. You can aid its flow sometimes by closing the upper lid and making gentle pressure on the cornea over the lids from below upwards with one finger.

(e) *Escape of vitreous.*—This is a somewhat serious accident, but varies according to the time when it escapes, being more serious before than after the ex-

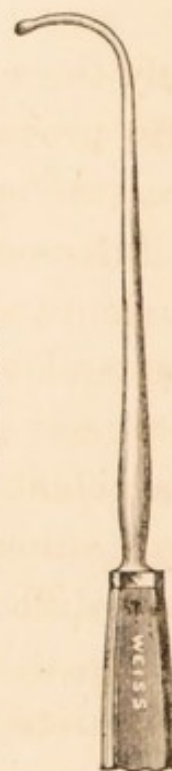
FIG. 13.



FIG. 14.



FIG. 15.



traction of the lens. In the latter case I have very rarely found the accident attended with grave consequences, if the operator immediately closes the lids, applies glycerine and belladonna over the brow, and administers the following pill :

R Opii gr. $\frac{1}{4}$ — $\frac{1}{2}$,
 Quiniæ Disulphatis gr. iiss.
 M. fiat pil. Sig., t. d. s.

Apply the eye-plaster above mentioned, and when dry, use pressure with a pad and bandage over it ; the pressure being gentle, yet firm and elastic.

(f) *Intra-ocular hæmorrhage* is the most serious of all accidents, and usually occurs in eyes with a glaucomatous tendency.

Treatment seems of little avail, and fortunately it is an accident I have only once encountered in over 1000 operations I have performed for cataract, and is the most difficult to deal with.

After-treatment of cases.—After the completion of the operation the eye should be thoroughly cleansed, and no clots or pieces of hair allowed to lurk within the lips of the corneal incision or folds of the palpebral or ocular conjunctiva, otherwise healing is certain to be delayed, and complications are liable to set in if neglected. It is well to pass the curette between the lips of the wound, just to make sure that nothing in the shape of clots exists, nor is the iris entangled.

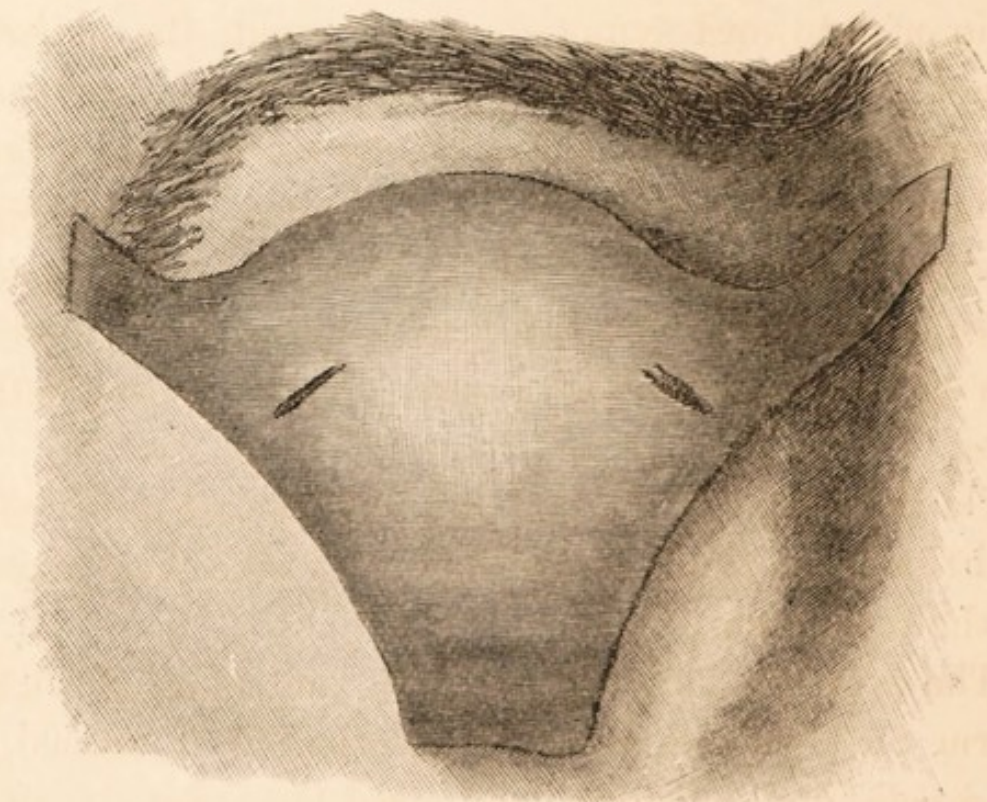
Vision should also be immediately tested after this,

to make certain that no cause of a removable nature exists, for it is better at one sitting to attend to this, than to leave it until weeks or months elapse before a secondary operation could be safely undertaken.

Having satisfied yourself that clear vision exists by holding up fingers to count, make a last inspection of the interior of the eye with a magnifying glass, lest soft cortex or any minute clots be lurking; if so, they must be removed.

The patient is now told to close his eyes gently, and not to blink or make any undue pressure on the globe. The antiseptic plaster, which is prepared beforehand,

FIG. 16.



and cut this shape (Fig. 16), is now dipped into a (1 in 10,000) warm mercurial solution and placed over each eye, which it fits into, and the slits at either canthus permit of discharges draining away.

The plaster is made of blue silk, dipped in a hot solution of (1 in 5,000) bichloride of mercury, and then into a (1 in 5,000) warm solution of gum and bichloride of mercury, which is carefully strained and freed from grit. It is then stretched over a clean board and dried, and cut into the proper shape as above, being always ready for use when needed.

The plaster adheres to the skin over the lids and orbit, and acts like a splint when dry.

The patient is now placed in a dark room, and if no pain or untoward symptoms are present, the plaster is not disturbed till the fourth day, when it is removed by moistening it with a 1 in 10,000 solution from the irrigator; the eyes are likewise cleaned, and a drop of atropine solution instilled into the eye. A light pad of sal-alembroth and a bandage are now applied over the eye operated on, and a green shade to cover both eyes.

On the sixth day the pad and bandage are removed, and the green shade alone allowed to take their place in the dark room.

The eyes are daily attended to, and cleaned with warm bichloride of mercury solution (1 in 10,000). As a rule, nothing more is required but strict cleanli-

ness for the next week or ten days, and the patient is cautioned not to touch his eyes with his fingers, nor to knock himself accidentally against the bed in rising or lying down.

It is well to give the patient the benefit of a little exercise and fresh air daily, before sunrise and after sunset, provided no complications contra-indicate it.

If complications arise, they must be treated promptly *secundum artem*.

I would now wish to refer to the very powerful and useful effects of grey powder and iodide of potassium during the ordinary treatment of cataract cases which are proceeding well, but where pieces of soft cortical substance or clots might be detected after operation. It is most important to be very vigilant in detecting these, for they act as foreign bodies in the eye, and set up iritis and other serious complications which endanger the organ. No sooner you detect them, give your patient grey powder gr. iiij to v, Dover's powder gr. v, t. d. s., or iodide of potassium gr. iiij to v, water ℥j, t. d. s. You require to watch your patient while administering either of these drugs, to stop short of ptyalism in the former and coryza and conjunctivitis in the latter.

But in referring to these drugs I would extol their virtues in their wonderfully powerful and rapid action in helping absorption of soft cortex and clots, and I cannot speak too highly of their value in ophthalmic

cases. Sometimes the one, sometimes the other, are found to be very useful. I make it a rule to give small doses of grey powder combined with Dover's powder at the outset of any case in which there is the least suspicion of impaired vision. I am thoroughly satisfied of its extreme value after cataract operations. If not pushed to ptyalism, I do not see why it should not be used after every case of cataract operation, as a preventive of complications, in cases which present the very least suspicion of an unsuccessful result.

Subjoined is a tabular statement of 500 cases of cataract operations which I have performed in the North-Western Provinces and Oudh with iridectomy. I hope to publish a tabular statement of 500 other cases later on, in some of which iridectomy has been omitted, in order that the advantages or otherwise of an eclectic method might be discussed. From the list before you it will be observed that 98 double cataract operations have been performed, *i. e.*, 196 eyes have been treated by the double operation, leaving 304 which were single extractions. The advantages of the double operation over the single did not lead me to choose the procedure; but they were in no way discouraging, and as the patients preferred the two operations at one sitting, and I saw no reason to dissuade them, the double operation was performed. A comparative tabular statement of these two

methods will bear me out in having performed the double operation, although there are certainly risks attending it which require full consideration; but if the cataracts in both eyes are mature and ready to undergo operation, I see no reason why, if the patient desire both eyes to be done at one sitting, the double operation should not be performed, although I will confess, that it requires greater care of your patient, and it would be well to consider his general health before undertaking the step.

Tabular Statement in Comparison of Accidents in the Single and Double Operations for Cataract in 500 Cases of Linear Extraction.

SINGLE (304).		DOUBLE (196).	
Slight prolapse of iris . . .	5	Slight prolapse of iris . . .	4
Large prolapse of iris . . .	0	Large prolapse of iris . . .	2
Cortex retained . . .	10	Cortex retained . . .	4
Slight escape of vitreous . . .	3	Slight escape of vitreous . . .	4
Large escape of vitreous . . .	0	Large escape of vitreous . . .	1
Suppuration . . .	8	Suppuration . . .	6
	<hr/> 26		<hr/> 21

Grand total 47

It will thus be seen that out of 500 cases of linear extraction 26 accidents occurred in single operations whilst 21 occurred in double operations. In the single operations there was not a single case of large prolapse of iris, or large escape of vitreous, whilst the double operations gave 2 and 1 under these respective heads.

Cortex was retained in 10 single cases and 4 double cases. Suppuration occurred in 8 eyeballs in single cases but in 6 only in the double cases, so that, on the whole, the double operation cannot be said to be discouraging. If the percentage be considered out of the number actually performed by each method, the figures are as represented against each.

SINGLE (304).		DOUBLE (196).	
	Percentage.		Percentage.
Slight prolapse of iris .	1.6	Slight prolapse of iris .	2.0
Large prolapse of iris .	0	Large prolapse of iris .	1.0
Cortex retained .	3.2	Cortex retained .	2.0
Slight escape of vitreous .	0.9	Slight escape of vitreous .	2.0
Large escape of vitreous .	0	Large escape of vitreous .	0.5
Suppuration .	2.6	Suppuration .	6.2

The above figures certainly weigh in favour of the single operation over the double. Out of 500 operations the following are the results :

Success	453	=	90.6 per cent.
Accidents and complications	33	=	6.6 „
Loss by suppuration	14	=	2.8 „
	<hr/>		<hr/>
	500		100

It must be considered, however, that among the lists of accidents and complications which I have given the total number of, namely 33, are a large number of cases of prolapse of the iris, retention of

3-2
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cortical substance, and escape of vitreous. The slight cases of prolapse of the iris had all useful vision; the cases of retention of cortex, most of them had absorption of the same during after-treatment; whilst it is a remarkable fact that in the cases in which vitreous escaped in small or large quantity, viz. 8, no untoward symptoms set in as the result of this accident.

Noyes in his work on the eye gives some results from Schweiger's statistical tables of 371 cases of extraction with iridectomy, which I take the liberty to extract and insert in these pages.

Success	278	=	75.1 per cent.
Secondary cataract	71	=	19.2 „
Loss	22	=	5.7 „
	<hr/> 371		<hr/> 100

The escape of vitreous cannot be regarded in the sense of a grave accident after the delivery of the lens. In some of the cases which have been under my care, the rupture of the hyaloid membrane has been intentionally done, viz. in cases Nos. 71, 110, 281, 318, and 319; in each of these cases, vitreous has escaped either externally in small quantity, or within the anterior chamber only, for the purpose of removing an impairment of vision after successfully operating for cataract. The full description of the operation, and the arguments in its favour will be seen in the

second part of my paper, which deals with the subject more extensively.

Case No. 254 is of much interest, inasmuch as there was spontaneous absorption of the lens, leaving the anterior and posterior layers of the capsule agglutinated and blocking up the area of the pupil, forming a membranous cataract. Such forms of cataract may be dealt with in a far more simple manner than by the ordinary operation of linear extraction with iridectomy, if a correct diagnosis is made in the first instance. They certainly do not present the solid appearance of the lenticular forms of cataract, but have a somewhat cobweb-like texture, and if carefully examined there will be seen to be on the surface very minute white specks like calcareous substance scattered here and there, which are probably degenerated changes in the lens substance previous to disintegration and final dissolution. It is important that such a cataract should be diagnosed early, in order that the operation be modified to meet its trivial requirements. All that is needed is the ordinary incision for iridectomy with Jaeger's iridectomy knife. I prefer to make the incision a little larger than you would for iridectomy, and through this incision you insert the curved iris forceps, and gently direct the same to the surface of the membranous cataract at the centre, seize the membrane and draw it out with the forceps. No iridectomy is neces-

sary in such cases, and the results are very satisfactory.

Cases No. 422 and 423 are a patient whose lenses were delivered spontaneously after the linear incision was made. A great deal of vitreous escaped; but there was no unhappy result whatever, for vision was very good in both eyes.

The average age of the 500 patients operated on by myself is 51.17 years. There were 136 females and 364 males, of whom 206 were Mahommedans, and 294 Hindus and other castes, which latter are low caste Hindus, such as sweepers and others. The average number of days in hospital is 15.0.

I would desire to mention that the surgical cases under treatment in our dispensaries and district hospitals are nursed by a class of men known as compounders and dressers, who are trained locally. They are not skilled nurses in the sense of the word, but are very much what you make them, by care, patience, and constant drilling. For eye cases I always had the same compounder to have charge of the patient during my absence, since I consider it dangerous to allow eye cases operated on to come into contact with the attendants on general surgical and medical cases.

The colour wash of the walls of the eye-wards was yellow, and the window-panes a dark blue. Special care was paid to the number permitted to occupy one ward at the same time, and great attention was given

to the closing of doors to prevent flies from getting to the patients. In the height of the hot season the floor of the wards was carefully washed with cold water twice a week, to keep the wards clean and cool. A four-foot dado of coal tar was painted around each wall of the ward, and in fact everything was done to promote the comfort, care, and cleanliness of the sick, who were attired in hospital uniform, and a great many were supplied with cataract spectacles on their discharge from hospital, and their vision was excellent, I am happy to say. I have seen hundreds of my cases, two, three, and four years after the extraction was performed, and no secondary operation by discission or simple linear extraction has been considered necessary. I do not attribute success on my part to any particular mode of operation, but to thorough care and cleanliness of the patient by carrying out Listerian principles of surgery in every particular detail, gentleness and caution, and the eclectic mode of operating.

Some surgeons might argue by saying that an Indian is a more favorable subject for operation than a European. I do not think so, for while the European might be more subject to sthenic forms of inflammation, the native of India is more liable to asthenic forms; his system is frequently broken down with malaria and impoverished blood, and he has not the advantage of skilful nursing.

Tabular Statement of 500 Cases of Cataract operated on by Linear Extraction with Iridectomy.

m = Male. f = Female. O = Other caste. H = Hindoo. M = Mahomedan. C = Cured. R = Relieved. O¹ = Discharged otherwise. D = Died.

No.	Name.	Age.	Sex.	Caste.	Results.				No. of days in hosp.	Remarks.
					C.	R.	O ¹ .	D.		
1	Makhan .	53	m	H	1	12	Sloughed. Capsule retained and puckered.
2	Gindia .	31	f	H			1		20	
3	Tanwal .	40	m	H			1		10	
4	Nawal .	54	m	H	1	...	...	...	12
5	Choté .	50	m	H	1	11	} Double cataract.
6	Chheda .	50	f	M	1	...	...	...	11
7	Chotay .	52	m	M	1	...	...	...	14
8	Chhedo .	50	f	M	1	...	...	...	13
9	Hosein Bux	30	m	M	1	...	...	...	11
10	Safgar Ali	63	m	M	1	...	...	...	12
11	Noor Bux	55	m	M	1	...	...	...	14
12	"	55	m	M	1	...	...	...	14
13	No. 329 .	50	f	H	1	...	...	...	10
14	Khilaro .	35	m	H	1	...	...	...	15
15	Sakhawah	30	m	M	1	16	} Do.
16	Rahim Bux	60	m	M	1	...	...	...	9
17	Phoosa .	50	m	H	1	...	...	...	10
18	"	50	m	H	1	...	...	...	10
19	Chunna .	50	m	M	1	15	} Suppuration. Double cataract.
20	Hulaso .	30	f	H	1	...	...	...	14
21	Niadar .	60	m	H	1	...	...	...	12
22	Imam Bux	55	m	M	1	...	...	...	20
23	Chhajjoo .	50	m	M	1	...	...	...	17
24	Nabi Bux	35	m	M	1	...	...	...	10
25	Silo .	70	f	H		...	1	...	21	
26	Mahomed Bux	50	m	M	1	...	...	...	11
27	"	50	m	M	1	...	...	...	11
28	Chhajjoo .	55	m	M	1	...	...	...	14

No.	Name.	Age.	Sex.	Caste.	Results.				No. of days in hosp.	Remarks.
					C.	R.	O ¹ .	D.		
29	Motee .	.30	m	H	1	13	Suppuration. Double cataract.
30	Zahan .	.60	f	M		...	1	...	17	
31	Tijna .	.60	m	H	1	...	...	...	15
32	"	.60	m	H	1	...	...	...	15
33	Hattoo .	.50	m	H	1	...	...	...	12
34	Jewni .	.50	f	H	1	11	Do.
35	Fatiman .	.30	f	M	1	...	...	...	11
36	No. 19,473	.70	f	M	1	...	...	...	13
37	Lalee .	.50	f	M	1	...	...	...	12
38	Eiazuddin	.60	m	M	1	...	...	...	11
39	Imam Bux	.50	m	M	1	9	Do.
40	"	.50	m	M	1	...	...	...	9
41	Mariam .	.60	f	M	1	...	...	...	15
42	Majjoo .	.50	m	M	1	...	...	...	16
43	"	.50	m	M	1	...	...	...	16
44	Rahman .	.40	f	M	1	11	Do.
45	"	.40	f	M	1	...	...	...	11
46	Radhay .	.50	m	H	1	...	...	...	12
47	Lal Mahomed	.50	m	M	1	...	...	...	17
48	Sukha .	.45	m	H	1	...	...	...	14
49	Balay .	.80	m	H	1	13	Do.
50	"	.80	m	H	1	...	...	...	13
51	Moonnee .	.50	f	M	1	...	...	...	10
52	Jhao .	.30	m	H	1	...	...	...	9
53	Jhabboo .	.60	m	M	1	...	...	...	15
54	Ali Mahomed	.60	m	M	1	12	Do.
55	Kisho .	.50	m	H	1	...	...	...	14
56	Mokha .	.40	m	M	1	...	...	...	11
57	Nasiban .	.50	f	M	1	...	...	...	14
58	"	.50	f	M	1	...	...	...	14
59	Inchha .	.45	m	H	1	13	Do.
60	Abdul Haq	.70	m	M	1	...	...	...	8
61	Nathoo .	.45	m	H	1	...	...	...	9
62	Khema .	.48	m	H	1	...	...	...	11
63	"	.48	m	H	1	...	...	...	11
64	Sejo .	.50	f	O	1	17	Do.
65	Khem .	.54	m	H	1	...	...	...	12
66	Gurdyal .	.55	m	O	1	...	...	...	8
67	Niada .	.60	m	O	1	...	...	...	7

No.	Name.	Age.	Sex.	Caste.	Results.				No. of days in hosp.	Remarks.
					C.	R.	O ^l .	D.		
68	Ruzya .	.50	f	M	1	...	...	...	7	Slight prolapse of iris.
69	Alum Beg	.50	m	M	...	...	1	...	4	Suppuration.
70	Kurey .	.35	m	H	1	...	...	...	20	
71	Mir Singh	.20	m	H	1	...	...	...	14	Laceration of hyaloid membrane.
72	Joharo .	.50	f	H	1	...	...	...	19	
73	Dhanno .	.40	f	O	...	1	...	...	44	Indistinct vision.
74	Rhama .	.30	m	M	1	...	...	...	13	Prolapse of iris.
75	Alla Bux .	.40	m	M	1	...	...	...	15	
76	Nen Sukh	.60	m	H	1	...	...	...	8	
77	Niadur .	.40	m	H	1	...	...	...	11	} Double cataract.
78	„ .	.40	m	H	1	...	...	...	11	
79	Choti .	.50	f	H	1	...	...	...	21	} Do.
80	„ .	.50	f	H	1	...	...	...	21	
81	Saliman .	.50	f	M	1	...	...	...	15	
82	Miran .	.50	f	M	1	...	...	...	24	
83	Khushalo .	.40	f	H	1	...	...	...	19	
84	Harsukh .	.60	m	H	1	...	...	...	10	
85	Prem .	.60	m	H	1	...	...	...	14	Piece of cortex retained.
86	Man Singh	.50	m	H	1	...	...	...	12	
87	Kurwa .	.30	m	H	1	...	...	...	11	} Double cataract.
88	„ .	.30	m	H	1	...	...	...	11	
89	Anup Ram	.45	m	H	1	...	...	...	9	
90	Debi .	.45	m	H	1	...	...	...	10	
91	Munir .	.60	m	M	1	...	...	...	8	
92	Jiya .	.80	f	O	1	...	...	...	14	
93	Kana .	.60	m	H	1	...	...	...	11	
94	Kamwal .	.50	f	H	1	...	...	...	12	
95	Cheltu .	.45	m	O	1	...	...	...	11	} Do.
96	„ .	.45	m	O	1	...	...	...	11	
97	Nagar .	.60	m	H	1	...	...	...	13	
98	Jhansia .	.50	m	O	1	...	...	...	17	
99	Jhunna .	.40	m	H	1	...	...	...	13	} Do.
100	„ .	.40	m	H	1	...	...	...	13	
101	Mula .	.50	m	H	1	...	...	...	13	
102	Kallu .	.55	m	M	1	...	...	...	17	} Do.
103	„ .	.55	m	M	1	...	...	...	17	

No.	Name.	Age.	Sex.	Caste	Results.				No. of days in hosp.	Remarks.
					C.	R.	O ¹ .	D.		
104	Nathan .	.50	m	O	1	10	Piece of cortex re- tained.
105	Silo .	.80	f	H	1	...	...	...	14
106	Bhop .	.50	m	H	1	...	...	...	8
107	Sohania .	.50	f	H	1	15	{ Double cataract. Piece of cortex retained.
108	" .	.50	f	H	1	...	...	...	15
109	Mina .	.50	f	H	1	20	Laceration of hya- loid membrane.
110	Bhai-Singh	.60	m	H	1	...	...	...	23
111	Abdullah .	.60	m	M	1	12	{ Double cataract. Slight prolapse of iris.
112	" .	.60	m	M	1	...	...	...	12
113	Garibullah	.40	m	M	1	11	} Double cataract.
114	Lalji .	.45	m	H	1	...	...	...	10
115	Baban .	.60	f	M	1	...	...	...	11
116	" .	.60	f	M	1	...	...	...	11
117	Silo .	.80	f	H	1	...	...	...	9
118	Ram Sukh	.50	m	H	1	11	{ Double cataract. Prolapse of left iris.
119	Bibi .	.50	f	H	1	...	...	...	17
120	Bhola .	.50	m	O	1	...	...	...	13
121	Ahmad Hasun	.35	m	M	1	...	...	...	15
122	Jani .	.50	m	M	1	...	...	...	18
123	" .	.50	m	M	1	18	} Double cataract. Prolapse of left iris.
124	Roran .	.50	m	H	1	...	...	...	15
125	Mawasi .	.40	m	O	1	...	...	...	15
126	Buddhan .	.38	f	O	1	...	...	...	8
127	Debi .	.50	m	H	1	...	...	...	13
128	Balak Ram	.62	m	H	1	8	Piece of cortex re- tained.
129	Jahano .	.40	f	H	1	...	...	...	26
130	Hakim-Shah	.50	m	M	1	...	...	...	16
131	Ashraf-Ali	.50	m	M	1	12	
132	Chena .	.50	m	O	1	...	...	...	12
133	Murwa .	.60	m	M	1	...	...	...	9
134	Miran .	.70	f	M	1	...	...	...	10
135	Nen Sukh	.60	m	H	1	...	...	...	14
136	Idah .	.80	m	M	1	...	...	...	22

No.	Name.	Age.	Sex.	Caste.	Results.				No. of days in hosp.	Remarks.
					C.	R.	O ¹ .	D.		
137	Gyano .	.45	m	O	1	...	...	...	13	} Double cataract.
138	„ .	.45	m	O	1	...	...	...	13	
139	Marey .	.80	m	O	...	...	1	...	18	Suppuration.
140	Zahiruddin	.60	m	M	1	...	...	...	12	Piece of cortex retained.
141	Marey .	.50	m	O	1	...	...	...	15	Do.
142	Jamayati .	.60	m	H	1	...	...	...	9	
143	Azimulla .	.55	m	M	1	...	...	...	27	
144	Shib Lal .	.50	m	H	1	...	...	...	17	
145	Budham .	.40	m	O	1	...	...	...	17	Piece of cortex retained.
146	Nathu .	.40	m	M	1	...	...	...	7	
147	Ram Sukh	.50	m	O	1	...	...	...	10	Iris entangled in cicatrix.
148	Medi .	.60	f	M	1	...	...	...	22	Piece of cortex retained.
149	Kallu .	.62	m	O	1	...	...	...	10	
150	Durga .	.50	f	H	1	...	...	...	30	
151	Mokha .	.50	m	M	1	...	...	...	17	} Double cataract.
152	„ .	.50	m	M	1	...	...	...	17	
153	Adey .	.60	m	H	1	...	...	...	18	
154	Bhola .	.50	m	O	1	...	...	...	8	
155	Chanda .	.50	m	H	1	...	...	...	10	Piece of cortex retained.
156	Sohania .	.45	f	H	1	...	...	...	9	Do.
157	Heta .	.50	m	H	1	...	...	...	10	
158	Budhan .	.50	m	O	1	...	...	...	9	
159	Gheesua .	.60	m	M	1	...	...	...	29	
160	Nanliua .	.45	f	O	1	...	...	...	17	
161	Hasan Shah	.56	f	M	1	...	...	...	15	
162	Shibia .	.60	f	H	1	...	...	...	18	
163	Abdul Rahman	.60	m	M	1	...	...	...	26	
164	Mumtaz Ali	.40	m	M	1	...	...	...	14	
165	Odey Singh	.40	m	H	1	...	...	...	9	
166	Najibulla .	.38	m	M	1	...	...	...	21	} Double cataract.
167	„ .	.38	m	M	1	...	...	...	21	
168	Roshan .	.50	m	O	1	...	...	...	19	
169	Kallu .	.50	m	H	1	...	...	...	17	
170	Harsukh .	.60	m	H	1	...	...	...	17	

No.	Name.	Age.	Sex.	Caste.	Results.				No. of days in hosp.	Remarks.
					C.	R.	Ol.	D.		
171	Harpal .	46	m	H	1	15	} Double cataract.
172	" .	46	m	H	1	...	...	...	15
173	Daya .	52	f	O	1	...	...	...	16
174	Sakto .	46	m	O	1	...	...	...	19
175	Chando .	30	m	M	1	18	} Do.
176	Jharya .	60	m	O	1	...	...	...	21
177	" .	60	m	O	1	...	...	...	21
178	Badho .	45	f	M	1	...	...	...	16
179	Munsokh .	45	m	O	1	16	Absconded.
180	Ghulam Bux	50	m	M	1	...	...	...	12
181	Nuthia .	50	f	H	...	...	1	...	14
182	Maroa .	60	m	H	1	...	...	...	14
183	Hera .	60	m	H	1	22	} Double cataract.
184	Mohar Singh	60	m	H	1	...	...	...	18
185	Nabi Bux	66	m	M	1	...	...	...	20
186	" .	66	m	M	1	...	...	...	20
187	Behari .	45	m	H	1	20	Slight escape of vitreous.
188	Nathwa .	60	m	M	1	...	...	...	19
189	Chaina .	60	m	H	1	...	...	...	15
190	Nathu .	60	m	H	1	...	...	...	16
191	Hero .	60	m	H	1	...	12	Anterior synechia present.
192	Nuthwa .	55	m	H	1	11	} Double cataract.
193	Nusibulla	50	m	M	1	...	...	...	11
194	" .	50	m	M	1	...	...	...	11
195	Thatura .	60	m	H	1	...	...	...	11
196	Majid .	40	m	M	1	21	} Do.
197	Gurdyal .	60	m	H	1	...	...	...	21
198	Shadi .	45	m	M	1	...	...	...	18
199	Prenia .	60	f	O	1	...	...	...	12
200	" .	60	f	O	1	12	} Double cataract.
201	Abdulla .	60	m	M	1	...	...	...	18
202	Nasibulla	50	m	M	1	...	...	...	35
203	Lekha .	45	m	H	1	...	...	...	36
204	" .	45	m	H	1	36	} Do.
205	Nathia .	45	f	M	1	...	...	...	14
206	Khushali .	50	m	H	1	...	...	...	13
207	Oda .	42	m	H	1	...	...	...	14

No.	Name.	Age.	Sex.	Caste.	Results.				No. of days in hosp.	Remarks.
					C.	R.	O ¹ .	D.		
208	Zalim .	55	m	H	1	19	} Double cataract.
209	" .	55	m	H	1	...	...	...	19
210	Behari .	55	m	H	1	...	...	...	31
211	Noora .	60	m	M	1	22	} Do.
212	" .	60	m	M	1	...	...	...	22
213	Hulasa .	55	m	H	1	5	} Scoop used.
214	Mohana .	50	m	O	1	...	...	...	12
215	Lachmi .	56	f	O	1	19	} Double cataract.
216	Khuda Bux	60	m	M	1	...	...	...	26
217	Maho .	45	m	O	1	...	...	...	15
218	" .	45	m	O	1	15	} Do.
219	Zaharya .	40	m	O	1	...	...	...	18
220	" .	40	m	O	1	...	...	...	18
221	Jhando .	50	m	H	1	6	} Do.
222	Mano .	80	f	M	1	...	...	...	9
223	" .	80	f	M	...	...	1	...	9
224	Mohar Singh	60	m	H	1	27	} Do.
225	Gyano .	45	m	H	1	...	...	...	27
226	" .	45	m	H	1	...	...	...	27
227	Marey .	39	m	M	1	13	} Do.
228	Mokha .	50	m	O	1	...	...	...	38
229	" .	50	m	O	1	...	...	...	38
230	Sukha .	54	m	M	1	29	} Do.
231	" .	54	m	M	1	...	...	...	29
232	Dullia .	40	f	M	1	...	...	...	8
233	" .	40	f	M	1	...	8	} Do.
234	Gyano .	50	m	H	1	...	...	...	14
235	" .	50	m	H	1	...	...	...	14
236	Rupa .	80	f	H	1	14	} Do.
237	Jhunia .	50	f	O	1	...	...	...	21
238	Ram Kishore	60	m	H	1	...	...	...	9
239	Gulab Shah	65	m	M	1	16	} Do.
240	" .	65	m	M	1	...	...	...	16
241	Naspat .	48	m	O	...	...	1	...	40
242	" .	48	m	O	1	40	} Patient nervous.
243	Itwari .	65	m	M	1	...	...	...	5
244	Bhoorya .	52	f	O	1	...	...	...	12
245	" .	52	f	O	1	12	} Double cataract.
246	Doulat .	56	m	H	...	...	1	...	5

No.	Name.	Age.	Sex.	Caste.	Results.				No. of days in hosp.	Remarks.
					C.	R.	O ¹	D.		
247	Ballo .	35	m	M	1	12	Scoop used. Slight escape of vitreous.
248	Piro .	45	f	M	1	...	...	...	13
249	Ganga Ram	68	m	H	1	...	...	...	17
250	Kallo .	60	m	H	1	...	...	...	14
251	Kallu .	60	m	O	1	...	...	...	25
252	Nathu .	45	m	O	1	30	Lens absorbed. Piece of capsule remains.
253	Kharati .	50	m	M	1	...	...	...	33
254	Badamia .	45	f	O	1	...	...	...	27
255	Zabun .	50	f	M	1	...	...	...	23
256	Hasni .	50	f	M	1	...	...	...	23
257	Gyano .	56	m	O	1	35	} Double cataract.
258	" .	56	m	O	1	...	...	...	35
259	Badamo .	70	f	H	1	20	Absconded.
260	Harkaw .	50	f	H	...	...	1	...	17
261	Ghisya .	60	f	M	1	...	...	...	28
262	" .	60	f	M	1	...	...	...	28
263	Mango .	36	m	O	1	...	...	...	20
264	Shadi .	56	m	O	1	20	} Double cataract.
265	" .	56	m	O	1	...	...	...	20
266	Cheto .	55	m	O	1	20	} Do.
267	Bidhi .	80	m	O	1	...	...	...	17
268	Lala .	50	m	O	1	...	...	...	17
269	" .	50	m	O	1	...	...	...	17
270	Rhoosa .	60	m	O	1	...	...	...	12
271	" .	60	m	O	1	12	} Do.
272	Chisya .	60	f	M	1	...	...	...	19
273	Ghisi .	50	f	M	1	14	
274	Nabi Bux	50	m	M	...	...	1	...	19
275	Ram Sukh	50	m	O	1	...	...	...	13
276	Mohamad.	50	m	M	1	...	...	...	13
277	Jowahir Das	60	m	H	1	...	...	...	20
278	Khairya .	60	f	M	1	18	Large escape of vitreous.
279	Roshan .	60	m	M	...	...	1	...	11
280	Jeoni .	80	f	M	1	25	Hyaloid lacerated.
281	Nathwa .	60	m	H	1	...	...	...	9

No.	Name.	Age.	Sex.	Caste.	Results.				No. of days in hosp.	Remarks.
					C.	R.	Op.	D.		
282	Saltu .	.60	m	H	1	...	...	...	11	
283	Bool-Chand	.65	m	H	1	...	...	...	23	{ Double cataract. Slight prolapse of iris.
284	"	.65	m	H	1	...	...	...	23	
285	Jhuniah .	.50	f	H	1	...	...	...	14	{ Double cataract.
286	" .	.50	f	H	1	...	...	...	14	
287	Bhop .	.35	m	H	1	...	...	...	12	
288	Bhoop .	.35	m	H	1	...	...	...	12	
289	Gulzari .	.50	m	H	...	...	1	...	4	Absconded.
290	Bholo .	.70	m	M	1	...	...	...	10	Piece of cortex retained.
291	Teju .	.60	m	H	1	...	...	...	15	Slight escape of vitreous.
292	Hanix .	.50	m	M	...	...	...	...	16	
293	Chaino .	.60	m	O	1	...	...	...	9	{ Double cataract. Piece of cortical substance retain- ed.
294	" .	.60	m	O	1	...	...	...	11	
295	Marey .	.40	m	H	1	...	...	...	11	Slight prolapse of iris.
296	Jamo .	.60	f	M	1	...	...	...	10	
297	Puran .	.60	m	H	1	...	...	...	16	{ Double cataract.
298	" .	.60	m	H	1	...	...	...	16	
299	Budhan .	.55	m	M	1	...	...	...	16	{ Do.
300	" .	.55	m	M	1	...	...	...	16	
301	Ahmad Hasan	.43	m	M	1	...	...	...	14	
302	Badamo .	.55	f	H	1	...	...	...	11	
303	Shabbo .	.45	m	M	1	...	...	...	16	Slight escape of vitreous.
304	Ishri .	.45	m	H	1	...	...	...	12	
305	Jedeyi .	.40	f	H	...	...	1	...	20	{ Double cataract. Cornea small and irregular; corti- cal substance re- tained.
306	" .	.40	f	H	...	...	1	...	20	
307	Shib Lal .	.50	m	H	1	...	...	...	23	
308	Herapuri .	.58	m	H	1	...	...	...	14	
309	Rajjo .	.45	f	O	1	...	...	...	24	Small piece cap- sule retained.

No.	Name.	Age.	Sex.	Caste.	Results.				No. of days in hosp.	Remarks.
					C.	R.	Ol.	D.		
310	Muno .	.55	m	O	1	...	...	...	19	
311	Elahi Bux	.60	m	M	...	1	...	...	20	Great escape of vitreous.
312	Sahamat .	.60	m	M	1	...	...	...	11	} Double cataract.
313	" .	.60	m	M	1	...	...	...	11	
314	Eda .	.45	m	M	1	...	...	...	12	{ A little cortical substance retained. Slight escape of vitreous.
315	" .	.45	m	M	1	...	...	...	12	
316	Sadho .	.70	f	M	1	...	...	...	15	} Double cataract.
317	" .	.70	f	M	1	...	...	...	15	
318	Budha .	.60	m	M	1	...	...	...	18	{ Double cataract. Hyaloid lacerated; vitreous chamber opened, slight escape of vitreous.
319	" .	.60	m	M	1	...	...	...	18	
320	Ramdhani Lal	.48	m	H	1	...	...	...	10	
321	Chajjo .	.40	m	M	1	...	...	...	8	
322	Naneh .	.60	m	M	1	...	...	...	38	Escape of vitreous in fair quantity.
323	Karimya .	.60	f	M	1	...	...	...	8	
324	Bansi .	.48	m	H	1	...	...	...	9	} Double cataract.
325	" .	.48	m	H	1	...	...	...	9	
326	Bhop .	.58	m	H	1	...	...	...	11	Slight escape of vitreous.
327	Abdulla .	.50	m	M	1	...	...	...	19	Vision indistinct.
328	Kallo .	.45	m	H	...	...	1	...	8	Suppuration.
329	Manohur .	.60	m	H	1	...	...	...	18	} Double cataract.
330	" .	.60	m	H	1	...	...	...	18	
331	Mokha .	.60	m	O	1	...	...	...	10	
332	Omra .	.50	m	O	1	...	...	...	14	
333	Raghubar	.45	m	H	1	...	...	...	9	
334	Zahorar .	.60	f	M	1	...	...	...	20	
335	Shocharan	.50	m	H	1	...	...	...	28	
336	Bholo .	.50	m	H	1	...	...	...	10	
337	Sujan Kaur	.50	f	H	1	...	...	...	9	
338	Mijabat .	.55	m	M	1	...	...	...	10	
339	Banwari .	.50	m	H	1	...	...	...	6	Pupil sluggish in action.

No.	Name.	Age.	Sex.	Caste.	Results.				No. of days in hosp.	Remarks.
					C.	R.	O ^l .	D.		
340	Kallo .	.45 m	H		1	8	Glaucomatous tendency.
341	" .	.45 m	H		...	1	...	...	18
342	Jhabbo .	.40 f	M		1	13	Iritis.
343	Sawai .	.40 m	H		1	8	Lens slightly im- mature.
344	Muasi .	.40 m	H		...	1	10	Slight escape of vitreous.
345	Chaito .	.60 m	O		1	7	} Double cataract. Suppuration.
346	Sabir Bux	.60 m	M		...	...	1	...	15
347	" .	.60 m	M		...	...	1	...	15
348	Jhabba .	.35 m	O		1	...	...	...	11
349	Shibbia .	.48 f	H		1	...	...	...	23
350	Sohania .	.40 f	H		1	17	} Double cataract. Suppuration.
351	Sahabo .	.50 f	H		1	...	...	...	20
352	Muasi .	.45 m	O		1	...	...	...	12
353	Dhania .	.38 f	H		1	...	...	...	12
354	Ram Sukh	.43 m	H		1	...	...	...	26
355	" .	.43 m	H		1	26	} Double cataract. Suppuration.
356	Bhopo .	.50 f	H		1	...	1	...	26	
357	Nathua .	.60 m	H		1	10	Slight prolapse of iris.
358	Zalam .	.50 m	H		1	...	...	...	17
359	" .	.50 m	H		1	9	} Double cataract.
360	Ram Bux	.65 m	M		1	...	...	...	16
361	Saiba .	.53 m	H		1	...	...	...	16
362	Biddhi .	.40 m	H		1	...	...	...	11
363	Karimuddin	.45 m	M		1	...	...	...	11
364	Chanda .	.45 m	M		1	...	...	...	6
365	Lachcho .	.60 f	H		1	...	...	...	9
366	Kanhiya .	.60 m	H		1	...	...	...	16
367	" .	.60 m	H		1	...	...	...	16
368	Gumano .	.60 f	H		1	...	...	...	9
369	Ram Sahai	.60 m	H		1	11	
370	Budha .	.65 m	H		1	...	...	...	24
371	Ashghari .	.70 f	M		1	...	...	...	20
372	Harbans Lal	.60 m	H		1	...	...	...	26
373	Khuda Bux	.60 m	M		1	...	...	...	11

No.	Name.	Age.	Sex.	Caste.	Results.				No. of days in hosp.	Remarks.
					C.	R.	Ol.	D.		
374	Muneran .	55	f	M	1	...	...	...	12	} Double cataract.
375	" .	55	f	M	1	...	...	...	12	
376	Khuda Bux	60	m	M	1	...	...	...	18	} Double cataract.
377	" .	60	m	M	1	...	...	...	18	
378	Parma .	60	m	H	1	...	...	...	12	} Double cataract.
379	" .	60	m	H	1	...	...	...	12	
380	Kanhia .	50	f	H	1	...	...	...	12	
381	Bholay .	40	m	H	1	...	...	...	13	{ Double cataract. Slight prolapse of iris.
382	" .	40	m	H	1	...	...	...	13	
383	Chajoo .	30	m	H	1	...	...	...	20	
384	Solar Bux	70	m	M	1	...	...	...	20	
385	Rani .	45	f	H	1	...	...	...	16	} Double cataract.
386	" .	45	f	H	1	...	...	...	16	
387	Azimulla .	60	m	M	1	...	...	...	16	
388	Sumru .	30	m	H	1	...	...	...	11	} Double cataract.
389	" .	30	m	H	1	...	...	...	11	
390	Shahzadi .	54	m	H	1	...	...	...	18	} Double cataract.
391	" .	54	m	H	1	...	...	...	18	
392	Chajoo .	30	m	H	1	...	...	...	13	
393	Koli .	41	f	H	...	...	1	...	13	Posterior synechia, some deep nervous mischief probably.
394	Hutti .	50	m	H	1	...	...	...	16	} Double cataract.
395	" .	50	m	H	1	...	...	...	16	
396	Bholu .	40	m	M	1	...	...	...	15	
397	Mahd. Husain	60	m	M	1	...	...	...	11	
398	Pirano .	55	f	H	1	...	...	...	9	Suppuration.
399	Husia .	60	f	M	1	...	...	...	13	} Double cataract.
400	" .	60	f	M	1	...	...	...	13	
401	Dalu .	32	m	H	1	...	...	...	23	
402	Punia .	70	f	H	1	...	...	...	6	
403	Bholu .	40	m	M	1	...	...	...	16	
404	Dabi .	50	m	H	1	...	...	...	12	} Double cataract.
405	" .	50	m	H	1	...	...	...	12	
406	Dabi .	32	m	H	1	...	...	...	12	
407	Mahd. Husain	55	m	M	1	...	...	...	9	
408	Kanhia .	50	f	H	...	...	1	...	9	} Double cataract.
409	" .	50	f	H	...	...	1	...	9	

No.	Name.	Age.	Sex.	Caste.	Results.				No. of days in hosp.	Remarks.
					C.	R.	O ¹ .	D.		
410	Miru .	32	m	M	1	13	{ Slight escape of vitreous. Double cataract.
411	„ .	32	m	M	1	...	...	...	13
412	Bholu .	43	m	M	1	11	{ Slight prolapse of iris. Double cataract.
413	„ .	43	m	M	1	...	...	...	11
414	Akbar Ali	50	m	M	1	11	{ Double cataract.
415	Chidu .	50	m	M	1	...	...	...	8
416	„ .	50	m	M	1	...	...	...	8
417	Tolu .	55	m	H	1	...	...	...	17
418	Amarnath	50	m	H	1	...	...	...	10
419	Kallu .	50	m	M	1	17	Slight escape of vitreous.
420	Shadi .	50	m	O	1	18	{ Double cataract.
421	„ .	50	m	O	1	...	...	...	15
422	Bholo .	45	m	H	1	14	{ Double cataract. Great deal of vitreous escaped. Lens was de- livered sponta- neously.
423	„ .	45	m	H	1	...	...	...	14
424	Jahangira	60	m	H	1	13	{ Double cataract.
425	„ .	60	m	H	1	...	...	...	13
426	Kuria .	40	f	H	1	13	Slight escape of vitreous.
427	Nathwa .	42	m	H	1	10	{ Double cataract.
428	Kallu .	40	m	H	1	...	...	...	10
429	Najjo .	50	m	M	1	...	...	...	19
430	Mare .	40	m	O	1	...	...	...	15
431	„ .	40	m	O	1	...	...	...	15
432	Dhumma .	50	m	M	1	...	27	Iris was wounded. Occlusion of pupil.
433	Phulya .	50	f	M	1	17	{ Double cataract.
434	Incha .	42	m	H	1	...	...	...	10
435	Badamo .	50	f	H	1	...	...	...	19
436	Azim .	60	m	M	1	...	...	...	12
437	„ .	60	m	M	1	...	...	...	12
438	Bhinka .	70	m	M	1	12	{ Double cataract.
439	„ .	70	m	M	1	...	...	...	12

No.	Name.	Age.	Sex.	Caste.	Results.				No. of days in hosp.	Remarks.
					C.	R.	O ^d .	D.		
440	Bhajira .	35	m	H	1	...	...	...	11	} Double cataract.
441	" .	35	m	H	1	...	...	...	11	
442	Nabi Bux .	48	m	M	1	...	...	...	16	
443	Bhoop .	65	m	H	1	...	...	...	20	
444	Premo .	45	f	H	1	...	...	...	13	
445	Imamuddin .	60	m	M	1	...	...	...	8	
446	Ghassi .	60	m	M	1	...	...	...	11	
447	Chunna .	40	m	M	1	...	...	...	11	} Double cataract.
448	" .	40	m	M	1	...	...	...	11	
449	Miran .	50	f	M	1	...	...	...	8	
450	Manglo .	50	m	M	1	...	...	...	20	{ Double cataract. Occlusion of pupil.
451	" .	50	m	M	...	...	1	...	20	
452	Pirthi .	50	m	H	1	...	...	...	13	} Double cataract.
453	" .	50	m	H	1	...	...	...	13	
454	Bilasa .	60	m	H	1	...	...	...	9	
455	Koshan .	50	f	M	1	...	...	...	15	
456	Silo .	40	f	H	1	...	...	...	16	{ Do. Slight escape of vitreous.
457	" .	40	f	H	1	...	...	...	16	
458	Edo .	38	f	M	1	...	...	...	10	} Double cataract.
459	" .	38	f	M	1	...	...	...	10	
460	Khillya .	50	f	H	1	...	...	...	8	} Do.
461	" .	50	f	H	...	...	1	...	8	
462	Rhimuddin .	40	m	M	1	...	...	...	14	Slight prolapse of iris.
463	Khamani .	55	m	H	1	...	...	...	13	
464	Kadhira .	45	m	H	1	...	...	...	9	} Double cataract.
465	" .	45	m	H	1	...	...	...	9	
466	Kallo .	35	m	H	...	...	1	...	23	{ Do. Slight escape of vitreous. Suppuration.
467	" .	35	m	H	...	...	1	...	23	
468	Bahadur .	50	m	H	1	...	...	...	9	
469	Alla Bux .	65	m	M	1	...	...	...	18	
470	Shadi .	40	m	H	1	...	...	...	12	
471	Earmian .	50	f	M	1	...	...	...	11	} Double cataract.
472	" .	50	f	M	1	...	...	...	11	
473	Miro .	65	f	M	1	...	...	...	18	} Do.
474	" .	65	f	M	1	...	...	...	18	

No.	Name.	Age.	Sex.	Caste.	Results.				No. of days in hosp.	Remarks.
					C.	R.	O ^l .	D.		
475	Niada .	.30	m	O	1	...	...	...	16	{ Double cataract. Slight escape of vitreous.
476	„ .	.30	m	O	1	...	...	...	16	
477	Odam .	.35	m	H	1	...	...	...	11	
478	Mokha .	.30	m	H	1	...	...	...	13	
479	Chotey .	.41	m	M	1	...	...	...	13	
480	Peer Bux .	.30	m	M	1	...	...	...	12	
481	Rai Singh .	.60	m	H	1	...	...	...	25	
482	Garilean .	.45	f	O	1	...	...	...	19	Slight escape of vitreous.
483	Nurpat .	.60	m	H	1	...	...	...	14	{ Double cataract.
484	„ .	.60	m	H	1	...	...	...	14	
485	Darbo .	.55	m	H	1	...	...	...	16	
486	Chotey .	.45	f	M	1	...	...	...	17	{ Do.
487	„ .	.45	f	M	1	...	...	...	17	
488	Harkishen	.50	m	O	1	...	...	...	20	{ Do.
489	„ .	.50	m	O	1	...	...	...	20	
490	Lala .	.55	m	H	1	...	...	...	18	
491	Kuar .	.55	m	H	1	...	...	...	11	
492	Kallam .	.38	m	O	1	...	...	...	13	
493	Omra .	.55	m	H	1	...	...	...	10	
494	Bhoopo .	.45	f	H	1	...	...	...	15	
495	Nagar .	.50	m	H	1	...	...	...	14	
496	Nur Bux .	.40	m	M	...	1	...	...	20	
497	Sumro .	.40	m	H	...	1	...	...	10	{ Do.
498	„ .	.40	m	H	...	1	...	...	10	
499	Kallo .	.35	m	H	...	1	...	...	10	{ Do.
500	„ .	.35	m	H	...	1	...	...	10	

PART II

ON THE TREATMENT

OF

CERTAIN CASES OF IMPAIRMENT OF VISION

AFTER SUCCESSFULLY OPERATING FOR CATARACT BY
LACERATING THE HYALOID MEMBRANE

IN a small percentage of cases in India, after successfully operating for cataract, there is impairment of vision to be found on testing sight by holding up fingers to count.

Through the kindness and courtesy of the President of the Ophthalmological Section of the British Medical Association, which met in Bristol in July and August last, I was permitted to read a paper on this subject on the last day of the sectional meetings; but not having given previous notice, as is the custom, I placed my paper in the hands of the typist to be clearly typographed, and being promised the return of it early on the following morning, which unfortu-

nately could not be done, owing to pressure of work, I was deprived of the privilege of reading it; but the President was kind enough to accept the paper as read.

The worthy President of our Indian Medical Congress, having kindly invited me to contribute a paper, I responded to his call, and recalled my paper therefore from the press of the 'British Medical Journal,' giving my urgent reasons for doing so, since I was anxious to place the same before the members of the Indian Medical Congress in Calcutta, and I was pleased that my request was accordingly granted. I now deem it a high honour and privilege to be able to read my paper before the members of our profession in India who are assembled together for the discussion of subjects which tend towards the progress and development of European medical and surgical science and art.

India offers a wide field for the study of the eye and its surgery, and splendid opportunities are afforded in the North-Western Provinces and Oude in this particular branch. Success attracts large numbers, but failures deter scores from visiting our hospitals and charitable dispensaries. The people of the country will travel long distances by road to be operated upon by a successful surgeon, whose reputation as a good operator wanders far and wide in these days of civilisation and enlightenment.

European surgery in India at the present day commands the highest esteem and gratitude in the hearts of the people, irrespective of colour, race, or creed, since the members of our profession have achieved as grand, if not grander results in some of their branches than our compeers in Europe. No class of surgeons in India are regarded so skilful and fit to be classified among the deities of the East as ophthalmic surgeons. Their work of restoring vision is a miracle, and it behoves us therefore, if we desire to maintain our exalted position in the hearts of the people, to strive to perform every operation we undertake with success; and that is only to be attained by careful selection and correct diagnosis, together with rational treatment of our patient. The treatment of the patient, and not of the disease alone, is to be applied as strongly to ophthalmic surgery as to any other branch of medical or surgical science.

The methods of operation for cataract which I have adopted for the last six years, in over 1000 operations performed by myself, are the recognised methods of European surgery under as strict antiseptic precautions as are at my command, and with such modifications as are suggested to me in considering my patients' powers of endurance and fitness from every conceivable point.

In our hospitals in India, which are frequented

chiefly by the poor, we witness various grades of poverty and various conditions of robustness of health, which need our full consideration, and demand most careful attention, and in some cases necessitating our fitting our patient for such a grave operation as we are about to undertake. Unfortunately, the ignorant do not see the force of waiting to undergo this preparation, so many of them abscond. We are then compelled to undertake our operations on the spur of the moment, without further consideration, and our enthusiasm and eagerness to mount up our operations often gains the supremacy over the dictates of our scientific experience. Skilfulness and dexterity of course are gained by a wide experience ; but that surgeon is most skilful and dextrous who pays most regard to the *pros* and *cons.* of his case before him, ere he lifts his scalpel or his knife to undertake an operation.

The question of iridectomy, about which there has been so much controversy of recent years among British surgeons, seems to attract more attention than the condition of the patient as to his fitness or otherwise for the operation, and the momentous question has been in many cases overlooked, while iridectomy or non-iridectomy has been held responsible for inflammation of the tunics of the eye if it should set in.

The question of iridectomy undoubtedly is one

of great importance to the ophthalmic surgeon ; but upon it alone does not hinge the whole results of our operations. I maintain that our methods of operation on various patients require to be as carefully selected in the operation for cataract as in the treatment of pneumonia or any other disease, and we have to steer and feel our way through the difficulties for the recovery of our patient, and thus avoid the rocks of dogmatism which frequently obstruct our course in a long and tedious case.

I feel that the surgeons of the present day in India have achieved the results that they have by skilful care in steering their patients through difficulties which meet them, and I believe that the question of iridectomy is decided upon whenever there is some distinct indication for such. So high an authority on the eye as Brigade-Surgeon Lieutenant-Colonel Drake-Brockman of Madras, whose acquaintance I had the honour of making at Bristol lately, I know holds this view on the subject of iridectomy.

The indications which I take into consideration are as I have already given expression to in page 358 of the 'Indian Medical Gazette' for December, 1890, when I published the results of 100 operations for cataract performed by myself in the year 1889. I only allude to this matter since I am anxious to bring to your notice the fact that the matter of iridectomy or non-iridectomy by myself, is one of selection after

fully considering the nature of the cataract and the condition of my patient.

I think I might be excused for being somewhat egotistical if I refer to the subject again. "Never perform iridectomy if you have no special and immediate reasons to do so." The special and immediate reasons which I take into consideration are—

(a) *The nature of the cataract.*—The large nuclear and black cataracts are generally difficult to extract without iridectomy, because the lens is large and hard, and in extraction the pressure and strain on the iris is too great, whilst the sudden relief of tension from behind ruptures the hyaloid membrane, and vitreous escapes. In cortical and fluid cataracts no iridectomy is required.

(b) *The condition of the cornea.*—If there be the slightest indication of haziness or irritability around the edge of the cornea, iridectomy is performed.

(c) Glaucomatous tendency in the eye operated on, or in the other eye.

(d) In cases where there is a central leucoma present.

(e) Where the iris is accidentally presented in front of the knife, and cannot be moved out of the way, and has therefore to be boldly cut through.

The next question, as to whether the capsule of the lens should be pricked or not, is dealt with according to the following circumstances.

(a) *The nature of the cataract.*—If fluid or cortical it can be easily extracted without laceration of the capsule. There are exceptional cases where I have extracted nuclear, striated, and black cataracts without pricking the capsule. It is always worth trying to extract the cataract without pricking the capsule, and if it comes away easily, well and good; if not, you prick the capsule, and the immediate effect of this, if done according to Tweedy's method, is to produce an increased dilatation of the pupil frequently, through which the lens gains an easy exit. This fact has led me in several cases to decide upon iridectomy or not. If I find that by pricking the capsule the pupil immediately dilates, I have very rarely found it necessary to perform iridectomy, for the lens comes away very easily by gentle coaxing, with that degree of pressure with the curette which is necessary, and which only the experienced hand can appreciate by a sort of muscular sense.

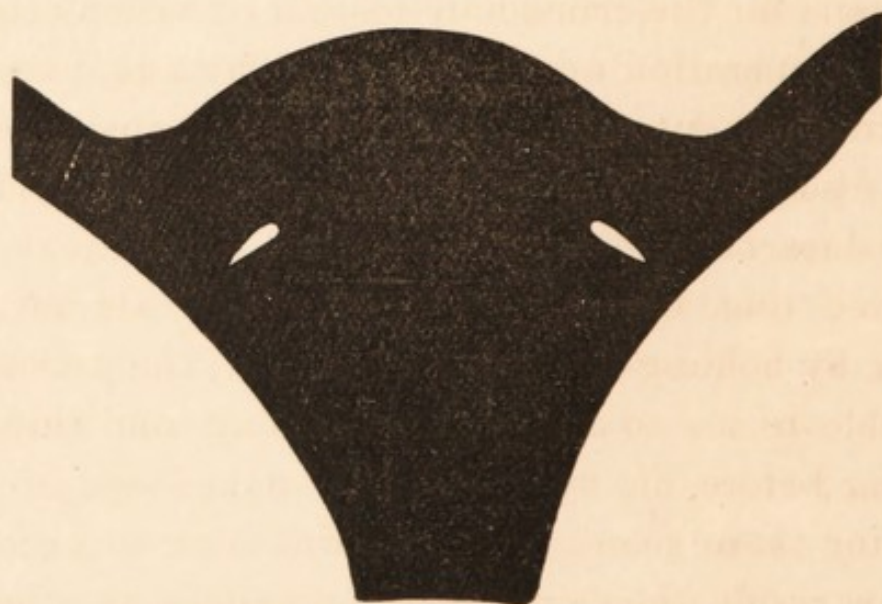
You can easily understand that such a cataract as a Morgagnian cataract, which consists chiefly of fluid cortex, with a small nucleus floating in it, and enclosed within a capsule, would easily adapt itself to the opening of the pupillary area, which is already dilated by means of atropine; and the only difficulty which is experienced in the extraction of such a cataract whole in its capsule, and without iridectomy, is the degree of pressure to be exercised in coaxing it out, which

pressure, as I said before, was a sort of muscular sense which only the experienced hand could fully appreciate the meaning of.

Morgagnian cataracts are peculiarly adapted to such operations, owing to their power of accommodating themselves to the opening of the pupillary area, through which they gain an easy exit.

It is my practice, after extracting a cataract, to test the patient's vision immediately by holding up my fingers to count, in order to satisfy myself that vision is present, and that no cause of impairment exists which can be removed at one sitting. It also satisfies

FIG. 17.



the eagerness and curiosity of the patient and his friends, otherwise there is frequently an attempt

made during after-treatment to remove the antiseptic plaster, or the pad and bandage. Of course, the closure of one eye or both after operation is merely a matter of experience, but I prefer to cover both and use the antiseptic plaster, which is a solution of gum and mercury lotion (1 in 5000), in which a piece of blue silk cut this shape (Fig. 17) is dipped, and there are two slits or openings for either canthus to discharge secretions. The advantage of the plaster over the pad and bandage in India is that it is cooler, and that it adheres like a splint to the eyelids, and on endeavouring to remove it by the patient himself it adheres to the downy hairs, and produces pain by pulling on them, and so the attempt is abandoned.

I claim for the immediate testing of vision after a cataract operation another great advantage, namely, that in about 1 to $1\frac{1}{2}$ per cent. cases operated upon I have discovered, after the most successful operation for cataract has been performed, the patient has declared that he could not see at all. On testing vision by holding up fingers to count, the patient is not able to see to count, but says that something is moving before his eyes. To the naked eye of the operator there seems no cause whatever to account for this result, the centre of the pupillary area being black, and no soft cortex or membrane is seen to be floating about, which in India can generally be seen if present, owing to the splendid light one generally

has. On examining the eye with a magnifying glass carefully, a diffuse and deep haziness is observed in the centre, which gradually fades away towards the periphery. In my first case I endeavoured to remove this haziness with the point of the cystotome, introduced to the centre of the area very carefully, and under antiseptic precautions. On trying to remove the hazy membrane the cystotome met with some resistance, and on further attempts there was noticed that the membrane gave way, the hazy area was now occupied by a jet-black appearance, and on removal of the cystotome a few drops of vitreous escaped. I immediately closed the lid of the eye, allowed it to rest for a while, and then very carefully, by means of Desmarre's retractors, lifted the upper lid and tested vision with the fingers. The patient said he could see, and saw very clearly indeed. I closed the eyes, applied glycerine and belladonna to the eyebrow, applied the antiseptic plaster, and as an additional safeguard the pad and bandage over the plaster on drying of the same. The following prescription was also administered :

℞ Quiniæ Disulphatis, gr. iiss.

Opii, gr. $\frac{1}{4}$ — $\frac{1}{2}$.

Mix and make a pill.

Sig. : To be taken thrice a day.

I have since had several cases of this peculiar condition after the operation for cataract has been

successfully performed, and have invariably dealt with them in a similar manner with the most satisfactory results to vision.

Ophthalmologists have varied in their opinion from time to time as to the identity of the posterior capsule of the lens with the hyaloid membrane, but the most recent opinion is that they are not identical, but distinct membranes. Such being the case, I am firmly of opinion that in aphakic eyes, in which this peculiar form of impaired vision exists, the hyaloid membrane is responsible for this condition after a successful operation for cataract has been performed.

The escape of vitreous externally in such cases is scarcely appreciable, although no doubt it advances into the anterior chamber in some cases; but as a rule, if the operation be performed with a delicate touch, and the cystotome removed carefully and quickly, and the eyelid closed over gently for a little while before testing vision again, no external escape of vitreous occurs.

Is this condition a secondary cataract, or is it the form of cataract known as posterior polar cataract, or what?

Let us analyse the opinions of some of the highest authorities in ophthalmology with regard to these two forms of cataract. Fuchs, in his work on 'Ophthalmology,' says with regard to "cataracta secun-

daria," "It often happens, even in cases in which the operation has been well performed, that the result of the operation is impaired by the retention of portions of the cataract. This happens particularly when the operation is done on immature cataracts; but by no means fails to occur also in those that are mature or hypermature. If the anterior capsule is thoroughly opened, the portions of lens left behind (if they were not already opaque previously) grow opaque, swell up, and become absorbed. In this case, therefore, a fine black pupil is ultimately obtained. But if the layers of the capsule become agglutinated early, and shut off the remains of lens substance from the aqueous, these remains are not absorbed, but persist as a white membranous opacity. This is called after-cataract (*cataracta secundaria*). If this is present in only one part of the pupil, while another part of it is quite clear, the sight may be perfect. But if the whole pupil is filled by the secondary cataract, the sight is diminished in proportion to the density of the opacity. It may also happen that the after-cataract does not develop until later on; the epithelium of the anterior capsule which has been left behind proliferating, and inducing a secondary thickening and opacity in the latter. After-cataract, when it interferes with sight, requires a secondary operation, namely, discission or simple linear extraction. The secondary operation should be performed not

sooner than four weeks after the cataract extraction."

Swanzy, in his work on the eye, classifies secondary cataract under the following heads :

(a) Posterior polar cataract.

(b) Total secondary cataract, which he states "often ensues upon contact of the lens with inflammatory products in the eye, *e.g.* where false membranes have been produced by inflammations in the uveal tract. It is sometimes then called cataracta accreta, when the iris or ciliary processes are adherent to it. Cataract is also caused by detachment of the retina, intra-ocular tumour, absolute glaucoma, &c. The reason of this is that the lens in these cases imbibes abnormal nutrient fluid from the diseased tissues with which it is in contact.

"Such cataracts often undergo a further degeneration and become calcareous. These secondary cataracts rarely come within the range of treatment, as the diseases which give rise to them are usually destructive to sight. When occasionally they can be dealt with, they should be extracted.

"The term 'secondary cataract' is also used in cases in which after a cataract extraction the capsule of the crystalline lens, which is left behind, presents an obstacle to good sight."

Meyer and Freeland Fergus, in their 'Practical Treatise on Diseases of the Eye,' state—

“Under the name of secondary cataract are included opacities of various kinds which are formed in the pupillary field after a cataract operation, and which present the complete re-establishment of vision.

“As a general rule we must take care not to perform any secondary operation shortly after the extraction of cataract. The time which we must wait varies with the duration and severity of the inflammatory process which the eye has undergone. We should decide to perform the secondary operation only when all traces of irritation, such as swelling of the lids, photophobia, and pericorneal injection, have disappeared. If we do otherwise we are apt to revive the inflammation, and not only lose the benefit which may be derived from our operation, but also find that other opacities are added to those which already exist.

“It then becomes necessary to subject the patient to another long period of waiting before we can attempt another operation on the eye.”

Noyes, in his ‘Diseases of the Eye,’ states, “In a large proportion of cases some membraniform obstruction appears in the pupil after the operation. We have every grade, and may speak of the simple and complicated secondary cataract. The simple may be extremely thin and nearly transparent, or quite thick and opaque.

“The complicated varieties of membranous cataracts appear immediately. The rule with them, they thicken and contract, and draw the adherent iris up to the wound, and may obliterate the pupil. Consecutive changes may be severe, the eye go into atrophy with detachment of the retina, the vitreous become fluid, and the changes which cyclitis causes may ensue.

“From this may follow also the irritation which sets up the sympathetic ophthalmia.

“The time when secondary cataracts may be operated on is not easily determined, but is seldom less than within four weeks or three months, never until all irritability of the eye has ceased, and this may be often six months or a year.”

With regard to the posterior polar cataract (*cataracta polaris posterior*) Fuchs states, “‘*Cataracta polaris posterior*’ consists of a small white dot at the posterior pole of the lens, which on account of its deep location is generally to be discovered only with the ophthalmoscope. It belongs to the posterior capsule, upon the posterior surface of which it is deposited, hence also called posterior central capsular cataract.

“Posterior polar cataract is congenital, and dates from the time when the hyaloid artery passed through the vitreous to the posterior pole of the lens. When this disappears incompletely some of its tissue remains upon the posterior capsule. Hence we sometimes find posterior polar cataract simultaneously with

persistence of the hyaloid artery. The interference is inconsiderable when the cataract is small. Treatment, none.

“The anterior and posterior polar cataracts are capsular, while the partial stationary cataracts are all lenticular.”

Swanzy, Meyer, and Freeland Fergus, together with Carter and Frost and Noyes of New York, all agree that posterior polar cataract is situated in the posterior layers of the lens or its capsule, which converges towards the posterior pole. Some believe it is congenital or acquired, or both ; but all agree with the point that it has some connection with deep mischief within the eye as the result of disseminated choroiditis, retinitis pigmentosa, diseased vitreous, or other deep-seated changes of the inner tunics of the eye. Noyes, of New York, states that it is associated with hyalitis and myopia. Juler regards it as a spurious form of cataract, since there is no opacity of the lens or its capsule, but merely a small piece of the capsulo-pupillary membrane adherent to the latter, and that the acquired form is progressive. Juler also clearly states that the congenital form is probably in some way connected with imperfect absorption of the foetal hyaloid artery, and cases have been recorded in which a minute thread corresponding in position and size to that structure has been visible, passing back from the opacity towards the optic disc.

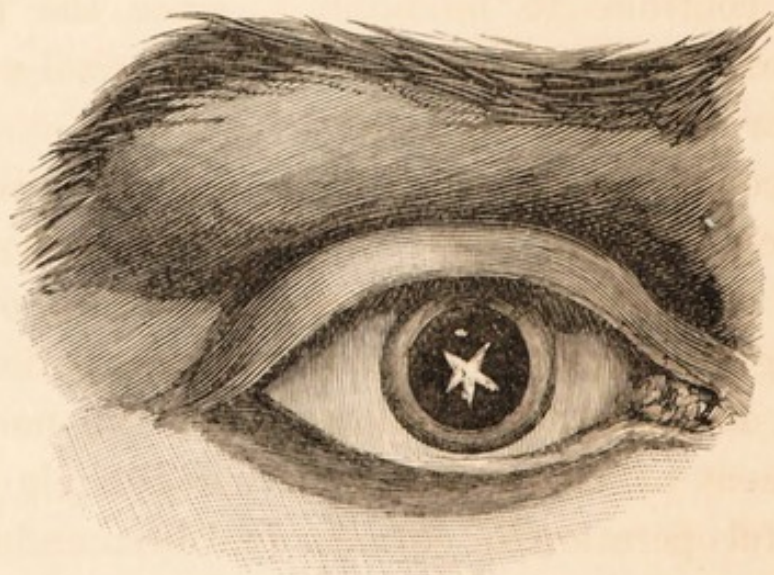
I am of opinion that Juler's view of this particular form of cataract is the correct one, namely, that it has no connection with the posterior layer of the capsule of the lens, nor with the lens itself, for the simple reason that in cases where the lens has been extracted whole in its capsule it is found to exist, and the only conclusion I can draw is that its position is in the *fossa patellaris* of the hyaloid membrane and vitreous; that it may be congenital or acquired I also agree with, and that the latter form is of a progressive nature.

I would place before you the accompanying diagrams from Plate XV after Juler, showing posterior polar cataract as seen by the ophthalmoscope (red) and by oblique focal illumination (black). In both these diagrams the cataract presents a stellate appearance, which in the congenital form might be explained by the traction of the fine shrivelled thread of the foetal hyaloid artery in the centre of its attachment to the hyaloid membrane at the *fossa patellaris*. Moreover, when the eye is examined under the ophthalmoscope or by oblique focal illumination, there is the act of accommodation which also comes into play, and the lens which alters its convexity, and in doing so carries the posterior capsule with it forwards, and still further draws upon the central line of attachment by its contiguity to the hyaloid membrane; hence the stellate appearance.

FIG. A.



FIG. B.



(PLATE XV AFTER JULER.)

Whether the acquired form of posterior polar cataract is due to diseased conditions of the deep tunics of the eye alone, or can be produced by abnormal tension of the globe, or by pressure of the swollen and opaque lens against the hyaloid membrane in the process of its development and maturity, whilst in some cases false membranes form in the fossa patellaris by reason of the pressure exerted, is a matter for further investigation and inquiry; but whatever the changes might be that take place, I am inclined to give this particular form of impairment of vision, after successfully operating for cataract, the name of "hyaloid cataract"—a term which is already given to crescent-shaped opacities of the lower portion of the posterior capsule, and which should no longer continue to be applied, since the hyaloid membrane is no longer considered identical with the posterior capsule of the lens.

The conditions observed by myself after the performance of over 1000 cataract extractions by various methods to meet the particular form of cataract, together with the condition of the patient and his eye, do not lead me to suppose that this particular impairment of vision can occur immediately after a successful operation for cataract had been undertaken with all the care and precautions possible. The changes might be secondary to the developmental period of a cataract or to the progressive changes of

diseased inner tunics of the eye ; but the latter condition, in my opinion, is rare, and, if progressive, I believe it can be arrested by the operation of discission or dilaceration of the hyaloid membrane with a light touch of the cystotome. The posterior layer of the capsule of the lens might present false membraniform attachments by agglutinations, owing to its proximity to the hyaloid membrane in the fossa patellaris, and in such cases it is advisable to extract the lens whole in its capsule ; and if there still be impairment of vision by testing with the fingers, then laceration of the hyaloid membrane vertically from below upwards should be undertaken immediately.

The changes in the vitreous, choroid, and retina might possibly be secondary to changes by pressure and adhesions in the fossa patellaris. It is a curious fact that in lacerating the hyaloid membrane for this condition the vitreous has no tendency to escape rapidly or in large quantities externally ; it is rare for it to do so if the operation be done with a light touch. It is probably due to some change occurring in the external wall of the canal of Stilling, which passes through the vitreous and causes the cellular structures within to form fine adhesions which support the fluid structures as if in the meshes of a very fine stroma. Particularly might this be the case where, as Juler states, the remnant of the hyaloid

artery is a fine thread, which acts almost like a foreign body and sets up changes. We know that foetal remnants are capable of lighting up mischief in adults by their mere presence.

I am anxious to impress upon you the importance of testing vision immediately after cataract operations.

It is, I feel now, of the highest importance to note the changes in every eye which give symptoms of cataract formation, making an ophthalmoscopic examination from the very onset of the disease until its full maturity. In our dispensary practice in India this is a difficult matter frequently, and only exceptionally can we follow a case in its earliest stage to the termination. It is better for the surgeon to satisfy the curiosity of his patient and his friends in the matter of vision after his operations, rather than run risks of examination by the patient and his friends, whose curiosity will be satisfied in some cases in the wards during your absence. It is beyond human powers of resistance almost, when the surgeon daily visits his ward and tests the vision of a case which is progressing well, and the dresser has been ordered to remove the plaster and bandage, and the patient is overjoyed all day long at being able to see, and probably asks the others half a dozen times or more if they too can see, and they are all anxious to get just one glimpse of the outer world, to be able just to say they have seen ; but dirty fingers and rough

hands remove the plaster or pad and bandage, and the eye is lost. I claim for this particular mode of treatment of impairment of vision as great an advantage as the modern operation of litholapaxy has over lithotomy. It is far better to remove the impairment at one sitting rather than wait weeks or months after cataract extraction has been performed. In the operation of discission or dilaceration for secondary cataracts as performed at the present day, it cannot be undertaken from four to six weeks after cataract extraction has been performed. It necessitates long waiting, in some cases for months, and it certainly gives time for firmer adhesions by false membranes, which increase the risks of a secondary operation.

The escape of vitreous, which is regarded as one of the accidents in cataract operations, need not be feared so terribly after the eye has been deprived of the lens. It certainly is an accident to be feared before the lens is extracted, for obvious reasons ; but in this particular impairment it certainly seems rather an advantage, since vision is clear, and remains so till the termination of the treatment in hospital, which is about fourteen to fifteen days on an average. I have seen some of my patients a year or two after the operation, and have only been obliged to adjust their spectacles, whilst in other respects there has been clear vision.

Very, very seldom has it fallen to my lot to per-

form the secondary operation for cataract, and I have the greatest faith in cases of doubt, where pieces of cortex have been left behind or lurk behind the iris, in the use of grey powder, gr. iij to v; Dover's, gr. iij to v, three times a day. Occasionally, when these fail, iodide of potassium gr. iij to v, water ℥j, will be found most useful at the very outset of the treatment, but their effects need to be most carefully watched daily; and in the case of the former, ptyalism must not be allowed to come on; whilst in the latter conjunctivitis and lachrymation sometimes set in; but the drug must promptly be stopped when this is observed. I believe that these drugs, when used as directed, have powerful absorbent properties, and if persevered in, I am convinced that secondary cataracts ought to be less common than they are at the present time.

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