

Avoid the iris.

No delay necessary in fluid cataract.

so long as any opaque matter comes forward into the pupil. Care must be taken to keep the open end of the syringe well away from the iris, otherwise the iris may be drawn into the instrument and get bruised or injured.

In cases of fluid or very soft cataract, there will be no necessity for waiting for a few days after the capsule has been opened, but the wound in the cornea having been then and there enlarged, the suction instrument is to be introduced, and the opaque matter removed as above described.

THE FLAP OPERATION. I have already stated my convictions as to the advisability of administering anæsthetics in operating by flap-extraction for the removal of an opaque lens.

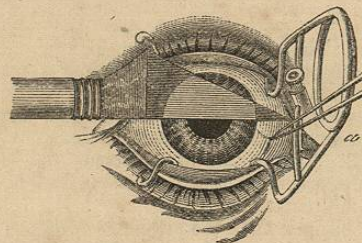
1st Stage.—The employment or rejection of ether makes some little difference in the manipulation necessary in the first stage of the operation, for no one operating with the patient under the influence of ether would think of making his section without first having fixed the eye to be operated on, by means of a pair of forceps; whereas if anæsthetics are not given, I think it is better not to attempt to fix the eye in this way, as the proceeding causes the patient a good deal of pain, and may make him strain more than is desirable while we are making the section in the cornea. I shall therefore describe the operation—first, supposing our patient to be under the influence of chloroform; and secondly, without its administration. I would premise that we are about to operate on the right eye, and by the upper section. The pupil of the eye to be operated on should be previously dilated with atropine.

I. Directions for operating under chloroform.
I. Supposing the patient to be fully under the influence of ether, and laid on his back upon a convenient couch, with his head slightly raised and facing a clear bright light, which should fall obliquely on his face, and not from above, otherwise the surgeon, in bending over his work, will throw a deep shadow upon the patient's eye, which will prevent him from clearly seeing any flakes of lenticular matter or capsule left in the eye after the removal of the lens. A stop-speculum should be adjusted as represented in Fig. 36, the end of the instrument, *a*, resting against

the nose. The surgeon, standing behind his patient, with the left hand seizes a fold of the inner and lower part of the conjunctiva, near the cornea, with a pair of toothed forceps, so as to steady the globe of the eye. I think it is better to fix the eye from the point mentioned, rather than from below the cornea, because the forceps can be used effectively under these circumstances to resist the eye from turning inwards as the knife is being passed through the cornea; it tends, in fact, to secure the line through which the knife passes in transfixing the eye, a matter of the greatest importance in this operation. The eyeball having been fixed as above described, be quite certain that your patient is fully under the influence of ether. The surgeon then holding the cataract-knife in the right

Preliminary arrangements.

FIG. 36.



hand as he would a pen in writing, the little or ring finger being placed against the patient's temple, so as to support and steady the hand.

The point of the knife is then to be passed through the cornea near the extremity of its horizontal diameter, and about a quarter of a line from its margin, so as to be fairly within the structure of the cornea; the blade, when once introduced, is to be thrust steadily across the anterior chamber, until its point again pierces the cornea opposite its entrance, and at an equal distance from the margin. The same movement is to be continued, the blade being kept absolutely parallel with the iris, so as to fill the wound in the cornea, and prevent the aqueous from escaping, until the counter-opening in the cornea has been completed. The knife having been pushed onwards almost

Making the corneal section.

up to its heel (see Fig. 36), a small bridge of the cornea will still remain undivided; the surgeon now lets go his hold of the conjunctiva with the toothed forceps, and turning the edge of the knife a little forwards, divides the remainder of the corneal flap as he withdraws the instrument from the eye, so that the last portion of the cornea is cut through by a movement from within outwards, instead of from without inwards.

The section of the cornea having been completed, we must remove the stop speculum, and allow the lids to close; this finishes the first stage of the operation.

II. Supposing we do not wish to administer anaesthetics, the manipulation above described will have to be somewhat modified. The position of the patient is the same as before, but the stop speculum had better not be used; and if we wish to fix the globe with forceps, they must be handed over to an assistant, who should seize a fold of the conjunctiva near the lower part of the cornea. The surgeon, standing behind the patient, raises the upper lid with the fore and middle fingers of the left hand (the right eye being operated on), and gently rests the ring and little fingers against the upper and inner part of the sclerotic, so as to steady the eyeball. The section of the cornea and the further steps of the proceeding, are precisely similar, whether ether is administered or not.

It may happen that the surgeon does not think it necessary to make use of the fixing forceps, in which case his assistant simply everts the lower lid, drawing it well downwards, and fixing it against the malar bone, so that no pressure may be exerted on the globe of the eye, but I need hardly repeat the remark I have already made, that anaesthetics, the fixing forceps, and a stop speculum, are of great use in enabling us to make a satisfactory opening in the cornea, upon which proceeding, the success of the operation in a very great measure depends.

2nd Stage of the Operation.—This consists in lacerating the capsule of the lens, which may be done with a curved needle or a cystitome. It may be necessary at this stage of the proceeding, if the patient is under chloroform, to draw the eye slightly downwards with the fixing forceps, or, if sensible, to make him look toward his feet; the cystitome is then to be intro-

The flap completed in withdrawing the knife.

II. When chloroform is not used.

Manipulation different.

The same section to be made.

2nd Stage. Lacerating the capsule.

duced into the anterior chamber, with its convexity downwards, so as to avoid wounding the iris. When opposite the pupil, the handle of the instrument should be rotated, and its point made to tear open the capsule by two or three incisions. The instrument is then to be withdrawn from the eye, and the lids allowed to close.

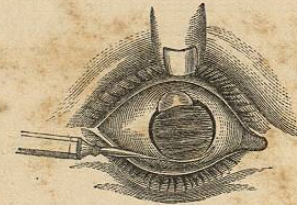
3rd Stage.—The third stage of the operation consists in removing the lens. The concavity of the curette is to be laid against the lower part of the sclerotic, and slight pressure made with it upon the globe; at the same time the point of the forefinger of the left hand is to be placed on the sclerotic, just above the section; by careful pressure, first with the curette and then with the point of the finger, the upper edge of the lens slowly turns forwards, passes through the pupil, and gradually protrudes through the incision in the cornea (Fig. 37). The pressure is now to be diminished, the lens being completely extruded by the elasticity of the tissues compressing it; and it may be coaxied on if necessary by inserting the curette into the wound, and exerting a slight degree of traction force on the lens, thus helping it onwards and out of the eye.

The lens having been removed, the lids are to be closed, and after a few minutes again opened, and the eye carefully examined; any small particles of lenticular matter which may be seen in the anterior chamber should, if possible, be removed with the curette. The edges of the flap are then to be adjusted and the lids closed, a compress and bandage being at once applied over both eyes.

Accidents during the Operation.—Before considering the after-treatment to be followed in cases of flap extraction, I may advert to one or two of the most common mishaps that may occur during the operation, and the best means of providing against, or overcoming them.

Accidents during flap extraction.

FIG. 37.



Avoid the iris.

3rd Stage. Removing the lens,

by gently compressing the globe,

and slight traction.

Remove fragments.

Close lids.

I think it always very advisable to dilate the pupil fully with atropine before attempting to operate by a flap extraction. If the pupil does not dilate fully under the influence of atropine, then I strongly recommend that Graefe's operation should be performed in place of the proceeding above described. If it is determined to administer chloroform, let the patient be completely under its influence before we commence the operation.

Escape of aqueous.

If while the section through the cornea is being made the aqueous escapes, the iris will very probably protrude before the edge of the knife. Under these circumstances, the surgeon should make gentle pressure over the cornea with the point of his finger, so as to force the iris back behind the blade of the knife; but if this manipulation does not succeed, it is better to cut steadily on, and finish the section, cutting through a fold of iris at the same time. A knob of iris being thus shaved off, a bridge of this structure is often left between the hole thus made and the pupil; this strip of iris had better be divided before attempting to remove the lens.*

The iris may be wounded.

Enlarge too small a section.

If the section in the cornea is too small to allow the easy egress of the lens from the eye, do not try to force the lens through this insufficient opening; any such endeavour will lead to irreparable damage in at least fifty per cent. of the cases in which you attempt it, and in many others it will altogether fail to effect the object in view, the vitreous rather than the lens being squeezed out of the eye. Under these circumstances, supposing the patient not to be under the influence of chloroform, both he and the surgeon will have to exercise all the patience at their command, the latter endeavouring to enlarge the opening in the cornea by means of a pair of blunt-pointed scissors, the incision being carried downwards, so as to leave an ample opening through which the lens may escape.

Escape of vitreous before the lens.

Very gentle pressure should be made with the curette on the globe of the eye, so that in squeezing out the lens we may not press out a quantity of the vitreous at the same time. If any of the vitreous escapes before the lens, we should at once cease all pressure on the globe of the eye, and a scoop or a

* Lawrence on "Diseases of the Eye," p. 627.

sharp hook may be passed through the wound, and the lens gently withdrawn from the eye.

It sometimes happens that on making pressure upon the eye, the lens does not readily present itself in the pupil, in consequence of our not having sufficiently lacerated the capsule, in which case the cystotome must be re-introduced, and the capsule fully torn open. In most of these cases, however, it is an insufficient section in the cornea, and not the capsule of the lens, which is at fault.

But supposing that at the moment the lens escapes through the opening in the cornea, a gush of vitreous follows, the eyelids must be at once closed, and a compress and bandage applied over both eyes. I do not believe that the loss of a small quantity of vitreous from the eye is a matter of consequence, and even a fourth of the vitreous may be lost, and yet the patient make a very good recovery;* nevertheless authorities of repute declare that accidents of this kind are to be carefully avoided, for loss of vitreous they think likely to be followed by irido-choroiditis, or even by detachment of the retina.

Loss of vitreous after.

After the section has been completed, if, on opening the eyelids we find that a portion of the iris is engaged in, or prolapsing through the wound, we should at once endeavour, by means of a gentle rotatory motion of the point of the finger over the closed eyelid, to return the prolapsed iris into the anterior chamber.

Prolapse of iris.

Replace if possible.

If this method does not succeed, the best plan we can adopt is to perform iridectomy, removing the superior section of the iris. We may save an eye by this proceeding when all other means of treatment would fail. If, however, the patient has been rendered perfectly insensible with chloroform, there will be far less chance of a prolapse of the iris taking place than if he is straining, which is almost sure to happen towards the close of the operation if chloroform is not employed.

Iridectomy.

Prevented by chloroform.

The extraction having been completed, care must be taken in closing the upper lid, otherwise the corneal flap may be turned backwards. To prevent this, some of the cilia should be taken hold of, and the upper eyelid gently drawn away from the globe as the lid is

Guard against reflection of the flap.

* Lawrence on "Diseases of the Eye," p. 627.

being closed; the eye must then on no account be again opened.

The After-treatment of Flap extraction.—This should be directed in the first place towards keeping the edges of the wound in the cornea in accurate apposition, so that it may unite by the first intention; consequently, during thirty-six hours after this operation, the eye and the patient must be kept absolutely at rest. The former of these objects may be secured by applying a compress and bandage carefully over both eyes, and the second, by keeping the patient in bed, and everything about him as quiet as practicable.

Promote union by rest.

Immediately after the operation a little cold cream may be smeared over the eyelids, and before the patient rises from the operating table or bed, a piece of soft linen is to be laid over the closed eyelids of both eyes, and two light pads of cotton wool are placed over the linen, and the whole secured in position by means of a gauze bandage, so as to keep the eyes at perfect rest; if all goes on well, the bandage need not be removed for thirty-six hours. I apply the bandage very lightly, and with the sole object of keeping the eye at rest, and the edges of the corneal section in apposition till they have united.

Apply a compress and bandage.

The bandage having been adjusted on the operating-table, the patient must be conveyed to a bed, and directed to lie as much as possible on his back for the first few hours after the operation; he may then be allowed to turn on either side, but not to raise his head off the pillow, cough, or use any straining effort, and by no means to disturb the bandages. If the eye is bandaged in this way there is no necessity, and in fact it is not advisable, to keep the patient in a dark room. If there is much pain in the eye towards the evening after the operation has been performed, the compress must be removed for an hour or so, and the eye fomented with poppy-head fomentations; the surgeon should under these circumstances remain with his patient until the pain has subsided. Together with the fomentation a drop or two of a strong solution of atropine should be dropped into the eye, and then the elastic bandage without the compress may be applied, and the patient may soon fall off to sleep. A dose of morphia also may be given. There will

Morphia if there is pain.

necessarily be some uneasiness in the eye after the operation, but this is to be expected.

With regard to diet, the patient may from the day of the operation have chicken soup, milk, or other fluids which can be poured into his mouth with a feeding cup; it is of importance not to allow him to rise from his bed, or chew any hard substance during the first twenty-four hours after the operation.

Liquid food.

Two days having passed away from the time of the operation, we may allow our patient more liberty; he may sit up and begin to take solid food; in fact, if all has gone on well, he may now return to his usual dietary, and in some cases beer or wine may be taken, in others it is necessary to abstain from stimulants until the patient can move about a little. On this subject Mr Dixon remarks—"Independently of prolapsus iridis, non-union of the corneal wound results from the same cause which prevents the union of a flesh wound, or of a broken bone—namely, the depression of the patient's nutritive functions below the proper standard of vigour. To keep an old and feeble person upon 'slops' for several days after extraction, for fear inflammation should set in, is surely contrary to common sense, and to all analogy in sound surgical practice."*

Usual diet after two days.

Stimulants if required.

If at the expiration of thirty-six hours we remove the bandage, and find the eyelids of the eye operated on of a natural colour, not swollen, and no purulent discharge escaping from between them, the patient being free from pain, we may be almost sure that all is going on well. The pad and bandage must be again applied. Any unnecessary opening of the lids, in order to ascertain the amount of vision the patient possesses, is most injudicious.

State of the lids a guide to that of the eye.

After three days, we may gently open the eye, and look at the cornea and the state of the pupil; but the compress must be worn for the first five days after the operation, and then a bandage without a compress may be employed for three days more, and subsequently, if all is well, a shade may be substituted for the bandage. The patient must be kept in his room for some fourteen days, after which he can generally bear the light, and may be allowed to use his eye. A month having expired, we may order our patient suitable

Look at the eye after three days.

May be used in a fortnight.

* Dixon "On Diseases of the Eye," p. 325.

convex glasses, without which, I need hardly say, he will not obtain the full advantages which the removal of the opaque lens is capable of affording.

Accidents following the Operation.—If some thirty-six hours after the operation, the patient complains of considerable pain in the eye, without any apparent cause, we must remove the bandage, and may either give a full dose of morphia, or inject a solution of morphia beneath the skin of the temple. A cold compress over the eye may be useful in these cases, provided the patient is not subject to rheumatism or gout, in which case warm poppy-head fomentations may be found soothing, and a light bandage should afterwards be applied over the eye. A dose of castor-oil is sometimes beneficial under these circumstances.

Supposing the patient, within two days of the operation, suffers from considerable pain in the eye, and on opening the bandage we find the lids puffy and swollen, with a muco-purulent discharge oozing from between them, we shall have good reason to fear that suppuration of the cornea has set in, and we should at once examine the eye. If diffuse keratitis has begun, the conjunctiva will be found chemosed, the corneal flap may appear swollen and opaque, the edges of the wound infiltrated with pus, and the whole cornea hazy if not opaque; this state of things is utterly hopeless, the disease in all probability having commenced in the iris.

It may be, however, that the suppurative action is limited to the part of the cornea included in the flap, in which case we may still hope to save the lower part. A strong solution of atropine should be applied to the eye every second hour, hot compresses must be employed for two or three hours night and morning, and in the meantime steady pressure must be made upon the eye by means of the compress and bandage. Full doses of morphia should be given, so as to relieve the pain and irritation from which the patient suffers, and in robust and healthy patients two leeches may with great advantage be applied to the temple over the affected eye for three consecutive days; in weakly subjects large and repeated doses of the tinctura ferri muriatis and chlorate of potash are sometimes useful; and last, but not least, we may have to administer port wine and beef-tea; but do what we will, we shall

Accidents
after the
operation.

Pain.

Remedies.

Diffuse
suppurative
keratitis,

a hopeless
condition.

Partial
keratitis.

Treatment.
Atropine.
Com-
presses.

Morphia.

Stimulants.

seldom succeed in saving an eye under these circumstances.

Among the lower classes we not unfrequently find subacute suppurative keratitis commencing in hyperaction in the iris, following flap extraction. Within thirty-six hours of the operation, on opening the bandage, we notice some muco-purulent discharge oozing from between the lids; the patient probably complains of little or no pain in the eye, and the eyelids are not swollen, but on everting them the conjunctiva is found to be œdematous, and the cornea hazy, the pupil filled perhaps with yellowish lymph, and the upper section of the iris presenting spots of a similar kind on its surface; the edges of the wound are gaping open, and not the slightest sign of action or an attempt at reparation is apparent in the parts. Under these circumstances, we must endeavour by means of hot bandages, a firm compress, stimulants and nourishment, to excite nature to a reparative effort; but do what we will she is generally incapable of responding to our call, and necrosis of the cornea follows.

Another danger which we have to fear after extraction is, that a prolapse of the iris may occur. This accident may take place at any time within eight days from the operation, as the wound in the cornea will not have thoroughly healed until the first week is over, and of course, till then, the iris may at any moment be protruded through the section; a slight straining effort, such as a cough or sneezing, may be quite sufficient to produce this result.

A prolapse having taken place, the patient will experience increased irritation and pain in the eye; the lids become slightly swollen, and a muco-purulent discharge is observed on the compress, or at the inner corner of the eye. On opening the lids, the cornea appears bright and clear, but the lips of the wound are more or less gaping, and a portion of the iris may be seen protruding from between them.

Under these circumstances, the prolapsed portion of the iris should be touched with a pencil of caustic, and a firm compress and bandage applied over the closed eyelids, and kept there for twelve hours; the bandage may then be removed, and the lids bathed with a little tepid water, but not opened. Some cold cream having been smeared over them, the compress and bandage

Subacute
suppurative
keratitis.

Employ
warmth
and stimu-
lants.

Prolapse
of the iris.

During first
week.

Symptoms.

Apply arg-
nit. and
compress.

should be reapplied. This treatment may be continued for a month, the nitrate of silver being employed from time to time. But if after this period the prolapse is as prominent as before, it will be advisable to incise it with a broad needle; the aqueous behind escapes, and the prolapse contracts; the compress and bandage must then be reapplied. This little operation may have to be repeated every other day or so, until the prolapse has disappeared.

Incise the
prolapse,

or remove
it.

If this treatment does not succeed, the prolapse may subsequently be snipped off with a pair of curved scissors.

If on opening the eyelids soon after the operation we find a large and widely distended section with a considerable portion of the iris protruding through it, we must at once excise the prolapse with a pair of scissors, and then closing the lid carefully bandage up the eye. Considering the steps taken in flap extraction, it is evident, especially in large hard senile cataracts, that the iris unless fully dilated with atropine must be more or less pressed upon and bruised, as the lens is forced through the pupil and out of the section in the cornea; consequently we might expect to meet with cases of iritis after this proceeding, and such is in fact one of the complications we have to contend with; cases of apparent sloughing of the cornea not unfrequently commence in inflammation of the iris after flap extraction: but by far the most common cause of iritis is occasioned by fragments of the capsule and cortical matter of the lens being torn off, and attaching themselves to the iris set up considerable irritation and inflammation in the part. Moreover, no one can have watched disease involving the posterior layer of the cornea, without observing its liability to spread to the iris; and the epithelium of the posterior elastic lamina is often scraped off in the passage of the lens from the eye.

Iritis follow-
ing extrac-
tion;

About the
sixth day.

Iritis may come on within the first six days after an extraction; it may commence by symptoms of violent and rapidly destructive inflammation in the part, involving also the cornea; on the other hand, everything may seem to have been going on well until about the fifth day; the patient then begins to complain of pain in the eye, and on examining it we may discover all the symptoms and appearances of iritis: it is unneces-

sary for me to recapitulate these here, as they are fully described in the section treating of iritis.

With regard to treatment, we should apply two leeches to the temple over the affected eye for three consecutive days, but atropine will be our mainstay, and must be freely employed. But if small particles of lenticular matter are seen attached to the iris, or lodged between it and the cornea, and if the pupil will not dilate under the influence of atropine, it is well to give the patient chloroform, and making an opening in the cornea, to remove all the lenticular matter we can see with a scoop. If we are in any doubt as to there being lenticular matter behind the iris, which we cannot remove, we hesitate to perform an iridectomy; excision of the iris is, however, sometimes followed by favourable results under these circumstances. The question arises as to the advisability of attempting to reduce the iritis, and subsequently performing an iridectomy if the pupil is closed. I think, if on examining the patient's eye on the third day, we find the cornea hazy, pupil dull if not closed with lymph, iris refusing to dilate under atropine, and the patient in great pain, we may, having placed the patient under chloroform, excise a fourth of the iris; but if the case has been allowed to run on for twelve or fifteen days I would recommend its being treated simply for iritis, and an iridectomy being performed when all active symptoms of inflammation have passed away; or an incision through the closed pupil, may under these circumstances be all that is necessary; but the operation had better not be performed until hyperaction has apparently ceased in the iris and parts around it.

Treatment.

Atropine.

Remove
lenticular
matter.

Iridectomy;

When to be
resorted to.

Supposing, however, that on opening the eye on the third day after the operation we find a discharge from the conjunctiva, the cornea hazy and pupil occupied by lymph, we must try the effect of constant instillation of atropine, and smearing the extract of belladonna and atropine over the patient's brow. The atropine should be used in this way for twenty-four hours, and should the pupil dilate under its influence we may trust to time and treatment, taking care to keep the eye at perfect rest with a pad and bandage.

Atropine.

The most dangerous complication that can occur after extraction of the lens, is the rupture of some of the vessels of the retina or choroid. The operation has,

Rupture of
retinal
vessels;

perhaps, been an easy one, but within a few minutes of the removal of the lens, the patient complains of great pain in the eye, and to our dismay, on opening the lids, we find the anterior chamber not only full of blood, but blood oozing out through the wound in the cornea.

a hopeless case.

A case of this kind is utterly hopeless: we can do no more than apply ice over the eye, so as to check the bleeding, but as an organ of vision the eye is completely destroyed, and can never recover. This accident may occur some hours after the operation, if the patient sneezes or coughs violently.

MODIFICATIONS OF FLAP EXTRACTION.

MODIFICATIONS OF FLAP EXTRACTION.—I may now proceed to consider some of the principal modifications of the flap operation which have been advocated within the last few years.

Iridectomy; some weeks before extraction.

Iridectomy in Extraction.—It has been proposed to excise a portion of the iris some weeks before the extraction. In the first instance iridectomy is to be practised on the upper section of the iris, and after six weeks or two months the lens is to be removed as usual by means of the flap operation. Against this proceeding it is advanced that few patients will consent to undergo two operations of this kind if it is possible to do all that is necessary at once.

Iridectomy after extraction.

Iridectomy has been practised immediately after the extraction of the lens with success by Professor Jacobson; he removes the lens in the first instance through a flap formed from the lower part of the cornea, and he then excises a fourth of the corresponding section of the iris.

Immediately before removal.

Lastly, an iridectomy may with the greatest advantage be made immediately before the removal of the lens; the section being an upper one, the superior fourth of the iris is excised, and the lens removed as usual. In old subjects, whose pupils do not dilate under the influence of atropine, and particularly if adhesions exist between the iris and capsule, an iridectomy, made at the time of the operation, vastly lessens the dangers to which such an eye is exposed from flap extraction.

Removal of lens in its capsule.

The Removal of the Lens in its Capsule.—This is by no means a new method of extracting the lens, having been practised with varying success since 1773, and

lately strongly advocated by Dr. Pagenstecher and M. Sperino; and I certainly agree with these surgeons, believing that if it were possible in every case upon which we operate to remove the lens in its capsule, without damaging the other structures of the eye, we should have reached perfection in the extraction of cataracts.

The object we have in view in the operation now under consideration is to remove the lens without opening its capsule. The advantages it offers are, that no capsular cataract can possibly form, and there is no chance of any soft lenticular matter being left clinging to the iris, and setting up irritation and inflammation in that delicate structure: and the greater my experience in these matters, the more convinced I am that most of our failures in extraction are due to the fact of soft lenticular matter and capsule being left in the eye after the removal of the lens.

Atropine having been applied so as fully to dilate the pupil, the patient is to be laid on his back. The surgeon, standing by the side of his patient, applies the stop-speculum; and the eye, being fixed with a pair of forceps, an upward linear incision is to be made through the *sclerotic*, immediately beyond the margin of the cornea, the same precautions being taken in making the section as I have already described in the case of ordinary flap extraction. A portion of the iris is then to be excised, and gentle pressure exercised with the curette upon the lower part of the *sclerotic*, and at the same time counter-pressure is to be made with the point of the fingers upon the upper part of the eyeball. In this way the lens in its capsule may be gently forced out of the eye. If the lens is not readily displaced upon slight pressure being made on the globe of the eye, a shallow round curette may be inserted behind the lens, and a gentle traction exerted on the lens, so as to start it from its position.

In making the flap, we must keep slightly external to the margin of the cornea, so as to leave as large an opening as possible, through which the lens may escape, its bulk, when contained within the capsule, being considerable.

This operation is no doubt a very valuable one, and often leads to most favourable results. Even supposing there is a difficulty in extracting the lens in its capsule,

Prevents capsular cataract and iritis.

The section in *sclerotic*.

Iridectomy.

Gentle pressure,

or traction.

The section must be ample.

Results favourable.

the latter may be opened, and the operation completed as in ordinary flap extraction; in fact, it will be advisable to resort to this proceeding, unless the lens and capsule pass through the section in the cornea upon slight pressure being made on the eyeball: any extra force is likely to squeeze out a considerable quantity of the vitreous: and we cannot too strongly insist on the fact, that in extracting a cataract force must never be employed.

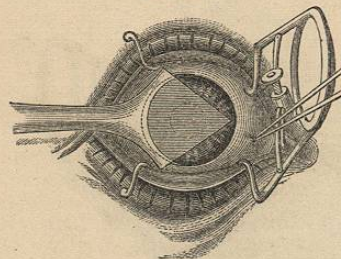
The operation which I have practised in a very large number of cases within the past few years, is a modification of the proceeding I have described in former editions of this work, under the heading of "modified linear extraction." I found that by making an incision through the extreme outer margin of the cornea, and then removing the lens with a scoop, that I seldom lost an eye from suppuration of the cornea—an accident, in spite of all our care, too common among the natives of Lower Bengal, if operated on by means of the ordinary flap extraction. I was always rather indisposed to iridectomy in extraction, upon the principle of not removing from the eye, or any other part of the body, any structure which could be retained without interfering with the result of the operation. And as I have before remarked, in addition to this objection to excising a part of the iris, it appeared very certain to me, that in cases in which the pupil dilated fully under the influence of atropine, the dangers which the eye ran in extracting the lens was not so much from bruising of the iris, as from leaving detached portions of lenticular matter and capsule in the eye; these loose organic substances in the eye, and the unjustifiable endeavours to force a lens through a section in the cornea too small to permit it to glide through, seemed to me the sources of many of my unsuccessful cases of extraction: and in order if possible to obviate these difficulties, and almost in ignorance of what was going on in other places, it would seem that I have settled down into performing an operation for extraction very similar in many respects to that practised by several other surgeons in Europe.

THE
AUTHOR'S
OPERATION
without excision of
iris.

The pupil having been kept widely dilated with atropine for two or three days before the operation, the patient is laid on his back, and placed under the influence of chloroform. The operator adjusts a stop-speculum,

Supposing the right eye is to be operated upon, the surgeon standing behind his patient with a pair of fixing forceps, seizes a fold of the conjunctiva together with the tendon of the internal rectus, so as to have a steady, firm hold of the eyeball, and in the other hand takes a short and broad-bladed triangular knife (Fig. 38), and thrusts its point through the line of junction of the cornea and sclerotic, on the temporal side of the eye. The blade of the knife is to be passed steadily onwards nearly up to its heel (Fig. 39), so that

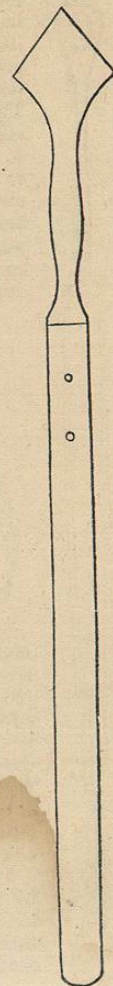
FIG. 39.



the incision made through the sclerotic is at least half an inch long. The point of the lance-shaped knife, entering the eye at the junction of the cornea and sclerotic, it is evident that as the blade of the instrument is thrust into the anterior chamber, parallel to and in front of the iris, that the extremities of the incision will extend into the sclerotic.

The knife is to be withdrawn very slowly from the eye, so as to prevent the sudden escape of the aqueous humour, which may cause the pupil to contract. The speculum and hold of the internal rectus being retained, the scoop (Fig. 40) is to be inserted

FIG. 38.



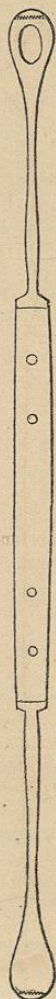
Directions
for making
the section.

Form of
the knife.

Extraction
of the lens.

FIG. 40.

Manipulation with the scoop.

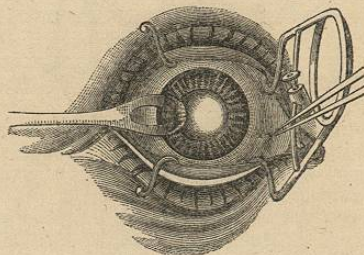


Rupturing the capsule.

The lens may be removed in its capsule.

so far into the anterior chamber as to enable us to reach the margin of the pupil; the handle of the instrument being raised and its rounded extremity depressed, the latter evidently rests on the capsule of the lens, immediately within the margin of the pupil. The scoop is now to be slightly withdrawn, still keeping its extremity on the lens, but so as to draw open the pupil far enough to enable us to pass the scoop round the outer circumference and thus behind the lens (Fig. 41), the scoop being thrust onwards along the posterior capsule, until its bent and toothed extremity embraces the inner margin of the lens; in this way the

FIG. 41.



lens comes to lie in the concavity of the scoop, and may be removed from the eye (Fig. 42), if possible without breaking the capsule. Should the capsule of the lens be ruptured, however, during the above-described manipulation, the bulk of the lens must still be drawn out of the eye by means of the scoop; and subsequently particles of lenticular matter remaining in the anterior chamber must be taken away.

In performing this operation, my aim is to remove the lens in its capsule, particularly if there is much transparent cortical matter round the lens, which would escape detection at the time of the operation,

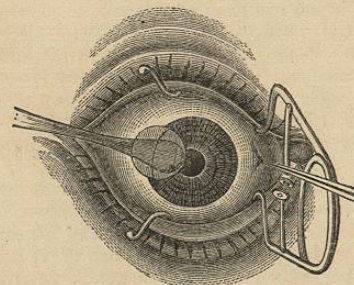
and adhering to the iris, might excite inflammation of that part. Moreover, in cases of senile cataract, the capsule often adheres to the lens with considerable tenacity, and may therefore the more readily be removed with the lens.

After the lens has been taken away, I adjust a compress and bandage over both eyes, and the patient is removed to his bed.

Thirty-six hours after the operation, if there is pain in the eye I usually evert the lower lid, and drop a solution of atropine into the eye. If the pupil expands under the influence of the mydriatic, we need have no further apprehension as to the result of the case; but if the iris refuses to respond to atropine, we

Atropine to follow the operation.

FIG. 42.



have to fear that iritis may supervene. I have been in the habit of performing the operation above described in instances of senile cataract, in which the pupil dilated very slowly, and never very fully under atropine, with, however, this important addition: after having made my incision into the eye, I excise a fourth of the external section of the iris, and then passing the scoop behind the lens, ease it out of the eye without dividing the capsule.

The *After-treatment* is to be carried out upon precisely the same principles as those I have indicated in instances of flap extraction; but these rules may be less rigorously enforced. The greater the care immediately after the operation, the less chance of subsequent evil.

After-treatment as in flap extraction.