

On the form, construction and use of a cataract needle, of a particular description / employed by Arthur Jacob.

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ON THE
FORM, CONSTRUCTION AND USE
CATARACT NEEDLE.
PARTICULAR DESCRIPTION
EMPLOYED BY

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WITHOUT taking part in the protracted discussion respecting the comparative merits of the different operations for cataract, I shall recapitulate late the arguments which have been urged in favour of that operation, to which I consider the needle, which I have to describe, as particularly applicable. The operation to which I allude is that of opening the texture of the lens to produce its absorption by exposing it to the action of the aqueous humor.*

* Ophthalmic surgery is indebted to Mr. Fox for the important

For Mr. Lawrence
with the Author's compliments

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PARK-STREET.

WITHOUT taking part in the protracted discussion respecting the comparative merits of the different operations for cataract, I shall recapitulate the arguments which have been urged in favour of that operation, to which I consider the needle, which I have to describe, as particularly applicable. The operation to which I allude is that of opening the texture of the lens, to produce its absorption by exposing it to the action of the aqueous humor.*

* Ophthalmic surgery is indebted to Mr. Pott for the important fact, that cataract may be removed by absorption, if exposed to

The strongest argument in favour of this operation is, that it is the most easily performed, affording a valuable resource to the surgeon, who, unpractised in extraction, wishes, to avoid the evil consequences of depression. Another argument scarcely inferior in weight to the last, is, that the injury inflicted on the organ is much slighter than in extraction, where so extensive a wound of the cornea is made, or in depression, where the vitreous humor is necessarily lacerated, and the retina frequently injured. If the objections to depression be well founded, recourse must be had to this operation in those

the contact of the aqueous humor by opening the capsule; and doubly indebted to Mr. Saunders for establishing by repeated operations the value of the suggestion. Attempts have lately been made to transfer the credit of this improvement to others Mr. Guthrie first gives the merit to an old lady, cotemporary with Theodore Mayerne, and then, with more reason, to Paul Barbette: but as the works of these authors have not been republished since 1690, and as the copies extant are not of frequent occurrence, it must be allowed that it is probable they were not plundered by Mr. Pott and Mr. Saunders. Frick, an American writer, attributes the improvement to Gleize, who himself actually gives Mr. Pott the credit of the discovery.

Among other technical terms in ophthalmic surgery introduced from Germany, we have that of *Keratonyxis* applied to this operation generally, although it can have reference to the anterior operation only; and with the word, we have the claim of Dr. Buckhorn to the anterior operation, which English surgeons have been practising for nearly twenty years at the suggestion of Mr. Saunders, and this on the grounds that Dr. Buckhorn, published an *inaugural Dissertation* on the subject in 1806.

cases where extraction is ineligible or impracticable. If after the operation has been commenced the lens is found too firm to yield to the needle, extraction may immediately be performed. It is, if not the only operation applicable to capsular cataract in general and congenital in particular, at least the preferable one : where the eye cannot be fixed without subjecting it to considerable pressure, it is obviously to be preferred. It is urged as an objection to this operation, that it is applicable to cases of soft cataract only. Whatever meaning may be attached to the term soft cataract, my experience leads me to the conclusion, that the operation, properly modified, is applicable to the great majority of cases, perhaps to nine in ten. It is said that it often requires to be repeated ; but this is a minor evil to which we submit, in preference to incurring the risk of either of the other operations. Extraction, if unsuccessful, cannot be repeated, and a repetition of depression is not very desirable. It has been said, without the least foundation in truth, that vision is not as perfect after this as after other operations ; the reverse is, I believe, generally speaking, the fact. That more time elapses between the performance of the operation and the recovery of sight than in the other operations must be admitted, but this, which may be a very valid objection on the part of metropolitan oculists, many of whose patients come from a distance, cannot be considered of great importance else-

where, the disadvantage of delay being counterbalanced by the greater security afforded by the mildness of the operation. From the circumstances above stated it appears, that this operation must be, and is, very generally resorted to by surgeons, and therefore any attempt to improve it should be treated with indulgence.

It has been a subject of some controversy, whether this operation should be performed by introducing the needle anterior to the iris, through the cornea, or posterior to it, through the sclerotic; and hence the terms anterior and posterior operations. The strongest argument in favour of the anterior operation is, that the injury inflicted is much less, the needle being passed through the cornea only; while in the other case it is passed through the sclerotic and choroid; wounding the ciliary processes, and probably often pricking one of the ciliary nerves. The sclerotic being a fibrous membrane, there is every reason to apprehend the consequences which generally result from injury of structure of that description; added to which we have the consequences of the injury sustained by the choroid. On the other hand, there are few varieties of structure which bear injury so well as the cornea: it heals rapidly when scratched or wounded: the extensive incision made by the extracting knife heals in a short time, although exposed to the friction of the eyelids, and bathed in tears: the wound of a cataract needle is closed in a few hours: if a

staphyloma, or a dropsical eye be opened, a portion of the cornea must be removed, or a foreign body introduced, to prevent the orifice from closing. Wound of the iris may occur in either operation. That the lens can be more effectually lacerated, and its texture opened, by introducing the needle, of which I shall presently speak, through the cornea, I am quite satisfied.

Some high authorities, among whom is Mr. Travers, are inclined to think that the objections urged against the posterior operation, on the ground of the injury sustained by the sclerotic and choroid, exist in theory only. I am however inclined to believe that those evils which we are justified in apprehending from the nature of the parts injured, actually do occur, and that the posterior operation is more frequently followed by destructive inflammation than the anterior. There can be no doubt that surgeons become biassed in favour of the operation which circumstances have led them to adopt, but the opinion of Mr. Saunders, who practised both operations, should have great weight; he says, (p. 149.) The surgeon has more power in the posterior than the anterior operation; but *the latter excites less pain and inflammation*, and inflicts a slighter, if any, injury on the vitreous humor.

The surgeon who would succeed in restoring vision, by exposing the lens to the contact of the aqueous humor, should never forget that the most

formidable impediment to his success is the inflammation which follows the operation; and that his aim should therefore be, to accomplish his object with the least possible injury to the organ. He must also recollect that the lens displaced, whether whole or in fragments, is equivalent to a foreign body in the eye, and must therefore be so disposed that it shall not press on the iris. A notion very generally prevails, which I cannot but call a very mistaken one, that it is necessary to place the fragments of the lens in the anterior chamber to accomplish their solution and absorption. The inexperienced operator may rest assured that if he adopt such practice indiscriminately he will have reason to repent of it. Sir W. Adams, describing such a proceeding, says after noticing the method of introducing the instrument, "I then turn the edge backwards, and with one stroke of the instrument, cut in halves both capsule and cataract. By repeated cuts in different directions, the opake lens and its capsule are divided in many pieces, and at the same time I take particular care, to detach as much of the capsule as possible from its ciliary connexion. As soon as this is accomplished, I turn the instrument in the same direction as when it entered the eye, and, with its flat surface, bring forward into the anterior chamber as many of the fragments as I am able." See his work on Cataract, p. 255. It happens luckily for those who attempt such an operation that it cannot often be accomplished: a lens must be very soft indeed which could be cut across, and chopped into fragments, upon a struc-

ture affording so little resistance as the vitreous humor: if it yielded so easily under the edge of the knife it must also break under the needle in depression. Portions of cataract will certainly dissolve more rapidly when placed in the anterior chamber, because they are completely immersed in the aqueous humor, while in the posterior they have perhaps only one surface exposed; but it is absurd, and contrary to experience to suppose, that they cannot be dissolved behind the iris. I shall quote one or two passages from the work of Mr. Saunders to enable the reader to contrast his mild, delicate, and successful operation with the practice to which I allude. "As soon as the needle has penetrated the tunics, he gently depresses its handle so as to direct its point towards the capsule through the thin edge of the lens, and steadily projecting its flat surface between the capsule and lens, he arrives at the centre of the capsule, which he opens, taking the same precaution as in the anterior operation, not to rend it extensively, lest he should dislocate the lens. He now cautiously opens the texture of the lens, and withdraws the needle. In his subsequent operations, he will complete the central aperture in the capsule, and then loosen the texture of the lens, suffering the flocculi to fall into the anterior chamber, *but not projecting into it any considerable portions of the lens, for the process of its solution and absorption is best accomplished in its natural position.* (Treatise on Diseases of the eye, p. 147.)

I must not however be understood to say that the

fragments of the lens are in no case to be brought into the anterior chamber. A cataract is often soft and friable, falling almost to a powder under the needle; in such case the fragments necessarily fall into the anterior chamber, so as to fill it half way up, and are afterward rapidly absorbed without producing inflammation: such are certain lenticular cataracts of a blue tint, not generally found in old persons. If however the fragments be larger than the head of a common pin they are liable to produce inflammation by pressing on the iris, which pressure can only be obviated by keeping the pupil completely dilated by belladonna, an object that cannot always be accomplished. I have frequently had an opportunity of witnessing the solution of cataract *in situ* after the capsule had been opened, and I could with a magnifying glass observe from day to day the change in form which occurred from the removal of particles of cataract, until at last a portion has disappeared, and left a passage for the light. In such a case I observed three several times, that when a small fragment fell out of the capsule into the anterior chamber, pain and slight inflammation supervened, and continued until the particle was absorbed. In cases of hard cataract I do not attempt to break up the lens, because it would certainly be dislocated from its situation in the capsule in the attempt; I merely open the cataract, as directed by Mr. Saunders, and as much of the lens as I can with safety, leaving it for a future operation, when the lens shall be found softened,

and capable of being broken down into small fragments.

Another circumstance which has interfered with the success of the surgeon in this operation, is his forgetting that much time is required to accomplish the absorption of a lens, and consequently neglecting to prepare his patient for the delay. In cases of congenital cataract Mr. Saunders says, (p. 149.) "The number of operations which may be necessary to accomplish the cure of a congenital cataract will very much depend on the texture of the capsule and the size of the lens. It is frequently cured by a single operation, more frequently it requires two, often three, sometimes four, but very rarely five. This period of cure will of course depend on the same circumstances. Some are cured in a few days, the greater number in one or two months, in many the process is protracted to three, and in a few to four or even five months." The common period I have found to be from two to five months; soft cataracts are of course more rapidly dissolved. Occasionally cataracts operated on in this way disappear in a few days, not from being absorbed, but, as I conclude, from falling down into a fluid vitreous humor; as I have observed to take place in eyes otherwise diseased, especially with the tremulous iris. I have learned to look upon such an occurrence with apprehension, notwithstanding that it is attended by an apparent cure. Surgeons frequently in their anxiety to obtain a speedy cure, sacrifice all pros-

pect of success by too early a repetition of the operation. While the broken lens lies well in the posterior chamber, without pressing on the iris, the operator has reason to congratulate himself, and it is only when he has ascertained that no change is taking place in the cataract, that he is called upon again to disturb it. He should be particularly cautious not to repeat the operation while any trace of inflammation exists.

If the surgeon determine to adopt this operation of opening the texture of the lens through the cornea, he has next to make choice of the instrument which will accomplish this object most effectually, and with least injury to the organ. I conceive that all that is required for this purpose is a fine point; a cutting edge or knife being only required where the lens is to be cut in pieces. I also consider that the needle should be curved at the point, to enable the surgeon to open completely the texture of the lens if it should prove soft or friable, and it should be so constructed that the aqueous humor shall not escape. It is obvious that these objects cannot be attained by the use of the old spear-pointed couching needle, or by the smaller needles of Hey or Scarpa, unless they be very much diminished in their proportions. The flat needle of Mr. Saunders, however successfully used by him, is objectionable on account of its strait form, and the impossibility of rolling it between the fingers to produce the effect of a drill on the lens. That the modifications of

Scarpa's needle, recommended by Langenbeck and Guthrie, may be employed with the best effect, there can be no doubt; but I have to object to every needle fabricated by a cutler, that, however delicately the instrument may be formed, it is liable to leave a mark in the cornea, and when made very small to guard against this occurrence, can seldom be obtained of the proper temper and finish: if too soft they bend, or if too hard, break. To attain the desirable objects stated above, and to avoid the difficulties to which I have just alluded, I determined to try a fine sewing needle curved at the point, and after about forty operations I do not feel in the least inclined to repent of my choice. I am on the contrary every day more and more satisfied that it affords peculiar and unquestionable advantages. It rarely, if ever, leaves even the slightest mark in the cornea. I could produce examples where it has been three times introduced, and where not the slightest speck can be detected; and I have introduced it through the very centre of the cornea without any bad consequence. When fairly introduced into the eye, it is capable of accomplishing any object to be attained by a needle. The capsule can be opened to any extent: a soft or friable lens can be actually broken up into a pulp, by pushing the curved extremity of the needle into its centre, and revolving the handle between the fingers; large fragments can be taken up on the point of the needle from the anterior chamber, and forced back out of the way of

the iris, or if sufficiently soft, may be divided by pressing them against the back of the cornea with the convexity of the needle ; a method which I have repeatedly adopted with advantage. When the lens has been displaced from the capsule, in consequence of the needle sticking in it in attempting to open its texture, I have, without removing the needle, placed the lens in the anterior chamber, and then extracted it ; and in other cases have forced it back into the vitreous humor, out of the reach of the iris. From the fineness of its point, and the ease with which it can be turned and twisted in every direction, it enables the surgeon to deal most effectually with an opaque capsule ; he may pick it with the point from any attachment it may have formed to the iris, or if it hangs flaccid he may entangle and detach it by pulling or twisting. In certain cases the pupil is found nearly closed, and adhering to a small cataract of nearly cartilaginous hardness ; in these I have introduced the needle, and with the point picked up the adhesions between the margin of the pupil and this hard mass, which I have then placed in the anterior chamber, and removed through an opening in the cornea, with a pair of forceps. It may be said that all this might be accomplished by a diminutive needle on the plan of Scarpa ; but not, I conclude, with the same prospect of success, on account of the much greater size of even the smallest of such needles.

There is one difficulty attending the use of the

round needle ; it requires very considerable force to pass it through the cornea ; so much indeed as frequently to embarrass those who use it for the first time. I can however safely assert, that very little practice enables the surgeon to surmount this difficulty. It is only necessary that he should be aware of the degree of force required, that force he is perfectly safe in employing. The surgeon who rejects an instrument which affords peculiar advantages, or refuses to adopt superior methods of operating, because difficulties in execution stand in his way, can never expect to obtain the character of a good operator. The greatest advantage in the use of the needle results from the very circumstance which causes the difficulty in its introduction, it is from its conical form firmly wedged in the cornea, prevents the aqueous humour from escaping, and in consequence of being thus fixed, gives the surgeon a power of holding the eye that defies every effort on the part of an unruly patient, unless he actually pluck out the instrument with his hand. If the head be suddenly drawn back the surgeon has only to let the instrument rest loosely on his hand, and follow the motions of the patient. I have seen the needle under such circumstances slip from the hand of the surgeon, and hang from the eye without serious mischief, the handle being very light.

The size of the needle is known in the shops as number *seven*, being the forty-fourth part of an inch in diameter, about one half the size of the finest Saunders's needle which is made. The

point can be turned to the requisite curve by means of a pair of cutting forceps, or the ward of a small key ; of course without heat, which would destroy the temper. It must not however be expected that all needles are so soft as to be bent thus cold : there may not be ten in an hundred of this temper, but when once turned they retain the curve without any danger of bending or breaking, and certainly possess a degree of strength and temper never observed in needles separately forged and finished by the best cutlers. They should always be tried before use by passing them repeatedly through thick calves-skin leather. After they have received the requisite curve, the point should be cut flat on each side, on a fine hone, and carefully examined with a magnifying glass to ascertain that it is perfect. The extent to which the point should be curved may be left to the choice of the surgeon, reminding him that the greater the curve the more effectual the needle will be when introduced, but the difficulty of introducing it through the cornea will also be greater. I therefore recommend those who use it for the first time to choose one slightly curved. After the point has been turned, the needle, held in the jaws of a pair of pliers or a vice, is to be run down into a cedar handle, without cement, leaving only *half an inch* of blade, which I have found to answer every purpose. If the blade be left longer it will yield and spring when opposed to a resistance. The handle should be about a fifth of an inch in diameter, and four

inches long. I use the handles made for camel-hair pencils, and find that a metallic ferule, which increases the weight, is unnecessary and objectionable. A needle thus constructed, and preserved free from rust, will retain its point for a great length of time: I have used the same one a dozen times without sharpening.

The surgeon, provided with such a needle, places himself in the usual position with respect to the patient, availing himself of whatever assistance he may find necessary to secure the lids.* He then brings the point of the needle within a very short distance of the eye, and when the cornea is brought into an advantageous position, he suddenly strikes the needle into it near its circumference. As I do not apprehend any opacity from the wound, I am not very particular with respect to the precise point where the needle pierces; I generally, however, enter it sufficiently near the margin to obviate defect from this cause. The point of the needle once fastened in the cornea, the surgeon has complete command of the eye; no action of the muscles can disengage it, and there is no danger of the needle slipping into the anterior chamber; an elevator or ophthalmostat is therefore altogether useless. The operator now

* Some ophthalmic surgeons recommend that the left hand be employed to operate on the right eye, supposing the operator to sit in front of the patient. I operate on the left eye sitting opposite to the patient, on the right standing behind him with the head resting against my chest; this latter position I find by far the most favourable and convenient.

pushes the needle through the cornea, which frequently yields like wet leather, and the eye often turns so much toward the inner canthus that the pupil is hid, and he must rely upon his knowledge of the course which the needle necessarily takes, in order to conduct it to the lens. This is the principal difficulty to be surmounted. If the surgeon does not now steadily push the needle forward, whatever resistance he may feel, he will find, when the eye returns to its proper position, that the point of the needle is still merely entangled in the cornea. This also is the period of danger to the iris: if the operator does not keep the flat of the needle to that membrane, with the point down and the convexity up, he will be very liable to injure it. Should it happen that the point of the needle has passed through the iris, it may be easily extricated by gently drawing back the instrument without removing it from the eye. After the needle has been fairly entered, and that the operator sees its point at the opposite side of the pupil, he brings the cornea forward merely by pulling it upon the needle, to which it is completely secured, in consequence of the blade being wedged into its texture. He now turns the point directly back, and gently tears open the capsule, picking and scratching the surface of the lens with a rotatory or drilling motion of the instrument; not with the lever or cutting movement, which is necessary when Saunders's needle is used. If the lens be soft and friable, the fragments fall like snow into

the anterior chamber, and the surgeon may deal very freely with it, pushing the needle deep into its structure, and twirling the point round so as to mash it into a pulp. If however it proves hard, and that he attempts to deal thus with it, he fixes his needle in its tough and glutinous structure, turns it out of the capsule, drags it against the iris, and makes it necessary either to extract it or force it back into the vitreous humor. As I have already observed, if the cataract be hard, the capsule should be opened, and the centre of the lens cautiously scratched with the point of the needle, so as to expose its texture to the contact of the aqueous humor, by which it is softened and fitted for breaking up on a future occasion. In withdrawing the needle the surgeon has to encounter the same description of difficulty which attends its introduction; it is tightly held by the cornea, requiring to be turned on its axis in order to extract it, as an awl is drawn from leather. It must not however be forgotten that this wedging of the instrument is attended with the great advantage of enabling the surgeon to operate on the most unsteady eye without an ophthalmostat or elevator.

While advocating the merits of this instrument I am not ignorant of the proposal of Buckhorn and others to employ a round needle. I have not, however, been able to ascertain from the books what is the precise form and size of Dr. Buckhorn's instrument, and as I have not seen his

Essay I must be excused if I have been repeating what he has already stated. Scarpa's needle is round in the stem, but it is spear-pointed, and consequently allows the aqueous humor to escape, a disadvantage that must attend the use of every needle so constructed. In the needle which I have been describing we have combined the advantages of a delicately small blade, of great strength and fine temper, inflicting so minute a wound that no mark remains in the cornea, capable of opening the texture of the lens as effectually as any other needle, and from its conical form, not permitting the aqueous humor to escape during the operation.

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OBSERVATIONS
RESPECTING
AN ULCER OF PECULIAR CHARACTER,
WHICH
ATTACKS THE EYE-LIDS AND OTHER PARTS
OF THE FACE.

BY ARTHUR JACOB, M. D.

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ATTEMPTS to establish the specific character of a particular disease, however fruitless they may prove, are attended with the advantage of promoting accuracy of observation, and exciting minute inquiry. With the hope that such may, in some degree, be the case in the present instance with respect to the obscure subject of tumors and ulcers, I am induced to call the attention of surgeons to a disease, which, although probably observed by many, has never, I believe, been accurately described. I allude to a destructive ulceration of peculiar character which I have observed to attack and destroy the eyelids, and extend to the eye-ball, orbit, and face. The characteristic