examination, must state whether he intends to compete for honours in any subject or subjects; and, if he does so intend, must specify the subject or subjects.

A candidate who enters for, but fails to obtain, honours in any subject, may be recommended by the examiners for a pass in that subject, if they are satisfied that he has shown such a competent knowledge thereof as is required by the regulations for the pass examination.

That is to say, that if a young fellow thinks that he knows enough organic chemistry to warrant his aspiring for honours in that subject, and happens to have over-estimated his attainments by but a few degrees, he not only fails to obtain those honours (which must now look very empty, I should think), but he even fails to get a pass-plate. You notice that the regulation says that the examiners *may* recommend him for a pass in that subject. But, for my own part, I would have little belief in the tender mercies of a gentleman who could, without a murmur, make himself a party to such a scheme. Moreover, a foot-note to the regulation honestly hints that when the weather is hot and sultry, Burlington House is no place for rest and grateful shade. Here is the foot-note:—

Candidates must bear in mind that the standard of attainment for the honours examination is much higher than that for the pass examination; and they should, therefore, exercise due caution in making their choice.

Of course they should be careful! But it is hardly necessary for the Senate to tell the student that it is much more difficult to attain to a pass standard in an honours paper than in a pass paper. "Every schoolboy" actually does know that.

To call an institution which could elaborate such refinement of unkindness, *alma mater*, is to misapply two sweet words. Let us rather call her *injuncta noverca*, for she is still the stony-hearted step-mother of our student days. And this, be it remembered, is the only institution through which London students can at present obtain a degree in medicine.

ON ONE HUNDRED CONSECUTIVE CASES OF CATARACT, MATURE AND IMMATURE, TREATED BY INTRAOCULAR INJECTION.*

By W. A. McKEOWN, M.D.,

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THE question of intra-ocular injection in the extraction of cataract, brought by me before the profession in 1884, has occupied so much attention, particularly on the Continent, that I embrace the opportunity now presented of stating my views and my most recent experience before the representatives of ophthalmology of various nationalities.

From the time I began the practice in 1884 till the present time, I have used intra-ocular injection in every case in which it was indicated. I have followed generally the lines laid down in my address to the Ophthalmological Section at Belfast in 1884. My views at that time are my views now. I have proceeded cautiously step by step, operating on cataracts less and less mature, until I have reached the practical point of extracting lenses which are sufficiently clear to admit of patients going safely about, but presenting too much opacity to enable them to follow their occupations. I consider it a blemish on ophthalmic surgery that patients with opacities of the lens requiring very many years to develop to anything like maturity, as hitherto understood, should be obliged to go about doing nothing, losing health, strength, spirit, and, if without means or helping friends, to become inmates of workhouses or private charitable institutions.

I purpose now presenting to you the statistics of the last 100 operations for cataract, of all degrees of maturity and immaturity, in which I used intra-ocular injection, and I would remind you that you have no analogous statistics. There is a large number of cases of striated cortex with clear triangles interspersed, and of cases in which the surgeon could see more or less the details of the fundus. All these would be rejected by the surgeon practising ordinary methods as unsuitable for operation.

Of the 100 cases there were 81 cases of idiopathic cataract uncomplicated, 5 complicated by affections of the eye or its appendages, and 14 traumatic. Of the 81, 13 patients before operation could see to go about, and could count fingers from two to fifteen feet, but had not been able to work for a considerable period, and the fundus could be seen with more or less distinctness; 9 had striated cortex with triangular areas transparent; making in all 22 of various degrees of immaturity. In the 81 cases there were 8 escapes of vitreous, all

slight but one, and of these only 2 occurred during injection. The proportion of escapes of vitreous, though a little more than usual, has, therefore, no bearing on intra-ocular injection. As to the sequences of the 81 operations, there were:

1. One case of panophthalmitis occurring three weeks after operation. On the sixth day I opened the eye, expecting everything right, there having been no complaint. I found vitreous projecting in wound enclosed in unruptured hyaloid membrane. Bandage for two weeks having been continued without material improvement, I cut off projecting vitreous; panophthalmitis supervened. The operation had been perfect in every respect, and I think the prolapse occurred from some injury to the eye.

2. Three cases of pretty severe iritis; fair vision still remaining, and capable of improvement. One counts fingers at four feet, another at one foot, and another at six inches. The first was owing probably to syphilis and rheumatism, and the other two to impaction of iris in angle of wound.

3. Three cases of irido-cyclitis and choroiditis. *a.* One in case of patient (in whom double extraction was performed) who would not allow bandage to remain on for six days after operation. Fortunately only one eye suffered, and when he left hospital the eye was quiet and field good. *b.* Another in case of old congenital cataract with thickened capsule in man, aged 30. Removed thickened capsule with forceps; vitreous began to come; used scoop syringe, as I have sometimes done successfully in escape of vitreous, but in this instance was obliged to leave considerable part of lens behind. An iritis with a nodule of pus and inflammation of ciliary region developed after some weeks. Made a section; removed remains of lens with syringe with complete relief. Saw him lately, when I found eye perfectly quiet, perception of light good, and tension normal; but as other eye, also operated on, had good vision, I did not propose further operation. *c.* The third in case of man, aged 70, very nervous, and accustomed to stimulants in the morning, as I learned afterwards. Operation normal. On sixth day wound unhealthy, showing a slight focus of infiltration at one part of cornea, and a little pus in anterior chamber. Iris became involved; no pain. Treated by stimulants and hot steeping. Field of vision good, and could see bulk when I saw him a month ago. I have not seen him since, and cannot give further particulars.

Having entered into these details regarding the whole 81 cases, I shall refer in particular to the 13 very unripe cataracts.

CASE I.—Female, 65. (Counts fingers at 2 feet before operation); after operation reads 0.5 at 8 inches with + 18 D.S.

CASE II.—Male, 63. (Before operation counts fingers at 1 foot, pupil undilated); reads 0.8 at 8 inches with + 18 D.S. after operation.

CASE III.—Female, 70. (Before operation counts fingers at 15 feet); after operation reads 0.5 at 7 inches with + 18 D.S.

CASE IV.—Male, 61. Opacities in lens ill-defined, slight central haze of cornea; sees No. 3 Sn. at 4 inches; can see disc; extensive posterior staphyloma. After operation reads 2.25 Sn. at 4 inches with + 16 D.S.

CASE V.—Male, 57. Before operation counts fingers at 3 feet; after operation reads 1.75 with + 18 D.S.

CASE VI.—Male, 51. Able to go about. After operation, iritis. Syphilitic and rheumatic subject. After operation counts fingers at 4 feet; iridectomy indicated; other eye perfectly successful.

CASE VII.—Male, 63. Before operation counts fingers at 2 feet, can see large part of fundus; after operation sees 0.5 at 5 inches with + 18 D.S.

CASE VIII.—Male, 55. Sees 1.75 at 3 inches, very myopic always, vision same for years, can see fundus; after operation sees 0.6 at 4 inches with + 18 D.S.; will probably be further improved by tearing capsule. After tearing capsule he came to see 0.5 at about 10 inches with very weak convex glass.

CASE IX.—Male, 61. Iridectomy performed by another surgeon four years ago, probably for simple glaucoma; always very myopic; small radiate opacities only; can see fundus. After operation reads 1.75 at 4 inches with + 16 D.S. The vision was only slightly improved by operation; slight irritation and fluctuation of tension for a long time after operation; slight haziness of cornea.

CASE X.—Male, 55. Obligated to give up work a year ago; left eye simply a central cloudiness and some peripheral streaks of opacity; can see fundus. After operation sees 0.5 at 8 inches with + 18 D.S.

CASE XI.—Same patient. Right eye same condition; find he can read with great effort smallest type, but could not see far off, which he required to do for his work, and he desired operation. After operation and subsequent needling of wrinkled capsule sees 0.5 at 8 inches with + 18 D.S.

CASE XII.—Male, 50. Not able to work for four years, and vision stationary; can see fundus; superficial radiate opacities. On injection

* Read in the Section of Ophthalmology at the Annual Meeting of the British Medical Association held in Dublin, August, 1887.

some vitreous came with transparent cortex. After operation could read small type, but I have not note of exact particulars.

CASE XIII.—Female, 64. Other eye operated on previously successfully; can see fundus, but in a haze. On sixth day after operation severe pain, which I found owing to impaction of iris in one angle of wound; removed incarcerated iris; eye became quiet, but requires iridectomy. Counts fingers at six inches.

Several of these thirteen cases represent the ultimate point to which ophthalmic surgery in the matter of cataract operations can be expected to reach.

As to the other nine cases of immature cataract, with striated cortex and transparent segments, the results were all excellent.

I have nothing to remark about the five complicated with serious affections of the eye and its appendages, save that in one complicated with a chronic dacryocystitis, which latter affection was treated in the usual way for a week before operation, the eye was lost from supuration of the cornea, notwithstanding thorough antiseptic treatment before, during, and after operation, including injection of M. Panas's solution into the interior of the eye, and application of Galezowski's gelatine antiseptic disc over the wound.

Of the fourteen cases of traumatic cataract, a considerable number were immature, but I have only to note one mishap—namely, a panophthalmitis starting from the wound, notwithstanding thorough antisepticism, so far as it could be carried out. The patient was beyond control. He would not allow bandage to remain for ten minutes at a time after the operation.

I have entered into these particulars because without them bare statistics would be very misleading. Of the three cases of panophthalmitis in the whole hundred, not one can be attributed to the injection, and not one could have been avoided except by not operating, or by putting the patients under a sort of prison discipline. Of the three cases of iritis in the 81 vision may be improved, and of the three cases of iridocyclitis I can only speak definitely of one; but assuming that the other two, which I have not seen for some time, have taken the worst form, I should only have a total of 3 complete losses in 81 operations on idiopathic uncomplicated cataract, including the 22 unripe.

I shall now touch very briefly on some general questions.

1. Is injection of distilled water previously boiled and reduced to the temperature of the body attended with any appreciable danger as regards the introduction of germs within the eye? In all cases except thirty (in which I injected M. Panas's solution), I have used distilled water, and in not one case have I seen any evidence of intra-ocular inoculation.

2. Is injection dangerous because of the force employed to remove cortex? As may be observed from the notes of unripe cataracts operated on, the water must have exercised considerable force to clear out transparent and sticky cortex, yet the results are quite as good as in the ordinary operations for mature cataract.

3. Is the injection of M. Panas's solution desirable? I have injected it only 30 times in 100, and therefore cannot speak very decidedly about it. I would remark, however, that in two cases it did not prevent supuration of the cornea and panophthalmitis; true, in one case there was an affection of the tear passage, and in the other the patient was unmanageable. I fear it has an influence, though it may be a small one, in causing iritis. I have seen extensive posterior synechiae and muddiness of posterior surface of the cornea arise from its injection into the anterior chamber after removal of a cyst of the iris. At any rate, I have found no advantage from it, and have abandoned it.

4. Is the injection of M. de Wecker's solution of eserine desirable? I have injected it nine times, and I have used the solution a considerable number of times by simply pouring it into the conjunctival sac, and easing the pressure of the eyelids on the ball, so as to facilitate the entrance of the solution into the anterior chamber, and I have found that the latter mode is quite as effectual in contracting the pupil as the former, indeed, perhaps more so. I do not apply the bandage till the pupil is well contracted. I have noticed in some instances some adhesions, and have been obliged, because of pain, occasionally to apply atropine; but I have so far found no positive disadvantage from the eserine. I wish to do strict justice to M. de Wecker's eserine treatment, and therefore add that in one respect I have not followed his advice, namely, in removing a piece of the anterior capsule. I have simply torn it freely.

5. Should force be used in the injection? I consider it impossible to remove the cortex in the majority of cases of immature cataract on which I operate without force. The more cortex left behind, the less likely is force to do harm, and the more it is required. I am never troubled because of the quantity remaining after the nucleus is expelled. It is a mistake to suppose that one injection—at least by the

old syringe, whose piston was too easy—is always enough. Sometimes two or three are required; but it is probable, with the improved piston of the new syringe, the clearing out of the cortex may be more easily accomplished. Experience teaches the surgeon what he can safely do. He should use injection at first in cases in which he is not likely to experience any difficulty; then take up cases of striated cortex not far from being ripe; and, finally, cases of very slowly progressing cataract, such as those of which I have given particulars. In this way he will acquire confidence and the dexterity born of experience.

6. Allied to the question of force is that of the instrument to be used. One of the most striking things about this question of intra-ocular injection is the number of instruments devised since 1884. I at first used the force of gravitation, and changed to injection. M. Wicherkiewicz uses the force of gravitation from his "undine," and the force may be considerable. M. Panas describes his instrument as follows: "L'instrument laveur du globe est analogue à un compte-goutte muni d'un tube en caoutchouc durci." M. de Wecker's consists of a body like a small sized ear speculum, the wide extremity being covered by india-rubber, and the small end having a silver terminal to introduce into the eye. He says: "C'est évidemment le meilleur instrument de contrôle car la pulpe si sensible du doigt indicateur appliquée sur le tambour permet de régler avec la plus grande précision le degré de pression qu'on veut exercer pour introduire le liquide à injecter dans la chambre antérieure."

M. de Wecker also points out as an advantage of his instrument and method, that the danger of suction is avoided, and the tension of the eye estimated and regarded. If the tension is high, the small aperture in the nozzle of his instrument may be obstructed. I hold that the instrument should be so constructed and capable of exercising such force as to clear out the remains of the lens, without regard to tension. The very small instruments, with small capacity, with tiny nozzles and small slits and holes in the sides and in front are insufficient to cope with ease with unripe cataract, but are doubtless useful in washing out the anterior chamber and interior of the capsule in ordinary operations. My instrument is so constructed as to yield a free and broad flow regulated in its force by the finger on the piston, just as the force in M. de Wecker's instrument is regulated by the finger on the india-rubber covering of his compte-goutte. The finger is just as delicate a regulator of force in one case as the other.

In the new instrument I present to you you will find many changes. There are two bodies of syringe of different lengths, and various nozzles of different lengths widths and forms to suit different hands and sections of different position and size. I have found that the syringe and nozzle hitherto in use are unsuitable for the upper section in very prominent eyes, particularly if the hand of the operator is short, and likewise for lower and for lateral sections. I have, therefore, provided short nozzles of various widths and lengths. The chief idea to be borne in mind is: that the various nozzles are only the channel for conveyance of the water power, and are not to be regarded as ordinary scoops or levers, and are therefore not to be considered as agents for exercising the ordinary mechanical force of scoops. The terminals with a little ledge at the end, like that of Critchett's scoop, may be used as scoops, but they are only meant by a little to and fro movement, and not by a leverage action, to aid the removal of masses of adherent cataract set in motion by the water. A new form, with a scooped out part at each side, is meant to break the force of the water in cases requiring little force.

7. Should iridectomy be performed? In one of my papers I stated that I considered iridectomy should be performed in all cases of intra-ocular injection. M. de Wecker points out, however, that intra-ocular injection has a marked influence in causing contraction of the iris, and therefore ensuring a greater immunity from the old blot in the old flap operation—prolapse of the iris. He adds to the beneficial effect by using a solution of eserine instead of plain water. He, however, considers iridectomy necessary in immature cataract. I entirely agree with his view as to the restriction of iridectomy, and now I always operate on cataracts, mature or nearly mature, in patients on whose obedience to instructions reliance may be placed, without iridectomy; but in very immature cataracts with iridectomy. I do not now, as a rule, inject eserine into the eye, but instil it freely, as I have already stated.

8. General applicability of intra-ocular injection. A point which cannot be too much impressed is the wide sphere of usefulness of intra-ocular injection. It may be used in every sort of extraction except the extraction of the lens in its capsule; for example, in the flap operation, old or new, with or without iridectomy; in Graefe's operation, in simple linear extraction, as a substitute for the old spoon extraction and the suction operation. It may be applied in unripe idiopathic cataract and unripe traumatic cataract. Its universal

applicability is one great feature. The gentle, moderate, and diffused power of a fluid is substituted for leverage instruments and pressure outside the eye. It rejuvenates old methods discarded, unsettles old notions about ripeness of cataracts, and brings us nearer the goal of the surgeon—to give speedy and effectual relief to sufferers hitherto doomed by imperfect methods to long years of delay and misfortune.

I do not wish to say that any one of all the instruments devised for intra-ocular injection is perfect. I wish to emphasise the method as that of the removal of cortex by the force of a fluid. The operation for cataract is a purely mechanical procedure, and I hope that year by year we shall more and more perfect our appliances, and that all the instruments we have hitherto devised may be replaced by others more effectual, and that by our labours we shall increase the sum of human happiness.

ON THE AFTER-TREATMENT OF CATARACT AND OTHER OPERATIVE CASES TO THE EXCLUSION OF DARK ROOMS, BANDAGES, Etc.

By SIMEON SNELL, M.R.C.S.,

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WHEN a new method of treatment has been advocated, especially when at variance with the plans usually adopted, it appears to me to be only fitting that he who is responsible for such advocacy should, at a subsequent date, state whether or not further experience has confirmed his views. These are the reasons for my reading this brief communication. For it may be recollected, by some at all events, that in an article in the *Lancet* nearly twelve months ago (September 18th, 1886), I spoke in high terms of a mode of treating cataract and other cases after operation without the stereotyped bandages, dark rooms, etc. Instances of operation cases in support were recorded, and I said I was disposed to adopt Chisholm's words, "From this time hence all bandages, compresses, and dark rooms will be among the things of the past, to be remembered only for the discomfort they occasioned."

My subsequent experience confirms all I stated in my first article. The plaster method has now been used in my hands in forty-eight cataract extractions in hospital and private practice. and in over one hundred other operations, including several for traumatic cataract, needlings for congenital cataract, opaque capsule, iridectomies, sclerotomies, and others. The stay in hospital of the cataract cases has been shortened, and the comfort to the patients has been great. Those who had previously undergone treatment under the old *régime* readily appreciated the altered conditions of the new plan. The mode of cutting and applying the plaster recommended by me I have found very convenient.

The engraving gives the metal shield for cutting the plaster in the desired shape. By reversing it the same does for each eye, and is marked R and L on the respective sides.

I have reason to believe that others in different parts, since the appearance of my paper, have adopted the plaster treatment.

Chisholm (*American Journal of Ophthalmology*, June, 1887), who

¹ Read in the Section of Ophthalmology at the Annual Meeting of the British Medical Association held in Dublin, August, 1887.

with Michel, was in America the advocate of this revolution in the after-treatment, has advanced beyond the position to which I alluded last year. Now he finds closing one eye sufficient, and no longer requires the patient to take to his bed; he lies on a lounge, and retires at ordinary bed time, and dresses before breakfast in the morning. "His present practice is to treat the wound made in the extraction of cataract as if it were an ordinary corneal wound, such as we daily see resulting from accident." At the end of the first week the patient can be allowed the privilege of the entire house.

From the first in cases of operation for traumatic cataract, and in some iridectomies and sclerotomies, I have not always seen the necessity of fastening up both eyes, and bed has, after the day of operation, been dispensed with. As far as cataract extractions are concerned, there have appeared to me to be advantages in securing both eyes, and I should rather hesitate to regard them merely as ordinary corneal wounds.

ON THE OPERATIVE TREATMENT OF ZONULAR CATARACT.¹

By DAVID LITTLE, M.D.,

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IN bringing the subject of zonular cataract before you, it is my intention to make a few remarks on the operative treatment, and I shall confine my observations chiefly to those cases of ordinary uncomplicated zonular cataract in which there is no arrest in the development of the eye, no shrinking of the lens, and no vitreous opacity or deeper seated disease.

I may say at the outset that I have nothing new to offer in the way of operation, beyond advocating a method which I have found from experience to be the best for gaining good vision. It is this, that when destruction of the lens is decided upon, I recommend a free crucial rupture of the capsule with a needle, so as to make the whole lens opaque and more soft, and two or three days afterwards to perform extraction by means of a Teale's suction instrument.

The disturbance of vision caused by zonular cataract depends altogether upon the extent and density of the opaque layer. If, on dilating the pupil, the zone is broad and perfectly transparent, vision may be fairly good; on the other hand, if the central opacity is great, considerable reduction of sight must exist.

My experience in the examination of the refraction in these cases is that some are emmetropic, a few only are hypermetropic, but the great majority are myopic. I never fail to test the vision before and after atropine, at the same using lenses to correct any defect in the refraction.

In the case of very young subjects whose vision cannot be accurately ascertained I postpone all interference for a time, unless it is quite manifest from the extent of the opacity that sight is bad. It is upon such an examination as this that I base my opinion for operative interference or otherwise.

I recommend destruction of the lens in all cases that are found to be of a progressive character, also in non-progressive cases where vision equal to at least twenty-fiftieths is not obtainable, after dilating the pupil with atropine. I would go further than this in exceptional cases, and say, if I found that twenty-fiftieths was not sufficient sight for the requirements of the patient, and if he or she were between the ages of 10 and 25 (which I consider the most favourable age for operation), with perhaps some myopia, and all other conditions favourable, I would not hesitate to recommend extraction. When the lens, then, has to be dealt with, there is the operation by solution. This is a tedious process, and I hardly ever adopt it in zonular cataract.

I have been most satisfied with the suction operation. Having dilated the pupil, I make a free rupture of the capsule across the pupil extending from margin to margin; a similar rent is made from above downwards, keeping the needle well in the anterior part of the lens. The capsule is extensively ruptured in this way to cause its retraction well behind the iris, and so avoid secondary operations; the needle should not penetrate too deeply for fear of rupturing the hyaloid or dislocating the lens. A light bandage is placed over the eye, the patient is kept quiet, and atropine freely used to dilate the pupil. After two or three days, or more, according to the condition of the eye, extraction is performed by a Teale's suction curette. This is accomplished by making an incision in the outer part of the cornea, halfway between the limbus and centre, with a double cutting edged needle from 3 to 4 millimètres broad. Through this wound the curette

¹ Read in the Section of Ophthalmology at the Annual Meeting of the British Medical Association held in Dublin, August, 1887.