One of these was in a case in which I was specially interested, and which I have been able to keep under periodical observation. A man aged about 75-80, father of my bearer, who is himself an elderly man, and had been an officer's servant during the mutiny, came from his home saying he had been blind for 10 years; the cataract was over mature and with some hesitation I operated two years ago; vision was good immediately after operation, but on the third day pain set in and a hæmorrhage was found filling up the anterior chamber, probably caused by an injury during sleep; there was also iritis later; in about a month the whole thing cleared up and there was moderate vision. He went home and returned six months later for glasses, and said he could get about by himself, whereas he had been led about for 10 years. Glasses were supplied and he is reported still to be able to get about and look after himself as much as any other man of the same age.

## ON IRRIGATION OF THE ANTERIOR CHAMBER IN CATARACT OPERATIONS.

By G. M. GILES, F.R.C.S.,

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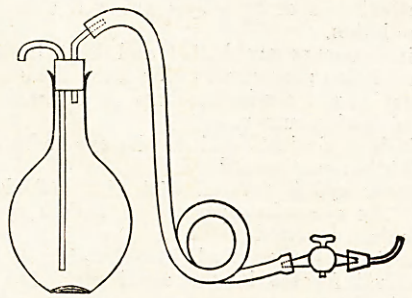
EXCEPT as regards the details of the construction of the very simple apparatus employed, there is, of course, nothing original in the method of dealing with cataract I am about to describe, but it is nevertheless a fact that it has been tried by but few operators.

Every one who has any extended experience in operating, as most of us have, in these parts, must have constantly met with cases in which pieces of residual cortex refuse, in a most teasing way, to be delivered by external manipulation of the eyeball, and which ultimately have to extracted by the scoop, the use of which appreciably diminishes the certainty of success.

Some six years ago, after a considerable interval in other branches of departmental work, I found myself once more in charge of a civil station in the North-West Provinces and, as a necessary consequence, at once found myself having to undertake a number of ophthalmic operations which, if but small in comparison with the six or eight hundred per annum done by certain giants of physical and technical energy at work in neighbouring districts, would at least have been thought large by the ordinary London ophthalmic specialist.

I dare say that, at the start, my hand was not so steady as it now is, and it may be that this led me to cast about for some better method of dealing with cortical matter than the customary massage and scoop. When looking over my 'Brathwaite' I found an account of some excellent results obtained in this direction by McKeown of Belfast by the agency of free irrigation of the anterior chamber:—

I did not want to wait for months till I could get the instrument from Europe, and, moreover, the plan of securing sterility of the flask and its contents appeared to be somewhat cumbersome, and likely to be uncertain in the hands of the average "compounder," and I therefore set myself to construct an apparatus for myself. The only part in which the aid of an instrument-maker was indispensible was the smooth-ended nozzle which is introduced into the anterior chamber, and I chanced to have, amongst my microscopical tackle, an injecting apparatus fitted with a tiny tap, the nozzles of which were just such as were required for the purpose. A chemical flask, holding about 4 oz, and some bits of glass and rubber tube furnished the rest of the apparatus; which I figure below:—



As will be seen, it consists of a chemical flask fitted with a rubber tube which is perforated by two holes. Into one of these holes is fitted a piece of glass tube reaching nearly to the bottom, and bent completely round in the part outside the cork. This tube serves to admit air, and so to allow the contents of the flask to flow out through the other tube, by gravitation, when the flask is inverted. The other tube projects only about half an inch inside the cork and is slightly bent, at an oblique angle, just outside it. Its total length is about 3 inches, and it is connected with the nozzle by means of about 14 inches of small drainage tube.

It is employed as follows:—The flask is three-quarters filled with saline solution (one drachm common salt to a pint of water) which is filtered *at the time of using* directly into the flask, by means of an ordinary small glass funnel and filter paper. The rubber cork with its tubes, but with the rubber tube detached, is then introduced and *tied in* and the flask is then placed on a retort stand, over a spirit lamp, and brought to a boil. When the steam issues freely from the shorter tube, the tube and nozzle which are always kept immersed in carbolic solution, are taken in one hand and the free end of the rubber tube slipped over the exit tube of the flask, *taking care of course* that *the tap is open.*

With the other hand, guarded by a flannel holder, the flask, still boiling, is taken off the retort stand, and smartly inverted; on which the boiling fluid begins to run out through the jets. After allowing a little to run, the tap is closed, and the sterilization of the interior of the apparatus, and the solution is secure.

The flask and its jet are then placed in a small bowl of cold boric or carbolic solution, and by the time one's other instruments have been boiled, will generally be found to be just the right temperature. At first I had a third hole in the cork, in which was inserted a chemical thermometer so that I might ensure the fluids being exactly of normal temperature, but I soon found this to be a cumbersome and needless refinement, and in practice it is quite easy to judge of the temperature by letting the jet play on the hand for an instant. Before using, the nozzle and part of the tube is dipped, like every other instrument into boiling water, and we thus secure the absolute sterility of the irrigating fluid, in a manner that leaves hardly any chance of miscarriage.

The incision having been made, and the lens delivered in the usual way, the irrigator is held, by an assistant in an inverted position, about 8 or 9 inches above the level of the eye, and the operator introduces the nozzle of the miniature irrigator between the lips of the wound, and directs the current in turn from side to side of the anterior chamber.

In the majority of cases, the whole of the remaining cortical matter is cleared away, as if by magic; but in a few cases it may be necessary to exercise some finesse in dislodging some particle that chances to remain adherent to the capsule, and I do not mean to say that I have not met with cases in which, in spite of my irrigator, I have been obliged to resort to the scoop, but such a necessity at any rate arises only very rarely.

Though I have often thought of having a more *pucca* apparatus made, my original makeshift has answered so well that I have used it ever since, and although I have broken dozens of flasks, the old injecting tube and tap are still to the fore.

I have often intended to send to the *Gazette* a description of the easily improvised instrument that has served me so well; but the man who only counts his cataract operations by hundreds is hardly entitled to "bark" as "Sir Oracle" in this country, and, but for the fact of the coming cataract number and the fact that I am bidding adieu to the "Land of regrets" and so have probably "done" my last cataract, I should probably have continued to wait till I had accumulated a locally respectable number of cases and found the energy to put them into statistical form. In saying good-bye, however, to the service I wish to put what I have found a most useful 'tip' at the service of others, which, I am convinced, is one which, if it can hardly improve, will at least be found to lessen the tediousness of the work of even experienced operators.

## OBSERVATIONS ON 235 CASES OF OPERATIONS FOR CATARACT.

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I HAVE upto now performed about 400 operations for cataract, but I could collect records of only 235 cases. I propose to give a short résumé of the recorded cases, with the technique of the operation, as performed by me:—

TABLE I.

| Age. | Male. | Female. | Total. |
|---|---|---|---|
| 20—30 | 4 | 1 | 5 |
| 30—40 | 20 | 7 | 27 |
| 40—50 | 35 | 17 | 52 |
| 50—60 | 95 | 36 | 131 |
| 60—70 | 12 | 8 | 20 |
| TOTAL ... | 166 | 69 | 235 |

It would appear from the above table that the disease occurs most between the ages 50-60. Cases noticed between 20-30 were either traumatic or zonular.

**The technique of the operation.**—(*a*). *Preparation of patient.*—I have always found it useful to keep the patient in hospital for at least a couple of days before operation, during which time he gets used to the surroundings, and, by conversing with the patients whose eye-sight has been restored by operation, his confidence is ensured. During this time his general health may be looked into, which is of great importance in diabetic subjects. Urine with 30—40 grs. of sugar to the ounce, or with albumen, I consider as contra-indication. I have operated on such cases and have met with serious results. I have found them, however, quite amenable to treatment with restricted diet for a few days. An operation thus undertaken is free from all risk. I dwell particularly on this point, as diabetes is so very common in Bengal.

On the day of operation the eye and the external parts are asepticized by a thorough soap and water wash, followed by an irrigation of Lotio. Hydrag. Perchlor., (1 : 2000 for external parts and 1 : 4000 for conjunctival surface). The inner canthus should be specially attended to. Any discharge from the lachrymal sac should be well pressed out. Shaving of the eye-brows and clipping off of the eye-lashes are not necessary. Instruments can be boiled in a big test-tube in carbolic lotion (1 : 20). For anæsthetizing the eye, the solution of cocain should be prepared with cold distilled water. The lotion thus prepared works much better than when made with hot water.

(*b*). *Corneal section.*—I always make an entirely corneal section, as by attempting to make sclero-corneal section, on three or four occasions I injured the ciliary bodies, leading to serious irido-cyclitis. The section should embrace $\frac{2}{3}$ of the circumference of the cornea. Small incisions invariably give rise to difficulties in the delivery of the lens, causing bruising of the iris, with subsequent serious iritis. I have seen Surgeons obliged to bring out the lens piece-meal, and sometimes to leave the lens substance behind, owing to the small incisions. It is better to err on the side of making a too large rather than a too small incision. I have tried both the upper and lower incisions, and have found them equally advantageous, though, as a matter of habit, I prefer the upper one. In some extremely nervous people, where it is impossible to make them look downwards, a lower section is advantageous. Dilatation of the pupil before operation, except for diagnostic purposes, is of no practical utility, as it contracts as soon as the knife traverses the anterior chamber. Sometimes I have made a conjunctival flap, unintentionally, while completing the section. In these cases union took place earlier.

(*c*). *Iridectomy.*—The question of iridectomy is still an open one, but it will be seen from the following table that there are more after-troubles, such as, iritis, synechia, prolapse of the iris, &c., when the operation is performed without iridectomy than when it is done with it. It must be admitted, however, that an operation without iridectomy is more perfect, as there is less mutilation of healthy parts and the optical results are decidedly better. In illiterate persons, where optical perfection is not of much importance it is better to do an iridectomy, as there is less risk and more certainty:—

TABLE II.

| | Cured without trouble. | Cured with trouble. | Lost. | Total. |
|---|---|---|---|---|
| With Iridectomy ... | 104 | 9 | 7 | 120 |
| Without Iridectomy... | 91 | 13 | 11 | 115 |
| Total ... | 195 | 22 | 18 | 235 |