annual meeting of the Ophthalmological Society of the United Kingdom, Glasgow, May 1-3, 1924. It was received too late for insertion in the official programme and was not published.

In a personal communication, under date of April 8, 1924, Dr. Ballantyne wrote: "I have occasionally seen things a little like yours, where a small splash of molten metal has been gripped between the lids, but I have never seen one in which so extensive a cast of the parts has been made."

Naturally, the question will be asked: "How did the eyelids escape with such slight damage, while the eyeball was destroyed and much of the content of the orbit was cooked?"

The answer must be this: "At the moment of explosion the patient's eyes were opened widely; the boiling metal, in the form of a sphere, must have struck the cornea centrally; instantaneously closure of the eyelids followed, helping to flatten the molten metal into the shape which the cast bears. Under any other situation the eyelids must have sustained a much greater damage."

AVOIDANCE OF POST-OPERATIVE INFECTION IN CATARACT OPERATIONS

BY

B. P. BANAJI, F.R.C.S.I.

BOMBAY

THE exceptionally good results that I have obtained in my last series of 500 cases of cataract operations as regards freedom from infection has induced me to publish this communication. In this series of 500 operations only one eye was lost by irido-cyclitis, and even in this particular case the iritis developed ten days after the operation, when the patient had left the hospital. Every operator of experience knows how impossible is the treatment of panophthalmitis after an ocular operation and how difficult and trying the management of severe iritis can be. No amount of energy therefore could be said to be ill spent in trying to avoid septic infection after cataract operations, and one is justified in using all the available precautions against sepsis, even though some of them may seem superfluous.

Choice of Operation

It would not be out of place here to discuss the relative merits of the two methods of extraction in vogue in India, especially from the point of view of post-operative infection.

After having had first-hand experience of the intra-capsular method of extraction under Colonel Smith at Amritsar, I myself performed about 800 extractions by that method in Bombay. The result of my observations on those cases made me once again revert to the old capsulotomy procedure, as I felt certain that Colonel Smith's method exposed the eye to greater danger from infection both during and subsequent to operation. The vast majority of cases were done with an iridectomy. The simple operation by this method is far more difficult.

In my opinion the principal cause of failure in Smith's operation, may be said to be late infection, which may come on months or years after the operation.

These late infection cases have the same clinical appearance as those which occasionally occur after the fistula operation for glaucoma. In spite of the most careful replacement of the iris, owing to the large size of the section, the iris has a tendency to get incarcerated or prolapsed even after a combined operation. What adds greatly to the danger is that the uveal tissue gets healed in the wound without the protective covering of the conjunctiva, since the section is usually corneal. These late infections generally end in total destruction of vision and the only treatment that I found of value in these cases was the subcutaneous injection of mixed phylacogens in increasing doses.

Panophthalmitis, secondary glaucoma, and detachment of retina in myopes also occur with greater frequency in Smith's operation, judging from personal experience.

Selection of Cases

In the above series the cases were not selected. Even patients suffering from pyorrhoea, frontal and maxillary sinusitis, and sprue were operated on, and the healing has been perfect. Bright's disease with oedema is to be regarded as a distinct contra-indication to operation. The series comprises patients of all ages, one in particular being (as far as could be definitely verified) over a hundred years of age.

Preliminaries

(a) Sixty grains of calcium lactate per day are given two days before and a dose of 20 grains on the day of operation. It is a well-known fact that the local inflammation of the conjunctiva produced by irritants is absent or milder in experimental animals that were previously treated with subcutaneous injections of calcium chloride. This inhibitory action on inflammation was independent of the coagulation of the blood for it also appeared during the simultaneous employment of hirudin. It has also been suggested

that calcium chloride changes the vascular walls by making them denser and less permeable, *i.e.*, it has a remote astringent effect.

I have given it as a routine in my series of 500 cases and I have very little doubt that it acts beneficially in the prevention of infections.

(b) Haemoplastin 2 c.c. is injected an hour before operation in cases where bleeding is expected, such as in cases with high blood pressure, subjects suffering from diabetes and in glaucomatous patients. A mixture of blood and cortex in the anterior chamber may act as a culture medium to pathogenic germs.

The lashes of the upper lid are cut and tincture of iodine is applied to the lid borders.

Irrigation of the conjunctival sac with mercury perchloride lotion, should be regarded as the sheet anchor of defence against microbic invasion. Previous instillation of 1 per cent. silver nitrate solution I found after trial to be no substitute for mercury irrigation. About 3 oz. of the solution is poured out through a narrow tipped undine taking particular care that the fluid reaches the upper fornix. Colonel Herbert was amongst the pioneers to emphasize the value of perchloride irrigation in the prevention of panophthalmitis. I myself had dressed about 1,000 of his cases without seeing the loss of a single eye by suppuration at the C. J. Hospital in Bombay. This result was achieved twenty years ago, and represents a part of his wonderfully good statistics. His operations were done on eyes a good proportion of which had suffered from trachoma, in the room of the out-patient department without the aid of trained nurses or sterilized dressings. This reflects great credit on his method and foresight, and every cataract operator, even the most experienced, would, I feel sure, gain by perusing the pages of his book "Cataract Extraction."

External Canthotomy

This small procedure is highly to be recommended as a routine measure. A few drops of novocain solution (2 per cent.) are injected at the outer canthus which is cut with a pair of scissors. The bleeding is hardly ever troublesome. It gives a broader field for operation, lessens the squeezing power of the lids, drains away the conjunctival fluids and lessens the chances of the instruments becoming contaminated by contact with the lid borders. It is absolutely free from any bad effects.

I recently observed at the Freiburg Clinic of Professor Axenfeld the following procedure which very effectively controls the movements of the eyeball. The superior rectus is caught together with the overlying conjunctiva with fixation forceps and a suture passed

under it which is held by the assistant. The pull on the suture fixes the eye in patients who have difficulty in looking down and in troublesome cases the same procedure enables the surgeon to perform the operation with ease.

I attach great importance to the following few points during operation :

A conjunctival flap is absolutely necessary.

Instruments once used should never be re-inserted in the eye without being re-sterilized.

Whilst doing the section particular care must be taken that the portion of the knife near the point, if it has touched the skin or lashes, does not come in contact with the wound.

The size of the incision should be as small as possible compatible with the easy expulsion of the lens, the size and the consistency of which should have been studied beforehand.

Purely corneal section undoubtedly is more prone to lead to panophthalmitis particularly if it be a large one and vitreous has been lost.

Every operator should aim at making the knife cut in that part of the cornea covered by the limbus, as this region seems to be the most resistant to microbic invasion. This is seen in cases of *ulcus serpens* where the peripheral rim of the almost clear cornea stands out to the last.

Replacement of the Iris

This should be done most deliberately. Nothing mars more the result of a successful operation than entanglements and prolapses of the iris in the wound which, if uncovered by the conjunctiva, may lead to disaster any time afterwards.

Injection of Milk

Immediately after the operation an injection of 10 c.c. of boiled milk in the outside of the thigh is highly to be recommended and I have used it specially under the following conditions :

- (a) When both eyes are operated on at the same time.
- (b) When one has been already lost.
- (c) When the operation has been a prolonged one, especially in an unruly patient.
- (d) When a considerable amount of blood and cortex is left in the anterior chamber.

In short, whenever there is the slightest misgiving in the mind of the operator after a cataract extraction an injection of milk should be given as a preventive of infection.