have been reported without detail since. The favourite technique seems to have been iridectomy followed by a spoon extraction, with or without counter-pressure (10 cases). Iridectomy, extracapsular extraction, and later needling, have been done in two cases. One case each are on record by simple extraction, delivery by needle, delivery by forceps, and the Madras method. Vail noted that vitreous was certainly lost in seven cases, probably he thinks, in three other vaguely reported cases. Three extractions were complete failures, three were followed by retinal detachment later, and in three cases iritis is noted. Probably in 12 cases useful vision was obtained.

So many cases are reported with a tremulous lens that intra-capsular extraction seemed worth trial in the case reported above.

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INCLUSION CONJUNCTIVITIS

BY

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INCLUSION conjunctivitis is a term which includes three forms of follicular inflammation of the conjunctiva; these are swimming-bath conjunctivitis, conjunctivitis of swimming-bath type but contracted elsewhere than in swimming-baths, and inclusion blennorrhoea or non-bacterial ophthalmia neonatorum.

Each of them is caused by an identical virus infection which consists of bodies included within the cytoplasm of the epithelial cells of the conjunctiva. The inclusion bodies exhibit two phases of development known as elementary bodies and initial bodies, collectively they are called Halberstaedter-Prowaczek Körperchen (or for short H.P.K.) after their original discoverers.

Swimming-bath conjunctivitis is rarely seen in England but is not uncommon among young men on the continent of Europe. It is propagated by persons infected with inclusion urethritis or

inclusion cervicitis who urinate while in the bath. A conjunctivitis of a similar clinical type may be contracted by persons who have never entered a public swimming-bath from association with one who has swimming-bath conjunctivitis, or from an infant the subject of inclusion blennorrhoea. Non-bacterial ophthalmia neonatorum or inclusion blennorrhoea is acquired during the passage of the infant through the birth canal of the mother; it may coexist with bacterial ophthalmia neonatorum. The mixed form of ophthalmia neonatorum due to bacterial (generally gonococcal) and inclusion infection has been found by McKee in Montreal, where women of the poorer classes are often attended by ill-trained midwives.

The clinical signs of inclusion conjunctivitis are as follows:— After infection by a carrier of the virus there is an incubation period of about 8 days, but may be from 3 to 12 days. One eye is usually affected first, the inflammation spreading to the other, though perhaps not for several weeks. The first signs are some tumefaction of the eyelids and conjunctival injection. The conjunctiva becomes oedematous and velvety, and on pulling down the lower lid or everting the upper lid, the dark red conjunctiva is seen to lie in parallel folds, among which are nodular infiltrations which do not rupture on pressure. The inflammation is at its height 4 or 5 days after its commencement. The onset of the disease is usually acute with much discharge; however only slight signs of inflammation may be exhibited; thereby in both respects inclusion conjunctivitis resembles trachoma. There is much photophobia and lacrimation, but little pain. The preauricular gland is often palpable but is not painful.

The inflammation gradually subsides and all discomfort ceases about the twentieth or thirtieth day; nevertheless on everting the lids the mucous membrane of the fornices is seen to be thick and hyperaemic and the nodular infiltrations numerous. It is not until the end of the second month that regression of the signs shows real progress. The nodules may persist for 6 months or even longer but finally disappear without leaving a trace.

Involvement of the cornea by neovascularization, by infiltration or by ulceration does not occur.

The mixed form of ophthalmia neonatorum in which both bacteria and inclusions are found has the same clinical signs as in cases due to bacteria alone or inclusions alone.

The differential diagnosis between inclusion conjunctivitis and trachoma with acute onset cannot be determined during the first week after development of signs of inflammation, for in each case intracellular virus inclusion bodies can be found. After a week or so biomicroscopical examination allows the detection of neovascularization of the upper fifth of the normally clear cornea in

trachoma, a phenomenon absent in inclusion conjunctivitis. Nodular infiltrations, if present in inclusion conjunctivitis, do not rupture on pressure as is the case in trachoma. In both conditions oedema of the superficial epithelium of the upper palpebral conjunctiva is seen with the slit-lamp, and after the condition has persisted for some weeks papillary hypertrophy can be detected.

Diagnosis of inclusion conjunctivitis must be based on the discovery of inclusions within epithelial cells of the conjunctiva together with the presence or absence of pathogenic bacteria. The method of preparing a suitable slide on which to make a smear is as recommended by Coles; a new slide is vigorously rubbed with whiting which is washed off under the tap; it is then rubbed with the cut surface of an uncooked potato and carefully dried with a clean linen handkerchief and kept in spirit until required. The conjunctiva of the everted upper lid is carefully wiped with a pledgelet of cotton wool, and then lightly scraped with a full-bellied scalpel without drawing blood. The epithelial debris thus obtained is spread lightly on the dried slide and fixed for 15 minutes in methyl alcohol before staining with Giemsa. Ten c.c. of recently boiled distilled water, which has been cooled, is measured with a graduated pipette and placed in a Petrie's dish; to this is added 10 drops of Gurr's old Giemsa stain; if the new improved Gurr's Giemsa is employed I use two drops and add two drops of May-Grunwald stain. The fixed film should be placed film downwards, the extremities of the slide resting on two bits of broken glass. After 24 hours the slide is removed and washed in cool, recently boiled distilled water. After drying, examination under the oil-immersion lens of a good microscope may be made. There are other much more rapid methods of staining but I have not found them to be invariably reliable, though often successful.

Elementary bodies are to be found within epithelial cells as pink dots which may be massed together or scattered about the cell; by experts they may be recognized extracellularly. Their size is about 250 $m\mu$. Initial bodies are bluish and larger, about 300 to 800 $m\mu$. The life cycle of the virus is probably about the same as stated by Bedson for psittacosis, 48 hours, initial bodies breaking up into elementary bodies and then initial bodies re-appearing (Thygeson). The virus is filterable through an Elford collodion membrane of average pore diameter from 450 to 650 $m\mu$ (Tilden and Gifford, Julianelle, Thygeson), and is transmissible to the Sphinx baboon and to *Macacus rhesus*. On rare occasions only can inclusion-bodies be demonstrated in the experimental disease. An attack of the disease confers no immunity and the previous infection of a baboon with trachoma virus does not render the animal resistant to infection with the virus of inclusion conjunctivitis.

Those who have experience in the treatment of ophthalmia neonatorum recommend that all varieties should receive one of the drugs of the sulphonamide group by the mouth. This is the only treatment in use at the Rotunda Hospital, Dublin (Somerville Large), together with frequent cleansing of the eyelids and the instillation of a drop of medicinal paraffin or a drop of oil.

In inclusion conjunctivitis of adults the same treatment may be tried since the application of caustics, such as silver nitrate, is without effect.

Local treatment of the conjunctiva with a sulphonamide derivative has been recommended, but the difficulty is to prepare a solution of the drug of sufficient strength to exert any action and which is not too irritating.

At Sheffield either sulphapyridine (M. & B. 693) or sulphathiazole is used for babies; the dose recommended is 0.125 gramme ($\frac{1}{4}$ tablet) three hourly for the first twenty-four hours, then four hourly for the next twenty-four hours, and finally six-hourly for four days in all. The drug is given crushed in sweetened water and is well tolerated. The response is said to be invariably prompt and satisfactory; in twenty-four hours the oedema of the lids will be much less, and in forty-eight hours the discharge will have almost ceased and the eyes will be open (Clancy).

The treatment of inclusion conjunctivitis in adults, when the disease is in an early, acute stage, will be under hospital conditions and full doses of the particular sulphonamide used may be given with all the care and experience that the exhibition of the drug demands. When the disease has become chronic a dosage of 2 grammes a day for a fortnight or three weeks may be tried while the patient lives at home. It is open to doubt as to whether the blood concentration of the drug is high enough to have any effect on conjunctival organisms with such small doses.

A study of the therapeutic literature of virus diseases reveals the experience of physicians that these diseases are unaffected by drugs of the sulphonamide group. However, it is claimed by some that this is not the case with lymphogranuloma inguinale, trachomatous conjunctivitis and inclusion conjunctivitis, all of which diseases are said to improve under sulphonamide treatment; a claim not universally acknowledged.

The term "sulphonamide" is a generic one and embraces numerous compounds made by different firms of chemical manufacturers. It appears that there is little difference in the effect of these drugs, though the dosage varies. It is said that they do not stimulate leucocytic activity, are not simple germicides, and do not affect the rate of production of specific immunizing bodies, either in quantity or quality. Probably they act by neutralizing a metabolic function or an enzymatic activity. The balance of

evidence indicates that they affect the invading organism in the sense of producing a bacteriostatic action which, in many cases, is not sufficient to effect sterilization without the co-operation of the defensive mechanism of the host (MacCallan).

It is hoped that the above memorandum may be of interest to those ophthalmologists, who, under present conditions, are unable to peruse foreign literature.

A FIRST HUNDRED CASES OF INTRA-CAPSULAR CATARACT EXTRACTIONS

BY

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THIS is a report on the results of the first hundred cases on which I attempted to perform cataract extraction by the intra-capsular method. The patients were not selected, they were routine cases, 23 being private and the remainder hospital patients.

Starting off on this method of removing the lens my chief fear was the prospect of having an increased number of vitreous prolapses which must always be considered a major catastrophe, although the immediate results when the lens is gone are less serious.

The minimum age of the 100 cases was 50 years, and the maximum 88 years. Forty-nine were females and 51 males. The number of days in hospital after operation for the 100 cases was 15.3 days. The lens was delivered in its capsule in 67 cases out of the 100; they required 15.6 days in hospital. In 33 patients I was unable to deliver the lens in its capsule. During the expressing of the lens in 21 cases the capsule ruptured, in 4 cases the lens was intumescent and it was not possible to grasp the lens with the forceps. In 8 patients I was not able with reasonable pressure and traction to dislocate the lens, so the intra-capsular method was not persisted with. The number of days in hospital for the 33 extra-capsular extractions was 15.2 days.

The intra-capsular method employed was that of Elschnig in which the lens is "tumbled." In cases where there is a large nucleus if the lens is grasped low down and pressure with the hook is made in the correct position the lens dislocates, but if faulty pressure is made the lens will pass up behind the limbus; this type of lens should be delivered by traction.

Pre-operative slit-lamp examination is essential. The following points I would stress:—