Personally I am in favour of attacking the condition from every possible point of view. Absolute rest in bed, constitutional treatment to combat any general condition, absorptive treatment, and counter-irritation to endeavour to remove the exudate in the inter-retinal space—for example, hot-air baths, mercury inunctions, potassium iodide, blisters to the temple, and subconjunctival injections. If after a fortnight there is no improvement it is advisable to proceed to scleral punctures to drain the inter-retinal space, with or without making an adhesive spot to which the retina may become glued.

For purposes of discussion, I would summarize my remarks.

In retinitis striata and diffuse fibrous degeneration of the vitreous all treatment is useless.

In detachment associated with a hole treatment offers little chance of success.

Definite fibrous bands in the vitreous may be divided.

Detachment associated with retinitis or choroiditis should be actively treated.

Simple detachment in which the mechanism of the detachment is not determinable should be given the benefit of the doubt and treated.

Lastly, treatment, if attempted at all, should be thorough.

The plea of this short communication is for greater thoroughness in our examination of cases of detachment, which should include the careful exploration of the vitreous with the slit-lamp by an expert. By such an examination we may hope to gain new information (1) by which to group our cases more rationally, and (2) by which future treatment may be more successful than that of the past.

By these means the more hopeful cases will have the best chance of restoration of sight, and the hopeless cases may be protected from a course of mental strain and expense the disappointing results of which were a foregone conclusion.

DISCUSSION.

Dr. W. CLARK SOUTER (Aberdeen) gave short notes of six cases of spontaneous reattachment of detached retina—two traumatic, two idiopathic, one myopic, and one pregnancy—recently seen, in which a gross detachment of retina had apparently disappeared, leaving choroido-retinal atrophy-like changes in three, retinitis striata in two cases, and an apparently normal fundus in one case. He discussed the pathological findings in published cases where reattached retinae had come to the microscope, special mention being made of the cases of Rönne and Klainguti. In one of his retinitis striata cases, an idiopathic one, watched over seventeen years, the long white band at the edge of the reattached area was crossed by vessels which were obviously not retinal, and not likely to be choroidal, but rather like new vessels, making a strong resemblance to, and in the author's opinion a possible explanation of, those cases described by Sir William Lister in the *Ophthalmic Review* for 1903, under the heading "Angioid streaks of the retina."

Mr. INGLIS POLLOCK (Glasgow) said he had operated on two patients with detached retina, both of whom recovered. In the first case a relapse occurred and, although the patient had to wait six months for readmission to the infirmary, a second operation was successful in restoring the retina to its normal situation. This was seven years ago, since when there had been no recurrence. In the second case one operation sufficed, and the patient had had no recurrence since the operation, six months ago. Both cases showed that there was no improvement until the inter-retinal fluid was withdrawn; in fact, both patients became worse while they lay up at home with both eyes bandaged. The first showed that success might follow operation in spite of the recurrence of the detachment. Mr. Pollock further said that he had seen a small detachment cured by operation, followed by recurrence of the detachment, and subsequent complete loss of sight in the eye by the extension of the detachment all over the fundus.

Mr. J. W. TUDOR THOMAS (Cardiff) described a case of double detachment of the retina in which reattachment of the retina followed in one eye, leaving pigmentary changes

resembling slightly the pigmentation of retinitis pigmentosa. A detachment developed first in the left eye, which became blind, and the lens gradually grew opaque. A large fluid detachment of the retina developed in the right eye about six months after the left eye commenced to fail. Posterior sclerotomy was performed, using the electric cautery. Some opacity developed about the posterior pole of the lens, but ten months later no detachment of the retina could be found, and the retina showed numerous spots of pigmentation. The opacity at the posterior pole had not advanced further up to the time of the last examination. During the last year or so he had observed three cases of detachment of the retina in pregnancy. These cases had several points in common. They were all double detachments, and all three patients had albuminuric retinitis of pregnancy. The detachments all cleared up, and useful vision was restored in each. The vision in one case became 6/12 for each eye; slight macular changes were present.

Dr. J. ROWAN (Glasgow) mentioned several cases of retinal detachment, in one of which the condition was obviously due to a tumour; the patient was myopic in the eye affected. Later the myopia was gradually reduced till the patient became hypermetropic. Both conditions were confirmed by retinoscopy. Enucleation was refused till the eye became glaucomatous; it was then removed and the diagnosis was confirmed. He instanced another case where, with rest in bed and subconjunctival injections, there was a complete cure. The late Mr. Edward Nettleship had agreed that the detachment was completely back in its place; this lasted for a few months, but after going a short railway journey the condition returned. In spite of different methods of treatment the outlook in these cases was very black.

Dr. KERRY (Montreal) gave details of a case of traumatic detachment of two weeks' duration which recovered after a course of iodine injections; in this case there was also almost complete recovery of the lost field. He advocated these iodine injections to promote absorption, and cited another case in which recovery had followed their use. Dr. Kerry thought that the subject of retinal detachment would be much better understood when more was known of the cellular function of absorption.

THE VALUE OF ANTISEPTICS IN MODERN OPHTHALMIC SURGERY.*

BY

SIR ARNOLD LAWSON, K.B.E., F.R.C.S.,
Ophthalmic Surgeon and Lecturer in Ophthalmic Surgery,
Middlesex Hospital.

I HAVE been tempted to bring this subject of antiseptics in ophthalmic surgery before the meeting because it seems to me that there is still a considerable amount of difference of opinion on what is or should be a simple matter in these enlightened days.

Some time ago I read in one of our chief ophthalmic journals a long account of an operation for the extraction of cataract, the description of the operation being preceded by meticulous details of preliminary douchings and treatment applied to the eye in order to obtain an aseptic condition, which would eliminate risks of operative and post-operative sepsis.

Similarly, a very recent article in the *Acta Ophthalmologica* (vol. iv, fasc. i) dealing with the same subject of disinfection of the conjunctival sac, starts thus: "It has hitherto proved impossible to make the conjunctiva reliably sterile. It is therefore always with a certain feeling of insecurity that the ophthalmic surgeon proceeds to his operations."

Many surgeons, in fact, seem still to be of opinion that the field of intra-ocular operations requires a somewhat similar course of preparation as is essential when a skin surface is involved. They are impressed with the possibility

* A paper read before the Section of Ophthalmology at the Annual Meeting of the British Medical Association at Edinburgh, 1927.

of disaster in the way of sepsis if such preparations are not carefully observed.

I propose to consider the question of treating the ophthalmic operation field, antiseptically or aseptically, from four points of view: (1) contamination from the conjunctiva; (2) contamination from instruments and dressings; (3) contamination from the fingers of surgeons and assistants; and (4) contamination from the lash area.

There are, of course, other minor sources of contamination, but the ones just mentioned are the most important, and I will confine my remarks to them.

The Conjunctival Sac.

Many years ago I published the report of an exhaustive inquiry into the bacteriology of the normal conjunctival sac. The results of this investigation, which, so far as I am aware, have never been contradicted, and which have certainly guided me safely through many years of operative work, may be summarized as follows. The normal sac is in itself antiseptic and requires no treatment prior to operation. So far as its lower section is concerned it is never sterile; it always contains many organisms, but these are either in themselves perfectly harmless, or, if not so harmless, their virulence is speedily destroyed by some inherent antiseptic power of the conjunctiva, which in this respect resembles the peritoneum. This can be easily proved by growing cultures from the lower sac and injecting a solution into the conjunctival sac of animals or even subconjunctivally. In neither case does anything happen. The normal conjunctival sac can never be sterilized for even twenty-four hours by any known means, and all attempts to effect this by antiseptic lotions of sufficient strength to act as effective germicides are futile, simply tending to defeat their object by setting up a reactionary irritation.

Long before antiseptic or the later aseptic surgery was introduced intra-ocular operations were performed with comparative safety, as compared with operations on the body. Indeed, long after the principles of aseptic surgery were generally accepted, ophthalmic surgeons as a class took no very special precautions. I was the first surgeon at Moorfields Hospital to adopt an overall, and my election was in 1900; my revered teacher, Sir John Tweedy, up to the time of his retirement in that year, always used his index finger to effect counter-pressure, and to prevent the eye rotating inwards when making his cataract section, instead of employing fixation forceps. The results obtained then will bear quite a favourable comparison with those seen nowadays with masks, caps, overalls, and all the other appurtenances, which are quite rightly held to be *de rigueur*. I do not advocate a neglect of precautionary measures before operation; the point I wish to make is that the routine use of antiseptic measures arises from a wrong appreciation of facts. What we have to ensure is not that the conjunctiva is sterile, for that is unnecessary and impossible, but that it is healthy, and we can do that by the simplest means. The one great factor in determining this point is the presence of discharge, which can be definitely proved by tying up the eye for a few hours with an aseptic pad. If any discharge appears on the pad on removal or is found clinging to the lashes or canthi, then the conjunctiva is unhealthy, and means must be taken to free the sac from the cause of the discharge before operation is undertaken. Taking smears from the conjunctiva, and acting on the report of the presence of organisms found by this method of examination, is only of value if discharge is present; in its absence the organisms found may be held to be avirulent and harmless. As a matter of fact it is generally possible to tell by mere inspection whether the conjunctiva is healthy or not, but I always adopt this well known and simple expedient of determining it.

If the conjunctiva at the time of operation is healthy it may safely be assumed that it will remain healthy during post-operative treatment under bandage and pad, and such is indeed the case.

Contamination by Instruments and Dressings.

This may be dismissed in a cursory manner, for it is a first principle of all surgery that instruments and dressings

must be sterile. I would simply just mention the point that the instruments should not only be sterile but dry.

Contamination from Surgeons' and Assistants' Fingers.

The surgeon's fingers as a source of contamination may obviously be a fruitful cause of disaster. Some surgeons avoid trouble by wearing rubber or other forms of gloves, but, personally speaking, I found the disadvantages of gloves in destroying, as they do, the fine sense of touch which is so important in many ophthalmic operations, to outweigh entirely their manifold advantages in maintaining asepticity, and I entirely gave up their use many years ago in intra-ocular and strabismus operations. But if no gloves are used the surgeon must be meticulously careful that no part of any instrument other than the shaft or handle is ever touched by his fingers. It has to be remembered that washing and scrubbing the hands before operation in no sense renders the fingers sterile. It has been shown that rubbings taken from fingers freshly washed and scrubbed in warm water produce luxuriant growths of organisms, and that while removing surface contamination to some extent, the hands still remain a means of readily infecting the wound. Personally, I endeavour to counter the point to some extent by well soaking my hands in spirit after scrubbing, and by having a bowl of spirit at hand during operation in which I can rinse my hands at any moment if I think it desirable. I do not think this simple fact is nearly so much appreciated as it ought to be, otherwise one would not observe, as I have often done, great indifference on the part of surgeons in the handling of instruments when gloves are not worn. I have often seen surgeons, when operating for strabismus, pick up needles with their fingers and put the needles in the needle-holder, instead of using serrated forceps for the purpose, with the consequence that the sutures are apt speedily to become more or less septic. Then, again, sutures are themselves a ready means of contamination, even after careful sterilization. The satisfactory manipulation of sutures presents real difficulties and requires meticulous care. It is presumed that in cases where sutures are going to be employed the skin of the face as a matter of course will be shut off by a gauze mask excluding all except the operation field, while the scalp is guarded by a folded sterile cloth. The sutures must be kept free from the surgeon's fingers, and this can only be effected by the greatest attention to detail. If, as is commonly the case, the needles and threads are rolled each one on a piece of folded gauze or lint, the needle should be disengaged from the roll with serrated forceps, as just mentioned, and the suture, as it is unrolled, should be held by the assistant in a pair of serrated forceps, and kept free from all contact with his or the surgeon's hands until the suture has been properly adjusted; and when it is being tied the surgeon must be extremely careful that his fingers never approach that part of the suture which is applied to the wound area. It is all perfectly simple, but often, I think, there is lacking that delicacy of attention to detail which is required.

It must be admitted that, even with the greatest attention to detail, sutures will sometimes touch something that they should not, and in this respect an efficient antiseptic, which can without any irritation whatever be applied to the wound area, is most helpful, and gives the surgeon a great feeling of security.

There is nothing, I think, so good for this purpose as flavine. A solution of 1 in 1,000 of this drug can be freely applied to the eye at the time of applying the sutures, and thereafter it can safely be dropped into the eye twice daily in a strength of 1 in 4,000 without causing the slightest disturbance or without producing the smallest delay in the healing process. The charge has been made against flavine that it delays healing, but I can assure all who have not tried it that this accusation, when flavine is used of the strength just mentioned (1 in 4,000), is entirely baseless, healing pursuing its natural course by first intention. I can say that since using this drug regularly, as I have done now for ten years, I have not had a single case of septic sutures after strabismus operations.

Contamination from the Lash Area.

The last point I wish to mention is contamination from the lash area, which is the neighbourhood most difficult to preserve clean when an eye has to be kept bandaged for any length of time. It is not, I am thankful to say, the most important, because there is not the same risk of infection of the operation field from the ciliary border as there is from the other sources of contamination—the conjunctiva, the instruments and accessories, and the surgeon's fingers. On the other hand, I think it is quite impossible, unless special means are taken, to keep the lash area from becoming dirty, and often very quickly so when the eye is kept tied up. In other words, it is quite impossible to sterilize the ciliary borders satisfactorily on account of the organisms which lie beneath the surface round and about the lash follicles. The testing pad worn before operation may be entirely free from all discharge, and the lashes themselves be apparently perfectly clean, but soon after operation, even if they have been cut short, as they should have been, the stumps are apt to get sticky and dirty, and the discharge will then tend to get more and more objectionable, unless the source of trouble can be checked.

It is, therefore, in this regard, as well as in the dealing with sutures, that a non-irritating, efficient antiseptic becomes of extreme value, and once more I urge the use of flavine, which will generally do its work admirably.

After every operation I cover the affected eye with a gamgee pad well sprinkled with a 1 in 4,000 solution of flavine. It makes a delightfully comfortable dressing, which I change twice daily; if this procedure is followed the lash area will rarely cause any trouble whatever. If trouble does occur it will be of a mild character and easily controlled. Something must then be used in addition to, or as a substitute for, flavine, and I know of nothing better than a 2 per cent. solution of protargol employed

twice daily as drops. Used at this strength protargol never irritates the wound, and it acts very efficaciously in arresting the discharge.

To sum up, then, the gist of these few remarks is to urge that the maintenance of a healthy operation field with quick normal healing can be obtained by the simplest methods before, during, and after operation. Antiseptics of any kind are only needed as *extra* measures, especially with regard to needles, sutures, and the lash area. If to these simple measures is added meticulous attention to detail, suppuration in the operation field can be eliminated with absolute certainty.

One exception must, however, be made to this assertion, and that arises when force of circumstances prevents the taking of routine precautions. It is occasionally necessary to operate on an acute glaucoma when there is intense congestion and obvious sepsis. In such an exceptional case I think the best antiseptic to use is hydrogen peroxide, with which the eye is flooded immediately before the knife section is made. It is much better than flavine, because the latter is strictly an antiseptic in the true sense of the word, and is not of much value when sepsis is already present.

Finally it is, perhaps, legitimate to quote personal experience in these matters, and I can claim that, in my private practice, I have never experienced the tragedy of intra-ocular suppuration after operation. In hospital practice I must, I think, have occasionally experienced this misfortune, though I cannot recall any instances, and certainly I have no single case impressed on my mind. In hospital work, however, it is not nearly so easy, for many reasons, to impress attention on certain details or to see that such details are carried through, and consequently accidents are more likely to occur there than in private work, where one assumes sole and entire responsibility.

PATHOLOGY OF THE TUBERCULOSIS OF CHILDHOOD AND ITS BEARING ON CLINICAL WORK.*

BY

EUGENE L. OPIE, M.D.

(From the Henry Phipps Institute, University of Pennsylvania, Philadelphia.)

RECOGNITION of the widespread occurrence of tuberculous infection acquired during childhood introduces into study of the disease two conflicting factors, one or other of which is often forgotten: (1) the increased resistance to the disease from a somewhat ineffective immunization, and (2) the danger that latent infection may cause manifest and perhaps fatal disease.

If attention is limited to tuberculous infection which is so advanced that it produces cough, fever, loss of weight, and obvious physical signs, while less advanced infection which remains concealed, for a time at least, is ignored, spread of the disease in families and in the community is studied under a heavy handicap, and ancient problems concerning its contagion remain unsolved. We might with equal reason study the epidemiology of measles by limiting our attention to instances of the disease followed by pneumonia, or of small-pox by excluding all cases except those with haemorrhagic lesions.

The Pathology of Latent Tuberculosis.

I am inclined to believe that more knowledge of the pathology of tuberculosis can be obtained by careful examination of the tuberculous lesions of those who die from causes other than tuberculosis than from fatal instances of the disease. The frequency of concealed tuberculous infection is thoroughly recognized, in great part as the result of almost innumerable studies made with the tuberculin test, but the variety and severity of latent tuberculous lesions is not fully understood. Sir Arthur Newsholme¹

assembled evidence to show that there is a long latent period between exposure to infection and the appearance of the symptoms of phthisis. The frequency of calcified pulmonary nodules which may be regarded as scars of an infection acquired in childhood is well known, but it is less fully realized that one in five of adults² who die from causes other than tuberculosis have apical tuberculous lesions which are caseous or partly calcified.

X-ray photographs of lungs excised at autopsy furnish a satisfactory means of depicting the distribution of tuberculous lesions, particularly when calcium salts have been deposited in caseous material, or new formation of fibrous tissue has increased the density of lung tissue. They serve as a guide in dissection to scattered nodules and reveal lesions which would otherwise be discovered with much difficulty. All types of lesions which are discoverable in x-ray plates prepared from excised lungs can be identified in plates prepared from the living chest. Radiologists who are doubtful concerning the interpretation of latent tuberculous lesions evident in x-ray plates of the living chest should prepare a series of plates from lungs removed at autopsy and should identify by dissection the lesions which are revealed.

First Infection with Tuberculosis.

Tuberculosis of infancy and early childhood, which resembles that of an animal inoculated with tubercle bacilli, forms a lesion at the site of infection and quickly affects the nearest lymph nodes. The severity of tuberculosis in early infancy seems to indicate great susceptibility to the disease, but exposure of the infant to massive infection from those who tend it may explain the high mortality from tuberculosis during the first year of life. At this period general dissemination through the body accompanied by tuberculous meningitis is common. During the second year of life the mortality from tuberculosis falls rapidly, and during the next few years gradually. From the fifth to the twelfth year the death rate is lower than at any other period. It is noteworthy that during this interval of low mortality infection with tuberculosis, indicated by the tuberculin reaction, makes its appearance with

* A paper read in connection with a discussion in the Section of Tuberculosis at the Annual Meeting of the British Medical Association, Edinburgh, 1927.