ON THE TREATMENT OF SOME OF THE MORE COMMON EYE AFFECTIONS.

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I have been in the habit in my clinical lectures to post-graduates of directing attention more to questions of treatment, both surgical and medical, than to discussions on pathology. In text-books, as a rule, somewhat scant justice is done to treatment, which, after all, is the most important and practical. The busy practitioner is more directly interested in knowing how to treat than in attempting to follow the often conflicting views which are held on matters of pathology.

To me it has long been a matter of surprise and admiration to find how sound and how extensive is the knowledge on all practical questions of medicine and surgery of the general practitioner of this country. If the publication of the substance of my post-graduate lectures should serve as a useful guide to any in the treatment of a small but important group of cases with which they must frequently come in contact, I shall feel that, in complying with the request of some who have attended the lectures, I have not undertaken an altogether superfluous task in giving to them the form which they will assume in these pages.

The Normal Conjunctiva.—Very considerable differences exist in the appearances presented by the healthy conjunctiva. There are differences in vascularity, differences in the fulness and thickness of the transition fold separating the palpebral from the ocular conjunctiva, and differences in the smoothness of surface. Indeed, it is not too much to say that only those who have made a point of studying the appearances met with on eversion of the lids in many thousands of cases, can always confidently distinguish between the healthy and the pathological conjunctiva.

It undoubtedly often happens that perfectly healthy conditions of the conjunctiva are taken for inflammatory even by those who have had, as specialists, considerable experience of eye diseases. This is often, as might be supposed, the case when the subjective symptoms are more or less suggestive of conjunctivitis, but the mistake may also be made even when, in the absence of any symptoms, some chance has led to an examination of the lids.

The vascularity of the conjunctiva is not only subject to individual differences, but varies at different times in the same
individual. The appearances presented in this respect depend upon both local and general conditions. Exposure to strong light, prolonged use of the eyes for reading or other work close at hand, especially reading with insufficient illumination, cause temporary hyperemia. The same condition of course follows rubbing of the eyes, the irritation of some foreign body, dust or smoke or impure atmosphere. It is also a necessary accompaniment of emotional disturbances which lead to weeping.

Further, any cause which gives rise to congestion of the vessels of the face, such as indigestion, stooping, etc., is also followed by conjunctival congestion. In general anaemia, on the other hand, the conjunctiva is often distinctly pale, though the existing poverty in hemoglobin is usually more readily seen in the colour of the gums.

The conjunctival fold, particularly that of the lower lid, is very different in different people. The difference depends in great measure upon the subconjunctival tissue. In some people the conjunctiva in this situation appears more plentiful and is thrown into a greater number of lax folds than in others. In some, again, as the lid is everted, the fold springs into view as a more stretched and apparently less vascular covering to the mass of more or less dense and hard subjacent tissue.

In most adults the surface of the conjunctiva is smooth, or there are to be seen, only here and there and especially in the fold of the lower lid, small and irregularly triangular-shaped eminences—follicles. In young people, on the other hand, it is the rule to find more evidence of these prominent follicles. In many children, indeed, the follicles may be seen in considerable numbers arranged along the ridges of the folds in the retrotarsal section of the conjunctiva of the lower lid, and often also at the outer and inner portions of the conjunctival membrane covering the upper border of the tarsus in the upper lid. Even an excessive development is far from uncommon in children. Certainly those accustomed to see only the conjunctiva of adults might well imagine that the appearances then presented were pathological. In point of fact, however, this adenoid overgrowth, on account of the absence of any accompanying symptoms, as well as of its frequency, can hardly be looked upon as pathological. It is probably of the same nature as the adenoid hyperplasia which is so common in the nose-pharynx in children, and, like that, always disappears more or less completely with growth. I shall refer to this so-called "folliculosis" again in connection with conjunctivitis (see p. 346).

CONGESTION OF THE CONJUNCTIVA.—When congestion of the conjunctiva persists, it must of course be considered pathological. More or less persistent conjunctival hyperemia is not infrequently met with. This condition gives rise to symptoms
which, according to the degree of congestion, to its causation, and also to individual temperament, are variously described. Some complain of a hot, burning sensation in the eyes, others of a feeling as if there were sand in them. The eyes feel heavy and tired, or are weak and watering. All such symptoms, too, may be aggravated by exposure to light of an amount which under normal circumstances would cause no inconvenience.

The causes of conjunctival congestion are both local and general. Direct irritation may be caused and kept up by noxious gases or fumes, by minute particles of irritating substances, or by prolonged exposure to strong light. There is usually something in the occupation or habits of those who suffer from congestion due to any such irritation, which, when inquired into, will lead more or less conclusively to the discovery of the cause. Permanent conjunctival congestion arising in this way is, however, not very common.

A more important local cause of congestion of the conjunctiva is some error of refraction. Slight astigmatism, hypermetropia, and less frequently myopia, when uncorrected, often lead to a more or less involuntary semiclosure of the eyes and frowning, by which the sight is improved. This pursing up of the eyes and frowning, however, by pressure on the cornea, and especially in astigmatism, where such pressure has the effect of correcting, more or less completely, its abnormal curvature, often leads to irritation. Usually when the conjunctival congestion is due to this cause, a slight rosy circumcorneal or patchy congestion of the subconjunctival vessels in the neighbourhood of the cornea may be found associated with the hyperemia of the palpebral conjunctiva.

In most, though not all, cases where the cause of congestion is in the first place an error of refraction, the symptoms are all aggravated by the use of the eyes for near work, as it is mainly then that the unconscious effort to correct the refractive error is persisted in.

Another cause of conjunctival congestion which may perhaps also be looked upon as local, is the participation of the membrane in a hyperemia which has its origin in the naso-pharynx.

What may be classed as the general causes of hyperæmia of the conjunctiva are probably numerous, and such as lead to both active and passive congestion—the absorption into the blood of different toxins, the accumulation of uric acid and oxalates, etc. A large proportion of cases of slight conjunctival congestion, in which the symptoms complained of seem out of all proportion to the local circulatory changes, are of a gouty nature. Not unfrequently, too, hyperæmia seems to be kept up in connection with constipation, and may then presumably be either active, from the irritation of absorbed toxines, or simply passive, or both combined.

In all cases in which the congestion met with in the conjuncti-
tiva is due to general as opposed to local causes, there are other symptoms, such as indigestion, headache, vertigo, etc., to which attention has to be directed before the real cause can be established; and although the symptoms may be aggravated by the use of the eyes for reading, or near work of any kind, this is not so invariably or so distinctly noticeable as in that arising in connection with refractive errors.

_Treatment of Conjunctival Congestion._—In all cases where the congestion is evidently due to some external irritant, the treatment should of course mainly consist in, as far as possible, removing the cause. In addition, hot sponging and occasional bathing with a mild antiseptic—preferably a 2 per cent. solution of boracic acid—may be used. Strong antiseptics, cold compresses or poultices of any kind, or astringents, must be avoided. Often, and particularly where the congestion has been set up or aggravated by exposure to strong light, dark neutral-tinted glasses may be used out of doors, or at work when the nature of the work entails subjection to strong illumination. Blue glasses, as they do not, although absorbing some light, sufficiently shut out the chemical (actinic) rays, which are the most irritating, are not so suitable.

In all cases of persistent congestion the state of refraction should be examined into, and hypermetropia or astigmatism be properly corrected. More especially is this advisable when there is a habit of frowning when reading. Even although an existing error of refraction may not have been the principal cause in originating the state of congestion, it may often contribute more or less towards keeping it up. Apparently even slight degrees of astigmatism, which do not appreciably lessen the visual acuity, so far at least as can be detected by the ordinary tests, may, when associated with frowning and other unconscious efforts at correction, help to keep up hyperaemia. Correcting glasses should therefore be used for reading.

Where the presence of congestion does not receive a satisfactory explanation from any refractive error or the exposure to any external irritant, it is often accounted for, as has been said, by some derangement in general health. Attention must then be given to diet, to the action of the bowels, to exercise, etc. It is often useful to restrict the allowance of farinaceous food, and to have animal food taken finely minced, and not too much cooked. In many cases where there is other evidence of gouty irritation, some preparation of lithia, such as the citro-tartrate, taken between meals, and also colchicum, is most useful. By such therapeutic and dietetic treatment the symptoms are often very quickly overcome. Sometimes a nasal douche may be used with advantage when the conjunctival congestion is but one element of a more extensive hyperaemia—in hay-fever, for instance.

The great point to bear in mind always in all cases of simple
conjunctival congestion is, not to over-treat locally. Especially is it advisable to avoid astringent lotions of all kinds. The tendency to abuse in this direction is very common. Indeed, the principal cause for the persistence of the congestion in many cases one sees is in reality the treatment to which they have been subjected.

CONJUNCTIVITIS.—When, in addition to hyperaemia, there is marked increase and alteration in the conjunctival secretions, the case must be looked upon as an inflammation-conjunctivitis.

A good clinical division of the different varieties of conjunctivitis may be made, in the first place, into those which are not followed by any destruction of tissue and subsequent cicatrisation, and those which are complicated in this way. Of the first group, in which, after recovery, there is a complete return to the normal condition, we may distinguish two classes, according to the nature of the secretion from the inflamed conjunctiva. In the first the secretion is muco-purulent, and there is comparatively little or no general swelling of the lids. In the second the discharge is decidedly purulent, and the inflammation of the conjunctiva is accompanied by considerable, often by excessive, swelling of the lids and subconjunctival oedema—so-called chemosis.

There are no doubt many varieties of muco-purulent conjunctivitis. There is, however, not much difference in their clinical aspects. Cases of this nature are probably for the most part set up by the pathogenic action of definite and different microorganisms. Already four or five different microbes have been shown to cause conjunctivitis. This has been demonstrated by their constant detection in the secretion from the inflamed conjunctiva, and also by direct inoculation of the healthy conjunctiva with pure cultivations of the microbes. The main clinical differences which appear to characterise the inflammation resulting from different specific germs are, differences in the severity and duration of the inflammation, and in the extent to which eczematous thickening of the skin of the lid or of the lid-margin is associated with the conjunctivitis.

While, therefore, no doubt, a proper scientific classification of conjunctivitis cases must be based upon bacteriology, the clinical differences are barely sufficient to be of much importance. The main point to bear in mind is the frequency altogether of some microbic origin.

In the ordinary muco-purulent or catarrhal conjunctivitis there is more or less thickening of the conjunctiva, with swelling and increased fulness of the folds. This, with the greatly increased vascularity, gives rise to a more equable red coloration, and to a somewhat velvety appearance of the inner surface of the lids, especially noticeable where the inflammation has become chronic. There is on the whole a tendency for the hyperæmia to be confined
to the palpebral conjunctiva. When, however, it also involves the ocular portion, it is always most marked in the periphery, diminishing in intensity towards the corneal margin. This is a point which should specially attract attention, as, when the cornea, iris, or deeper parts of the eye are inflamed, the hyperæmia is, on the contrary, most intense in the circumcorneal zone, where the deeper and closer network springing from the anterior ciliary vessels is injected. An absence, then, of any diminution of injection of the white of the eye in the neighbourhood of the cornea should always, in a case of conjunctivitis, arouse suspicion of some corneal complication.

The secretion from an acutely inflamed conjunctiva is at first so preponderatingly composed of tears that it is distinctly watery. Only gradually, and after a day or two, does it assume a more viscid and eventually more definitely muco-purulent character. The constant overflow of tears and of the more copious and altered secretion causes excoriatioon of the skin. The skin surrounding the outer canthus especially usually soon comes to have a raw, macerated appearance. When the eyes have been kept closed for some time, and therefore in the morning after sleeping, the lids are glued together by the secretion which has been retained in and dried upon the eyelashes.

The subjective symptoms in an ordinary acute case of muco-purulent conjunctivitis are: sensitiveness to light, tiring of the eyes on reading, and a hot, burning feeling in them, which, in severe cases, and in particularly sensitive subjects, may even amount to more or less violent pain.

The duration of an attack is very variable. The severer symptoms generally only last a few days, but may continue for weeks. As a rule, when recovery is not fairly complete in a fortnight, the treatment has been the cause of the delay. No doubt some cases have a tendency to be prolonged altogether independent of treatment. In such there has probably been some less usual microbic infection, perhaps derived from discharges from a purulent inflammation in some other part of the body, or it may be from some less evident source.

The early recourse to astringents, such as alum and sulphate of zinc, is a very common cause of aggravation. The same may be said of poulticing, which, if continued for any time, may have, however, much worse consequences. The relief from pain which is afforded by poulticing at the beginning not unnaturally gives rise to the belief that such treatment is beneficial. Continued poulticing greatly increases the swelling and vascularity, and also, by favouring the growth and multiplication of different germs, which are more or less constantly present in the conjunctival sac without doing harm, make these a source of danger in the diminished state of vitality of the tissues. In addition, therefore, to the effect of one specific kind of germ, which may cause but an unim-
portant reaction of no great duration, further inoculation by others of a more virulent type is apt to take place. Even iced compresses, which are so frequently recommended, more often do harm than good. This depends to a great extent upon the manner in which they are usually applied, namely, as compresses laid upon ice, and then transferred to the eye, and frequently changed. To get the proper effect from ice, which in any case should only be used at the beginning, and before the secretions have become altered and increased, the temperature of the compress must always be maintained at the freezing-point. This can be done by running iced water through a coiled tube resting on the compress. It must always be borne in mind, however, that where there is any corneal complication ice applications are dangerous. On the whole, there is no advantage to be gained by ice which cannot just as well be got by the efficient use of antiseptic lotions.

In the treatment of conjunctivitis in the acute stage, the principal point to attend to is not to interfere too energetically. There is, as I have already hinted, a danger in doing too much. All that is necessary in most cases is to freely remove the secretion during the day, and to prevent its too great retention within the conjunctival sac at night. Even those who are sufficiently alive to the disadvantages of an active treatment with astringent lotions, rarely seem to take care that the more suitable mildly antiseptic or other bland lotion which they employ is so used as to properly irrigate the inflamed conjunctival surface. An efficient removal of discharge is not got by merely squeezing a little lotion from a sponge or piece of cotton-wool into the lower conjunctival sac, or by using an eye-bath. In very many cases, however, the tendency to a speedy return to the normal in the absence of irritative treatment is so great, that this is not of much consequence. It certainly, however, is a better plan to irrigate properly. This may be done by allowing a pint or more of the lotion (preferably a 2 per cent. solution of boracic acid at a temperature of 90° to 98° F.) to stream by gravitation over the whole surface of the conjunctiva three or four times daily. For this purpose the vessel containing the liquid may be held 10 or 12 inches above the head, and allowed to run through indiarubber tubing, to the end of which is fixed a flattened glass nozzle. The nozzle can be readily inserted below the upper and lower lids without touching the cornea. It is usually best to begin by everting the upper lid, and, after irrigating its tarsal surface, to insert the glass nozzle behind the upper margin of the tarsus, so as to get at the retro-tarsal fold.

In the more severe and protracted cases, a daily direct application to the conjunctival surface, with a camel's-hair brush, of a strong antiseptic solution is useful. The most suitable are strong (fully saturated) chlorine water and nitrate of silver in a 2 per
cent. solution. Though not always so readily got, the first is the better, and when painted over the palpebral conjunctiva causes no pain to speak of. Corrosive sublimate solutions should be avoided; they are more irritating and far less penetrating.

The margins of the lids should in all cases be kept smeared with some bland ointment. Fresh lard or fresh butter do very well. Vaseline is not always pure, and may cause irritation. Boracic ointment (boracic acid 38s, almond oil 20 mm., and spermaceti ointment 38s) is what I generally use.

The questions of light, and of the use of the eyes for reading, etc., remain to be considered. With all inflammations of the eye itself, as well as of the conjunctiva, there is more or less photophobia, or dread of light. It does not follow, however, that the light is actually hurtful. The actinic rays are known to cause direct irritation of the conjunctiva, which may, indeed, as in snow-blindness and electric-light ophthalmia, be so great as to cause violent inflammation. On the other hand, the same rays have been shown to exert a powerful bactericidal effect. It is a very common treatment to keep patients suffering from conjunctivitis in a dark room. Often this is continued for weeks; and although the discomfort which light causes is thus avoided, there is little doubt that this treatment tends to prolong the inflammation rather than to cut it short. The patient, too, soon has his retina so adapted for the dark that even a little increase of light is painful, just as one may experience a degree of dazzling from the light of a match struck at night.

The light of an ordinary room in the daytime, when the sun's rays are not passing directly into it so as to be unpleasant to anyone else, has not any bad effect on a conjunctivitis. On the other hand, the use of dark glasses outside in bright weather is advisable. They enable the patient to keep his eyes properly open, and subject him less to great differences of illumination. The glasses should be neutral-tinted, and not blue. Blue glass, although absorbing light, transmits a larger proportion of the most irritating (chemical) rays. The open air, in the absence of rain or dust-clouds, is unquestionably good. This is often not properly realised; it is perhaps natural to suppose that there is an indication with a "cold in the eye" to remain in-doors.

Reading or writing should not be allowed. In acute attacks it is seldom, however, that attempts at reading are persisted in. Why reading should be hurtful is not quite evident. It is certain, however, that it adds greatly to the discomfort caused by the conjunctivitis, increasing at the same time the congestion. This discomfort, besides, does not pass off on continuing reading, as does the discomfort first felt in ordinary light on coming from a darkened room.

Whether as the result of inappropriate treatment or otherwise, inflammation of the conjunctiva, instead of entirely subsiding,
may continue for an indefinite time as a chronic condition. *Chronic conjunctivitis* is met with in all degrees of severity, from what is little more than slight hyperemia of the conjunctiva, to a greatly thickened, fleshy-looking, pus-secretting state of that membrane, with incrustation of the lid margin; and often, too, owing to deeper infiltration, the palpebral fibres of the orbicularis fail to keep the lower lid properly in contact with the eye. The swollen conjunctiva thus becomes everted, and the excretion of tears is interfered with. The overflowing tears cause exccoration of the skin, and the ectropion once set up becomes more and more marked as time goes on. The everted conjunctiva, besides being thickened, is, as the result of constant exposure to the air, also hardened, and may even be incrusted or covered by scales or scabs.

These very bad cases of chronic conjunctivitis are mostly met with in old people of uncleanly habits; they are not the cases one is most frequently called upon to treat.

In all cases in which conjunctivitis has become chronic, the first points to be ascertained, before any line of treatment is begun, are the nature of the external surroundings and of the treatment which has already been adopted. Where the patient is constantly subjected to smoky or hot and close atmosphere, or to any evident source of irritation, such conditions should, as far as possible, be removed. If he has been poulticing, or, what comes to the same thing, keeping moist applications to the eye, or tying it up and allowing the bandage to become moistened by tears, or if strong astringent lotions have been used, such treatment should at once be discontinued. It is generally well, too, to look to the state of the mucous membrane of the naso-pharynx, as a chronic catarrh in this situation is apt to keep up a conjunctivitis, even although it may not have been the principal cause in originating it. Still more important in this respect is the state of the tear sac. Inflammation of the mucous membrane lining the tear duct and sac is not infrequently complicated by conjunctivitis, which is then generally set up by inoculation from this source. On the other hand, even severe purulent primary inflammation of the conjunctiva seldom, if ever, spreads to the tear sac. A proper treatment of the inflammatory condition of the naso-pharynx is often useful, in addition to anything which may be undertaken for the more direct treatment of the conjunctivitis. But treatment of the sac for a co-existing blephorrhcea is an absolute necessity. Without an improvement in this situation no treatment of the conjunctivitis alone can be of much avail.

In the least severe cases of chronic conjunctivitis, in which there is little or no thickening of the conjunctiva, and not much increase in the secretions, it is not generally necessary, if the precautions referred to as to surroundings be taken, to do anything very active. It is mainly in respect to their origin, namely,
a preceding acute attack, that they differ at all from cases which I have described as conjunctival congestion. They should therefore be treated much in the same way. Change of air, especially to some dry, high-lying inland place, may be tried, and any existing error of refraction should be corrected. In addition, a weak astringent may sometimes be useful, such as solutions of hazeline, tannic acid, myrrh, alum, cinchona, or ichthyol.

The following are prescriptions which may be recommended for this purpose:

R Hazelini . . . . . 3iv.
Aque carui . . . . . 3viii.

R Acidi tannici . . . . . gr. vi., xii.
Sodae biboratis . . . . . 5iii.
Glycerini . . . . . 3vi.
Aquam camphorae ad . . . . . 3xii.

R Tincturae myrrhæ . . . . . 5ii.
Aque destillatae . . . . . 3xii.

R Aluminis . . . . . gr. x., xx.
Aque roseæ . . . . . 3xii.

R Extracti cinchonae flavae liquidi . m48
Acidi hydrocyanici diluti . m15
Glycerini . . . . . 5vi.
Aquam destillatam ad . . . . . 3xii.

R Ichthyoli . . . . . 3i.
Aque sambuci,
Aque destillatae, āā . . . . . 3vi.

In more severe cases, with thickening of the conjunctiva, swelling of the folds and deeper infiltration as evidenced by slight ptosis, and with more or less distinct muco-purulent secretion, there is, I believe, nothing better than lead. A solution of the neutral subacetate of lead, in the strength of 10 grs. to the 3i. of water, may be painted directly over the mucous surface of the everted lids once daily, and an irrigation of boracic acid made twice or thrice daily, or a wash of the same lead salt in weaker solution (1–2 grs. to the 3i.) may be used about three or four times in the twenty-four hours. In the worst cases, painting with strong chlorine water or a 2 per cent. solution of nitrate of silver once daily, is useful in addition to the lead wash. Where there is ectropion of the lower lid, the lower canaliculus should be slit with a Weber’s knife. The scales must also be removed from the lid
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margin, and an ointment of iodoform and vaseline (1 to 6) smeared on the raw surface.

Owing to the frequency of folliculosis in young people, it often happens that the appearance of the conjunctiva presented in an ordinary muco-purulent inflammation is such as to suggest some different and specific type of conjunctivitis. The overgrowth of adenoid tissue may be so marked a feature, that the follicles appear as numerous papillae in the swollen and congested membrane. When this is the case, it is not uncommon to hear the conjunctivitis spoken of as a *follicular conjunctivitis*. It is not improbable that the same irritation which causes the conjunctiva to inflame may give rise to some further follicular enlargement, but, as far as the inflammation goes, both in its causation and course, it is a simple conjunctivitis. The treatment should be in every way the same as that already described. Special care is, however, required in irrigating, as the presence of the many elevations makes it more difficult to thoroughly remove the secretions.

*(To be continued.)*

NOTES ON THE EXAMINATION OF THE BLOOD: (1) SERUM DIAGNOSIS; (2) A FORM OF HÆMACYTOmeter.

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I. *Serum Diagnosis of Fevers.*—If the name of any investigator is to be attached to the method of using the reaction of the blood serum of patients on appropriate bacilli, it should undoubtedly be that of Professor Max Gruber of Vienna. Since other names have been brought forward, I may be permitted to quote the words which gave the first intelligence to the public on the matter. It was early in April 1896, at the Congress für innere Medicin,¹ held in Wiesbaden, that Professor Gruber made the following remarkable statement:—"I have brought several animals here, which have received immunising doses many months ago. It is now fifteen months since one of these animals (guinea-pigs) received its last immunising injection; and in fact it has never been highly immunised, the total amount of bacterial culture given being only some 30 mgmrs. Yet the blood of this guinea-pig still contains abundant *agglutinins*, as is shown by testing minute drops

¹ *Verhandl. d. Cong. f. innere Med.,* Wiesbaden, 1896, S. 213. I ought to state that this paper was written before I was aware that Professor Gruber intended to publish a plain unvarnished tale of the historical side of the question (*München. med. Wochenschr.*, 1897, S. 455 and 477). To this Widal has made an insufficient and hardly well-tempered reply (*Ann. de l'Inst. Pasteur*, Paris, 1897, footnote, p. 358).