cure the local disease. But in the third class of cases, we should try to ascertain which of the branches of the fifth nerve is principally involved, and, as a guide to its discovery, we may exert pressure at different points of the surface—for example, over the exit of the supra-orbital nerve, and notice if it influences the spasm of the lid; or, again, we may examine in the same way the inferior dental nerve at the dental foramen. If we can thus discover the point of departure of the irritation among the branches of the fifth, we may very probably, by division of the nerve, interrupt the chain of nervous actions on which the spasm of the orbicularis depends. It may be necessary to divide the nerves on both sides of the face; and at first the beneficial effect of the operation may not be very apparent, but gradually the spasm passes off, to the great relief of the patient. Unfortunately, after an apparent cure has been effected in this way, the disease will sometimes return.

Divide sentient nerve,

on one or both sides.

Among other remedies which may be usefully employed for the relief of blepharospasm, are electricity, the continuous current being used; and also the subcutaneous injection of morphia. These should always be tried before we have recourse to surgical interference. The injection should be made, in the first instance, over the branches of the supra-orbital nerve.

Faradization.

Morphia.

We should never omit to make a careful inspection of the teeth in this form of disease; for the extraction of a carious tooth may remove the blepharospasm. In like manner, the cicatricial tissue of a wound, involving branches of the fifth nerve, may have to be dissected out to relieve the irritation it occasions in the sentient fibres. In fact, careful consideration, and a judicious adaptation of remedies will be called for, to enable us to comprehend and successfully meet the various forms of this very troublesome complaint.

Extraction of teeth.

Dissection of cicatrices.

MALPOSITIONS OF THE EYELIDS AND EYELASHES.

ENTROPIUM, or an incurving of the margin of the eyelids, may be partial or complete, and may be conveniently divided into two classes—the spasmodic, and permanent.

ENTROPIUM.

The first is seldom met with except amongst old people, whose skin has become lax and wrinkled. We occasionally see cases of the kind resulting from the application of a compress and bandage, as after the operation of extraction of the lens.

1. Spasmodic.

The lower lid is generally affected in instances of spasmodic entropium: its ciliary margin, being curved inwards on itself, carries the cilia with it, so that the latter cannot be seen unless the skin of the lid be retracted, when the cilia assume their normal position; the irregular contraction, however, of the fibres of the orbicularis soon causes the margin of the eyelid to become again incurved. There is not only a lax condition of the cutis in these cases, but the outer fibres of the orbicularis lose their contractile power; whereas those near the margin of the lid, acting with unusual force, turn the cilia inwards in the way described. The eyelashes being thus brought into contact with the cornea, cause such an amount of irritation, that pathological changes gradually take place in its fibrous structure, which end in vascular opacity, or, it may be, destructive ulceration of the cornea.

Confined to lower lid.

Condition of the parts.

Irritation of the cornea.

Treatment.—Should the entropium have arisen from mechanical causes, as, for instance, after the extraction of a cataract from the pressure of a bandage over the eyelids, it is only necessary to remove the cause, and after a time the orbicularis will regain its functions, and the lid be restored to its normal state. This result may be hastened by first retracting the lid, and then applying a layer of collodion, or a strip of plaster, along its cutaneous surface, so as to keep the lid in its natural position.

Remove the cause.

Apply collodion or plaster.

In the more inveterate cases, whether depending on mechanical or other causes, it will be necessary to excise an elliptical portion of the skin and subcutaneous tissues, parallel to the free margin of the lid; when the contraction of the tissues as they cicatrize will, by shortening the external covering of the lid, retain the ciliary border in its normal position.

Excise a portion of skin.

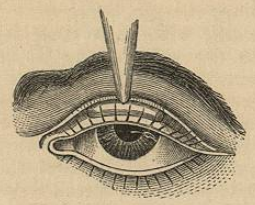
One would suppose, from the numerous proceedings propounded, that this was a difficult operation, whereas nothing can be more simple. A pair of entropium forceps should be used to pinch up a fold of the skin, running parallel to the ciliary margin of the lid, which may then be excised with curved scissors (*vide* Fig. 12). The amount of skin to be removed will depend upon the extent of the entropium, and may be judged of by

Operation.

noticing if the fold seized between the blades of the forceps is sufficient to restore the cilia to their normal position. Care must be taken to avoid wounding the puncta; in fact, it is seldom advisable to remove the skin towards the inner angle of the eye; for although the punctum may not be wounded, it may be everted by the contraction of the cicatrix, and will thus inconvenience the patient, the tears not being able to escape through the puncta, and a watery eye results. This accident may be avoided by preserving the skin in the situation indicated.

Avoid the region of the puncta.

FIG. 12.



2. Permanent entropium, from granular conjunctivitis, or age.

Permanent entropium differs from the spasmodic form, in that the incurving of the lids depends upon changes in their structure, very often caused by granular conjunctivitis. It may also occur, among old people, from the eyeball sinking into the socket; the palpebral border of the orbicularis is then very apt to become inverted. The upper and lower lids are equally subject to this form of malposition, and one or both eyes may be affected.

As I have above remarked, in the majority of cases, permanent entropium results from the effects of granular conjunctivitis, which leads to the formation of cicatrices of the mucous and submucous tissues; these cicatrices in contracting, shorten the tarsal cartilage from side to side, as well as from above downwards, so that the ciliary margin of the affected lid is turned inwards, in consequence of the increase in the natural curvature of the cartilage. The lid affected in this way thus becomes shortened from side to side, and its mucous membrane is generally much hypertrophied; it is evidently impossible, in the presence of so much structural change, to restore the cilia to their normal position by retracting the skin of the lid, as in the spasmodic form of entropium.

Cartilage shortened.

Curvature increased.

In permanent entropium the eyelashes are often destroyed, a few irregular and distorted cilia alone remaining. These stumps, however, by constantly rubbing against the surface of the cornea each time the

Cilia rub against cornea.

eye is opened or closed, produce such an amount of irritation, that the transparency of the cornea is gradually lost, and the sight for all practical purposes destroyed.

Occasionally we meet with inversion of the free margins of the eyelids, following the chemical action of lime or some such material falling into the eye, and which has caused sloughing of the conjunctiva, the formation of a cicatrix, and consequently entropium.

Entropium from lime.

The Treatment of Permanent Entropium consists in either removing the cilia together with their bulbs, so as to prevent their rubbing against the cornea for the future, or else excising a portion of the skin, and grooving the tarsal cartilage, so as to restore the margin of the lid to its normal position.*

Treatment.

Remove or evert the eyelashes.

The excision of the cilia and their bulbs is to be managed as follows:—A pair of Desmarres' forceps having been applied to the lid, an incision is made through the skin and subcutaneous tissues, down to the tarsal cartilage, parallel to, and about one-eighth of an inch from the margin of the lid. The extremities of this cut are to be carried down to the free edge of the lid, and the small flap of skin, enclosed within the incisions thus made, is to be dissected away from the tarsal cartilage, together with the subcutaneous tissue and bulbs of the cilia. The wound must be carefully cleaned and examined for any remaining bulbs of the cilia, which should be removed. Cold-water dressing may then be applied till the wound has healed.

Excision of cilia.

If it is not thought advisable to destroy the cilia, the following operation may be resorted to:—Desmarres' forceps having been adjusted to the lid, an incision is to be made through the skin and subcutaneous tissues, down to the tarsal cartilage, parallel to and about the sixth of an inch from its ciliary border, taking care to

Operation for preserving the cilia.

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* In considering the operative proceedings advocated for the cure of chronic entropium and ectropium, the author has been obliged to confine his remarks to the operations he has himself practised: for were he to attempt to describe them all, it would occupy more space than could be spared in a work of this kind. The reader may consult on the subject "Arch. für Oph." x. 2, p. 221; and the third volume of the *Ophthalmic Review*, p. 299, where A. von Gräfe's method of operating in these cases is described, and, like all the handiwork of that eminent oculist, doubtless demands our attention.

keep clear of the bulbs of the eyelashes. A second incision is to be made of the same depth parallel to the first, and about a quarter of an inch from it, and joining it at either extremity. These incisions are then to be deepened, but cutting obliquely downwards into the tarsal cartilage, so as to form a groove in its substance, and the skin, subcutaneous tissue, and cartilage, contained within the above incisions, are to be dissected away. The object of this operation is, in fact, to cut an elongated, wedge-shaped piece out of the skin and tarsal cartilage, so that when the edges of the wound have united, the incurved palpebral margin of the lid will be everted, and resume its normal position. In this operation care must be taken not to wound the puncta, or cause them to become everted by removing the integument about them.*

Grooving the tarsal cartilage.

Shortening of the palpebral fissure.

As entropium is frequently complicated and augmented by a shortening of the tarsal cartilage from side to side, it necessarily follows that the longitudinal diameter of the palpebral fissure becomes lessened in these cases; hence, as I shall further explain when describing the mode of treating vascular opacities of the cornea, it is often necessary to elongate the contracted fissure, by slitting up the outer commissure of the eye, as far as the orbital process of the malar bone, and keeping the lips of the wound apart, until their edges have cicatrized; there will then be no fear of their again uniting, and the palpebral fissure will remain permanently elongated.

How corrected.

Operation.

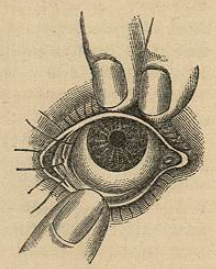
The following is the method of proceeding:—After dividing the external commissure, the edges of the wound must be tied, the upper to a fold of the integument of the forehead, and the lower to the cheek, so as to keep the lips of the incision apart, converting, in fact, the primary horizontal wound into a vertical one. This is represented in Fig. 13, where sutures are supposed to be passed through the thickness of the lid at the extremity of the cut, and tied to folds of skin as above directed. So long as these sutures can be retained, the edges of the incision evidently cannot unite; in practice, however, we find it very difficult to get our patients to submit to this treatment; the pain

Practical objections.

* Streatfeild, "On Grooving the Fibro-Cartilage," *Ophthalmic Hospital Reports*, vol. i. p. 123.

and inconvenience they endure is very great, and though, undoubtedly, the proceeding is most beneficial if it can be carried out, still it is desirable that some simpler means should be devised for attaining the same end. This may be very imperfectly accomplished by slitting up the commissure, and then uniting the conjunctival and cutaneous edges of the wound by means of several sutures.

FIG. 13.



Pagenstecher's method.

Pagenstecher, after dividing the external commissure, takes up a horizontal fold of skin and orbicularis muscle with a pair of forceps, and then passes several ligatures through the base of the fold, allowing them to ulcerate their way out through the skin; the cicatrices thus formed produce permanent eversion of the incurved lid. In passing the ligatures through the fold of skin, the point of the needle is to be entered close to the external surface of the tarsal cartilage, and its point brought out at the edge of the lid; the ligature is to be firmly tied, and allowed to suppurate out, which it generally does in six or eight days. Water-dressing may be applied subsequent to the operation.

ECTROPIUM.

ECTROPIUM, OR EVERSION OF THE EYELIDS, may be divided into three classes. 1st. Temporary eversion of the lids, depending usually on purulent conjunctivitis. 2nd. Ectropium arising from hypertrophy of the conjunctiva. 3rd. Ectropium from the contraction of a cicatrix, the skin of the lid having been destroyed either by an injury, or from disease.

Three varieties.

1. Temporary.

From conjunctivitis.

1. The first form of ectropium generally arises under the following circumstances:—In cases of purulent conjunctivitis, the mucous membrane may be so much swollen that the free margin of the lid is forced away from the eye, to such an extent as to become doubled back upon itself, in precisely the same way as if we had everted it for the purpose of examining the palpebral conjunctiva. Under these circumstances the fibres of the orbicularis, at the line of eversion of the

lid, form a constricting band, which, by pressing on the vessels, impedes the circulation of blood through them, and the everted conjunctiva may in consequence slough away, irreparable injury being done to the eye. Among young children suffering from purulent conjunctivitis, this form of ectropium is especially likely to occur, the lids having been everted, perhaps in dropping some lotion into the eye, and no trouble taken to restore them at once to their natural position.

May cause sloughing.

Frequent in children.

Treatment. Scarification.

The Treatment of this form of eversion of the lids, consists in scarifying the swollen and everted conjunctiva, so as to empty its vessels of blood, after which a little gentle pressure on the swollen lid will reduce the œdema of the part, and the lid may then generally be returned to its natural position with ease, but in some cases may have to be retained there with a pad and bandage applied over the eye for twenty-four hours. The dressing should be removed from time to time, to enable us to clean the eye, and apply the necessary remedies for the cure of the conjunctivitis.

Pad and bandage.

2. Chronic form.

2. The second form of ectropium, arising from hypertrophy of the conjunctiva, is often thus produced:—Among aged people the skin of the lids becomes lax, and the puncta no longer fit closely against the globe, and the tears are retained in contact with the eye. The lacus lachrymalis being thus always full of tears, considerable irritation of the mucous membrane is excited, and chronic inflammation and hypertrophy of the conjunctiva are ultimately induced; the thickened mucous membrane then forces the lids away from the eye, and ectropium results. The eversion of the lid is usually augmented under these circumstances by inflammation and ulceration of the skin at the inner angle of the eye, caused by the irritation of the tears constantly flowing over it, and the efforts of the patient to keep the part dry.

From hypertrophy of conjunctiva.

From paralysis of orbicularis.

Another cause of this form of ectropium—brought about, however, in precisely the same way—is a partial paralysis of the fibres of the orbicularis muscle: the lower lid droops away from the eye, the puncta are everted, and hypertrophy of the conjunctiva and ectropium follow.

Eversion of the lid occasioned by chronic irritation and thickening of the mucous membrane, whether

arising from the causes now mentioned or any other—as, for instance, tinea ciliaris—in course of time not only induces a permanent eversion of the tarsal cartilage, but also a lengthening of the lid from side to side. The exposed mucous membrane becomes converted into a thickened reddish mass, assuming very much the characters of the skin. The disease is, therefore, not only very unsightly, but since the patient is unable to close his eye, dust and dirt get lodged on the cornea, and these, together with the contact of the air, produce vascular opacity, and it may be destructive ulceration in the cornea, or even changes in the deeper structures of the eye.

Changes in the cartilage,

and cornea.

Treatment.—In the first instance, in slight cases, we may try the effects of the red precipitate ointment, applied over the ectropium and along the margin of the lids, twice a day. If this does not succeed, the ectropium should be still further everted by traction on the neighbouring skin, and the conjunctiva having been dried, a glass rod, wetted with nitric acid, should be drawn over the surface of the mucous membrane, parallel to and about the eighth of an inch distant from the margin of the lid. Immediately after this application, a stream of water must be syringed over the part, so as to wash away the excess of nitric acid remaining on the conjunctiva; and a little sweet oil having been smeared over the surface, the lid is to be kept carefully closed with a pad and bandage. It will generally be necessary to repeat this application once a week for a month, before the desired result will be attained. The conjunctiva seldom sloughs, as we might suppose it would do, after the application of the acid, but a sufficient amount of contraction gradually takes place in the hypertrophied tissues to overcome the ectropium, and restore the lid to its normal position. It may not happen, however, that even then the lid fits accurately enough against the eyeball to allow the lachrymal secretion to pass through the punctum; and it may therefore be necessary subsequently to slit open the canaliculus, as described in the next chapter. In place of nitric acid, any other escharotic, as, for instance, nitrate of silver, may be employed.

Treatment. Ung. hyd. ox. rub.

Nitric acid.

How to apply it.

Slitting the canaliculus.

In old standing cases, caustics often fail, and it then becomes necessary to excise an elliptical portion

Excising a portion of conjunctiva.

of the everted conjunctiva, extending along the breadth of the lid, and parallel to its ciliary margin. The amount of conjunctiva to be removed will depend upon the extent of the displacement; in fact, we must excise a fold of the mucous membrane in ectropium, in precisely the same manner as we remove a portion of skin in certain cases of entropium; all that is required is, when the wound heals and contracts, that the everted lid shall be drawn back into apposition with the eyeball. After the operation, the eye must be closed with a pad and bandage.

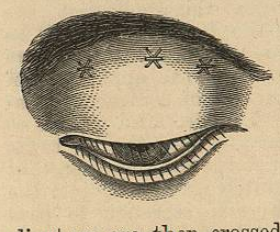
I have already observed that, in old standing cases of ectropium, the tarsal cartilage is apt to become elongated from side to side. In this condition of the parts, it would be useless simply to excise a portion of the conjunctiva; to correct this malposition one of the following operations may be resorted to:—

Another operation.

In old cases accompanied by hypertrophy of the long-exposed conjunctiva, we excise with a bistoury, or strong scissors, an elliptical piece of the conjunctiva, proportionate to the degree of hypertrophy of the mucous membrane, parallel to the inferior (become superior) margin of the tarsal cartilage, and one line distant from it. We pass three strong waxed ligatures through the lips of the resulting wound, using a curved needle with a large eye; both ends of each thread are then passed together through the eye of its needle, and the needle is guided along the nail of the left index finger, between the eyeball and the eyelid, made to penetrate the conjunctiva at its angle of reflection from the globe, and brought out as high up as possible through the skin. The two ends of each ligature are then crossed over a bit of plaster, and tied close under the arch of the orbit, as shown in the annexed figure. Chloroform should be given in this operation. Cold compresses must subsequently be employed to keep down the inflammation, and the ligatures removed at the end of three days.*

Fixing the lid by ligatures.

Fig. 14.



* *Ophthalmic Review*, vol. iii. p. 113.

In ectropion of the lower lid, caused by elongation of its free border, and also of the tarsal cartilage, the lid must be rendered tense in a horizontal direction, and at the same time lifted up, if we hope to make it fit the eyeball again. The simple narrowing of the palpebral fissure is almost always insufficient.*

Excision of flap from outer angle of eye.

If the ectropion be accompanied by no very great shortening of the integument, and if the margin of the lid is in other respects normal, the excision of a triangular flap, from the outer portion of the lid, and closing the wound by sutures, is generally sufficient. For this purpose the edges of the lids in the outer commissure are slit up with a scalpel. Then a triangular flap of integument is dissected away, as shown in Fig. 15; and the edges of the wound are united by suture, and a protective bandage applied until adhesion has occurred. In order to lessen the stretching, it is well, before closing the wound, to separate the inner edge of the skin from the tissue beneath for a little distance, particularly if the subcutaneous tissue is somewhat thickened from previous irritation. It is also advisable to diminish the tension of the parts by keeping them drawn together by strips of plaster.

If we wish to secure great elevation of the lid and of the commissure, we should close the lids, bring the lower one into a normal position, then the border is put slightly on the stretch in a horizontal direction. We should then mark with ink the two points of both the edges of the lids, where both lid-margins fit each other, when they are in a normal position, and there is a slight amount of tension of the lower lid outwards. Then, the lids being kept in the position described, the integument over the outer commissure is lifted up in a horizontal fold, and as much of the integument of the lower lid very gradually fastened between the fingers as is necessary to bring the lid into its normal position, and to elevate the outer commissure to the level of the inner angle. When the breadth of this horizontal fold of integument is also indicated by two lines parallel to the margin of the lid, we excise the

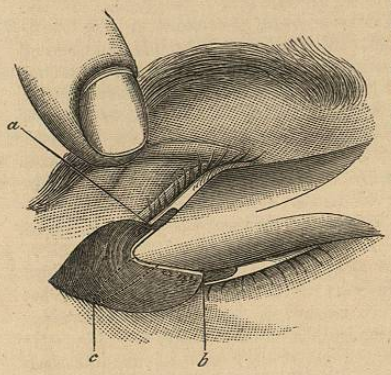
* "Treatise on the Diseases of the Eye." By Carl Stellwag von Carion, translated by C. E. Hackley and D. B. St. John Roosa, p. 402; London, R. Hardwicke, 1868.

portion of the integument within the described boundaries.

Steps of the operation.

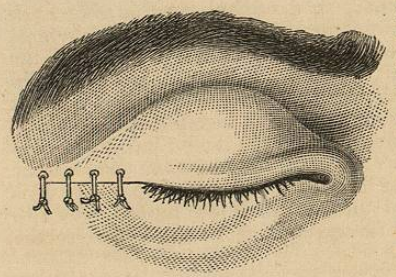
While one assistant holds the head of the patient, and another restrains the bleeding, the operator (*see* Fig. 15) pushes a small horn-spatula under the outer commissure, lifts it up from the globe, and splits it into two layers, first thrusting in a broad, lance-shaped knife immediately in front of the fascia tarso-orbitalis, and then enlarging the wound with a scalpel on both lids, up to the vertical boundary lines *a* and *b*.

Fig. 15.



When this intra-marginal splitting is done sufficiently, the lower and then the upper margin of the lid are pared in a direction inward from the vertical boundary line, for about one-half to three-quarters of a line, by a horizontal incision. The whole breadth of this incision falls behind the lashes. (*See* Fig. 15.)

Fig. 15*.



The horizontal incision is to be made at a greater or less distance from the edge of the lid, according as the outer commissure is to be more or less elevated; but it should always be so made that the two run together at an acute angle. The integument is dissected up, and the wound closed by three or four sutures. The first suture is placed close to the vertical boundary line. (Fig. 15*.)

Subsequent treatment.

In order to lessen the tension, strips of adhesive plaster as well as the protective bandage, may be used. These are fastened on the cheeks and forehead, drawing up the integument lying between them.

When there is a very great difference in the length of the edges of the lids, the result of the operation is endangered by the bulging forward of a large fold of the cartilage and the fascia under the suture. It is, therefore, advisable, after the separation of a circumscribed flap, to cut out a piece of the cartilage next to the outer commissure, whose base is about the same size as the difference in the length of the edges of the lids. The edges of the incision in the cartilage and the fascia should then be included in the suture.

3. Ectropium from cicatrices.

3. Ectropium, arising from the contraction of a cicatrix of the skin, is often a most troublesome deformity to overcome. It matters not if the cicatrix has been formed by a wound or a burn, if it involves the skin of the lid it is almost sure to be followed by ectropium and its consequences. The treatment to be pursued in these cases consists in freeing the lid from the contracting bands of the cicatrix; it is evident that simply excising a portion of the conjunctiva will not effect this object.

Set free the lid.

Operation in slight cases.

In slight cases it may only be necessary to make an incision through the integument, parallel to the ciliary margin of the lid, and of such an extent as will enable us, by dissecting the subcutaneous tissue from the cartilage, to separate it from the adhering cicatrix. The lid, being freed in this way from the cicatricial tissue, may be closed, and should be kept in this constrained position by passing a suture through its edge, and tying it down to a fold of the skin of the cheek, or forehead, according as the upper or lower lid has been operated on; or in some cases, a well-applied pad and bandage will answer the same purpose.

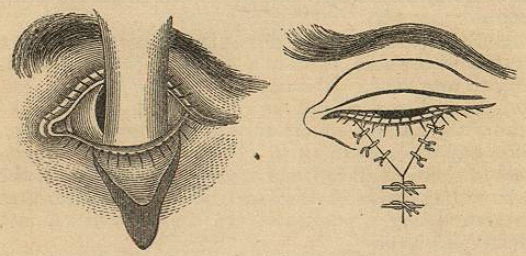
In severer cases.

In more severe cases, the operation recommended by Mr. Wharton Jones should be resorted to. Supposing the upper lid to be everted and bound down to the

Jones's operation.

supra-orbital ridge, Mr. Jones directs* that two converging incisions should be made through the skin, from over the angles of the eye upwards to a point where they meet (*vide* Fig. 16), somewhat more than an inch from the adherent ciliary margin of the eyelid. By pressing down the triangular flap thus made, and cutting all opposing bridles of cellular tissue, but without separating the flap from the subjacent parts, we shall be able to bring down the eyelid nearly into its natural situation, by the mere stretching of the subjacent cellular tissue. A piece of the everted conjunctiva should be snipped off. The edges of the gap left by drawing down the flap are now to be brought together by sutures, and the eyelid retained in its proper place by plasters, and a compress and bandage. Fig. 16 represents this operation for the lower lid.

Fig. 16.



Dieffenbach's plastic operation.

Other surgeons recommend that the cicatrix should be separated from the lid, and a piece of healthy integument, from the cheek or forehead, transplanted into its place. Of the operation proposed, that known as Dieffenbach's is generally to be preferred, though it is almost impossible to lay down any rules strictly applicable to all instances; each case requiring some special modification, which the skill and ingenuity of the surgeon must supply at the time of the operation.

Dissection of cicatrix.

Dieffenbach's operation is performed as follows:—The cicatrix is first to be dissected away, so as to leave a triangular wound having its base towards the margin

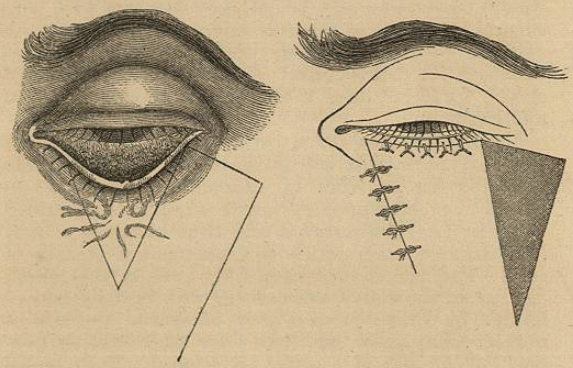
* "Ophthalmic Medicine and Surgery," by T. Wharton Jones, third edition, p. 629.

of the lid, the line of the ciliary border of the lid and tarsal cartilage being, if possible, preserved. But if these have been destroyed, the conjunctiva alone remaining, it is to be dissected out and laid over the eyeball. The surgeon then makes an incision (*see* Fig. 17), through the sound skin and subcutaneous tissues, extending from one or other of the angles of the base of the triangular wound already made, according to the situation of the cicatrix. From the outer extremity of this incision, a second one is to be carried parallel to the edge of the triangular wound; the enclosed flap is then to be dissected from off the subcutaneous tissue, and being transposed, is to be fitted into the gap left by the cicatrix; the margin of the transplanted skin is then to be carefully united to the edges of this wound by fine sutures. Water dressing

Transplanting the skin.

Sutures and dressing.

Fig. 17.



should be subsequently applied, and the part kept at rest. The flap may be formed, half from one side of the cicatrix, and half from the other side, but under any circumstances it must be considerably larger than the gap it is intended to fill; in fact, one is hardly likely to err in making too large a flap, but mistakes are often made in transplanting too small a portion of skin.

Precaution.

As I have before remarked, I can do no more than indicate the principles upon which these operations