

times attributed to an injury. Sometimes the lachrymal glands of both orbits in one individual have been found to be similarly affected. The tumor may, by entering the cavity of the brain and the brain substance, cause the death of the patient.

Various forms of tumors of the lachrymal gland have been observed, but opinions differ very considerably with regard to what may be considered a tumor of the lachrymal gland and what not.

The writer has seen and examined the following forms of tumors, which unquestionably took their origin from the lachrymal gland.

1. *Adenoma* of the lachrymal gland shows the typical picture of an epithelial neoplasm. Epithelial-cell cylinders, which compose the bulk of the tumor, lie embedded in a small quantity of connective tissue. The cells of every one of these cell cylinders are arranged around a central canal, which in some cases is very considerably enlarged by a transparent fluid. The cell cylinders are made up of one layer of polyhedral, almost cuboid epithelial cells, and have a distinct *membrana propria*.

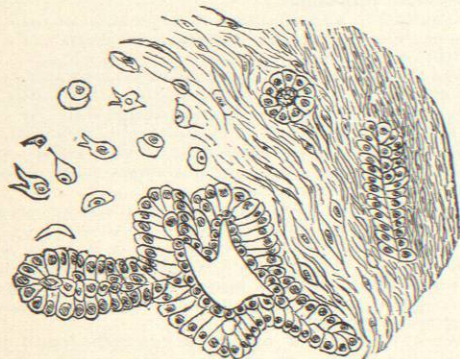


FIG. 2005.—Enchondroma Myxomatodes Carcinomatodes of the Lachrymal Gland.

The lachrymal gland has also, in a number of instances, been the seat of *adeno-carcinoma*, of *lymphoma*, and of *lymphadenoma*.

2. *Myxoma* and *myxo-sarcoma* of the lachrymal gland are characterized by the development of spindle cells with long offsets, and stellate cells embedded in a mucoid intercellular substance, and by the gradual disappearance of the glandular structure. This kind of tumor of the lachrymal gland is, however, but seldom observed alone. It is more frequently the case that the glandular tissue does not disappear, but, instead, an atypical growth of tissue takes place, at least in some parts of the tumor, and thus gives to it the character of an *adeno-carcinoma*. In some cases we find, moreover, besides these two kinds of new formations, a number of islets of hyaline cartilage tissue. Thus, instead of a simple *myxoma* or *myxo-sarcoma* of the lachrymal gland, we have then a *myxoma carcinomatodes*, or a *myxoma carcinomatodes chondromatodes*. In other cases the hyaline cartilage may be the prevailing tissue; in which case we would have to call the tumor an *enchondroma myxomatodes carcinomatodes*.

3. *Spindle-cell sarcoma* of the lachrymal gland has been described by a number of writers. In one of my own cases the tumor developed quite rapidly, and consisted of densely packed spindle cells in its older portions. The younger portions of the tumor showed round cells and small spindle cells. Not a trace of glandular tissue was found.

4. In *lympho-sarcoma* of the lachrymal gland the bulk of the tumor consists of densely packed lymphatic cells, with hardly any intercellular substance.

5. *Epithelioma* of the lachrymal gland is formed when an atypical growth of the epithelial elements of the glandular tissue takes place. We find, then, instead of

the glandular apparatus, solid epithelial-cell cylinders and nests of epithelial cells. This form of growth seems, however, generally to be combined with the development of myxomatous tissue in the lachrymal gland. The cases described as *epithelioma* of the lachrymal gland should probably with more correctness be regarded as cases of *adeno-carcinoma*.

6. In the older ophthalmological literature, a number of cases of *cystic degeneration* of the lachrymal gland, or its ducts, have been described as *dakryops*. These cysts grew very slowly, and had to be removed on account of their impairing the motility of the eyeball. It is not known whether the whole of the lachrymal gland is likely to undergo such a change.

XII. TUMORS OF THE LACHRYMAL CARUNCLE.—The lachrymal caruncle is sometimes the seat of a new formation. Thus, congenital dermoid tumors have been observed in this region. Papillomata are not rare.

In advanced life the caruncle may become the seat of epitheliomatous new formations as well as of sarcoma. The latter kind of tumors are usually pigmented. The development of these tumors is almost always attributed to an injury.

XIII. TUMORS OF THE LACHRYMAL DRAINAGE APPARATUS.—In rare cases small *granulomata* (polyps) have been found in the lachrymal sac, and even in the lachrymal canaliculus. It is obvious that such little tumors may gain some clinical importance by the stoppage of the canals through which the tears ought to be carried off. Their formation is due to chronic inflammatory conditions of the mucous membrane of these channels.

Adolf Alt.

EYELIDS, AFFECTIONS OF THE.—The eyelids present two surfaces, both of which are subject to disease. The posterior, or under surface, *i.e.*, the surface which is in contact with the eye, is covered with conjunctiva, and affections of this surface are described under this head. (*Cf. Conjunctiva, Diseases of.*) In describing the affections of the eyelids we have to consider the anterior or upper surface, and the structure between the two surfaces.

The upper surface of the eyelid is covered with integument which is continuous with the integument of the forehead and face. It differs from the integument of the forehead and face in being thinner. Under the skin of the eyelids we find the subcutaneous areolar tissue, which frequently becomes infiltrated with effusions, and distended with air in injuries to the nose and air sinuses. The next tissue is the orbicularis muscle, the function of which is to close the eyelids. This is the muscle which is affected in paralysis of the facial nerve, producing inability to close the eyelids, or, as it is sometimes called, *lagophthalmus*. Beneath this muscle are the tarsal cartilages, upper and lower, the functions of which are to add to the protection of the eye, to preserve the contour of the lids, and, in the upper lid, to give attachment to the muscle which raises the lid—the *levator palpebræ superioris*.

The tarsal cartilages contain in their substance the Meibomian glands, whose sebaceous secretion lubricates the edges of the lids. The tarsal cartilages are thicker at the free margins of the lids, and gradually taper back to a thinner edge; they are about one inch in length. The upper cartilage is about one-third of an inch in breadth at its centre, and narrowing toward its outer and inner extremities has a somewhat semilunar shape. The cartilage of the lower lid is much smaller in width, having a more or less elliptical shape. The free margins of the upper and lower lids—*i.e.*, the edges where the anterior or cutaneous surface and the posterior or conjunctival surface meet—lie in contact with each other when the eye is closed, and contain the cilia, or eyelashes, together with the openings of the ducts of the Meibomian glands. The extremities of the margins of the upper and lower eyelids are joined together, and are called the outer canthus and the inner canthus.

These canthi, with the extremities of the cartilages,

are attached to the frontal processes of the superior maxillas at the inner sides, and to the malar bones on the outer sides, by the canthal ligament. It is important to bear this in mind in operations on the outer canthi especially.

The inner canthi are shaped somewhat like horseshoes, and at the free extremities of the openings of the lachrymal canals, the *puncta lachrymalia*. Under the tarsal cartilages is the palpebral portion of the conjunctiva.

The eyelids are subject to diseases affecting the integument generally, as well as to affections peculiar to themselves, because of the structures involved.

The departures from the normal which may affect the cutaneous surfaces of the eyelids, either separately or in common with the skin of the forehead and face, are, *erysipelas*, *exanthemata*, *ecchymoses*, *herpes*, *oedema*, *emphysema*, *venereal sores*, *eczema*, and *acne*.

Erysipelas and *exanthematous diseases* seldom, if ever, attack the eyelids except as they affect the cutaneous surface generally. *Erysipelas* is never confined to the integument of the eyelids alone, except that the attack may originate in this situation and spread to other parts. Its restriction to the eyelids, under these circumstances, would be only temporary, lasting, at most, not more than forty-eight hours. The writer has seen a patient attacked with what appeared at the onset to be a purulent conjunctivitis, with eyelids red, swollen, and oedematous, together with a moderately profuse purulent discharge from the conjunctiva, develop in less than thirty-six hours into a case of facial *erysipelas*, the eye symptoms subsiding as the disease spread over the face. There are none of the *exanthemata* in which the eruption manifests itself first about the eyelids, and when the eyelids are involved it is only as a part of the general cutaneous involvement. *Eczema* may manifest itself on the eyelids as the result of a general facial condition, or may be secondary to the inflammatory condition of the edges of the lids known as *blepharitis*; of this we will speak later.

Acne may also affect the eyelids as the result of a general cutaneous affection.

The treatment of these general inflammatory affections of the integument of the eyelids does not differ from the treatment of the same disease when located elsewhere in or on the cutaneous surface. It may be necessary to be cautious in the employment of lotions, embrocations, and ointments, containing irritating substances, because of the danger of injuring the delicate structure of the eye itself, but other than this the treatment of affections of the lids, such as we have mentioned, will not differ from the usual treatment employed when these affections are situated in other parts of the body.

Venereal sores which may affect the integument of the eyelids are *chancres*, *chancroids*, and *venereal ulcers*. One would be naturally suspicious of the nature of an ulcer or sore on the eyelid in a patient known to be suffering from syphilis, or in one who had *chancroids* or sores known to be of venereal origin, located elsewhere. Even when symptoms of venereal disease do not exist elsewhere, venereal sores may exist on the eyelids. When patients present ulcerations of the integument of the eyelids which do not yield promptly to treatment, and which the microscope does not demonstrate to be malignant, our suspicions should be aroused at once—as to their possible venereal origin.

Chancres of the integument of the eyelids are not so common as chancres of the conjunctiva, and we do not wish to be understood as intimating that they are commonly met with in the latter situation. They are, however, occasionally encountered in the integument of the eyelids, and are not always easily distinguished, macroscopically, from malignant diseases, especially *epitheliomata*. The diagnosis may have to be made with the microscope.

The treatment of venereal sores and ulcers will depend on whether their origin is syphilitic; but whether syphilitic or not, their treatment will differ radically from the treatment of malignant growths or neoplasms.

Syphilitic and venereal sores and ulcers of the eyelids will require the local and constitutional treatment commonly given this class of affections without regard to their situation. Malignant growths, on the other hand, will generally require operative treatment.

Herpes affecting the eyelids, oftener the upper, is not uncommon. We commonly meet with a mild form of herpes—fever sores as they are called—but we also meet with a severe form, the two differing so as almost to warrant describing them as different affections. We have herpes in the mild form, occurring as the result of febrile disturbances in children, occasionally also in adults. It may follow exposure to high winds, sunburn, and irritations of the skin generally. The herpetic eruptions from these causes affect all parts of the integument of the face indiscriminately, often both sides at the same time, including the eyelids. There appears a slightly elevated red spot, more or less rounded in outline, varying in size from 3 to 20 mm. in diameter, or even larger. This red spot tingles and burns, and in twenty-four hours begins to be vesicular in character, composed of a number of small vesicles. The fluid in these vesicles, which in the beginning is watery, soon becomes flocculent, changing into pus. The vesicles coalesce and break down, forming a scab. If this scab is removed we find the surface beneath ulcerated. Whether removed or not, the sore heals in a week or ten days, leaving a reddened surface, which may persist for a week or two weeks longer. Attacks of herpetic eruption such as this are of frequent occurrence in neurotic people, the result of some slight nervous irritation, or of direct irritation of the terminal endings of the sensory nerves. The course is mild, the treatment palliative, and the prognosis good.

We have another form of herpes, as we have said, known as *herpes zoster*, which affects the supra-orbital branch of the fifth nerve, generally unilateral, and often very serious in its consequences. *Herpes zoster* is ushered in with violent pain over the distribution of the nerve, producing intense supra-orbital neuralgia, which may last a day, or even two days, before the eruption takes place, and at times persisting during and after the eruptive period. The skin of the upper eyelid becomes reddened and swollen, and the lid itself oedematous. There is more or less marked febrile action. The eruption appears to be the same as that described in the simpler form of herpes, except that the underlying ulcers are deeper and frequently leave scars. The condition takes its name from the parts affected, as *herpes zoster frontalis*, *herpes zoster palpebralis*, and *herpes zoster ophthalmicus*. When it affects the eye itself (*herpes zoster ophthalmicus*) very serious results, even destruction of the eyeball, may follow.

The writer has seen several cases of *herpes zoster* affecting the eyelids and forehead which have been diagnosed by attending physicians who were not familiar with the disease as *erysipelas*, all coming from malarial districts.

The treatment consists of cathartics, hot applications to the affected parts to relieve the pain, and even opiates may be necessary. During the beginning of the eruptive stage, the intense irritation may be allayed by applications of weak solutions of acetate of lead, lead and opium wash, or carbolic acid. After the vesicular stage has passed, an ointment of carbolic acid and vaseline will soften the scabs and prevent, possibly, the formation of deep scars. In the writer's experience the best results have followed the internal administration of quinine.

Oedema of the eyelids is a symptom of importance in affections of the eye itself, as denoting the intensity of the exciting cause, which is generally of an inflammatory nature. Oedema may occur in the eyelids also because of disease of organs remote from the eye, as in cardiac and renal disease, and in *anæmia*.

When due to local causes situated in the eye or adjacent structures, the amount of the oedema will generally be in proportion to the intensity of the disease which produces it, as well as to the location of the affection. For example, we frequently find in *iritis*, both primary

and when due to cataract extractions, an oedema of the lids at the inner canthus. The same will be true of keratitis, scleritis, tenonitis, and inflammations of the eye and its appendages generally. Oedema of the eyelids from affections of the eye itself is never so extensive or marked as we sometimes find it as the result of purulent inflammations of the conjunctiva, dacryocystitis, panophthalmitis, frontal-sinus disease, and retrobulbar abscesses or tumors, in which affections it may become so marked as to threaten the destruction of the eye from pressure. Oedema of the eyelids may also be present as the result of stings of insects. There is ordinarily very little to be done for oedema of the eyelids. When due to renal disease it is more pronounced after rest in a recumbent position; when due to cardiac disease it is more or less constant, although more pronounced after physical exertion. There is no local treatment which will remove oedema when due to these two causes. If we find associated with the oedema—as we sometimes do—an irritation of the eye and the under surface of the eyelids, we can obtain a certain amount of relief from the use of bicarbonate of soda and tannic acid, each ten grains to the ounce, or a solution of boric acid in camphor water.

When due to inflammatory conditions of the eye and surrounding parts there is nothing to be done for the oedema itself—beyond the application of a light bandage—except when the swelling of the lids is so great as to threaten the eye, when the pressure can be relieved by the operation known as external canthotomy, or division of the external canthus. Such extreme treatment is, of course, seldom necessary.

It this connection we may mention an affection of the eyelids which may be mistaken for oedema. This is emphysema, due to injury of the nose or of the sinuses which surround the eye. The onset is sudden, following a traumatism, and characterized by swelling of the eyelids, one or both, depending on the situation and extent of the injury. There may be redness of the integument of the lids,—which, in fact, is true in any swelling of the lids, even when not of an inflammatory nature; and palpation gives to the fingers a crackling sensation. This distention is apt to be more marked in the lids than in the surrounding parts, for the reason that the integument of the lids is so loosely connected with the underlying parts, and its areolar tissue has so little adipose tissue in its meshes that it becomes easily inflated when the walls of the sinuses, or other air cells which abound in this situation, are broken. No treatment is necessary for the emphysema itself, except in extreme cases, when a bandage may be applied. When the cause of the emphysema is removed the air disappears.

The pathological conditions grouped and described under the heading of skin diseases may affect the integument of the eyelids, acne and comedo being perhaps the least common, while milium, molluscum, and xanthelasma occur frequently; acne merits, at our hands, no description, differing in no way from the acne seen in other parts of the body. Comedones, or black-heads, can be removed, here as elsewhere, excepting that while in other parts they may be removed with the time-honored watch key, or the expressly designed comedo pressers, in the eyelids they are best removed by pressure between the thumb nails. The minute white elevations with sebaceous concretions known as milia, or the larger masses with depressed centres known as mollusca, require a slight incision made in their apices before they can be expressed without the infliction of considerable traumatism, or bruising of the skin.

Xanthelasma, the buff or yellowish-colored patches which are found at the inner part of the lids, and which affect middle-aged people, especially women, can be removed only with the knife or scissors. If they are not too large, the writer's method is to grasp them with a broad-pointed forceps and snip them off with scissors. The skin, which is very loose on the eyelids, can be slightly undermined with the same scissors, and one or two sutures will obliterate all trace of the affection, which is never anything more serious than a blemish. If

the xanthelasma is large it may be impossible to excise it without sacrificing more skin than it is wise to remove. In such a case it would be better to advise the patient to tolerate the blemish, with the assurance that it will never assume a serious or malignant character.

We meet occasionally, in or under the skin of the eyelids, with horny and warty growths, lipomata, and cysts. These are easily removed, under either cocaine or general anaesthesia, leaving only small scars, which time effaces.

The skin of the eyelids is not infrequently the seat of malignant growths, the most common form being epitheliomata.

Epitheliomata seldom appear in the eyelids before middle age; indeed, most of the cases seen by the writer have occurred long after middle age. The history is alike for all cases; there has appeared a small, roundish, elevated patch or pimple, which may exist for months or even years, without causing very much annoyance. Then without apparent cause, or sometimes as the result of the patient's picking it, this patch or pimple becomes ulcerated, and refuses to heal under ordinary treatment. When these patients present themselves to the specialist the growths have passed, as a rule, into the ulcerative stage, and the patients are prepared to hear that they have malignant disease or cancer.

Even when ulceration has begun, a long time may elapse before the affection takes on a rapidly growing malignant character. There is always, in cancerous affections of the eyelids, a long period during which removal can be effected without serious deformity to the lid, and during which time removal means permanent cure. It is only after the disease has existed long enough to involve the entire structure of the eyelid, the skin, the conjunctiva, and the tissues between, when not only is there a deeply ulcerated spot, but the surrounding tissues are infiltrated, that the question of extensive operation, possibly the removal of an entire upper or lower lid, has to be considered.

It is not just to our patient to conclude hastily that a suspicious-looking ulcer of the eyelid is a malignant growth, any more than it is to defer action in the hope that it may not be malignant. We of course consider the history of the case, the age of the patient, and other points which may occur to us at the time, but the knowledge which should influence us, and which we should obtain as soon after seeing the patient as possible, is that furnished by the microscope. When we have this information, and are satisfied that a patient has malignant disease, the indications for treatment are very clear. There is but one thing to do in cancerous disease of the eyelid as elsewhere, and that is to remove the offending neoplasm; and, should we elect to remove it with the knife, we should not hesitate to remove sufficient tissue to include not only the growth itself but all infiltrated structures as well.

In removing cancerous disease of the eyelids, ophthalmic surgeons, almost without exception, prefer to resort to the knife. Some of the authorities mention the use of caustics, but the writer has been unable to find, among the various text-books on diseases of the eye, even one which recommends any other method than the knife.

It is safe, as a rule, to be guided by the advice of those who have had large experience and who are considered authorities; the exclusive use of the knife in removing cancerous growths of the eyelids is, no doubt, advocated as the result of experience. One author on diseases of the eye (Noyes) mentions the use of caustics, and his objection to their use is that they leave scars which have to be removed by operation later, while with the knife in the beginning both the cancerous growth can be removed, and the resulting deformity remedied at the same time, which is of course true. Still, a deformity of the eyelid, while it may be disfiguring, is not fatal to life, and many persons have so great a fear of the knife that, to them, death may be preferable. Then too the element of time may be a consideration. A surgeon would hesitate to perform a plastic operation for the removal of a cancerous growth and the repair of the eyelid except under

general anaesthesia, and with the knowledge that his patient would remain quiet for at least two weeks following the operation, in order to secure proper healing. With the caustic treatment it would perhaps be possible for a patient to attend to his ordinary business occupation while undergoing treatment. We have in mind a case of this kind. An elderly gentleman, earning a precarious living as an insurance agent, with a large and helpless family depending on him, presented himself for treatment for an epithelioma of the upper eyelid. The disease had entered upon the ulcerative stage, and involved a spot in the centre of the lid, about 3 mm. in diameter. He was willing to submit to an operation providing it did not interfere with his work; he was unable to stop his work for even one week. In such a case it seems as if one would be justified in employing a caustic application. The resulting scar could be remedied at any time, while the epithelioma, if allowed to go on unchecked, would destroy tissue, and involve structures which could be remedied only by great sacrifice, if at all. Dr. A. R. Robinson, in "Observations in the Treatment of Cancer," concludes "that the majority of cases of cutaneous cancer can be removed with the greatest certainty and with least deformity by caustics, provided the patients are seen before the lymphatic glands are invaded." This, of course, applies to cutaneous surfaces generally, but with less force, perhaps, when the disease is in the integument of the eyelid, because of the danger to the eye itself from the caustic application. It is impossible to lay down rules which shall be invariable guides, or to give advice which is to apply to all cases indiscriminately, but the writer believes that while the use of the knife is the best method of treatment in most cases of cancer of the eyelids, there are times when caustics may be employed with advantage.

Of the affections which are situated at the margins of the eyelids, one which is not uncommon is phthiriasis, or pediculi ciliares. This affection, which is not by any means confined to unclean people, is discovered by the specialist or the family physician, and its discovery horrifies the patient and fills him with wonder. The symptoms are, itching and redness of the margins of the eyelids, and, if the condition is neglected, falling of the eyelashes. Inspection reveals the presence of the pediculi on the edges of the lids and the ova pediculi on the lashes. The treatment will consist in the removal of the offending parasites, crushing them between the thumb nails, and the application of some parasiticide. Bichloride of mercury wash must be used with caution, because of the irritating effect of this drug on the cornea. As a rule removing the parasite with the nails, as mentioned above, and the application of the yellow oxide of mercury ointment, will effect a cure in a few days.

Hordeolum is an inflammation of one of the glands of the skin of the eyelids, situated at or near the margins of the lids, and often attended with considerable swelling and tenderness, and even constitutional disturbance. There are generally a succession of the hordeola, a new one appearing as another gets well, until a dozen or more have appeared. Such a condition has often underlying it some general constitutional debility, and will require for its treatment nourishing diet, fresh air, and tonics. It is doubtful, however, if this condition of furunculosis, if it may be given this name, ever attacks and is confined to the eyelids, even when there is marked constitutional debility, unless there is added to the general derangement a local exciting cause as conjunctivitis, or some weakness or abuse of the eye itself. It is advisable, as a preliminary to the general treatment, to give attention to the local cause. If there is found to be an uncorrected refractive error in the eye, it should be corrected, and a coexisting conjunctivitis should be treated. For the hordeolum itself, nothing relieves the pain and hastens the termination of the inflammation so

much as the application of hot water. Warm poultices, to hasten suppuration, which would be advisable elsewhere, should not be used for inflammations here, because of their effect on the conjunctiva. Some of the most aggravated cases of conjunctivitis the writer has ever seen have been caused by the application of flaxseed and tea-leaves poultices. Suppuration is the final outcome of a hordeolum, but it has seldom been necessary in the writer's experience to employ the knife for the evacuation of the pus, this being, as a rule, rapidly brought about by the hot applications. Spirits of camphor has been recommended to abort the inflammatory process, and while it does not invariably accomplish this, the writer has seen beneficial results follow its use.

A chalazion is a distention of a Meibomian gland with its normal secretion. This is caused by an occlusion of the duct of the gland, which may be either permanent or temporary. The distended gland sometimes becomes inflamed, when it simulates a hordeolum. Ordinarily a chalazion presents itself as a circumscribed swelling, hard to the touch, and of variable size. It may be in either the upper or lower eyelid, and not infrequently

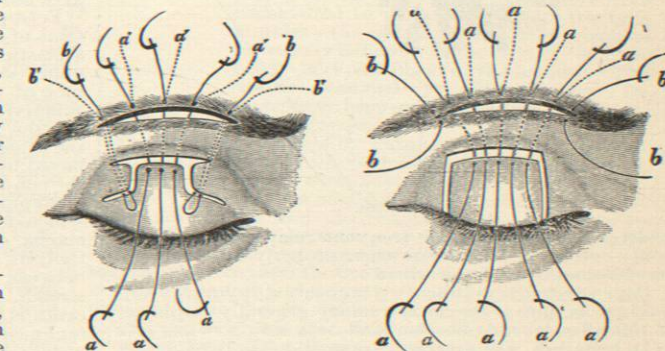


FIG. 2066.—Panas' Operation for Ptosis. (After de Schweinitz.) a, a, Sutures uniting flap to integument of brow; b, b, sutures closing extremities of incision in brow.

there are more than one in the same lid, and they often exist in all four eyelids at the same time. They also are caused by conjunctivitis, which may or may not be due to uncorrected errors of refraction.

A chalazion may sometimes be cured by massage of the eyelids, the accumulation within the gland being pressed out through the duct. When this cannot be accomplished the cyst can be incised and the sac curetted. It has been recommended that the incision be made into the sac through the margin of the lid, or, if the incision is made through the conjunctiva, that it be perpendicular to the margin of the lid, so as to avoid cutting other Meibomian glands than the one involved. While the incisions can be made equally well in either situation, *i. e.*, through the margin of the lid or through the conjunctival surface, in some cases, in others the method to be employed will depend on the size of the tumor and its location. There is no danger of the incision destroying other glands in either case, and no evil results ever follow incisions made in either situation.

Blepharitis marginalis can be properly classed as an affection due to the same causes as hordeola and chalazia. It is possible to have blepharitis as the result of phthiriasis, but the affection commonly known as blepharitis is due either to conjunctivitis or to uncorrected errors of refraction, and more often to the latter.

Blepharitis is characterized by a redness of the margins of the eyelids, with which is associated a scaly condition, and finally by an interference with the nutrition and growth of the eyelashes.

This may be the cause of trichiasis and distichiasis, but

oftener it results in the death of the eyelashes, the lids finally becoming entirely devoid of these hairs.
The treatment of this condition is local, and consists in applications to the eyelids themselves, and the correction of errors of refraction with suitable glasses. It is not unusual to see stubborn cases of blepharitis, which

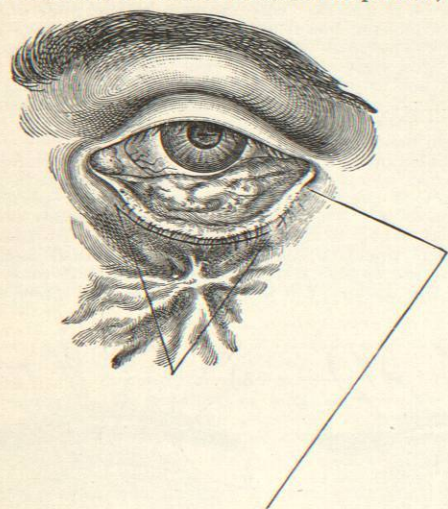


FIG. 2068.

resist treatment, or after frequent relapses, finally become cured and remain so, when properly fitted glasses have been adjusted and worn.

Pagenstecher's ointment (Unguentum hydrargyrum oxidum flavum) is the local remedy generally employed in this affection. It is often made too strong, when it is very irritating; the greatest care should also be exercised in selecting a proper base, and having it thoroughly mixed. The ointment should never be made stronger than one grain to the drachm (except as a parasiticide) and the best base to employ is vaseline. Fatty bases, as cold cream, simple cerate and others—which contain lard—decompose; the fatty acids alter the chemical nature of the yellow oxide, making, as before mentioned, an irritating ointment. This is an important consideration which should not be forgotten.

Trichiasis and distichiasis, together with entropion, are the results of inflammatory affections of the conjunctiva, such as chronic conjunctivitis and chronic trachoma. As a result of cicatrization of the conjunctiva, the tarsal cartilage becomes curved, and the eyelashes, instead of curving outward, curve inward and sweep over the eyeball. The eyelashes can be pulled out, and for this purpose specially devised forceps have been made, called epilation forceps. The relief afforded by this treatment is only temporary and incomplete. The eyelashes grow again, and even if pulled again the inner edge of the margin of the lid rubbing over the eye keeps up the irritation. The radical cure of this condition is by operation, and the writer prefers the operation in which a wedge-shaped piece of the tarsal cartilage is removed. The results obtained from this operation are good and lasting. It is performed as follows: The patient is anesthetized (which, by the way, is best in all plastic operations about the eyelids). Cocaine gives satisfactory results only in operations on the eye itself. An incision is made through the skin, parallel with and about 2 mm. from the tarsal margin, extending down to the tarsal cartilage. Pushing the muscle and connective tissue aside, the operator should expose the whole surface of the cartilage and should carry the incision straight down, in such a manner as to involve almost the entire thickness of the cartilage. Sometimes the knife will go through the cartilage,

but this does no harm. A second incision is then made in the cartilage, about 2.5 mm. from the first, tapering to and meeting the first incision at the ends. This second incision, instead of going straight down through the cartilage, is made obliquely, and meets the first incision not only at its ends, but at the bottom as well. The wedge-shaped piece of cartilage thus formed is removed. A central suture is then passed through the lower edge of the incision in the skin, and through the lower edge of the incision in the cartilage. It is then carried through the upper part of the cartilage, passing over the groove made in the cartilage by the removal of the wedge, and finally brought down through the upper edge of the cutaneous incision. Two more sutures like the first are inserted, one on either side of the central suture, and as many more as the operator thinks necessary. When these sutures are tied the margin of the lid and the lashes will be permanently everted. This operation can be employed only in the upper lid. Operations for the relief of entropion of the lower lid are not nearly so satisfactory. The cartilage in the lower lid being so small, the best we can do is to remove an elliptical piece of skin, which will give relief, often lasting a long time.

Ectropion is the result, as a rule, of cicatricial contractions of the skin of the eyelids, and requires for its relief a plastic operation. We will consider these operations under wounds and burns. There are two forms of ectropion of the lower lid, however, one due to chronic conjunctivitis, in which the hypertrophy of the conjunctiva and the underlying connective tissue everts the lid, and the other the result of senile change, which can be relieved by applications of alum or sulphate of copper to the conjunctiva.

Blepharophimosis, a narrowing of the palpebral orifice, which may be congenital or the result of chronic trachoma, can be remedied by the operation known as cantholysis, or canthotomy. A wire speculum is inserted between the eyelids, and the external canthus put on the stretch. With straight and strong scissors the external canthus is then divided, both mucous membrane and integument, back to the margin of the orbit. The mucous membrane is then lifted with forceps and the external canthal ligament divided. The mucous membrane at the bottom of the wound thus made is united to the integu-

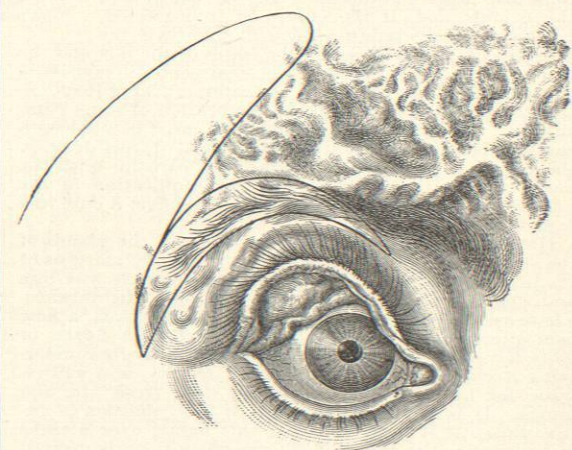


FIG. 2069.

ment and at the sides as well. A vaseline dressing is applied, and the stitches are removed in three or four days.

Canities is a name given to white eyelashes, of which there may be one or more in an eyelid whose other lashes are of darker color, even black. This condition may be congenital, or the result of some interference with the nutrition of the cilia. Nothing can be done for this

except epilation, which may be resorted to if the white lashes are not too numerous.

Interference with the motility of the eyelids, due to paralysis or other causes, is of frequent occurrence and demands attention. The most annoying and dangerous to the patient's sight, and which will often baffle the physician, is the inability to close the eyelids in paralysis of the seventh nerve. In this condition the eyelids are

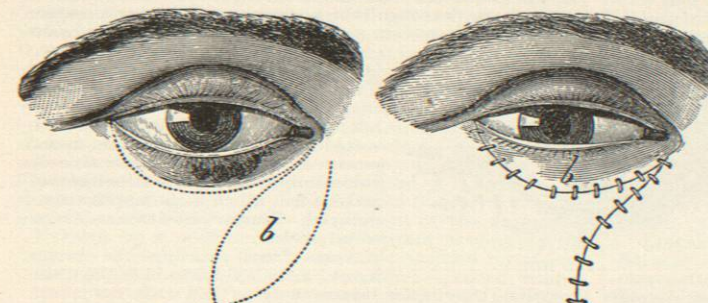


FIG. 2070.

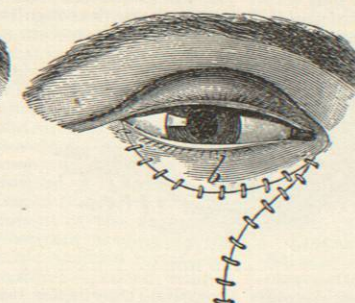


FIG. 2071.

open when awake and when asleep, and the eye frequently becomes irritated and even ulcerated and destroyed, from this constant exposure to wind, smoke, and irritating substances generally. If the paralysis is transitory, it may only be necessary to protect the eye with a bandage or with a shield; when the paralysis becomes permanent, however, as sometimes happens, it may be necessary to resort to operative procedure, and to close the eyelids by suturing the upper and lower lids together, first denuding the edges.

The opposite condition to paralysis of the seventh nerve is the inability to open the eyelids when the third nerve is paralyzed. This condition is known as ptosis, and when due to paralysis of this nerve is generally acquired, and amenable to treatment by drugs. Paralysis of the third nerve—the motor oculi communis—may be due to intracranial growths, when it becomes a very serious condition; in the majority of cases, however, this paralysis is due to acquired syphilis, and responds quickly to antisyphilitic treatment. We do occasionally meet patients in whom ptosis due to this cause persists, even after prolonged treatment, and when we have every reason to believe the syphilis has been cured, and then it is necessary to resort to operative treatment if we desire to remedy the defect. We may not consider it advisable to remedy this deformity always, as we shall consider later.

Ptosis may be due to other causes; it may be congenital or it may be the result of chronic conjunctivitis or trachoma.

In congenital ptosis there may be associated with the paralysis, or imperfect development of the levator palpebræ superioris, paralysis or imperfect development of some of the other muscles of the eye, notably the superior rectus. Any or all the recti muscles may be involved, generally one of those supplied by the third nerve. The writer has seen a patient in whom not only were the muscles supplied by the third nerve affected, but the external rectus, which receives its motor power from the sixth nerve, was also involved. When the superior rectus is involved the eye will be rotated downward, and when the internal alone is affected the eye will be drawn outward. The recti muscles are generally affected in syphilitic ptosis, and frequently are not affected in congenital ptosis. They are not involved when the ptosis is due to inflammatory conditions of the conjunctiva. To overcome the ptosis by operation

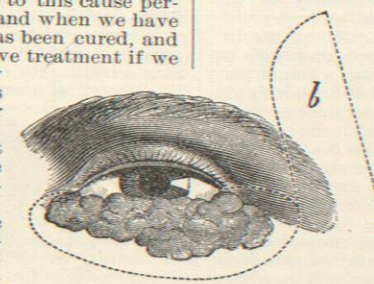


FIG. 2072.

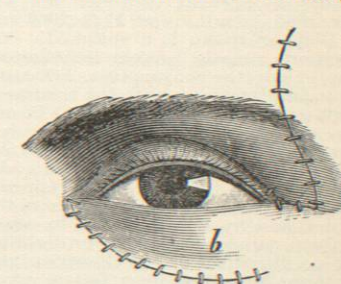


FIG. 2073.

when any of the recti muscles are involved may, by exposing a deviating eye, produce an annoying diplopia, and this will have to be considered before advising such an operation.

In trachoma, after the disease is cured, a drooping of the upper eyelid will sometimes persist, which may necessitate an operation, and it is in cases due to this cause that our best results are often obtained. Various operations

have been devised to overcome this deformity, and the results have been until recently rather unsatisfactory. The levator palpebræ superioris muscle, which raises the upper eyelid, arises in the orbit, from the lesser wing of the sphenoid bone, directly in front of the optic foramen. Its insertion is in the upper eyelid, to the convex margin of the tarsal cartilage. Its action is to draw the lid upward and backward. In the absence or imperfect development of this muscle, and when it is inoperative because of some affection of the nerve supplying it with motor power, operators have endeavored to make the occipito-frontalis muscles—the anterior portion of which is intimately adherent to the skin of the forehead—take the place of the levator. The results obtained by Pagenstecher, De-

Wecker, and others, have been only partially satisfactory, the effects not being permanent.

The operation devised by Panas has given satisfactory results, which have been permanent. The operation is, however, somewhat complicated and difficult to perform. The writer has modified this operation, making it extremely simple, and the results in his hands, and in the hands of other operators as well, have been generally successful. It is performed as follows: The patient being anesthetized and the brow shaved, the face and forehead are thoroughly cleansed with a bichloride wash. An assistant then inserts under the upper eyelid a horn shield, and with his free hand steadies the skin of the brow, as directed by Panas. The operator then makes in the upper lid, at or slightly above the upper convex margin of the tarsal cartilage, an incision which commences at the inner side and includes the middle third of the lid. From the inner extremity of this incision another is made extending down to the ciliary border, and a third is made in like manner from the outer extremity

of the first. The integument enclosed by these three incisions is dissected from the underlying tissue, down to the ciliary border of the lid, making a flap. A final incision is made in the brow, parallel with the first incision in the lid, but slightly longer. The integument between these two horizontal incisions is then undermined in such a manner as to make a bridge. The parts are carefully cleansed, the flap is passed up under the bridge and secured by stitching its upper margin to the upper margin of the incision in the brow. This is accomplished by means of five interrupted silk sutures. The outer and inner extremities of the final incision (i.e., the outer and inner extremities of the incision in the brow after the flap has been stitched in

place) are sutured, and the whole is covered with sterilized vaseline and bichloride gauze, and bandaged. The bandage is not to be removed for two days, after which it should be removed daily for a week, when the stitches can be taken out and the dressing discontinued. The epithelium of the flap becomes macerated and exfoliates, and the true skin unites with the under surface of the bridge, of which it becomes a part, or perhaps disappears.

It is not well to make the flap too narrow; it may even be made to include more than the middle third of the lid. Its length should vary with the degree of ptosis to be

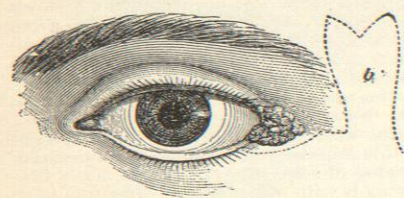


FIG. 2074.

overcome. Sometimes after the operation the eyelids may not close in sleep, but this is only temporary. Another point to be considered is the tendency of the bridge to curl, causing a scar in the brow. This can be avoided by including the upper edge of the bridge in the sutures which unite the flap to the skin of the brow. The epithelial surface of the flap may also be scarified slightly, to hasten its union with the under surface of the bridge.

This modification differs from the original operation of Panas in that the lines of incision are straight, and extend only through the integument, whereas Panas recommends that they extend down to the periosteum, which must necessitate a longer time in healing, and adds to the operation the danger of wounding deeper tissues, as, for example, the supra-orbital nerve.

The object of this operation is to make the occipito-frontalis muscle take the place, or do the work, of the levator of the lid; the flap, uniting by first intention with the upper edge of the incision in the brow, becomes a part of the skin controlled by the contractions of the occipito-frontalis, quite as much as it would if the incisions were deeper. The two lateral sutures advised by Panas to prevent ectropion are not necessary in the modified operation (see Figs. 2066 and 2067).

Blepharospasm is a spasmodic contraction of the orbicularis muscle, present in inflammatory conditions of the eye or the conjunctiva. Occasionally, when it persists and interferes with the treatment of the underlying inflammatory condition, it may be necessary to perform the operation known as canthotomy, which we have already mentioned. Blepharospasm may also be associated with the affection known as tic douloureux. If the cause of the tic can be ascertained, the treatment will suggest itself. In some cases nothing seems to afford relief, and we are compelled to resort to operative procedure, namely, stretching or dividing the trigeminus, or even extirpation of the Gasserian ganglion. Even these extreme measures often fail to give relief. The writer now has a patient under observation who has facial tic with blepharospasm, and who has become an opium victim, whose ganglion was removed many years ago. When last seen this patient was taking sixteen grains of morphine sulphate daily to relieve the pain.

Nictitation, or winking of the eyelids, is due often to local troubles, as conjunctivitis and trachoma. Even uncorrected errors of refraction may be the cause. When due to these conditions, the removal of the cause will effect the cure. At times a general nervous derangement seems to be the cause, when tonics are indicated. One must not expect, however, to cure all these cases, especially when the patients are markedly neurasthenic.

Echymosis of the eyelids occurs as the result of traumatism or of paroxysms of coughing, as in whooping-

cough in children and in chronic bronchitis in older persons, or it may occur without apparent cause.

When echymosis of the eyelids occurs in elderly people without apparent cause, we should be suspicious of atheroma of the blood-vessels, and the interior of the eye should be examined for hemorrhages. We should also bear in mind that a hemorrhage of this character may be the precursor of cerebral hemorrhage. Extremely hot applications are recommended by some authorities as giving the best results in echymoses due to traumatism, while others recommend iced applications. The writer

prefers the ice for the reason that it is easier to apply, and is therefore likely to be more efficiently applied than hot applications. Either very hot or very cold applications, if resorted to as soon as the traumatism is received, will prevent extensive discoloration of the skin, but neither will accomplish much if the application is delayed. Warm fomentations are not to be advised.

Aside from painting the integument of the eyelid to hide the discoloration, time is the best remedy.

Almost every conceivable injury which can happen to the integument of the body elsewhere can occur about the eyelids. The writer has seen a patient whose eyelid was nearly torn off in a street fracas, and has also seen an eyelid split by the branch of a tree, and by being caught on a butcher hook. Any of these injuries can be repaired while still fresh by carefully cleansing the parts and bringing them together, retaining their apposition with sutures. Larger and older wounds may require extensive plastic operations, the extent and nature of which will depend on the wound.

Burns of the eyelids are not uncommon, and especially gunpowder burns. It is well in powder burns to remove, as thoroughly as possible, all particles of powder which may be in the skin. The only way in which this can be accomplished is to pick the particles out, one at a time, with a forceps or spud. It may take hours of patient work to do this, but the result amply repays the time so spent.

In many, perhaps most, powder burns, only the epithelium of the lid will be injured. When this is the case, it is only necessary, after the powder specks have been removed, to apply a bichloride vaseline, bandage the parts, and keep them clean.

Where more than the epithelium has been injured, it may be necessary to stitch the lids together and resort to skin grafting in order to prevent the deformity which the cicatricial contraction will produce. The method of

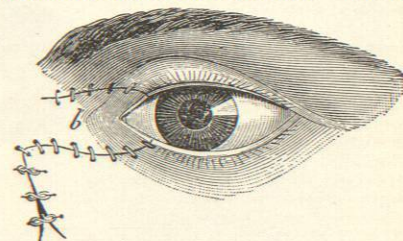


FIG. 2076.

skin grafting which gives the best results is the Thiersch method.

The repair of damages to injured eyelids, and the relief of deformities occasioned by cicatricial contraction of wounds caused by injuries and burns, will give opportunity for the display of all the ingenuity and skill an operator may possess.

It is impossible to lay down definite rules as to when deformities are to be remedied by skin grafting, and when it may be necessary to resort to extensive plastic opera-

tions and the transplantation of large pieces of skin from the forehead and face. As a rule, it is better to reserve the Thiersch method for those cases in which the damage is so extensive that it is impossible to secure enough sound skin from the face or forehead to repair the damage—a condition sometimes found after scalds and burns. There may be times when both the transplantation of skin and the Thiersch method may be employed.

An eyelid, or both eyelids, on one or both sides, may be required to be replaced by skin taken from the forehead or cheek, or even from some other part of the body, as the arm. The necessity for taking a flap from the arm happens infrequently, and can be considered only when a cicatricial condition of the face or forehead makes it impossible to secure it from these parts. To remove a large piece of skin in toto and transplant it on some other part of the body would result, as a rule, in the speedy death of the part so transplanted, unless it remained attached to its original situation by a pedicle. In order to transplant a flap of skin from the forearm to the eyelid, and still retain the attachment of the flap to the forearm by a pedicle, would necessitate bandaging the arm to the head in a firm, immovable position for at least forty-eight hours. This has been done,—indeed, such a transplantation has been successful without a pedicle,—the pedicle being severed when the flap has united. Generally, however, it is possible to obtain enough sound skin from the face, except, as we said above, when there is extensive cicatricial contraction. A few general rules are necessary in order to secure a good result in plastic operations. When the margins of the lids are widely separated or everted, by cicatricial contraction, the first step must be to divide the cicatrices and bring the lids together, holding them in proper position with sutures. Every contraction which draws in any way on the margins of the lids should be freely loosened. We shall then have exposed the whole denuded surface which it is necessary to repair.

The next step must be to secure the flap with which to cover this denuded surface. Undoubtedly we have selected the spot from which this is to come before we began our operation, and have been influenced in our choice by the necessity of obtaining a strip of skin large enough to fill in the denuded surface, from a place where it is possible to secure also a healthy pedicle. The flap should be as nearly as possible devoid of cicatricial tissue, and it is even more important to have the pedicle of healthy skin. We have seen transplanted flaps thrive when they included superficial cicatrices, but when it is possible to utilize only healthy skin it is better to do so.

The flap should be large enough to prevent any tension on it or the parts to which it is sutured, when *in situ*, and it should be as free as possible from adipose tissue. The pedicle by which it retains its continuity with the surrounding tissues should be as broad as it is possible to make it, and should lie as flat as possible. A slight twist in the pedicle is not fatal to a good result, but any twist which is likely to interfere with the circulation of blood in the flap is to be avoided. In attaching the flap to the skin with which it is desired to secure union, fine ironed black silk is to be preferred. The sutures should be close together, should not be very deep, and should not be tied too tightly. The writer does not recommend the use of harelip pins, believing that when they are necessary there is apt to be too great a tension on the flap to permit of union by first intention. A fatal mistake in plastic operations is to unite the parts before all bleeding has ceased. Severed arteries which persist in bleeding despite torsion should be tied with catgut ligatures, and the oozing of capillaries can be arrested by the application of hot water, or by gentle pressure; we must not use so much hot water that we destroy tissues and cause sloughs. The writer believes in the frequent washing of the parts with a weak bichloride solution during the operation.

After the parts are stitched in place, the spot from which the flap was taken must be repaired. This can be easily accomplished anywhere about the face, because of

the looseness with which the integument is applied, by freely undermining the edges and bringing them together. Here is a consideration which must be taken into account when choosing a site from which to take a flap. We must be sure that the bringing of the parts together after the flap has been removed will not create a tension on the edges to which the flap is stitched after it is in its new position.

Flaps should not be taken from the cheek of a man whose beard is heavy and placed on the eyelid. The writer has seen this done, the flap producing a thick growth of hair which was annoying as well as disfiguring.

When the flap has been stitched in place, and the parts have all been adjusted to our satisfaction, a dressing of bichloride gauze should be placed over the wounds and a bandage loosely applied. This can be removed in two or three days, the parts cleansed if necessary, and the dressings reapplied. It is desirable to disturb the wounds after plastic operations as little as possible. The stitches can be removed, a few at a time, in from three days to a week. (Figs. 2068-2076.)

Epicanthus is a congenital defect characterized by a flatness of the bridge of the nose, and by the presence of crescentic folds of skin over the inner canthi. The defect is remedied by removing an elliptical piece of skin from the bridge of the nose and bringing the parts together. (Fig. 2077.)

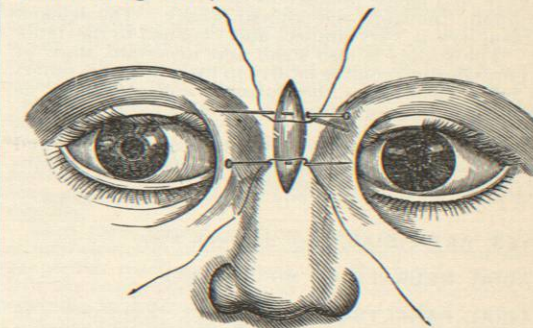


FIG. 2077.

Coloboma of the eyelid may also be congenital, and is remedied by paring the edges of the coloboma and sewing them together.

Nevus, another congenital defect, assumes a variety of forms. A simple reddened spot which varies in the intensity of its hue, often is seen in the eyelids of the newborn infant. Frequently these spots disappear in the first few months of life. Sometimes an intensely livid spot may cover the whole lid, or even the whole side of the face as well; when marked, these spots do not disappear, and very little can be done for them. Sometimes the distorted and enlarged blood-vessels may form distinct and irregular tumors. Treatment will be excision by means of the knife, or destruction of the blood-vessels by means of hot needles plunged into them. At times it may be possible to destroy a telangiectatic tumor by tying of the blood-vessels. The variety of these tumors renders it impossible to go into their treatment in detail in this article. Sometimes the results obtained are very satisfactory, and at other times, unfortunately, they are not satisfactory. Frank Van Fleet.

EYE-STONES.—The opercula of certain species of gastropod mollusks. These organs are horny or calcareous valves, situated in the so-called foot of the mollusks, and serving to close the apertures of their shells when the animals withdraw themselves into them. They are of different shapes and variously developed in different species—in many species they are absent altogether. Those which are used as eye-stones are hard, stony, plano-convex bodies, about as large as split peas, 0.005