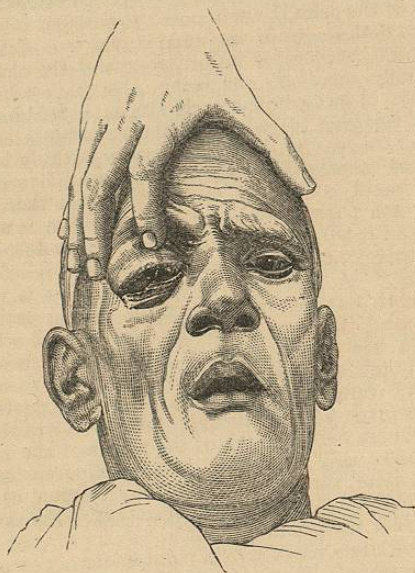


got a photograph taken of the patient, from which Fig. 8 is copied.

On admission into hospital a tumour could be distinctly felt, growing from the outer and upper part of

FIG. 8.



Supposed to be encysted.

the orbit, and pressing the eyeball downwards and inwards. The sight of the eye was perfect, the skin of the lid was not involved, and the tumour felt exactly like an encysted one; so much so, that I determined to operate. I was the more confirmed in this view, as the man had little or no pain in the part, and the glands of the neck were not enlarged; in fact, I undertook the operation supposing I had a non-malignant tumour to deal with.

Operation.

The patient having been put under the influence of chloroform, I slit up the outer canthus and reflected

the upper eyelid, so as to expose the morbid growth, which then, and not till then, I discovered to be scirrhus. Malignancy revealed.

The cancerous mass was attached to the orbital plate of the frontal bone, and extended deeply into the orbit. I removed the whole of the tumour, and then applied the chloride of zinc paste to the wound, hoping to save the eyeball. Removal.

The day after the operation the cornea was opaque, evidently from the effects of the chloride of zinc, and it ultimately sloughed, and the eye was destroyed.

It is useless my giving the details of the after-treatment in this instance. The wound gradually healed; but before it had cicatrized, the glands of the neck became enlarged, and I doubt not the poor old man speedily sunk from the effects of the disease. Unfavourable result.

Medullary Cancer of the orbit is characterized by its soft consistence and fungoid appearance, when protruding from the orbit. Its growth is rapid, and it invades all the surrounding structures; of all the tumours of the orbit it is the least hopeful as regards treatment.

EPITHELIAL CANCER is but rarely met with in the orbit. An interesting case of the kind is reported by Mr. Hulke.* The disease made its appearance subsequent to a blow received on the cheek. Six weeks after the accident, the patient presented much the appearance of a person suffering from an abscess, pointing at the lower and inner angle of the eye. The swelling was punctured several times, but no matter escaped, the mass yielding only a soft gelatinous substance. The tumour gradually increased, pressing upon the eyeball on one side, and obstructing the nostril on the other. The skin covering it was of a dusky red colour, and marked with sago-grainlike dots. EPITHELIAL CANCER.

Following a blow.

Extensive connexions.

After a time a spot of ulceration formed over the caruncle, which bled rather freely, with some relief to the patient; the morbid growth, however, continued to increase in size, and this was accompanied with much pain in the part.

Mr. Hulke removed the whole of the morbid mass, which extended downwards into the antrum, and back-

Removal.

* *Ophthalmic Hospital Reports*, vol. v. p. 336.

wards into the left nasal passage, projecting into the pharynx through the posterior nares, so that much of the maxilla, the left nasal bone, and lateral mass of the ethmoid had to be removed.

The tumour presented all the characters of epithelial cancer.

Unfavourable result.

The neighbouring lymphatics became involved, and the disease reappeared in the neck. Ultimately the patient died, eight months after the operation.

MELANOSIS.

MELANOSIS (*Melanoid Cancer*) sometimes attacks the contents of the orbit. Dr. Mackenzie mentions two instances of the kind. When the disease makes its appearance in the orbit, it runs precisely the same course as in any other part of the body, involving the bones and other structures it meets with in its progress.*

A few days before the case of scirrhus above described came under my care, another man presented himself at the hospital, suffering from a melanotic tumour of the orbit:—

CASE.

S. D., aged thirty-two, states that he had a small tumour removed from near the inner angle of the left eye, about four years ago. We can obtain no clue to the nature of this morbid growth. A year after the operation a tumour again commenced growing in the same situation; it caused him no pain.

Growth slow and painless.

At present a morbid growth is seen situated towards the inner part of the orbit, Fig. 9. It has evidently deep-seated attachments, and feels hard to the touch; the skin is not involved. The left eyeball is displaced by the tumour an inch outwards, and fully one inch forwards, from its normal position; nevertheless the eye moves in unison with the other one, and its sight, for both near and distant objects, is perfect. The patient's general health is good, and no enlargement of the glands of the neck exists.

Eye displaced.

Health good.

Removal.

On the 15th of October I proceeded to remove the morbid growth, at the same time endeavouring to save the eyeball.

After making the necessary incisions through the skin, and exposing the tumour, I found that it was attached to the lower, and also to the inner walls of the

* Case in point by Mr. J. Z. Laurence: *Transactions of Pathological Society of London*, vol. xvi. p. 235.

orbit; I consequently removed not only the morbid growth, but also cut away a considerable part of the

FIG. 9.



(From a Photograph.)

bones with which it had been united. Lastly, the wound was filled with lint soaked in the chloride of zinc paste. Caustic applications.

The cornea became hazy immediately after the application of the paste, and subsequently sloughed, the eyeball collapsing; but, excepting this loss of the eye, the case progressed most favourably, and the wound healed and cicatrized. Four years subsequently this patient returned to the hospital; a small bleeding fungoid mass was growing from the site of the original tumour, the glands of his neck were enlarged, but the man appeared otherwise healthy. The excision of the tumour has in this case evidently stayed the progress of the disease, although it has not cured it. Results.

The morbid growth was a perfectly black mass, about the size of a small orange; it presented to the naked eye, and under the microscope, the characteristics of melanoid cancer.

OPHTHALMIC ANEURISM.

Protrusion and pulsation of eyeball.
"Bruit de diable."

ANEURISM OF THE OPHTHALMIC ARTERY is said to have been met with occasionally.* The quick development of such a tumour, causing the eyeball to be considerably protruded, its pulsating character, accompanied by an aneurismal bruit distinctly audible on placing the stethoscope above the supra-orbital ridge, together with the absence of symptoms indicating any other form of disease—these features would appear to be sufficient for the purposes of diagnosis; but we shall see hereafter, that in cases of this kind, we can never speak very confidently as to the exact seat of the lesion.

Ligature of carotid.

The only treatment we can adopt, with any hope of success, for the cure of an aneurism so situated, is to apply a ligature round the corresponding common carotid artery. We should hesitate, however, to have recourse to so serious an operation, unless pressure made upon the artery either stops, or at any rate lessens, the pulsation of the globe.†

DIFFUSED ANEURISM.

Exophthalmos.

Bruit and pulsation stopped by pressure.

A DIFFUSED ANEURISM has been known to form in the cellular tissue of the orbit, as in other parts of the body, in consequence of an injury, or spontaneously from disease and rupture of a vessel and effusion of blood into the cellular tissue of the part, producing some slight exophthalmos. As the protrusion of the globe increases, the vessels of the conjunctiva become congested and swollen, and the movements of the eyeball are diminished. The eyeball pulsates, and the arterial souffle may be heard in its neighbourhood; this may be stopped if the eyeball be gently pressed

* "Lectures on the Operative Surgery of the Eye," by G. J. Guthrie, p. 169; London, 1827. Where a fatal case of true aneurism of the ophthalmic artery on both sides, preventing operation, is recorded.

† Case of supposed aneurism, by Dr. Morton, successfully treated by ligature of common carotid: *Ophthalmic Review*, vol. ii. p. 198. Another case is reported by Mr. Poland, *Ophthalmic Hospital Reports*, vol. ii. p. 219.

back into its socket, and the pulsation of the globe ceases at the same time, to be renewed the moment the compressing force is removed. If the pressure is discontinued, the eyeball slowly protrudes to the same extent as before the compression was made.

Should the symptoms make their appearance after an injury to the part, we should be led to suppose that an effusion of blood has taken place in the loose cellular tissue of the orbit, and that the clot, having been partly absorbed, has left an aneurismal sac communicating with the injured vessel. In other instances similar changes are said to have occurred after a severe strain, probably not noticed by the patient at the time, but which has caused the rupture of an artery already in a diseased condition, and thus given rise to an aneurism.

Arising from injury

or disease of vessels.

On the other hand, we must remember that pulsating tumours of the orbit may occur in consequence of a fracture of the base of the skull, involving the internal carotid artery in the cavernous sinus, and giving rise to symptoms such as those I have above referred to; in fact, increased pulsation of the ophthalmic artery or its branches, as well as obstructions in the ophthalmic vein or cavernous sinus, will produce pulsation of the eyeball.

The nature of pulsating tumours of the orbit are consequently very hard to diagnose; and it is more by the careful exclusion of other forms of disease, than by any positive indications, that we can arrive at a satisfactory diagnosis. Compression of the carotid generally causes a marked diminution of the bruit, and is sometimes accompanied by fulness and pain in the head.*

Diagnosis difficult.

The Treatment of false aneurism in this situation will be the same as that of true aneurism, and consists in tying the corresponding common carotid artery.†

Treatment. Ligature of carotid.

* *Lancet*, vol. i. p. 473 of 1875, Mr. W. Rivington "On Pulsating Tumours of the Orbit."

† Lawrence "On Diseases of the Eye," p. 766, where two cases successfully treated in this way are recorded, one by Mr. Travers, the other by Mr. Dalrymple. See, also, *Medico-Chirurgical Transactions*, vol. ii. pp. 1—16 and plate, and vol. vi. pp. 111—123.

Digital compression of the carotid has proved successful in a few cases; in one recorded instance it was continued for fifty-six hours without avail. It is advisable when practicable under these circumstances, to raise the carotid and compress it between the fingers, rather than attempt to fix it against the spine. But little dependence can be placed on other remedial measures, yet a remarkable case of aneurism successfully treated by the administration of ergot and veratrium, is reported in the *Ophthalmic Review*, vol. i. p. 288.

ERECTILE
TUMOURS.
Painless.

Pulsating
exophthal-
mos.

Recedes on
pressure.

Ligature of
carotid.

Injections.

ERECTILE TUMOURS may form in the cellular tissue of the orbit; they are painless growths, and usually increase very slowly, the patient's health remaining unimpaired. As the vascular tumour augments in volume, it causes more or less exophthalmos, and the prominent eyeball has a pulsating movement imparted to it; this ceases, however, on gentle backward pressure being exercised on the globe of the eye, the eyeball may thus also be made to recede into its normal position. The size of the tumour increases if the patient makes a straining effort, as in crying. If the erectile mass projects forward beneath the conjunctiva, the colour and general characters of the morbid growth will be more apparent, and render the diagnosis comparatively easy.

Treatment.—A case of this kind is probably best treated by ligature of the carotid,* unless the erectile tumour is of small size; we may then be justified in attempting to obliterate the vessels, by means of injections of perchloride of iron, or tannic acid, into the morbid growth; but great care is necessary in a proceeding of this kind, for it is hardly possible to limit the extent or direction in which the injected fluid will run, or to prevent it entering some of the larger vessels: the galvanic cautery would seem to be well adapted for the treatment of erectile tumours in the orbit, a small portion of the growth being dealt with from time to time.

To the foregoing account of vascular tumours in the

* Desmarres records a case in which such a tumour was removed, together with the eye, by Dupuytren: "Maladies des Yeux," vol. i. p. 234.

orbit, it should be added, that they are very rarely met with, and their diagnosis is at all times difficult and uncertain. Cases of pulsating, vascular protrusion of the eyeball, exhibiting most of the features above described, as characteristic of those affections, sometimes present themselves; but in most of them it is doubtful whether the disease is really within the orbit. Several cases of supposed orbital aneurism have proved to be of a different nature, when the opportunity has been afforded of correcting the diagnosis by a *post-mortem* examination, and hence the unavoidable inference that others may have had no better claim to be so regarded. Mr. Nunneley, who has had an unusually large experience in such cases, believes that aneurism within the orbit, whether true or diffuse, is almost unknown. He remarks, that in a large majority of instances of "vascular protrusion of the eyeball, there is no disease whatever in the orbit; the seat of it is mostly intra-cranial. The protrusion of the eyeball is passive, and the other distressing symptoms are secondary, depending on obstruction to the return of the blood through the ophthalmic vein."* Cases are recorded in which all the symptoms of orbital aneurism have arisen from compression of the ophthalmic vein, preventing the passage of blood from the orbit, as for instance, an aneurism of the ophthalmic artery near its origin. It is satisfactory, however, to know that, whether the seat of the tumour be within the orbit or not, the treatment will be the same, and that ligature of the carotid has been successfully practised under these circumstances.†

Fallacies in
diagnosis.

Existence
of orbital
aneurism
doubted.

A case, which forcibly illustrates Mr. Nunneley's observations, has been recorded by Mr. Hulke.‡ The patient, five months after receiving a blow on the left side of the head, presented all the capital signs of an orbital aneurism—fulness of the left orbital region—protrusion and pulsation of the eyeball—a distinct sibilant bruit heard extensively in the neighbourhood. The common carotid artery was tied, but the patient

Case in
point.

* *Medico-Chirurgical Transactions*, xlvi. p. 30. Previous Cases and Observations, vol. xlii. p. 167.

† See a case by Mr. Bell, *Med. Journ.*, July, 1867.

‡ *Ophthalmic Hospital Reports*, 1859-60, vol. ii. p. 6.

subsequently died, and on making a *post-mortem* examination, phlebitis of the cavernous, transverse, circular, and petrosal sinuses was discovered.

BONY
TUMOURS
OF ORBIT.

BONY TUMOURS OF THE ORBIT may grow from any part of the walls of the orbit; they most frequently present a nodular form, and are of an ivory-like texture. Sir James Paget is of opinion that they usually grow from the diploë or neighbouring sinuses, as isolated or narrowly attached masses; their tendency being to extend in all directions.

Exophthal-
mos.

The *Symptoms* to which an exostosis in the orbit gives rise, will vary somewhat with its position, and the rate at which it grows. The globe of the eye is pushed forwards before the morbid mass, and protrudes to a greater or less extent from its socket. Pain is by no means a prominent symptom in these cases, and frequently we hear no complaints of it from the patient. As soon as the tumour attains a considerable size, it may be felt as a hard, rounded, or spiculated mass attached to the bone, sometimes by a broad base, at other times pedunculated.

Pain little.

Tumour
hard and
fixed.

Treatment.

Treatment.—It is seldom possible to remove these bony tumours of the orbit, in consequence of their tendency to penetrate into the skull. Nevertheless, instances have been recorded in which tumours of the kind have been cured by nature, the ivory-like mass sloughing away; and it may be well, as Sir James Paget remarks, to expose tumours of this description, by making incisions through the soft parts covering them, and applying, if need be, escharotics to the surface of the bone.*

COMPRES-
SION OF
ORBIT.

Hydro-
cephalic.

EXOPHTHALMOS FROM COMPRESSION OF THE ORBIT.—The cavity of the orbit may, as I have before remarked, be encroached upon by pressure from without as well as by growths from within. In some remarkable cases of chronic hydrocephalus, the accumulation of fluid within the cranium has been known to force the orbital plate of the frontal bones downwards and

* Paget's "Lectures on Surgical Pathology," 3rd ed. p. 536.

forwards, causing the eyeballs to protrude so far from their sockets as to prevent the lids from closing over them. It would be useless to dwell longer on the description of such cases as these, as their nature must be at once apparent.

From Diseases of the Frontal Sinuses.—Distension of the frontal sinus is generally caused by a blow on the face which has fractured some of the anterior ethmoidal or frontal cells, and so induced a closure of the infundibulum, preventing the escape of mucus from the sinus into the nares. The secretion of the frontal sinus being in this way retained, gradually accumulates and expands the sinus, often to a very considerable extent. If the malady cannot be traced to an accident, we may assume that closure of the infundibulum has taken place as a result of disease. The symptoms may be either those of active inflammation, or of a chronic character: in the former case the patient complains of great pain over the brow and root of the nose, the frontal sinus becomes rapidly distended with pus and may burst, the pus finding an exit into the nose or upper part of the orbit. When the latter accident occurs, the abscess protrudes from the inner and upper part of the orbit, pushing the eye in the opposite direction. The upper lid is much inflamed, and the protrusion is very tender; fluctuation may ultimately be felt in it.

Distension
of the
frontal
sinus.

Symptoms.

Displace-
ment of
the eye.

In chronic cases of this disease there may be little or no pain, or other symptom of inflammation; but the gradual formation of a tumour, at the upper and inner part of the orbit, protruding the eyeball downwards, outwards, and forwards. The disease is usually confined to one sinus, but may attack both.

If, from the bulging condition of the frontal bone and pain in the part, we are led to believe that the sinus is so distended with fluid, it will be advisable to cut through its bony walls and allow the pent-up matter to escape.*

Treatment.

In a case recently under my care, I followed out

* See the report of a case in which this operation was successfully performed by J. W. Hulke: *Ophthalmic Hospital Reports*, vol. iv. p. 176.

Open the sinus.

with complete success the plan of treatment recommended by Mr. G. Lawson. He says:—A single curved incision parallel with the fold above the lid is to be made over the most prominent part of the tumour, and having by a little dissection exposed its surface the scalpel should be plunged into it, and an opening made to the extent of the incision. The index finger of the right hand is now to be pushed into the sinus through the wound, to ascertain the size of the cavity and if there is any necrosed or carious bone. Whilst thus exploring the sinus, the little finger of the left hand should be passed up the corresponding nostril, and an endeavour made to find out the spot at which the tip of the finger in the sinus will approximate most closely the end of the one in the nose. After a little search it will be found that at one part the fingers will almost meet, there being only a thin plate of bone between them. Having gained this information, the finger in the frontal sinus is to be withdrawn, but that in the nostril is to be retained *in situ* to act as a guide to the gouge or elevator, which is to be passed into the sinus and made to force a passage into the nose through the lamina of bone on which the tip of the little finger is resting.

Force a passage to the nose.

Insert a drainage tube.

A communication between the frontal sinus and the nose having been thus established, an india-rubber drainage tube, with holes cut at short distances, is to be introduced, one extremity of which is to be afterwards fastened on the forehead, whilst the other end protrudes slightly from the nostril. The easiest way of introducing the drainage tube is to pass a probe with an eye up the nostril and out of the wound, and having fastened the tube to it by means of a piece of string, to draw it back again through the nose. The object of the drainage tube is to keep the channel between the two cavities from closing, and to enable the attendant to wash out the frontal sinus at least twice a day with some astringent and disinfectant solution. For the latter purpose the lotio alum. cum zinc. sulph., or the lotio acid. carbolica, may be injected with a glass syringe through one of the openings at the upper extremity of the tube. The drainage tube should be worn for five or six months, or until all discharge from the nose had ceased. The

results of these cases when thus treated are usually most satisfactory.*

Hydatid cysts and polypi have occasionally been met with distending the frontal sinus.†

Hydatids and polypi.

From Diseases of the Antrum.—The orbital fossa, however, is more frequently encroached upon from below, than from any other direction, in consequence of malignant growths, or the accumulation of fluid within the antrum, forcing the orbital plate of the maxillary bone upwards.

Abscess of the antrum or an accumulation of its natural secretion from closure of the passage leading into the nose, may distend the walls of this cavity to such an extent, that the hard palate, cheek, and orbital plate of the bone are thrust outwards; and in this way the orbital fossa may be so far encroached upon, as to occasion some protrusion of the eyeball.

Abscess of antrum.

A polypus growing from the walls of the antrum, or from the nostril, may, by its gradually increasing size, so far displace either the inner or inferior wall of the orbit, as to lessen the dimensions of the orbital fossa. In these cases the distortion of the face will render the diagnosis comparatively easy; mistakes however do occur: Mr. Poland relates an instance in point; he says, "Only a short time back there was a case where excision of the eyeball was actually proposed for this affection, when it was discovered that the protrusion was due to an abscess in the antrum, which was opened, and the eye saved and resumed its natural place."‡ Such a history as this shows a want of forethought and consideration against which it is impossible to arm individuals, however profuse or practical our rules may be.

Diagnosis.

The following table drawn up by Mr. Poland exhibits the causes of protrusion of the eyeball.§

* "Diseases and Injuries of the Eye," by G. Lawson, second edition, p. 365; London, 1874.

† Mackenzie "On Diseases of the Eye," 3rd edit. pp. 55—58.

‡ *Ophthalmic Hospital Reports*, vol. i. p. 22. § *Ibid.* p. 22.

- Causes of Protrusion of the Eyeball.
1. Congenital
 1. *Real* protrusion.
 2. *Apparent*—from shortening of levator palpebræ and lids.
 2. In the eye itself
 1. Inflammation of globe, ophthalmitis.
 2. Phlebotic ophthalmitis.
 3. Hydrophthalmos.
 1. Scrofulous.
 2. Encephaloid.
 3. Melanotic.
 4. Osseous degeneration.
 5. Hydatid.
 4. Tumours in eye.
 3. Within orbit
 1. Inflammation of cellular tissue—idiopathic and traumatic.
 2. Suppuration and abscess.
 3. Erysipelatous and phlegmonous inflammation.
 4. Foreign bodies.
 5. Excess of development of fat.
 1. Encysted.
 2. Hydatid.
 3. Encephaloid.
 4. Osseous.
 6. Tumours
 7. Aneurism and effusions of blood.
 8. Venous congestion; exophthalmic goitre.
 9. Paralysis of muscles of eyeball—ophthalmoplegia.
 10. Spasm of muscles of eyeball, as in tetanus.
 4. External to orbit
 1. Above—Nodes, hydrocephalus, fungus of dura mater, polypi in frontal cells and diseases thereof, tumours of brain, inflammation and diseases of lachrymal gland.
 2. Below—Diseases of the antrum.
 3. Internal—Nasal polypi and tumours.
 4. External—Exostosis.
 5. In front—Contraction of lids, and eyes slipping through, hernia oculi.

DISLOCATION OF THE EYEBALL.

DISLOCATION OF EYEBALL.

Case.

Dislocation of the eyeball is said to exist when the eye has been forced out of the orbit, as for instance by a foreign body being thrust between it and the orbital walls. I saw an instance of this kind not long since. The patient was a sailor, and in a quarrel with a comrade had had his left eye gouged out. The eyeball was hanging down on the poor fellow's cheek, and as the whole of the tissues at the posterior part of the eyeball had been torn from their attachments, and with them apparently the optic nerve, it was useless attempting to save the eye.

Cases are on record, however, where an eye has been dislocated, the patient, for the time being, having entirely lost his sight, but on the eye being replaced in

its socket vision has been restored.* Except therefore in cases where we have evidence that the optic nerve has been divided, it will be well to separate the eyelids and restore the dislocated eye to its socket. A firm compress and bandage should subsequently be applied over the closed eyelids, so as to keep the eyeball in its place. If at the end of four or five days the patient has no perception of light, it will be advisable, if practicable, to examine the eye with the ophthalmoscope, and should the retina be detached from the choroid, or the optic disc atrophied, it would be useless attempting to save the eye, and better to extirpate it at once, substituting an artificial eye, supposing the patient can afford the luxury of ornamentation.

If, on the other hand, the patient has the least perception of light in the injured eye, four or five days after the accident, we must retain it in its place by a pad and bandage for three weeks or so. The firmer the compress can be worn the better, the eyeball being forced back into the orbit by this means, and giving the divided muscles the best opportunity of forming adhesions near the anterior part of the eyeball, so as to reduce, as far as possible, the amount of exophthalmos and diplopia which must result from an accident of this kind.

EXTIRPATION OF THE EYEBALL.

Extirpation of the eyeball may be rendered necessary by the presence of foreign bodies in the eye, or other injuries; by staphyloma, sympathetic irritation, and other diseases. The operation is performed as follows:—

The patient having been laid on the operating table and chloroform administered, a stop speculum or retractors are introduced, so as to keep the eyelids well apart. A fold of conjunctiva having been laid hold of with a pair of forceps, the mucous membrane, sub-conjunctival tissue, and capsule of Tenon are to be cut through all round the cornea, with a pair of slightly curved scissors, so as freely to expose the sclerotic; the straight and oblique muscles are then to be divided close to their insertion

Where the nerve is whole,

Replace the eye. Apply a compress.

If vision lost, remove the eye.

EXTIRPATION OF EYEBALL.

Operation.

Extirpation.

* Mackenzie "On Diseases of the Eye," third edition, p. 13.

into the sclerotic, with a few strokes of the scissors; this manœuvre is facilitated by dragging the eyeball in the opposite direction to that of the muscle whose tendon we are about to divide; there is no necessity to take up each of the recti muscles on a strabismus hook, and divide them one by one, for there is no difficulty at all in cutting through these muscles at their insertion into the globe of the eye, provided the blades of the scissors are kept directly in contact with the sclerotic. The eyeball being thus separated from

its muscular attachments, is to be seized and drawn well forward; the curved scissors may then be passed behind it (Fig. 10), and the optic nerve divided close to the sclerotic, together with any other structures which prevent our entirely removing the eyeball.

As a general rule the bleeding after this operation may

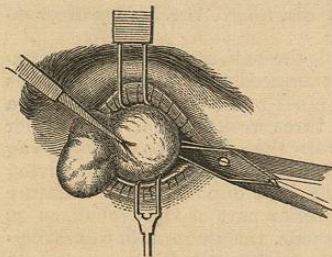
be arrested, by means of pressure kept up for a short time by an assistant, with a sponge thrust into the cavity from which the eyeball has been removed, and no arteries will have to be tied; but it is well to have ice at hand in case of hæmorrhage. The stop speculum having been removed, cold-water dressing is to be applied over the closed eyelids, and retained there with a light bandage. The use of sutures to bring the edges of the conjunctival wound together are in my opinion quite unnecessary, and, in fact, likely to set up irritation and do more harm than good; compresses of lint or a sponge inserted within the orbit, except for a few minutes as above directed, after the removal of the globe, are not called for to restrain hæmorrhage, and are consequently only to be employed in exceptional cases to stop excessive bleeding.

The subsequent treatment of these cases is usually very simple: the parts must be kept clean, and to do

Hæmorrhage trifling.

After-treatment.

FIG. 10.



(From Stellwag v. Carion.)

this properly it will be necessary to open the eyelids from time to time, and syringe out the wound with a little tepid water, or weak solution of carbolic acid. Should inflammation of the cellular tissue of the orbit supervene, it must be treated upon the principles I have already laid down on this subject.

It will be noticed that in this operation the globe of the eye is removed from within the capsule of Tenon* (see Fig. 1, p. 1) without wounding the cellular tissue of the orbit; the muscles, nerve, and, in fact, the attachments of the eyeball being divided close to the sclerotic. Should the patient wish for an artificial eye, the contracted capsule of Tenon, with the muscles attached to it, forms a very good stump upon which the glass eye may rest.

Capsule of Tenon preserved.

ARTIFICIAL EYES.—An artificial eye is made of a hollow hemisphere of enamel, coloured so as to resemble the front of the other eye.

ARTIFICIAL EYES.

It was formerly the practice in removing the globe of the eye to cut wide of the sclerotic, and in fact to take away the greater part of the contents of the orbit. One of the advantages of the operation of excision, as now performed, is, that the capsule of Tenon, with the attachments of the muscles, is left in the orbit, and forms a moveable stump upon which an artificial eye may rest, and thus move in harmony with the sound one. A still better support is afforded by the operation of abscission, to be hereafter described. (See chap. viii.)

Advantages of modern practice.

Improved stumps.

In some cases, after the eye has been destroyed by purulent conjunctivitis or other causes, we may with advantage fit an artificial eye over the atrophied eyeball.

Care is necessary in adapting the artificial eye to the requirements of individual cases, and this can best be done by the manufacturer; or a cast of the outer part of the orbit may be made and forwarded for his guidance.

Adaptation to stump.

Under any circumstances, the false eye should not be worn until all inflammation and irritation have disappeared.

* "Lehrbuch der praktischen Augenheilkunde." Von K. Stellwag von Carion. Wien, 1864, p. 553.

How introduced. In introducing it, the upper eyelid must be raised, and while the patient looks downwards, the upper border of the artificial eye should be pushed beneath the lid, which is then allowed to fall: and the lower one being in turn depressed, a little manipulation is sufficient to make the remaining portion of the eye slip into the lower palpebral sinus.

How removed. In removing the artificial eye, the lower lid must be everted, and the thumb-nail, or the point of some instrument, may be introduced under the lower edge of the eye; it is thus lifted away from the remains of the globe, and falls down into the open hand, or upon a soft cushion ready to receive it.

Precautions. After being withdrawn, the artificial eye should be dipped in water and cleansed. Under any circumstances it is liable to get corroded and rough in course of time, and then sets up much conjunctival irritation. Whenever this is the case, or if, independently of changes in the surface of the glass, it causes the patient any inconvenience, it should not be worn; otherwise it may excite dangerous sympathetic irritation in the other eye.

The artificial eye should always be removed at night, and only worn at first for a few hours during the day.

DISEASES OF THE LACHRYMAL GLAND.

INFLAMMATION. INFLAMMATION OF THE LACHRYMAL GLAND may be either acute or chronic; the former is an affection seldom met with. Chronic inflammation of the gland is also a very rare form of disease, occasionally seen among people affected with scrofula. The secluded position of this gland preserves it from injuries by direct violence; on the other hand, it favours the propagation of inflammatory action from the gland to the connective tissue around; and it is thus sometimes impossible to distinguish a case of inflammation of the gland from one of general inflammation of the cellular tissue of the orbit.

Symptoms.—In cases of acute inflammation of the gland the patient complains of a severe darting or shooting pain in the orbit, extending over the forehead and side of the head; the conjunctiva and eyelids become intensely congested and much swollen, the

Pain.

Congestion.

globe of the eye being pressed downwards and forwards, or inwards and backwards. These symptoms are usually accompanied with fever. If the inflammatory action advances, fluctuation will soon be felt at the upper and outer part of the orbit, and after a time matter will burst through one or more openings in the upper eyelid, and the abscess having discharged its contents, the swelling and inflammation gradually subside. It sometimes happens, however, that the periosteum, and subsequently the bone in the immediate vicinity of the gland becomes involved, in which case a fistula forms, and remains open so long as the diseased action in the bone continues. In case of chronic inflammation of the lachrymal gland, there is a more or less considerable nodulated swelling at the upper and outer margin of the orbit. The skin is moveable over the swelling, which is but slightly painful, and as it increases in size causes more or less displacement of the eyeball. When in this condition the gland may at any time become acutely inflamed.

Treatment.—In acute inflammation, we may endeavour, in the early stages of the disease, to prevent suppuration by leeches and the application of cold compresses to the part; subsequently, if suppuration appears inevitable, hot poultices should be applied and changed every two hours. It will generally be advisable to administer morphia to allay the constitutional irritation, and the usual diaphoretic mixture may be given if febrile symptoms are present. The earlier an abscess in this situation is opened the better: a free incision must therefore be made in the gland, as soon as fluctuation can be detected. In chronic cases we may try to get absorption of the enlarged gland by means of iodine.

HYPERTROPHY OF THE LACHRYMAL GLAND is an affection almost peculiar to young people, the subjects of a scrofulous diathesis. Probably one of the first symptoms of which the patient complains is a certain amount of double vision, from the impeded motion of the eye, consequent on the enlargement of the gland. On examination, the hypertrophied gland, which may grow to a considerable size, will be felt behind the outer part of the upper eyelid, and might be mistaken for a malignant growth, but it is painless,

Displaced globe.

Suppuration.

Treatment.

Leeches and cold.

Poultices.

Opium.

Incision.

HYPERTROPHY.

Scrofulous.

Double vision.

- Slow and painless growth. and increases in bulk with remarkable slowness.* In the course of time the glandular swelling may gradually decrease and disappear as it came, or it may suppurate, and a chronic abscess result, the discharge from which frequently lasts for months, causing the patient much annoyance, but little or no pain.
- May suppurate. In treating cases of hypertrophy of the lachrymal gland we must depend chiefly upon good food, fresh air, and cod-liver oil, and the iodide of iron, in the hope of promoting the absorption of the tumour. Cases may arise in which it may seem advisable to excise the gland.† If suppuration should occur, we must open the abscess as soon as possible.
- Iodide of iron. Cod-liver oil. FIBRO-PLASTIC AND CANCEROUS GROWTHS.—This gland is occasionally affected by fibro-plastic growths, and by scirrhus or melanosis. The former is characterized by more or less displacement of the eyeball downwards and backwards, and after a time the enlarged gland may be distinctly felt behind the outer part of the upper lid; its growth is painless and usually slow. Should cancerous disease become developed in this situation, we shall, in addition to the above symptoms, have those superadded which are common to malignant disease in other parts of the body.
- Fibro-plastic growth. The observations I formerly made against the practice of removing scirrhus from the orbit, are equally applicable to malignant disease of the lachrymal gland.
- Cancer. In cases of hypertrophy or fibro-plastic growth, on the other hand, the diseased gland should be excised, otherwise, by long-continued pressure on the eyeball, it may ultimately lead to its destruction.
- Question of removal. *Excision of the Lachrymal Gland* is thus performed:—An incision is made about an inch and a half long, through the upper lid, parallel to the outer two-thirds of the supra-orbital ridge; the edges of the wound being separated, and the cellular tissue divided, the gland is exposed, together with its accessory lobe, and it may then be separated from its attachments with the handle of the scalpel and removed. Clots of blood should be carefully washed out of the wound,
- Excision of lachrymal gland.
- Operation.

* Tyrrell "On the Eye," vol. i. p. 504.

† An instance of this kind will be found in the *Ophthalmic Review*, vol. i. p. 163.

and its edges brought together with sutures, cold-water dressings being subsequently applied.

Mr. J. Z. Laurence directs that, in excising the gland, a transverse incision of three-fourths of an inch in length should be made into the orbit, over the upper and outer third of the orbital ridge; he then divides the external commissure of the lids with scissors; and by connecting the outer ends of the two incisions, forms a triangular flap, which is thrown up. The lachrymal gland is thus exposed, secured by a sharp hook, drawn forwards, and removed. The edges of the wound are then united by sutures. The linear scar of the incision is subsequently inappreciable, being lost in the folds of the upper eyelid.* The extent of the incision will of course vary with the size of the tumour to be removed.

If the eyeball has been forced from its socket by the morbid growth, a pad should be applied over the lids subsequently to the operation, so as to retain the globe of the eye in its natural position till the tissues around it have retracted to their normal condition.

* *Medical Times and Gazette*, Sept. 1, 1866, p. 231.