

directly, or to a tendinous prolongation of the inner corneal lamella, so that its contraction would retract or depress the cornea. The posterior muscle passes between the sclera and the choroid—is a tensor of the latter, and the homologue of the human ciliary muscle. In reptiles there is a striped tensor choroideæ, but no Crampton's muscle. In batrachia the quantity and blackness of the pigment present an almost insurmountable obstacle in the way of minute examination of the ciliary region.

In the conjunctiva the points most noticeable are the somewhat tougher texture of the palpebral part as compared with the ocular; the specialised club-like terminations of the nerves, named after Krause, their discoverer; and the presence in the palpebral part, and more particularly in the loose fold between the lid and the globe, of small glandiform bodies, minute spherical capsules, enclosed in a net of fine capillary bloodvessels, and, according to some observers, also surrounded by lymphatics. These, when enlarged, form the transparent sago-like grains characteristic of a form of contagious ophthalmia.

The sclerotic is composed of white fibrous or common connective tissue, in the form of flat fibrillated bands closely interwoven in planes which cross one another at every possible angle, but with a general direction parallel to the surface. It is thickest posteriorly, around the insertion of the optic nerve, becomes gradually thinner to the insertion of the recti muscles, and thicker again in front of them. It is pierced by a large funnel-shaped opening for the entrance of the optic nerve; and by many smaller openings for the passage of the ciliary nerves and bloodvessels. The openings by which the *venæ vorticosæ* leave the eyeball are so oblique as to be valvular, and are thus partly or entirely closed by increased intraocular pressure.

The optic nerve pierces the sclerotic a little below and to the inner side of the posterior pole of the eyeball; appearing within the eye, nearly a millimetre to the nasal side of the fovea centralis, in the form of a disc, usually circular in outline. The common aperture through the sclerotic and choroid embraces the nerve tightly in front, loosely behind. Around this opening the sclerotic and choroid are very intimately united; and the minute recurrent branches of the posterior ciliary arteries distributed to the outer part of the sclerotic, effect a slight communication with the capillaries in the nerve-sheath, and indirectly with those in the nerve itself. Some of these last inosculate also with choroidal vessels at the level of the choroidal opening; and through these collateral channels a small amount of blood may find its way to the retina when the *arteria centralis* is plugged. In the plane of the choroid and of the inner third of the sclerotic the nerve opening is crossed by a fibrous web, the *lamina cribrosa*, which peripherally merges in the connective tissues of these two coats. In the living eye the lamina reveals itself as a white tendinous-looking spot, striped with minute grey dots, the bundles of nerve-fibres lying in its meshes. In the healthy nerve-disc these details are only recognisable in a small central area, the physiological pit. A sharply defined image of these details overstepping this limit, and reaching towards or even to the edge of the disc, is a sign of atrophy.

Behind the lamina the nerve-fibres are of the opaque or double-bordered kind, while in front they are pale and transparent. Behind, each fibre consists of an axis cylinder, a delicate external tubular sheath (the homologue of the sarcolemma of a primitive muscular fibre), and an intermediate medulla (the white substance of Schwann). At the lamina the medulla ceases, and the axis cylinder, with perhaps a very attenuated prolongation of the sheath, passes forwards into the retina.

In the arrangement of its sheath the optic nerve differs from all other large nerve trunks. They have but one tightly fitting tube of connective tissue, the external neurilemma, but the optic nerve has a double sheath. It has a tightly fitting sheath representing the sheath of other nerves, from the inner surface of which septa are carried inwards between the nerve-bundles to support them, and to carry their nutrient vessels. In front of the lamina cribrosa in the nerve-disc the neurilemma is of the more delicate kind to which Virchow has given the name *neuroglia*. The outer sheath of the optic nerve is continuous posteriorly with the dura mater, so that coloured fluids injected between the sheaths find their way into the

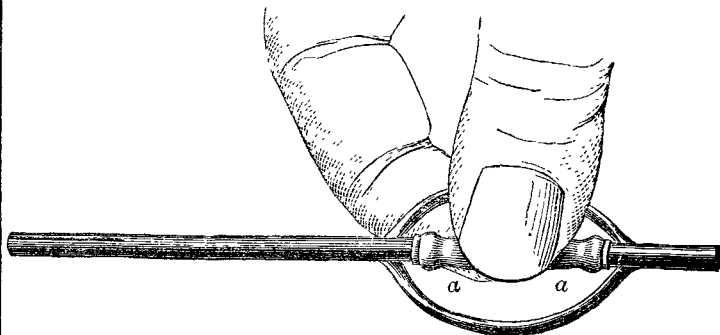
cranial cavity, and in severe injuries of the head blood is sometimes extravasated into the space, which is normally occupied by a very loose areolar tissue.

EXCLUSION OF AIR FROM THE PLEURAL CAVITY AFTER PARACENTESIS.

To the Editor of THE LANCET.

SIR,—I believe that a *very simple* contrivance for keeping the air out of the pleural cavity after paracentesis would be acceptable to those who think that this caution is always or sometimes necessary. A trocar whose canula is represented in the accompanying woodcut appears to me to supply this desideratum, and may perhaps be useful for other similar operations.

While the stilette is drawn back, the thumb and index finger watch its passage through the inserted india-rubber tubing, which is compressed at the proper moment. An elastic



a a, India-rubber tube.

tube is fixed to the outlet, filled with water, and let down into a basin full of water. Then the two above-named fingers allow and regulate the discharge of the morbid fluid.

The instrument was made for me by Messrs. Krohne and Sesemann.—I am, Sir, your obedient servant,
ARTILLERY-PLACE, MAY 27th, 1870. AUGUSTUS HESS, M.D.

THE HYDRATE OF CHLORAL.

To the Editor of THE LANCET.

SIR,—I shall esteem it a privilege if I may be allowed, through your columns, to add my testimony in favour of hydrate of chloral as a hypnotic. I have made use of it for the relief of pain arising from several different causes, and by a suitable dose was invariably able to produce sleep.

In one patient, advanced in years and suffering acutely from shingles, doses varied in accordance with the severity of the pain, from ten to thirty grains, always gave several hours of quiet sleep, though the pain returned on waking; other sedatives, including opium, had previously failed. When five-grain doses four times daily were administered to this patient, and a night-draught containing fifteen grains, a feeling of lassitude and faintness resulted; though with considerable relief to the pain. I do not think it would be well to give it in conjunction with colchicum for the relief of gout, except in moderated doses of both.

I have also given it in spasmodic affections. In one case of colicky pain in the bowels, the patient, after exclaiming as she took the draught, "What can he be thinking of to send me such nasty stuff?" in ten minutes fell fast asleep, and did not awake till aroused four hours afterwards. The dose in this case was twenty-five grains.

Another patient, in great pain owing to the passage of a calculus down the ureter, took twenty-five grains and then went to sleep almost while he was talking; awaking again, however, in about an hour. In lumbago it has proved equally useful, and has never, in my experience, been followed by headache, though its use has sometimes been accompanied with constipation. If combined with compound infusion of roses, syrup and peppermint water, its disagreeable taste is almost entirely concealed.

Feeling thankful to have been made acquainted with this additional means for relieving pain, I venture to urge its extended use.—I am, Sir, your obedient servant,

Louth, June 4th, 1870.

THOS. WEMYSS BOGG.