f the base of the tumour be small, than with any other instrument; and the forceps should have short and narrow blades, and long handles. It is judicious to be prepared with two pairs, the one straight, the other convex or angular. In addition to these, there should be provided a variety of small saws and gouges, of different shapes and sizes; in short, all the modern instruments that are used for operations on diseased bones. The upper wall of the orbit, and the inner, require the greatest care in operating; but, as elsewhere, the surface throwing out an exostosis is generally thickened.

Encephaloid Tumour. This comprises an extensive subject, and therefore, in a short lecture, I can do no more than allude to certain points, those which it most concerns the surgeon to know, and which bear directly on practice.

All the forms of cancer do not occur in or around the eye with equal frequency. Colloid cancer has never yet been found in the eye or orbit. Scirrhus is exceedingly rare as an affection either of the eyeball or of its appendages. Epithelial cancer attacks only the eyelids or conjunctiva. Recurrent fibroid disease has been met with as intraorbital tumour in one instance only that has come to my knowledge. Medullary cancer, in the form of encephaloid or melanosis, may attack either eye or orbit; and it is the one or the other variety, more particularly the former, which is present in the great majority of cases.

As soft cancer is a common cause of ocular protrusion, so, perhaps, is it the most difficult to be diagnosed in the early stage, especially by the inexperienced. But, before I proceed further, I will go into a question that has perhaps occurred to many of those who hear me. Does the position of the eyeball in any way determine the nature and situation of the cause of the protrusion? In obscure cases, where there is not any indication to be gathered from the state of the eyelids, the direction of the protrusion might somewhat assist in diagnosing the nature of the case, by localising it more certainly. But such evidence may be wanting; and in no instance can it be solely relied on, because of the irregularity in form and unequal development of morbid growths. In estimating the value of doubtful physical signs, the dissimilar axes of the eyeballs, and of the orbits, demand attention; while the manner in which the globe is tied by the oblique muscles, and the anatomical relations of the optic nerve, will influence the direction it will assume from pressure posteriorly. Displacement inwards is more readily effected than in any other direction. When, from the commencement, the displacement is lateral to the axes of the eyeball, it is reasonable to presume that the force also is lateral. Direct protrusion will in general prove the most embarrassing; for with bony and other growths at the side of the orbit, within certain limits of size, and situated rather posteriorly, the eyeball may be pushed forwards without any lateral displacement. This, I presume, must be attributed to the mechanical properties of the fat in the orbit. Yet, if the only symptom be direct protrusion, until further evidence to the contrary, the cause must be considered to be seated at the back of the orbit; I will not say the apex, for that is indeed a very rare position. Certainly, in soft cancer, the direction of the protrusion does not in the least assist in diagnosis.

Malignant tumours originating deeply in the orbit exhibit no peculiarity in the physical changes which they produce in the orbit or orbital appendages of the eye, by which they can be at first distinguished from simple tumours.

In some instances, however, the rate of progress, or other peculiarities in any given case, may pro-

duce the suspicion of malignancy at an early period.

It is necessary to say something about the seat of malignant growth. It may be in any part of the cellular or adipose tissue, or even to spring from the optic nerve while the eyeball is yet sound. Then the cancer may originate in the frontal cells or from the antrum of Highmore, and make its first appearance in the orbit. When, however, the disease advances and protrudes laterally, or at least can be felt tolerably, the true nature can generally be made out by the peculiarity of fixedness and immobility. It seems as if it grew from the side of the orbit, and from a large base. Of course, any constitutional effects of the malady, and any development of blood-vessels, assist to a right conclusion; but these appear only late. The rapid growth, then, the immobility, and the youth of the patient, are the signs to be relied on. I have very rarely seen an example after forty years of age, and the majority have occurred to me between the ages of fourteen and thirty.

It is a momentous question respecting what is to be done. Most certainly, my experience is against operating, as a rule. If an operation will only relieve pain, or if it will arrest bleeding, and for a time prolong life, or if the pressure of the morbid growth on the brain is productive of any ill consequences, I should operate. As soft cancer is merely the local evidence of a poison at work with the system, any idea of curing the disease by operation can be only attended by disappointment.

Periostitis. Inflammation of the periosteum of the orbit, which must, I presume, be always more or less combined with inflammation of the bones, may protrude the eyeball; and, although such disease may follow traumatic injury, constitutional causes, such as struma, and syphilis in particular, generally produce it; but, whichever it may be, the diagnosis is seldom obscure, if proper investigations be instituted.

Disease of the Optic Nerve has been a cause of protrusion. A tumour of the size and shape of an olive, just a little behind the sclerotica, and consisting principally of thickened neurilemma, the nerve-tubes being unaltered, had displaced the eyeball upwards and outwards. The discovery was made in a dissecting-room.

ON A NEURO-MNEMONIC TRIANGLE AT THE BASE OF THE SKULL.

By WALTER GARSTANG, M.D., F.R.C.S. Edin.,
Blackburn.

THE Neural Triangle, to which the purport of this communication, written for mnemonic purposes a few years ago, is the invitation of the young dissector's attention for a moment, includes a small portion of the anterior, middle, and posterior fossæ, at the base of the skull, corresponding, respectively, to the encephalic lobes. Along its boundary-lines, as in the subject before me, are seen the whole of the cerebral (intracranial) nerves of each side, at situations that are internal to the dura mater, and at which we usually find them to be divided with the scalpel, on removing the brain from the cavity of the cranium. It is to this fact that the triangle owes its mnemonic-anatomical significance; and the practical application of it by the inexperienced student of anatomy will, I apprehend, remove one of the many causes of his early dissecting-room perplexities, and will enable him to remember with certainty no inconsiderable item of cranio-neural anatomy, more expressly with reference to the relation of parts.

Posteriorly, the triangle is bent in the direction of the foramen magnum, and rests on the inner third of the posterior surface of the petrous portion of the temporal bone, and the eminentia innominata of the occipital. The illustration submitted, without any pretension to rigid accuracy, is deduced from the left side of the cranium, where the sides composing the triangle are found to have the relative admeasurements of the diagram adjoined, of which the scale of parts has been reduced to one-half; and they observe the following courses.

Curvilinear in direction, the external boundary is viewed as coursing from the apex of our triangle, along the outer margin of the groove for the olfactory nerve, on the cerebral surface of the lesser sphenoidal wings, and thence across the optic foramen, by the internal surface of the anterior clinoid process, and upon the superior angle of the petrous portion of the temporal bone, terminating at the centre of the meatus auditorius internus. This line, at its commencement, is the guide—first, to the olfactory bulb, and to the nasal branch of the ophthalmic nerve; secondly, to the ophthalmic nerve and ophthalmic artery, where these enter the optic foramen; thirdly, to the oculo-motory nerve, which pierces the dura mater just at the outer side of the anterior clinoid process; fourthly, to the trochlear nerve; fifthly, to the triple-facial nerve; and sixthly, to the facial and auditory nerves, and internal auditory branch of the superior cerebellar artery.

Again, line 1-9, commenced anteriorly at the centre of the left division of the cribriform plate of the ethmoid bone, runs almost directly backwards; passing, on the bare bone, by the external side of the middle clinoid process, along the internal margin of the furrow, seen on the basilar portion of the occipital bone, for the inferior petrosal sinus, then close by the eminentia innominata, down to the centre of the anterior condyloid foramen. If we should thence prolong this line to nearly one inch, it will lead, as at 10, to the place of exit, from the spinal canal, of the suboccipital nerve—sometimes regarded as the tenth cranial nerve—corresponding with a groove behind the superior articular process of the first cervical vertebra. In the tract of this line are seen, from before backwards (*vide* diagram), in the recent preparation, the olfactory bulb, and the sixth and ninth cranial nerves.

Lastly, the line 7-9, which constitutes the base of the triangle, connects the two former. It runs directly inwards, downwards, and backwards, and crosses in the middle of its course, the anterior division of the foramen lacerum posterius, which affords exit to the trunks of the eighth nerve, consisting of the glosso-pharyngeal, pneumogastric, and spinal ac-

cessory nerve. As a whole, the foramen, it may be remarked, transmits, additionally, the blood from the lateral sinus into the internal jugular vein, the inferior meningeal branch of the occipital artery, and the posterior meningeal branch of the ascending pharyngeal artery.

Transactions of Branches.

SOUTH-EASTERN BRANCH: WEST KENT DISTRICT MEDICAL MEETINGS.

ABSTRACT OF A CASE OF SEVERE INJURY TO THE BRAIN.

By FREDERICK FRY, Esq., F.R.C.S.

[Read October 28th, 1864.]

THOMAS H., aged 22, a labourer, was admitted into the West Kent General Hospital at Maidstone, on December 29th, 1859. He was watching the blowing up of a blacksmith's anvil. The wooden plug splintered; and some pieces entered the patient's head through an aperture in the right supraorbital ridge sufficiently large to admit the insertion of the little finger. Several fragments of wood were extracted by forceps. Cerebral substance escaped. The patient was conscious. No bad symptoms occurred, and he was sitting up in a few days. Some small pieces of bone came away with a slight amount of suppuration. He was discharged on February 7th, 1860, forty-one days after the accident. There was only a slight oozing from the aperture at this time.

He attended as an out-patient for two or three months. Subsequently, he worked for five weeks at brick-making, but was compelled to desist because of pains in the head. He became an out-patient for the second time, and attended the hospital for three or four months. He was then seized with intense vomiting, failure of the powers of speech, strabismus, and difficulty of walking. He now kept his bed at his own home, and was visited by the house-surgeon. The contents of the rectum and bladder were voided involuntarily, and the patient became almost idiotic. He died whilst taking food, apparently choked. His death occurred in February 1861, upwards of thirteen months from the receipt of injury.

POST MORTEM EXAMINATION. The body was well nourished. There were sprouting granulations in the wound, whilst the aperture in the bone was closed by osseous matter to a point that would but just admit a probe. The dura mater was healthy. An abscess, containing about twelve ounces of laudable pus, was found occupying the middle and posterior lobes of the right hemisphere. The lateral ventricle was empty, and not opened into; but its roof was depressed. The right hemisphere pressed against the left, but there were no adhesions; and the falx suffered pressure. The abscess appeared to possess a pyogenic membrane. Two pieces of wood (one measuring about an inch by an inch and a half, and the other an inch and one-eighth by five-eighths of an inch) were found imbedded in the cerebral substance at the posterior extremity of the abscess, behind the collection of pus. The thickness of the pieces of wood was that of a lozenge.

In the discussion that followed the reading of this paper, the rarity of osseous closure of apertures in the skull was commented upon.