the joint. 3. In the case of the thumb, subcutaneous division of one or both heads of the flexor brevis muscle. 4. Incision into joint under antiseptic precautions, with replacement of ligament or the long flexor tendon. 5. Excision of the head of the metacarpal bone after severe compound fracture or ankylosis of joint (especially of the thumb).

Harley-street, W.

THE FUNCTIONS OF THE AMNION.

By FRANCIS EDWD. CANE, L.R.C.P. & L.R.C.S. ED.

THE amnion is a vesicular or sac-like covering of the embryo. It does not exist in amphibia or fishes. In the human ovum the amnion is formed at a very early period. In reptiles, birds, and mammals—the three classes of animals in which it exists—its structure is essentially the same. It possesses the property of muscular contractility in a high degree. These contractions are rhythmic, and may be seen in the incubated egg from the seventh day or earlier. Soon after the amnion is formed it becomes distended with fluid, in which the embryo is suspended. Speaking of the amniotic functions, most authorities tell us that the amnion is the receptacle for the fluid in which the foetus floats. This fluid protects the embryo from shocks and jars, and from undue pressure from the uterine walls; by distending the uterus it saves that organ from injury, which otherwise might be inflicted by the movements of the foetus; it prevents the foetus from forming adhesions to the amnion; it protects the umbilical cord and placenta from pressure; it affords equable temperature; and, finally, it assists in the dilatation of the os uteri and the lubrication of the passages during labour. A defective amount of liquor amnii is said to favour malformations by allowing the uterus to compress the foetus unduly.

So far what I have put down is the ordinary matter of the text-books. I shall now set forth what I consider to be the essential functions of the amnion and its fluid. Everything that man does, either voluntarily or automatically, is due to muscular action. In the earliest stages of his being a muscular heart is propelling fluid through muscular tubes. The force developed by the muscular heart is propagated by fluid, which distributes the pressure equally on all sides; but the muscular tubes convey and modify that pressure, which is also acted upon by all the other muscles as they become developed. Thus we see that muscular action is the great and primary mechanical agency by which the embryo is elaborated and grows. But, from the nature of the case, it is necessary to supply a surrounding medium wherein the delicate embryo will be supported equally on all sides, and so allow the heart and muscles to continue their work without being subjected to unequal pressure and the undue effects of gravity. A gaseous or atmospheric medium, owing to elasticity and lesser density, would subject the embryo to unequal pressure, and so cause inequality of muscular action and blood pressure. This in varying conditions would cause numberless deformities. The embryo must have some surrounding medium distributing pressure equally on all sides. This is supplied in the first place by the amnion itself, which is muscular and possessed of rhythmic contractility. It grasps the embryo on all sides, supports it, and assists in moulding it. Then almost immediately, as the embryo grows and is subjected to greater effects of gravity from its own increasing weight, the amnion secretes the watery fluid, which allows the muscular action and blood pressure to continue their work symmetrically, and protects the weak embryo from being crushed by the increasing uterine contractions. As the embryo is now not sufficiently light, the lungs at first are developed as a so-called rudimentary swim-bladder, which ensures the requisite protective buoyancy. But up to this time the umbilical vessels have not formed their placental connexion for the purpose of oxygenating the foetal blood. The embryo, however, must have oxygen for the purposes of its life, growth, and circulation. This is secured because of the amniotic water dissolving oxygen by osmosis through the delicate membranes of the amnion and chorion. This oxygen is taken up and breathed first by transpiration through the fine embryonic integument, and later by the loops of vessels in the so-called rudimentary branchiæ of the foetus then coming into existence, and which are finally

obliterated when the placental circulation is established. It is therefore evident that the so-called rudimentary gills, swim-bladder, and fish kidney or Wolffian body are vestiges of embryonic function when they were needed by the embryo existing in similar conditions to a fish. The fishes, because they exist in water, need gills and swim-bladders and Wolffian-like kidneys; and man in the earlier stages of his being lives also in water, and so requires organs similar to a fish.

To sum up, I consider the chief primary function of the amnion is to support and assist in moulding the embryo by muscular contraction. Its next function is to secrete the liquor amnii. The first use of this fluid is to afford equal pressure and support on all sides to an embryo growing by blood pressure, developed and modified by muscular action. The next essential use of the liquor amnii is to convey oxygen for the purpose of keeping the embryo alive until the time when the new being obtains another means of getting that oxygen for its system. Following these primary essential functions come all those enumerated in the various text-books. Fishes and amphibians have no need of an amnion and amniotic fluid, because the sea and the rivers and the lakes are their amniotic cavities and liquor.

Leeds.

A CASE OF GUMMA IN THE RIGHT SUPERIOR TEMPORO-SPHENOIDAL CONVOLUTION.

By THOMAS WILSON, M.D. LOND., &c.,

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THIS case is briefly alluded to by Dr. Gowers in his work on "Diseases of the Nervous System" (vol. ii., page 21), and I have to thank him for permission to publish the detailed account.

Edith H—, married, aged thirty-three, was admitted into the National Hospital for the Paralysed and Epileptic, under the care of Dr. Gowers, on Oct. 25th, 1886. Six weeks previously, three weeks after her confinement, she was standing looking out of a window, when she suddenly heard a dreadful noise "like the clicking of machinery"; then objects in the street seemed to move to and fro and became blurred, and the patient fell, losing consciousness and becoming convulsed, the face being drawn to the left. She did not bite her tongue or pass urine during the fit; there was no headache or sleeplessness afterwards, nor was it followed by any localised paralysis. After this attack she remained fairly well for a fortnight, when she had five other exactly similar attacks in two days. Then headache, described as a heavy feeling, chiefly in the right frontal region, but also at the nape of the neck and in the right occipital region, began and continued till admission; the headache was worse at night, and interfered with sleep. For a week before admission the patient had vomited everything she had taken, and there had been constipation for the last few days. The woman was married at the age of twenty, and contracted syphilis from her husband, having sores, sore throat, and rash; and her first pregnancy resulted in a seven-months' child, born dead. After this she lived apart from her husband for several years, and then resumed cohabitation and bore three full-term children, who are all now living and well, the eldest being six years of age, and none of them, as far as can be ascertained, presenting any symptom of congenital syphilis, and there is no family history of fits, insanity, paralysis, phthisis, cancer, or tumour.

On admission there was no sign of paralysis discoverable on careful examination. All the reflexes, both superficial and deep, were normal. There was continuous severe pain of an aching character, with shooting exacerbations, over the vertex of the head, rather more on the right than the left side, extending forwards to the frontal region, and also down the right side of the neck, where it was very severe. Deep pressure elicited some tenderness over the right superciliary ridge, but nowhere else on the head. The patient felt continually sick, and vomited after everything she took. The heart and lungs were normal. The urine contained no sugar

or albumen. The ophthalmoscope showed very slight wooliness of the edges of both optic discs. The right pupil was smaller than the left; both reacted readily to light, and with convergence.

The patient was ordered five grains of iodide of potassium with five minims of tincture of cannabis indica three times a day. By Oct. 30th the margins of the disc on each side were decidedly hazy, the right more than the left; the headache was not so severe; there was still occasional vomiting; the dose of iodide was increased to ten grains, three times a day, and in addition a drachm of mercurial ointment was ordered to be rubbed in every evening. On Nov. 5th, the dose of iodide was increased to twenty grains, the inunction being continued until the 10th, when the patient's gums became tender, and it was stopped. On the 9th there was great swelling and tortuosity of the veins in either fundus; the margins of the optic discs were obscured all round; there was swelling of each disc, requiring +1.5 D to focus the summit on the right side, and +1 D on the left; and there were two hæmorrhages on the right disc. The headache and vomiting had ceased entirely for several days before Nov. 19th, and the optic neuritis was rapidly subsiding. On the 23rd a mixture containing ten grains of iodide of potassium, half a drachm of liquor hydrarg. perchlor., and ten minims of tincture of gelseminum was ordered to be taken three times a day. By Dec. 4th the optic neuritis had almost entirely disappeared in the left eye, and the edges of the right disc were becoming clear; the veins in this eye, however, still remaining large and tortuous. The patient still complained of occasional darting pains about the head, and had had a good deal of buzzing in the ears. Examination of the ears showed that the tympanic membranes were rather thick and opaque and cupped, and the woman said she had often had earache when young. A watch was heard at a foot on either side, and equally well through the bones in each ear. On Dec. 22nd the appearance of the left disc was quite normal; the edges of the right disc remained a little woolly, but the swelling and tortuosity of the veins had almost disappeared. There had been no headache or other symptom since the note on Dec. 4th, and the patient was discharged much improved, and ordered to continue the iodide in ten-grain doses. There had been no fit of any kind during her stay in the hospital.

The woman was next seen in the out-patient room on January 12th, 1887, when it appeared that two days after leaving the hospital she had a fit, which began with tingling in the hands and fingers for ten minutes, followed by noises in the head as in the previous attacks; then loss of consciousness and general convulsion. On Jan. 7th pain in the right frontal and temporal regions and sickness had recommenced and continued. The edges of both optic discs were again a little woolly, but no sign of paralysis was discoverable anywhere. When the patient went home, the vomiting increased and the headache became very intense, and on the 15th she died, having, as far as could be ascertained, remained conscious to the last. There had been no more fits, and no twitchings or spasms of any kind.

Permission was obtained to examine the brain five days after death. The body was in good preservation, there being no sign of putrefaction. On removing the brain, nothing abnormal was observed about the bones or sinuses. On opening the dura mater, it was found adherent over an area an inch and a quarter by three quarters of an inch in extent on the surface of a tumour in the right temporo-sphenoidal lobe. The convolutions over the entire surface of both hemispheres were extremely flattened, and the sulci almost obliterated, the surface of the brain being very dry. The vessels at the base were mostly thickened and opaque in patches. The pons, medulla, and cerebellum showed no unnatural appearance. The tumour mentioned above occupied on the surface of the brain a roundish area about an inch and a half in diameter, situated chiefly in the right superior temporo-sphenoidal convolution, of which it occupied about the second and third fifths from before backwards. Above, it extended across and obliterated the Sylvian fissure, and slightly encroached on the ascending parietal and frontal convolutions in their lowest parts. Below, it involved the middle temporo-sphenoidal convolution to a greater extent. A vertical transverse section through the upper extremity of the fissure of Rolando passed through about the middle of the tumour, and showed that this extended about an inch and a quarter into the substance of the brain in its deepest part. Above,

the outer half of the fissure of Sylvius was obliterated by the tumour, the inner half remaining distinct. A horizontal section across the middle of the tumour showed that the anterior and inner part just reached and involved the claustrum; the basal ganglia were not affected. The border of the tumour was fairly distinct; its substance was firm, and was sharply divided into two distinct portions: one hard, opaque, white in colour, attached to the dura mater by a distinct coat formed of thickened arachnoid and pia mater; the other larger, not so firm, surrounding and spreading from the first, of a greyish colour, and presenting several small irregular hæmorrhages. Under the microscope, the latter described portion of the tumour was seen to be composed of cells of varying shape, chiefly round and oval; between these fibrous tissue was present, in some places in fair quantity, in others in small quantity or absent; numerous blood-vessels were scattered through the growth. This portion was sharply marked off from the hard, opaque white part of the growth, the boundary being formed by cells and fibrous tissue, the latter preponderating in one or two places, so as almost to form a capsule. The white portion took stains badly, and had a granular appearance, with here and there indication of cell structure; a great number of bloodvessels were present in this part also, many having undergone thrombosis.

Remarks.—This case is of great interest owing to the position of the tumour in the superior temporo-sphenoidal convolution. The auditory centre has been placed by experiment in the posterior half of this convolution, and the present case supports that localisation, the tumour involving the anterior part of the centre to a small extent. That the aura was not referred to the left—i.e., the opposite—ear, as no doubt it should have been, is a matter for little surprise, considering the difficulty one finds in getting aural patients generally to refer sounds correctly to one ear or the other, and bearing in mind also the volume of the noise “like that of machinery.” That there was no difference of hearing on the two sides apparent on rough examination is easily explained by the small amount of destruction of the centre, and by the fact that, even when one centre is destroyed, hearing in the opposite ear is soon recovered. Unfortunately none of the fits which the patient had occurred during her stay in hospital, so that the immediate after-effects of these attacks upon the hearing could not be investigated. That the tumour was situated on the right side was indicated by the following:—1. The headache, which, though widespread and general, was consistently described by the woman as being always worse on the right side. 2. Tenderness to percussion was observed on the right side, but at a distance from the seat of tumour, as afterwards ascertained. This localised tenderness is often a very misleading symptom, and can only be relied upon when it agrees with the other localising symptoms in a case; in the present patient, more stress was of course laid upon the character of the aura, and correctly, as appeared at the necropsy. 3. The optic neuritis was distinctly more marked and longer in subsiding on the right side. 4. In the fits, the head was said to have been drawn to the left; to this observation very little importance could be attached, none of the attacks being seen by a competent observer.

The relation of this case to syphilis is also of the very greatest interest and importance. The patient marries and contracts undoubted primary syphilis from her husband, and has a seven months' miscarriage; she then lives apart from her husband for some years, and gets so far cured that she bears three healthy children showing no sign of congenital disease; and finally, in spite of this, which one would be inclined to look upon as unassailable evidence of the syphilis being eradicated from her system, a gumma develops in the brain, and apparently yields readily to energetic treatment by mercury and iodide of potassium, but again bursts into activity and rapidly destroys life, notwithstanding that the patient continues to take fair doses of the iodide.

Cannock, Staffs.

THE SWEATING SYSTEM.—Mr. Sprague Oram, who, we understand, has been appointed by the Committee on the Sweating System to inquire into the condition of the distressed chain and nail makers at Cradley Heath, proposes to ascertain what wages the operatives receive, what are their hours of labour, and on what system the middlemen conduct their business.