between the pulmonary and costal pleuræ. On making a section of the lobe of the lung it is in the stage of gray hepatization. The remainder of the lung is healthy. On examining the condensed lung microscopically there is no tubercular substance visible. Both ventricles of the heart are distended with blood. The auricles are empty. The other organs of the body are healthy.

The preceding history indicates that pleuro-pneumonia may advance unperceived to the stage of gray hepatization, and be the physical explanation of sudden death. It is difficult to estimate the duration of the disease. Had an examination been made during life it is quite possible that the case might have been deemed one of tubercular consolidation, from the site of the disease and general wasting. It is known from the laborious and interesting researches of Laennec, Andral, Lombard, and Louis, that the right lung is twice as often the seat of pneumonia as the left; and on the other hand, that the left lung, especially the apex, is most liable to tubercular deposition.

Death apparently occurred by exhaustion or syncope, the heart being unable to expel the blood from the ventricles, the pleuro-pneumonia acting as an intense and lasting shock.

VI.—*Cases Illustrative of Diseases of the Ear.* By T. M'Call Anderson, M.D., Physician to the Deaf and Dumb Institution, Physician to the Dispensary for Skin Diseases, &c., Glasgow.

No. VI.

ACUTE AND SUB-ACUTE SUPPURATIVE INFLAMMATION OF THE CAVITY OF THE TYMPANUM.

On the evening of the 5th February, 1862, I received a hurried message to go to the country for the purpose of visiting a young lady, the wife of a medical man. A week previous, she began to experience pain in the left ear, which gradually increased in severity till at last it became excruciating, was accompanied by a feeling of throbbing and considerable fever, and prevented sleep. Poultices were applied to the side of the head, and salines and morphia administered.

From the history which I received of the case, I at once came to the conclusion that acute inflammation of the cavity of the tympanum had occurred, which had ended in suppuration. I accordingly went provided with an instrument (see fig. 11.) for the purpose of puncturing the drum and giving vent to the matter.

On my arrival, however, I was glad to find that, on turning her head a few hours previous, matter had escaped from the throat, followed shortly afterwards by a slight discharge from the meatus, and with great relief to the pain.

Fig. 11.

On examination there was considerable pain on pressing the point of the finger into the meatus, and the auricle was tender, owing to the repeated poultices which had been employed. Having gently washed out the meatus with the syringe and warm water, which came away almost clear, showing that the discharge was slight, the hearing immediately improved—the tick of the watch being heard at the distance of two and a half yards from the ear. On examination with the speculum, the meatus, though red and tender, was not much contracted; and the membrane of the tympanum, though white and papery, was not perforated.

I remained all night, and next morning found that the pain and tenderness on pressure were gone, and no appreciable discharge had taken place from the meatus. The patient had slept well. I recommended that the meatus should be washed out with tepid water daily, and an eighth of a grain of the bichloride of mercury given twice daily after food for some time, and followed by a tonic.

On the 15th February I was informed that the inflammatory symptoms had completely subsided, and that the hearing was perfect.

A young gentleman from Ayrshire, of average good health, consulted me on the 5th March, 1862, with regard to an attack of inflammation in the right ear, which had lasted for about fourteen days. It commenced with acute pain, after catching cold apparently, which deprived him altogether of sleep. At the end of eight days he felt something give way in the ear, and this was immediately followed by a discharge of matter from the meatus, and relief to the pain. A day or two thereafter, he incautiously went out of doors, when he was again attacked by severe ear-ache, which had, however, moderated when I saw him.

I found that the pain, which was not constant, was increased on pressing inwards upon the meatus with the finger, and that the discharge was not abundant. The canal was considerably contracted, and its walls moist, softened, and tender. Owing to its calibre being narrowed, only the posterior portions of the drum could be seen. It was white, like parchment, and streaked with red vessels. An orifice, however, must have existed in the anterior portion, as air whistled freely out of the ear on causing

the patient to close the mouth and nose, and expire forcibly. On inflating the drum in this way, he felt as if a little fluid was gurgling in the bottom of the ear. The tick of the watch was heard at the distance of two feet. The left ear was healthy. I ordered the ear to be washed out morning and evening with warm water; three leeches to be applied to the edge of the meatus; a hot bran poultice over the side of the head at night; and a sharp purge, containing calomel, scammony, and jalap.

This patient did not return, and in all probability the treatment was effectual.

A gentleman, aged about 60, began to complain of pain in the left ear about the 1st of December, 1862. It steadily increased in severity for four days, although it did not interfere with sleep, at the end of which time, a discharge of pure serum took place, with relief to the pain; this became so abundant that it was continually dropping from the ear, to the great astonishment of the patient. The meatus was washed out with warm water, a solution of sulphate of zinc (gr. iv. to the ℥i. of water) injected night and morning, and the mastoid process blistered.

On the 11th December I was requested by my friend Dr. Scott Orr to see this patient along with him. By this time the pain was quite gone, and the discharge, which was still most profuse, was thick and purulent, and accompanied by tinnitus. The tick of the watch was inaudible when pressed firmly against the temple or ear.

After washing out the ear with warm water, the meatus, though wide, was much congested, and there could be no doubt that it was the chief source of the discharge. The membrana tympani was completely gone; the mucous membrane of the cavity of the tympanum congested and thickened; and, projecting forwards from the posterior wall of the tympanic cavity, there was a considerable prominence, which appeared to us to be owing to portions of the ossicles and the promontory of the tympanum being covered with inflammatory deposits. On causing the patient to expire forcibly, the mouth and nose being closed, air whistled freely out of the ear, showing the complete patency of the eustachian tube. It was agreed that an injection of nitrate of silver (gr. v. to the ℥i. of water) should be substituted for the sulphate of zinc solution, and that the mastoid process should again be blistered, so as to establish for a time a counter-discharge, and prevent any ill effects from following upon the cessation of the discharge from the ear.

On the 16th December, the tick was faintly heard when the watch was pressed on the temple, but inaudible when pressed against the ear. The discharge was much less, but granulations appeared to be sprouting up in the cavity of the tympanum.

The meatus and granulations were touched with a solution of nitrate of silver (℥i. to the ℥i. of water), and the injection was continued.

I did not see this gentleman again till the 17th of January, when I found the symptoms much the same as on the previous visit. I now ordered an injection, first of acetate of zinc (gr. ii. to the ℥i. of water), later of sulphate of zinc (gr. v. to the ℥i), and touched the granulations in the cavity of the tympanum, at intervals of about a week, with the solid nitrate of silver.* I also ordered the citrate of iron and quinine in doses of 5 grains, in solution, thrice daily. On the 11th February the granulations had completely disappeared, the discharge had ceased, and the tick of the watch was heard at the distance of half an inch from the ear. All local treatment was omitted.

On the 18th the watch was heard at the distance of one inch, and on the 26th two inches and a half from the ear. There had been no return of the discharge; the tinnitus was rapidly disappearing; and the patient stated that his general health had greatly improved.

There can be no doubt that the hearing will continue to improve, now that the discharge has subsided, and that the tinnitus will soon completely disappear.

Suppurative inflammation of the cavity of the tympanum is unfortunately a very common occurrence, especially in the chronic form and after fevers. The acute, is, however, rare, in adults at least, in comparison with chronic inflammation of the tympanic cavity. It is oftenest brought on by exposing the ear to cold, as, for example, by sitting in a draught, or by going from an over-heated room into a cold atmosphere. It may come on in the course of, or shortly after the subsidence of a fever, particularly scarlet fever, though the chronic form is much more frequently observed than the acute from this cause. Its origin may sometimes be traced to violence, as blows upon the ear, or pulling the ear violently—a mode of punishment which was far too frequent at schools not very long ago. Sometimes it is set up in consequence of extension of inflammation from the throat through the eustachian tube; or, the throat being inflamed, the inflammation in the tympanum may occur sympathetically, the eustachian tube being unaffected. There can be no doubt, likewise, that persons tainted with syphilis, or subject to gout or rheumatism, as also those of the lymphatic temperament, the scrofulous, and debilitated, are more liable to it than healthy persons, though usually one or other of the foregoing exciting causes must be superadded.

* For the method of doing this, see my fourth paper in *Glasgow Medical Journal* for October, 1862.

The first symptom complained of is pain—slight at the commencement, but gradually and steadily increasing in intensity, till at last it becomes agonizing, so that sleep is out of the question, and the patient tosses about and moans, or even screams at intervals. The pain is aggravated by motion, touching the ear, coughing, sneezing, or swallowing. It is not confined to the ear, however, but extends over the side of the head and down the neck; and just as the pain of a carious wisdom tooth often extends to the ear, and leads the patient to the belief that he is labouring under ear-ache, so the pain from the tympanic inflammation may extend to the throat, and produce the sensation of affection of that part. The countenance is anxious and suffering, the patient gloomy and foreboding the fatal termination of the complaint, being convinced that inflammation of the brain has set in, an opinion which is not unfrequently shared in by the medical attendant who has not had much experience of the complaint. This idea is further strengthened by the occurrence of delirium, which may take place in severe cases without implication of the brain or its membranes. Tinnitus is almost invariably complained of; the noises are of the most varied kind, every conceivable sound being described by different patients; and if the ear-ache is not so intense as to drown every other sensation, they occasionally distress the sufferer much.

The meatus often participates in the inflammation, its walls being congested and swollen, so that in some cases the drum cannot be seen. The latter is of a dull red colour at first, marked by numerous bloodvesels, thickened and semi-opaque. In the later stage it becomes quite white, thick, and opaque. The eustachian tube is usually pervious at first, though it is unjustifiable, when the symptoms are acute, to ask the patient to inflate the tympanum, and still more so to make use of the eustachian catheter for this purpose; for the act of inflating the tympanum sends a rush of blood to the inflammed part, and may give rise to increase of the pain and the other symptoms.

In some cases paralysis of the portio dura nerve supervenes, so that the whole of one side of the face becomes immovable, and the features are drawn to the opposite side, a circumstance which still further increases the alarm of the patient. The reason for this complication will be at once apparent if it is remembered that this nerve passes through the aqueduct of Fallopius, which courses along the inner wall of the tympanic cavity immediately above the fenestra ovalis, and that sometimes this osseous canal is incomplete, so that the mucous membrane of the tympanum comes in direct contact with the nerve. The paralysis is due therefore to extension of the inflammation to the nerve, and we may accordingly expect that, in the great majority of cases, as the inflamma-

tion subsides, the portio dura will resume its functions, and the palsy of the face ultimately disappear.

The local symptoms are invariably accompanied by constitutional disturbance in acute cases, though in the sub-acute variety this may be slight, as in the third case which was detailed. If the inflammation is severe, the fever is high, the pulse rapid and bounding, the tongue coated with a white fur, the appetite gone, the bowels costive, the skin hot, and the urine high-coloured, and depositing lithates on coating. These symptoms are all the more likely to become prominent, if the periosteum of the mastoid process becomes affected. Acute pain is then complained of in this situation, especially if the part be pressed; swelling and puffiness occur, and finally the skin assumes a dusky red colour, and fluctuation is detected.

But the most serious of all the complications consists in the extension of the inflammation to the membranes of the brain, or to the cerebral substance itself. In these cases the symptoms before referred to put on their most aggravated forms—the pain agonizing, the fever intense, the anxiety of the countenance well-marked. In addition to this the face is flushed, there is intolerance of light, the pupils are often contracted, and though delirium is sometimes observed when the inflammation is limited to the middle ear, it is more constant when the brain or its membranes become implicated. If vomiting occurs it is a suspicious symptom, and rigors too often indicate the formation of an abscess in the brain, or between the dura mater and the bone. The patient frequently moans, is very restless and stupid, and made to understand and to answer questions put to him with difficulty. If in addition to all these symptoms stertorous breathing, coma, or convulsions be superadded, we know too well that the inflammation is not limited to the middle ear, but has extended to more vital parts, and in all probability has done irreparable mischief.

On dissection it is sometimes found that the dura mater has become detached from the petrous portion of the temporal bone, and the interspace filled up with serum or pus. In other cases the inflammation has extended to the brain, and not unfrequently an abscess is detected. This abscess is occasionally situated in the middle of the cerebral substance, an apparently healthy portion of brain intervening between the temporal bone and the abscess, so that it cannot have been the result of simple extension of inflammation from the middle ear.

Acute inflammation of the tympanic cavity rarely terminates in resolution. In the great majority of cases suppuration occurs, and the patient is in great agony till the pus comes away. In some cases, as in the first which I have detailed, it is discharged through the eustachian tube into the throat, but as a general rule

the membrane of the tympanum gives way, and it comes through the meatus, as in the second and third cases detailed, the third case being an instance of sub-acute inflammation of the tympanic cavity coupled with acute inflammation of the meatus. Almost simultaneously with the occurrence of suppuration within the tympanum a sympathetic discharge often takes place from the meatus, so that the physician may look upon this discharge as an indication that the drum has given way, and that it proceeds from the cavity of the tympanum. But if the discharge is from the meatus, as in the first case detailed, it does not come away suddenly, the patient stating that something had burst in the ear, but is gradually established, and in using the speculum the drum is found to be entire. The amount of purulent matter which sometimes comes in a gush through the meatus when the tympanic membrane gives way, shows that the inflammation has extended to the mastoid cells, and that much of the pus comes from them, as the cavity of the tympanum is very small, and its walls unyielding, and it is therefore incapable of containing a large quantity of purulent matter.

After the inflammation has subsided, the patient is apt to become careless and to expose himself to cold, a circumstance which is very apt to induce a relapse, as in the second case detailed.

If the patient is scrofulous or debilitated, and particularly if the disease is neglected after the acute symptoms have passed off, the inflammation may become chronic, and may last for months or years. The discharge, which continues more or less during that time, gradually but steadily increases the injury to the ear; the deafness slowly but surely becomes more marked; polypi not unfrequently complicate the affection; caries of the temporal bone may supervene; and inflammation of the brain may be set up at any moment, and often when the patient and practitioner least expect it.

Though the symptoms of acute inflammation of the cavity of the tympanum are often most alarming, the prognosis is generally favourable. We must always, however, bear in mind the possibility of the extension of the inflammation to the brain, especially if the general health of the patient is unsatisfactory; a complication, which is only met with exceptionally, and the distinctive features of the occurrence of which have already been sufficiently discussed.

As a general rule, the hearing returns almost to the same state as it was before the commencement of the inflammation, if it is properly treated throughout, and the discharge quickly arrested. In some instances, however, where the drum has been in great part destroyed, and the orifice of the eustachian tube

permanently closed, and the mucous membrane of the tympanum permanently thickened, the deafness may be considerable, though never so marked as during the progress of the acute symptoms. In forming an estimate of the degree of deafness likely to ensue, we must carefully regard the general health of the patient, as in strumous persons the acute is very apt to merge into the chronic form of the complaint, which is more rebellious to treatment, and the ultimate result of which it is hardly possible to foresee. With regard to treatment:—If the patient's general health is good, and if we see him at the commencement of the attack, his bowels should be cleared out by means of a calomel and scammony purge, and a dozen or more leeches applied at the edge of the meatus, and below the ear or over the mastoid process; the leeching to be repeated if necessary, and followed by the application of a bran bag wrung out of boiling water, and kept constantly hot, which relieves the pain wonderfully. Gargling the throat with hot water, though beneficial in some cases, ought not to be recommended if the pain is very intense, as the act of gargling tends to increase it. Catheterism of the eustachian tube should on no account be attempted. The patient should be brought rapidly under the influence of calomel and opium, according to some authors; and, if the pain is severe, a large dose of opium may be combined with each dose of calomel with advantage. Some recommend the use of the bichloride of mercury, which may be given after the acute symptoms have subsided, along with a tonic, and continued for some time. In the early stages of the inflammation, benefit will often accrue from the employment of sudorifics combined with opiates—Dover's powder, for instance. If on examination it is found that pus has accumulated in the tympanic cavity, and is pushing the drum forwards, a puncture should be made in it by means of an instrument similar to that delineated in the woodcut (see fig. xi.), vent being given to the pus as in the case of abscesses in other situations. This usually gives instant relief, but it requires a hand skilled in the use of aural instruments to effect it, and even then it sometimes cannot be done if the meatus is much contracted. After the drum has been punctured or been ruptured by the pressure of the purulent matter within, and especially if the meatus is pouring forth a sympathetic discharge, the ear should be washed out with a syringe and warm water two or three times daily; and if the discharge becomes chronic, astringent and caustic injections, and other means usually employed against the so-called otorrhœa, and which it would be out of place to refer to here, must be resorted to.

If inflammation of the periosteum covering the mastoid process takes place, and even although we cannot detect fluctuation, an

early free incision down to the bone should at once be made, and great relief often follows. The incision should be an inch and a half long, and carried along the middle of the mastoid process from above downwards.

If there is reason to suspect that the *dura mater* or the cerebral substance has become implicated, the usual treatment recommended for the removal of meningitis and cerebritis, and which, unfortunately, is too often ineffectual, must be put in force.

VIII.—*Notes on Puerperal Convulsions.* By George K. H. Paterson, L.R.C.P.E., Balbeggie, Perthshire.

Not a few have, as might be expected, written already in the most interesting manner upon puerperal convulsions, and whose valuable contributions have thrown much light on very important facts regarding the pathology and treatment of this disease. Nevertheless, the subjoined cases which, occurring at different and no very distant periods, came under my care, and were read before the Perthshire Medical Association, 30th January, 1863, may not be deemed unworthy of being recorded.

Case I.—Early on the morning of the 12th of April, 1847, I was summoned to attend Mrs. M., aged 29, *primipara*, in the ninth month of pregnancy. On my arrival, I found her in bed, rather composed, though anxious-looking. I was told that her pains had been often recurring since midnight till within the last two or three hours, during which they were not coming so regularly as before. On making a vaginal examination, the os uteri was found dilatable to some extent—sufficient to allow of a natural presentation being made out. Soon afterwards, I induced her to get up, and walk about the room and sit betimes, alternately; when, having been out of bed for some time, she seemed to become feverish, with urine scanty. I also observed her face at times much flushed, and accompanied by twitchings of the countenance, and occasionally tremor of the body. My patient being of a stout make and sanguineo-nervous temperament, with a pulse between 80 and 90 and infrequent, I took away as soon as possible an ordinary bleeding from the arm, and then gave a dose of castor-oil to open bowels. In a short time after this, the os uteri began to dilate considerably, with a gradual increase of the pains. About mid-day she was seized with a convulsion, which lasted for some minutes. Another, and another in a brief space of time ensued, notwithstanding the previous bleeding, with short intervals between them. On each fit subsiding, she seemed not