FATAL CASE OF CARIES OF EXTERNAL MEATUS: OTORRHŒA AND SECONDARY AFFECTION OF BRAIN.

By F. M. PIERCE, M.D.,

Senior Surgeon to the Manchester Ear Institution.

THE following case contains some points of interest to the general practitioner as well as to the specialist. It is one of a class of cases, the termination of which is more frequently witnessed by the former than by the latter. In private practice, the earlier symptoms are often entirely overlooked, and the fatal result is attributed to any cause but the true one. The specialist, consulted by patients from a distance, is too far away to have the care of such a case in the last stage, and probably only learns the result by mere accident, long after it is too late to obtain *post mortem* proof of his diagnosis.

I was called about 3 A.M. on Tuesday, October 24th, 1877, to see a German gentleman, who had suffered from slight otorrhœa of the left ear on three or four occasions during the last six years. On these occasions, the discharge was slight and almost unaccompanied by pain, and did not continue more than a few days. The patient was a rather stout, stiff-built, apparently healthy man aged 56, of great muscular ability; there were, however, indications that in early years he had been very strumous (cicatrices of abscesses in the neck and of disease of the carpal and metacarpal bones), and had had syphilis.

On Saturday, October 20th, the patient complained of slight pain in the left ear, accompanied by otorrhœa. He did not pay much attention to these symptoms, which he had had on previous occasions without causing further trouble.

On October 21st, the earache and discharge gradually increased and prevented sleep.

October 22nd.—Though still suffering from pain in the ear and otorrhœa, with slight nausea, he persisted in going to business. During the day, he became very giddy, unsteady in his gait, had sharp pain over the left temple, and severe attacks of vomiting, which compelled him to return home, when his medical attendant, Dr. Gumpert, was called in. His pulse was then 120, and temperature 101 deg. Fahr. Towards evening, the pain and discharge were aggravated, but the retching ceased; the pulse, temperature, and respiration increased as the night advanced, and delirium set in.

About 4 A.M., Wednesday, October 24th, I saw the patient with Dr. Gumpert. He was then lying in bed, on his back, almost comatose, moaning, and constantly twitching the eyelids and face, and picking at the bedclothes. There was no ptosis or facial paralysis, and the pupils were equal and about normal. The skin was bathed in a cold clammy perspiration. The pulse 150, respiration 50. The temperature was not taken. In front of the left tragus, over the temporo-maxillary articulation, there was a hard tender tumour, like an enlarged gland, which had made its appearance within the last twelve months. The mastoid process was unaffected. On examining the left external meatus after removing a profuse collection of pus, an old perforation of the anterior superior quadrant of the membrana tympani was seen. It appeared clogged with thick muco-purulent discharge; and on exploring the meatus, a probe distinctly detected a small spot of carious bone on the anterior superior wall of the meatus, near to the membrana tympani. I immediately enlarged the opening in the membrane, by cutting upwards and downwards through a speculum with lateral aperture attached to Brunton's auroscope, and incised the walls of the meatus. The tympanic cavity was rendered thoroughly impervious by means of the Eustachian catheter, and ten leeches were applied in front of the tragus and behind the auricle. The patient gradually sank, and died at 10.45 A.M. the same day, October 24th.

NECROPSY, twenty-eight hours after death.—Blood was oozing from the left ear. On opening the skull, a large quantity of fluid black blood escaped from the cerebral sinuses, which were much congested, as were also the vessels of the dura mater, which looked opaque and thickened over the anterior half of the left hemisphere. On raising the dura mater, the whole surface of the anterior half of the left cerebrum, from about one inch from the longitudinal sinus down to the surface of the petrous bone was covered with thick yellow creamy pus. On careful examination of the cranial surface of the petrous and temporal bones, no caries or lesion could be detected to account for the purulent deposit. There was no abscess in the brain-substance, and no effusion into the ventricles. The temporal bone was not removed.

REMARKS.—There can be no doubt that many fatal illnesses, accompanied by convulsions, coma, and other cerebral symptoms constituting meningitis in one form or other, are due to undetected ear-disease. In this case, the fatal issue was very rapid, considering the

slightness of the premonitory symptoms. The existence of a perforation, evidently produced at some previous attack, tended to diminish the probable extension of the suppurative inflammation to the brain. How long caries of the wall of the meatus had existed is uncertain, whether coexistent with the first appearance of otorrhœa or with the last. If with the first attack, it is singular that signs of caries should have remained dormant so long; and if the last attack were the origin of the bone-affection, its rapid course is somewhat unusual. How did the pus reach the position in which it was found? We know that the upper wall of the external meatus is closely contiguous to the dura mater and cerebrum, but in this case there was no evidence of direct extension of the caries of the anterior superior wall of the meatus to the dura mater covering the petrous bone. Probably the pus was conveyed from the meatus by means of the smaller petrosal veins to the vessels of the dura mater. Branches of the middle meningeal artery pass in the adult from the dura mater to the tympanic cavity; and when we remember the pre-eminently vascular relations of the petrous bone with the cerebral meninges, we cannot be surprised at the frequent occurrence of embolism, abscess, thrombosis, and blood-poisoning from purulent ear-disease.

Professor Gruber points out that fatal ear-affections most frequently originate in disease of the external portion of the ear—meatus, etc.—and this case is certainly corroborative. Mr. Hinton says: "The fatal result is the consequence either of caries affecting the brain or vessels by continuity, or of poisoning through the veins of the diploë: or abscess may form in the brain in the neighbourhood of an inflamed tympanum without caries or any apparent means of propagation of the morbid action."

A CASE OF CEREBELLAR ABSCESS.

By JOHN SERVICE, M.B.,

Assistant to the Professor of Clinical Medicine in the University of Glasgow, and Assistant-Physician to the Dispensary for Skin-Diseases.

THE following case, though not fully reported, may possess some interest.

Sarah H., aged 16, was sent into Belvidere Hospital on September 18th, as suffering from fever. An examination showed this to be incorrect; and at no subsequent time did she present a febrile temperature. Her history was as follows. Three months previous to admission, she began to complain of a slight, though constant, headache; and even before that, there were frequent attacks of giddiness. She never had had fits or convulsions. Her appetite had remained good; but the tongue became foul. A month after headache first began, a purulent discharge from the right ear made its appearance; and this, for a short time, is said to have given her a little relief. Soon, however, the pain returned as before, and gradually became worse.

On admission, her only complaint was of severe pain in the forehead and nape of the neck, and an inability to turn her head without great pain. The pupils were, if anything, slightly dilated. The tongue was covered by a white fur. The temperature was normal, and the pulse 80. The bowels were costive. After being ten days under observation (during which time purgation and blisters to the nape of the neck were resorted to), the patient said she was quite well, and was permitted to get out of bed. In two days more, however, she was worse than ever. The pain returned to the forehead. The pupils became very much dilated and immovable. Both eyelids drooped, and could not be completely raised; there was, therefore, ptosis. Her sight, too, was imperfect, but the power of vision varied in intensity at different times. Her tongue again became foul, and the bowels continued obstinately constipated. Twice, while at stool, she became giddy and fell forward, so that the use of the bed-pan was ordered. The temperature remained about 98.6 deg., and the pulse 60. Throughout, she remained in a drowsy state, and did not care about being disturbed. Her breath was very fetid; and for about a week before death (which took place on October 13th), there was a discharge of greenish matter from the nostrils. There was no paralysis of the limbs or anæsthesia; and she retained perfect control over speech. The heart-sounds were irregular and the second was accentuated.

To recapitulate: the leading symptoms, therefore, were persistent frontal headache, giddiness on standing, drowsiness, dilated and immovable pupils (both alike), partial ptosis, imperfect vision, and constipation. The treatment consisted of light diet, purgation, and blisters to the scalp. Transient relief was always experienced after the blistering. The iodide and bromide of potassium had also a trial.

At the necropsy (twenty-six hours after death), an abscess was found in the right lobe of the cerebellum, containing about three

drachms of greenish pus. The interior of the cavity consisted entirely of white brain-substance, and was of a firmer consistence than the rest of the brain. There were also in the cavity two small blood-clots, partially organised. The right lobe of the cerebellum was, comparatively speaking, a mere shell; and the left lobe, as well as the pons Varolii, was to a small extent also implicated. The membranes were perfectly healthy, and there was no apparent communication between the abscess and the suppurating ear.

NOTES OF A CASE OF CARBONIC ACID POISONING, TREATED BY INHALATION OF OXYGEN :

WITH A DESCRIPTION OF A NEW APPARATUS FOR RENDERING
IMPURE AIR RESPIRABLE.*

BY CHARLES B. BALL, M.D.,
Surgeon to the Blaenavon Iron Works.

ON January 16th, 1877, I attended a family who were found insensible in bed that morning. I found a man aged 55, his wife aged 48, and daughter aged 16, in one bed, in a very small room, quite insensible. There were the remains of a large fire in the grate, the chimney of which was imperfect. Upon admitting plenty of air and using the usual restoratives, the woman became sufficiently conscious to say that she remembered being up at 2 A.M., when she experienced considerable difficulty in breathing and a severe headache; after which she remembered nothing further till she was restored to consciousness. The man became semiconscious, but the girl remained perfectly insensible. I had her, therefore, removed to another and well-ventilated room, where artificial respiration was resorted to. She now had violent tetanoid convulsions, at intervals of a few minutes. The muscles of the face were, however, exempt from the general spasm. The pupils of the eyes were of average diameter, but dilated in bright light and contracted when the light was removed. This phenomenon was also noticed in the man's case.

During the day, the man and woman progressed favourably, but the girl became much worse, the convulsions appearing at longer intervals and the intervening coma being more profound. The treatment now adopted in her case was the application of a blister to the back of the neck, stimulating enemata, and the hypodermic injection of pure ether. None of these measures had the desired effect, and at ten o'clock that night she was apparently dying. The convulsions had entirely subsided. The pulse at the wrist could not be felt, and the respirations were few and shallow. Through the kindness of Mr. P. C. Gilchrist, F.C.S., I now obtained a large supply of pure oxygen, which, by a little arrangement of an ether-inhaler, I was enabled to give her to breathe in any degree of dilution required. At first equal parts of air and oxygen were given, but afterwards the proportion of oxygen was increased. It produced a rapid and most marked effect; the pulse soon became perceptible, and quickly increased in force. After the inhalation of about four gallons of gas, it was discontinued, respiration and circulation having been well revived. During the inhalation, the convulsions recurred, having been absent for several hours. Although not sensible during the night, she was decidedly better, being able to swallow fluid nourishment, and the convulsions gradually subsiding. She did not recover consciousness till the morning of the 18th, being forty-eight hours from the time I first saw her.

The different degrees in which the persons suffered, although exposed to the same poison, appears to be worthy of note. The intensity of the girl's symptoms is, I think, accounted for by the fact that she suffers from phthisis, and has therefore a smaller available lung-surface. As the woman got up to walk about the room during the night, she for the time respired a higher, and therefore purer, atmosphere; and this may account for the fact that her symptoms were the lightest of the three. The action of the pupils with regard to light, noticed in two of the cases, was remarkable and very apparent. Although the inhalation of oxygen has been recognised in medicine since the time of Sir H. Davy, yet its use amongst the generality of practitioners is not frequent, and the above case was the first time I have ever used it. Its action impressed me greatly; for I have never witnessed a life so certainly saved by any other therapeutic agent. One great objection to its more general use has been the difficulty of obtaining the gas readily, in a state of purity and in a portable form. This has now been obviated; and I have here a copper flask, into which fifteen gallons of pure oxygen have been compressed. I obtained it from Messrs. Barth

of 26, Duke Street, Bloomsbury, and it appears to be very convenient for medical purposes, being easily carried about, as its weight is only five pounds three ounces when full; the diminution in weight will tell roughly the amount of gas used.

From my experience in this case, I was led to the construction of an apparatus for obviating the bad effects produced by inhaling an atmosphere containing a large percentage of carbonic acid, by the simultaneous inhalation of an increased supply of oxygen; the applicability of some such apparatus being demonstrated by the experiments of Regnault and Reiset, who found that animals could live in an atmosphere containing a large quantity of carbonic acid, provided the percentage of oxygen was proportionally increased. The action of this apparatus is partially illustrated by the annexed diagrams. (Fig. 1.) It consists essen-

Fig. 1.

tially of a tightly fitting face-piece, which communicates with a chamber of a capacity sufficient for one inspiration. The chamber is separated from the outer atmosphere by a sheet of wire gauze, and the air is made to traverse several partitions. Behind the partition next the face-piece, oxygen is allowed to escape from a perforated tube, which is in communication with a reservoir, carried in the manner of a knapsack. The tube is supplied with a tap, which will allow the escape of

Fig. 2.

oxygen up to 30 per cent. of the air respired. During the intervals of respiration, the diaphragms will prevent the escape of oxygen from the chamber; and at each inspiration, the amount of oxygen required will be washed through the valve at the face-piece by the external atmosphere. The expired air is made by a system of valves to pass through an elastic desiccator, and thence supply a lamp. (Fig. 2.) By this means, the lamp can be made a guide as to the amount of oxygen required. By the use of this apparatus, I expect that a collier would be enabled to go into a mine charged with carbonic acid. In the case of an explosion, in which all the oxygen had been converted into carbonic acid and steam, the explorer would be enabled to supply himself with such an amount of oxygen as would neutralise the effects of the carbonic acid. The man could easily carry a supply of oxygen which would last for two hours, even when he was using the maximum quantity required; and, by connecting a second tube and face-piece to the oxygen-reservoir, he could revive any sufferer whom he might find overcome by carbonic acid. I may mention that, in the experiments connected with the construction of this apparatus, I have myself respired, without feeling any discomfort, during a considerable time, a mixture containing 18 per cent. of carbonic acid, but in which the

* Read at the South Wales and Monmouthshire Branch.