AN ACCOUNT OF A SPECIMEN CONSISTING OF THE
WHOLE BONY LABYRINTH, SEPARATED BY
NECROSIS, AND REMOVED AS A
SEQUESTRUM FROM A CHILD:
WITH REMARKS UPON
SIMILAR CASES.

Read before the Medical Society of London.

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THE specimen here shown is one which I lately presented to the Museum of the Royal College of Surgeons, and I have to thank the Curator for his permission to exhibit it. It is, I think, of interest in other ways besides the mere fact of its rarity, although it does not appear that any metropolitan museum now contains a similar or parallel specimen.

A moment's inspection of the preparation (Figs. 1 and 1A) will enable it to be recognised as consisting of almost the whole of the left labyrinth, and of the labyrinth only. The tympanic cavity, the three semicircular canals, and the cochlea, are present in almost their whole extent, and with a lens the details of the scale, the lamina spiralis, etc., can be very beautifully seen.

FIG. 1.—Specimen of labyrinth, including the vestibule, cochlea, and semicircular canals, removed as a sequestrum, September 1883 (enlarged). A, Cochlea. B, Upper semicircular canal.

FIG. 1A.—Outline of Fig. 1 (natural size).

The history of the case of the child from whom this sequestrum was removed, may be very briefly told. She was $4\frac{1}{2}$ years of age on her admission into the Victoria Hospital for Children, and then presented the usual appearance of abscess beneath the periosteum of the mastoid process, with probable suppuration within the mastoid cells, and superficial necrosis of the bone. The pus had made its way into the meatus, and also discharged through an opening on to the skin, at the bottom of which, rough bare bone could be felt with a probe. There was absolute deafness on the affected side, the hearing on the right side being normal. The above symptoms dated from an attack of scarlet fever, eighteen months previously. Shortly before admission, she developed the symptoms of left facial paralysis, which very quickly became complete, and was not attended with pain or any cerebral symptom. The paralysis extended to all the muscles supplied by the portio dura, including those of the tongue, and was associated with irritation of the cornea. On September 22nd, 1883, as the discharge had continued unabated for about three months, I decided to enlarge the external opening and determine whether there was any sequestrum loose enough to be removed. Accordingly, a semicircular incision was made behind the ear; and, on exposing the bone, a ragged opening in it was found, nearly half an inch behind, and on a level with, the auditory meatus. This led directly inwards, and, at the depth of about an inch, a loose irregular shaped sequestrum could be felt with a probe, but it could not be removed through the surface-opening. This was consequently considerably enlarged with a gouge, and the

specimen now shown was then extracted in its present condition. The cavity in which it lay was smooth, and felt like the ordinary bony chamber of a sequestrum, except in its upper part, where it was soft and bulging; but to the finger the impression of depth was very striking, it being difficult at first to believe that it (the finger) was still within the boundary of the petrous bone, and was not engaged in one of the central cavities of the brain.

There was no bleeding, and the after-treatment was perfectly simple; the child had no bad symptoms from first to last, the wound healing quickly and soundly, and the discharge from the ear ceasing in about a week.

The course of the facial paralysis is more noteworthy. This was noticed to improve very soon after the operation (about ten days probably, but the exact date is not noted), and at the end of two months was obviously much diminished.

On referring to Toynbee's *Diseases of the Ear*, on page 374, it is stated that examples of disease advancing from the tympanum in the direction of the labyrinth, and involving the latter, are very rare, a statement confirmed by Wilde (*Aural Surgery*, 1853), and Politzer (*Text-book of Diseases of the Ear*, Eng. Translation, 1883). Toynbee then goes on to mention three illustrative cases, the second of which is in exact accordance with my own, and has a somewhat similar history. In the first case, the entire cochlea, and the cochlea only, was discharged from the ear of a patient of Mr. Hinton's, after a purulent discharge continuing for some years. The specimen was added to Toynbee's collection, but I cannot find it now at the College, nor is there any similar sequestrum there; a fact the more curious, inasmuch as Toynbee himself pointed out, subsequently to the appearance of his book, that the cochlea forms sequestra far more frequently than any other part of the labyrinth (*Chicago Medical Journal*, vol. xxvi; see also Politzer, p. 525).

The account of the second case is taken from the *Pathological Society's Transactions*, vol. viii. The account is a full one, but may be thus summarised.

The patient, aged 7, was admitted into the Middlesex Hospital, under Mr. Shaw, July 31st, 1855. Double otorrhoea had commenced after scarlet fever two and a half years previously. In the left ear, a piece of dead bone protruded into cochlea. There was left facial paralysis and complete deafness. The protruding dead bone being taken away, a cavity was exposed in which another loose piece of bone could be felt rolling about (compare my own case), and was, with some little difficulty, seized and removed. The patient made a good recovery, but the paralysis was apparently permanent.

This sequestrum is described in the *Transactions* at considerable length, but it may shortly be stated that it turned out to be so much of the petrous bone as included the tympanic cavity, showing the fenestra ovalis and rotunda, the promontory, etc., and, leading from that chamber, the vestibule, cochlea, and "portions of the semicircular canals, broken off near their junction with the vestibule."

It will be seen that, in its causation (being a sequela of scarlet fever), in the accompanying facial paralysis, and, indeed, generally, the case here quoted is practically a parallel one to that I am now describing, with the exception of the manner of removal, that is, through the meatus instead of by an incision behind. It would have been interesting to have compared these two specimens; but, unfortunately, Mr. Shaw's sequestrum has somewhat mysteriously disappeared. It seems that it originally belonged, as naturally would be the case, to the Middlesex Hospital Museum; but, by some means or another, it came to be placed among the specimens presented by Mr. Toynbee to the College of Surgeons' Museum. It was there recognised by Professor Flower (then Curator) as not rightfully part of the collection or the property of the College, and it was restored to the Middlesex Hospital; but a long search made recently failed to discover it there, nor does any entry appear as to its presentation or restoration, either in the old manuscript catalogue of the museum, or in the one just published under the direction of Dr. Kingston Fowler.

It is, however, a matter of such frequent occurrence for the treasures of a museum to become temporarily mislaid, or forgotten, or overlooked, that it may be hoped that this interesting specimen will yet be found. This is the more desirable, in that no drawing of it appears to have been made.

The third example of this necrosis quoted by Toynbee, is one described and figured by Wilde (*Aural Surgery*, p. 377); and a reference to the accompanying figures (Figs. 2 and 2A) will show that the specimen is almost identical with that now being considered, save that it is far less perfect, especially with regard to the completeness of the semicircular canals. Nevertheless, Wilde holds the specimen to be of such rarity and perfection, that he thus (*loc. cit.*) describes it.

"I am indebted to Sir Philip Crampton for an examination of one of the most extraordinary pathological dissections of diseased bone, perhaps, in existence, consisting of the entire internal ear, cochlea, vestibulum, and semicircular canals, from the meatus of a lady, who, after the most urgent symptoms of inflammation of the brain, with paralysis of the face, arm, and leg, with total deafness of one side, recovered from the head-symptoms and the paralysis of the extremi-

FIG. 2.—Wilde's sequesterum (enlarged on the same scale as Fig. 1).
FIG. 2A.—Outline of Fig. 2 (natural size).

ties, after a copious discharge of matter from the ear. The discharge continued until Sir Philip, perceiving a portion of loose bone lying deep in the meatus, drew forth the specimen from which this illustration has been made. In this, it does not appear that the hard external enamel of the bone was affected, but the scala cochleæ is far more beautifully displayed than could possibly have been done by art."

This case differs obviously from Shaw's and Hinton's, and from the present one, in the severity of the constitutional symptoms; and the unilateral paralysis is noteworthy. Politzer, commenting on this case, reads that this disappeared after the removal of the sequesterum; but it will be seen that Wilde's language is not clear on this point, for the statement would apply equally well to the deafness, from which the patient can hardly have recovered.

In addition to these cases, one or two more of sequestra of nearly all the labyrinth, but probably not including the semicircular canals, and a few more of the removal of fragments of the organ, may be found among the records of otology,¹ but Shaw's and Sir Philip Crampton's cases appear to be always quoted as the most complete and illustrative ones of this pathological condition; and, inasmuch as neither specimen appears to be accessible at the present time to aural surgeons, I have thought it worth while to present my own specimen to the Hunterian Museum, and to direct the attention of the Fellows of the Medical Society to it.

But little difficulty will be experienced in recognising the various parts of the specimen now shown, suspended as it is in nearly its natural position in the body, by the superior transverse vertical semicircular canal, which is almost perfect, and within which a trace of the membranous canal may be seen with a lens. The other two canals will also be seen to be hardly less perfect than the upper one. The common opening of the inner extremities of the longitudinal and transverse canals is well shown, as is also the outer ampullary dilatation of the former. The cavity of the vestibule is displayed on the outer side, about the centre of the specimen; and the terminations of the internal auditory meatus and of the aquæductus vestibuli (?) are similarly to be seen on its internal aspect. The remains of the round and oval fenestræ are with less certainty recognised. The anterior extremity of the specimen shows upon its outer side the cochlea opened, just below its apex, exposing the spiral lamina, modiolus, etc.; and upon the inner side a small part of the interior of the tympanic cavity and the canal for the tensor tympani are seen. The posterior part of the specimen consists of an irregular portion of the mastoid cells.

With regard to the clinical aspect of the case, also, but little need be said. The implication of the portio dura is only what might be expected, and what almost invariably seems to happen; but the partial recovery is interesting, as illustrating the great resisting power which nerve-cords possess against inflammatory disintegration.

The fact that the brain was seemingly not at all disturbed by the near presence of this severe necrosis is also noteworthy. The frequent absence of cerebral complications has been commented upon by Toynbee and Politzer, and is doubtless due, as the latter states, to a

conservative proliferation of the connective tissues in the outer lamellæ of the dura mater.

But, perhaps, the most interesting point about all these cases of sequestra, consisting of the whole, or of portions of the labyrinth, is the fact that we have here the inflammatory process acting as the anatomist of by-gone days, fashioning out of the various component parts of the periotic capsule that artificial creation "the bony labyrinth"; as if it, indeed, were a separate irregular eburnated sac, embedded in the petrous bone, like a fly in amber; in it, but not of it.

That such a conception is erroneous, is, of course, now well recognised, for the investigation of the mode of development of the parts in connection with the organ of hearing shows that the auditory capsule, or sac of the membranous labyrinth is surrounded by and enclosed in the cartilaginous segments of the periotic capsule, which latter ossify around this labyrinth, forming the petrous and squamous bones, and having large lymphatic spaces intervening, within which the perilymph collects.

The greater density of those portions of the three original periotic bones which are next to these perilymphatic spaces, gives the appearance as of a structure embedded in, and differing from the rest of the petrous bone; and, no doubt, from this same cause, the general progress of the disintegration by necrosis of the petrous bone, was arrested, in the specimen here exhibited, so that the appearance is presented of a "bony labyrinth," dug out, as it were, from the rest of the bone to which it properly belongs.

A CASE OF STRANGULATED HERNIA INTO THE FOSSA INTERSIGMOIDEA.

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IN his very valuable lectures on the Anatomy of the Intestinal Canal and Peritoneum in Man, Mr. Treves refers to (BRITISH MEDICAL JOURNAL, March 31st, 1885, p. 583) a case of hernia into the fossa intersigmoidea, which I narrated in some lectures (*Illustrations of Intestinal Obstruction*) given at the Royal College of Surgeons in February, 1884. This fossa, first described by Hensing, is met with as a pouch or depression of the peritoneum, forming the left or under layer of the meso-sigmoidea passing to the upper part of the sigmoid flexure. For details of its position and relations, reference may be made to Mr. Treves's lectures, to the classical monograph of Treitz (*Hernia Retro-peritonealis*, Prag, 1857), or to a later summary of the subject by Waldeyer (Virchow's *Archiv*, Band lx, s. 66).

Augusta H., a dressmaker, aged 63, was admitted to St. Bartholomew's Hospital, under the care of Dr. Southey, on December 30th, 1882. She stated that she had been in good health until December 26th, at 10 A.M., when she was suddenly seized with violent constricting pain around the abdomen in the region of the epigastrium, was immediately violently sick, and passed a large loose motion. She had sometimes suffered with indigestion, with a similar tightness across the epigastrium to that she now experienced, but was relieved by purgatives. Her bowels had always been regular. On the 27th, she passed a very small motion, with a little slime and blood. After the onset of the attack, she vomited all food. The vomit was at first bilious, but on the 28th it became brown, and smelt like a motion. She had noticed that she had passed much less urine than usual.

When admitted on December 30th, her expression was anxious; pulse 84; temperature subnormal; respirations 20. She complained of slight pain in the abdomen, which was largely, uniformly, but not tensely, distended, and showed, through its walls, vermicular movements of the coils of intestine. The tongue was furred, but moist. There was incessant retching, but no vomiting. The rectum was free, and an enema of three-quarters of a pint of warm water returned, with small soft masses of feces and blood-stained mucus. During the first eighteen hours after admission, she voided eleven ounces of urine, of specific gravity 1022. She passed a restless night, and at 1 A.M. on December 31st vomited for the first time, the vomited matter being feculent. Five minims of tincture of opium were given every four hours.

January 1st, 10 A.M. There had been slight vomiting in the night, but none since then. She had less pain, but prostration was greater. Pulse 108; temperature 97.8°; respiration 20. The tongue was moist, with a thick brown fur.

January 2nd. After a consultation, Mr. T. Smith performed the operation for right lumbar colotomy. A portion of intestine was opened, and much fecal matter evacuated.

¹ Thus Voltolini has extracted the whole labyrinth by the meatus in a child, and describes a similar case in the practice of Jacobi (*M. für Ohrenheilk.* 1870). Delstanene fils removed the labyrinth, with the exception of one semicircular canal. There was also necrosis of the external meatus (*Arch. für Ohrenheilk.*, vol. x). Gottstein showed, at the meeting of the Congress at Milan in 1880, a sequesterum of a portion of the labyrinth only (*Arch. für Ohrenheilk.*, vol. xvii). Moos (quoted by Politzer, *loc. cit.*) records a case where severe cerebral symptoms, existing only a week or two, disappeared on the removal of the necrosed semicircular canals. Again, sequestra of portions of the labyrinth may remain *in situ*, and be found on *post mortem* examination. Toynbee (*op. cit.*), Troltsch (Virchow, *Arch.*, vol. xvii), and Politzer (*op. cit.*).