Supposing now that we leave aside all scholastic disputations as to the fluidity of the blood, and of the necessary association of these murmurs with a condition of anæmia, and that we make use of the faculty of hearing in pronouncing upon the nature and gravity of every case of ear disease that comes before us, what, then, will be our position? Why this, that certainly in a very large proportion, if not in quite as many as we would put it—namely, in 95 per cent. of aural patients, taking these as they come before us promiscuously in the out-patient department of an hospital, we shall find that such murmurs prevail.

This, at least, is my experience, and I can lay no claim to any special delicacy of stethoscopic perception; it is, I conceive, in every way a most important observation, as it not alone establishes the existence of a pathological entity in connexion with our basic aural dyscrasia, but it enables us to pass judgment upon the probability of aural involvement years before such infirmity pronounces itself by noticeable imperfection of hearing, and it also, as we shall see, supplies a logical and sufficient explanation of the extreme difficulty that exists in the removal of the symptom, deafness, when it becomes an established infirmity.

(*To be concluded.*)

ART. XIII.—*Ivory Exostosis of the Auditory Meatus.*^a By ARTHUR H. BENSON, F.R.C.S.I.; Ophthalmic and Aural Surgeon to the City of Dublin Hospital; Assistant-Surgeon to St. Mark's Ophthalmic Hospital.

It is not many years since the first case of successful operation for the removal of ivory exostosis of the meatus was recorded, and though since then several such have, from time to time, been placed on record, the case which I wish to bring before the Academy of Medicine possesses some points of interest which, perhaps, justify its publication.

The terms “exostosis” and “hyperostosis” are ones which are rather indefinitely used by different authors, and this has led to confusion. Cassells^b is at considerable pains to distinguish between these two forms; the term “exostosis” he confines to *new growths* of bone in the meatus, usually ossified granulations, tolerably soft,

^a Read in the Surgical Section of the Academy of Medicine in Ireland, February 20, 1885.

^b Trans. Int. Med. Congress. 1881. Vol. III.

tender to the touch, usually pedunculated, growing from the posterior wall, and only to be found arising at the outer half of the external auditory meatus, having their origin in the periosteum of the mastoid, close to the meatus, and usually single.

The "hyperostoses" are *hyperplasms*, are never pedunculated, are usually of intense hardness, not tender to the touch, may grow from any portion of the osseous canal, and are usually multiple. The following case would, therefore, belong, according to the above definition, to the class of "hyperostoses," but I have preferred to follow the more usual, if not the more scientific, nomenclature :—

CASE.—Mr. N., aged thirty-three, of full habit of body and an indefinitely gouty and rheumatic descent, was sent to me by Dr. Allen, of Middleton.

History.—He stated that formerly he used to bathe much in the river, but that he gave it up many years ago because it affected his ears, and he suffered from ear-ache, which he sought to relieve by applying laudanum and sweet oil, but that for the last three or four years he had not had any trouble of that kind. Recently he had applied to Dr. Allen, in consequence of deafness in the right ear, caused by an accumulation of cerumen in the meatus. On removing this with some difficulty, an exostosis was observed, and he was recommended to consult me, which he did in September, 1883.

Stat. Præs.—I found in the right ear three bony bosses protruding into, and partially blocking up, the lumen of the meatus externus. Two of these were situated close to the membrana tympani, and grew from the anterior and posterior walls of the meatus. Between them a tolerably wide slit existed, through which the membrane could be seen to be healthy. The third boss, which was also the largest, was growing from the anterior wall of the canal, and a considerable distance external to the others. It was conical in shape, and extended into the meatus so as to render full examination of the deeper growths difficult. Around and internal to this there was a considerable collection of cerumen and epithelial *débris*.

It seemed that the deafness was entirely caused by the accumulation of cerumen, &c., behind this bony prominence, for when the collection was removed by syringing the hearing was perfectly normal again.

This most external tumour was covered with pale, smooth skin, was not tender to the touch, appeared of ivory hardness, and was perfectly immovable. In the left ear a somewhat similar condition prevailed, but to a much less degree.

The diagnosis was plain, and the question of treatment at once presented itself. The choice lay between some operation for the removal of

the growth, and purely palliative measures, as removing the cerumen from time to time; for few will now-a-days place much reliance upon local applications of nitrate of silver, or iodine tincture, or yet upon blisters to the mastoid, or iodide of potassium internally—all of which have, from time to time, been used and praised by high authorities. The obvious disadvantage of adopting the palliative course was that sooner or later the passage would become too small to permit the removal of the cerumen, &c., and operation would then be imperative, whilst the growth being bigger and the passage smaller, the difficulties of the case would be greatly increased.

On the other hand, to undertake so serious an operation as the removal of an ivory exostosis before it became absolutely necessary to do so, seemed to me to be open to objections also. I therefore determined to try the effect of "electrolysis." I judged that by applying the current with a needle to the tumour in a number of places, I could so destroy the vitality of its covering as to produce a superficial necrosis, and, perhaps, in this way, remove the growth sufficiently.

Treatment.—A ten cell Leclanché's battery was accordingly brought into play, and a gold needle attached to the negative pole was thrust into the skin, covering the exostosis, the circuit being completed by making contact over the mastoid process with a pad attached to the positive pole.

In order to get at the internal aspect of the growth, I had a needle bent into a hook, which I was able to pass behind the apex of the cone, and stick into its internal surface. The pain caused by the application was considerable, but not excessive, and no pain or inflammatory reaction followed the *séance*. The application lasted five or six minutes, and after the removal of the needle the meatus was dusted with boracic acid in powder. Fourteen or fifteen such applications were made on consecutive days, and the whole top of the tumour was thus riddled with needle holes, and denuded of its soft parts. The patient was then sent down to the country, and I asked Dr. Allen to keep a look out for whatever might come from the ear. Six weeks later Dr. Allen sent me up a shell of bone, the top of the exostosis which had necrosed, and which he had removed when syringing the ear. It was evident, therefore, that the treatment had, so far, succeeded.

On January 24, 1884, five months after his first visit, he again consulted me. The exostosis had grown but very little, if at all, since I last saw him. The hearing was perfect, and the ear was not tender. He was, however, anxious that something further should be done, as the cerumen still collected on and behind the growth, and I gave him a choice of another term of electrolysis, or the more rapid and radical removal by the aid of a dental engine. He chose the latter.

Operation.—Dr. Arthur Baker kindly assisted me at the operation, which was done in his consulting room. Sitting in the dental chair,

ether was administered, and a vulcanite speculum, which was cut short for the occasion, was inserted as a guard to the soft parts.

The idea was to perforate the base of the tumour with a drill, and then with a saw or file^a cut upwards and downwards from the central hole. This I found impossible to do, owing to the extreme density of the tumour, its sloping side, and the difficulty which I experienced in working the drill in the ear. After some unsuccessful attempts to make an impression on the side of the base, Dr. A. Baker suggested that it might be more easy to use the saw from the top. The soft parts over the exostosis were removed by a few turns of the rose, and the saw (which Dr. Baker showed) being attached to the engine, a groove was, with much difficulty, cut by Dr. Baker in the base of the tumour; into this a small chisel was inserted, and the bony apex of the exostosis, which I show, was, by a slight blow of the hammer, removed. There was a very considerable amount of bleeding during the operation, which, however, soon ceased, and the ear was plugged with boracic acid powder. The greatest possible difficulty was experienced in working in the ear with the instruments intended for the teeth, as they were not long enough to reach in without blocking up the view of the parts, and rendering it necessary to stop and syringe out the meatus every few seconds.

Had it not been for Dr. Baker's skill in working the engine, I do not think the operation would have succeeded, for he did most of the latter part of the work. The operation lasted two full hours, and we were both fairly exhausted when it was over. No bad symptoms followed, and in a fortnight the ear was looking quite healed; the hearing, which for a few days was defective from the swelling, &c., was normal, and he returned to the country. Since then I have seen him from time to time, last on January 20, 1885, just a year after the operation. There was not the slightest trace of an exostosis in the old position, only a slight scar marking the place it had occupied. The exostoses near the membrana tympani were, perhaps, somewhat larger, but hearing was then, and had since been, perfect. The exostoses in his other ear were somewhat more prominent, and larger than when last seen.

Into the question of ætiology I shall not enter, so many and various are the theories which have been from time to time advanced. My patient had never had rheumatism, syphilis, or gout; he had bathed in fresh, but not in salt water, and in his opinion it was the bathing which first started the ear trouble. This would agree with Field's ideas, but in his cases the agent was salt water. It seems probable that very many different causes may produce the periosteal changes which give rise to ivory exostosis.

^a The saw is more like a screw; it is used on the flat, and cuts with a steady motion, without any backward and forward, or sawing motion whatever.

There has, of late years, been a steady and ever-increasing flow of opinion in favour of early operations in many classes of cases.

I am aware that, in operating in the case above described, I violated the rules laid down by most competent authorities, and I would, therefore, especially wish to obtain the opinion of the members of this Academy on two questions :

I. What is the proper time to operate on an exostosis?

II. What is the best method to adopt?

Most writers^a lay it down as a canon that the operation is not to be performed until "total deafness has occurred in both ears," unless in the case of otorrhœa, where an exit must be provided for the discharges. It seems, however, reasonable, in view of the result of the case I have just described, to say that the earlier operation may, under some conditions, be the best. If the operation can be done with tolerable safety, and with but little fear of the tumour growing again, I think that the earlier it is performed the better—before the parts get much changed, whilst still it is possible to know the exact condition of, and see the exact position of, the membrane, and before the patient has had to endure the dreadful misery of gradually getting deaf, with all its isolation and despondency.

As to the best method of operating, each case must be considered according to its peculiar features. In electrolysis we possess an agent capable of doing good service in certain cases, and with patients too nervous to undergo the more formidable operation it would probably be borne well, and combined with the application of acids to the denuded surface, might prove curative. It is, however, slow, and rather painful.

Of the gouge and hammer alone I shall say nothing ; the method seems to deserve nothing but condemnation.

That which we adopted in this case seems about as likely to succeed as any method, and has the advantage of almost absolute safety. It is much more easy for a drill to go astray in its course, and penetrate some vital part, than for the so-called saw to get out of the proper direction ; and by making the cut only through, say, three-fourths of the tumour, and separating the remainder with a chisel and hammer, almost all danger of wounding the membrana tympani, or other parts in the middle ear, is avoided. It would be advisable, however, to get the saw considerably longer in the shank than the ordinary dentist's instrument, as with it the difficulty of illumination is very great.

^a Politzer, Cassells, Barr, Burnett, &c.