given strength of current produces a much more powerful coagulating effect, without increased discomfort or danger to the patient.

In most of the cases hitherto recorded a small number of cells were used, and yet considerable uneasiness and pain were experienced. This was obviated in the present instance by the use of a rheostat introduced into the circuit, which enabled us to apply the full force of twenty cells without the patient feeling even any uncomfortable sensations. When the current from a large number of cells is suddenly applied to the body, not only is there a severe shock, but the burning pain afterwards is unbearable. It is, however, well known that galvanism is a nerve-anaesthetic; hence a feeble current dulls the sensation for a subsequently stronger one, and this in turn for one more powerful, and so on. Thus, by slowly and insidiously increasing the strength without producing any shock, which the rheostat can accomplish, a current so powerful can be passed through the tissues without pain, which if suddenly applied would be intolerable.

That a powerful current in this case actually passed through the blood was demonstrated, not only by the positive needle being dissolved, but by a galvanometer, which was always employed. By this it was ascertained that in the circuit, of which the aneurism formed a part, there passed a current measuring from twenty to thirty millivolts.

A somewhat pertinent question was asked at the post-mortem examination, Are the organised clots the result of the galvanism, or did they not exist before the operations were performed? From the appearance of the formations themselves, it is difficult to settle this question. The fact of their being dense, organised, and laminated, suggests their being of ancient date, and whether it is impossible for such to be produced in six weeks after electrolysis, is a point I cannot answer. The lamination is in no way opposed to the clot being produced by electricity, as Dr. McCall Anderson and others describe and figure precisely similar conditions resulting from galvano-puncture. On the other hand, when the patient was admitted, the tumour was carefully examined by many competent physicians and surgeons, who all agreed that it was soft, fluctuating, pulsating, and with lateral expansion; and before death the same regions were found by the same observers to be dense, hard, resistant, and non-fluctuating. From these facts it may be assumed that the subsequent consolidation was due to the action of the electricity on the blood.

In conclusion it may be stated that, with our improved knowledge of electricity, and the more perfect instruments for its application we now possess, a great field is opened out for the treatment of aneurisms in general, and those of the aorta in particular. Hitherto the results of this procedure in the latter have not been successful as regards saving life, but this may be explained on the ground that it has only been employed in hopeless cases, and in those, after which every other treatment having failed, it has been adopted as a last resource. In the present case, had the operation been performed when the patient first came under observation a year ago, judging from the post-mortem appearances, the prospect of a cure or prolonged alleviation, appears not only possible but probable. As it was, this treatment was carried out because it was judged the patient if left to nature could not live many weeks. Considering that galvano-puncture if properly conducted appears to be practically harmless, there need be no hesitation in resorting to its application in any case of aortic aneurism, which can be easily diagnosed to be saccular in character, and which can be reached without difficulty.

REPORT ON ONE HUNDRED CASES OF EAR DISEASE.

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FROM July, 1878, to December, 1879, one hundred different cases of ear disease came under my care at the above institution, of which notes, more or less complete, have been kept. They include the following forms of ear affection: One case of abscess of the auricle; four cases of diffuse external otitis (unilateral); eighteen of impacted cerumen

or epidermis (nine unilateral and nine bilateral); one case of exostoses of the external auditory meatus (unilateral); two cases of Eustachian obstruction; four of acute catarrh of the middle ear (two unilateral and two bilateral); and one case of otitis media serosa (unilateral). There were also twenty-seven cases of otitis media purulenta chronica (thirteen unilateral and fourteen bilateral), nine of these being complicated with polypus (the growths being unilateral in eight cases and bilateral in one instance). One case of chronic purulent inflammation of the middle ear was complicated with mastoid periostitis. Results of suppurative processes in the tympanum were found in fourteen cases (five unilateral and nine bilateral); and there was one case of necrosis of the temporal bone, and one of deaf-mutism. Of the remaining forty-seven cases, the great majority were classed under the head of "otitis media catarrhalis chronica," or would be better termed "otitis media non-suppurativa chronica," seeing that they included also the sclerotic or dry forms of middle-ear disease. In a considerable proportion of these cases (as well as of those above classified as "results of suppurative processes") there was evidence of nerve-impairment to a greater or less extent. Whether this was secondary to the tympanic mischief or constituted the chief affection could not always be accurately ascertained, partly from want of time, and partly from irregularity of the patients' attendance—circumstances which unfortunately often render records of out-patient practice incomplete. Apart from this, however, as Lucae has not long since pointed out,¹ the distinction between nerve-deafness and chronic non-suppurative inflammation of the middle ear (in the less well-marked forms) constitutes one of the weakest points in aural diagnosis. In at least three cases nerve-impairment was well marked, one of them being a case of congenital syphilis, which is still under treatment (March, 1880). More than one of the above diseases of course often occurred in the same patient.

Impaction of cerumen or epidermis.—In four of these cases (two unilateral and two bilateral) the impaction of wax came on after bathing or diving. The symptoms being deafness with tinnitus, continuous or pulsating, and of "hissing," "rushing," or "singing" character. This, as far as my experience extends (both in dispensary and private practice) is the most common form of ear-affection, attributed by the patients to bathing. Removal of the wax almost invariably relieves all the symptoms. Under the same heading is included the following case of impaction of epidermis, associated with chronic purulent inflammation of the tympanum and nerve-impairment, which forms a well-marked instance of the disease described by Wreden of St. Petersburg as *keratosis obturans*.

Case of keratosis obturans.—M. J.—, aged forty-five, chemist's assistant, applied on August 15th, 1879, with the following history:—Has had dulness in the *left* ear since he was a boy, which has been worse the last three months. No noise, pain, or discharge. Never had any fever. On admission, with the *right* ear watch² was heard at $\frac{1}{2}$ in. distance; *left* not at all. Tuning-fork on teeth heard loudest on left side, but not heard on forehead or on bridge of nose. A large quantity of epidermis in long-shaped pieces removed from the *left* meatus by syringing, but as some still remained drops of bicarbonate of soda dissolved in glycerine and water were ordered to be instilled into the meatus.

Aug. 18th.—A quantity more of white folded and corrugated epidermis was removed from the left meatus, a large portion of it having to be carefully extracted with forceps, as it was very adherent to the walls of the canal. Afterwards the meatus appeared dilated and of pearly and shining aspect. Hearing for watch not improved on the left ear.

29th.—There had been some discharge from the left ear. Watch heard with right ear at $\frac{1}{2}$ in.; left slightly on pressure on auricle and mastoid. More large epidermic scales removed from left meatus by forceps and scoop, after removal of some purulent discharge by syringing. Left membrana tympani then presented a white surface with scales on it and granulations in the posterior superior segment. On Politzerising perforation sound in left ear. Afterwards hearing about the same.

¹ Archiv f. Ohrenheilkunde, xiv. 2, p. 125.

² The watch mentioned throughout this paper is heard audible normally at about ten feet.

The patient was seen a few times after this, and the granulations touched once or twice with a solution of nitrate of silver (a drachm to the ounce). They presented the peculiarity of bleeding, not only when touched with the tuft of cotton-wool in applying the caustic, but even on mere syringing. When last seen, the watch was not heard at all at the left ear.

Remarks.—Whether in this case the perforation was the result of the pressure of the accumulated epidermis, or whether the tendency to the excessive formation of epidermis was superadded to a case of chronic suppuration in the tympanum, must, I think, remain doubtful. Although, owing to the nerve-impairment, the removal of the epidermic accumulation did not effect any improvement in the hearing power, it was undoubtedly of benefit in preventing any accumulation of pus behind the epidermic masses. (The specimen removed from this case was exhibited, and an account of the case given before the Sussex and Brighton Medico-Chirurgical Society in November last.)

The case of *exostosis of the auditory meatus* occurred in the ear of a man aged thirty-one, suffering from chronic non-suppurative inflammation of the tympanum, probably of gouty origin. They were two in number, and situate on the anterior and posterior walls of the meatus respectively, but as they did not encroach greatly on the lumen of the canal, they demanded no special treatment. The four cases of *acute catarrh of the tympanum*, which all occurred in adults, did well without paracentesis. The operation did not appear indicated, probably because the cases were not seen early enough. In only one case was a minute perforation observed whilst the patient was under treatment, and in this instance it healed readily.

The following case is interesting on account of the obstinate recurrence of the effusion into the tympanic cavity, associated with repeated occlusion of the Eustachian tube:—

Otitis media serosa; paracentesis; reaccumulation of fluid; treatment without paracentesis.—Mary S—, aged forty-eight, single, applied on March 31st, 1879, with the following history. Left ear has been deaf for years from discharge. Right ear has been deaf for one year, she believes owing to cold from sleeping near a damp wall. She thinks it gathers sometimes, and discharges down her throat. Throat feels swollen and aches at times. Last summer she had violent pain in the right ear, and went to the Throat Hospital in Golden-square, where she says the ear was punctured. *Present state:* Watch heard only on contact with right temple. Right membrana tympani yellowish. After Politzer-inflation watch was heard right ear at half an inch, also on contact with right mastoid and temple. The posterior segment of the right membrana tympani is then seen bulging outwards, with yellow fluid shining through.

April 2nd.—Right ear: watch heard almost on contact, and slightly on contact with mastoid. Membrana tympani has a yellow tint, and appears somewhat streaky. Politzerising produces no improvement in the hearing for watch, although it causes the membrane to bulge with yellow fluid, showing through, as yesterday. On the anterior segment of the membrane is a thin layer of wax or hardened secretion. A puncture about two millimetres long is then made vertically downwards in the posterior segment, which allows some serous fluid to escape. On repeated Politzerising, producing, of course, a perforation sound, a considerable quantity of clear yellow fluid runs out into the concha. Parts cleansed with dry wool. Immediately afterwards watch is heard with right ear at one inch and a half.

3rd.—With right ear watch heard at one inch and three-quarters, and plainly on right mastoid. Point of puncture indicated by a small blood spot. The posterior segment of the membrana tympani has lost its yellow colour. On Politzerising air enters the right tympanum freely, but I cannot be sure of perforation sound, and no change in the puncture is produced, neither does any discharge escape.

4th.—There has been no discharge from the ear. The hearing has improved to 3 in. for watch. No perforation sound on Politzerising; but inflation diminishes the hearing to 1½ in.

7th.—After removal of a thin layer of yellow discharge from the surface of the membrana tympani, there appears to be yellow discharge shining through its anterior inferior segment, but not through the posterior. Politzerising improves the hearing from ½ in. to 1½ in.

The patient was then seen about thrice weekly until

August 1st. She was treated locally by Politzer-inflation, vapours of compound tincture of benzoin, fir-wool-oil, creasote, &c.; internally, tonics and chloride of ammonium. On three occasions (June 6th, July 2nd, August 1st) the catheter had to be employed, as air would not pass on Politzerising. The tube did not always yield on catheterising, but subsequent Politzerising was always successful, usually with considerable improvement to the hearing (from which it may perhaps be concluded that the obstruction in the tube was at or near the faucial orifice). The hearing for the watch, though it varied very much, improved decidedly on the whole. After each inflation the hearing was usually found improved, but on one or two occasions it was temporarily diminished, perhaps owing to a rushing noise in the ear produced by the inflation. Not only did the lining membrane of the tympanum participate in the inflammatory condition, but also the outer surface of the membrana tympani; for on July 14th the membrane appeared opaque and uneven, with the hammer very indistinct, only the small process being visible. A short time after, a regular membrane of dry yellow discharge was removed with the scoop and forceps from the surface of the membrana tympani. When the patient was discharged, on August 1st, the hearing distance was—Right ear, watch 5 in.; after inflation 7½ in.

On Aug. 18th she was readmitted, yellow fluid again showing through the membrana tympani, the hearing having gone back to 1 inch. This time she was only treated by inflation and vapours, and was discharged on Sept. 15th with hearing distance:—Right ear, watch, 4½ in.; improved by Politzerising to 8 in.

Quite recently—Feb. 27th, 1880—this patient has returned with the hearing for the watch reduced to “contact,” and the fluid reaccumulated. I proposed to puncture the membrane again, and if necessary pass a stream of fluid through the ear; but the hearing has improved so much on simple inflation, with the head held so that the Eustachian tube is in the most dependent position in order to allow the fluid to run out (as recommended by Politzer),³ that I have not done so yet.⁴

The following case is one of interest:—

Tinnitus, audible objectively.—E. D—, aged twenty-three, unmarried, laundress, applied on Oct. 14th, 1878, giving the following history: For three years on and off she has had a clicking noise in the left ear, and has noticed deafness in that ear during the same period. No pain or discharge. Has always enjoyed good health. The noise, which is audible to other persons, is louder than it used to be, and her neighbour, who accompanies her, thinks it comes on especially when she is excited. She sometimes has a buzzing noise in the right ear. (It appeared subsequently that about a year previously there had been discharge from the ears, chiefly the right one.) On examination the watch was heard with left ear at 3½ in. Left membrana tympani presents a large circular perforation, rather below its centre, into which the handle of the malleus projects. Perforation quite dry, and the exposed mucous membrane of tympanum appears of yellowish colour. Both in front and behind the malleus the membrana tympani presents a hard white surface, probably chalky deposits. Perforation-sound on Valsalvan inflation. There is no noise at present.

Oct. 18th.—Since last seen she has had the noise twice, lasting twenty minutes. With right ear watch heard at 15 inches. Right membrana tympani presents a considerable sized perforation at the lower part, and also two chalky deposits on the membrane. No discharge.

21st.—No noise till yesterday, when it lasted ten minutes. Left membrana tympani appears the same. On making her move the upper jaw up and down, a fine clicking sound is heard which takes place irregularly, but soon ceases after the movement of the jaw is stopped. On careful inspection of left membrana tympani, during the noise no movement of the malleus can be detected, nor any bubbling through the perforation. The clicking sound is brought on again by Politzerising, but soon ceases. She says it is often much louder than this. The noise heard to day resembles very much that produced by snapping the nails together. Throat, nothing abnormal.

Nov. 1st.—On swallowing, a similar click is heard through otoscope placed in left ear, only somewhat fainter than when it occurs independently of swallowing. When the otoscope

³ See his Handbuch, vol. i., p. 325.

⁴ Subsequent experience confirms the great tendency to relapse in this case, and inflation only appears to improve the hearing for a time (August).

is placed in the right ear, a very faint click is heard on deglutition, apparently similar in character to that heard on the left side. The noise is heard to-day a few times independently of deglutition, but is not loud. After the clicking ceases she has a buzzing noise in the ear.

I was naturally anxious to hear the noise in this case during one of the attacks, when it was occurring loudly, especially with a view to examining the throat during its occurrence, but in spite of repeated injunctions to the patient (who lived at some distance) to present herself if possible when the noise was taking place loudly, I could not get an opportunity of hearing it.

I saw this patient again in February, 1879. There was no change in the membrana tympani, and the clicking noise still continued at intervals. My attempts to see the patient during an attack were again unsuccessful. On one occasion she reported that after retching during a bilious attack, the noise came on very loud, and lasted for half an hour. It should be mentioned that although the buzzing noise occurred in both ears, the objective clicking sound was, according to the patient, confined to the *left ear*.

Remarks.—Although the observation of this case is unavoidably incomplete, I think (from the similarity of the noise to that produced during swallowing, and from the absence of movement in the malleus) there can be little doubt that the clicking noise was produced by a separation of the moist walls of the faucial orifice of the tube as occurs during deglutition. This view agrees with that of Burnett, who describes these cases at length in his work on the ear. Quite recently also he has reported⁵ the case of a gentleman who was able to produce a noise of this description at will. On the other hand, however, Dr. Bremer of Copenhagen has lately⁶ described the case of a boy who could voluntarily produce an objective noise apparently of similar character, which continued *unchanged in intensity and character* whilst a bougie was passed through the catheter to the isthmus of the Eustachian tube. Although no movements in the membrana tympani could be observed Dr. Bremer attributes the noise in this case to the action of the intrinsic muscles of the ear, especially the tensor tympani.

Arguing from the fact that complete cessation of the noise occurred after spontaneous perforation of the membrana tympani in a case under his care, Burnett⁷ recommends artificial perforation in these cases if relief from the symptoms should be urgently required. My case appears to throw doubt on the success of this plan of treatment, for in this patient the membrane, as mentioned, was already perforated. This affection appears to be more common in men than in women, for, according to Burnett (who writes in 1877)⁸ "of all those in whom such an objective aural noise, either voluntary or involuntary, has been observed only three were females." The points of interest in this case are, therefore, that the noise was involuntary, that it occurred in the female sex and in connexion with an ear of which the membrana tympani was perforated.

The term "*chronic catarrhal or non-purulent inflammation of the middle ear*" includes, I cannot but think, a number of cases which are really of very different character. For the history, and also the prognosis, in some of these cases are so different that but for the name they appear to have little in common. The subject, however, is too large a one to be discussed in this paper. There are several other points of interest in different cases in this series; indeed it may be said that a large proportion of ear-cases, if only carefully studied and treated, present features of interest. An account of these, however, must be postponed until the special subjects to which they refer are dealt with.

Brighton.

⁵ Archives of Otolaryngology, Dec., 1879.

⁶ Monatsschrift für Ohrenheilkunde, Oct., 1879; and London Medical Record, Feb., 1880.

⁷ A Treatise on the Ear, p. 447.

⁸ Op. cit., p. 443.

ON THE ANTI-MALARIAL ACTION OF THE CHINCHONA COMPOUNDS.

By T. J. MACLAGAN, M.D.

(Continued from p. 167.)

BUT though there are many analogies between continued and malarial fevers, there are also great and important differences. These, equally with the analogies, demand attention. They are as follows:—

1. There is ample evidence that the poisons of the continued fevers are reproduced in and given off from the system in large quantity during the course of the maladies to which they give rise. There is not such evidence in the case of malarial fevers.

2. The continued fevers are communicable from the sick to the healthy. Malarial fevers are not.

3. The continued fevers have a continuous regular course, and a definite period of duration. The course of malarial fever is intermitting and irregular, and its period of duration indefinite.

4. One attack of the continued fevers confers, as a rule, immunity from a second. There is no such immunity in malarial fever.

Let us consider each of these points.

1. *Contagia are produced in and given off from the system. Malarial poisons are not.*—The evidence of the reproduction of the poisons of the continued fevers is their elimination in increased quantity and in an active form. And the evidence is sufficient. A poison cannot be received into the system in small quantity, and be given off from it in large, without having been reproduced there. But though increased elimination is a proof of reproduction, its absence is not a proof to the contrary. An organised poison might be reproduced in, and exercise its action on, the system, without being eliminated in an active form. Its life history might be completed in one cycle of growth within the system, and itself come to an end in the course of the morbid action which it set going. Or it might be destroyed and disintegrated in the system and thrown off by the eliminating organs. In either case it would pass from the system in a form different from that in which it entered it. It is certain that in malarial fever the poison is introduced from without. It is probable that this poison is an organism. If it be so, its action is likely to bear a relation to its organic growth.

The phenomena of these fevers are, indeed, such as can scarcely be explained on any other view. A short residence—even one night—in a malarial district may give rise to a fever of some weeks' duration. If during one night the patient inhales enough poison to cause so prolonged an attack of fever, if the whole of the poison requisite to the production of such an illness exist in the system at the commencement of the attack, he surely should be killed right off by it. Again, if the dose taken suffice to cause the fever, why does it not go on acting? Why are there intermissions and remissions? Why is the patient one day in a raging fever, and the next day free from it? And why, in the absence of treatment, does this alternation of pyrexia and apyrexia go on indefinitely?

If the whole of the poison necessary to the production of all the phenomena of the malarial fevers existed in the system at the commencement of the illness, they would lose their intermittent and remittent character, the full effects of the poison would be produced at once, and their phenomena would be concentrated into one violent attack of fever which could scarcely be recovered from.

It is impossible to explain the phenomena of the malarial fevers on the supposition that the whole of the poison necessary to the production and full development of each exists in the system at the time of its onset. Their varying course, their often increasing severity, their prolonged duration, and their small mortality, can be accounted for only on the view that their poisons are reproduced and destroyed during the course of the maladies to which they give rise—that that which produces the symptoms of to-day has to-morrow ceased to be active, but has given rise to an offspring which keeps up the action which its parent set agoing, and in its turn hands down to its offspring the same morbid properties which itself received.

APOTHECARIES' HALL OF IRELAND.—On the 2nd inst. the following were elected office-bearers for the ensuing year:—Governor, Edward H. Bolland; Deputy Governor, Thomas Collins. Court of Directors and Examiners: John Evans, Arthur Harvey, Charles Holmes, Charles H. Leet, Charles J. Moore, Robert Montgomery, Henry P. Nolan, Jerome O'Flaherty, Edward J. O'Neill, George B. Owens, John Ryan, James Shaw, George Wyse. Examiners in Arts: H. Colpoys Tweedy, Arthur Wilson. Representative on the General Medical Council: Charles H. Leet.