DISCHARGES

FROM

THE MIDDLE EAR

ACUTE AND CHRONIC

THEIR CAUSES AND TREATMENT

With Reports of Illustrative Cases.

BY

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Discharges from the Middle Ear,

Acute and Chronic.

THEIR CAUSES AND TREATMENT, WITH REPORTS OF ILLUSTRATIVE CASES.

BEFORE beginning the discussion of the affections of this portion of the ear, it will be well to examine very carefully what the structure of the middle ear is, so that we may the more fully understand how it is affected with the forms of inflammation, etc., which attack it. From the general practitioner's view the middle ear consists of an irregular cavity separated from the external auditory meatus by the tympanic membrane and traversed by a chain of ossicles; while connected therewith, superiorly, postero-superiorly, and postero-inferiorly, there is a series of cavities or cells, the largest and most important of which is the Mastoid Antrum, all situated within the mastoid, all having communication with each other, and all lined with a muco-periosteum identical with that of the antrum; rich in glands which secrete abundantly; and, finally, all connected with the outer air by means of the Eustachian tube. The structure here differs very considerably in the child from that found in the adult, and will account in no small degree for the number of apparent or actual cures which occur after suppuration of the middle ear in young children, especially during the period of dentition. In children, instead of having a great number of cells connected with the mastoid antrum, we rarely find more than a single cell—the mastoid antrum itself—and from its position, with a perforated tympanic membrane, we get free drainage and consequent cure. With all these cells, or honeycomb of cells, communicating directly with one another, and all lined with a secreting mucous membrane, it is easy to understand how an inflammation which at first may be very slight soon assumes very grave proportions, as well from the amount of surface exposed, and the unyielding nature of the cavity walls

(all being bony except the tympanic membrane), as from the situations of the openings leading from one cell to another; and lastly, the mere action of gravity on the pus and other secretion as affected by the different positions of the head when lying down and when up and going about, may have a more or less direct effect in extending the disease from one cell to another until finally the whole are involved. Here again the passage between the antrum and tympanum is in some cases very narrow, and as a consequence easily blocked up, so that pus or other secretion is kept back in the antrum, and will as a natural result travel in the line of least resistance to the other cells connected therewith, and so infect the whole. But even although a very great portion of the whole cavity be involved, if the condition of the patient be good, the power of resistance of the mucous membranes may be such as to yet throw off the mischief, short of a suppurative attack.

In discussing the diseases which involve this portion of the ear, and which account for by far the greater proportion of all the chronic ear troubles, we would divide them into two distinct classes: (1) Acute inflammation of the Mastoid; (2) Chronic inflammation of the Mastoid; though how far the one merges into the other is difficult to determine. But before considering the actual disease it will be well to consider the chief causes which tend to give rise to it. Here it is most important to bear in mind the anatomy of the parts and their connection with the outer world through the Eustachian tube. (I.) First amongst the causes giving rise to this trouble are the various exanthemata, and amongst these the foremost place may be given to scarlatina; second, measles; third, influenza; and fourth, enteric; (II.) Any acute inflammation of the upper respiratory tract (Diphtheria, Tonsilitis, Pharyngitis and inflammations of the anterior and posterior nares), or Pneumonia; (III.) Acute Ptomaine poisoning, see Case XVI.; (IV.) Post-nasal adenoids. In all these conditions there is more or less severe inflammation of the naso-pharynx, and with this the Eustachian tube is invariably involved. With this inflammation of the tube the specific bacteria find an easy entrance into the middle ear; and once there — should there be a lowered vitality of the general

system, and with it of the middle ear, so that the mucous membrane is not able to destroy these bacteria and pathological products—an acute inflammation is very soon established; and once it has been established in a chamber where the natural outlet (the Eustachian tube) is more or less completely blocked with the inflammatory state of its walls, we soon find the chamber too small for the amount of secretion and pus. This must find an outlet somewhere, and naturally will follow the course of least resistance, which is invariably through ulceration and rupture of the tympanic membrane. Should this rupture be free and large, and the general condition of the patient remain good, then one would naturally expect the inflammation to be gradually cleared up by nature's efforts; but should the vitality be low and other intercurrent mischief be present, the result will not be so favourable, and the disease will pass on to the chronic state, unless appropriate means are used to combat the mischief (see treatment of acute cases).

As regards the probable cause of infection through the Eustachian Canal, it is possible, as pointed out by Mr. Bond, F.R.C.S., in his address on surgery at the annual meeting of the B.M.A., held in Leicester this year, that the ascending currents along the mucous walls of the Eustachian Canal (mucous canal) may have much to do with the frequent infection of the middle ear through that channel, following on the various conditions which give rise to inflammation of the naso-pharynx.

Acute Inflammation of the Mastoid.

The diagnosis of acute inflammation of the mastoid according to Broca has to be determined under two chief heads. (1) Is there disease of the mastoid? (2) Where, if present, did the disease begin?

The diagnosis must be considered in three different cases.

(*a*) Where there is no apparent alteration of the tissues covering the mastoid.

(*b*) Where there is œdema and swelling, with abcess formation showing.

(*c* Where there is an abcess in the maxillo-pharyngeal triangle.

(*a*) What are the symptoms which would lead one to suppose there is anything the matter? The patient will refer you to a

acute pain in or behind the ear, which has commenced after sitting in a draught, getting a severe chill, a thorough wetting in cold weather, etc., or has come on in the course of an acute illness such as scarlet, measles, typhoid, etc. Here, if you examine the mastoid carefully, you will probably find pain all over on direct pressure, and will certainly always find pain on deep pressure over the supra-meatal triangle and at the tip. There may be some redness over the mastoid region. There will be rigors with shiverings, increase of temperature, general malaise, loss of appetite and sleep, with rapid pulse. There may be vomiting, and if there has been a discharging ear, the discharge will become less or cease altogether. Through the speculum, one may almost certainly see some redness of the tympanic membrane, and if this be intact one may even see the level of the pus within the tympanic cavity. There will be seen some bulging and redness of the postero-superior wall of the bony meatus over the region of the border cells as well as of the tympanic membrane, should it be intact and pus be present. This area will be somewhat tender on being touched with the probe, but that will be in marked contrast to the excruciating pain on touching a meatal abcess. There will, if hearing has been present before, be deafness, more or less pronounced, in the ear on the affected side. If one be supplied with an electric lamp small enough to penetrate the meatus—supposing the cavity be not too painful for its introduction—then one may get some help from the transillumination test as to whether it be simply a periostitis of the mastoid or an acute exacerbation of old inflammation of the mastoid cells. If there has been old inflammation and all the air cells are filled with granulation, pus, or sebaceous matter, it will be easy to detect the condition by the transillumination; otherwise, it will be of little or no value.

(*b*) Where there is œdema and abcess formation showing:

The diagnosis at first seems easy, but on this point I would especially advise caution, for though it may seem at once apparent what the condition is, it will repay here as in every other branch of medicine and surgery to exclude all possible sources of error before adopting treatment. The swelling may be one of many things. It may arise from eczema, may be due to erysipelas, to a local abcess

in the posterior wall of the meatus, or a tumour formation of some kind. The first and most important point to judge will be the condition of the meatus; next the condition of the lymphatic glands; then the condition of the mastoid itself; and lastly the condition of the patient previous to and during our examination. Should the swelling be due to erysipelas then one would look for the general symptoms of this trouble, and examine the glands along the border of the sterno-mastoid as well as the condition of this muscle itself; for, though we may have swelling and pain, there will be little or no pain referred to the muscle; whereas in inflammation of the mastoid every movement of the muscle will aggravate the pain. The same will apply to eczema, but one must always bear in mind the possibility of more than one condition being present.

Abcess in the posterior wall of the meatus may give one almost every symptom of mastoid abcess, but a closer examination will invariably lead to the right conclusion, as the pain in the sterno-mastoid will be absent unless both conditions be present, and if it be only an abcess there will not yet be any enlargement of the glands, or if there be they will be in a different site to those involved in mastoid abcess—namely, along the anterior border of the sterno-mastoid, instead of in front of the mastoid apex; and again, direct pressure over the supra-meatal triangle will always elicit pain in the mastoid abcess, whereas in meatal abcess there will be no pain (but any movement of the ear will give intense pain in meatal abcess). In this condition the hearing will be of little help as a guide, as it will have gone rapidly worse in both conditions. "Various kinds of tumours may be present, but probably sarcoma is the only one about which one may have a doubt, both as regards signs for diagnosis and treatment. Schwartze, with all his skill, on one occasion plunged a bistuary into a sarcoma which he mistook for an abcess, so it behoves one to walk cautiously."—*Broca.*

(*c*) Where there is an abcess in the Maxilla-pharyngeal triangle:

This condition I have never seen, but reasoning from analogy and from what Broca has said on the subject, one gathers that it may present very many variations. (See two cases reported in Curtiss's translation of Broca's work on mastoid abcess, pp. 44-5-6).

Chronic Mastoid Abscess or Chronic Disease of the Mastoid.

In contradistinction to the acute, this is the condition which in this district I have been asked most often to treat. The symptoms here, from the patient's point of view, are invariably vague; but most often one is asked to cure an old-standing deafness which may have suddenly become worse. On enquiring into the history of the case one usually gets an account of an oldstanding discharge from the ear, varying in quantity from time to time, but always fœtid and very offensive. In adults this invariably has had its beginning in childhood, following scarlet or measles. But as it never caused any great inconvenience, the old idea of never interfering with a discharging ear while it causes you no trouble or discomfort, has usually been followed.

The chief symptoms are (1) Deafness; (2) Discharge from the Ear; (3) Growths in the meatus (polypoid); (4) Pain; (5) Giddiness, buzzing in the ear, etc.; (6) Paralysis of the facial nerve.

(1) Deafness: The causes of deafness must be various, because one often finds old discharge from the ear with the hearing only modified or slightly impaired; but in the majority, while there may not be absolute deafness, when tested properly, the hearing is found to be very defective on the affected side. Again, the degree of deafness varies with certain conditions, usually becoming worse during a cold or after sitting in a draught, or after a wetting in cold weather; and also it depends on the state of the ossicles, whether they may have become ankylosed or may have disappeared altogether with some of the rest of the tissues, in the general inflammatory mischief; also whether the antrum is filled with caseo-necrotic matter, or granulation tissue, and whether the meatus is blocked with polypi, exostosis, or hypertrophy of the tissues, chronic inflammatory thickening, inspissated discharge with epithelial debris, wax, etc.; also it may arise from the entrance of water, either accidental, during the washing of the face, or by imperfect syringing; or from oils being put in to soften wax, when the partially dried up debris absorbs the moisture, swells up and firmly blocks the meatus, causing somewhat sudden and complete deafness; or an acute exacerbation of

the old mischief may have blocked up the free outlet of pus from the antrum; and lastly, the internal ear may have become involved in the general destructive process.

(2) Discharge from the ear: The origin of this discharge is in the tympanic cavity, the attic, antrum and mastoid cells. On examining the meatus one invariably finds the further extremity more or less blocked with thick pus, mucous and epithelial debris, with some wax or occasionally granulation tissue. This having been washed away, one often finds a bleeding surface, below and anteriorly, from the presence of slight eczema and excoriation due to the long continued discharge. Then, after having dried the part carefully with cotton wool or gauze (be careful, as in the drying there is often a good deal of sensitiveness, if not severe pain), with the reflected light and speculum a good view will be got of the condition, unless the walls of the meatus are thickened and the canal partially blocked, and will most often reveal that the drum membrane has been perforated or even completely destroyed, as well as that an opening has been formed in the postero-superior wall of the bony meatus. From these openings pus can often be seen escaping, and easily so if the patient blows the nose or if the Politzer bag be used. In the more severe cases there may be little or none of the drum membrane left, and on altering the position of the patient's head one may see the pus flowing from the cavity. There will also be seen the peculiar bulging out of the postero-superior wall of the bony meatus due to the presence of pus or other matter filling the border air cells of the mastoid, if the process has not already gone too far and the swelling has not ulcerated itself away. It is well also to test with the otoscope as the gurgling of pus and fluid can so easily be made out in the majority of cases. This test is especially useful where the perforation is small and difficult to detect with the eye, and where the meatal canal is narrow and tortuous. (See reports of all cases treated).

(3) Polypi, or Polypoid growths. These may show as fungating masses at the meatus, bathed in thin foul-smelling pus; or they may appear as small points of granulation tissue in the postero-superior wall of the external auditory meatus; or they may be seen

coming through a perforation in the tympanic membrane. In all these cases there has been a prolonged discharge and the pus has a very foul smell and is thin in consistence. The origin of these polypi can easily be demonstrated during the radical operation as being in the walls of the antrum, the air cells of the mastoid, the attic, or in some cases the dura mater, through a perforation in the roof of the attic. (See Cases V., VI., XII., XIII., XV.)

(4) Pain. Pain is a variable symptom and certainly in the later stages of the disease is not much complained of, but on deep pressure, especially over the supra-meatal triangle and over the tip of the mastoid this symptom may be very readily made out in the majority of cases. So, as a symptom, when carefully and properly looked for it is very certain and reliable. See Case XII.—much mischief with no complaint of pain. See also Case XIV.—much pain.

(5) Paralysis of the facial nerve. This symptom is not often present, but in a case of old-standing discharge from the ear, where there is marked destruction of the tympanic membrane, and easily detected areas of dead bone, where facial paralysis comes on suddenly, then I take it one ought to advise radical operation at once, as the symptom is most grave. (See Case VIII.)

(6) Giddiness, noises in the ear, etc. In the later stages of the complaint, these symptoms are often most distressing to the patient, indeed more so than all the other symptoms put together. Fortunately they are only present in a minority of cases so far as my experience goes. The noises as a rule are most complained of at night. (See Case IX.)

TREATMENT.

Having examined the symptoms of both the acute and chronic phases of the disease, we can now determine what treatment may be adopted so as to ensure as far as possible success in either condition.

(1) The Acute.

As a general rule it may be laid down here, that if there be no urgent brain symptoms, palliative treatment ought to be thoroughly tried for 36 to 48 hours.

This will consist of a brisk purge of Calomel or Pulv. Jalapae Co. at first, with rest in bed, a bland soothing diet chiefly of milk, broth, beef tea, etc., and local applications of ice-bags over the painful mastoid, or hot fomentations and poultices, application of leeches, painting with soothing liniments like Belladonna, applications of cooling lotions (Pb. c. op.), or simple Pb. lotion, menthol and cocain with carbolic, etc., and finally should an abcess point there will be considerable relief from simple incision right down through the periosteum (Wilde's incision) followed by warm antiseptic dressings (Boric lint wrung out of hot water covered with oiled silk, etc.) Early incision of the membrana tympani is useful if there be any bulging.

Should all this, or whatever part or parts of it be employed, give little or no relief by the end of 36 to 48 hours, then an anaesthetic ought to be given and the part cut freely down upon as if for the radical mastoid operation (the description of which see), and if disease of the bone be found as well as pus, the latter ought to be evacuated at once, the wound dressed and the further treatment deferred until the pus has more or less cleared up. In this case if the antrum be freely opened and drained a cure will take place in most cases under good conditions, but should the condition not show signs of getting better at the end of ten days or a fortnight, then the complete operation could be performed. In any case where intercranial symptoms show, operation ought not to be delayed but should be undertaken at once and be radical. It is hardly necessary here to say that good general treatment of the patient as to food, fresh air, etc., is of the foremost importance in getting a cure. Also, where we have other acute illness present at the same time, as scarlet fever, measles, etc., every care and attention must be given to the trouble.

NOTE.—The Politzer bag ought never to be used in an acute case, and all operative interference such as incision of the membrani tympani, Wilde's incision, etc., must be done under the strictest antiseptic precautions.

Chronic Mastoiditis.

The treatment of this condition ought to be much more familiar to the general practitioner than any other about the ear. In my experience this condition is more common than any other, and in no portion of the body is one compelled to treat symptoms of disease rather than the disease itself more than here; for what is the pus, the granulation tissue, the polypus protruding from the external auditory meatus, more than a symptom of disease more deeply situated in each case. Yet one is more or less compelled at first to treat each of these conditions, perhaps in turn, in the same case, in hope (to the patient) of affecting a cure. In this condition a most careful examination will always repay as it leaves one in a better position as to what advice to give the patient and what line of treatment to carry out. Having made a careful inspection of the external auditory meatus, the drum membrane or what may be left of it, the post-nasal space, the hearing, the external condition of the mastoid for pain or old cicatrices, then the treatment may be determined upon.

It may be laid down here as in the acute that where there are no urgent symptoms, palliative treatment ought always to have a fair trial before the radical operation is advised, unless there be some very distinct reason for radical treatment outside of urgent symptoms.

(1) Cases where there is chronic discharge without other symptoms: In these cases a careful examination will sometimes show a moist eczema of the drum membrane and meatus which when dried with appropriate remedies will cure the condition, or if due to post-nasal adenoids the removal of these will effect the cure. Where the discharge is coming through a perforated tympanic membrane then careful washing out of the ear three or four times daily at first with a warm antiseptic lotion, and stuffing loosely with sterile gauze with Politizeration once a day will cause a marked diminution in the flow in a few days, after which the washing need not be so frequent, say once or twice daily; then once; then every second day, etc. Packing with boric powder loosely, or gauze, after each washing, will in a number of cases effect in time a complete cessation of the flow, and a cure. But in all cases where I have found

post-nasal adenoids present these had to be removed ere any benefit could be had, and then the cure was complete and thorough in a very short time after their removal.

Washing through the Eustachian tube may I think be here dismissed as impracticable, except in the hands of experts, and even in theirs I doubt much whether any success would attend the effort, on account of the narrowness of the canal. The very small amount of water which could make its way through would in all probability only cause the pus cells to swell up and render them more tenacious and difficult to dislodge, and from the benefit which is derived from the dry method of Politzeration without any great risk of attendant bad results (if the Politzer bag be clean), I think the general practitoner will be better advised to adopt it alone, or to be content with careful washing out, and antiseptic dressing without the use of the Politzer.

So much may be said for the palliative treatment of this condition, which should be persisted in for some months. But watch carefully that the cessation of the discharge is not followed by more severe symptoms in the mastoid itself. (See Case XIV.)

In cases where there are polypi or granulations showing anywhere in the meatus, the treatment will have to be carried out on different lines. Should there be no urgent symptoms we may remove the growths either with the snare (fine wire) or polypus forceps. For either procedure it will be well to have the aid of a trained nurse or assistant, and if convenient to have the patient under a general anaesthetic; but local anaesthesia with Eucain or Waites, or the Ethyl chloride spray will serve. Remove all the growth present, and carefully dry out with sterile wool or gauze, apply chromic acid or A_gNO_3 to the insertions and dress loosely with sterile or Iodiform gauze. Repeat this treatment as often as required, being careful as far as possible to keep the parts sterile, and in some instances where their origin is not deeply seated we may expect a permanent cure. But where the origin is in the attic or the dura mater, such treatment will not be of any value. Should we have the patient under a general anaesthetic, then we can make a more detailed and deliberate examination with the bent probe, etc., and

determine whether there be any area of dead bone, and if so, its extent and position, and so be the better able to advise the patient as to the further treatment necessary. (See Cases V., VI., XII., XV.)

Pain.—This is a variable symptom and often with the most severe conditions little or no pain is present. (Contrast Cases XII. and XIV.) The treatment will be similar to that for pain in any other region, but ear cones of menthol cocain and carbolic often give much relief.

Facial Paralysis.—When this sympton comes on suddenly where we have an old-standing mischief of the middle ear, it is a symptom which demands immediate attention by a radical mastoid operation. (See Case VIII.)

Symptoms of sinus thrombosis (Case VIII., later stage), tubercular disease of sinus, or any intra-cranial symptom, demand complete and immediate radical operative treatment. (See Case XIV.)

Radical Operation.

The steps of the complete radical operation on the mastoid for middle ear disease with its complications as stated above must be more or less familiar to most of the younger generation of practitioners, and for this we are indebted to such men as Schwartze, Stack, Broca, Sir William Macewen, Milligan, etc., but it may be well for me as a general practitioner to give the general outlines and details of the operation as I myself have performed it in ten or more cases.

The following description of preparation applies to chronic cases, where one can choose one's own time for operating, but where urgent symptoms demand immediate operation then of course the details of the preparation must be considerably modified.

In this as in all other major operations to ensure success, perfection in preparation and detail are essential, and have to be carefully thought out beforehand if possible.

(1) The patient ought to have the bowels well cleared out with a sharp saline or calomel purge the day before operation, and after be fed on a simple milk diet.

(2) A good general bath, special attention being paid to all folds of skin, etc., over the body, and the head to be well scrubbed with warm water and soap in addition to what it may have had in the general bath. Clean clothes to be put on, and a clean bed prepared. In children the hair over the whole scalp ought to be cut short, but in adults an area around the mastoid which is to be operated upon extending about one inch beyond the edges of the wound generally speaking will be ample. This area ought to be shaven both in children and adults, and ought then as far as possible to be made sterile, by being scrubbed with warm water and ordinary soft soap, then follow with æthereal soap and plenty of hot water, and finally with McClintock's green soap. Now wash out the external auditory meatus with plenty of warm water, into which may be dissolved some carbonate of soda. Then follow with perchloride solution, 1 in 1,000, dry out with sterile gauze or cotton wool, and finally pack with sterile gauze and apply a sterile dressing over the whole prepared area and bandage firmly. Then before operation surround the whole head and hair with a dry sterile towel covered with another towel wrung out of carbolic or biniodide lotion, and the part will be ready to have the temporary dressings removed, and the operation can proceed. In nervous patients it answers all right to do the final sterilizing and shaving just before the operation when the patient is under the anaesthetic, but of course this prolongs what is already going to be a tedious operation. The above details may seem long and uninteresting, but they make for success later.

As regards the anaesthetic to be used a word here may not be out of place. In all the cases on which I have operated chloroform has been used, and I believe Dr. David McKeown, of 25 St. John Street, Manchester, never uses any other, and lately he informed me that he had then operated over 250 times without a death, on cases without special selection. As an anaesthetic it is perfectly safe, and though the operation is tedious (two to four hours), very little of the anaesthetic requires to be used after the patient has been put thoroughly under at first and the skin incision has been made.

The patient having been prepared as above and put thoroughly under, and turned partially on the opposite side to what is being

operated upon, and supported with pillows, etc., wedged behind the back, the shoulders ought to be partially raised with a firm pillow or pad below the neck and head. The operator takes his stand behind the patient, and having drawn his imaginary line from the tip of the mastoid parallel with the post-auricular furrow and about one quarter of an inch behind it, makes his first incision from the tip of the mastoid as far as the post-auricular furrow extends above, carrying his knife right down to the bone for the entire distance, always beginning at the tip. Any bleeding vessels are now secured and the edges of the wound retracted. He now proceeds to incise the periosteum along the same line and carefully elevates it both anteriorly and posteriorly over such an area as will give him a complete view of the bony area on which he is going to work. This part of the operation requires some patience and care so that the periosteum may be removed as far as possible intact and be left alive to take its part again in the filling up of the cavity and so to help in the final healing of the wound. After having separated the periosteum, before going farther one must carefully define the landmarks of the mastoid, especially such as are to be the guide in the operation. Chief among these are the supra-meatal spine, the posterior wall of the external auditory meatus, and the mastoid tip. Having clearly defined these, the next step is to draw an imaginary line about one-eighth of an inch below the supra-meatal spine horizontally backwards over the mastoid. An opening is made in the bone below this line about one-eighth to one-quarter of an inch behind the post-edge of the meatus, working towards the meatus and removing the posterior wall as we go down. The opening may be made small at first and gradually enlarged with the burr as we get deeper down. The antrum will be found slightly inwards, upwards, and forwards from a point three-eighths of an inch behind the supra-meatal spine; but as the middle fossa of the skull often dips considerably between the petrous and squamous portions of the temporal bone, the opening should for the first quarter-inch or so be made directly inwards, after which we can gradually work forwards and upwards with the burr, cleaning out often with moist pads of wool either fixed on wire holders or with long slender forceps, so that all the time we may

have a perfectly clear view of the structures underneath the burr. Having opened up the antrum we proceed to clear out all the granulations or caseous matter found therein with the small spoon, then gradually clear away the divisions between it and the attic with the burr, and similarly clear out with the spoon this cavity with the tympanum complete. Having cleared out all the disease we now proceed to smooth off any excrescences or spurs with the burr, watching carefully for the Fallopian canal and horizontal semi-circular canal in the depths of the wound. The Fallopian ridge will be easily seen in the anterior inferior portion of the cavity and must be avoided as well as the Fenestra rotunda and ovale, but the opening of the Eustachian tube ought to be clearly made out and the mouth of it curetted vigorously so that it may block up the canal, as the open passage through this gives some trouble in the ultimate healing of the wound. Every vestige of the disease having been carefully cleared away the wound ought to be carefully and thoroughly washed out with 1 in 1000 $HgCl_2$ lotion and dried with sterile swabs. We have now converted the external auditory meatus, antrum, attic and tympanum into a single cavity. We next proceed to stitch up the wound behind the ear, leaving the stitches untied until we have split up the posterior wall of the external auditory meatus. This is best done by passing a director through from behind and lifting up the integument and then splitting the membrane from the front as high as we deem it necessary, beginning from the deepest portion. Having done this we proceed to fill the cavity with Iodoform and boric powder (1 in 4) and carefully pack the whole cavity from the external auditory meatus with gauze (Iodoform). Having packed the cavity moderately full we next proceed to tie the stitches (which have passed through the whole integuments as well as the periosteum), bringing the edges accurately together, and if need be pack in more gauze so that the cavity may be completely filled up in every nook. We then apply a small flat pad of gauze over the wound behind the ear, filling up the furrow, etc., carefully. Next fill all the cavities in front of the auricle, and apply a large pad of gauze over the whole, then flat pads of cotton wool and bandage firmly, taking care that the auricle is in good position

and not bent on itself at any part. Apply the bandage so that it may surround the head without going under the chin or covering in the other ear. This seems to give the patient a good deal of ease without the unnecessary discomfort of a tight band causing a greater or less degree of choking when passed under the chin.

The after treatment is in every respect quite as important as the primary. In the operation one should aim at removing every vestige of the disease, but this is difficult in some cases, and here the greatest vigilance will be required in the after treatment.

Supposing there be no rise of temperature, etc., and the patient be apparently doing well, the first dressing ought not to be disturbed for four or five days. Then on careful removal I have in all my cases found the wound dry with a good layer of Iodoform all over. I then repack carefully with Iodoform gauze after having introduced a little fresh Iodoform without washing out (should any pus or other discharge be present wash out with 1 in 1000 Hg Cl_2) and carefully dress the external wound and ear as before. This dressing invariably remains on till the ninth or tenth day, when the stitches come out. The posterior wound nine times out of ten will have healed by first intention. This time remove the packing very carefully and wash out gently with 1 in 1000 Hg Cl_2, dry out carefully with sterile gauze, so that the flaps formed by the splitting up of the posterior wall of the external auditory meatus may not be disturbed from the position into which they were packed at first. Introduce Iodoform again, and pack very carefully, gently, and thoroughly with Iodoform gauze. After this dressing granulation will have begun pretty freely, and for the next ten days or so will require dressing every day or second day with careful washing out with 1 in 3000 Hg. Cl_2. After the third week in my later cases I have not packed any more but have examined the case every day, touching any point which looked too prominent with A_gNO_3 (gr. 30 to 1 oz.) and brushing the whole surface over about once a week with A_gNO_3 (gr. xv. to the oz.), occasionally applying glycer. ac. tan. or carbol. and occasionally applying absolute alcohol for a few minutes, then washing out with clean water and drying. During this latter phase of the treatment the wound is left open to the air.

In this way I think the time of after treatment has been shortened very considerably (the last three cases being completely healed inside eight weeks, whereas my others went on for from thirteen to twenty weeks). After complete healing I make it a rule to examine the case once a week for two months, then less often for a considerable time longer, so that any accumulation of dead epithelium, wax, etc., which may have gathered in the canal may be cleared away, and so prevent the setting up of a fresh infection of the surface, and thus giving rise, if to nothing more serious, to a troublesome eczema. After complete healing and all danger of further trouble past, the patient ought to have the ear examined every six months at least, and any accumulation of epithelial debris cleared away.

The instruments which I have used are:

(1) A strong scalpel;
(2) Dissecting forceps;
(3) Catch forceps, a few pairs (a dozen if you have them, but four to six will do);
(4) Retractors, a pair, three-quarters to one inch wide, toothed, rake shaped;
(5) Periosteal elevator;
(6) Dental or other engine, with half-a-dozen surgical burrs of different sizes;
(7) Several gouges, different sizes;
(8) Probes, fine and coarse, with ends bent at right angles;
(9) Curettes, different sizes and shapes, for antrum and attic;
(10) Searcher and scoop (MacEwen's);
(11) Needles (Hagedorn's, half-curved);
(12) Face cutting bone forceps (Dentists');
(13) Syringe, ordinary Higginson with ear nozzle;
(14) Half-inch trephine.

The above instruments are all essential for the operation, and I would advise no one to attempt a radical mastoid operation who has not got a full supply of the instruments necessary.

The question of treatment, etc., of cases where we have ingrowths of epithelium through a perforation in the tympanic membrane, or destruction from pressure due to an exostosis from the external auditory meatal wall, or some form of chondroma from the cartilaginous wall of the external auditory meatus, or where we have sequestra formed within the mastoid, or complete destruction and separation of the internal ear as a sequestrum, has not been touched upon in this paper, first because in general practice, so far, I have met no case, and secondly, with a good general knowledge of treatment no difficulty ought to present itself in the treatment of any of these conditions when they do arise.

The question of removal of the ossicles in the treatment of middle ear discharges has also been left out, because where we have had chronic discharge of old enough standing to have caries of the ossicles there is invariably also disease of the mastoid, which then requires removal as well, and the whole is done under the radical operation. Their removal, if ankylosed, for improvement of the hearing, will come under a different head.

List of Cases Reported.

I. Edmund Taylor, chronic discharge, cleared up with palliative treatment.

II. Miss Taylor, chronic discharge, cleared up with palliative treatment.

III. Chronic discharge, cleared up by rem. of P.N. adenoid and Politzeration, etc.

IV. S. N., chronic disch., palliative and rem. of P.N. adenoids left ear cured, Rt. advised Rad. opn.

V. Janet Wild, polypoid granular growth, chr. disch., dead bone. Rad. opn., cure.

VI. Edw. Baines, polypoid granulations, chr. disch., dead bone, Rad. opn. twice, cure.

VII. Ethel Wall, chr. disch. both ears, granulation left ear, P.N. adenoids rem. Rad. opn., left ear twice, cure.

VIII. John Marshall, facial paralysis, chronic discharge. Opn. Sinus thrombosis, further opn., cure.

IX. Liz. Chadwick, chr. discharge, granulations, dead bone. Rad. opn., cure.

X. Liz. Whitehead, chr. discharge following blow on ear, tub. family history, granulations, dead bone. Rd. opn., cure.

XI. A. M. Meadowcroft, old chr. discharge, now giddiness and fainting fits, dead bone, no polypus. Rad. opn., cure.

XII. Bertha Rigg, chronic disch., polypoid granulations showing at meatus, much dead bone and mastoid periostitis. Rad. opn., cure.

XIII. Jas. Kershaw, chr. disch., granul. on drum, dead bone. Rad. opn., cure.

XIV. John McClellan, chr. discharge, cessation, intra-cranial symptoms, peri-sinus collection of pus found on operating, general pyæmia, death 5th day.

XV. Emily Elms, large bleeding granular polypus, left ear showing at meatus, large area of dead bone, chr. discharge. Rad. opn., cure.

XVI. Mrs. M., acute discharge following Ptomaine poisoning.

XVII. Chronic discharge following influenza.

CASE I.

Edmund Taylor, aged 19 years. Saddler.

Father living, aged 42, in good health, no deafness.

Mother living, aged 40, in good health, no deafness.

No brothers living or dead.

One sister living, aged 17 years, in good health, no ear mischief or deafness.

P.H.—always had good health. Had measles when 5 or 6 years old; left no bad result. When 10 or 11 years old remembers having been troubled with ear-ache on and off for about 2 years, but does not remember any discharge from the ear at that time. Ear began to discharge when he was 15 years old and continued so to do for next 4 years, when he came under my notice for treatment.

Exam.—Rt. ear considerable foul-smelling discharge. Drum membrane mostly gone, some small granulations showing. Left ear, some discharge, but no perforation can be made out. Hearing watch 2 inches from right, 6 inches from left. Some post-nasal growths, not well marked.

Treatment.—Washed both out carefully, used Politzer. Hearing much improved. Dressed ears with loose packing of pulv. ac. boric., and used Politzer every second day, with the result that the discharge had dried up in about a month, and the hearing was much improved. Ears remained quite dry with the improved hearing for next 5 or 6 months, after which there was a slight return of the discharge and deafness. This time I gave an anaesthetic, cleared out the p.-n. spaces, and treated the ears after the first week as before, and in a few weeks the trouble had quite subsided, and the hearing had much improved. Now almost 3 years later, the ears remain well and the hearing is satisfactory. Right ear, watch (same as before) 1 foot, left ear, 4 feet, so this case may now be regarded as a permanent cure.

CASE II.

Miss Taylor, aged 37 years.

Father died aged 67, Rheumatics.

Mother died aged 73, old age.

One brother, aged 47, in good health.

One brother died aged 41, typhoid fever.

Three sisters living, in good health.

Five children died, probably of some tubercular mischief, fits, etc., in each case.

Grandmother died of consumption.

No other member of family deaf.

P.H.—Had good health except for a severe illness at 14, which terminated in an abcess in the left ear, which discharged profusely up till 4 years ago, when she had a voyage to America, after which the discharge grew less and almost ceased for a time. About 2 years ago she came under my notice. Hearing almost gone, watch, 1 ~~and~~ to 2 inches away. Drum membrane quite destroyed, with a very considerable foul-smelling discharge from the left ear (right ear all right). I then put her on a course of mild treatment, getting the ear well washed out, then Politzer, washing away the fresh discharge, drying carefully and packing the meatus loosely with boric powder and cotton wool, with the result that in about 6 weeks' time the discharge has completely cleared away, and has remained so since, now more than 18 months. When I last saw her 3 months ago, the ear was quite dry and the drum had shrunken so that now only a small opening remains. The hearing has not improved.

CASE III.

Liz. Orrell, aged 7, at school.

Father and mother both living, in good health.

No brothers.

Six sisters all living and in good health.

P.H.—Healthy child up till 2 years previously, when she had measles, with a good deal of throat mischief, which left her with discharging ears

Exam.—Two years later. Copious discharge from both ears. The meati being swollen up and eczematous on both sides. Washed out carefully, but was unable to see either drum; very deaf on both sides, marked p.n. adenoids. Gave anaesthetic. Removed the adenoids, after a week used the Politzer a few times. Kept ears clean. Discharge cleared up in a short time and now four years later there is no trace and the hearing is perfect.

Case IV.

S.N., aged 11, at school. 14, . . . Street, Oldham Road.

Family history imperfect. Illegitimate child, taken up and reared by this woman.

Has been delicate all his life. Began with discharge from both ears following measles about 3 years previously, since when there has been constant discharge.

Exam.—Profuse discharge from both ears; washed this away. Both drums almost gone. Hearing, watch about 3 inches on left side and less on right side. P.N. adenoids.

Treatment.—Anaesthetic; rem. adenoids; at the end of a week Politzer daily and careful washing out. At the end of a month left ear well, but hearing not much improved. Right still discharges, a considerable area of dead bone to be felt; sent boy to seaside for 3 weeks, with careful instructions as to treatment of right ear. Came home again much improved in health, but condition of ear not altered. Advised Radical operation which was refused.

Case V.

Janet Wild, aged 15. Woollen operative.

Father living, in good health.

Mother living, in good health.

No brothers or sisters living or dead.

One aunt with an old-standing discharge from her ear.

P.H.—Only illness measles, otherwise perfect health. From the measles she made a perfect recovery without any complication.

Six months previous to my seeing her she suffered for a week with very severe ear-ache, but neither she nor her mother remember any discharge coming from the ear.

Exam. (Nov. 1896).—Left ear normal. Large granular polypus projecting from right meatus. Hearing: left normal; right quite deaf. I removed the polypus piecemeal, dried out the cavity, touched with caustic and dressed. Repeated this several times, but as there was a large area of dead bone to be felt, I advised Radical operation, which was done on February, 1897. Now, in January, 1905, the ear remains quite well. Hearing remained absolutely away on this side.

Case VI.

Edw. Baines, aged 17 years. Operative, eyelet works.

Father died aged 41, consumption.

Mother died aged 39, consumption.

One brother living, aged 20, in good health.

Two or three died of fits as infants.

Two sisters living, aged 21 and 11, in good health.

No sister dead.

P.H.—Never had any serious illness as a child and never had scarlatina or measles.

About 7 years ago noticed ear beginning to discharge, but felt no pain and never was known to complain of any. Eight years ago had tonsils removed in Wrexham Infirmary and sometime later (6 or 9 months) his mother noticed the discharge from the ear. About 4 years ago he came under my notice.

Exam.—~~Rt.~~ ear normal; hearing normal. ~~Lt.~~ ear, hearing fair, watch 4 inches away. Large granular polypus showing at meatus. This I removed under an anaesthetic and explored, and found a large area of dead bone. I then advised Radical operation, which Dr. McKeown, Manchester, performed. From this he made a good but slow recovery so far as healing was concerned, and the hearing remained rather better than before operation. Three years now elapsed since the primary operation, when in June, 1904, he again came under my notice. On examination I again found a very considerable area of dead bone, and after trying palliative treatment with no benefit for 6 weeks, I advised a further operation. This time I operated myself, making my incision in the old line. I reflected the tissues backwards and forwards and so followed with the periosteum. This being reflected, I simply removed all the newly formed bone, etc., with the burr, following the disease in all directions, laying bare the sigmoid sinus for a distance of about three-quarters of an inch, as well as the roof of the attic, exposing the dura mater over an area of about one-quarter inch by three-eighths inch, as well as the perpendicular portion of the Fallopian canal. No facial paralysis was present before operation, but this followed operation, but cleared up again in a few months. The operation

was completed on the ordinary lines, and the wound packed with Iodoform and gauze; the post wound stitched and healed by first intention. No rise of pulse or temperature throughout. Healing took place slowly in about 6 months, and now, 6 months later, is quite sound. The hearing good, watch 6 inches away.

CASE VII.

Ethel Wall, aged 11. 195, Ashfield Road.

Father living, an instructor at the Gymnasium, in good health, but suffers from nasal polypi.

Eight brothers and sisters died of phthisis. (Father's)

Mother living and healthy; no consumption in her family.

No children dead. Two younger, healthy, but suffer from enlarged tonsils, etc.

P.H.—Fairly strong child up till 6 or 7 years ago, when she began with discharging ears. Five years ago she came under my notice suffering from discharge from both ears, with deafness, worst on the left side.

Exam.—Discharge from right ear. Discharge from left ear with granulations showing through the drum and from the posterior-superior wall of the meatus. Post-nasal adenoids.

Treatment.—P.N. adenoids removed. Rt. ear discharge cleared up and hearing returned fairly well, with use of Politzer bag. Left ear continued to discharge; removed the granulations. Found large area of bone bare, and considering family history, I advised radical operation, which was done at Dr. McKeown's, 25, St. John Street, Manchester. Healing was slow, but ultimately got all right.

Four years later child again brought to my surgery. Then said to be dull and listless, with headache and giddiness, and much foul-smelling discharge from the ear again. Tried to examine the ear but failed owing to her restlessness. Gave anaesthetic on February 17th, 1905, and explored, and found large area of dead bone again. I then advised further operative interference, which was done on the 19th.

Patient put under chloroform. Incision over the old scar; removed the periosteum posteriorly; dead bone down the whole post-meatal wall and extending one-eighth to one-quarter inch back over

mastoid. The new bone was spongy and soft, so that it all came away easily with the gouge. I then commenced with the burr and followed up every trace of dead bone. This led me soon down on the sigmoid sinus, which was laid bare for a distance of about one-half to five-eighths of an inch. Going towards the roof I found several perforations through where the attic ought to have been. I here removed an area equal in size to about half a penny stamp with the burr. The dura was intact and seemed healthy and no further exploration was done there. The Fallopian canal was healthy, and the nerve was untouched. The disease being completely removed the wound was washed and packed with Iodoform and gauze; the post wound stitched and healed by first intention. The meatal cavity healed up completely within 3 months, in spite of the great extent of bone removed, and the important structures involved.

CASE VIII.

John Marshall, aged 33. Plumber.

Father died aged —.

One brother, aged 36, in good health.

Three sisters living and healthy, all older than himself.

P.H.—Always had good health. Remembers having measles at 4 years old or so; soon after remembers suffering from repeated attacks of intense ear-ache, always on the left side. He distinctly remembers his left ear discharging since he was 9 or 10 years old, but never had any treatment for the ear. Seven or eight years ago suffered from Bell's paralysis on the right side, which cleared up in a short time. Two years ago, after working on a roof on a very cold day, developed Bell's paralysis of the left side of the face. This he treated himself for 10 days, thinking it would clear up as the other had done. He then sent for me and I found him suffering from marked Bell's paralysis of the left side of the face. On examination I found the evidence of old-standing middle ear trouble. Secretion now scanty but very foul smelling. I advised him that the trouble was in this instance arising from the condition of the ear. However before anything was done he determined to try a few weeks longer palliative treatment. This was done without

benefit, indeed at the end of this time the condition was rather worse. He now consulted Dr. McKeown, Manchester, on my advice, and he advised a radical operation at once. This was performed next day. Disease was extensive; sinus laid bare for a short distance thought to be healthy; wound dressed and posterior wound healed by first intention. However at the end of 6 or 7 days he began to show signs of sinus thrombosis, plunging temperature and pulse, rapid loss of flesh, sickness, etc., so we determined to reopen the wound and find the cause. On the tenth day we reopened and found everything apparently healthy, but on removing a little more of the sinus wall, found some infiltration and deposit in the anterior wall of the sinus; on removing still more of the bony wall more disease was found which fortunately extended towards the neck. We then ligatured the internal jugular as high up as possible, got everything ready, opened up the sinus and removed the diseased portion. After this the temperature and pulse came to the normal and he made an uninterrupted recovery, except for a large gluteal abcess which I cleared out at the end of another fortnight. Two years later, there is now a perfect cure. Healing was slow and the paralysis has almost cleared up. There is a fair amount of hearing present, watch at 3 or 4 inches.

Case IX.

Lizzie Chadwick, aged 23. Cotton operative.

Family history good; no history of injury to the ear.

P.H.—Always had good health.

Right ear began to discharge 3 or 4 years ago; cannot give any cause for this. Left ear normal.

Exam.—As above. Hearing: left normal; right, watch close up to ear. Right, granulations showing over drum and from posterior superior wall of meatus. Thin discharge, foul smelling.

Treatment.—Removed granulations, touched base with chromic acid, used Politzer, dressed with boric powder and gauze, washing out every second day. No improvement at the end of 6 weeks and bare bone easily detected with bent probe. Advised radical operation, which I performed. Found antrum full of caseous matter, also tympanic ossicles diseased at junction of malleus and incus;

removed these. Curetted the whole cavity and attic, smoothed down wound, packed as before. Posterior wound healing by first intention; meatus within three months. Eighteen months later: wound perfect, hearing watch at 3 or 4 inches.

CASE X.

Lizzie Whitehead, 19 Cecil Street, aged 14 years. Woollen operative.

Father died aged 39, consumption.

Mother living, healthy.

One brother living, aged 20, now in good health.

Three brothers dead, two died aged 8, one from scarlet fever, the other from heart disease following rheumatic, other died aged 22 years, consumption.

One sister living aged 25, in good health. No sister dead.

P.H.—Always had good health; no serious illness at any time. About 6 or 8 months before September, 1903, was working in the mill, when an overlooker struck her a blow on the left ear, which caused it to bleed. A few weeks later the ear began to discharge and there was considerable ear-ache. In September, 1903, she came under my notice. On examination I found the right ear normal, but the left was quite deaf, and there was a foul-smelling discharge, which when washed away, there was found some polypoid granulations springing from the membrana tympani, also bulging of the posterior superior wall of the meatus close up to the drum.

Treatment.—Granulations removed; ear washed out; absolute alcohol applied and dressed with Iodoform and packed with gauze. Palliative treatment was kept up till February 14th, 1904. At this time there was still discharge and a considerable area of bone bare, so I advised a radical operation, which was done on February 14th, 1904, from which there was an uninterrupted recovery, and now, eighteen months later, she remains perfectly well, but still absolutely deaf on that side.

Case XI.

Anna M. Meadowcroft, aged 35. Weaver. 11 Leamington-St.
Father drowned, aged 75.
Mother died, aged 70, senility.
One brother living and healthy.
None dead.
Two sisters living and healthy. None dead.

P.H.—Always good health, except for discharge from the ears, which commenced when she was 10 or 11 years old, following an attack of measles, followed by typhoid. After this she was taken more or less regularly for the next 20 years or so to the out-patient department of the Manchester Ear Hospital for palliative treatment. This kept the discharge in check but never cured it.

In July, 1904, she consulted me, because the right ear began to give more trouble, with more profuse discharge, and this of a foul smell, as well as severe noises in the ears and frequent turns of giddiness and fainting turns, and sleeplessness from the noises in the ears.

On examination I found a foul-smelling discharge coming from both ears, but worst from right. The meati narrow from long-continued discharge and slight eczema. Hearing almost gone on both sides, but worst on right side. Examining with the bent probe a large area of dead bone was found in the posterio-superior wall of the meatus. I advised a radical operation on the right side. This was done 3 days later. I then found very extensive disease of the bone; this was completely removed with the gouge and burr. The wound finished and dressed as in the other cases. Post: wound healed by first intention and the meatus had granulated up completely in about 10 weeks, and now, 1 year later, remains perfectly dry.

An interesting phenomenon followed the operation in this case, which I have not seen in any of the others, viz., the hearing returned for the first 72 hours after the operation, so that she could hear the faintest whisper with that ear, but unfortunately this state did not continue, as after then she went absolutely deaf on that side as she had been before the operation.

Case XII.

Bertha Rigg, aged 7 years.

Father living and quite healthy.

Mother died, aged 34, drink, malignant disease of stomach.

Two brothers living, aged 15 and 19, in good health; none dead.

Two sisters living, aged 5 and 12, in good health.

Two children died as babies.

P.H.—Has been living with her aunt for past three and a half years and during that time has been apparently healthy. On one occasion, about 3 years ago, she complained of ear-ache, but does not remember which ear.

Her aunt noticed discharge coming from the right ear about eight weeks before I saw her, but did not notice any deafness, and she noticed a growth at the right meatus the day before she consulted me.

After examining as carefully as I could I advised removal of the polypoid growth under an anaesthetic, with thorough exploration. This I did next day and found the whole posterior superior wall of the bony meatus bare and some extention over the mastoid itself. The following day I did a complete mastoid operation. On cutting down I found the greater portion of the mastoid bare, though there was now and before the operation little of anything to denote such an extensive denudation of bone, as pain, swelling, etc., except that during the 8 weeks which the ear had discharged she had lost flesh to a very alarming extent, but this without complaint about the ear. After making the longitudinal incision and finding so much denuded bone, I made a further horizontal incision backwards for about one inch. This gave me a much larger and better view of the bone. I then began with the periosteal elevator and elevated what periosteum was left. Then with the gouge and burr removed every trace of the disease; in so doing I exposed a considerable length of the sigmoid sinus whose wall was found healthy, also the Fallopian canal. Then the attic roof was found perforated at several points; this was removed over an area of about one-quarter inch square. A remnant of the incus was found but no malleus. Every portion was now smoothed down with the burr, and the wound washed out most

carefully, for considerable cavities of pus, etc., were found during the operation, then dried and packed with Iodoform and Iodoform gauze, and the posterior wound stitched up, which healed by first intention. The posterior wall of the meatus had not to be split up here as it had already all been ulcerated away. In spite of this, we never had a rise of pulse or temperature, and the child made an uninterrupted recovery, the meatal wound healing perfectly within three months. The hearing was absolutely gone before the operation and has remained away.

CASE XIII.

James Kershaw, aged 17 years. Cotton operative.

Father living, healthy.

Mother living, healthy.

One brother, aged 20, good health.

One sister, aged 23, good health.

No ear trouble or family history of deafness on either side.

P.H.—Had whooping cough, measles, and scarlatina, otherwise quite strong and healthy.

Left ear has discharged on and off since whooping cough. Right ear all right.

Left ear has given more trouble as to the amount of discharge and offensiveness of the discharge during the past 12 months.

Exam.—Right ear normal. Left ear blocked more or less with wax and discharge. This being washed away, I found some granulations on the drum and bare bone at the posterio-superior side of the external auditory meatus. Pain on deep pressure both over supra-meatal triangle and tip of mastoid. Advised operation, which was done the next week. Cleared out the antrum, and found the disease extending towards the tip, more so in this case than any of the others; cleared this away, and dressed, etc., as usual. Uninterrupted recovery. Healing complete in 11 weeks. Hearing then in this ear, watch at 4 inches.

CASE XIV.

John McClellan, aged 15½ years, at Buckley Hall Orphanage.

Family history unknown and too far through when first seen to give any account of himself,

Began with rigor and high temperature with bilious vomiting one week before I saw him, for which he was under treatment with Dr. Baldwin of the Orphanage. On looking through this temperature I found it typical of some intracranial trouble, probably sinus thrombosis. Temp. taken every 4 hours showed great variation, one time 106° F., next time 97° F.

Seen first by me in consultation with Dr. Baldwin, March 2nd, 1905, about 4 p.m. Then he had little or no complaint, but pain over the mastoid. Discharge had ceased and a very foul smell was noticed on the probe which easily struck bare bone; no optic neuritis present.

I advised operation at once, which was performed the same night, beginning at 11-50 p.m. and finishing at 1-50 a.m., March 3rd. Extensive disease of the whole mastoid process, all spongy and infiltrated with pus; antrum, tympanum, and attic all full of foul smelling pus and caseous matter. Cleared this all away and proceeding back through diseased spongy bone came down on the sinus; exposed this freely and let away about 2 drachms of very foul-smelling pus. Pulsation in sinus good and walls seemed healthy; washed out all pus, etc., and dressed. Next morning patient felt better, pulse normal; temp. normal; no more vomiting or thirst; tongue clean. Some hours later there was a rigor and general pyæmic symptoms set in; swelling and pain in right knee, then left hip, and finally then apex of left lung, then base of right lung, and finally death on the 5th day from lung complication.

It may be here stated that the wound remained perfect to the end, and on examination about 6 hours before death, showed no further signs of necrosis, and the pulsation on the sinus was then good. This case would have done well, had it been operated on at the beginning instead of the end of the acute symptoms, but here undoubtedly there was absorption through the sigmoid sinus from the pus surrounding it, and the consequent pyæmia, from which death resulted. The case amply illustrates the folly of waiting to see what may turn up in a case of old-standing middle ear disease, when once an acute exacerbation sets in.

CASE XV.

Emily Elms, aged 18, Norden. Cotton operative.

Family history good, no consumption on either side. Mother suffered from discharging ear.

P.H.—Always had good health. Began to have trouble with the left ear some considerable time before. Treated by Dr. Joss. Polypi removed and dressed as I had advised him in other cases. Return of granulations.

March 19.—Large bleeding polypus showing at the left meatus. Discharge, thin foul-smelling pus. Bent probe detected large area of dead bone behind and above the insertion of the polypus. Radical mastoid operation. Eburnation of mastoid. Disease confined chiefly to the antrum and tympanum. Cleared this away and dressed as usual. Result satisfactory, complete healing in about 4 months. Treated by the open method after the first 3 weeks.

CASE XVI.

Mrs. M., aged 42, 104, Marland Row.

Family history good.

P.H.—Health always good. Present attack being due to ice-cream poisoning (ptomaine), she being one of a batch of about 130 who developed signs of ptomaine poisoning after partaking of ice-cream at a Sunday school picnic.

The symptoms here were most acute for several days; the temperature remained over 105° F.; and there was continuous vomiting and diarrhœa, vomited matter and the stools being alike. At the end of 7 days she developed acute infective inflammation of both parotids, and suppuration occurred on both sides. Two days later she complained of acute pain of both mastoids and in both ears, but the swelling in the parotid region being so great and the pain so severe, and the external auditory meati on both sides being involved in the swelling, a view of the tympanic membranes at first could not be had. Two days later both ears began to discharge profusely, and this continued after the swelling had subsided and the discharge from the parotids had ceased, so that it could then be seen coming through a perforation in each tympanic

membrane. No doubt the early bursting would be brought on partly at any rate from the hot applications, etc., used to allay the pain in the parotids, as well as over the mastoids.

The discharge completely cleared up with simple syringing and boric powder dressings in about three weeks, with the use of the Politzer bag.

CASE XVII.

H. L., aged 22. . . . Hotel, Spotland. Employed at home.
(Seen in consultation with Dr. Carse, Spotland).

Father living, aged 44, in good health.

Mother living, aged 40, in good health.

No brothers living or dead. No sisters dead.

Two sisters living, one older and one younger, in good health.

No history of deafness or ear mischief in the family.

P.H.—Always had good health. In March, 1902, had a severe attack of influenza which was followed by an attack (mild) of middle ear disease, which subsided after discharge from the right ear of several weeks' duration. Here all the usual remedies were used with Politzerisation as the attack was subsiding. Nothing more was heard of the case till June, 1903, when she had another attack of ear trouble in the right ear, which again subsided under ordinary treatment. Again in April, 1904, she had a severe attack which subsided under the usual treatment, and had repeated mild attacks since. Last one a month ago. After this one she determined to follow Dr. Carse's advice and have a radical operation performed, which was done on Aug. 13th, 1905. When she was under the anaesthetic I found there was extensive disease of the bone, with perforation through the border cells. The bone was very cellular throughout and the disease extended right down to the tip. The antrum and attic were cleared out of the caseo-necrotic matter which they contained; no polypoid granulations were present. The disease extended back to the sinus, but its wall (which was laid bare on the anterior surface for a distance of half an inch) was found healthy in appearance and the circulation was all right. The whole cavity was now smoothed off finally with the burr, the posterior wound stitched (stitches left untied), cavity filled with Iodoform, posterior

wall of the external auditory meatus split up on the director. The cavity was packed partially with Iodoform gauze tape, the stitches now brought finally together, and the cavity packing completed. The external dressings applied; and now at the end of five days there has been neither rise of temperature or pulse, and the patient seems going on the fair way to recovery. The first dressing has not yet been removed. The above illustrates a case of acute inflammation of the mastoid following an undoubted attack of influenza which apparently got well, but from the after history of the case some mischief must have remained and was ready with each fresh cold, etc., to start afresh, whereas if the antrum had been cleared out and properly drained at first little permanent ill effect would have remained.