sequent liability to be fractured, is possibly another objection to its use. It further appears to me that any substitute material employed in addition to being non-porous ought to be tough, resilient, smooth, non-absorbable and capable of being moulded, and celluloid possesses all these qualities. The material which I have made use of has been about $\frac{1}{16}$ in. in thickness; when warmed it can be moulded to some extent, not so perfectly as aluminium or silver perhaps, but its elasticity and resilience are much greater, and probably therefore it is capable of offering more satisfactory resistance to external violence, blows, etc.; in the case of Mrs. C. (Case 1), for instance, the plate certainly served a useful purpose in protecting her brain from injury from a blow which fell directly upon it.

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AURAL CASES IN GENERAL PRACTICE.*

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MR. PRESIDENT AND GENTLEMEN,—Let me try to repay your courtesy in asking me here, by submitting to you some general rules, which I seem to myself to have learned from a good lot of throat and ear work, and to have found useful. You must forgive me if I speak in a vague and haphazard way, and range over many subjects; but what I have to say mostly concerns the examination of these cases.

The examination of throat and ear cases comes under three headings: First, the history of the case; next, the physical signs of the case; next, the testing of the patient's hearing. These are our three methods of going into the case: The history, all that we are told; the physical signs, all that we see and touch; and the testing of the hearing, all that we can deduce.

The last of these three methods, I venture to say, is of very little importance. What, after all, is the value in practice of the ordinary testing of the hearing with a watch or a tuning-fork? A man may fail to hear the ticking of a watch, yet he may hear fairly well the voice of a friend; or he may hear a watch easily, yet may fail wholly to enjoy a concert or a play, or to catch and appreciate the general talk round the family table. Hearing is an intellectual process, active, not passive; we bring our will and our attention to bear on it, we contribute experience, and insight, and the power of guessing the missing word. All his life a man has been listening to voices and music, and the noises of the town and the harmonies of the country; and he may still catch, by force of habit or of will, these familiar sounds, even though his ears are dull to a sound so unfamiliar and unprofitable as the ticking of a watch. There is more in the act of hearing than a mere stimulation of the auditory nerve; there is habit and memory and will, and these faculties help us to apprehend and piece together those sounds which we want to hear; but nobody wants to hear a watch ticking, or has listened to watches ticking all his life.

Now take the ordinary tests with a tuning-fork, are they of much practical use? They always seem to me most vague in the very cases where we ought to find them most definite. It is claimed for them that they can distinguish affections of the middle ear from affections of the internal ear; and that is just where they so often fail, and no wonder, seeing how often these two structures are involved together in the same set of troubles. I confess that I have given up the tuning-fork, believing that it is worth next to nothing for diagnosis, and worth nothing for treatment; besides, it requires from the patient a higher power of observation than is common among out-patients.

We come now to a method of examination which is of far greater importance: I mean the careful study of the history of the case. Let the patient tell his own story his own way, full length, without prompting, just as it strikes him; and you will be sure to learn something. Next to abdominal cases, there are no cases where it pays

better to get a deliberate account of all that the patient has to tell. Take, as instances of the value of a full history of the case, the influence, in the production or perpetuation of aural troubles, of rheumatism, syphilis, drink, worry, over-work, and unhealthy occupation. Or take the gravity of the fact that there is, as the patient says, "deafness in the family." Or consider how many patients forget that they had earaches in childhood, which yet laid the foundation of their present deafness. Or, which is the best of all instances of the importance of the patient's own words, take what aural patients say of those subjective sounds which we call tinnitus. One patient will merely say that he has a sort of buzzing or humming in one ear. We may be able to cure that patient: he may have nothing worse than a plug of wax in his ear, or a slight catarrh blocking his Eustachian tube. Another will say that he hears a thumping sound, which goes in time with his pulse. We are less likely to cure him. Another will describe in vivid, exact, and picturesque words a complex, articulate, elaborate set of sounds: he will compare them to this or that sound in Nature; will dramatize and act what he hears. He will say, "I hear a lot of birds singing in the trees," or, "I hear a regular tune, just like music, and I could almost sing the tune"; or, "I hear church bells ringing in my head, some near and some far off, as if they were in different villages." We shall hardly cure that patient. Such a heterogeneous and fantastical tinnitus represents a perversion of the very centres of hearing and of understanding; it is inaccessible; it is almost of the nature of a hallucination, or of an epileptic aura; it has captured not only the perception of the patient but also his imagination; and we shall not easily dislodge it from that stronghold.

Next come the physical signs of the case, and all that we can learn from the evidence of our senses. In hospital practice I always advise students to try to see, in every case, everything—the membrana tympani of each ear, the front view of the inside of the nose, the back view of the inside of the nose, the mouth, the back of the throat, and the larynx. All this should be done as a matter of routine. The patient is not unwilling to be thus carefully studied; and it is the one and only way in which the student can learn this part of his work. For he learns how to distinguish real disease from mere defects or abnormalities of structure or of function, which do not amount to disease and do not require treatment; he learns not to mistake a turbinated bone for a polypus, or a group of papillae circumvallatae for a new growth, or the redness down the handle of the malleus, just after the ear has been syringed, for an acute inflammation of the middle ear. Moreover, by this methodical examination of everything in every case one makes, now and again, a discovery. For instance, a patient had complained only of earache, and had been treated only for that; but the cause of the earache was found, by more thorough examination, to be cancer of the tongue. Another patient had an incessant, hacking, noisy cough, and had been treated for his cough, and in vain; then, by more thorough examination, both ears were found plugged with wax, and the removal of the wax practically cured the cough; it was a reflex cough, such as we often provoke by putting a speculum into the ear. To look at every structure, in every case—tympanic membranes, anterior and posterior nares, mouth and pharynx, and vocal cords—that is the one way to learn throat and ear work, and to escape a good many errors of judgement.

And here let me submit to you a lesson which I seem to myself to have learned very late from my throat and ear cases. I say we should examine everything, including the mouth, and in the mouth I include the teeth. Not only for this reason, that a stump in the upper jaw may cause suppuration in the antrum, and the cutting of a back tooth may be attended by earache and even by inflammation of the middle ear, but for this reason, that caries of the teeth seems to me to have a great deal to do with setting up or keeping up an unhealthy condition of the upper air passages. Dr. William Hunter has taught us to recognize the remote effects of oral sepsis in chronic gastritis, and, finally, in pernicious anaemia; but it has also a less remote effect. Patients come to us with a history of repeated attacks of tonsillitis, or with weak throats and swollen uvulae, or with what we call rather vaguely post-nasal catarrh and chronic hyper-

* A paper read before the North Lancashire and South Westmorland Branch of the British Medical Association.

trophic rhinitis, and we find carious molars and stumps in their mouths; they may have, if one adds together all the teeth, not less than half a square inch, each of them, of dead and infective matter in the mouth—enough, surely, to irritate many square inches of mucous membrane; and I feel sure that I have often seen immediate improvement of the state of the upper air passages following the removal of decayed teeth and the giving of proper care to the cleansing of the mouth.

I come now to two points in the examination of throat and ear cases which are, to my thinking, of great importance. One is the advantage of using a lens when we examine the membrana tympani: the other is the need of a careful and unbiassed examination of the naso-pharynx before we advise that an operation should be done for adenoids. For nearly twenty years I have used a Brunton's otoscope to view the membrane: and it shows fifty things which the naked eye might fail to see. Consider that the membrane is no bigger than one's little finger-nail; and, on that small surface, we have to observe and estimate all the diverse changes of colour, texture, and curvature, all recent or old scars or perforations, and all signs of congestion, or of inflammation, or of fluid behind the membrane: and we have to distinguish those abnormal appearances which are merely featural from those which are signs of real disease. If the membrane lay on the surface of the body, of course we should take a lens to examine it. Without a lens, we hardly know how easy and how full of interest we can make aural work, and how many little changes we fail to observe. Besides, it gives one assurance and an exact and positive judgement: and thus one may win a ready and cheap reputation for wisdom. It is a simple thing to say to a patient, "You have been picking your ear with a hairpin," when one sees one or more haemorrhagic spots or scratches on the membrane—little flecks of blood, looking as if a minute vessel had given way; and these punctiform haemorrhages on the membrane, or on the meatus close to the membrane, are not uncommon in hospital practice. I counted, in one case, six or seven distinct scratches where the patient had jabbed a pin into her ear. Again, it is a simple thing to say to an elderly patient, "Once, I perceive, you had a discharge from the ear—it may have been half a century ago"; and he says, "Bless my soul! now you mention it, so I did," and thinks you very clever. Again, with Brunton's otoscope, one learns to recognize in a moment the look of the relaxed membrane, or of a relaxed area of the membrane—the thin, bright, filmy, gauzy surface which comes forward with a sudden flap when the patient forces air up his Eustachian tubes, like a sail suddenly caught by the wind, or as one might blow out a paper bag; and, of course, in such a case, it is of little or no use, or worse than no use, to politize the patient; for he is already self-politized, and perhaps over-politized. I remember the case of a girl who, by the incessant trick of blowing out her ears, had so stretched a relaxed membrane that the whole thing came bulging forward every time she blew, with a curve like the top of an egg. Again, with an otoscope, one learns to see what I call the "dancing bubble" in cases of recent perforation with discharge. A drop of discharge, or a drop of lotion left in the ear after syringing, catches the light, and reflects it as a bright spot; and this spot, as the fluid rises and falls with the pulsation of the middle ear, bobs up and down, or from side to side, in time with the pulse. That is a certain sign that the membrane is perforated; and with infants, in whom it is so hard to see anything, or to be sure of what one does see, this dancing drop, rising and falling as the pulsation of the middle ear reaches it through the hole in the membrane, is a very useful sign.

These are four instances of unhealthy states of the ear which we are apt to overlook unless we magnify the membrane. All of them—the punctiform scratches, and the healed or obsolete perforation, and the relaxed membrane, and the dancing bubble—are fairly common; and it would be easy to add to the list. We are handicapped in aural work by the smallness of the membrane, and the depth at which it lies at the bottom of a *cul-de-sac*; and the use of the otoscope is an immeasurable help toward making the work more pleasant and more accurate.

Give me leave now to say something about the examination of the naso-pharynx for adenoids, and the imperative need of clearing our minds of prejudice in these cases.

So far as the examination is concerned we may of course, in some cases, be able to see the naso-pharynx with a little mirror, and thus avoid a digital examination. If we must make the digital examination I venture to remind you that the finger should be kept not in the middle line of the mouth, but close to one or other of the tonsils. Here, just at the spring of the soft palate, it is easy to get one's finger up into the naso-pharynx; but near the middle line, at a touch, the palate becomes retracted, and then one is in danger of being rough and hurting the child.

Anyhow, when we do get our fingers right up to the very top of the pharyngeal vault, what do we find? It is here that we must keep an unbiassed mind. For we find one of three conditions: either adenoids, or a trace of adenoids, but not enough to account for the child's troubles, or no adenoids. If I may make a guess I would say that of 100 cases who come to my department to have adenoids removed 60 have adenoids, 20 have a trace of adenoids, and 20 have no adenoids; and I believe that a vast number of children are submitted to operation for adenoids who are none the better for it, and ought to have been left alone. The troubles for which they come are much the same in all the 100 cases: deafness, and dullness, and earaches, and mouth-breathing, and snoring, and broken sleep, and night-terrors; they all have the look of children with adenoids, and the symptoms of children with adenoids; and many of them have already been subjected to operation. I have seen children whose throats have been scraped four times; I have seen one child who at three hospitals had been scraped altogether six times.

What are these cases that look like adenoids yet are not adenoids? They are cases of general narrowing and ill-development of the upper air-passages. It is as rare, at any rate among the London poor, to find a perfect set of upper air-passages as to find a perfect set of teeth. The septum is more or less crooked or spurred; the palate is narrow, high, like a Gothic arch, pinched from side to side; and the naso-pharynx, which should be square and ample, is so shallow and low-roofed and sloped inward that it feels as if one's finger were not in a vault but in a mouse-trap. Our teeth are not alone in their degeneracy; they only share the general feebleness and arrested development of the upper air passages; everything is crowded and irregular and ill-shaped. I believe that we might go further and say that the mucous membrane lining the upper air passages is also tending toward degeneracy—weak, irritable, easily thrown out of order, and slow to recover. Anyhow, even if our upper air passages be not degenerate in action, they are inferior in structure; and the multitude of these cases of "false adenoids" is nothing more than a multitude of young people whose noses are overcrowded inside, and the naso-pharynx is so narrow that it is always getting obstructed, and they suffer all the inconveniences of adenoids without adenoids, or with only a trace of adenoids.

And, if I may digress for a minute, let me suggest to you that we ought to hesitate before saying that these faults are, in the modern phrase, "stigmata of epilepsy." Doubtless they are a sign of some sort of degeneracy: doubtless they are often found in association with some degeneracy of the central nervous system; but that is no proof that they point straight towards epilepsy. These faults of the upper air passages are, after all, only one fault; and that is overcrowding, and, from the point of view of a dental surgeon or an aural surgeon, this overcrowding is so common that he attributes it vaguely to "civilization." So are nervous diseases common, and may also be attributed to "civilization." But it is a different matter to assert that the nervous degeneracy came first, and stamped its mark on the lower half of the face; and we must think twice before we admit that these innumerable multitudes of cases of "false adenoids" are the victims of an unhealthy nervous system.

But, coming back to my subject, let me point out the practical rule: that we must bear in mind these cases which simulate adenoids, and must never, to spare a child the discomfort of digital examination, anaesthetize him and then examine him. If we do that, we shall not go long before we find ourselves setting to work to remove adenoids which are not there. That child who was subjected to six operations, what are we to believe about her? Either she had a most amazing power for reproducing

adenoids after removal, or she had mere overcrowding of the air passages, and five of the operations were worse than useless. I am inclined to hold the latter theory. For I see every week at hospital children who present the whole and perfect picture of adenoids, yet have none, or nothing more than a trace.

Forgive me if I just touch, to finish with, one or two elementary rules of routine treatment. What can we do to alleviate or cut short an earache? In some cases we may cut it short by the timely use of Politzer's bag; it may be painful at the moment, but the cases where it hurts are just the cases where it helps. As for the use of drops, what is the good of laudanum? The opium in a few drops of laudanum is a very small fraction of a grain; it cannot act as a local sedative, much less as a general sedative. The spirit in the laudanum is a mere irritant; it can only do harm. The laudanum must be put in its proper place, where it is of inestimable value, and that is in the child's stomach, not in its ear. But cocaine drops are often useful; they have a direct sedative action, and a direct constricting action on the blood vessels of the congested membrane. Hot fomentations may be applied over them; and with these four methods—Poltzer's bag, cocaine drops, incessant fomentations, and a dose of laudanum—we can often cut short an earache and avert puncture or perforation of the membrane.

Next, take an ordinary case of otorrhoea—one in which there is no immediate reason to advise an operation. For the thorough cleansing of the discharging ear, there is nothing better than a solution of hydrogen peroxide; the patient must lie flat, with the ear looking straight upward, and the whole ear must be filled, like a test tube, with a drachm or more of the lotion, and must be kept filled, for five minutes or more, till all the frothing has come to an end; and then, after the peroxide has been washed away with boracic lotion, the ear must not be left sopping, but must be very carefully dried with twisted tufts of wool, and this must be done till the tufts of wool come back as dry as they went in. What one does next will depend on what one finds, and I will only suggest that a solution of boric powder in spirits of wine will penetrate further into the unhealthy recesses of the ear than the same powder in a solid state, and that the use of powders is seldom successful in cases where there is granulation tissue.

Finally, let us always be careful to take a general all-round view of these throat and ear cases. It is a great mistake, in our dealings with them, to overlook the patient's inheritance, family history, habits, occupation, and surroundings, his mental temperament, his personal worries, his previous illnesses. One, or more than one, of these influences is sure to be at work on every case, helping to turn the course of it this or that way.

THE INDICATIONS FOR OPERATION IN CHRONIC SUPPURATIVE DISEASE OF THE MIDDLE EAR.*

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THERE is probably no condition in which we are so handicapped by the opinion of the lay public as in this of chronic ear discharge. Only a discharging ear, and it has gone on for so long without any harm coming of it, there can be no danger! Indeed, there are many people going about with this disease who look upon it as of such little importance that they will not trouble to mention it to their medical man, even when he may be already attending them for some other illness. Not so many years ago, too, this was the attitude of mind taken up by the majority of the profession itself; and yet to-day a noted surgeon, who has done pioneer work in this subject, declares that the man who has a chronic otorrhoea has, metaphorically, a charge of dynamite in his head which may explode at any time with disastrous results. At first glance this no doubt appears painted in somewhat lurid colours, but, even without making allowances for the zeal of the missionary, if we ponder for a moment on the eventualities

that may occur, we can hardly call the simile inapt. Taking such a strong line, this surgeon, and others with him, to the question, "When is operation called for?" would answer, "In every case"; and if that were the opinion of the author of the present paper, my communication would be most commendably brief.

Such, however, is not the opinion of the majority of those more directly engaged in the treatment of aural affections. We find that in many cases—indeed, in probably the larger proportion—of this disease, cure, or cessation of the discharge, as in some instances it may be more correctly described, is effected by what is known as the ordinary antiseptic treatment. My further remarks, however, will be found to qualify this statement. My aim, therefore, is to draw your attention to those indications, both objective and subjective, which would, on the one hand, give us reasonable hope of cure by the milder antiseptic procedure; or, on the other hand, would suggest to us the advisability, amounting in some cases to the absolute necessity, of resort to operation.

ANATOMY.

First, if you will allow me, I should like to briefly rehearse the anatomy of the region with which we are dealing. Its leading feature is the number of important structures which are crowded together into a very limited space. Not only so, but the exact relations of these structures the one to the other vary greatly in different individuals. Taking the tympanic cavity as the centre, we have externally the membrana tympani and the external wall of the attic, as the upper part of the tympanic cavity is called, separating it from the external meatus. The inner wall separates the middle from the inner ear and is bony, except at the two windows, the fenestra ovalis being closed by the footpiece of the stapes and its membrane and the fenestra rotunda by its own membrane. Above the oval window, and extending in a circling manner to the posterior wall and along its base, is the Fallopian canal for the passage of the facial nerve. This canal is frequently imperfect, and this applies especially to children. Beneath the floor lies the internal carotid artery in the carotid canal. The roof is thin and separates the cavity from the dura lining the middle fossa of the skull and so from the temporo-sphenoidal lobe. It is known as the tegmen tympani and along its external border runs the petro-squamosal fissure which is occasionally patent in the earlier years of life, in which case there may be got a process of the dura mater continuous with the lining of the middle ear. Through the posterior wall the attic communicates by the aditus with the antral cavity, which is of prime importance in connexion with the subject under consideration. Immediately beneath the inner wall of the aditus and posterior to the bend of the Fallopian canal lies the external semicircular canal. The antrum itself communicates with the cellular spaces, the vertical cells of the mastoid process. Posterior to it and usually more superficial is the sigmoid bend of the lateral sinus and beyond this the lateral lobe of the cerebellum. The tegmen antri is continuous with the tegmen of the tympanum. The inner surface of the mastoid process is of importance in that an erosion in its surface may allow pus to infect the cellular tissues of the neck. The antrum has small openings in its walls for the passage of veins and lymphatics, the former passing to the lateral sinus and the latter to the subdural space. In children there is often a small canal running from the antrum through the petrous bone to its inner surface. Finally, we must bear in mind the internal auditory meatus connecting the inner ear with the posterior fossa and subdural space.

ACUTE AND CHRONIC MIDDLE-EAR SUPPURATION.

Except that I am sorry to tire you with these details I do not apologize for this recapitulation, for the dangers of middle-ear suppuration are to a great extent dependent on the anatomy of the region, and with a mind-picture of this it is easy to understand what these dangers are likely to be. Just a few words as to the distinction between acute and chronic middle-ear suppuration. Without entering into debatable questions—which is outside the scope of this paper—we may take it that acute suppuration arises from an ordinary catarrh, the exudation becoming purulent. The membrane is perforated either by the tension of the tympanic contents or operatively, and the discharge continues for a fortnight

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