ON
NON-PURULENT CATARRH OF THE
MIDDLE EAR.

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The object of this communication is to direct the attention of the Society to, 1stly, the several conditions under which the Eustachian tubes become so obstructed as to prevent the free passage of air from the pharynx into the tympanum ; 2ndly, the various effects which follow catarrhal affections of the lining membrane of the tympanum, when the secretion is strictly of a mucous character, so far as they are observable during the life of the patient (this excludes all the effects of the purulent variety of catarrh of the middle ear) ; 3rdly, the treatment adapted for such cases.

The remarks which follow are based upon the notes of cases under treatment at St. George's Hospital during the last twelve months, and others under notice during the past three years. In the appendix to this paper only typical cases have been selected, and an abstract has been made of twenty of these.

The general term "obstruction of the Eustachian tube"

conveys but a very imperfect idea of the condition under which the patient who is the subject of it is suffering, and none whatever of the probable course of the affection, whether a few days or many months are likely to pass by before relief is obtained, or whether the obstruction is likely to be a permanent one. These differences are most markedly apparent in the case of children on the one hand, and adults on the other; in a less degree, but very distinctly, in individual cases of either class. In each it is sufficiently apparent that the impaired hearing which is always present, and the tinnitus which is occasionally so, are immediately in consequence of the regular supply of air in the middle ear being suspended, as both these symptoms disappear coincidently with an artificial inflation of the tympanum. In the case of adults, the Eustachian tube may become the seat of catarrh lasting for only a few days, giving rise to considerable deafness, which disappears without any treatment as the catarrh subsides; or the catarrh may entirely subside, leaving impaired hearing for an indefinite time. In some few cases this may be at once and permanently relieved by a single inflation of the middle ear on Politzer's method. In six of the cases this happened, no recurrence of the deafness taking place. In one the obstruction had lasted for six weeks, and in another for four. In none of these, after careful inspection was there any appearance either of the tympanum, or the faucial orifice of the Eustachian tube being affected; so it would seem that the obstruction must have been in some part of the course of the tube, (possibly due to a little mucus which was removed from its situation by the current of air); and that the mucous membrane lining the tube was not at the time secreting in excess; hence the non-recurrence of the deafness. More frequently the tube is the seat of catarrh lasting for some time, and it is then necessary to keep the middle ear inflated until it is recovered from. In those cases where the faucial orifice of the Eustachian tube was affected, astringent solutions were applied to the spot, apparently with considerable benefit. The longest period in adults during which it was found necessary to continue treatment was six

weeks, and as a rule, one tube only was affected at a time. In about one fourth of the cases, as air did not pass freely on Politzer's plan, the Eustachian catheter was employed, and on each occasion air could be heard through the otoscope to impinge on the tympanic membrane with a thud, and the patient was fully conscious of its so doing. From these results it would appear that there are two varieties of the affection in adults, the more chronic form showing in some measure a likeness to bronchitis. In both, the only abnormal appearances observed in the tympanic membrane were increased concavity, more than usual prominence in the short process of the malleus, and a tilting inward of the handle of this bone. The translucency of the membrane was unimpaired, and its natural curvature was resumed after a successful inflation.

In the case of children and young persons, the state of things is widely different, and may persist for months or even in severe instances for years. With them the whole mucous membrane lining the nares and fauces is affected, and the opening of the tube into the pharynx shares the same condition; their tonsils are enlarged, they breathe entirely through the mouth, and their well marked aspect is characteristic of this malady. In seven instances it was deemed advisable to remove the tonsils, as they interfered with the respiration and tended to keep up the unhealthy state of the throat.

In the most obstinate examples of this kind the good hearing which follows inflation of the tympanum will only last for a few hours, the patients afterwards becoming as deaf as ever. The perseverance in treatment which it may be necessary to exercise is well shown in case 2. The boy, fifteen years of age, had been very deaf for more than three years on both sides. The improved hearing after the first inflation lasted for only six hours. He was taught to use a Politzer's bag for himself, and for three months did this twice a day, thus keeping the hearing fairly good. After this, once a day for three months. The periods of good hearing increased in length, till in twelve months one inflation a week was only

necessary to maintain it. Astringent solutions were applied at various times to the throat. The case was under observation for eighteen months, at the end of which time, the boy had quite recovered.

Excepting in degree, this treatment in no way differs from that employed in all similar cases. It would seem that the desirable frequency for artificial inflation of the tympanum is proportionate to the length of time which improvements in hearing last, and that the seat of the obstruction with these patients is in chief part at the faucial opening of the Eustachian tube.

The next class of cases are those in which the mucous membrane lining the tympanum has become affected. This may either be in consequence of extension of the same condition from the Eustachian tube, or the cavity of the tympanum may become primarily attacked. In each instance the lining mucous membrane becomes swelled and secretes in excess. The first noticeable result of this is closure of the tube at its tympanic orifice, causing proportionate deafness. When these cases were seen a few days after the commencement of the attack, as the patients pressed air into the middle ear with the mouth and nose closed, the mucus in the tympanum could be detected by the moist squeaking rle which was heard through the otoscope. Only partial improvements followed immediately on using inflation. In some instances for the first few days, there was occasional pain in the ear, but never very severe, and in about half the cases more or less tinnitus.

The various abnormal appearances which the tympanic membrane exhibited at different stages of the affection were respectively as follows; one or more being present in all instances:—1stly, increase in the natural curvature; 2ndly, opacities; 3rdly, general thinning accompanied with a sodden appearance; 4thly, thinning in circumscribed spots; 5thly, perforation in these places; 6thly, calcareous degeneration.

A change from the natural to an increased curvature of the membrane which was observable in all the cases of not

long standing would be a natural consequence of the temporary closure of any part of the tube.

The various degrees of opacity which were invariably noticed would in like manner be easily explained, inasmuch as the innermost layer of the tympanic membrane was at the time a surface secreting unduly, no less than the other part of the mucous membrane lining the tympanum. It should be borne in mind, however, that opacities may be present whenever the external layer has suffered from changes taking place in the course of affections of the external auditory meatus; and therefore taken by itself, this appearance cannot be regarded as indicative either of previous or existing catarrh of the tympanum.

The general thinning of the membrane was only evident in those instances where the secretion was very copious and rapidly effused, and was frequently noticeable where the pressure from within the tympanum was eventually productive of a perforation.

It is especially important to direct attention to this change, as it is in these cases the question arises as to whether an attempt should be made to prevent a pathological opening (so to speak) in the membrane, by making an opening with a knife. If the first of these two issues occur, it cannot of course do so without more or less loss of substance taking place during the process of ulceration, and in a very large proportion of cases the perforation never heals; for very soon after the membrane has given way, the lining membrane of the tympanum begins to secrete purulent matter, and the same condition is arrived at which is seen when the perforation has taken place during the purulent variety of catarrh of the middle ear. In case 1, a small opening was made in the tympanic membrane with very good effect. The presence of fluid in the tympanum was amply evident by the sound which was produced upon passing air into this cavity, the patient herself being able to hear the fluid bubble. To judge from what happens under similar conditions, there would seem to be no reasonable doubt but that the tympanic membrane would have given way if no attempt had been made to relieve the

tension. The catarrh had lasted for twenty-eight days, the deafness was extreme, and only trifling and temporary benefit followed inflation with the catheter. How thinned the membrane had become was shown by the very slight resistance given to the knife as the incision was made; the state of the membrane might have been not inaptly described by comparing it to tissue paper soaked in water, altogether different from the crisp parchment-like consistence usually met with. On this as on other similar occasions, a small straight double-edged knife was employed, and light was reflected down a speculum from a reflector worn on the forehead. The hearing was completely regained, which certainly would not have been the case if the membrane had given way, or if the secretion had become inspissated in the tympanum.

The thinning of the membrane in circumscribed spots is not apparent by inspection alone, and it is necessary that the patient should inflate the tympanum while the membrane is being looked at. This appearance was more often observed some months or years after all symptoms of catarrh had passed away.

The precise shrunken aspect described by Dr. Adam Politzer, which led him to adopt the treatment of making an artificial opening and then to expel the mucus through the cut by passing a stream of air into the tympanum, was not seen in any of the cases; but it is fair to infer that it was a degree of the same condition behind the membrane which induced all the varied appearances that have been noticed.

The value which should be accorded to thickening of the tympanic membrane may be estimated by considering the effects of this change when the increase of substance is extreme. In a large number of the cases the tympanic membrane was the seat of calcareous deposit, and in several, the history would lead to the supposition that there had at some previous time been a perforation which had subsequently healed. Extensive, slight, and intermediate degrees of deafness were observable with this change, but against these must be placed a certain number in which calcareous deposits occupied large portions of the membrane, and this with per-

fectly good hearing on the affected side. It would seem probable from this, that the source of impaired hearing must be sought for in the changes which have taken place behind the tympanic membrane, and that the change in substance in this structure is not a serious matter excepting so far as being evidence of previous disease which may or may not have been recovered from.

A not very uncommon phenomenon when the mucus is in a fluid state in the tympanum is that great changes in the capacity for hearing may be induced by alterations in the attitudes assumed by the patients. Thus, in one case seen in June, 1870, after the catarrh had lasted for a month, as the patient lay with the head on the same level as the body, he could hear conversation quite well and a watch at six inches from the ear, and upon rising was in a few seconds extremely deaf to conversation and could hear the watch at only one inch. He recovered after six inflations of the tympanum with the catheter. In case 11 the patient was very deaf with the right ear, but on shaking the head violently and holding it to one side he could hear conversation very well, and a clock ticking at a distance of three feet, which before he could hear only when the ear was close to it. Injections of a warm solution of soda 5 grs. to the oz. were practised for ten times every other day. The ultimate result was good hearing.

In case 1 the order was reversed, as the patient who was hearing when she stood up became very deaf after lying down. In another case, a change from the erect to the prone position did not affect the hearing, but produced tinnitus. This symptom was relieved after an incision had been made in the membrane.

In these instances it would appear probable that a change in position of the secretion was the immediate cause of an alteration in hearing power.

Wherever there was obstruction within the tympanum on one side and a healthy ear on the other, the vibrations of a tuning-fork placed on the head were intensified in their effects on the deaf ear. This is readily explainable as the morbid products to the tympanum would interfere with the

outward passage of sound through the cavity, and so the vibrations would be reflected on to the labyrinth.

A very large proportion of the cases were not seen until long after the catarrhal condition had subsided, sometimes many months or even years. With these air passed into the tympanum with a dry sound, and no immediate improvement in hearing followed.

Where there were distinct nervous symptoms in addition to the tympanic disease no treatment was pursued; otherwise for the most part, it consisted in injections of warm solutions into the tympanum. Bicarbonate of soda 5 grs. to the oz. Hydrochlorate of Ammonia 4 grs. Iodide of Potassium 3 grs. Iodine vapour, or simply warm water. With some, a few drops of the solution was injected through the Eustachian catheter with the aid of an india-rubber bag. With others (the greater number) the following plan was adopted. The head was bent completely to the side to be acted upon, about half a drachm of the solution was put into the inferior naris of that side from a glass syringe, and as the patient swallowed it was forced into the tympanum with a Politzer's bag. This quite painless proceeding is especially useful for young children where considerable opposition is met with in using a catheter.

The general results of this treatment in cases apparently quite similar both in their history, and in the appearances of the tympanic membrane, are perplexing in the extreme. It seems to be almost impossible to say of any case seen for the first time, and examined ever so carefully, whether any benefit at all will result, and if so how much. Cases 12 and 20 were successful beyond all anticipations, but before and after these are seen to be case after case almost precisely similar in history and in none of them was there any appreciable improvement.

In case 20 a boy of nineteen years of age had a history of catarrh during childhood, was rejected for deafness by an army board, and could only hear a raised voice on either side. Injections of bicarbonate of soda, and afterwards of iodide of potassium were practised in all only six times, and the

middle ears were inflated on Politzer's method on the days after each injection, with the result of nearly perfect hearing on both sides. Before treatment the left ear was much the more deaf of the two, becoming afterwards rather the better one.

During life it is not surprising that it should be found to be quite impossible to estimate the changes which catarrh has wrought in the cavity of the tympanum. The amount of thickening of the lining membrane, situation of such thickening, the extent of immobility of the ossicles, the position occupied by the inspissated mucus—all these must be a matter of pure conjecture, and therefore arises the extreme difficulty of forming any opinion as to whether the injection of fluid into this cavity will lead to such softening of the dried mucus as to allow of its dislodgment by the air douche, for this is the manner in which this method of treatment is presumed to act. This presumption is favoured by the fact that in some cases, after injections have been practised for several successive days, on some single occasion upon inflating the tympanum, great improvement in hearing has followed, and has been permanent. In case 9 this was very noticeable. On a review of all the old standing cases the best results followed when the tympanum had been injected daily for about a week, and treatment resumed some weeks afterwards.

The number of cases where the operation was practised of making an incision into the tympanic membrane and afterwards passing fluid through the middle ear in the manner described by Mr. Hinton in the 'Guy's Hospital Reports' for 1869 was not sufficiently large to justify any conclusions being drawn as to the general value of this method of treatment in cases of tympanic disease of many years standing. The experience of the writer would lead him to limit this operation to those cases where there is unmistakeable evidence of the presence of mucus in a fluid or rather semi-fluid condition, as shown by the sound conveyed through the otoscope when the patient inflates the tympanum, as well as by the appearances in the membrane, and to place a further limit to this number by

restricting them to those instances where either the membrane was in danger of giving way from pressure within the tympanum, and to those others where more simple means have failed to induce the dispersion of the mucus, or at any rate its displacement from such situations as interfere with hearing. The number of such cases will necessarily be small, but where they can be distinctly defined there can be little doubt of the value of this treatment. In case 7 the patient himself could induce a bubbling in the tympanum each time he blew his nose. This was a source of great annoyance to him, but gave rise to very little deafness. After he had been treated by the air douche through the catheter for a time, and an interval of six months had elapsed, leaving him in the same condition, a small incision was made behind the handle of the malleus, the patient blew out a little mucus through the cut, the incision healed in two days and he had no more discomfort.

From the foregoing remarks it will be seen that in the cases of obstruction of the Eustachian tube when the tympana were not involved, the patients recovered, and the same may be said of catarrhal affections of the tympana which were seen in an early stage. On the other hand when the secretion had become inspissated before the patients applied for relief, when the sounds heard on inflation of the tympanum were of a dry character, the results were in a large proportion of the cases unsatisfactory, in others of these only partial improvements in hearing followed, and in a very few good hearing was effected.

In submitting these remarks to the Society the writer has attempted to make it clear that the result of careful observation has been to impress him with a strong conviction of the necessity of treatment in quite the early stage of the affection.

APPENDIX.

CONTAINING AN ABSTRACT OF TWENTY CASES.

Subacute Catarrh of Tympana.

CASE 1.—1870, May 30th, E. P—, girl, æt. 20. Five weeks ago could hear quite well. Then became deaf on left side, and a week later on the right; left tympanic membrane very opaque; right tympanic membrane translucent as in health; both drawn in more than natural. On passing air into the tympana with a Politzer's bag the hearing was slightly improved on both sides, but she was as deaf as before in an hour afterwards. Eustachian catheter was used for both ears every day for a week, the tympana being in this way vigorously inflated; considerably improved hearing at the end of this time, but still very deaf. The air passed into the tympana with a squeaking sound. On 20th June there had been a good deal of pain for two days in the left ear; inflation increased it. A small incision behind the malleus was made, and a little warm water passed through the tympanum and out at the nostril by means of a syringe made with a piece of india rubber on the nozzle which fitted the external meatus. On the 23rd the incision had healed and the hearing was good on that side. On the 18th, when the pain in the ear first began, she was hearing very well on this side; but after lying down on a sofa for a quarter of an hour she was quite deaf with that ear.

On the 25th June pain came as in the right ear, and by the 28th all the translucency was gone from the tympanic membrane, it had a sodden appearance; she was very deaf indeed with it, and on passing air into the tympanum there was a distinct bubbling sound. The same treatment was adopted for this ear as for the other and in making the incision there was very little resistance to the knife, probably due

to the fact that the membrane had become very much thinned. Some opaque fluid oozed through the cut which healed in forty-eight hours. The hearing in both ears now continued good until the early part of August, when there was a relapse on the left side. As this did not yield to ordinary measures the incision was repeated; good hearing following.

Last seen on September 15th, up to which date there had been no return of deafness.

Catarrh of Eustachian Tube.

CASE 2.—1870, September 7th, F. P—, æt. 15. Could hear well a little more than three years ago. Then became deaf, and in six weeks was nearly as deaf as now (in India at the time), but during the past six months has been getting rather worse; very deaf to conversation. Watch at two inches from the right ear, one inch from the left; mouth always open; does not breathe through nose; nares and fauces relaxed very much; no tinnitus. Both tympanic membranes quite translucent as in health, and the curvature increased to about an equal extent on each side. On passing air into the tympana with Politzer's bag the hearing was increased to three feet with a watch on either side, and was very fair for the voice. In six hours he was as deaf as before.

Treatment.—Occasional application of aqueous solution (3j to the oz.) of perchloride of iron to the pharynx. He was taught to use the bag himself, and did so as follows—twice a day for three months, once a day for next three months, every other day for next three months, twice a week for three months, and afterwards once a week.

In May, 1872, he heard well and had discontinued any treatment. No relapse occurred.

CASE 3.—1871, September 6th, M. D—, girl, æt. 15. Two years ago could hear quite well; at that time she became deaf during a cold, and has been getting slightly worse ever

since. Both tympanic membranes are very opaque. The hearing on the right side is fairly good for conversation addressed immediately to her by a person sitting near, and the watch is heard at thirteen inches from the ear. On the left side she is very deaf indeed, and can hear the watch at one and a half inch from the ear. Tuning-fork heard well when placed on the vertex. No nervous symptoms. Politzer's inflation gave no improvement, the air impinging on the tympanic membrane with a dry sound. Soda solution was injected into this as well as the other tympanum four times. No improvement followed. This treatment was resumed again in three weeks but with same results.

CASE 4.—1871, September 19th, J. E—, æt. 46. On the 12th August went to sleep close to open window, the door of room being also open at the time. Slept for two hours, and then went to bed. The following morning was very deaf in left ear, and slightly so with the right. Since then has been getting worse with the left side. Now very deaf to conversation and hears a loudly ticking watch only when in close contact with the ear (left). The tympanic membrane very opaque. Moist sound accompanies inflation of the tympanum. After two inflations the right side recovered (the translucency of the tympanic membrane was not at all impaired), but only temporary improvements were effected on the left side. The Eustachian catheter was used every day for six times, three times for injection of soda solution, 5 grs. to the oz., and three times for air douche. The hearing was now much better, and on October 3rd he reported that he heard well. There was no relapse.

CASE 5.—1871, September 29th, M. V—, æt. 20. Attended with a polypus and perforation of the right tympanic membrane. During treatment the left ear became affected in following manner:—After not coming to the hospital for a week, on the next visit she said that five days previously she became slightly deaf on the left side. This had increased very much, and occasionally there had been pain in the ear

lasting for two or three hours. The tympanic membrane had lost its translucency; air entered the tympanum with rather a moist sound, improving the hearing for a few hours afterwards. A week later she came to hospital saying that the hearing had become worse until the previous day, when upon waking in the morning there was a little oozing from the ear and she heard much better. A slight perforation could be seen behind the handle of the malleus.

The perforation had healed by the next week, but seven days afterwards the membrane gave way in the same place. A discharge from the ear followed and in July, 1872, the perforation had not healed. The hearing though impaired was not very much so.

CASE 6.—1871, December 20th, M. C—, delicate-looking girl, æt. 15, never heard at all with right ear. Two years ago attack of deafness on left side, which passed off in two days. Twelve months ago hearing became very imperfect on left side and has been getting worse. Watch is heard at two inches from the ear and conversation very badly indeed. The tympanic membrane somewhat retracted, and rather opaque. Tuning-fork heard fairly on the vertex. Inflation on Politzer's method gave some slight improvement but very little. Not seen again until April 10th, when the hearing was considerably worse than on former visits.

Treatment.—Injection of solution of iodide of potassium every other day, and inflation daily, for fourteen days. The hearing gradually improved until she could hear conversation in an ordinary tone from a person sitting close to her. This state of hearing, which was a great advance on the condition before treatment, was maintained. In the month of March of the same year she had been taught to speak on the fingers as the difficulty of holding conversation was so great. Injections were resumed again in June for a week, but no further improvement followed their use.

Chronic Catarrh of Tympanum.

CASE 7.—1871, December 21st, J. C—, æt 30. Four years

ago well. Then some affection of the throat lasting a few weeks. A stuffed feeling in left ear at intervals ever since. This sensation has been more troublesome during the last six weeks. The hearing is perceptibly, but not much impaired. The tympanic membrane is opaque, and the outline of the handle of the malleus is indistinct. As he passes air into this tympanum a squeaking bubbling sound is very distinctly audible through the otoscope, or if listened for close to the ear without the otoscope.

Treatment.—The catheter used four times on successive days with some benefit. He then went home to Manchester and returned on May 27th, 1872, no better than on the first visit. Then a small opening was made; he blew out through the cut a very little mucus; the incision had healed on the 29th. Dismissed on June 1st well, and had no recurrence of the unpleasant symptom. Before the incision was made, the vibrations of a tuning-fork placed on the vertex were heard much louder on the deaf side. Afterwards there was no perceptible difference for either ear.

CASE 8.—1871, December 28th, E. G—, girl, æt. 8. Very deaf for four years with both ears, especially with the right, speech impaired in consequence, breathes entirely through mouth which she keeps always open. Both tonsils enlarged, but the right very much so. The right tonsil was removed, inflation of the tympana on Politzer's method twice a week until February 9th, when she was discharged hearing as well as she had done during the previous fortnight.

CASE 9.—1872, January 14th, A. W—, æt. 26. At Christmas became deaf in right ear, having a cold at the time. Now extremely deaf to conversation, and a watch heard at four inches which can be heard at twelve feet with the other ear. Tympanic membrane opaque, and malleus retracted. Inflation on Politzer's method improves the hearing very slightly, but the change only lasts for an hour. Injections through the Eustachian catheter were practised six times altogether, with the result of very little change in hearing

power until the last occasion when the hearing immediately afterwards became natural, and there was no return of the deafness subsequently.

CASE 10.—1872, January 24th, J. W—, æt. 18. Two months ago he could hear well. Then became deaf in left ear, and a week afterwards in the right. Both tympanic membranes of natural translucency, curvature increased. Inflation with Politzer's bag gives some improvement, but not very much. On the right side excellent hearing followed the air douche through the catheter, and after this had been repeated three times he could hear well on this side. On the left side, however, the catheter would not pass through the inferior naris as the vomer was bent very much to this side, giving a crooked shape to the nose. It was not until after several attempts that air passed freely into this tympanum on Politzer's method; when it did so the hearing improved, but not permanently until after the inflation had been practised once a week for eight weeks.

Subacute Catarrh of Tympanum.

CASE 11.—1872, January 30th, F. F—, æt. 50. Ten years ago could hear quite well, then became slightly deaf and remained so for twelve months, but recovered without treatment. On four separate occasions has had attacks of deafness which have been recovered from on proceeding from England to Spain and remaining a few weeks in the latter country. Three weeks ago was hearing as usual and became deaf in right ear gradually. This, the better ear of the two generally, is now the worse. Conversation only heard with a raised voice, and a watch when pressed firmly against the ear; throat somewhat relaxed; the curvature of the membrane on the right side considerably increased; translucency not very much impaired; vibrations of tuning-fork on head intensified on this side. On shaking the head and bending it downwards can hear fairly well.

Treatment.—Inflation for three successive days, giving some

slight, but only transient improvement. Not seen again till March 9th, no better. Every other day for ten times solution of carbonate of soda, 5 grs. to the oz. through the catheter. On April 10th, hearing quite good on this side.

CASE 12.—1872, February 17th, J. H—, æt. 35. At ten years of age measles, occasional pain at the time in the right ear, followed by discharge which remained for a few weeks and then stopped. After this, deaf on this side as now. Five years ago pain on several occasions in left ear, this passed off leaving good hearing; never any discharge on this side. Three months ago became deaf with this ear and has remained so since. At present very deaf to conversation with both ears, but hears somewhat better on the left side. The tickings of watch heard at one inch from each ear. Occasionally slight tinnitus on left side. Right tympanic membrane very much fallen in and opaque. Left tympanic membrane opaque; not any very perceptible change from natural curvature. Air entered both tympana on Politzer's plan.

Treatment.—Injections of carbonate of soda, 5 grs. to the oz., into both tympana for seven successive days. Afterwards every third day till March 6th. Hearing on left side gradually improved, and some improvement though not very much on the right side. On this date he could hear as well as ever on the left side. Dismissed. Seen in July and reported there had been no change.

CASE 13.—1872, April 17th, L. H. F—, æt. 5. Parents noticed two years ago that he was slightly deaf and he has continued so ever since. The last three months when on voyage from Australia been getting worse, and his speech in consequence is becoming impaired. Both tympanic membranes more concave than natural; translucency unimpaired; rather enlarged tonsils. Watch heard only when in contact with both ears. Requires a raised voice rather close to hear what is said to him. Inflation on Politzer's method gave good hearing which lasted on the first occasion for forty-eight

hours. Solution of perchloride of iron applied to the throat. The tympana inflated every day for six days. Then twice a week for two weeks. Then once a week until July 1st. Dismissed hearing well and has had no return of deafness.

CASE 14.—1872, May 4th, M. S—, could hear quite well two weeks ago when she became deaf in both ears. After four or five days felt a crack in right ear, which was followed by good hearing and has since had no return of deafness on that side. Some tinnitus and very bad hearing on the left side. This was completely relieved by one inflation on Politzer's method, and no further trouble. The tympanic membrane was healthy with the exception of some increase in the curvature. No relapse.

CASE 15.—1872, March 19th, M. H—, girl, æt. 20. In 1863 could hear well, then became deaf from a cold and completely recovered without treatment in about a week. From that time has been subject to attacks of deafness; each fresh attack leaving the hearing more impaired than the last one; the right tympanic membrane translucent; the left opaque; much more deaf with a cold; no nervous symptoms or tinnitus; tuning-fork placed on vertex heard well. Inflation of tympana gave no improvement. Injections of soda, 5 grs. to the oz., for four days in succession. After the lapse of a week for three days in succession, no perceptible change in the hearing of either side.

CASE 16.—1872, May 9th, E. L—, girl, æt. 19. Has been very deaf with both ears for the last two years, requires raised voice near the ear to hear conversation. Tympanic membranes both translucent, but very much more concave than natural. Air entered both tympana on Politzer's method with a bang increasing hearing from one inch with a watch from the ear to three feet. Both tonsils very much enlarged, affecting voice and breathing. Tonsils both removed with guillotine. Tympana inflated twice a week; on each occasion the periods of good hearing increased in length.

On June 27th, a fortnight had elapsed and good hearing had been maintained during that time. Discharged.

CASE 17.—1872, May 22nd, B. H—, æt. 23, delicate looking girl, could hear quite well a week ago, became in a few hours very deaf in right ear. Previously had relaxed throat which was recovered from. At present—left ear, good hearing and healthy membrana tympani. On using Politzer's inflation on the first occasion air did not pass into the right tympanum. On the second occasion it did so, increasing the hearing from six inches with a watch to two feet. The tympanic membrane on this side was very much more concave than natural, and the translucency was impaired though not to any very great extent. The improvement from inflation only lasted for four hours. Vibrations of a tuning-fork placed on the vertex were much intensified on this side.

Treatment.—Injections of carbonate of soda, 5 grs. to the oz., for four successive days. Inflation on two separate visits at an interval of three days. Hearing perfect on 29th May. No recurrence of deafness.

CASE 18.—1872, June 10th, E. M—, girl, æt. 5. Six weeks ago could hear well, now very deaf to conversation, a watch at one inch from the right ear, and three inches from the left. Relaxed throat, both Eustachian tubes obstructed, good hearing immediately on both sides after using Politzer's inflation, became deaf again in eight hours though not so much as before. Perchloride of iron solution was applied every day for eight days to the throat. Politzer's bag used every day for two weeks, afterwards twice a week for three weeks, once a week for three weeks. Then hearing good, and no recurrence of deafness.

CASE 19.—1872, June 13th, C. E—, æt. 30. One week ago she could hear well. Now watch at one inch from the right, and in contact with left. Translucency of both membranes unimpaired, air entered (with a bang) both tympana, giving natural hearing. No recurrence of deafness.

CASE 20.—1872, June 19th, R. W—, æt. 19. Never heard well with the left ear, and now depends chiefly on the right. Scarlet fever when a child, but no history of discharge from either ear. Very deaf to conversation. Refused commission by an Army Board on the ground of deafness last year. Watch heard one inch from the right ear and half inch from the left. Vibrations of tuning-fork on vertex heard well. Both tympanic membranes very opaque, and concavity increased. Inflation on Politzer's method gave slight improvement, but lasting for a few hours only.

Treatment.—Injection of solution of bicarbonate of soda, 5 grs. to the oz., for five days successively. Vigorous inflation for three days; injection of iodide of potassium, 4 grs. to the oz., for four days, followed by vigorous inflation for two days. Dismissed on July 3rd, conversation heard perfectly well with the left ear (this was originally the worse of the two) and very nearly good hearing with the right. To use inflation himself occasionally during next two weeks. No relapse occurred.