

tion into the bowel of air or water, when properly done, is sometimes followed by reduction, and Dr. Kelley does not think the method should be altogether dispensed with. Very little is said in regard to the way in which it should be applied, the amount of pressure that should be used, nor the length of time the pressure should be maintained. Dr. Kelley thinks the figures that Morris gave some years ago placed the pressure at 8 or 9 pounds, which appears to be too high. He believes that air pressure is preferable to water pressure in very many cases, but it is so difficult to measure that he finds it succeeds best by using air first and then following it with water, which is more easily handled, and by means of which the air pressure can be measured. He prefers a pressure of four or five pounds, keeping it up for a period of 15, 20 or 25 minutes, and believes that this is more effective than a higher pressure for a shorter time.

DR. SAMUEL MCC. HAMILL, Philadelphia, said that it has been shown that irritation of the rectum produces reversed peristalsis, and this fact may have had some bearing in producing spontaneous reduction in the case reported by Dr. Erdmann.

DR. A. JACOBI, New York City, considers that the phenomenon mentioned by Dr. Hamill would not be of any practical value in the treatment of these cases, because the reverse peristaltic wave would undoubtedly be interrupted at the point of intussusception.

DR. JOHN LOVETT MORSE, Boston, reported that the experience at the Infants' Hospital in Boston is that babies not only bear laparotomy but other severe operations very well, providing they are kept warm during the operation. All the patients who are to undergo an operation are wrapped in cotton and placed on a special operating table, which is kept warm.

DR. JOHN F. ERDMANN said that eight or ten years ago Dr. R. T. Morris produced reversed peristalsis by irritating the rectum by the use of chlorid of soda, to determine what portion of the intestine he was dealing with—whether the afferent or the efferent portion. Dr. Erdmann considers that it is not only time lost, but that it is very apt to prove useless, because the colon and the rectum will not hold the amount of pressure we wish to use. The sphincter will not hold the water in the bowel. With both air and water the danger of producing a rupture of the bowel is very great. If Dr. Kelley could see the difficulty Dr. Erdmann has experienced in reducing an intussusception with the fingers after the abdomen is opened he would never again resort to the introduction of air or water. The coats of the intestine are soggy and edematous, and unless great care is exercised in the reduction, a rupture of the serosa and musculosa will occur. While Dr. Erdmann does not favor the use of injections, he would not object to their use during the first six hours. Among his last six cases there were two deaths. In one, the cause of death was given as status lymphaticus; the other patient died after an extensive resection, with end-to-end anastomosis. There is no question that the more rapid the operation, the less the shock, and the latter is frequently the cause of death. The youngest child he has operated on was 14 or 15 weeks; that patient recovered. Children, as a rule, bear operation well. He has recently operated on 22 cases of appendicitis, all under 5 years of age, with a mortality of 9.9 per cent., and at least 14 of these cases were of the septic type. In the majority of his cases of intussusception, the operation was done within 15 or 20 minutes. If those cases that he operated on were not mechanical, then he does not know what constitutes a mechanical obstruction. An intussusception will occlude the caliber of the gut as completely as a wad of cotton, and even more thoroughly. The paralytic type of obstruction does occur, particularly in pneumonia in children, when there may be a general pneumococcus peritonitis, with paresis of the bowels, and death. The majority of his patients were under 1 year old: two of them were over 5, and the rest under 3. He removed the appendix because it could be done without complicating or lengthening the operation to any extent. He thinks it wise to do so because it prevents the formation of subsequent adhesions and a second abdominal section.

CHOICE OF A TIME OF ELECTION IN MASTOID OPERATIONS.

SOME CONSIDERATIONS ARISING FROM THE DIFFICULTIES OF THE CHOICE—PROSPECTIVE RESULTS.*

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Although voluminous articles, reports and discussions have appeared on the subject of mastoiditis, the mastoid operation and its ultimate results; indeed, experiences so exhaustively detailed that it would seem the searcher after truth might find his way without groping, yet perplexities that defy satisfactory decision so constantly confront the otologist, that I have chosen to place before you some such perplexities as have arisen for me in the recent past; and especially the choice of the proper moment for most advantageous operation.

This paper deals with well-to-do private patients, with whose intelligence it is undoubtedly more difficult to co-operate than in the case of the ordinary grade of dispensary subject. For, adding, in the former instance, to the difficulty and confusion which the conscientious worker experiences at times in his own mind, and at a moment, too, when most he needs to be unhampered in power to decide, there are presented to him by relatives and friends such questions and demands for positive answers that the picture of uncertainty is complete for him. While in the latter instance with the usual dispensary patient, one may follow a more independent and assured attitude, more easily ignoring inconvenient demands for enlightenment on the problems involved until one has arrived at some satisfactory solution of the best course to pursue.

So varied, too, are the final chapters in the histories of these cases, even after the otologist has had freedom in following his best intelligence, that they are at times quite inexplicable to him. Although reports of cases, like statistics, may be made to serve most contradictory ends, and are therefore not so useful as they might be, yet I wish to enforce and illustrate my theme by a few experiences which I will relate as briefly and relevantly as possible.

For the sake of logical discussion I have grouped these cases as follows:

Group 1. Features obtaining in mastoiditis as a complication or a sequel of the exanthemata.

Group 2. Features obtaining in mastoiditis as a complication or a sequel of influenza.

Group 3. Features obtaining in mastoiditis as occurring in the course of chronic suppurative otitis media.

As an object lesson looking toward the more intimate discussion of each of the above-mentioned groups it becomes necessary to study briefly the histories of cases apparently similar, yet with results widely divergent.

REPORTS OF CASES IN GROUP 1.

CASE 1.—Female child, age 6 years. Scarlet fever of severe type of six weeks' duration. Subsidence of all symptoms except slight fever never ranging above 100.5 degrees. Without premonition, many days after apparent convalescence set in, pain began in the right ear.

Examination.—This revealed a highly congested, slightly bulging drum membrane, no sagging of the posterosuperior canal wall, mastoid sensitive to pressure.

* Read in the Section on Laryngology and Otology of the American Medical Association, at the Fifty-fifth Annual Session, June, 1904.

Treatment.—Free incision of drum membrane was followed by sanious discharge, which continued for ten days, during which time the temperature remained unchanged—99.5 degrees in the morning, 100.5 degrees in the evening—but with subsidence of all pain and mastoid sensitiveness.

Result.—Gradually the discharge from the ear diminished, then ceased, the incision closing, while the temperature remained within the same range for more than two weeks longer, when it at last became normal. Since this time the child has been in fair health, with unimpaired hearing. Frequent examinations were made by her physician during this time, but they failed to reveal signs of any intercurrent affection other than a pronounced anemia.

Observations on Case 1.—The long-continued course of slight fever in this case, almost a month after incision of the drum membrane, aroused constant suspicion of the presence of purulent deposit in the mastoid. Consideration also, of Ponfick's findings of 91 per cent. of the case of autopsy after exanthematous diseases as showing unsuspecting mastoiditis, did not tend toward lessening my apprehension in the study of this case, and he was long in doubt of his wisdom in postponing operation. But though return to health was discouragingly slow, yet in the absence of more decided symptoms, patience prevailed and in the end recovery seems complete.

There still remains, however, this same doubt of the superiority of so conservative a course, and the query still arises were it not better to have opened the mastoid and perhaps removed some slight focus of purulent deposit and hastened this recovery; and when in the course of this case ought this to have been done? Recourse to the bacteriologic examination of the discharge should theoretically help to aid in answering both these questions, but the systemic condition following the exanthemata varies so greatly with regard to vulnerability to bacterial attack, that practically it is extremely doubtful if the bacteriologic findings furnish a safe index for guidance in these cases.

CASE 2.—Male, 5 years old. Scarlet fever of severe type of four weeks' duration.

History.—Desquamation had ceased for ten days, the child was apparently doing well but for a continued elevation of temperature—99 to 100.75 degrees. After this had continued for ten days pain in the right ear began.

Examination.—When examined two days later the drum membrane was reddened and slightly bulging, no sagging of posterosuperior canal wall, nor was there tenderness on pressure over any part of the mastoid.

Treatment and Result.—The drum membrane was freely incised, liberating a moderate quantity of blood and pus. Pain promptly ceased but no fall in temperature occurred. The usual antiseptic treatment was ordered. Discharge of an odorless pus continued for two weeks. Repeated and careful examination failed to reveal other than the aural disease. Notwithstanding an unchanged temperature range the child gained considerably in strength, sat up in bed, later on played around the room, still showing no other symptoms than the slight temperature and the aural discharge. Very gradually the suppuration lessened both in quantity and consistency until only a colorless, mucoid discharge remained. So much improved had the conditions become that only an occasional visit, perhaps twice a week for three weeks, was made, when, without warning or apparent cause, the ear symptoms became suddenly aggravated, moderate ear pain ensued, with slight mastoid tenderness; the discharge was, however, unchanged. A slight though frequent and annoying cough began. The following day all the symptoms were more pronounced, temperature 103.5 degrees. There was now very slight swelling over the mastoid. The morning of the third day the mastoid was swollen and edematous, auricle displaced and immediate preparation made for operation.

Operation.—Immediately on incision a very considerable quantity of foul-smelling discolored pus was evacuated. The sinus leading to the mastoid antrum was readily found, the entire mastoid process was carious, only a curette being used to remove the diseased structure. The carious process had extended to the wall of the lateral sinus, which, owing to its anomalous position almost under the antrum, was perforated by the curette. Profuse hemorrhage indicated its freedom from thrombosis. The ruptured sinus was closed by a Mikulicz dressing and the operation completed. Recovery, with perfect hearing, ensued after two months.

Observations on Case 2.—It is to be observed that Case 2 presents an exactly parallel history with Case 1, in every particular except the former, Case 2, lacked mastoid tenderness. It seems highly improbable that the extensive necrosis found should have occurred in the two or three days preceding operation. Yet the extremely dangerous condition supervened with such apparent rapidity that I can not but believe that the time for most advantageous operation must have passed at some time during the five weeks of stationary temperature. Without, however, any signs except slight discharge, a marked grade of anemia and a moderate temperature, an exploratory mastoidectomy seemed to have been unwarranted.

CASE 3.—Female, age 3. Scarlet fever.

History.—During the desquamative stage acute otitis occurred in the left ear. The drum membrane perforated in two days. When seen, copious discharge was issuing from ear. Treatment only slightly modified the character and quantity of the discharge, yet the patient gained in strength so that she was brought to the office for two weeks for further treatment. Then pain of paroxysmal character began around the ear, temperature 100.5, no change in discharge, no mastoid tenderness at any time. On the fourth day slight edema over mastoid.

Operation.—Operation on sixth day revealed mastoid full of pus, complete necrosis, only curettement being necessary to clear away debris and enter antrum.

Observations on Case 3.—This case is so perfect a counterpart of the other two cases of this group up to the date of aggravated symptoms just preceding operation that there is due its discussion the same pertinent inquiry, ought exploratory mastoid operation to have been done during the weeks in which general improvement seemed in progress, and without other guiding symptoms than slight aural discharge with occasional slight elevation of temperature?

Examples of this group of cases might be multiplied with a quite unvarying symptom-complex, until perhaps, three to six weeks had elapsed in each case; the outcome in some cases being smooth, unexpected recovery in the end; in others, unequivocal demand for undelayed operation following sharply on what seemed a slow but satisfactory course of convalescence.

Bacteriology may in the future furnish the coveted data pointing to the need of operation during these latent intervals, but reinfection by streptococci during an otitis media of several weeks' duration is not only possible, but probable, especially in scarlet fever cases, or indeed in any of the exanthemata. Further, no private patient with the mild symptoms detailed above would permit a disfiguring operation though the presence of streptococci prognosticated eventual surgical interference. With a hospital patient whose time is important and who can have little care at home, the aspect is a totally different one and the bacteriologic examination ought to have due weight in arriving at a decision.

REPORT OF CASES IN GROUP 2.

CASE 1.—A thin, pallid woman aged 41 years.

History.—Had bronchopneumonia following grip, when she was attacked by acute otitis media of unusually severe nature.

Symptoms.—Pain violent and constant. Temperature 102.5 degrees. Drum membrane freely opened, releasing a quantity of sanious discharge. Pain was in nowise modified, radiating over entire side of head and neck, without ceasing. Considerable sensitiveness over mastoid and antrum, especially at tip, and over sternomastoid muscle, for several inches downward. At no time was there any edema or redness over mastoid. Copious discharge through external auditory canal and eustachian tube. Temperature remained 100.7 degrees a. m., to 101 degrees p. m.

Termination of Case.—Operation strongly advised, but positively declined because patient knew of one case of mastoid operation that at the end of one year was still unhealed. Indications were unmistakable for operation, but she persistently refused, and after about ten days recovery began and progressed slowly. There was much deafness and occasional severe pain about the ear and radiating about the head, especially the occiput, evidently indicating a resorptive process in antrum and mastoid cells.

Observations on Case 1.—As will be seen this case gave fairly urgent indications for operation. A recovery of rather an undesirable character seems to be in progress, for a possible operation still faces the patient. There is marked deafness which might have been escaped and the general health is very surely menaced by leaving nature to cope with the infection alone. It presents, however, an illustration of the difficulties of prognosis in cases of mastoid involvement.

CASE 2.—Woman, married, aged 28. Grip of three days' duration; when first seen temperature 101 degrees. Right drum had perforated with copious discharge; left ear acutely inflamed, membrane bulging, great pain.

Treatment and Result.—Membrane promptly incised, followed by profuse discharge of pus. Hot bichlorid irrigations every two hours gave some relief; temperature next day 99 degrees. During that night pain in the left ear recurred persistently. On morning of third day mastoid tenderness and frontal headache. Leiter coil applied for forty-eight hours. Mastoid swelling and tenderness slightly modified, temperature 99 degrees, with violent headache and pain in and around the ear. Discharge from right ear continued profuse, while that from left ear much lessened. No improvement by treatment; patient sent to hospital on fifth day for operation. Here much pus was expectorated, the incision in left drum membrane almost closed and discharge ceased.

Operation.—A diploëtic mastoid antrum was found filled with granulations, surrounding bone softened. Complete subsidence of the severe pain followed the operation; patient left hospital on the fifth day and on the seventh was sitting up, quite well and strong. She is now, at the end of three weeks, completely recovered, with excellent hearing.

Observations on Case 2.—The parallelism of these two cases as well as the contrast between them is so evident that they need little comment. The local and general conditions in each before operation were quite similar, minus the bronchopneumonia in the second case, while the operation undoubtedly changed the picture entirely in Case 2, from a slow, painful, doubtful and unsatisfactory recovery to a prompt and desirable one.

Group 2, unlike the examples in Group 1, offered no difficulty in deciding on the necessity for operation, nor as to the time for this procedure. One prominent feature to be observed in the history of these cases, as well as in that of several others, occurring recently and here unrecorded, and which were by prompt measures aborted, is the very rapid sequence of symptoms

which I have noted as characteristic of aural complications of epidemic influenza.

REPORT OF CASES IN GROUP 3.

CASE 1.—Woman, aged 40 years. In poor health, anemic, hysterical, constant headache, which had been attributed to some uterine trouble for which a number of curettements had been done, without result.

History.—Had had suppuration in left ear for several years. Had tried many treatments but without avail. Discharge thick, tenacious; foul odor; carious bone. Pain over mastoid marked though inconstant. Temperature normal.

Treatment.—The case was treated tentatively for three weeks without improvement, and the Schwarze operation was done. Mastoid carious, much pus; the antrum and cells were carefully cleansed, the aditus enlarged, the attic curetted; thorough drainage obtained. Wound healed kindly, absolute cessation of suppuration, complete relief from headache and hysterical state, and health completely restored.

Observations on Case 1.—The severe and unremitting head pain and the hysteria which had been for years ascribed to uterine disease were completely relieved by the removal of the focus of disease within the mastoid. There has been no complaint of uterine disease since restoration to health took place.

CASE 2.—Woman, aged 38 years, in fair physical condition.

History.—For several years prior to her first visit she had had pain over the right mastoid which was considered neuralgia, but without apparent middle ear involvement until an unusual exposure caused severe chilling and cold. Pain then became violent, drum quickly ruptured, profuse purulent discharge without cessation of mastoid pain.

Examination.—When seen at the office, temperature 99 degrees, muscles of neck of right side rigid, profuse discharge from a large perforation in drum membrane, mastoid exquisitely sensitive, hearing reduced to loud voice close to ear; immediate operation.

Operation.—Mastoid carious, antrum very small but filled with pus, aditus unusually large, no necrosis detected in middle ear. Entire mastoid process removed and free drainage through middle ear established.

Result.—On following day temperature 98.5 degrees, stiffness of neck muscles subsided, suppuration entirely ceased, and on third day patient was going about feeling well. Hearing has become almost normal, ear dry, health good.

Observations on Case 2.—From the extensive caries found after a few days of illness, it seems probable mastoiditis was present perhaps for a long time before the exposure which resulted in the exacerbation. However, could the aural surgeon have advised operation with positively no sign to guide him but occasional severe pain of neuralgic character in the mastoid?

CASE 3.—Woman, aged 52 years. Anemic and rapidly losing health and strength.

History.—Has had middle ear suppuration from left ear since ten years of age. Recently the discharge has become very much worse. It would suddenly cease for a day or two, during which time there was intense pain in and around the ear, radiating to the forehead and accompanied with considerable vertigo. These attacks of pain and vertigo became more frequent.

Examination.—When she presented at the office there was a profuse discharge flowing from the ear, of foul odor and thin as water. The superoposterior canal wall was bulging and sensitive; pressure over mastoid painful to only slight degree. No redness nor edema over mastoid. There was no displacement of auricle. Temperature normal. Immediate operation was advised and accepted.

Operation.—The mastoid was very small antero-posteriorly, diploëtic and ivory hard, the antrum almost obliterated and very deeply placed; only a small quantity—a few drops—of pus was found in the antrum, but the surrounding bone was carious down to the inner table of the temporal bone, which was chiseled away until the dura exposed, which was found to

be smooth and healthy. Fully two-thirds of the small mastoid was removed, and this opening was made continuous with the middle ear; thus a modified radical mastoid operation was done. The closure of the wound differed somewhat from that ordinarily employed. The posterior flap was dissected from the skull for about two inches, then drawn forward and stitched to the auricular flap, leaving an opening at its inferior end for drainage, a gauze wick was inserted and removed on the third day, and as the reparative process was satisfactory it was left out and the wound allowed to granulate, which, since there was perfect apposition, it did promptly. Drainage was then secured only through the external canal. This procedure has given me the most satisfactory result.

Result.—There remains absolutely no deformity. At the end of one month the bandage was discarded and the patient resumed her usual duties. The ear is not entirely dry, but the discharge is only serous, slight and odorless.

Observations on Case 3.—The length of time of continuous aural suppuration without ill effect until the sudden exacerbation a few weeks prior to the operation is rather unusual.

It is to be observed also, that there was total absence of fever, mastoid swelling or redness, the diagnosis being made from the sagging posterosuperior canal wall, the pain and the vertigo. It must appear evident, that to have awaited the appearance of the so-called classic symptoms, which should determine the time of election of operation, would have exposed the patient to dangerous complications.

CONCLUSIONS.

In conclusion, it will be a source of helpfulness and gratification not only to me, but undoubtedly to those of the profession who may be interested in the transactions of this Section, if this paper shall elicit a free discussion on its various aspects; and especially would it seem valuable to find a consensus of opinion of this body on the question whether exploratory operation on the mastoid in obscure cases is ever justifiable in the absence of positive indications. While inclined to conservatism regarding exploratory operation on a suspected mastoiditis, I feel that a sin of omission in these cases is a serious one.

Some authorities have striven for definiteness on this subject of an opportune time for operation. It is possible in a condition presenting so varied a symptom-complex as at times does mastoiditis, that an elected time for operation might not be said to be a practical offering to our present wisdom on this subject, but it seems that some nearer approach to a definite rule might be arrived at through discussions of this deliberative body. Others have grounded on this same rock of hesitation and uncertainty, and the transactions of this Section show other requests for discussions that should advance toward the formulation of definite rules on this subject.

As I have indicated, the opinion of the best workers this field, but by these conservatives such varied rules are given as permit a latitude, within which decision may be remarkably perturbing to the surgeon. As in all work the good judgment of the operator must needs play its part, and to no greater extent in other surgical work does accurate and careful observation and deduction make for success than in the varying phases of an acute, supposedly suppurative mastoiditis.

As I have indicated, the opinion of the best workers in this field abroad favors waiting a longer time than it seems safe here to do in many instances, and I am persuaded that the rapidly infected mastoid following the exanthems and influenza here do not obtain in

like measure abroad. From a very general survey of this subject, conjoined with my most intelligent prospective and retrospective study of the cases occurring in my work in the past few months, I am led to the conclusion that it is perhaps not possible to fix on a closer definition of the chosen time for operation than may be deduced from the following rules:

1. Delay in operation of cases belonging to the first two groups herein treated, should not be permitted beyond from thirty-six to forty-eight hours, if profuse discharge from the middle ear by incision or rupture, with ice to the mastoid and general antiphlogistic measures do not markedly improve the condition. Even with normal or slightly elevated temperature, if there is edema over the mastoid and sagging of the posterosuperior wall of the external canal, operation should not be delayed, for with what seems to be an improved general state, in the majority of cases operation will eventually be needed.

2. Cases showing infection with streptococci, while at time for days the symptoms lie in abeyance, such cases should not be treated tentatively on appearance of pronounced symptoms of aggravated pain about the ear, fresh rise of temperature, lessened or suppressed discharge from middle ear, but should be operated on without delay in order to prevent the extensive caries which occurs in from two to three days in such infection.

3. In cases of slow, painful recovery, even if promising in the end to be complete, it would be wise to operate after a reasonable period of observation, in order to assist nature in her task.

4. Since this paper deals with private patients who are seen without undue delay, and who have usually had the benefit of good care of a palliative kind, it may be stated that as a rule applying to these cases of chronic otitis media, that the radical operation with its disfiguring results may quite often be replaced by the simple operation conjoined with careful curettage of the middle chamber.

5. Cases of chronic otitis media may be permitted more latitude, if there arise no signs pointing to intracranial involvement. However, if there be present constant otorrhea, neuralgic pains over the part, lowered general health, with nervous irritability, perhaps vertigo, operation should be undertaken after from two to six weeks, if treatment has failed to relieve the condition.

As a last word I wish to disclaim any hope to offer novel material to this interesting and widely discussed subject. I have told my experiences and propounded queries which have confronted me while undergoing these experiences; and have offered rules not exhaustively applicable to all imaginable cases, but serviceable to me in dealing with the groups herein treated; and withal seeking in discussion more light. The various important surgical procedures all have a few characteristic features on which to base unequivocal indications for operation. Independence to the individual operator would undoubtedly be gained through a concurrence of conviction on this theme by the members of the Laryngologic Section of the American Medical Association.

DISCUSSION.

DR. B. A. RANDALL, Philadelphia, referred to the frontiersman's phrase: "If you see sign of Indian, be careful; no sign of Indian, more careful." That is true of disease of the middle ear. The symptoms may be obscure while destruction of a deep-seated character is going on, usually because dense cortical tissue is shutting in the process and its symptoms. If

patients have been made to understand that they have but one chance and they take that chance and recover without operation, one can only tell them they have been extremely fortunate and that it is a consolation to give other patients in the future. Dr. Kuyk will probably hear from that mastoid yet. Frank confession of difficulties in these operations may encourage younger men in their work, showing them that every one must do his best earnestly and conscientiously to make the fewest possible mistakes.

DR. J. F. BARNHILL, Indianapolis, said that, in a considerable number of cases of mastoiditis, in which the mastoid operation should be performed, the condition is almost symptomless, there being present no pain, fever, redness nor swelling. We must take into account the fact that the discharging ear does not show a tendency to dry up, and that in most instances the amount of the flow is out of all proportion to that which could possibly come from suppuration in so small a cavity as the middle ear alone. Since external evidences of mastoid involvement are often wanting, and when present do not always indicate the gravity of the ailment, most thorough otoscopic inspection and examination by every known means becomes an essential. Sagging of the posterior superior meatal wall is, of course, a most valuable indication, but unfortunately is not always present. Politzer says that if there is a pulsating light reflex on the bead or pus which projects through the drum membrane after cleansing the external meatus, and persisting two weeks after its rupture, it is certain evidence of disease of the mastoid cells. Dr. Barnhill does not believe it is ever wise, unless we have more positive evidence than is usual, to say to the patient that the only chance for his recovery is through operation. Patients get well that we thought would die without operation; and if we tell them there are absolutely no chances of recovery, and they afterward fall into the hands of quacks who treat them until such unexpected recovery takes place, they do the profession harm, for they are examples of our failure to foretell the truth. It is wise to spread a greater knowledge of ear diseases. Other surgeons have been more energetic in teaching the public in this respect. When we have a case in hand, we should make explanations, perhaps exhibiting some cuttings. This method has acted as the greatest kind of persuasion to the patient, easily showing that what is commonly regarded as the ear is in reality only one small part of the hearing apparatus, and that when the disease once reaches the cells behind the ear, the drainage is very poor. If the patient sees the relation of the mastoid cells himself, he is much more ready to consent to surgery than he would otherwise be, because it must be clear to anyone who sees the arrangement of the middle ear, mastoid cells and other parts liable to become affected, that surgery is often the only rational means of relief and cure.

DR. D. McAULIFFE, New York, said that it takes one of great diagnostic ability to determine this question. There is something recognizable in the patient himself which guides a man, more than the local symptoms. The symptom complex generally put down is so rarely met with in the vast majority of cases that we have practically no guide to determine the time of operation. Tenderness from pain depends on the elasticity of the cortex of the mastoid. He finds that temperature is the best guide, and that generally a case will show some slight elevation of temperature after two weeks. Bulging of the posterior wall does not take place unless infection has occurred. If the forward march of the sepsis is not well marked, this bulging will be absent. In mild attacks of mastoiditis there are very few local symptoms, but when they recover without operation the hearing is impaired.

DR. OTTO T. FREER, Chicago, emphasized that bulging of the posterior wall of the external auditory meatus does not always indicate suppuration of the mastoid antrum or cells. These cavities may be intact while a deep subperiosteal abscess may be the cause of the prominence of the posterior wall. There may be enough bulging to entirely close the auditory canal and yet the pus may be situated externally under the periosteum and not in the mastoid cells.

DR. H. E. SMYTH, Bridgeport, Conn., said that the surgeon who is always radical, or the one who is always conservative, has little trouble in deciding when to operate, but the man who endeavors to be radical or conservative, according to the disease in the temporal bone as indicated by external signs, is constantly in a dilemma. The amount of disease is sometimes so at variance with the symptoms that there is marked damage within the bone with little evidence externally to call attention to the fact, and conversely, marked symptoms with little disease.

DR. D. J. McDONALD, New York City, reported a case and remarked that we are taught now to look out for this condition of hidden sepsis. In every epidemic of measles Dr. McDonald said he inspected the secretions. If we do our work in this thorough manner, we shall be the means of publishing the results of otology to the world.

DR. D. A. KUYK asked if exploratory mastoidectomy in private practice is ever justifiable unless one has a fair proportion of symptoms indicating mastoid trouble and can assert positively the existence of mastoiditis. At what moment in the cases reported would have been the most advantageous time for operation?

DR. E. B. DENCH, New York City, said that he makes no distinction between private practice and any other; if there is any doubt whether to go in or not, he goes in. He would rather see a doubtful mastoid from the inside than from the outside. He explains to the family that an exploratory operation is justifiable and that there is no danger in it. In all cases where he has made this explanation and told the family he might find nothing, he has never failed to find something to justify the operation and to make him sorry he did not operate twenty-four hours before. He spoke of a case twenty-four hours after acute inflammation of the middle ear developed, in which he did myringotomy, and two days afterward opened the mastoid for tenderness and pain. He found pus in the mastoid cells, had a culture made, and it proved to be pure streptococcus. Had it been allowed to continue it would have spread to the deeper structures. When in doubt, operate, with explanations to the patient and family.

TWO CASES OF OBJECTIVE AURAL TINNITUS DUE TO THE ACTION OF TUBO- PALATAL MUSCLES.*

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Subjective noises in the ear, loud, distressing, and of various description, buzzing, ringing, roaring, singing, steaming, whistling, is one of the most familiar symptoms encountered in the practice of otology.

These sounds are sometimes so loud and intense that the afflicted patient is led to think that bystanders can hear them as well as himself, and it not infrequently happens that the physician is asked if he also can not hear the noise which the patient hears so distinctly.

But cognizant of their purely subjective character, the physician usually only laughs at the query.

It is worth while, however, to bear in mind that exceptionally this inquiry on the part of the patient is entirely justified and that if we put our ear close to his, we will discover that the sound, which we thought was heard only subjectively by the patient, may actually be heard objectively by another person.

Two kinds of objectively produced noises are distinguished:

1. Those of vascular origin, generally of a blowing, roaring or buzzing character, synchronous with the

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