students as well as practitioners, as implied by the preface, nor does the following seem safe advice for the embryonic laryngologist : "If "anæsthesia is not complete the larynx closes round the instrument, and "the surgeon will have to trust to his previously ascertained knowledge "of the position of the growth as to whether he passes his snare to the "right," etc. One can almost appreciate the fact (?) that the nose has been treated for acute articular rheumatism when one emerges from the list of ailments relieved by rhinological treatment here described, and one would hardly call hernia a characteristic of nose and naso-pharyngeal obstruction.

It is a pity the proofs have been hurried over, or else in Case 3, on page 527, it would not still be "too early to speak of result," considering this has appeared in each edition. After these few strictures one feels that the book is one which has done and will do good work, and will well repay the reading. *R. Lake.*

ASSOCIATION MEETINGS.

AMERICAN OTOLOGICAL SOCIETY.

Twenty-sixth Annual Meeting, held at the Fort Griswold House, New London, Conn., July 13, 1893.

MORNING SESSION.

The Society was called to order by the President, Dr. Gorham Bacon, of New York.

The Comparative Anatomy of the Ossicles.—The first paper was one with this title, read by Dr. LUCIEN HOWE (Buffalo, N.Y.).

As comparative anatomy frequently gives important hints concerning the function of different portions of our bodies, the author had examined various works on comparative anatomy for facts in regard to the ossicles in various animals. Finding that very little had been done in this direction, he had made some effort to obtain the ossicles from animals of widely different species. Attention was called to the following peculiarities, which had been noted in these observations:—

1st. As to the processus longus of the malleus, concerning which there is some difference of opinion. Gruber has described this process as bony in early life, considering that later it degenerates into connective tissue, and is then to be regarded as a ligament. A study of comparative anatomy appears to indicate that this is the true view, for in one or two we find the long process persisting as a true bone.

2nd. Concerning the malleo-incudal joint. Helmholtz has described this joint with much detail, and holds that in the human being rotation in one direction is practically unlimited, while in the other direction it is suddenly arrested. These observations have been verified by the author in the orang and some of the higher air-breathing animals.

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3rd. It is worthy of note that the form of the hammer and anvil differ very greatly, not only in different genera but also in individuals of nearly allied families. On the other hand, the stapes is remarkable in having almost always a certain approach to the stirrup form.

The author presented these observations on account of their possible intrinsic interest, and also with the hope that future observations may throw light on certain obscure questions regarding the physiology and pathology of the bones of the middle ear.

The Strongly Counter-irritant Effects of the Usual Mastoid Operation was the title of a paper read by Dr. ALBERT H. BUCK (New York).

The main object kept before the mind of the surgeon in opening into the mastoid process is the establishment of a free channel between the outer world and the centre of disease, which latter, in most instances, is situated either in some part of the middle ear or in the mastoid bone itself. Through this channel the products of inflammation find a much easier way of escape than by any route that Nature may establish through ulcerative action, and through it, besides, the surgeon is able to introduce such remedial or mere cleansing fluids as he may think likely to exert a curative effect. But in certain cases, and they are by no means rare, the good effects of the operation are not confined to the benefits directly attributable to good drainage and thorough cleansing of the parts ; the derivative or counter-irritant influence of the operation plays, I believe, a very important part in effecting a cure of these cases, and it is for the purpose of directing attention to this point that I have prepared the present paper.

Setons and issues were looked upon as valuable therapeutic agents even so recently as twenty-five years ago, but nowadays one scarcely ever hears them mentioned. In operating upon the mastoid we may establish an issue on a comparatively large scale. A gaping wound, two or three inches in length, is made in the skin, and a pit large enough to admit the end of a forefinger is excavated in the underlying bone itself. This deep excavation may be left gaping, and afterwards, for a time at least, be treated as an open wound. When this course is adopted, we have all the essential conditions of a large issue ; and if there be any virtue in the principle of counter-irritation, the beneficial effects that flow from it will be provided in liberal measure to the patient thus operated upon. On the other hand, if the edges of this gaping wound are stitched together in accurate coaptation, only a small outlet for the discharge being left at the lower angle, and then, if, in addition, such dressings are applied that no micro-organisms can by any possibility find an entrance into the wound, our patient will certainly be deprived in large measure, if not wholly, of whatever good effects counter-irritation is competent to supply. In the majority of cases, as I have already intimated, the disease will be cured without the aid of such additional counter-irritation, but in those cases in which the disease of the ear has set up more or less active intra-cranial inflammation this counter-irritant power may be sufficient to turn the scale from a fatal to a favourable issue.

While I cannot hope to furnish from my case-book convincing proofs

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of the correctness of this doctrine, I believe that the histories of the following three cases will go far towards establishing its soundness :—

Case I. : The patient, a vigorous man, about thirty-eight years of age, consulted me in March, 1890, for the relief of a discharge from the left ear, of at least thirty years' standing. Apart from the discharge and some impairment of the hearing, the ear, he said, had given him no trouble until within a few days, when a certain amount of bleeding became associated with the discharge, and had continued since. On examination I found the left external auditory canal filled with a large and very vascular polypoid growth. I removed it with the snare, and found that it sprang from what was left of the drum membrane, in the neighbourhood of the hammer. I recommended the daily use of Angelo's ear-douche, and under this *régime* the ear gave him no further trouble during the subsequent three years.

On April 15th or 16th of the present year he sat at an open window, with a current of air blowing upon the left side of the head. Soon afterwards the ear became painful, and the pain continued to increase steadily until the 18th, when he called upon me to obtain relief. On examination I found that the upper cutaneous wall of the left external auditory canal was markedly prolapsed. There was a scanty, rather thin, pinkish, foul-smelling discharge in the canal. The body-temperature was 103° F., and the pulse 102. The pain was referred to the deeper parts of the ear, and to the whole left side of the head. There was no tenderness over the mastoid region.

The treatment adopted, and carried out by my associate, Dr. Robert Lewis, was the following : A free, curving incision was made across the cutaneous wall of the canal at the point of greatest prolapse, and through this opening a slightly curved silver canula was introduced. Through this a stream of a 1 to 4000 bichloride of mercury solution was forced by air pressure generated through the instrumentality of a rubber foot-bag. This irrigation brought away an appreciable quantity of foul, cheesy material ; the stream apparently escaping directly from the middle ear. Three leeches were also applied behind and below the ear, as close as possible to the auricle ; and the patient was instructed to have hot flax-seed poultices applied continuously for three hours. Internally, he was given one grain of calomel, to be followed, the next morning early, by a full dose of Rubinat Condal water.

On April 19th the patient was found to have less pain, and the temperature had fallen to 102° F. The probe, passed through the opening in the prolapsed portion of the wall of the canal, encountered everywhere roughened bone. Dr. Lewis therefore attempted, by passing a small-sized Volkmann's spoon (bowl = 3 mm. in diameter) through the artificial opening, to gnaw away so much of the intervening ridge of bone—presumably carious—that the stream of water from his canula would play directly upon the contents of the antrum. In this he apparently succeeded, for in the subsequent washing he drove out considerable quantities of foul, cheesy material.

During the next two or three days all the local symptoms improved greatly. The discharge almost entirely lost its foul odour, the prolapsed

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wall of the canal returned to its natural position, the temperature and pulse became nearly normal, and the pain had very decidedly diminished in severity. The appetite, however, did not return, and the patient showed no desire to leave his bed. His tongue also remained heavily coated. The urine had been examined by his regular medical attendant, Dr. Samuel K. Lyon, and found to be normal.

On April 25th the temperature again rose to 103° F., and the patient seemed to have passed into a state of semi-stupor. As the ear had improved so markedly, it was thought that there might be a malarial element underlying the rise in temperature and the mental hebetude. Accordingly quinine was administered in divided doses until he had taken, during the twenty-four hours, twenty grains. An ice-cap was also kept constantly applied to his head. These measures produced no perceptible effect upon either the temperature or the drowsiness, and at the suggestion of his physician he was given two doses (about four hours apart the one from the other) of the hydrobromide of hyoscine, $\frac{1}{120}$ grain in each dose. This was on April 26th.

On April 27th the patient was found to be greatly improved in every way. The temperature had fallen to normal. The drowsiness had disappeared, the dusky colour of his face had changed to a natural ruddy hue. His eyes were bright. He asked for food. In a word, he seemed at last to be on the high road to getting well.

The visible parts of the ear having shown no signs of inflammatory action for at least three or four days, and apparently not requiring any other treatment than the frequent use of the warm douche with a very weak sublimate solution, the patient was left in charge of his regular attendant.

As we afterwards learned, the improvement noted above lasted only about twenty-four hours. The fever and drowsiness then returned, the right side of the body became paralyzed, and the patient died on the third or fourth day after we had last seen him.

This case is brought forward on account of the indirect testimony which it furnishes to the correctness of the statement that in those cases where the ear disease has already set up a certain amount of inflammation at the base of the brain, it is not sufficient to thoroughly drain and cleanse the original seat of the disease in the ear. Something more potent is required to bring about a subsidence of the deeper-seated inflammation, and this is to be found, I believe, in the counter-irritation furnished by the usual mastoid operation. In direct confirmation of this belief I will give the details of a second case, in which the local conditions of disease in the ear were very much the same as those noted in Case I., while the evidences of intra-cranial disease, at the time of the operation, were more pronounced—in fact, there was already well-marked paralysis on the opposite side of the body, and yet the patient recovered.

Case II. : The patient, a man twenty-two years of age, and of good general health, consulted me at my office on January 7th, 1893, on account of long-standing trouble in the left ear. He gave the following history :

There had been a discharge from the left ear since childhood, and on

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several occasions he had experienced pain in the ear, lasting perhaps for two or three days and then passing off. The last of these attacks had occurred during the previous November and had been of unusual severity. From that time to the present he had experienced a great deal of dizziness, and at times he had felt decidedly chilly, without having, however, a distinct chill. At other times he had felt feverish. The discharge, during this period, had remained unchanged in quantity, but from time to time he had found it streaked with blood. His general health had deteriorated appreciably during this period, and he had lost flesh to the extent of twenty pounds. Quite recently there had developed a new symptom which had given his family some alarm. I refer to the sensation, observed on the right side, of walking on cushions. His gait, too, had become somewhat unsteady, through inability to perfectly control the motions of the right leg.

When the patient called at my office I observed that he dragged the right leg a little, and that he presented the facial aspect of one who was seriously ill. An examination of the ear revealed the existence of a large polypoid mass which nearly filled the left external auditory canal. After it had been removed, it was found that an opening into the tympanic cavity existed in the vicinity of Shrapnell's membrane. A slender probe was introduced, but no exposed bone was encountered. Hyperostosis of the inner half of the external auditory canal concealed a large part of the drum membrane. The odour of the discharge coming through the sinus was very offensive. There was no tenderness or redness at any point in the immediate neighbourhood of the ear. Mastoid operation advised.

On January 10th, three days later, I found the patient, at his home in the country, materially worse. There was a moderate elevation of temperature (about 101·5° F.), and his pulse varied from 100 to 110 beats per minute, being at the same time quite weak. He had scarcely any power over the movements of the right leg, and he expressed himself as feeling very ill. Shortly afterwards he had a distinct chill.

Ether was administered, and the operation of opening into the mastoid antrum was performed in the usual manner. The bone was found to be everywhere of ivory-like consistence, requiring considerable force of the mallet to drive the chisel through it. Volkmann's spoons proved to be of no use until the antrum had actually been reached. They were then used in enlarging the opening into this cavity. By repeated injections of a warm 1 to 4000 bichloride of mercury solution, and by the frequent employment of the slender middle-ear probe, which was pushed as far as possible in all directions, the cavities of the middle ear were finally cleared of their foul, cheesy contents. It was surprising how large a quantity of this material was stowed away in this comparatively small space. A careful exploration was made for the purpose of ascertaining whether, through destructive ulceration, an opening had not been established in the bony tegmen tympani. No such opening, however, could be found.

The edges of the wound were left gaping ; iodoform gauze dressings were applied ; and daily cleansing of the parts constituted the essential feature of the after-treatment. (The patient was under the care of Dr. T. H. Andress, of Sparta, N.J.) About the fifth or sixth day, when it

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was found that the case was progressing favourably in every respect, the edges of the granulating wound were approximated by means of a silver suture, which had been put in place (ready to be utilized at some later date) at the time of the operation. On February 16th, five weeks after the operation, the patient called to see me at my office. The external wound had entirely healed, but there was still a very slight discharge from the external auditory canal. All pain in the ear and head had disappeared, and the right leg had returned to an entirely normal condition. His general health was excellent.

In the following case, thanks to an error which I made in the diagnosis, I am warranted in excluding wholly from consideration the possible effects of drainage and cleansing upon the favourable course produced by the obscure deeper-lying disease. Absolutely no ear disease whatever was found to exist in this case at the time of the operation, and consequently, in weighing the therapeutic effects of the latter, we are perfectly justified in speaking of it as an issue pure and simple. The history of the case is as follows :—

Case III. : The patient, a lady about fifty years of age, and, up to the time of the attack, in good general health, contracted a bad cold in the head early in April, 1892. This was soon followed by tinnitus and pain in the left ear, and impairment of the hearing. The pain resisted the ordinary measures employed for its relief, and gradually increased in severity. It involved the entire left side of the head, but was referred more particularly to the mastoid region. When the patient was seen by Dr. Thomas E. Satterthwaite, about May 1st, he found decided swelling and tenderness of the auricle and neighbouring soft parts ; the motions of the jaw caused pain in the left ear ; the glands on the side of the neck, below the ear, were swollen ; and there was a tense swelling on the posterior wall of the pharynx, behind the left tonsil. An incision of this swelling afforded escape to a considerable quantity of creamy pus. The posterior wall of the left external auditory canal was found to be swollen, and an incision in this region also gave vent to a certain amount of pus. From this time onward, for a period of nearly three weeks, the patient experienced comparatively little pain in the ear or in any part of the head. The hearing on the left side soon returned to a fairly normal condition. Pus, however, continued to escape from the opening in the posterior pharyngeal wall, and the patient steadily grew weaker. The constant escape of pus into the fauces rendered her less and less desirous to take food. In fact, she had to be coaxed a great deal before she could be induced to take the necessary amount of nourishment. It was observed, too, that her mind was beginning to be perceptibly affected, and the pupil of the left eye was noticeably larger than that of the right. The body temperature did not at any time during her illness rise above 99·5° F. The pulse rate was about 80, and the pulsations, as might be expected, were feeble.

About May 20th she was seen by Dr. Robert Abbe, of this city. He was disposed to refer the source of the pus, which continued to flow abundantly from the opening in the pharyngeal wall, to disease of the sphenoid bone. He advised against operative interference. Shortly

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after this the patient again began to complain of pain in the left mastoid region, and it was found that the hearing of the left ear had again become somewhat affected. There was also some redness of the skin behind the left ear, together with slight tenderness on pressure. As these symptoms persisted I was asked (on May 26th) to see the case in consultation with Dr. Satterthwaite, and Dr. Terhune, of Passaic, N.J. I found the patient in a condition of semi-stupor ; whether from simple physical weakness or not, I could not determine. Her pulse was 80, and decidedly weak. There seemed to be some redness and swelling of the left mastoid integuments, but as a blister had been applied over the lower part of the process, and some distance below it, two or three days previously, I could not feel sure of the correctness of my observation. The external auditory canal and the membrana tympani were entirely free from any evidence whatsoever of inflammatory action. The spitting-cup, filled with water, was shown to me, and in it, floating as a separate mass, was about a tablespoonful of thick yellow pus. This represented, I was told, the entire quantity that the patient had spat out during the previous twenty-four hours. An examination of the pharynx revealed no points of special interest. The exact spot from which the pus escaped could not be verified by mere ocular inspection.

In the presence of such conflicting evidence—a history pointing strongly to the left ear as the primary seat of all the trouble, and yet, at the time of my examination, an almost entire absence of any recognizable disturbance in that ear—I felt considerable hesitation about putting forward even a diagnosis of probabilities. Nevertheless, from the sequence of pathological events, and especially from the recent return of mastoid pain and tenderness, I felt disposed to believe that there was still, in the substance of the mastoid process, a small remaining centre of osteitis, the purulent products of which were escaping through some opening in the under part of the process, presumably in the vicinity of the digastric fossæ, and were seeking an outlet through the unhealed opening made with the knife in the post-pharyngeal abscess. This centre, I assumed, must necessarily be somewhat removed from the mastoid antrum, and from that part of the process which constitutes the posterior wall of the external auditory canal ; for otherwise it would have betrayed its existence by redness or swelling of the soft parts of this canal, both of which conditions (as already stated) were absent. I further argued that if, perchance, this diagnosis should prove to be correct, the more direct drainage and ultimate healing of this centre of mastoid inflammation, which we might reasonably expect to obtain by an operation, would in all probability cause the post-pharyngeal abscess to heal.

On the following day, May 27th, the operation was performed. A curving incision, about two and a half inches in length, was made through the skin and periosteum, the outer surface of the mastoid bone was freely exposed, and by means of the chisel and mallet and Volkmann's spoons a large part of the bone substance lying external to the antrum was removed. Not a trace of anything like diseased bone was found, either in the main body of the bony prominence or in the direction of its tip, a large part of which was removed with Volkmann's spoons. There

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was not even any recognizable congestion of these parts. In a word, the mastoid was found to be in a perfectly healthy condition.

The edges of the wound were left gaping, and simple iodoform gauze dressings were applied. From this time forward the patient, who remained under the care of her regular attendant at first, and then for a brief period under that of my associate, Dr. Robert Lewis, improved steadily, though not rapidly. In the course of from four to five weeks the outside wound had healed, the discharge from the post-pharyngeal abscess had ceased, the mental disturbances had disappeared, and she had fully regained her general health and strength.

By way of summing up, let me rehearse briefly the salient distinguishing features of the foregoing three cases. In the first two it is highly probable that the intra-cranial lesions were very nearly alike in extent and intensity. In the one the original centre of carious bone, with its accumulation of foul *débris*, was effectively cleansed and drained, and yet the intra-cranial disease pursued its course to a fatal termination without manifesting any but a transient tendency to quiet down under the influence of this drainage and cleansing. It had acquired so great an independent momentum that it no longer needed, for a continuance of its harmful course, the stimulus of the adjacent centre of middle-ear disease. The same remarks, I believe, apply with equal correctness to the second case. Here, too, the original centre of carious bone disease in the middle ear was drained and cleansed, but the intra-cranial disease, instead of growing worse, underwent a steady and permanent change for the better. To what shall we attribute this favourable change if not to the powerful counter-irritant effect furnished by the presence of an extensive issue in the immediate neighbourhood?

Finally, in the third case, the conditions of our problems in therapeutics are rendered peculiarly simple by the entire absence, so far as could be ascertained, of any centre of disease in the middle ear or mastoid bone. In this case, therefore, the establishment of an issue pure and simple is the only therapeutic procedure of which there can be any question. Indisputable, too, is the existence of some deep-seated and serious disease; whether at the base of the brain, or in the sphenoid bone, or where, is just now a matter of no special importance. The patient's full and, on the whole, rather quick recovery completes the series of facts. Do they not warrant the conclusion that counter-irritation, in the form of an extensive issue, effected the cure obtained in this case?

Dr. SAMUEL THEOBALD (Baltimore) said that the view of Dr. Buck was borne out in many cases in which the mastoid is opened and no pus found, and in which pus does not subsequently make its appearance, but yet the case is greatly benefited by operation. These cases sustained the view that much of the benefit is due to the counter-irritant effect.

Dr. H. KNAPP (New York) did not clearly understand what was meant by the revulsive or counter-irritant effect of the operation. In many cases there is simply a congestive mastoiditis. At the operation nothing but blood is found, but the result is almost always satisfactory.

In regard to the extension of the suppurative process to the brain, the

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speaker believed that when we destroy the source of the suppuration we act beneficially upon the extension of it. He thought that in many cases when the mastoid was opened, the cranial cavity opened, and the lateral sinus and jugular vein explored, a great deal of the good effect might have been obtained by simple opening of the mastoid without such extensive operation, especially if there is no great septic condition.

Extensive Caries and Necrosis of the Temporal Bone of a Child; Mastoid Operation; Death from Exhaustion and Hæmorrhage.

Dr. HERMAN KNAPP (New York) read the paper. The patient, a feeble, anæmic child, came under observation on April 28th, 1893. For a few months there had been copious and offensive otorrhœa of the left side. The mastoid region was swollen and soft, but no fluctuation was present.

May 1st: The mastoid was exposed; there was no sub-peritoneal collection of pus. The outer table of the mastoid was removed, with the exposure of a large cavity filled with necrosed bone and granulations bathed in pus. This was removed and the cavity packed with corrosive sublimate gauze. The child improved to some extent, but there was no tendency to repair. Some time later, and a week before death, the probe revealed that the posterior wall of the bony portion of the external ear canal had begun to loosen itself, but it was too firmly attached to permit extraction.

On July 3rd the ear was carefully probed. This was followed by escape of some dark blood, as had occurred at previous examinations. The wound was dressed and the child went home. During the night there was a continuance of the bleeding, and the child died the following morning. It was impossible to obtain an autopsy. The amount of blood lost did not seem great enough to have caused death; but in the precarious condition of the child it may have hastened the fatal result.

A Case of Chronic Middle-Ear Suppuration with Grave Brain and Lung Complications; Opening of the Mastoid and Wounding of Lateral Sinus; Complete Recovery.

Dr. KNAPP (New York) also reported the following case:—On December 22nd, 1892, Mrs. H., aged thirty-eight, came under observation, complaining of pain, discharge, and deafness in the left ear. There had been occasional attacks of inflammation during the past year. The upper posterior part of the drum membrane was red and bulging, and there was a large perforation in the lower part. There was also catarrhal rhinitis. Appropriate treatment was advised, and during the next three months the condition fluctuated considerably. On three occasions the condition became so aggravated that exploratory operation was decided on; but on each occasion sudden improvement occurred and operation was not done.

March 27th: The disease took a more serious turn. There was pain in the head, and swelling and tenderness of the mastoid, and pain on percussion about two inches back of the ear. Operation on mastoid was advised, but delayed at the request of the patient on account of the advent of menstruation.

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April 13th: There was severe pain in the head, delirium, with chill and vomiting, and complaint of discomfort in the chest. Pulse, 120; respiration, 30; temperature, 104° F. There was no discharge from the ear. The mastoid was red and tender. The optic disc was hyperæmic and swollen. There were no physical signs of involvement of the lung. The possibility of the lung complication being due to the ear disease led to operation on the mastoid. No pus or diseased bone was found. The bone was softer and more vascular the deeper the operation went. Chiselling still deeper, there was a sudden gush of dark blood. This ceased after a minute's pressure, and the cavity was packed with corrosive sublimate gauze. The ear showed no reaction, but for a week the patient was in a critical condition from the lung complication, which was declared to be a pleuro-pneumonia. From the ninth day after operation the patient improved steadily and made a complete recovery. In reviewing the case, it was thought that the otic disease was the origin of the difficulty, and that the inflammation passed into the skull through the roof of the drum cavity.

Dr. J. ORNE GREEN (Boston) thought that in some cases where hæmorrhage is attributable to the opening of the lateral sinus the blood does not come from that source. He had had two cases in which he satisfied himself that the free escape of blood did not come from the lateral sinus. A probe demonstrated a cavity with a complete bony wall. The great hæmorrhage in these two cases was attributed to the opening of a large diploic vein.

Autopsies in Two Cases of Complicated Middle-Ear Disease.

Dr. T. Y. SUTPHEN (Newark, N.J.) reported the following cases: —

Case I.: Man, aged thirty, had immense abscess involving the left mastoid region. This was opened. There was a long history of middle-ear suppuration. Two days later, when the author first saw the case, the mastoid was found extensively carious. During the next few days the patient became worse, with development of cough, elevated temperature, and dulness over the right side of the chest. In a week he died in coma.

Autopsy showed an abscess canal outside of dura mater, extending to the cerebellum, where it penetrated the dura and ended in abscess in the brain tissue, having adjacent to it other spots of softened tissue. There were also the lesions of a septic pleuro-pneumonia.

Case II.: Case of right middle-ear inflammation lasting several weeks. For ten days there had been severe headache on the right side. No swelling or tenderness over mastoid. No paralysis. Three days later the patient became comatose, with temperature of 104° F. The following day the mastoid was opened, but no pus was found. The patient died the next morning.

The autopsy showed no communication between the mastoid and the cranial cavity. The meningeal space contained a quantity of sero-purulent fluid. The right lateral sinus contained a large softened clot communicating with the meningeal cavity. The entire meningeal surface of the cerebellum was bathed in pus. No abscess was found in the brain substance.

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Fatal Thrombosis of the Lateral Sinus, with Autopsy.

Dr. EMIL GRUENING (New York) reported the case of a woman, aged thirty-eight, who had occasional discharge from the left ear for six years. Two months before coming for treatment profuse discharge set in and continued. There were two perforations in the drum membrane, and the mastoid region was red, swollen, and œdematous. The ordinary mastoid operation was done, and pus and granulation tissue found. The lateral sinus was exposed, but it did not pulsate. Four days later pyæmic symptoms manifested themselves, with marked and sudden variations in temperature. There were also evidences of lobar pneumonia. The patient died, and autopsy revealed pneumonia and thrombosis of the lateral sinus.

The Statistics of the Aural Department of the Massachusetts Eye and Ear Infirmary were presented by Dr. CLARENCE J. BLAKE (Boston).

They were for the three months, April, May, and June, 1893. The total number of patients seen during this time was 7685. Of this number 1414 were new patients. The cases were classified in tabular form, according to the disease present, under the following heads: (1) Morbi auris externæ; (2) morbi auris mediæ; (3) morbi labyrinthi et acustici; (4) morbi nasi et naso-pharyngis: and morbi et operationes. The total number of operations done was 208.

Detailed reports of a number of the more interesting cases were given.

AFTERNOON SESSION.

Dr. J. ORNE GREEN (Boston) exhibited a large number of pathological specimens of ear disease, and gave reports of the cases.

Stapedectomy and other Middle-Ear Operations was the title of a paper by Dr. CLARENCE J. BLAKE (Boston).

During the past year the author had investigated the question of the possibility and advisability of the extraction of the stapes in chronic non-suppurative disease of the middle ear. As a result of the investigation the following conclusions seemed justified: That in those cases of non-suppurative disease of the middle ear, with a high degree of deafness, the operation of stapedectomy is most likely to be futile, because of the degree of fixation of the base of the stapes, leading to fracture of the crura in the attempts at removal.

That in the class of cases where stapedectomy has apparently given the best results, viz., fixation of the stapes as a sequence of chronic suppurative disease, it is by no means certain that equally good results could not have been obtained by surgical mobilization and subsequent care.

That while removal of the stapes is by no means so hazardous a procedure, it still opens up the possibility of interference to an unknown degree with the most important part of the organ of hearing, and an almost equally important peripheral organ of equilibrium.

In order that the operator might, in the non-suppurative cases, avail himself of the co-operation of the patient, and apply, in the progress of the operation, a series of hearing tests to determine the location of the

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principal obstacle to sound transmission, and determine the extent to which surgical interference was advisable, the plan of "exploratory tympanotomy" was devised. The speaker prefers, when possible, in cases of non-suppurative disease of the middle ear, to begin with exploratory tympanotomy, which is an operation without general anæsthesia, leaving it to be determined by the examination and tests made during the operation as to whether the stapes can or shall be removed or not. In suppurative cases he prefers first doing synæchtomy, tenotomy, and crural circumcision, with, if necessary, the additional application of an artificial drum, allowing a proper time limit for the determination of the effectiveness of these procedures before submitting the patient to the final operation of stapedectomy.

Observations on the Removal of the Stapes.

Dr. FREDERICK L. JACK (Boston) presented a paper supplementary to the one he had read at the last annual meeting. Since bringing the matter before the Society last year, the operation had been tried in thirty-two additional cases. These, with the sixteen previously reported, furnish forty-eight cases for observation and study. In reviewing the cases there is much to encourage the adoption of the procedure, but its clinical application will require modification.

The following conclusions were presented :—

1. The operation is followed by the best results in the class of cases where, from the increase of time, the effects of suppuration, or hypertrophic inflammation, the stapes offer an obstruction to sound-waves; by its removal the hearing is improved. The results in cases of otitis media chronica insidiosa, on account of failure to extract the foot-plate, are not encouraging.

2. Inflammatory reaction is unusual, and followed by no bad results.

3. The hearing is not necessarily impaired by the subsequent growth of a thin cicatricial membrane over the fenestral niche.

4. Some cases of tinnitus and aural vertigo are relieved, and there is little chance of causing permanent vertigo in cases where it had not previously existed.

5. It rarely happens that a patient improves for all tones. Improvement in hearing the human voice was out of proportion to the improvement for other sounds, and the reverse sometimes occurred.

6. Failure of success in some cases may be due to hæmorrhage into the labyrinth at the time of the operation. It is believed to be a rare complication, but was thought to have occurred in one or two cases.

7. In removing the various ossicles, the stapes, if found diseased, should also be removed.

The Surgical Treatment of so-called Ménière's Disease (Aural Vertigo).

Dr. C. H. BURNETT (Philadelphia) maintained that the name "Ménière's disease" is inaccurate and unjust. It is inaccurate, because it is indiscriminately applied to all forms of aural vertigo, regardless of the seat of otic lesion; whereas Ménière attempted to prove the existence

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of a disease of the semi-circular canals as the only cause of aural vertigo—an entirely untenable hypothesis.

The name is unjust, because Flourens in 1822, and Deleau in 1836, described aural vertigo more accurately than Ménière in 1861, and Deleau came much nearer than any previous observer to the solution of the origin of aural vertigo in placing the cause in lesions of the middle ear. Ménière's observations of a case of aural vertigo, in which, owing to the sudden death of the patient, he is said to have made a *post-mortem* examination of the temporal bone, revealed nothing more than any roughly and rapidly made dissection of this bone would do—viz., pinkish serum in the semi-circular canals. It proved absolutely nothing as to the cause of aural vertigo observed before death, and has led to great confusion in diagnosis and error in treatment of ear-vertigo. In fact, there is no such phenomenon as "Ménière's disease," as commonly spoken of by the general profession.

Aural vertigo, on the other hand, due to lesions in the middle ear, is of very frequent occurrence. It is often not recognized, especially by the general practitioner, as aural vertigo, nor even as the so-called Ménière's disease, in which, to say the least, the cause of the vertigo is placed in the auditory apparatus. It is not unusual for aural vertigo to be attributed to intestinal disturbance, or to neurasthenia, instead of to an aural lesion. Hence, the diagnosis being erroneous at the outset, the treatment is wrong and the patients do not recover.

True aural vertigo, due to a lesion in the middle ear, chiefly from chronic catarrh of the tympanic cavity, is paroxysmal in character, and attended with tinnitus and deafness in the affected ear. It is caused by the inward pressure exerted upon the labyrinth-fluid by the retracted and anchylosed ossicles. The foot-plate of the stapes is thus unduly pressed into the oval window and there held by the above-named forces, paroxysmally and for longer or shorter periods.

The treatment consists in removing the retractive force and liberating the stapes, preferably done by the surgical removal of the incus. This bonelet, the incus, which in its relation to the other two auditory ossicles may be likened to a keystone in an arch, when removed, destroys the so-called arch, and the retractive and impactive power of the malleus can never again be exerted upon the stapes. This liberates the stapes, which furthermore is now pulled outward by the stapedius muscle, relieved of the antagonism of the tensor tympani.

Regarding the removal of the stapes from the oval window, it may be said that it does not seem that this operation is necessary for the relief of deafness or of aural vertigo, according to Dr. Burnett's experience. Liberation of the stapes, and not its entire removal, is all that is necessary in most cases. If the stapes be the "key to the situation," as it may indeed be, it seems wise to leave the key in the keyhole—the oval window.

That it is the liberation of the stapes in the oval window that effects the cure in aural vertigo would seem to have been demonstrated by a case reported by Dr. Burnett in 1888, at which time the explanation of the *modus operandi* in such cases was suggested by him.

Notes of several cases in which tinnitus aurium and aural vertigo had

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been entirely cured by the surgical removal of one or more of the auditory ossicles were recorded in the paper.

On the Difficulty of Operation in the Depths of the Ear Canal.

Dr. ROBERT BARCLAY (St. Louis) read a paper with this title, and presented a description and drawing of new instruments for surmounting the difficulty. Deep operations within the ear have recently been found to have a much wider application than was previously supposed. The indications for such operations have already been formulated, and their *technique* already elaborated by Drs. Sexton, Burnett, Blake, and Jack. The problem which still remains unsolved is how to overcome the difficulty attending the performance of these operations. The difficulty is in large part due to the peculiar conformation of existent instruments—specula and shafts of blades. To obviate the objection belonging to the ordinary aural specula, the writer's new speculum for operations has been designed. This consists of two parts—a tube and a handle. The tube represents the inner portion of the ordinary speculum, divided obliquely at two-fifths its distance from the outer rim. The handle is detachable and is made in three forms: like a spoon-handle, fixed to the tube dipper-shaped; like an imperfect ring, or like a split tailor's thimble. By means of the handle, the instrument is held in place by the finger or thumb, the rest of the hand being free; by dispensing with that portion of the speculum which projects beyond the intertragal notch of the ear, this instrument allows a hand rest for steadiness, and a maximum of shortening and of movement of instruments in operation within the ear.

Cases were cited where difficult, delicate, and dangerous operations had been done through this speculum. One was that of a large exostosis half an inch thick, lying within an eighth of an inch of the drumhead, which was removed, the drumhead escaping all injury. Another, that of an artificial auditory canal, a quarter of an inch in diameter, bored through a complete bony septum five-eighths of an inch thick.

The necessity for the most delicate and accurate manipulation of instruments in operations upon the deeper part of the ear, and the difficulty of satisfying it with instruments having the shaft and handle of existent patterns straight, once bent, or twice bent, with extremities parallel, had led the author to devise a shaft and handle so proportioned as to combine the desirable features of those already in use, without their defects. The essential features of the instrument are that the aluminium handle is of dimensions and weight most favourable to delicate and accurate manipulation; it is twice bent, the long axis of the handle passing directly through the operative extremity of the operating shaft. The lateral shaft, joining the handle to the operating shaft, is of length only sufficient to permit the greatest illumination and vision along and beyond the operating shaft. The operating shaft is of the smallest dimensions possible, and is at right angles to the lateral shaft.

The instrument is made in two forms. In one the handle and shaft are in one piece; in the other, the instrument is in two parts and separable, and interchangeable blades of such extremities as may be desired may be secured to the handle.

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The author expressed the hope that those improvements will be of service to inventors, and also stimulate research in this field of aural surgery, while rendering more generally available the resources in the operations designed by Drs. Sexton, Burnett, Blake, and Jack.

Aural Reflex of Unusual Character due to Impacted Cerumen.

Dr. SAMUEL THEOBALD (Baltimore) related the case of a woman about forty-two years of age, the mother of a large family and of a non-nervous temperament, who had suffered for six months with an annoying cough and with spells of inability to swallow food. These symptoms increased in severity, and it was noticed that any manipulation of the right ear brought on the attack. A plug of cerumen, which probably had been forced down upon the tympanic membrane by unsuccessful attempts to remove it, was discovered in the right ear. It was removed by syringing, and all the unpleasant symptoms at once disappeared. Ear-cough is, of course, of not infrequent occurrence, but spells of inability to swallow, due to reflex aural irritation, are rare. Burnett, in his work upon the ear, states that both Senac and Jissot have described cases of this character.

The Statistics of Ear Disease.

Dr. B. ALEX. RANDALL (Philadelphia) presented a tabulation of the five thousand cases of his past four years' work in illustration of some points of the statistical reports of practice, the nomenclature being practically that offered by Dr. Spear, and the grouping into columns, giving the ear affected, the sex of the patient, and whether adult or child. In its explanation he urged the report according both to diseases and individuals, with such subdivisions as given, and that the attempt should be made to give the therapeutic results, as being a good aid to progress in treatment. The more elaborate the report made, the more it would compel fulness and accuracy of record, and thereby prove increasingly instructive to the practitioner himself as well as others.

Dr. GORHAM BACON (New York) exhibited a new form of incus hook devised by his assistant, Dr. Hewit.

A paper entitled "*A Contribution to the Brain Surgery of Ear Disease*," by Dr. THOMAS R. POOLEY (New York), was read by title.

The following gentlemen were elected to membership: Dr. Eduard B. Dench (New York); Dr. William Cowen (New York); Dr. John L. Adams (New York); Dr. Eduard Fridenberg (New York); Dr. W. H. Wilmer (Washington, D.C.).

ELECTION OF OFFICERS.

The officers for the ensuing year are: *President*, Dr. GORHAM BACON (New York); *Vice-President*, Dr. ARTHUR MATHEWSON (New York); *Secretary* and *Treasurer*, Dr. J. J. B. VERMYNE (New Bedford, Mass.).

The Society then adjourned.

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