who had a history of previous attacks of laryngitis with hæmoptysis, and who had a tumour in the larynx on the left side, extending from the left false cord and covering the true cord on that side. The diagnosis of cancer of the larynx had been made by laryngologists who had seen her previously. The patient was admitted to Mount Sinai Hospital, and the writer asked to report upon her condition, and remove a portion of the growth for diagnosis, if necessary. Owing to the yeilding character of the growth, its bluish tinge, and the history of previous bleeding, the diagnosis was made of angioma of the larynx by Dr. Mayer. Removal of a portian for diagnosis was deemed too dangerous, and external operation was advised. This was subsequently performed by Dr. C. A. Elsberg. The growth was removed, the mucous membrane sutured; and the pathologist reported it to be a hæmangioma. The patient made an uneventful recovery. The writer concludes that angioma of the larynx is a rare disease, occurring mostly in adults, the proportion of males to females being about four to one. It may be mistaken for cancer. Endolaryngeal removal, even of a portion of the growth, for diagnosis is fraught with danger, while laryngofissure is entirely safe and feasible.

Dr. HENRY L. SWAIN: If Dr Mayer wants another case simply to bear out what he said about the danger in these cases, I might mention one in which I attempted to remove a growth of this kind. We got hæmorrhage all right. If anything further was needed to substantiate the diagnosis, the microscope did. I have a slide at home showing it to be true angioma of that type. I am interested to hear what Dr. Lynch thinks he could do with such a case by suspension.

Dr. ROBERT CLYDE LYNCH: I have never had an opportunity of seeing one of these cases, and have, therefore, had no personal experience with them. I think, however, that if it were possible to get underneath the place, and if the surface was not too broad and the position properly localised, it might be possible to do it under suspension. However, that could be decided at the time the case presented itself. After seeing the illustration of the size and site of this angioma, I would not attempt its removal under supension.

(*To be continued.*)

THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL SOCIETY.

Meeting at Chicago, June 15 *and* 16, 1915.

(*Continued from p.* 135.)

A Report of a Collective Investigation on the Curettement of the Eustachian Tube in Chronic Aural Suppuration.—Sidney Yankauer.—The author published in *The Laryngoscope* of July, 1910, a procedure for the cure of chronic otorrhœa. In order to ascertain what the experience of other otologists had been with this operation, he wrote to over 6000 otologists in the United States and elsewhere. Among nearly 2000 replies, he found 119 operators who had performed the operation from 1 to 53 times, the total number of cases operated upon being 735.

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Inasmuch as the operation is based upon the principle that the closure of the Eustachian tube is essential to the healing of the diseased ear, it naturally follows that in those cases in which organic atresia did not result from the operation, a cure could not be expected, and the statement that the closure of the tube will be followed by a cure can be true only of those cases in which the tube has actually been closed. Both sets of figures are given. Of the 735 cases the tube was successfully closed, after one or more curettings, in 609, or 83 per cent. of the cases. The number of patients reported as cured is 379, or 51·5 per cent. of the total number, or 62 per cent. of the number in which the tube was successfully closed. In other words, more than one half of all cases of chronic suppuration of the middle ear have been cured by closing the Eustachian tube through the intact external auditory meatus and without other surgical treatment.

In the author's experience, confirmed by observations extending over ten years, it might be stated as a dictum that whenever the Eustachian tube is permanently closed by organic atresia, a perforation in the drum membrane will never close, and cannot be made to close. Whenever, therefore, in any case it seems to be possible to restore the continuity of the drum membrane, after the suppuration has subsided, and so restore the ear to a perfectly normal condition, the Eustachian tube must not be closed. In such cases the operation is contra-indicated, as it is also in those cases in which it is intended to perform one of the so-called conservative radical operations, which are also supposed to result in the closure of the drum membrane. Furthermore, the procedure is adapted only for the cure of a chronic suppurative process, and should never be employed in the presence of an acute exacerbation. In like manner, the presence of intracranial complications demands the immediate exposure of the entire diseased area, and to delay such exposure until the results of tubal atresia can be known would be entirely unjustifiable; besides which, in the presence of intracranial complications, even if these have become latent, any operative procedure upon the ear, short of a radical exposure of the entire diseased area, might be dangerous, as is suggested by the single death which has followed this operation. The history of this case is detailed.

Inasmuch as the Eustachian tube, in the class of cases under consideration, has permanently lost its function, its closure is harmless; and, inasmuch as it assumes a perverted or pathological function, its patency is detrimental and its closure has become a therapeutic necessity.

Only 266 cases, or 36 per cent., were closed after the first curetting in this series, while two or more curettings were needed in 244 cases. Hæmorrhage, sufficiently profuse to be designated as severe, was reported in only twenty-six or 3·6 per cent. of the cases. The hearing was reported upon in 564 cases. It was improved in 258, or 46 per cent. of the cases, unimproved in 281 or 50 per cent. of the cases, and in 25 cases, or 4 per cent., it was made worse. Hence the hearing was improved in 90 per cent. of the cured cases. Tinnitus was reported in 365 cases, in which it was lessened in 189, unchanged in 159, and made worse in 17 cases.

His procedure may be carried out under local anaesthesia and in dispensary practice.

This collective investigation justifies the following position: Whatever method is adopted to secure the healing of the diseased middle-ear cavities, whether nature be allowed to effect the healing

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unaided, whether the efforts of nature be stimulated by the administration of vaccines, whether nature's work be made easier by the removal of some of the diseased parts by minor surgery, or whether her work be made easiest of all by radically removing all diseased tissue, in any event, in every case re-infection of the diseased area must be prevented by closing the avenue of infection, the Eustachian tube.

The following conclusions may be based upon these figures: (1) That closure of the Eustachian tube is harmless because it does not cause the loss of any function which has not already been permanently destroyed.

(2) That it is a valuable therapeutic agent because by it alone half of the cases are cured and the rest so improved that it enables the radical operation to cure the other half.

(3) That it is imperative, not only because the tube has assumed a perverted or pathological function, but because the only other resource which is open to tho patient is a radical operation, in which case the tube must be closed anyway.

(4) That every patient should be given the benefit of this procedure, not only because the chances of cure are sufficiently high, but also because if cured thereby the hearing will not only be preserved, but improved.

(5) That the figures here presented also justify the statement that on account of the difference in the effect upon the hearing, the radical operation should be regarded as unjustifiable in any case where there is useful hearing left, until a thorough trial has been given to the closure of the tube alone through the intact auditory passages.

Dr. Francis P. Emerson congratulated Dr. Yankauer on having devised an effective instrument for clearing out the Eustachian tube. He was in accord with Dr. Yankauer's views concerning the pathology of the Eustachian tube, and with reference to the importance of stopping the reinfection from the tube. His experience, however, and the statistics which he had gathered from other operators at the Massachusetts Eye and Ear Infirmary, did not conform to the essayist's ideas concerning the permanency of the closure of the tube. In the condition to be dealt with there was a funnel-shaped cavity which was already infected, in which the lining membrane might be absent, and in which necrosis of the bony element might be present. The endothelial elements were of lowered vitality. Healing must take place either through granulation or through cicatrization. If there was healing through granulation there would first be inflammation and reaction. During this stage the tube was closed down. But if statistics were to be of value as to the permanency of the healing of such a tube they must be taken two or three years after the operation. In order to try out this method he and Dr. Mosher had turned over all their cases to one of the assistant surgeons, Dr. Lougie, and his results were embodied in a paper read before this Society in Atlantic City, last year. Out of twenty-five cases examined it was found that the tubes were open, with discharge and granulations, in eleven cases; tubes closed, with ear discharging, in one case; tubes open with ears dry, in eight cases; tubes closed, with ear dry, in one case. There were four cases in which cholesteatomata were present. These should not be included. During the last month, in order to follow the matter a step further, the speaker went over the records of the Massachusetts Eye and Ear Infirmary, and of the cases which had been operated upon by different operators and in which no skin grafting had been done, only twelve reported for examination. Of these twelve cases only one tube was closed. This was a case in which Dr. Mosher had intro-

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duced into the lumen a piece of cartilage. Over the piece of cartilage there was a thin layer of epithelium.

Dr. JOHN F. FAIRBAIRN, Buffalo, N. Y., had tried the method in four selected cases, shortly after the publication of Dr. Yankauer's paper, and after Dr. Yankauer had demonstrated the method to him. He said selected cases advisedly, because he did not believe the procedure would be effective in the presence of a pathological condition in the attic, antrum, or of the ossicles, but absolutely indicated in tubal suppuration. In three cases he succeeded in getting dry ears; in the fourth he got no result. The only difficulty encountered was the intense reaction which followed the operation. This reaction extended up over the promontory. He had since used Urbantschitsch's modification of the Yankauer instrument and method. This instrument was a rasp-like celluloid bougie. A small-sized catheter was first passed through the extended canal to the aural opening of the tube, and through this the bougie was passed and the walls of the tube denuded. He had used this method successfully in five cases.

Dr. YANKAUER, in closing the discussion, said he had been unsuccessful in obtaining a reply from Dr. Lougie to the circular letter which he had sent out. He was therefore glad that Dr. Emerson had referred to it. It is not correct to judge the operation by comparing cases in which the operation had been successfully performed with those in which it had been performed unsuccessfully. It had been shown by this investigation that in cases in which the tube was not closed after curettement, a larger percentage were improved in regard to the suppuration. It was likely that if none of these cases of Lougie's had been curetted, not so many would have been cured. If all of them had been successfully curetted and the tube closed many more would have been cured.

Referring to Dr. Beck's remarks, he stated that it was necessary to remove the mucous membrane from the isthmus: because at this point there was an osteo-chondral synarthrosis, and at such a place, where cartilage meets bone, any irritation will cause thickening of bone, and hence here a bony atresia might be produced. That temporary closure of the tube could be produced by swelling of the mucous membrane seemed quite possible, and in such cases the tube would reopen.

The instrument of Urbantschitsch, to which Dr. Fairbairn referred, was a roughened celluloid bougie, and was introduced into the tube through the Eustachian catheter, and was not intended to destroy the mucous membrane, but merely to set up an irritative inflammation.

The End-results of the Radical Mastoid Operation.—S. MacCuen Smith.—The author gave a short review of the evolution of the mastoid operation from Riolanus in 1649 to Stacke in 1891. In his practice he had considered the indications for the mastoid operation valid only in those cases that had utterly failed to respond to persistent non-operative treatment, but he believes that the end results are probably much better, especially in point of hearing, when the operation is performed reasonably early.

In a large percentage of these chronic cases the middle fossa is found to be unusually low, the sinus in some instances being so far forward as to occupy the greater part of the antrum; hence the advantage of an X-ray photograph to determine these points, more particularly the position of the sinus.

Dr. SMITH sent letters to 334 patients requiring them to come for an

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examination as to the end results of the radical mastoid operation. Two-thirds responded. Suppuration had completely subsided in a large percentage of cases, and in those in which it still continued, its source was the tympanic cavity, being usually due to the Eustachian tube becoming patulous. An examination of some of the cases which showed no discharge showed complete dermatization, an improvement in the hearing, entire absence of all head symptoms, and not the slightest accumulation of desquamated epithelium. The time of examination varied from 2 to 14 years after operation, and the duration of the otorrhœa before operation ranged from about 1 year to 47 years. The time for after-treatment for out-patients in the hospital service averaged 3 months. This period was considerably reduced for the private patients. The author had never seen an intracranial complication develop after a radical operation. The patients, almost without exception, improved in general health. Dr. Smith found frequent intracranial or labyrinthine involvement at the time of operation, unsuspected before, which almost invariably complicated the recurrent type of chronic discharge.

The cases ranged from 1 year to over 50 years in age, the largest percentage being between 20 and 30. If the functional activity of the internal ear remained the same as before operation, the hearing of the average case should be as good after this surgical procedure as before. In 32 per cent. of the operated cases the hearing is definitely better. In 49 per cent. it remained relatively the same; of the remaining 19 per cent., in 11 per cent. the hearing decreased after operation according to actual records; while in 8 per cent. it decreased according to the statement of the patient. The author therefore believed that the operation is not likely to result in an impairment of hearing.

Bell's palsy developed in 3 cases of the author's series before operation, and 8 subsequent thereto. Two improved slightly, and 4 entirely recovered, and 2 approximately so.

The radical operation should be regarded as a major procedure. Nevertheless, it is usually productive of a maximum amount of good, and is therefore wholly justified. If chronic otorrhœa has its origin in the mastoid antrum or lower cells, it can be relieved, as a rule, only by mastoid operation.

Dr. Arthur B. Duel emphasized the fact that in chronic otorrhea requiring radical operation two distinct types of cases, offering two distinct problems, were encountered. In the first class of cases, the life of the patient was in danger because of the surgical condition present; in the second type there was an annoying discharge which repeated efforts had failed to cure. The end-results in these two types of cases were naturally different. The statistics which had been formulated as to the length of time of healing had been confused with regard to these two types. Those who claimed that their radical cases healed in from five to six weeks had operated in a class of cases in which the surgical condition consisted in a mass of granulations, without necrosis in the bone, and an annoying discharge. The cases which necessitated radical operation for the other condition required, in his experience, a longer time for healing: usually from eight to ten weeks, and in many cases, six months to a year. He would never consider a case in which cholesteatoma was present as healed until at least two years had elapsed without recurrence. The patient, in an uncomplicated case, could be considered out of danger as soon as the operation had been performed. In the cholesteatoma cases the patient was in some danger, though infinitely less after operation,

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until recovery was complete. For a long time he endeavoured to skin-graft all his cases, but in his experience had found it better to do the skin-grafting in the third week of the operation, that is, after the cavity had been covered over with granulations. He thought it much safer surgery to leave out the primary skin-graft in all cases. In cases in which exposed dura over the middle fossa or sinus was perfectly healthy it might be considered safe to cover immediately with a skin-graft ; but who could be certain, in a suppurating wound, that he was not bottling up virulent organisms? In many cseas it was necessary to expose large portions of dura which were covered with a mass of suppurating granulations. One could hardly doubt in such cases that there was great danger in covering this immediately with skin-graft, lest the organisms present set up an active inflammation either in the exposed dura over the middle fossa or sinus. Even allowing that antiseptics strong enough to sterilize these areas were used, they would at the same time render the granulations unfit for receiving skin-grafts.

Dr. E. B. Dench, referring to the effect of chronic purulent otitis media upon the general health, cited two cases in which there had been marked improvement in the general health following the radical mastoid operation. One patient had gained nine pounds in two weeks. This chronic aural suppuration produced a low-grade toxæmia, and it was often difficult to determine just what was the matter with the patient thus affected. The patient who gained nine pounds was supposed by the family physician to have malaria. As to the effects of the radical operation on the hearing, he was glad to see that Dr Smith's statistics tallied with those which the speaker had presented at the Otological Congress at Bordeaux. If hearing was very poor, and there were no labyrinthine complications, hearing would be improved after radical operation. If hearing was only moderately impaired, with no labyrinthine involvement, it would remain the same. If hearing was *very* good, the patient shonld be told that the operation would probably make the hearing worse. He had not been able to decide upon the two types of cases mentioned by Dr. Duel. he thought every case with chronic middle-ear suppuration in danger. It could not be said that one case was in danger and another not. Until one had cleared out the middle ear and tympanic cavity and mastoid, and could see the sinus and middle cranial fossa, one could not say there was no danger. The primary skin-graft had been successful in his hands. He had never seen a case in which the skin-graft caused trouble unless the sinus or the dura were very badly diseased. He had grafted over these areas repeatedly without trouble. Secondary grafting had not been so successful in his hands. He saw no reason for subjecting a patient to two anæsthesias. Two weeks was the shortest time in which he had had dermatization. This was almost the invariable rule in both private and hospital cases, the tympanic cavity, roof of the tympanum, and entire mastoid cavity being absolutely dermatised and dry in ten days or two weeks He had seen many patients two years after operation and had found the cavity perfectly dry.

Dr. George F. Keiper referred to the fact that life insurance companies refuse to accept persons with chronic otitis media, and for that reason he always advised such patients to submit to radical mastoid operation. He thought this advisable, not only for the preservation of life, but in order to enable the individual to occupy a more satisfactory position in life.

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Dr. JOHN W. MURPHY knew of no class of cases that placed more responsibility upon the doctor than cases of chronic otitis media, not only with regard to life, but also as to hearing. He recalled a case in point, that of a young woman, aged thirty, who had a deaf mother and sister, and who, in childhood, had had double otitis media. The left ear had ceased to discharge, but had no membrane except scar tissue. She had applied for treatment for a rather offensive discharge from the right ear. She had no hearing in the left ear, and a chronic condition in the right, with gradually decreasing hearing. He could not promise that the end-results would be better after operation. She consented to the radical mastoid operation. At the end of two weeks the discharge in that ear stopped, but at the end of two days she developed left-sided paralysis. If that had developed on the right side he would have thought the operation had something to do with it. It was a strange coincidence that a patient should have Bell's palsy on the side of the ear not operated upon, two weeks after the operation.

Dr. JAMES E. LOGAN spoke of cases in which, after thorough operation, with the cleaning out of all necrotic tissue, there were still recurrent attacks. In many such cases he had been able to give permanent relief by cleaning out the vault of the pharynx, which may have been the seat of infection, from time to time. He believed in many cases of chronic suppurative otitis the vault of the pharynx was the cause of the trouble.

Dr. FRANK ALLPORT had been in the habit of estimating his cases, with reference to hearing, in accordance with Dr. Dench's formula. In the large majority of cases the radical mastoid operation gave good results so far as hearing was concerned. For the last five years he had used gauze only for the first few days, substituting the gauze packing in a week's time with boracic acid powder, filling the cavity almost completely with the boracic acid powder, and covering this over with a little gauze. Healing took place more quickly under this form of packing than with anything else. He agreed with Dr. Logan with regard to the part played by the pharynx in the clearing up of these cases. The end-results would be better if all paid better attention to the pharynx, particularly to the clearing out of the fossa of Rosenmüller. He did not employ skin-grafting in all his cases. Whether one resorted to grafting or not, Dr. Dench's results with this method were notable. He had formerly employed the Ballance method, and also Dr Hammond's method, but latterly, when he used a graft at all, he followed Dr. Dench's plan.

Dr. GEORGE F. COTT said one sometimes had the opportunity of making *post-mortem* examinations of cases in which the radical mastoid operation had been performed. He had had 180 radical mastoid operations. One patient had had a discharge for forty years, and she was aged forty-four. He did a radical operation, when he found a hole in the dura $\frac{1}{8}$ of an in. in diameter, through which the probe passed $1\frac{1}{4}$ in. He dropped the probe down easily, slit this open, and did nothing more. The patient did well. At the end of two years she got sick suddenly, and died in two days. *Post-mortem* examination revealed basilar meningitis, with meningococcus infection. In another case, there was acute middle-ear suppuration, with intense pain for a week. He operated, the patient did well for two days, then the temperature, apparently normal, went up to 104°, then down to somewhat below normal. The patient died. The subarachnoid spaces were found, upon *post-mortem* examination, to be entirely filled with blood, in different stages of clotting. In the third case a girl had acute otitis media of six

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weeks' duration. At operation the entire mastoid bone was found to be sclerosed. She had had pain in her eyes since she was very young. She apparently recovered from the operation. He saw her at intervals for six months. She died suddenly, having considerable pain at the base of the brain. *Post-mortem* examination revealed a cerebellar abscess as large as the little finger. She had not had a symptom other than the pain. Two abscesses were found on the parietal lobe of each side.

Dr. THOMAS J. HARRIS said that, judging from the discussion, it would seem that the paper had given the impression that there was nothing but the favourable to be said concerning the mastoid operation. It was his own observation, in this country and abroad, that this was not the case, that such were not the results that were being obtained. It was for this reason that Dr. Smith had been invited to discuss this subject. One had only to go into a clinic in any large city to see patients treated week after week for chronic suppuration, to see case after case of facial paralysis going in for dressings. Was it fair to consider this operation from the results of brilliant operators, or should it not be considered from the point of view of the majority of operators? As Dr. Cott had said, there were cases of death. Was death, in these cases, due to the mastoid, or was it coincidental? The mastoid operation was not performed entirely for chronic suppuration; it was performed frequently as the next step in an intracranial operation. He wished that there might at some time be a *referat*, as had been done in Dr. Yankauer's paper, so that the results of those having a small number of cases might be obtained. There was a feeling that the radical mastoid operation was being overdone, that it was done too quickly. Was that the case? After reviewing the statistics, could it be said that the results for the last fifteen years have been good?

Dr. SMITH, in closing the discussion, said when skin-grafting was first introduced, he had used it with not very satisfactory results. He discontinued the method for a number of years, and then, stimulated by Dr. Dench's results, he had taken it up again, but could make no report on the cases so treated, because they were too recent. He employed Dr. Dench's method, using one large graft and two smaller ones, all primary grafts. He had had few cases of Bell's palsy, three of which occurred previous to operation. In two cases he was called out of town on the day appointed for the radical mastoid operation, and that night Bell's palsy developed. If he had operated at the appointed time the palsy naturally would have been attributed to the surgical procedure. Deaths following the radical mastoid operation were, in his opinion, due to complications. He had never seen a death occur in an uncomplicated case.

(*To be continued.*)

Abstracts.

PHARYNX.

Tonsillitis with Hæmorrhagic Adenitis.—Strange, C. F. "Lancet," October 14, 1916, p. 679.

Soldier, aged twenty-two. Onset sudden, with rigor and severe headache. The following day a large swelling appeared on the right side of the neck. This was opened three days later, and proved to be a large

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