esting to note that it is possible to get a favorable termination of the disease even in some of the most difficult and complicated cases by the use of conservative methods of treatment, which aim at aiding Nature in her effort to expel the focus of infection.

Some one has said that the hearing should be conserved after a radical operation by preserving the annulus, ossicles, etc. That does very well if one is fond of fine dissection, but, as a matter of fact, there is a surer way to cure the otorrhea and to save the hearing without a radical operation in the cases in which the tympanic contents are in place. Only the rare cases of extensive acute osteomyelitis really require this *tour de force* in dissection.¹

I first became familiar with the cleansing treatment of otitis media purulenta at the Massachusetts Charity Eye and Ear Infirmary in 1887 under the instruction of Surgeons J. Orne Green, Clarence J. Blake, Edmund D. Spear, Frederick L. Jack and Henry L. Morse and have practiced it ever since.

The lesson one may learn from a study of this method is that cleanliness or cleansing methods carefully applied in chronic middle-ear suppurations can give very satisfactory results and in some cases a rapid convalescence with good hearing.

DISCUSSION.

DR. J. F. BYINGTON, Battle Creek, Mich., said that no doubt in the hands of Dr. Bryant peroxid of hydrogen may be employed with impunity, but he protested against the indiscriminate use of this drug. In his ear practice it occupies but little place. He has found it efficacious occasionally in breaking up a hardened plug of wax, but he does not use it in the tympanic cavity. This fluid in the presence of pus goes off suddenly in all directions, much on the same principle as dynamite, and Dr. Byington believes that it is apt to open up new avenues of infection in any infected cavity and has little or no lasting antiseptic effect. Its action is purely mechanical, and he prefers to use dry air inflation of the Eustachian tube, or suction through the external auditory canal, to remove secretions from the tympanic cavity. In his experience the dry cleansing treatment advocated by Dr. Bryant has been most gratifying. He mentioned one case which forcibly illustrates its effectiveness. The patient had had an otorrhea for many years and had recently undergone an operation by a competent surgeon for removal of the ossicles. The discharge continued in an aggravated form after the operation, in spite of continuous treatment for some months. Both patient and doctor naturally were disappointed in the result, and the patient, a woman, was advised to make a change of climate. She came from Texas to Michigan. Dr. Byington does not know whether the Michigan climate was a factor in her improvement or not. At any rate the discharge entirely ceased and remained so after the second treatment, which consisted simply of dry wiping, inflation and blowing a very little boric acid into the outer canal. Her previous treatment had been the daily use of peroxid of hydrogen and syringing. Syringing simply dilutes what antitoxic fluids the tissues are able to produce, and lessens the resistance of the epithelium, to say nothing of the moist warm chamber it affords for the favorable growth of bacteria.

[NOTE: IN ADDITION TO THIS DISCUSSION, THE WHOLE SUBJECT OF MIDDLE EAR DISEASE RECEIVED A GENERAL DISCUSSION WHICH WILL FOLLOW LATER.]

1. The Radical Mastoid Operation Modified to Allow the Preservation of Normal Hearing. Trans. Amer. Otol. Soc., 1906, vol. x, part 2, pp. 292-295, N. Y. Med. Jour., Oct. 20, 1906, pp. 780, 781.

Race Culture.—We take vastly more pains in the study of the best conditions for the life and fine development of both plants and animals than we do in the growing of strong, beautiful, finely balanced children.—J. F. Rogers, M.D., in *Dietetic and Hygienic Gaz.*

OTITIC PHLEBITIS; ITS SYMPTOMATOLOGY, DIAGNOSIS AND TREATMENT.*

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During the past ten years much has been written on the symptomatology of this disease, part of which has been of inestimable value to those of us whose work lies along these lines, so that at the present time we are enabled to classify various symptoms, which, combined with our clinical experience, places at the disposal of the practical otologist a group of fairly definite symptoms from which to make a positive diagnosis of the disease.

In speaking of the symptomatology of otitic phlebitis I shall follow the lines of my personal experience and do so under three heads. First, the symptomatology in the typical cases; second, in the atypical, and third, in those where the bulb and sinus are primarily involved, without macroscopic disease of the mastoid process. As the majority of cases coming under our observation are those secondary to a mastoid involvement, or developing after the mastoid operation has been done, there are a few definite symptoms present which are fairly constant and which enable us without delay to recognize this condition.

SYMPTOMATOLOGY.

Temperature.—The symptom which I consider by far the most important is that of temperature; it depends on the amount of septic material entering the general circulation. If this be large in amount it is at once followed by a rise from normal to 104, 105 or even 106 F., and frequently higher, and this is quickly followed by a remission to near the normal point or below. There may be only one rise during a period of twenty-four hours, or several may take place, depending on the rapidity and the quantity with which the poison is entering the general circulation. If the patient is kept under observation for several days these exacerbations of temperature become more frequent and the variations greater.

Chills.—These are present in only a proportion of the cases seen, possibly 50 per cent., and I incline to the belief that this percentage is high. When present they usually precede the rise in temperature, and in some patients are followed by profuse sweating. In many of the cases coming under our observation the patients exhibit no definite chill; they merely complain of a slight chilly sensation, and frequently this is overlooked unless the nurse in attendance is on her guard and watching for such a manifestation. In a postoperative mastoid case, with frequent variations of temperature, these slight chilly sensations are quite as important as though a decided rigor were present. In a communication before the American Otological Society in July, 1899, particular stress was laid on this point, and during the intervening years at least one-third of all the cases observed has borne out the importance of watching for this but infrequently spoken of symptom.

Pulse.—In cases of phlebitis, when there is a sudden marked elevation of temperature, there is a corresponding rapidity of the pulse rate ranging from 120 to 160 per minute. In cases exhibiting a lower temperature range the pulse is often between 100 and 130, and when the existing phlebitis is complicated by a collection of pus in the brain it is much slower.

* Read in the Section on Laryngology and Otology of the American Medical Association, at the Fifty-eighth Annual Session, held at Atlantic City, June, 1907.

Respiration.—In the earlier stages of this disease the respiratory changes are but slight, but increase during the hyperpyrexia, at times becoming as rapid as 40 or 50 a minute. This is especially noticeable in the younger patients.

Pain.—In many of the cases of phlebitis coming under our observation the degree of pain is greater than that present when only an ordinary mastoiditis exists or that subsequent to a postoperative case. The pain is usually referred to the side of the head and to the occipital region, and is many times localized in the region of the forcular. In a few of the cases where the internal jugular vein becomes infected early there is decided pain in the neck along its course, and occasionally that pain will radiate down over the chest of the affected side. During the past year I have seen two cases where such pain was pronounced in this region, and in each instance the pleura and lung were negative. In many of the cases the pain present in the neck is caused, I believe, by an infected chain of lymphatic glands rather than by any obstruction in the vein.

Nausea and Vomiting.—These symptoms are usually present at some stage of the disease in a moderate or pronounced degree. The patient usually complains of nausea first, particularly on being aroused or on moving the head. This may be followed by slight vomiting, which later becomes more pronounced after the drinking of fluids. It may, however, occur at any time independently of the taking of solids or fluids and the amount ejected is usually small.

Intraocular.—In only about one-third of the cases coming under my observation have eye symptoms been present. This may be due to the fact that the patients in many of the cases were seen and operated on early, and had they been left until a later period of the disease intraocular changes might have taken place. In a small number of cases, when the phlebitis has extended to the cavernous sinus, there is pronounced swelling and puffiness of the eye and lid on the affected side.

Vertigo.—This I have observed only in those cases of long-standing purulent middle-ear involvement or where the meninges were affected.

Cerebration.—This has invariably been normal except in advanced cases. While some of the patients are drowsy and do not wish to be disturbed, yet they answer questions intelligently when aroused. If, however, the disease be allowed to progress this drowsiness increases and is followed by evidence of impaired cerebration.

Physical Signs.—We occasionally find the presence of edema in the mastoid region and edema over and around the exit of the emissary and occipital veins. The sign described by Gerhardt, and to which has been given his name, namely, that when pressure is exerted over both the external jugular veins it will show a marked increase of blood passing through the vein of the unaffected side, I have never seen demonstrated. In some of the well-advanced cases, both in adults and children, there is a marked stiffness of the muscles of the neck on the affected side and the head of the patient is drawn well over toward the shoulder of this side, showing a marked torticollis, as it were. Combined with this there is a well-marked rigidity of the neck muscles present. A physical sign which the books tell us to look for in phlebitis of the vein is a hard, cordlike swelling in the neck. While unquestionably such a physical sign does occur, in my experience it is an infrequent one and only present in patients far advanced in the disease. I have been

able to demonstrate such a condition but once, though I have tried to do so repeatedly before operation.

Metastatic Deposits.—In patients in which the disease is well advanced metastatic deposits may occur in any joint of the body, either single or multiple, closely adjacent to or remote from the original focus of infection.

General Symptoms.—Among these may be mentioned loss of appetite, a dry and heavily-furred tongue and a foul breath. The face is anxious, there is a pallid look, the skin is dry and later presents a yellowish tinge indicative of sepsis.

Atypical Cases.—These are cases invariably following a mastoid operation in which the patients usually do well for a few days after the mastoid has been opened. Then they become restless, irritable and disinclined to take food. The tongue, which before was clean and free from any coating, becomes dry around the edges and presents a whitish, glazed appearance in the center. The pulse increases from 100 to 130 or 140 a minute and there is a slow, gradual rise in temperature to 103, 104, 105 F. or higher, remaining so for several days. In some of the cases it will not vary a degree in twenty-four or forty-eight hours, while in others there is a little more variation, but there are no sudden drops and no sudden rises. The patient complains of headache and occasionally of nausea, but few reach the vomiting stage. They are unable to sleep for any considerable period of time, and if surgical measures are not instituted they later show all the signs of pyemia. There is no chill or chilly sensation present, cerebration is clear, the only evidence of any mental disturbance being an occasional irritability of temper, this being especially noticeable when they are first aroused. Later they become exceedingly drowsy, the skin begins to take on a yellowish hue and there is profuse sweating.

Physical Signs.—A physical sign which I consider of the utmost importance in this class of patients is that when we inspect the mastoid wound, in the early stages of the disease, we find every portion of it apparently doing well and covered with granulations except at one point, and this point is the bone forming the sigmoid groove. We will find the bone in this region darker in color than when it was first exposed at the time of the operation and there will be no granulations found on any part of it. In other words, we have a mastoid cavity showing all the evidences of healing except the bone over the sigmoid sinus. Should the infection progress farther and be allowed to go unchecked we shall find in three or four days that the mastoid wound presents an altogether different picture. The parts that formerly were covered with healthy, firm granulations have now become pale and flabby, with a tendency to soften and break down, while the bone over the sinus still remains dark in color, perfectly dry and devoid of any reparative process. If during the mastoid operation the sinus was exposed we find that at this stage the dura covering it presents a whitish or gray appearance, devoid of luster, and at times covered with a plastic exudate, and is pressure be exerted on this exposed area of the sinus it will be found easily compressible.

*Bulb and Sinus Primarily Involved.*¹—In this third class of cases there is an acute purulent otitis present with the usual symptoms found accompanying this condition in an aggravated form. The subsequent symptoms detailed are, I believe, the result of a direct infec-

1. Abstract from paper read before the Amer. Otol. Soc., May, 1905.

tion from the tympanic cavity to the blood current closely adjacent, namely, through the floor of the tympanum to the jugular bulb. The explanation of the possibility of this is quite clear if we bear in mind the fact that in a certain percentage of the skulls examined we find an unusually high dome encroaching on the middle-ear cavity or a dehiscence existing in this region. Under such conditions as these it can readily be seen how an active purulent infection of the middle-ear cavity can primarily affect the blood current. Without having to travel its usual course through the venous structure of the mastoid bone, its pathway of infection is through the small communicating veins and lymphatics or by a process of absorption directly through the thin wall of bone in this region.

The symptom in these cases of greatest importance is an unusually rapid rise in temperature (see chart), from 99 or 100 to 104, 105 or 106 F., and quite as sudden as the rise, a fall to 97, 98 or 99 F., or possibly 100 F. The temperature may remain low for several hours and then quickly rise again to the points first mentioned, to be followed by a rapid remission, and this may go on

DIAGNOSIS.

The first class of cases is easily recognized, our diagnosis being based on the temperature changes and the presence of a chill or chilly sensation preceding the rise in temperature and following an operation on the mastoid. If most of the symptoms given in this class be present it is, of course, a comparatively easy matter to make a diagnosis, but if several are absent the diagnosis can be made from those given above. In those cases where the sinus is operated on at the same time that the mastoid operation is done, and we have no previous symptoms to guide us as to its involvement, we determine whether or not it is necessary to open the sinus at the time by the physical signs which are found presenting when the mastoid is opened. Briefly they are, at times the presence of a necrotic area of bone over and around the sinus, with usually an epidural collection of pus, commonly called a perisinuous abscess. The dura covering the sinus wall is at times thicker than normal and darker in color, or it may present a lusterless appearance, darker at one point than another, and usually the lower end toward the bulb is

indefinitely. During the exacerbations of temperature the pulse rate is rapid, ranging from 120 to 170 per minute. There is no chill present. The only evidence of one found in these patients is that if seen when the temperature begins to rise they will be found to have cold feet and hands. They are exceedingly fretful and irritable and later become drowsy. The eye signs are negative. If the temperature range is allowed to repeat itself for several days the tongue becomes white and dry. During the temperature remissions these patients, who are usually young children, feel remarkably well, will ask for food and wish to sit up and play with their toys. This is one of the phases of the disease which the parents and uninitiated find hard to comprehend. They see such an apparent improvement in the little ones that they are misled as to the dangers existing and often believe they are well on the road to recovery until the next rise of temperature occurs.²

2. Since the original communication on Primary Jugular Bulb Thrombosis was published, thirty-six cases have been reported to me from different sections of the United States, Canada and Great Britain.

a whitish or gray color. At times there is a grayish plastic exudate adherent to the sinus wall, the sinus looks flat and does not present a rounded appearance when divested of its bony covering, is easily compressible, and does not fill quickly when pressure is removed. In the absence of previous symptoms referable to sinus involvement the presence of an epidural or perisinuous abscess is not a positive indication for opening the sinus; it is only when the physical signs above described are present, with or without the epidural collection of pus. Neither should the sinus be molested if the dura covering it be protected by granulations, for this is Nature's effort to combat the presence of disease.

Bacteriologic examination of the discharge from the ear is of value in certain cases, as when the bacillus of Friedlander is found the infection is prone to greater activity, travels more rapidly, and the sinus and vein are involved earlier than in many of the other forms of infection. Another valuable aid in diagnosis is the differential blood count, not so much for determining whether a leucocytosis is present as to determine the polymuclear percentage. For example, if we find a

differential count showing a polynuclear percentage of over 80, no matter what the leucocyte count may be, whether great or small, we are almost certain to find an infective process which calls for surgical intervention. The leucocyte count is of value only in giving us information as to the patient's resistance to the disease.

In the third class of cases, namely, when the bulb and sinus are primarily involved, the diagnosis is made almost entirely from the rapid excursions of temperature closely following an acute purulent otitis. Bacteriologic examination of the discharge from the ear is of value here as in the other cases. The same is true of the differential blood count, and the utmost importance should be attached to it; when the polynuclear proportion is found to be between 85 and 95 per cent. I believe this is a positive evidence that the patient is suffering from an acute septic process. As a still further aid in diagnosis all diseases should be ruled out by a process of elimination before operation is decided on.

TREATMENT.

No hard and fast lines can be laid down by saying that the same method should be followed in all cases, but we should treat each individual case as seems best to us at the time we are dealing with it. The treatment in the first and second class of cases does not materially differ. When a diagnosis of sinus phlebitis has been made the bony covering should be removed from the sinus from a point above the bend or knee down to the region of the bulb. Too much bone should not be removed posteriorly so as to uncover a large dural area over the cerebellum, as it is in this region that a hernia is liable to occur rather than at other points, and its occurrence is usually invited when a large amount of the bony covering posterior to the sinus has been removed. After the sinus has been exposed a small piece of iodoform gauze should be rolled up and placed over the upper end of the exposed sinus and pressed firmly under the edge of the bony groove so as to cut off the circulation in the vessel, should it be present. A similar piece of gauze should now be placed over the sinus in the region of the bulb and pressure exerted here, after which the dura forming the anterior sinus wall should be incised freely with a scalpel or scissors, between these points, and the contents of the sinus evacuated. Should we be unable to obtain a flow of blood from the distal end of the sinus after the pressure has been removed in this region by taking the roll of gauze away, then we should make a further exposure and proceed backward as far as the torcular, providing we do not secure a free return flow of blood before reaching it. For if we do not obtain a blood current in this region sufficiently free to show that all obstruction has been removed our patients do badly subsequently, either from an extension of the infective process to other blood channels or from an encephalitis which may develop one or two weeks later, caused by an extension from the infection we have left in this region.

When pressure has been removed from the bulbous portion of the sinus we at times encounter a free return flow of blood, but whether the source of such hemorrhage be from the internal jugular vein or from the inferior petrosal sinus, we are unable to say, for it is as likely to come from one as the other. Nevertheless, when such a free return flow is present, and the sinus above contained, on opening it, a parietal or firm and non-disintegrated clot, we usually end the operation here by packing gauze into the sinus and await further developments. If, on

the other hand, we find on opening the sinus, pus or a disintegrated clot present, we should desist from any further manipulations above at once, protect our already exposed field of operation and proceed at once to expose, ligate and resect the internal jugular vein from a point below at the clavicle to its exit from the skull. Should any of its tributaries be found involved they also should be ligated and resected well beyond any point of visible involvement. All diseased glands encountered during the resection of the vein should be removed. After this has been done the contents of the sinus should be evacuated above.

In many cases where the vein has been removed primarily before the evacuation of the sinus contents from above we find that the return flow from the bulb region is quite as free as we would expect to find it if we had the internal jugular vein carrying on its usual function, the blood coming no doubt from the inferior petrosal sinus. If, as occasionally occurs in this region, we are unable to obtain a return flow of blood from the bulb after the vein has been removed below it means that the inferior petrosal sinus is involved in the phlebitis. When such a condition confronts us (which, fortunately, is not frequent) we should, if the patient's general condition will allow it, expose the inferior petrosal sinus and remove the obstruction, as otherwise we are courting danger by allowing an infective process to remain, which may at any time cause further trouble. Should the superior petrosal sinus be found involved in the phlebitis it should be exposed and treated in a like manner.

In phlebitis of the internal jugular vein, complicating a similar condition of the sinus above, the first step in the treatment should be the exposure, ligation and removal of the vein, and this should be followed by evacuation of the contents of the sinus above. The method of treating the neck wound is optional, whether by the open method—to be later drawn together by straps, or by suturing at the time of the operation and inserting a large cigarette drain. I prefer the latter method, with wet saline dressings, changing every twenty-four hours, and each time the dressings are re-applied a small portion of the drain is removed, so that at the end of the fourth or fifth dressing the drain has all been removed and, in the majority of cases, primary union accomplished.

In the cases of primary involvement of the bulb and sinus, the patients being nearly all young children, the ideal treatment would be the same as in our other cases, but here we must remember that these cases are caused by a primary infection of the blood current, and when operated on early the percentage of recoveries is in favor of removing the clot without ligating the vein. For these little patients do not bear prolonged operations well, and it is a matter of much more difficulty to ligate and resect the internal jugular vein in a very young child than it is in an adult, for we have to deal with a neck that is short and chubby, and usually a number of enlarged glands to encounter, which prolong the operation, many times beyond the safety point. If, however, ligation becomes necessary later, owing to lack of favorable progress in our patient's condition, it can be done rapidly without subjecting these little ones to the added risk of a prolonged operation.

It must be said, however, that in this class of cases, when a so-called free hemorrhage is obtained from below, we can never be sure that all infective material has been removed, for so far it has been an impossibility to pass a curette from above into the jugular bulb, and

in all probability a large number of our patients operated on without ligation of the vein have some infective material left in this region, not, however, in such quantity that the system can not care for it, for were this so such cases would all be fatal. There is a type of cases in these young children to which strong exception must be taken to the conservative method of treatment, namely, those cases when on opening the sinus pus or a broken down clot be found. When such a condition exists, whether there be free hemorrhage at the bulb or not, I believe it is imperative for the safety of the patient that the vein be removed at once.

The treatment of the metastatic deposits may be either palliative or operative. When palliative the ice pack is used or the affected part may be enveloped in cloths saturated with the oil of gaultheria. A solution of lead and opium has also been used with good results. If pus once forms in the tissues affected the parts should be opened freely, drained and treated on general surgical principles.

A word about those cases of otitic phlebitis that show, prior to the operation, all of the positive evidences of an infective process present in the sinus and yet when we explore the sinus no clot can be demonstrated, but the patient begins to improve and goes on to complete recovery. What is the explanation? Simply that we had a small parietal or central thrombus to deal with and that when the sinus wall was freely incised there was a sudden gush of blood outward, which carried the clot with it, and many times careful search will reveal such a thrombus adherent to the towels surrounding the patient's head or neck or to the gauze that has been used in sponging.

In all cases of otitic phlebitis in which the patients were operated on with or without ligation and removal of the vein, when a varying postoperative temperature curve is shown, it means that there is still some infective material being displaced from time to time. The patients improve, notwithstanding, because the greater part of it has been removed and the system, thus strengthened, is enabled successfully to care for what remains. In all operative cases the time element is one that enters largely into a favorable prognosis, for the shorter the time that we keep our patients on the operating table the quicker will be their convalescence. I am convinced that our results would be better did we operate during the temperature remissions rather than when the temperature is at its height, for if operation takes place while the temperature is low the system certainly has more reactive power, there is less depression, and a more rapid convalescence surely follows.

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DISCUSSION.

DR. E. E. HOLT, Portland, Me., said that he agreed with Dr. McKernon's arrangement of the symptomatology and that the variations in the temperature from the normal were of first importance. In typical cases, the sudden rise of temperature, together with the quickened pulse, furred tongue, glassy eyes, dry, yellowish skin, give a clinical picture that points to involvement of the veins in connection with inflammation of the middle ear. Not infrequently the otologist opens the mastoid and removes the outer bony wall of the lateral sinus to find nothing to warrant him in opening the membranous lateral sinus. The patients, too, make good recoveries. It is probable that the free drainage gives the patient a better chance to recover. There are other cases in which the clinical picture is as complete, in which from one cause or another no operation is done and the patient finally makes a good recovery. Dr. Osler says: "Pyemia is a disease frequently over-

looked and often mistaken for other affections." If this is true in general it is especially true in regard to sepsis from inflammation of the middle ear, and it must follow that there are many cases of otitic phlebitis in which Nature overcomes the difficulty, but this is not mentioned as an excuse for not treating these patients according to well-established surgical principles. As the variation in the temperature from normal is one of the greatest sources of information in phlebitis it can not be too strongly urged that the clinical thermometer should be used frequently. Dr. Holt has no doubt, he asserted, that this variation in temperature has been missed many times, because it has not been taken often enough. But, however important the variation in the temperature may be, it must not be depended on alone, but keep constantly in view other symptoms and the general condition of the patient.

In this connection he referred to a case in which ablation of both mastoids was followed by one of the most remarkable variations on record in the temperature of the different parts of the body at the same time, and of the whole body at different times. There existed extreme high temperature in the mouth, with extreme low temperature in the rectum, then changing to low temperature in the mouth, with extreme high temperature in the rectum, again changing to extreme high temperature in both mouth and rectum, to be followed by extreme low temperature in both. The extremes of temperatures were not measured by any available thermometers that registered from 94° F. to 114° F., and four thermometers were broken by the intense heat. Later amblyopia developed in both eyes. There was complete recovery. (The report was published in the *Journal of Medicine and Science*, May, 1902.)

In septicemia in general, chills are regarded as one of the most important diagnostic points to determine. He is inclined to think that they were present in a larger percentage of the cases he has observed than that given by Dr. McKernon. It is often very difficult to find out that they did occur, because that stage is passed and more serious conditions engage the attention of the patient and his attendants. The pulse usually increases in frequency with the rise in temperature, but in Dr. Holt's experience it has not, in some cases, shown a corresponding variation from the normal. In older persons the respirations may not be noticeably increased except in the more serious cases. Pain in the posterior part of the mastoid and occipital region, loss of appetite, nausea and vomiting are usually present. Dr. Holt has repeatedly examined the eyes, and only in a few cases has he seen any inflammation of the fundus referable to the middle ear. The atypical cases, or those following operations on the mastoid, in which apparently every indication was met at the time of operation are the cases that give us the greatest concern. The mastoid operations, as Dr. McKernon says, usually do well for a time, then symptoms come on indicating involvement of the veins. These cases are a source of great concern both to the surgeon and to the patient, because they are so unexpected, and instead of the patient getting better he is getting worse. This is often apparent to the friends and relatives of the patient, as it is to the surgeon, and it gives rise to doubt and anxiety on the part of all concerned. As surgeons we must expect to take our share of such cases and we must be prepared to explain the cause and act for the best interests of the patient, though it involves another operation on a patient whom the relatives and friends think can hardly survive it. It is a satisfaction to the surgeon to know that in almost all the cases health is finally restored to these patients, but it takes courage and prompt action to carry them through. In regard to cases in which the bulb and sinus are primarily involved in acute purulent inflammation of the middle ear, Dr. Holt thinks that Dr. McKernon's explanation of the cause is acceptable, for it gives a reasonable explanation of the etiology of this unusual complication. The wonder is that it does not happen oftener, for earache followed by suppuration is common to almost every child some time during adolescence.

[NOTE: IN ADDITION TO THIS DISCUSSION, THE WHOLE SUBJECT OF MIDDLE EAR DISEASE RECEIVED A GENERAL DISCUSSION WHICH WILL FOLLOW LATER.]