

Dr. ASHBY, in reply, said that he distrusted the explanation which sought to fasten the onus on a "flopperty" epiglottis of producing the stridor in these congenital cases. He thought that in this instance, as in the case of defective speech and a difficulty in swallowing, the origin of the trouble lay in a failure of co-ordination, or, in other words, the nerve-muscle arrangements were imperfect. The close association between an emotional state of the infant and an exacerbation of the stridor and stenosis seemed to point to this.

THE PATHOGENIC INFLUENCE OF AURAL LESIONS IN SYSTEMIC DISEASE.¹

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SINCE the advent of bacteriology our views regarding the etiology of disease have materially changed. The study of micro-organisms and their products of metabolism, often toxic, has revealed to us an entirely new process for the propagation of disease. These studies have taught us that an insignificant focus in a distant organ or tissue may abruptly or insidiously produce a systemic affection. This is true, not only of pyogenic organisms, but of many other bacteria which are not strictly regarded as capable of generating septic processes. The medical literature of the last few years contains many reports of bacterial foci causing systemic disease after a long period of latency. As an illustration of this we may mention empyemata and arthritic suppurations occurring years after an attack of enteric fever. Often the original focus may be detected, and under suitable curative measures the resulting systemic affection is sometimes relieved. But there are many instances in which the underlying cause cannot be recognised. Since the manifestations are partly septic and partly pyæmic, Leube (¹) in 1878 proposed for these the term "cryptogenic septicopyæmia." In the majority of the cases there are no indications of trauma.

It has long been known that the mouth and aural passages are frequently the ports of entrance for bacteria, particularly for pathogenic micro-organisms. In these areas the soil is especially adapted to the cultivation and propagation of low forms of life; this explains the relation between tonsillitis and acute articular rheumatism, which was noted by the celebrated clinician Bouil-

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laud⁽²⁾. The condition here produced was not supposed to be reflex, but due to direct propagation.

The middle ear is often the seat of infection. In performing 100 autopsies on infants, Ponfick found only 9 presenting no disease of the ear; in 13 it was unilateral and in 78 bilateral. It is interesting to note that among 81,648 patients with disease of the ear Hessler⁽³⁾ found 116 cases in which death was due to intra-cranial disease; in 40—that is, 34·5 per cent.—to meningitis; in 28—that is, 24·1 per cent.—to brain abscess; and in 48—or 41·4 per cent.—to sinus, phlebitis, and pyæmia. In children with broncho-pneumonic foci 99 per cent. showed otitis media. The micro-organisms most often detected in acute otitis media are Fraenkel's diplococcus of pneumonia, the *Streptococcus pyogenes*, the *Staphylococcus pyogenes albus* and *aureus*, and Friedländer's pneumo-bacillus.

In the purulent as well as sero-purulent and mucous exudate of 43 infants whose cases he investigated bacteriologically Rosch found Fraenkel's diplococcus 33 times and once Weichselbaum's diplococcus. In 4 cases in which perforation of the tympanic membrane had occurred no pneumococci were found, but in 1 case staphylococci and in 2 cases tubercle bacilli⁽⁴⁾. Gonococci have been demonstrated by Finch and Haug in pus within the ear of the newborn. It is well known that otitis media (and even mastoid disease) is common in many of the acute infectious diseases—for instance, in influenza, enteric fever, measles, and scarlatina. It is also a frequent sequel of pneumonia, but is quite rare in typhus fever, relapsing fever, variola, and varicella. In acute rheumatic fever otitis is occasionally an early symptom of the localisation of the disease, but epidemic parotitis is rarely followed by disease of the middle ear. Erysipelas is sometimes accompanied by severe purulent otitis, which is prone to implicate adjoining structures.

Some of the chronic infections—such as tuberculosis and syphilis—as well as diabetes and Bright's disease, play a part in the etiology of disease of the middle ear. The affection has been observed in puerperal fever and in endocarditis (Trautmann), in both of these probably by means of an embolus. Körner⁽⁵⁾ reports that among 115 cases in which death resulted from an aural lesion and in which autopsies were held, in 31 simple meningitis was revealed, in 41 sinus phlebitis and pyæmia, and in 43 abscess of the brain. These figures clearly show the prevalence of sepsis in aural diseases.

Without doubt the overwhelming majority of cases of otogenous

sepsis which run their course with metastases originate from a septic phlebitis, and usually implicate the transverse sinus or the petrosal sinus, but not infrequently even the highest point of the bulb of the jugular vein (Lenhartz) ⁽⁶⁾.

PATHOLOGIC ANATOMY.

The pathology of otogenous septicopyæmia includes changes in the primary focus in the ear and secondary changes in the various organs and tissues from septicopyæmic metastases. In another series of cases the primary disease is propagated from the ear to the neighbouring sinus in the brain and to the jugular vein; therefore meningitis and brain abscess are ordinary complications of septic disease which originates within the ear.

The general lesions do not differ from those common to septic processes. There may be inflammation of any tissue or organ in the body, varying in degree from simple congestion to suppuration; no region is entirely exempt. It is extremely difficult to say why, in the individual case, a primary purulent focus runs its course without reaction, or why, on the contrary, it generates metastases or septicaemia. It is probable that other factors, such as exhaustion, starvation, alcoholism, anæmia, or preceding affections (especially the chronic ones, tuberculosis, syphilis), or metallic poisoning (lead and arsenic), may here play a rôle.

SYMPTOMS.

Septicopyæmia is the principal systemic condition to which disease of the ear gives rise. The symptomatology is so manifold and protean that a comprehensive description of the various signs and manifestations is almost impossible. This has led to a division into groups, in which one or more symptoms are apt to stand out prominently, characterising the type. Thus Jürgensen, in his article upon sepsis ⁽⁷⁾, proposes five groups, as follows:

(1) Group in which the general phenomena are most prominent. Rapid decay and death, as in any other severe infection.

(2) Group in which the cardiac implication is most prominent. Rarely is the inflammation limited to the myocardium, endocardium, or pericardium; it is best to speak of pancarditis, and in the individual case an attempt should be made to recognise the most markedly implicated part.

(3) Group of predominant implication of the bones and joints.

In this category belong the severe forms which have been known for a long time—bone or joint typhus as they were called by Chassaignac, now usually designated, according to Lücke, as primary, infectious, osseous, and periosteal inflammations. The metastatic arthritic inflammation in the old clinical picture of pyæmia belongs to this group. In the milder forms we must differentiate between the “rheumatic” affections and, above all, from acute articular rheumatism.

(4) Group in which inflammations of the skin and the subcutaneous connective tissue and in the muscles is predominant, thence affecting the mucous membranes and the serous membranes. The severe forms—acute septic phlegmon is the name of a pyogenic cocci infection which has been recognised for some time—gradually change into the milder variety. Any one wishing to do so may make subordinate divisions, but I myself believe that the general division is sufficient.

(5) Group in which inflammation of the internal organs is predominant—brain, lung, kidney, spleen, liver, stomach, and intestines. Here the disturbance in the activity of the affected organ is most marked in the morbid picture, often to the extent that it completely dominates the situation.

A further grouping is hardly necessary, although the temperature is of special importance. The temperature is so irregular as to justify the statement that “any type of temperature curve may be observed.” The absolute variations are between 109.5° and 93.5° F.; therefore febrile and afebrile temperatures are met with. A main condition referable to the fever is its tendency to very abrupt change in connection with a variable intercurrent of chills. The pulse is disproportionately accelerated, from 120 to 150, soft, dirotic, and often irregular.

A few symptoms must be described more in detail. These refer to inflammations of the joints and bones, cutaneous eruptions, some few nervous symptoms, and the ophthalmoscopic findings.

Of the greatest diagnostic importance, perhaps only second to the occurrence of endocarditis, is inflammation of the joints, of which one or more may be affected. At the same time the inflammatory condition disappears and recurs much as in acute rheumatic fever. But a septic joint inflammation is of a much more persistent nature. The entire process frequently is concentrated to one joint and does not show the tendency to symmetry which is so common in acute rheumatic fever. Another point of importance in regard to septic joint inflammation is the implication of the bone

itself as well as the joint; thus tenderness upon pressure over the bone is a common manifestation. Implication of the muscles is less frequent.

Another point, important in differential diagnosis, is the frequency of the disease of the small joints, such as those of the phalanges, in contrast to the condition in acute rheumatic fever.

The most varied skin eruptions occur in sepsis, from a simple erythema to different types of petechia. In fact, it may be stated that there is hardly a cutaneous manifestation which may not appear in the course of septicopyæmia. In three fourths of all cases eruptions are present.

Nervous symptoms are exceedingly common: headache, vertigo, insomnia, various psychological conditions, convulsions, and paralyzes affecting single nerves or even nerve groups. Meningitis, especially purulent meningitis, is very liable to be a resultant condition and the starting-point of sepsis in aural lesions.

Litten was the first to study retinal changes, especially hæmorrhages, in sepsis, and while such retinal hæmorrhages are not strictly pathognomonic, they nevertheless form an important link in the diagnosis.

DIAGNOSIS.

The diagnosis may be exceedingly difficult, particularly if the focus within the ear, from which the sepsis spreads, is overlooked. The differentiation from malaria offers least difficulty, for upon examination of the blood the plasmodium will be found in the greatest majority of cases. Besides the chill, fever and sweating by no means show the regularity in sepsis which is so characteristic of a malarial attack.

The kidneys are invariably affected. Albumen may be excreted in large amounts, and all forms of inflammation of the organ have been observed. Uræmic phenomena are common. Acute nephritis and even contracted kidney may be the result of sepsis.

When blood counts were first made to determine the presence or absence of severe infection, leucocytosis was the all-governing factor, but after more careful study, with numerous observations, the consensus of opinion is that a differential count must be made, and that leucocytosis is more of an index to body resistance in an infection than to its severity. For example, a person with good resistance may have a marked leucocytosis as the result of a slight infection, and, on the other hand, a person

with impaired resistance may have little or no increase in the number of white cells with a very severe infection. The relative number of polynuclear leucocytes is of the greatest significance in the determination of the presence of a purulent or gangrenous process. The normal percentage of these cells varies between 59 per cent. and 68 per cent., with an average of about 62 per cent. If there is a relative count of less than 70 per cent. no pus need be suspected. Pus is not common with less than 80 per cent., except in children, where it has been found with a count as low as 73 per cent. Above 93 per cent. indicates a very severe process, and when it reaches 95 per cent. it may be considered almost fatal. Fowler⁽⁸⁾ cites two very interesting cases:

(1) A young woman with serous otitis media had pain, rapid pulse, temperature, etc., indicative of acute mastoid disease, but as the polynuclear cells reached only 59.7 per cent., operative procedure was deferred, and the patient recovered without operation.

(2) A young man, recovering from mastoid involvement as a result of acute purulent otitis media, and for which he had been operated upon, began to show evidence of meningeal irritation with only slight inflammation, except that the polynuclear cells were up to 82.3 per cent. Operation disclosed a large abscess, and the patient subsequently died from meningitis. In both of these cases the percentage of polynuclear cells was accepted as an index for or against surgical interference.

From these observations we reach the following conclusions:

(1) A marked leucocytosis, with a relative percentage of polynuclear cells below 70, shows a slight infection with good resistance. (2) A marked leucocytosis, with relative percentage of polynuclear cells above 80, shows severe infection with good body resistance. (3) Slight or absent leucocytosis, with relative percentage of polynuclear cells above 80, shows severe infection with impaired resistance.

In the differential diagnosis acute articular rheumatism, malaria, acute miliary tuberculosis, enteric fever, and uræmia must be considered.

To differentiate from acute rheumatic fever is often difficult. Inflammation of the joint, eruptions, implication of the endocardium and pericardium, and sweating are common to both conditions, but in acute rheumatic fever the large joints are much more liable to be involved. There is a symmetry in the joint implication, as well as a more fleeting character of the arthritic inflammation; while in sepsis but a single joint may be affected, the inflammation showing no tendency to involve other joints. Besides, a therapeutic diagnosis may aid us. Thus, large

doses of the salicylates rapidly improve a rheumatic joint affection, while they have little or no influence upon the septic joint.

The differentiation from miliary tuberculosis is much more difficult. Common to both diseases is the acute flooding of the body with pathogenic organisms, the severe clinical picture, the enlargement of the spleen, the rapid pulse, the involvement of the pleura, pericardium, and peritoneum, meninges, and other serous structures; but in acute miliary tuberculosis dyspnoea and apical disease are much more liable to be present. Tubercle bacilli, if present in the sputum, urine, blood, or fæces, naturally are important in the diagnosis; but, unfortunately, this sign is often absent in acute miliary tuberculosis. The diagnosis can often be made only from the course of the disease.

Enteric fever is not so difficult to differentiate from sepsis. The characteristic eruption, the Widal reaction, the course of the temperature, favour enteric fever, while retinal hæmorrhages, inflammation of the joints, endocarditis, and leucytosis favour sepsis.

Uræmia often cannot be differentiated from sepsis, for uræmic manifestations, as previously stated, are by no means uncommon in the course of septic infection. The entire clinical picture must be considered before we can reach a definite decision.

Frequently we are greatly in doubt as to the exact nature of the complication arising from an aural lesion, especially when the focal disease is not in itself sufficiently severe to account for the alarming constitutional disturbance. This is well illustrated in the case reported by S. E. Allen (⁹):

G. H—, aged twenty-four, presented himself on March 9, 1898, suffering from acute middle-ear disease. He was seen daily until March 25, when he had a severe chill, with a temperature of 103° F., and was apparently seriously ill. His expression was anxious and the pain in the ear was intolerable. All the symptoms of a beginning purulent meningitis seemed to be present. He was admitted to the hospital and the mastoid process opened up into the antrum; no pus, necrotic or carious bone, nor granulations were found. The bone toward the lateral sinus was in a normal condition, and the sinus was not laid bare. The posterior wall of the meatus was then severed, and the healthy ossicles with the remnants of the drum membrane removed, thus giving access to the tympanic cavity. The cavity was thoroughly explored with a fine probe and no break discovered. The floor of the tympanic cavity was covered with slight granulations, and these were removed with a sharp spoon. The temperature at the time of the operation was 104° F. The patient rallied from the operation nicely, and the pain in the head and ear, which had been unbearable, left him, and was never afterwards complained of. The temperature, however, continued high, ranging from 101° F. to 103·5° F. A few days after the operation the patient complained of pain in the right foot, and its upper surface became reddened and slightly swollen. Then the right shoulder

and upper arm became swollen and extremely painful. One week from the date of the operation the patient was given an anæsthetic and a free incision made into the inner surface of the arm and some pus evacuated. There was no regular abscess cavity; the pus seemed to be diffused throughout the tissues. The right shoulder was also scarified. The temperature continued as before, the left wrist and elbow became swollen and painful, but no suppuration occurred. The patient's condition continued precarious till about the middle of April, when convalescence gradually set in, and he was discharged from the hospital on May 13.

In 1904 the writer ⁽¹⁰⁾ reported three cases of metastatic abscess of the liver in which it was shown that the hepatic infection had its origin in the organ of hearing. A brief history of one of those cases will serve as an illustration.

J. W. D—, male, aged forty-two, had had a suppurative otitis media extending over a period of twenty-seven years, the original infection complicating an attack of pneumonia. For about twenty years following the spontaneous rupture of the right membrana tympani, the patient suffered no inconvenience except a continued slight discharge from the ear. Then the disease became quiescent and the patient felt that he had been cured, the ultimate outcome of his former condition never having given him any concern except from a cosmetic standpoint. But this immunity was enjoyed for about two years only, when he suffered a relapse, which was characterised by severe pain for two or three days, followed by an offensive reddish-yellow discharge. There was marked improvement, however, within a few weeks in regard to both the quantity and quality of the discharge, though at the end of about one year he again suffered from an acute exacerbation, which recurred at frequent intervals during the following three years.

It was while suffering from one of these acute exacerbations, and about three weeks before the patient's death, that the writer saw the case with the attending physician. Briefly, the clinical picture was as follows: After a severe chill the patient's temperature suddenly registered 105.2° F., which was followed by profuse sweat. The only pain complained of was located in the right shoulder and neck, and was intensified when the patient moved or rested on his left side. A moderate muddy yellowness of the skin was noticeable on close inspection, the conjunctivæ, however, being normal. The aural examination revealed a chronic suppurative otitis media, with entire destruction of the membrana tympani, malleus, and incus; there was no acute inflammatory condition involving the tympanic cavity or canal, nor did the superior and posterior wall show any evidence of undue redness or drooping. The middle ear was entirely free from any granulation-tissue or other pathologic process. Pus was, of course, present, but was small in quantity and quite offensive. On microscopic examination it showed the presence of the *Streptococcus pyogenes*, *Staphylococcus pyogenes albus* and *aureus*, and the pneumococcus. The patient complained of no discomfort whatever about the head, and the mastoid and adjacent parts showed no evidence of involvement. The irregular fever, with chills and sweats, together with an ever-increasing pain in the right shoulder and neck, continued until within one week of his death, when for the first time he also complained of some pain in the right hypochondrium. On examination the attending physician observed distinct enlargement of the liver, with tenderness on pressure, and at the same time a marked increase of the icterus was noted.

The temperature was pyæmic throughout this latter attack, varying from almost normal to 106.6° F. The chills during the last week of his illness were not

severe, but his sweats were most profuse, at times saturating the bed-clothing. After the true nature of his illness became manifest, the patient received the most energetic treatment and intelligent care at the hands of his attending physician. Aspiration or other operative interference was not resorted to, the wisdom of which course was afterwards sustained by the *post-mortem* examination. Immediately preceding the patient's death the temperature registered 106° F. and a fraction, death occurring while in a state of violent convulsions.

It is well to state that, in connection with various methods of treatment, anti-streptococcic serum was used in full doses with only passing benefit.

The results of the *post-mortem* examination were interesting from the fact that every viscus except the liver was found to be normal, the liver being a mass of miliary abscesses. An especially interesting part of the patient's history was the incessant, and at times very severe, pain, involving the right shoulder and neck. On two separate occasions the writer felt he was not only justified, but that it was his duty, to make an exploratory incision to determine the possibility of a thrombosed jugular, notwithstanding all symptoms of such a condition, minus pain and suggestive temperature, were absent. The results of the autopsy demonstrated that the better judgment prevailed. It was also interesting to note the normal condition of the mastoid and interior of the skull generally.

A case of unusual interest, in which the patient died from an unrecognised and unsuspected ear lesion, is also reported by George Carpenter,⁽¹⁾:

D. R—, aged fourteen months, was brought to the hospital with the history of having received a blow on the back of the head and also an injury over the left ear. The accident was not sufficient to render the child unconscious. When first seen, four days after the accident, the patient was in a comatose state. The face was pale, the extremities cold, the pupils were equal and reacted to light, the pulse was quick but not irregular, the respirations were shallow and irregular, the head was retracted, and the temperature 102° F. The left ear was red, and blistered in the upper half. There were convulsive movements and slight rigidity on both sides of the body, but more marked on the left. The muscles responded to stimulation; the knee-jerk was very slight on the left, while quite brisk on the right. Protruding movements of the tongue were noted, and occasionally the eye became fixed towards the left. There was doubtful ptosis of the left eye, but otherwise it was normal. Examination with the otoscope failed to detect any abnormality. A diagnosis of meningitis was made and medical treatment instituted. The temperature continued to increase, reaching 107·6° F. on the third day, and the child died the following morning.

Post-mortem examination revealed a localised collection of pus in the middle ear. The tympanic membrane appeared healthy and there was no evidence of rupture. Patches of collapse were present in both lungs; the stomach showed dark brown patches of blood; all the other organs were free from disease, and no tubercles were found.

Carpenter states that "this case teaches a lesson which should ever be before the mind when called to diagnose a case showing head symptoms, namely to examine the ears as a matter of routine. A habit thus induced will presently become automatic, and sooner or later the doctor practising this routine will be rewarded by saving a life unnecessarily doomed to destruction, and the patient

will greatly benefit by his declining to accept as meningitis without a protest everything that stalks about in the garb of that disorder. I have, I believe, saved more than one case by a timely myringotomy and evacuation of the pus. Unfortunately, in my experience, pus, as in this case, cannot always be recognised through the tympanic membrane, and the appearance of the drum may not be sufficiently removed from the normal to warrant the suspicion of an acute inflammatory process 'well alight' behind it. That such may occasionally prove to be the case must in no wise prove an excuse for the relaxation of vigilance, and in a doubtful case no single examination can be considered to have absolved the doctor from all responsibility on the score of ear mischief."

We are greatly indebted to Carpenter for placing on record this very interesting case, but regret our inability to concur in his opinion that the presence of a purulent exudate within the tympanic cavity may not be diagnosed by the experienced aurist. Even in cases of hydrops *ex vacuo*, where there may be absolutely no inflammatory changes in the membrana tympani, the presence of fluid is readily recognised. It is, therefore, quite inconceivable that inflammatory *débris* can accumulate within the middle-ear cavity without producing pathologic changes easily recognisable.

The point of chief interest in Carpenter's case is the forceful manner in which he demands the routine examination (I may add by an expert) of the ear. This is especially important, as the writer has frequently pointed out, in all cases of illness in which the diagnosis is doubtful. To further illustrate this important point, the writer will briefly state one case, in which the ear, although not suspected, was subsequently shown to be the site of the primary lesion—in fact, the only organ in which disease could be detected.

C. K—, male, aged twenty, of good personal and family history. Had measles and mumps during childhood, otherwise enjoyed exceptionally good health until July, 1905, when he contracted a severe attack of diphtheria, convalescence occupying more than three months, most of which time he suffered from painful deglutition, but at no time did he show any evidence of ear complication.

On December 26, 1905, he was compelled to go to bed, after feeling more or less ill for several days, where he remained for two weeks. At the end of another week he returned to work, but was able to continue only a few days, on account of an ever-increasing "fulness" in the right side of the head. His condition grew worse from day to day, the prominent symptoms being headache, some temperature, chills followed by profuse sweating, mostly at night, pain in the back, chest, and abdominal region; to this was added considerable cough, with profuse dark-greenish expectoration. The pain in the head grew progressively worse, but not especially marked in any locality. His case was now pronounced typhoid fever.

For some days the above symptoms continued in an aggravated form, when suddenly he complained of some pain in the right ear, which was followed almost immediately by a discharge of foul-smelling pus.* The escape of the discharge from the ear, however, did not relieve his symptoms, which, on the contrary, grew progressively worse. He was now sent to the hospital, little or no thought having been directed to his ear. On admission his temperature was 102.2° F., pulse 101, respirations 30. While he was dull and listless, yet in some ways he manifestly exhibited signs of marked excitability, plainly showing his apprehension of impending danger. The writer was asked to examine the ear, and found unmistakable evidence of extensive tympanic and mastoid involvement. The cortex was normal in appearance, but painful on deep pressure; a foul-smelling, brownish-yellow discharge filled the canal, which, when removed, revealed a large carious opening through the bony canal leading into the mastoid and filled with granulation-tissue. The membrana tympani was mostly destroyed, which plainly showed the tympanic cavity filled with granulation-tissue and other inflammatory débris.

An immediate radical operation was performed. A carious opening through the attic roof and exposed dura provided drainage for considerable pus which escaped from the interior of the skull, evidently from the temporo-sphenoidal lobe. The sinus was also exposed by the necrotic process, but not otherwise involved. In brief, the mastoid was exceptionally large, the entire process having undergone extensive necrotic changes, making, when the operation was completed, the largest opening in the skull that the writer has ever seen. From the date of the operation the patient began to improve, all the obscure symptoms promptly disappeared, and the patient made an uninterrupted recovery.

The above case demonstrates clearly the value of routine aural examination in all cases of doubtful diagnosis, as this patient was treated in turn for tuberculosis, rheumatism, and typhoid fever. From the fact that the patient did not complain of aural distress, together with an entire absence of the clinical symptoms of mastoid disease, the ear lesion, the sole cause of his illness, suffered absolute neglect, notwithstanding a foul-smelling discharge was escaping from the external canal. This case, furthermore, serves to illustrate the curious—I may venture to say unpardonable—apathy of the profession toward an aural discharge and its far-reaching consequences. It would be both startling and humiliating to the medical world if it could even approximately compute the number of children borne to their graves under the professional caption of meningitis, while the primary cause of their illness, the organ of hearing, was not even suspected. This applies equally to cases without visible suppuration as well as to those presenting a discharging ear. Indeed, the writer's experience impels the belief that idiopathic infantile meningitis is decidedly uncommon, and that a great majority of such cases are aural in origin; notwithstanding, the ear as a causative factor is overlooked.

REFERENCES.

- (1) Leube, "Medical Diagnosis," 1904, p. 963.
- (2) *Clinique Médicale*, tome deuxième, 1837.
- (3) "Die otogene Pyämia," Jena, 1896, p. 229.
- (4) *Deutsche Klinik*, Bd. viii, p. 196.
- (5) "Ueber intracranielle Complicationen der Otitis Media Purulenta," *Hygieia* Bd. xl.
- (6) "Die Septischen Erkrankungen," Nothnagel's "Specielle Pathologie und Therapie," Bd. iii, 2, p. 338.
- (7) "Modern Clinical Medicine," p. 655.
- (8) "Treatise of Surgery," vol. i, p. 255.
- (9) *Cincinnati Lancet-Clinic*, vol. xli, 1898, p. 401.
- (10) *Archives of Otology*, April, 1904.
- (11) *Pediatrics*, vol. ii, 1896, p. 430.

DISCUSSION.

Dr. MURRAY MACFARLANE said that Dr. MacCuen Smith's paper indicated the advisability of examination of the ear in cases of general disease. Recently he had been called in consultation in a case of apparently acute articular rheumatism following a typical pharyngitis. The knees and elbows were the joints affected. The patient had suffered similarly before under the care of the same physician. Three days later he saw the case owing to "earache." He found the membrana tympani bulged, and made a free incision, thus liberating a serous fluid, which gave relief to the pain. A chill had been complained of a few hours before with a sudden rise of temperature. There was no mastoid pain. Being suspicious, he suggested the possibility of the joint affection being purulent, and next day aspiration revealed the presence of pus in large quantities. The mastoid, having become tender, was opened, and thrombosis of the lateral sinus was found. The usual removal of infective material was carried out. The question was whether there really ever existed an acute rheumatism. Was it pyæmia from the first, due to infection of the middle ear, with pus-formation, or were the ear symptoms a part of the general systemic involvement, or were the joints, already the seat of rheumatic disease, invaded by streptococci of problematical origin? The patient died about a week later.

The PRESIDENT considered the recommendation as to the blood count most valuable.

THE MEDICAL GRADUATES' COLLEGE will hold its eighth annual dinner at the Trocadero Restaurant, Piccadilly Circus, on Wednesday, December 12, at 7.15 for 7.30 p.m. Professor Clifford Allbutt will be in the chair.
