to looking into these matters, when he was content with a diagnosis of "rheumatism," when he asked a man if he had ever had a chancre and, if he said "No," let it go at that—conditions were hopeless. Now many practitioners are going further and want an eye examination. What should the oculist do? Mere routine study of vision, refraction error, etc., is insufficient. Perimetry and tonometry should be parts of our work.

With regard to Dr. Weiner's criticism: he thinks a patient ought to be "told the truth" when he has a "cataract." Of course, in so far as misstatements are concerned; but what is meant by "cataract" and what false impressions can be conveyed by the term "cataract" to you may mean a peripheral, non-progressive opacity in the lens; to the average layman it means slowly progressive blindness to an operation which may or may not succeed. We all know there are hundreds and hundreds of cases of peripheral striations which never come to an operative stage. These opacities do no harm; they do not get worse. What is the use of frightening a man with the idea that he is going blind? Call it "peripheral striations," tell him there is a little cloud at the edge of his lens and it should be watched; but while he has useful vision do not torment him with the idea that he is going blind. You are telling him the truth; you are simply avoiding that particular presentation of his condition which will scare him and make him think everything else is due to "cataract." To some extent you can dangerously mislead him. See quotation from Fuchs and case narrated.

What Dr. Weiner said about the campimeter is true. You can get a small scotoma with the campimeter that you can not get with the ordinary perimeter.

Dr. Woods has called attention to a very important matter. If we wait, in diagnosis, for the cupping of the disc, we are often too late. This brings me to another thing that I will take the liberty of speaking about for just a minute. Oculists should compel themselves to make perimetric examinations. A short time ago a man under examination before the American Board of Ophthalmological Examiners was asked to take a field of vision. He replied that he owned a perimeter, but used it as a hat rack; that he had not time to take fields because he was too busy with routine cases; it took him too long to get through. He knew nothing about perimetry. If this was his point of view, certainly many of his patients over forty got away without the sort of examination they needed. I have discovered cases of early glaucoma simply by making myself go through this routine. It is a branch of ophthalmology that has been sadly neglected.

After all, the thing gets down to what Dr. Cary has said: we must make the average young man afraid to make mistakes, and if we accomplish that we will do much.

AN ATYPICAL MASTOIDITIS FOLLOWING A STAPHYLOCOCCEMIA*

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It is the intention of the writer in the preparation of this paper to discuss the hematogenous infection of that type of mastoid disease which has been classified as primary mastoiditis or idiopathic mastoid abscess and to report a case of more than passing interest.

While the subject of primary mastoiditis is not a new one, in searching the literature on this subject the writer is surprised to find how little definite information has been thrown on those of hematogenous origin.

In the review of 40 cases of primary mastoiditis only 7 of these are stated to be of hematogenous origin. Plisson reports 1 case, Humblet 1, Labarre 1, and Chauveau 4. In only 1 of these cases is the affecting organism stated.

Plisson reports a case of general infection (perhaps influenza) in a man, age 22, with mastoiditis without involvement of the middle ear. Mastoid pus showed streptococcus in pure culture. He believes this to be a hematogenous infection. He states that primitive mastoiditis without middle ear involvement occurs most frequently in influenza, but also in other general infections.

Humblet reports one case in a woman, age 27, history of a broken and sensitive tooth. Redness and tenderness over the mastoid. No sign of middle ear involvement; tympanum absolutely normal. Infection was probably hematogenous. No bacteriological examination.

Labarre, in 1912, reported one case of primitive mastoiditis in which there was no sign of middle ear involvement and no previous history of ear disease. This case was reported as of hematogenous origin. The infecting organism was not mentioned. Chauveau reports 4 cases of primary mastoiditis. The original article was not attainable.

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Of the 40 cases of primary mastoiditis reviewed, 4 of this number showed a staphylococcus infection.

Brieger reports one case of primary mastoiditis not due to middle ear suppuration in which staphylococcus aureus was found in the pus. He does not state source or mode of infection, but notes that the staphylococcus aureus is one of the frequent organisms in osteomyelitis.

West reports one case in a girl, age 14, of mastoiditis without involvement of the middle ear. The pus showed staphylococcus. The case was complicated by malaria and malarial parasites were found in the blood. No mention of staphylococci in the blood and no attempt to explain the cause of the mastoiditis. White blood count was 14,000.

Of these cases reviewed in twenty-two there was no mention of the type of bacteria found in the mastoid process. In sixteen there was no attempt to indicate the source and mode of infection. In seven cases which were reported to be of hematogenous origin, in only one case was the type of organism mentioned. In searching this literature the most conspicuous fact was the infrequency of the report of any investigation of the bacteriology of the blood.

After the study of the literature on this subject with the observation as just stated, one could hardly escape the conclusion that the question of hematogenous infection of the mastoid apophysis has not received the attention and investigation which one at the present day would expect. Perhaps the explanation has been that the condition is a rare one, and for this reason few cases have been studied by the one individual.

However rare the condition may be, we know that it does exist. Rosenow says:

"The hematogenous origin of infection in regions which do not normally harbor bacteria, such as the endocardium, pericardium, joints and bone, is accepted."

Dabney, in his excellent contribution on "Idiopathic Mastoid Abscess," says:

"The hematogenous theory of mastoid disease rests on a sound and scientific basis."

In osteomyelitis we have the parallel of the infection of the mastoid process through the blood stream. Keen says:

"The infection of the bone is often secondary to local infection (such as a furuncle or car-

buncle) and the infecting organism may be carried from such focus by the blood and cause acute suppuration of bone in distant parts of the body."

In the study of osteomyelitis we learn that in the vast majority of cases the infecting organism is the staphylococcus pyogenes aureus and that it is generally found in pure culture. Barker, in his "Monographic Medicine," says:

"Multiple purulent metastases are very common in staphylococcus sepsis. When the cocci go over in the blood, the blood culture is sometimes positive, but is often negative, as the cocci are quickly removed from the blood by the organs (in contrast with streptococcus sepsis)."

The writer further states that the diagnosis of staphylococcus sepsis is made by finding the primary focus of infection, blood culture and cultures from the metastatic abscesses.

On becoming intensely interested in this case which I am reporting, I questioned my distinguished instructor of former days, Dr. Dench, as to his opinion relative to this history and pathology. His opinion, which is always of interest, is as follows:

"There is absolutely no reason why a staphylococcus in the blood stream should not give a metastatic abscess in the mastoid as well as in any other part of the body. If such a focus should exist the metastatic abscess would be independent of the middle ear and the drum membrane might be normal."

With the courtesy of the Society, I will report this case of atypical mastoiditis following a staphylococcemia. This case is worthy of publication on account of the interesting and unusual history, the condition of the middle ear, the type of mastoid involvement and the bacteriemia.

The patient, M. M., female, age 19, robust, no family history of tuberculosis or syphilis, was referred to me on September 1, 1919.

History.—For two months patient had suffered from a recurring furunculosis scattered generally over the body, principally on the lower extremities. No furunculosis of the external auditory canal. Patient first consulted me on account of a furuncle the size of a pea over the left eye brow. The furuncle opened and the swelling rapidly subsided. Pus showed a staphylococcus infection.

On September 6, the patient called again at my office complaining of a deep-seated pain back of her right ear. The middle ear was examined; fundus presenting a normal drum membrane; no scar of a previous perforation; hearing not impaired. Patient was advised to report at the end of two days for further examination.

On September 8, the patient was again seen, this time complaining of increase of pain, particularly at night. A sensitiveness to pressure

existed over the mastoid tip; no tenderness in the region of the antrum or emissary. Eustachian tube was catheterized. No fluid could be detected in the tube or middle ear. The patient's temperature was 100°, pulse 120.

On September 10, 11 and 12 temperature oscillated between 99 and 101°; pulse, 110 to 120. On September 13, a blood culture was taken and a differential blood count showed 20,000 white cells, 85 per cent polynuclear. On September 15, report of the blood culture stated that a staphylococemia was present. A roentgenological study was made and the following report was received: "There is a general loss of density throughout the lower half of the right mastoid and a haziness of cell outline which would suggest an acute mastoiditis."

A simple mastoid operation was immediately performed. Removal of a thin cortex revealed a large tip cell containing pus, and the immediate adjacent cellular structure showed a beginning caries. In the upper part of the mastoid and in the region of the antrum, macroscopically the bone presented only a hyperemia and no pus was evident. The antrum was opened; no granulations were present and no evidence of disease. The sinus was exposed, which showed a normal color. The pus culture from the mastoid showed a staphylococcus aureus in pure culture. The mastoid was closed except at its lowest extremity and a small drain introduced. On the following day the patient's temperature was normal. She stated that her headache no longer existed. An uneventful recovery followed, patient leaving the hospital on the ninth day with the mastoid wound entirely closed.

To review this case briefly, there was a recurring furunculosis extending over a period of two months. This can be interpreted as the primary focus of infection. A blood culture showed a staphylococemia and the metastatic abscess gave the staphylococcus aureus in pure culture. To the writer it would seem that this would make the diagnosis of a hematogenous infection complete.

In reading medical literature one can but come to the conclusion "that there is nothing new under the sun." I make no claim to priority in the report of this case, though in the literature reviewed I was unable to find where there was any record of a case of primary mastoiditis in which the organism was isolated in the primary focus of infection found in the blood stream and in the metastatic abscess.

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DISCUSSION

Dr. John J. Shea, Memphis, Tenn.—I think we owe a vote of thanks to Dr. Taylor for giving us a report of a case that has been worked out so thoroughly. Of course, he tried to cover up his scientific investigations by saying that in taking his first culture he did so in order to obtain the offending organism for an autogenous vaccine, but nevertheless he obtained the organism in its primary focus and the organism from the blood stream. The isolation of a staphylococcus from the blood stream is very difficult because the interval in which the organism may be isolated is very short.

The question always comes up of the blood culture becoming contaminated, and in talking this over with Dr. Taylor he said that the laboratory reported this as a true bacteremia.

The latest work on the reformation of bone is that bone reforms from the Haversian canal system. I imagine it was through this system that this atypical mastoid began to suppurate, for it is difficult to see any other explanation than that the bacteria become an embolus and lodge in the mastoid.

I think it is also impressed upon us that an x-ray should be taken in every one of our mastoid cases before we operate. It is of value to give you the landmarks and in a case where the ear is as near normal as this one, only with the aid of the x-ray would we be justified in doing a mastoid.

Dr. H. H. Briggs, Asheville, N. C.—It seems to me Dr. Taylor has come more nearly bringing to us a true case of primary metastatic mastoiditis than any case I have reviewed. It is true that perhaps the exacting bacteriologist would not accept the findings as true proof, especially if the postulates of Koch had to be satisfied, but nevertheless to us he has proven his case. He has found the organism both in the blood stream and in the furuncle. Whether it is a true bacteremia and metastasis may be questioned, but as I remember the furuncle was on the left side of the face and the mastoiditis on the right side, and it would be rather difficult to see how the lymph channel could be the sole means of carrying the infection. Finding the middle ear free from inflammation does not mean that the infection might not have gotten through the Eustachian tube in some way. This would be rather far-fetched, but is possible. I have seen one case somewhat similar to the doctor's, in a doctor's family, where there were the usual mastoid symptoms of pain and tenderness, with no evidence of otitis media. The pain was so severe that a paracentesis of the drum membrane was done, but no evidence of otitis media; later a mastoidectomy was done, and no evidence of pathology was found in the antrum, but going down to the tip the large cell was found full of pus. I am very glad that Dr. Taylor presented this subject so scientifically and gave us the benefit of his observation.

Dr. Clifton M. Miller, Richmond, Va.—Two years ago, when this Section was to have met in Asheville, I had prepared a report of two cases in which bacteriemia was not proved. The blood stream was not examined and beyond low grade infection in the postnasal spaces and around the tonsils, there was no focus of infection that we could find. But both cases were mastoid abscess without middle ear infection. One of them I was satisfied must have gone through the middle ear. It was a child and it waked up in the night crying with earache. I did not see it for a week after and at that time the drum was perfectly normal, so it must have had some low grade infection at the time. This must have gone into the mastoid antrum, but I did not get to operate until there was a subperiosteal abscess. The other case was a subperiosteal abscess also and was advised to be operated upon a week before he consented, and then the swelling behind the ear had become very marked. In spite of this post-aural swelling the antrum was dry. The perforation had been low down over the tip. He had an old, long-continued case of infection in his naso-pharynx. Both of them were x-rayed carefully before operation and I do not see how we can finally make up our minds to operate on these, in spite of the high blood count, without the x-ray. I think that is a great essential in the diagnosis of these cases. The source of infection we must work out. Neither of these were "flu" cases. This was prior to the epidemic.

Dr. J. A. Stucky, Lexington, Ky.—Anything atypical is always interesting and important, simply because we do not always look for the unusual. Less than three weeks ago a lady came into my office, sent to me by a group of physicians who had gone over her very carefully; she had been treated for five weeks for fistula. Five days before she had earache, which she learned was due to a diseased tooth. Extraction of the tooth relieved the earache. Examination by an otologist found no trouble in the ear. Then she began to have severe pains in the back of the head radiating to the left eye. This increased and she was sent to me because of slight swelling in the left temple and edema of the eyelid. Examination of the eye was negative except for this swelling, which looked to be entirely superficial. There was no trouble in the nose or accessory sinuses, the throat was normal, and I could not account for the headache. The drum membrane was a little congested, but no evidence of trouble in the middle ear. I then had an x-ray made and, very much to my surprise, it revealed evidence of disintegration not only of the entire mastoid, but in the posterior zygomatic root. There were no clinical symptoms, no pain on deep pressure, no sagging of the posterior wall, none of the usual symptoms of mastoiditis. On the strength of the revelation of the x-ray I operated that afternoon and found a most unusual condition in the mastoid. She had a very small mastoid, no antrum practically, just a cell as large as a pea. There was pus in the tip; there was pus in the zygoma roots; there was an extracranial abscess containing perhaps a dram of pus, and the lateral sinus from elbow to knee was covered with thick granulations and both the middle fossa and posterior fossa were involved. There was no cerebellar abscess. The patient has been in the hospital eighteen days and is walking about. That was an atypical mastoid revealed by the x-ray after all other causes had been eliminated, everything except something in the eye. A blood examination showed 11,700 leucocytes. Examination of the pus showed a mixed infection with staphylococcus aureus predominating. This woman had had "flu" fourteen months before and had a baby twelve months old. She is getting well. That was atypical. It taught me a lesson which I present to you.

Dr. W. W. Black, St. Louis, Mo.—Did you exclude tuberculosis in that case?

Dr. Stucky.—Yes, and the Wassermann was negative. She had been examined by a group of good men before I saw her and would not have been sent to me except for that little swelling in the eyelid which was due to involvement of the soft parts covering the posterior root of the zygoma.

Dr. Taylor (closing).—In closing, I can not refrain from emphasizing the importance that the cases which are recorded as primary mastoiditis should be worked out more thoroughly. The review of the literature of primary mastoiditis shows little evidence of any investigation of the bacteriology of the blood and it would seem that this would explain why the subject of idiopathic mastoid abscess has not been more closely associated with infections through the blood stream.