December 15, 1889, ten days after the patient had been discharged, I was called to see her on account of an intense earache. In the morning she had noticed considerable soreness in the lateral walls of the pharynx, which as the day wore on became more intense and radiated toward the ears. I examined the pharynx and found it quite normal in appearance both in the oro- and naso-pharynx. The auditory canals and membranes were normal. Hearing normal. The patient was evidently suffering, and I was perplexed.

December 16. Patient reported at my office in the morning. Had passed a sleepless night. Evidences of pain very marked. Had taken no food for twenty-four hours. Temperature 99.8. Nose, naso-pharynx, oro-pharynx, larynx, auditory canals and tympanic cavities normal. Now all the pain was referred to the ears. The growth at the base of tongue appeared about the same as usual.

December 17. Patient's appearance as she sat in waiting room gave me great concern. Her expression was one of extreme anxiety, and her face bore evidence of great suffering. The hypodermatic use of .016 gram of morphia the night before had given only a transitory relief. The organs giving rise to painful sensations all appeared as normal as ever. Temperature 100. While examining the patient's pharynx the happy idea occurred to me that the mass at the base of the tongue might be the cause of all the trouble, although appearing perfectly benign. Introducing my index finger into the mouth I essayed to make compression on the growth, when the patient gave evidences of the most intense pain. I immediately laid the abscess open through its anterior two-thirds, resulting in the evacuation of several drachms of a very offensive, thin, watery pus. The symptoms were immediately ameliorated.

December 18. The day and night's rest had worked a marvelous change in my patient. She willingly submitted to a thorough laying open of the abscess cavity, which was then thoroughly curetted and packed with iodoform gauze. From this date the patient made a rapid and complete recovery. Swelling disappeared, and at the present writing shows only as a slightly elevated linear cicatrix. The patient is now under my observation, and the cicatrix is all that shows of the former condition.

The most interesting feature of this condition is the fact that the abscess remained quiescent so many years and then took an active course. It is also interesting to observe that all the symptoms produced by this change in the nature of the abscess were referred away from the seat of the disease. There was no change in the appearance of the tissues over or about the seat of the abscess, nor was there any spontaneous or superficial pain in the part of the tongue affected. It was only when firm and great pressure was made that any evidences of pain were demonstrated.

1102 L. Street, N. W.

DISCUSSION.

Dr. WOOLEN—Possibly this case was not an abscess for all these years. I have a case of blood cyst, or perhaps more properly varix of the tongue, which I have watched with solicitude for many years for fear it would rupture. Possibly Dr. Richardson's case may have begun in that way. I can hardly understand how an abscess could exist for so many years and pus be carried in it all that time. I think it likely that there was degeneration of some cystic formation. In my patient the growth is bluish in appearance, has evidently liquid contents, and is the size and shape of a teaspoon inverted on the tongue. It is pulpy and fluctuates as blood fluctuates. It gives the patient no inconvenience, but I fear rupture either spontaneously or artificially.

Dr. W. H. BRYAN—I can hardly conceive of an abscess existing as such for so long a time. It is possible that there may have been a cystic condition from which has developed a septic inflammation at a later interval.

Dr. D. BRADEN KYLE—I have only seen one case of abscess of the tongue and that was tubercular. Not only the tonsil but the cervical glands were involved, although the glands did not suppurate. Six weeks before operation marked symptoms of abscess at the base of the tongue had developed. The abscess was opened and contained cheesy material in which tubercle bacilli were found. This was a so-called chronic abscess, but it was really an acute condition at the time it was opened.

Dr. MAX THORNER—I have seen two cases of chronic abscess of the tongue. One was produced by a foreign body. There was swelling and all the symptoms of abscess at the base of the tongue. The symptoms had been present for half a year. I found a fish-bone embedded in the abscess. In the second case there was a chronic abscess of the base of the tongue of ten months' standing, which was no doubt tubercular. There was great difficulty in healing the wound, which closed superficially leaving a fistulous opening. I could get no detailed account of the history.

Dr. C. W. RICHARDSON—I had also thought at first that my case was probably a broken down cyst that had undergone suppuration, but after looking up the subject I came to the conclusion that it was a chronic abscess, for several reasons. Cysts are usually situated where the glands are more prominent and more numerous. They are more on the surface than this, which was embedded in the tongue, or to use Dr. Woolen's description, looked as though a teaspoon had been placed on the surface of the tongue. I am ready to accept the diagnosis that the condition may have been tubercular. In fact this young woman has a strong tubercular history on the paternal side. Nevertheless I think there is such a thing as chronic abscess of the tongue, and that such cases have been described, among them some which have existed for years before being opened.

CASE OF RECURRENT HEADACHE, EACH ATTACK BEING RELIEVED BY THE DISCHARGE THROUGH RIGHT NOSTRIL OF A FLUID FROM THE CRANIAL CAVITY.

Presented to the Section on Laryngology and Otology at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

BY W. SCHEPPEGRELL, A.M., M.D.

NEW ORLEANS, LA.

The case which I report is so unusual that I am unable to find a similar instance in the records of medical literature. The case is one of recurrent headaches of a most violent character, each paroxysm continuing until relieved by the discharge of a watery fluid from the right nostril.

The following is the interesting history of this case: Sister M. J., a member of a holy order, suffering from deafness and an affection of the throat, was referred to me in January, 1893. While treating these conditions, from which the patient soon recovered, she called my attention to the repeated headaches from which she suffered, and to the fact that they were relieved by the discharge of a straw-colored fluid from the nostrils.

In February, 1885, the patient suffered from a most agonizing headache, which persisted in spite of the efforts of several physicians. The pain at times became so severe that the patient was entirely oblivious of her surroundings. This continued for three weeks, and was relieved by an accident which appeared almost providential. While descending a stair, the patient fell down a considerable distance, her head striking against a stone jar at the bottom of the staircase. The fall was so severe that the patient was unconscious for several seconds, but when she revived, she observed that there had been a profuse discharge

of a yellow watery fluid from the nostrils, and that the headache, which had persisted for three weeks, had entirely disappeared.

Five or six weeks after this occurrence the headache developed again, the symptoms being the same as in the former attack, but at the end of the fourth day there was a spontaneous discharge from the nostrils, principally from the right side, and again complete relief. These attacks recurred at varying intervals, the intermissions sometimes being only twenty-four hours, and rarely more than two weeks. The headaches persisted from three to five days, and sometimes as long as ten days.

Various remedies were prescribed for the relief of the patient, but without success. The discharge of the watery fluid from the nostrils, at the end of the attacks, did not appear to have attracted the attention of the attending physicians, or if it did, was considered as a mere coincidence.

On account of the unsuccessful efforts to relieve this condition, the patient finally decided to make no further attempts to relieve this affection, which made her life a burden.

In describing her symptoms to me, the patient stated that when these headaches commenced there was a feeling of stiffness in the neck near the collar bone; then the pain seemed to ascend until it formed a focus in the upper part of the head near the crown, and produced a sensation as if a boil were forming, the pain extending over the whole upper part of the head, and her eyes could be kept open only with difficulty. The face is flushed, but there is no elevation of temperature. An ophthalmoscopic examination gave negative results, and there was no exophthalmus.

From a careful study of this case, the conclusion was evident that there was direct cause and effect between the watery fluid, which afterward discharged from the nostril, and the recurrent headaches. The quantity of liquid discharged (about one ounce) indicated that an accumulation formed in a receptacle of about this capacity, and that the pressure was instrumental in causing the violent pain, and that relief was due to the discharge of the fluid.

From the location of the pain, my first impression was that the sphenoidal cavity of the right side was the cause of the symptoms complained of, and when I explained my view to the patient, she readily gave her consent to an exploratory puncture into this cavity, with a view of obtaining relief.

The opening of the sphenoidal cavity, as well as the other operative procedures, were undertaken during a paroxysm of headache, while there was evidence of strong pressure, so that liberation of the fluid and the subsequent relief would show that the seat of the trouble had been reached.

After thorough cocaineization of the right nasal cavity, a long trocar, with the point slightly bent upward, was passed close to the septum at the level of the middle turbinal and then directed upward in the posterior upper part of the nasal cavity. With some pressure and a slight rotary motion, the wall was perforated and the free entrance of the trocar showed that the sphenoidal cavity had been reached. The trocar was then withdrawn and the canula left in place, but there was no discharge of the liquid.

A probe was now passed into the cavity, which appeared to be normal. There was no discharge of fluid, and the patient experienced no relief from the headache. The operation was done with due regard

to asepsis, and there was no reaction or ill effects.

As there was considerable pressure about the eye, and from the fact that pain is sometimes referred to another locality by the patient, I then decided to open the frontal sinus. After an ineffectual attempt to catheterize this cavity from the nostril, the frontal sinus was opened externally under chloroform. A vertical incision was made over the inner superciliary region of the right eye, the skin and periosteum drawn back and an opening through the outer wall of the sinus was effected by means of a small trephine. There was no discharge of a fluid.

A probe passed through this opening entered the nasal cavity without difficulty. The periosteum and skin were then carefully stitched, and the wound healed by first intention. The scar was scarcely noticeable, but there was no relief from the headaches.

Although an affection of the ethmoidal cells could not readily explain the symptoms, still in view of the intense suffering of the patient, and her almost total disability to perform her duties, every attempt was made to relieve her. The ethmoidal cells were opened without success, and the antrum of Highmore was catheterized without giving relief.

While making a preliminary report of this case before the Orleans Parish Medical Society, a physician, in the discussion, stated his opinion that the symptoms might be of hysterical origin, and that there was no evidence, besides the word of the patient, that there was a discharge from the nostrils at the end of each paroxysm of headache.

Though this opinion was contrary to my belief, I decided to obtain corroborative evidence, and had the patient, during one of the attacks, placed in a private ward of the Eye, Ear, Nose and Throat Hospital, under the charge of two trained nurses, who were instructed never to leave the patient and to watch carefully for the discharge of the watery fluid from the nostrils.

At the end of three days the watery discharge was seen by the nurse, and a portion of it saturated a towel on the bed.

Having now excluded the various accessory sinuses, the probability of this discharge coming from the cranial cavity, which occurred to me from the early history of the case, became more fixed, and I decided to obtain a specimen of the discharge for microscopic examination. With this view, the patient was instructed to have a vessel always with her during the next paroxysm and, if possible, to catch the fluid so that a careful examination could be made.

The second attempt was successful, the larger part of the liquid being discharged into a bowl and soon after brought to me.

The fluid had a specific gravity of 1005, was slightly alkaline in reaction and contained a small amount of albumin. Chemically, the liquid resembled the cerebro-spinal fluid and the contents of the cranial lymphatic vessels in this region, which are almost identical in character. When this fluid was allowed to settle in a conical glass, there was a heavy white deposit; the clear supernatant fluid was of a pale straw color, and did not coagulate. The sediment consisted almost entirely of pavement epithelial cells, some occurring singly and others in flakes. A few red blood corpuscles were seen.

In a second specimen sent for examination, the admixture of blood was so large that it imparted a reddish tinge to the whole body of the liquid. In

this specimen, also, there was a heavy deposit of pavement epithelium or endothelium.

It has been shown by T. S. Flatau (*Deutsche Med. Woch.*, Leipzig, Oct. 30, 1891) that there is sometimes a communication between the subarachnoid space and the nostrils, and he quotes a case of hydrocephalus which recovered after an abundant serous discharge from the nose. The existence of such a communication is also demonstrated by Schwalbe, Key and Retzius. Naunyn and Schrieber were also able to inject warm salty solution into the subarachnoid space of the dog which was discharged at the nostrils, the phenomena being accompanied by a protrusion of the eye and chemosis. In investigations on the human subject, Flatau found that although injections into the subarachnoid space reached the nose, the injection of colored fluid into the nose did not lead to an entrance of the fluid into the arachnoid space on account of the barrier presented by the columnar epithelium.

Another case, which is interesting in this connection, is one of meningo-encephalitis consecutive to an exploration of a supposed frontal sinus, reported by Dr. Mermod (*Ann. des Mal. du Lar. et de l'Or.*, April, 1896). The following is a synopsis of the report of this interesting case: A man, 30 years of age, who had undergone the successive opening of the right maxillary, the left sphenoid sinus, and of the right anterior and middle ethmoidal cells, on account of a chronic suppuration of these cavities, was affected with a cephalalgia of the right frontal region, which diminished after a free evacuation of a clear nonpurulent liquid. Under the supposition that it was an affection of the right frontal sinus, a flexible shaft was introduced, which penetrated a large cavity resembling an enlarged frontal sinus.

A second exploration, made under the same conditions, to the depth of $6\frac{1}{2}$ cm., measured from the entrance of the nostril, was followed by violent pain in the head, rigors and unequivocal signs of meningitis. A large trepanation was then made, and it was found that the frontal sinus was entirely wanting, and its place was occupied by the frontal lobes. A sound introduced from above immediately and without difficulty penetrated into the nostril.

The patient died twenty-four hours later. The autopsy showed a sero-purulent meningitis commencing from the anterior part of the frontal lobes; there was no traumatism of the brain. Although the exploration had been made with care, and under all necessary antiseptic precautions, it had been the cause of the meningitis. The liquid, which ran intermittently from the nose, had been a cerebro-spinal fluid.

From a careful analysis of the case which I have reported, I concluded that the fluid, which had caused the first attack of cephalalgia, had accumulated in the cranial cavity, and that the fall had been instrumental in breaking through the barrier which existed between the liquid and the nasal cavity.

The point of differentiation, which now presented itself, was as to whether this fluid came directly from the subarachnoid space or from some cystic formation in this region, connected with the lymphatic circulation.

The subarachnoid space is the interval between the arachnoid membrane and the pia mater. At the base of the brain there is a wide interval between the two middle lobes, and also behind the hemispheres of the

cerebellum and the medulla oblongata. This space is filled with a cerebro-spinal fluid, which fills up the interval between the arachnoid space and the pia mater. The subarachnoid space usually communicates with the general ventricular cavity of the brain by means of an opening into the inferior boundary of the fourth ventricle.

The conformation of this space and the extensive communication of its fluid, including even the ventricular cavities of the brain, would easily explain the depressing as well as agonizing character of these headaches, the effects of which were so severe that they almost entirely incapacitated the patient from duty.

If this fluid were discharged from the subarachnoid space, it was difficult to understand why the same quantity came from the nostrils after each attack, and also why the discharge ceased so abruptly and did not continue to drip for some time after the first pressure had been relieved.

This peculiarity caused me to believe that it was due to a cyst connected with the lymphatic circulation in this region. The foramen cecum is an aperture formed by the frontal bone and the crista galli of the ethmoid, and when pervious transmits a small vein from the nose to the superior longitudinal sinus. If the efferent lymphatic vessel of the perivascular lymphatics surrounding this vein should become occluded, it would form a lymphangiectasis, which would continually dilate from the plasma oozing from the blood vessel surrounded by these lymphatics.

The location of such a cyst in this region would not only cause all the disturbances due to pressure in the subarachnoid space, but would also explain the limited amount of fluid which was discharged after each attack. The slight admixture of blood corpuscles evidently came from the ruptured point in the upper part of the nasal cavity.

When my conclusions had been formed in this case I declined to make further surgical interference. Learning that the patient had suffered from attacks of rheumatism, I suggested to her physician to push the anti-rheumatic preparations, which was done, however, without any beneficial influence on the recurrent headaches.

I have from time to time examined the nostrils of this patient to see whether, perhaps, the cyst might protrude into the nostril, as we know that continued pressure will sometimes cause absorption of even bony tissue, and that the attacks might be relieved by early incision, but this has not yet been the case.

Medical Building.

DISCUSSION.

Dr. GIBBONS—I am following at present a peculiar case of headache. Among the symptoms I find a suicidal tendency and also a fear of going insane. I think it is really a disease which ought to be termed "suicide," differing from melancholia in that really insane persons do not think they are insane, whereas these patients will tell you that they contemplate insanity or suicide.

The physiologic functions of this region are not well known. In my opinion, the cells have something to do with receiving from the air an electric current. They are grouped exactly like the cells of a storage battery, and I believe they have some such function. If Dr. Scheppegrell does not get relief after these operations, I believe it is because the enlargement of the cells or some other growth has not yet been reached.

Dr. J. SOLIS-COHEN—I would like to ask whether the possibility of specific disease has been eliminated.

Dr. SHEPPEGRELL—The attending physician had given iodid of potassium without effect.

Dr. J. H. BRYAN—Possibly it may be one of hydrops. Secretion may have taken place in one the deeper ethmoidal cells

which could not be opened. Hydrops is a very rare condition. I thought it did not exist until Dr. Herman Knapp made his interesting report of some cases, the history of one of which was very much like this.

Dr. MAX THORNER—There seems to be no doubt that the headaches were due to some intracranial pressure, though the ophthalmoscopic examination showed nothing unusual. In a case shown by Dr. Woakes in 1885 at the London Hospital for Diseases of the Throat and Chest, he considered the discharge from the nose to be cerebro-spinal fluid, in a case that bore close resemblance to the one reported. A chemic and microscopic examination, if I remember rightly, was not made at the time. The discharge occurred intermittently and was always preceded by headache. A communication between the arachnoid space and the lymphatics of the nose has been proved to exist by Flatau's magnificent demonstrations, made at the International Medical Congress at Berlin, in 1890. This fact accounts for many otherwise obscure phenomena.

Dr. J. A. STUCKY—From the history of the case and the quantity of the discharge, I am almost forced to conclude that the discharge was from the cranial cavity. There would not be over an ounce or so from the ethmoidal cells, even if they were much enlarged.

Dr. G. V. WOOLEN—I have often been surprised at the amount of discharge in the ethmoidal cells and at the large quantity of polypi that can be taken from this region. The amount of operative tolerance in this locality is remarkable at times. It does not seem that the fluid was cerebro-spinal, or there would have been other cerebral symptoms besides pain, such as coma, paralysis, etc.

Dr. A. DE VILBISS—Although many have done considerable work in the region of the roof of the nose, we should not invade that region without some fear of doing harm. Only about four months ago I witnessed the death of a patient from an operation in that direction. In old cases where we have empyema we can operate more readily than in acute cases. That the cerebro-spinal fluid can leak out and escape through the nasal cavity I believe, though I have never made any postmortem demonstration of the avenues by which it comes. I had a patient who, every few months, by bending the head forward could discharge about half a teaspoonful of cerebro-spinal fluid through the nose. He had also symptoms of focal epilepsy. He was relieved by puncturing the dura and drawing off the cerebro spinal fluid.

Dr. SCHEPPEGRELL—This case could not be one of hydrops of the ethmoidal cells, as this would not account for the sudden and complete discharge of the fluid, which indicates the existence of a kind of buffer, which in this region could be furnished only by the intracranial pressure. As already stated, a cystic accumulation in the subarachnoid space would alone explain the character of the fluid examined and the various symptoms presented in this case.

THE TREATMENT OF EMPYEMA OF THE FRONTAL SINUS.

Discussion in the Section on Laryngology and Otology, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, June 1-4, 1897.

OPENED BY J. H. BRYAN, M.D.
WASHINGTON, D. C.

In accepting your invitation to open the discussion on this most important and interesting subject, I feel that I can not do better than first to call your attention to a few of the anatomic peculiarities of the frontal sinuses, in order that the pathology and treatment of chronic suppurative inflammations of these cavities can be the better understood.

The size of the frontal sinuses varies greatly in different subjects, and frequently in the same subject the variation is very marked, one cavity occasionally being quite large while the other is many times smaller, or absent altogether.

After an examination of 120 skulls made by Herbert Tilley¹ he considers a sinus normal when it measures 28 mm. from the median line outward to about the junction of the inner and middle third of the supra-orbital ridge; and in vertical extent measured from the root of the nose from 20 to 22 mm. Lamb,² who

has also investigated the size of these cavities, found the right one with a varying capacity from one and one-third to six c.c. while that of the left sinus was from one and one-fourth to four and two-thirds c.c. As showing the difference existing between the two sides he found in one instance the left sinus was to the right as seventy to ninety-five.

In health these cavities are separated by a very thin partition or septum which in the majority of instances is complete, although they occasionally communicate through a small opening. The septum is occasionally not straight, deviating to one side or the other thereby rendering one cavity smaller than the other.

Situated between the frontal and ethmoidal sinuses there is a series of cells formed by the junction of the ethmoid and frontal bones, but which form no part of either of these cavities. They, however, bear a very important relation to both sinuses, for when affected by an extension of a morbid process in either of the adjoining cavities they seriously complicate these conditions and render the prognosis much more uncertain. I believe in nearly all severe cases of empyema of either the frontal or ethmoidal cavities these cells are to a greater or less degree, affected.

Chronic empyema of the frontal sinuses while not an uncommon occurrence in some of the continental countries, as Russia and Germany, has not been so frequently observed in this country until within the past few years, and especially since the frequent visitations of epidemic influenza, which seems to have a special predilection for the accessory sinuses. While chronic suppuration of this cavity may and does frequently arise from other causes such as an extension of simple catarrhal inflammations from the nasal cavities, and from the retention of the secretions in the sinus by obstructive lesions within the nose, the most frequent cause in my experience has been the extension of the morbid process from the nose in the course of an attack of grippe.

While the prognosis of this affection is generally favorable the treatment will be found to be difficult and tedious according to the methods adopted for its relief.

Since the rapid advances made in the study of diseases of the nose there is a tendency on the part of some rhinologists to treat this affection through the nose, especially since Jurasz has pointed out the feasibility in a few cases of passing a probe through the infundibular orifice in the nose. There is no doubt that in a few instances this can be done, but in the majority of cases it will be found to be impossible to pass a probe into the frontal sinus through the fronto-nasal duct, for generally this duct is situated far back, and is occasionally so tortuous that no probe can be made to follow its course. When sounding the frontal sinus is possible treatment conducted through the nose without first making an external opening is only suitable for acute cases.

Max Schaeffer has proposed opening the sinus by making a forced opening through the nose. It is only necessary to mention this method to condemn it as very dangerous, for there is already one fatal case, by this method, on record. Any one who has paid any attention to the anatomic irregularities that exist in this region can not feel assured that he can enter the sinus by forcing an instrument through the middle meatus or middle turbinated body. Even should one be successful in entering the sinus by either of the above mentioned methods little could be