FRONTAL AND ETHMOID SINUS EMPYEMA.

REPORT OF A CASE CURED BY OPERATION.

BY HENRY PERKINS MOSELEY, M.D.,
OF NEW YORK,

Assistant Surgeon to the Manhattan Eye, Ear and Throat Hospital
(Throat Department).

In view of the large amount of work which has been done in the past few years on the accessory sinuses of the nose, I have thought that it might be of interest to report a case of Empyema of the frontal and ethmoid sinuses which offered unusual features before a cure was accomplished. These cases are not very common, although the diagnosis and treatment of them has been more satisfactory in recent years, and all additional light that we can get on them will be of considerable help. In this case operative procedures had to be repeated several times, but in spite of this the resulting deformity which is shown in the accompanying photographs, is not so great as might have been expected. Whether more radical measures should have been attempted at the very beginning is a question. I am inclined to think that if this had been done at the outset much of the subsequent trouble might have been avoided.
It is of course much easier, in looking back, to realize what should have been done, and the indications in these cases are sometimes misleading, for the patients often recover from an acute inflammatory process without needing an operation; but when they have gone on to abscess formation, and the nitranastral drainage is insufficient, I think the treatment should be radical and thorough, removing as much of the diseased tissue as possible.

The patient, C. W. F., 63 years of age; married; German; janitor, was referred to me by Dr. F. Tilden Brown. He was first seen on April 23, 1905, and from his physician and his son the following history was obtained:

In January, 1905, he had an attack of influenza with marked supraorbital pain, which was followed by the formation of an abscess at the upper inner angle of the left orbit. This was opened at one of the smaller special hospitals in New York city on February 12 under cocaine anæsthesia, the patient remaining in the hospital three days; but as the discharge continued, he later had an extensive operation at one of the larger hospitals on March 16, on the left frontal sinus and left ethmoid. This operation is said to have been a "Killian." The wound was left open. He had erysipelas and was transferred to the isolation ward, returning to his home April 15. The wound gradually closed, and the patient did fairly well except that a purulent discharge continued from a silver tube which had been placed in the inner angle of the wound. On April 21, the tissues in the neighborhood began to swell and there was considerable pain associated with the swelling. On April 22, an incision was made over the outer part of the eyebrow, allowing the escape of considerable pus. He was at that time told of the necessity of a more extensive operation and was referred to Dr. Brown through whose kindness I then saw him, on April 23, 1905.

Examination showed a man in good general condition except for a marked general arterio-sclerosis with irregular pulse and irregular heart action. His temperature was normal. The local examination revealed the left eye closed with a marked cellulitis and infiltration of the tissues all about it, running well up onto the forehead. At the outer end of the old "Killian" scar, which
extended outward perhaps two-thirds the length of the supraorbital ridge there was a short incision $\frac{3}{8}$ of an inch in length from which pus was oozing. Just below the inner canthus was a silver tube which ran straight backward and inward $\frac{1}{2}$ inch; pus also discharged freely from this. When the eyelids were separated, the conjunctiva was suffused and boggy. Rhinoscopic examination revealed the presence of pus and crusts on the site of the left middle turbinated, which had evidently been removed. There was a small drop of pus at the site of the anterior and of the right middle turbinated, which was also missing. This was the only time that I detected any pus in the right nostril.

April 23, under nitrous oxide and ether anaesthesia, after inserting a post-nasal tampon, an incision was made from the outer discharging cut through the old scar down onto the nasal process of the superior maxillary. The tissues were all very oedematous. At the inner angle of the wound a probe detected loose bare bone and this was grasped with forceps and removed. Viewed in the light of subsequent events, this was probably the remains of the supraorbital arch and the floor of the sinus which had been left at the previous operation. It was irregular in shape, about 1\(\frac{1}{4}\) inches long and $\frac{1}{2}$ inch in its broadest diameter. When this was removed the cavity of the left frontal sinus was exposed, enabling the landmarks to be made out. This cavity was full of spongy purulent necrotic mucous membrane. This was all thoroughly removed with the curette; all dead bone was removed and the edges of the sinus were smoothed down with rongeur forceps. There was a fair-sized opening into the ethmoid and nasal cavity; this was thoroughly curetted and enlarged to the diameter of $\frac{3}{8}$ of an inch. There was an absence of a considerable part of the septum between the two frontal sinuses, so that a probe passed into the right frontal sinus $\frac{1}{2}$ inch beyond the midline. The right frontal sinus was then thoroughly curetted through this opening, much necrotic mucous membrane being found. The condition of the patient did not warrant further extensive operative procedures, and it was hoped that by what had already been done and by further intranasal treatment on the right side the wound would close and give no more trouble. After thoroughly flushing out both the wound, and the nasal cavity through the canal made into it, plain gauze
packing was placed \((a)\) through the canal into the nose, \((b)\) into the right sinus and in the wound which was left open entirely, and a dry dressing applied.

*Subsequent History.*—The patient did most satisfactorily following the operation. He had a good night, very slight pain; and required no stimulation. His pulse and temperature remained practically normal, the temperature once getting to 99° F.

April 24.—The drain through the nose was removed; all other drains were loosened; œdema was gone, conjunctiva was much better.

April 28.—The wound was granulating well; there was a very small amount of discharge; his condition was fine. The conjunctiva had cleared up. The patient could use the eye.

May 9.—The wound had healed over the eye; there was not much discharge. Since operation the nose had been irrigated from above through the inner angle of the wound. The left antrum was washed out through the inferior meatus but no pus was obtained.

May 26.—The wound had healed except at the inner angle close to the nose, where there was a small opening still persisting. It had not been possible to pass a probe into the right sinus from the nose nor had it been possible to pass any instrument down into the right nostril from the wound, although several attempts had been made with bent probes. Peroxide of hydrogen injected into the right frontal sinus through the wound did not appear in the right nasal cavity. At this time it seemed doubtful whether there was any communication between the cavity thought to be the right frontal sinus and the nose. It was thought that this cavity might have been an enlarged prolongation of the left frontal sinus. Transillumination of the right frontal sinus was not satisfactory and revealed nothing.

Attempts were made by cautery with saturated solution of nitrate of silver to close the fistulous opening, but a small amount of purulent discharge still coming from it, it was decided that operative procedures would be necessary to obliterate the cavity in order to cause the cessation of the discharge.

*Operation.*—August 2, 1905; Manhattan Eye, Ear and Throat Hospital. Nitrous oxide and ether anaesthesia; time
one hour. An incision was made from the fistulous opening directly across the bridge of the nose and curved out on the right supraorbital ridge to a point half-way between the inner and outer canthus. The skin and peristomeum being elevated, the right frontal sinus was opened. It was found larger than was expected; extending outward to a point about halfway between the inner and outer canthus. There was considerable necrotic tissue in it. The anterior wall was removed entire and all projecting edges and irregularities were smoothed down. A probe was passed down apparently through the naso-frontal duct into the nose, but to my finger in the nostril it felt as though there was mucous membrane or perhaps slightly thicker tissue between it and the probe. The probe was pushed through this resisting tissue, and left in place while a post-nasal tampon was inserted. On the probe, as a guide, a small-sized bone curette was then passed down through the wound to the finger in the right nostril and the canal was curetted out. A strip of gauze was then carried through from above, brought out of the nostril and drawn back and forth, bringing away the debris of the curettage and enlarging the canal to nearly the diameter of the little finger. The necrotic tissue was then thoroughly curetted from the frontal sinus, from the canal leading to the old fistulous opening and all around this opening. All bony irregularities were removed and the cavities were made as smooth as possible. After thorough irrigation with boric acid solution, a plain gauze drain was passed into the right nostril from the right frontal sinus and one from the sinus out through the site of the old fistulous opening. The wound was then closed with interrupted silk sutures, except at the left angle where the fistula had been. Firm pressure was accomplished by dry compresses and a tight bandage.

The patient reacted from the operation well and left the hospital in a week. The wound healed satisfactorily except for slight stitch abscesses, which cleared up on the removal of the stitches and the application of a wet dressing for three days. The wound was irrigated a few days, the fluid coming out of the nose. The cavity was also irrigated from below through the canal which had been made through the ethmoid.

On August 19 there was absolutely no discharge from the old opening, which was getting very small, just admitting the
point of a probe and there was no discharge from the nose. The frontal sinus was apparently filling up satisfactorily.

On September 8 the wound had healed completely. There was no depression over the right frontal sinus; there was no discharge from the right nostril; there was a small drop of yellow pus at the site of the left middle turbinate which had been present from the beginning, and is due I think probably to a small amount of necrotic tissue in the ethmoid region. There was of course a marked depression over the left frontal sinus as the supraorbital ridge at its inner end had been removed. This is shown in the photographs.

Examination in December shows the condition the same except that a slight depression over the right frontal sinus exists.

I think the presence of some diseased tissue left in the right frontal sinus accounts for the failure of the wound to close after my first operation. There was no drainage from the right sinus into the nose, which may be accounted for either by excessive granulation tissue filling up the opening of the naso-frontal duct, or it may have been one of the cases in which the naso-frontal duct opens into an anterior ethmoid cell instead of into the middle meatus, or ends in a blind prolongation.

This latter view is rather supported by the fact that the probe which was passed through the naso-frontal duct in my second operation met with resisting tissue before it was passed through this into the nasal cavity. The rapidity with which the wound closed after the last operation forcibly illustrates nature's power of repair when irritating influences are removed.

If the patient's condition had been better I should have done a complete operation on both frontal sinuses at the first operation but his condition did not warrant more than was done at that time. I have reported the case and operations in full details as the conditions met were rather unusual. The very small amount of discharge from the left side which is still present is so slight as to be of no annoyance to the patient and the use of a cleansing spray daily makes him perfectly comfortable.