ROYAL SOCIETY OF MEDICINE—LARYNGOLOGICAL SECTION.

April 3, 1914.

DR. D. R. PATERSON, *President of the Section, in the Chair.*

DISCUSSION ON THE INTRANASAL TREATMENT OF FRONTAL SINUS.

(I) Introductory Paper by P. Watson-Williams, M.D.[1]

Case of the "Incomplete" Operation: Subacute Case, with Nose too narrow for Inspection of Operation Field; Operation at one Sitting; General Anæsthesia.—P. Watson-Williams.—Male. Had suffered from right supra-orbital neuralgia during December, 1913; pus seen in middle meatus far back, at times cacosmia. Right antral exploration with suction syringe yielded pus. Skiagram showed right frontal sinus blurred. Right antral intranasal operation, with partial removal of posterior border of nasal process as it encroached on and narrowed the nasal passage. Anterior entry of right frontal sinus by removal of fronto-ethmoidal cells enabled a 6 mm. thick bougie to enter freely. Antral pus film, G. P. streptococci; some phagocytosis. Antral pus culture, G. P. streptococci; no staphylococci. At the time of operation 50 c.c. of anti-streptococcic serum were injected. Sensitized streptococcal vaccines (autogenous) followed, dosage 75 millions up to 450 millions. Discharge almost ceased. No headaches since the operation. The patient can pass a bougie into the sinus and lavage himself.

Case of "Complete" Operation; Chronic Frontal Sinus Suppuration.—P. Watson-Williams.—Male, aged thirty. Subject to left supra-orbital headaches for many years, but two years ago they became very severe, and then were relieved by discharges of pus. Recurrences ever since, usually once a week or so. His left antrum was opened and drained in 1912. On March 16, 1914, nothing larger than a 2 mm. cannula would enter his left frontal sinus. Anterior entry and removal of fronto-ethmoidal cells allowed admission of a No. 19 (6 mm.) bougie. On March 18 the crista nasalis burred, so that a No. 19–25 bougie entered (8 mm. by 6 mm.). No headaches since the operations on the frontal sinus, both under cocaine anæsthesia. Since the operation slight curettage of sinus, lavage and injection of collusol argentum. The 6 mm. bougie entered and withdrawn several times during the meeting. The patient can pass a frontal sinus cannula and lavage himself.

(II) Introductory Paper by Herbert Tilley, F.R.C.S.[2]

Sir STCLAIR THOMSON was reminded that it went without saying that all these researches on the frontal sinus should be confirmed by X-rays. It seemed to him only the other day that he (the speaker) presented some radiographs to the old Society, to show that no one could be positive that a probe or cannula was in the frontal sinus for the first time, unless

[1] See JOURN. OF LARYNGOL., RHINOL., AND OTOL., May, 1914, p. 225.
[2] See JOURN. OF LARYNGOL., RHINOL., AND OTOL., May, 1914, p. 242.

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it was confirmed by the radiograph. Some of the photographs exhibited showed that Dr. Watson-Williams was not in the frontal sinus, but in those cells which he (the speaker) many years ago called the orbito-ethmoidal cells, a term which had since been adopted, and was expressive. He was reminded of a remark attributed to Charles Lamb, that whenever a new book came out he always read an old one! When these new operations were brought forward he (the speaker) turned his thoughts to former external work on the frontal sinus. He confessed that he would feel much less nervous to-morrow in operating on a frontal sinus by the external method than by blindly using a burr or similar instruments inside the sinus itself. Perhaps that feeling might change with experience. Last time he was in Paris he asked Dr. Luc if he always thought it his duty to tell every patient he was about to operate upon that the external operation was a very serious one, and his reply was that he did not think it necessary since he had adopted the complete Killian method, for he thought it no more risky than any operation on a septic nose. He was also recently in Berlin, and found that Professor Killian now did fewer external operations on the frontal sinus, and in a clinic of some 15,000 new cases every year he only used the external method in six to ten cases. Killian had also been studying the internal route. Four weeks ago he saw the operation done by Max Halle. Halle turned down a flap and chiselled away part of the ascending process of the superior maxilla, so as to get at Mosher's agger cells. These he broke down sufficiently to pass Ritter's probes. Having done that, he came to what he (the speaker) regarded as the alarming part of the performance; he took the last of the three sizes of burr shown by Dr. Watson-Williams, and got it into the sinus before making it rotate, and he rotated it as he brought it out, and in that way he claimed to get down the crista nasalis. This method could not succeed in every case, owing to the anatomical diversities in the human body, and these were so common that the operator must be prepared for disappointments.

Into the orbito-ethmoidal cell of a skull the speaker had passed some black worsted. The cell could be seen to spread over the top of the orbit, and there was no communication between it and the frontal sinus. One might operate on the sinus successfully, without relieving the patient of a lot of nasal suppuration, and possible headache, from not knowing that there was this configuration, whereas when operating by the external method one was more likely to expose it. He asked members to note the very narrow fronto-nasal duct, and see the dangers that would be run from putting a rotating burr through it.

Coming to results, there could be no doubt that this internal route had a great future, particularly in women, who, quite naturally, would not consent to external defacement. But there would always remain the possibility of reinfection, and therefore the important question arose, Was it safer? His own feeling was that he had now little hesitation in recommending the external operation, although disasters would come at odd times, and he had published his—all in pioneer days. Luc had several disasters at first, but he had not now had any for a long time; neither had Mr. Tilley, nor he (the speaker). Still, he often quoted Killian's experience: he operated eighty-six times on the frontal sinus without a fatality, but before reaching his hundredth case he had had three deaths, one of which was from dammed-up pus in an undiagnosed sphenoidal sinus, another plea for making a very complete diagnosis before starting to operate. Those who were thinking of this operation should limit their attentions at first to the approach to the frontal sinus.

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Dr. Dan McKenzie said that perhaps the whole problem had not been dealt with in the manner in which it was troubling some minds. It was necessary to settle in what type of case the internal operation should be done, and when the external should be chosen. He, with the last speaker, would use caution before adopting the internal operation, which he thought was regarded by many as secondary in safety and in position. The swing of the pendulum in favour of radical operation three years ago was now at the opposite extreme, and there was too much tendency to operate intranasally. There were cases in which the internal operation would be perilous to the patient, and he knew of no method—not even X-ray examination—by which one could be quite certain of the anatomy before operating. If the intranasal operation were adopted in a general and enthusiastic manner, he felt convinced that many cases of disaster would be encountered. Certainly operating by this route should be done with the eyes wide open to its risks and dangers.

Dr. E. A. Peters had shown two cases operated upon by the method, and he did not doubt that there was much to recommend it over the external operation, but there were some points which he was not clear about. In another case operated upon one side which had discharged spicules of bone was dealt with by the external, and the other by the internal method. On the first side the mucous membrane was polypoid, and he wondered if such a condition could subside when the intranasal operation route were chosen. With regard to the probe which was used, both before the cutting operation was commenced and during the operation, to locate the position of the canal, it was useful to have its last eighth of an inch rather sharply bent. In a narrow nose he obtained an excellent approach by cutting vertically through the septum and working from the other side; he could then see into the cells, especially by using a Hartmann's speculum. The patients he showed were operated upon by a procedure which occupied only twenty minutes. He first cut off the anterior edge of the middle turbinal by small Luc's forceps, and then followed with a probe. In a short time he could pass a Good's raspatory, and then cut downwards through the agger cells if present. It was necessary to avoid using much pressure, and to do the cutting from above downwards and outwards. He did not think the method would be so good when polypi and carious bone were present.

Mr. J. P. I. Harty had performed the operation just described, and had been very pleased with it, and with the ease with which it was done. In most of the cases he had done it under local anæsthesia. The entry was easily made and the washing-out was easy, but the difficulty was as to when the suppuration would stop. In some cases which he had kept under observation the suppuration had persisted for some months, though the headache and other symptoms had been relieved.

Dr. Donelan had just been asked how many cases of chronic frontal sinus suppuration really needed operation. For his part he thought he did not see more than about twenty-five of such in a year, and many of them were perambulatory cases going to various hospitals. In chronic frontal suppuration he thought we had all been doing for years the most legitimate internal treatment. We had all removed the anterior end of the middle turbinal, and if we did not distinctly recognise the anatomical importance of the agger cell, if such really exist, one went through them with the forceps, and cleared upwards and outwards through the ethmoid as far as possible. Where this had not sufficed, he had always opened the inner end of the frontal sinus by an external incision. The ingenious drills shown on this occasion were all for the purpose of removing in

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more or less dangerous ways the obstruction caused by the nasal crest. He thought it could be much more safely removed by means of a curved chisel externally, and the advantage on the score of safety was so great that he thought this method was superior to any other. He must admit that in the great majority of the cases so operated by him, on inspection of the cavity and the use of a flexible probe through the small opening, it was decided to undertake the obliteration of the sinus. It was unnecessary to insist on the importance of this direct examination of the interior. Mr. Tilley had himself admitted in his paper that even when one had succeeded in entering the cavity by an exclusively internal route, the operator did not know where he was, pathologically speaking, for one could not know what was taking place round the corner. He could refer to only very few cases that really needed operation in which this combined method had been successful, and he was of opinion that if what he called the legitimate internal treatment were not successful, and the patient continued to complain of pain, the radical external operation should be performed.

Mr. HOPE said that a short time ago Sir StClair Thomson and he had a look at some specimens of skulls, and he was sure that in some of them there was not more than 4 mm. of safety in the region where Dr. Watson-Williams said there was usually a space of 9 mm.; hence there would have been danger if this operation were done on such. He asked what means there was for determining the depth of the sinus.

Mr. HOWARTH agreed as to the need of the surgeon having, in order to do this operation, a clear grasp of the anatomy of this region. That had been placed on a more satisfactory footing by the paper of Dr. Mosher, and his own examination of many skulls and *post-mortem* preparations had brought him to the same general conclusion as to the opening of the fronto-nasal duct and its relationship to the ethmoidal cells. Since Mosher published his paper, that authority had come to the opinion that the "agger nasi" cells were not present so frequently as he was at first led to suppose. It seemed to the speaker that one reason why Mosher's point of entry was a good one was that it was above the region of the agger nasi, and the ethmoid was entered by going through the middle turbinate itself. He believed that Mosher did not now lay particular stress on the preservation of the middle turbinate. He (the speaker) did not think that the internal operation could be applicable to all cases because of the varying anatomical configuration of the fronto-nasal duct. In those cases where the frontal sinus was developed from the third frontal groove in the frontal recess, the fronto-nasal duct was placed external to the infundibulum and opened into it obliquely. He had seen specimens where the fronto-nasal duct had been going down external to the whole ethmoid labyrinth, and it could not be safe to approach these by the internal method. The operation certainly had a great future, but he agreed with Dr. McKenzie that it would be necessary to choose with care the patients for submission to it. As regards his own procedure, he had not as yet been courageous enough to use the burr or raspatory to remove the nasal crest, but had followed Mosher's procedure and worked rather from behind forward. He thought that this gave a better approach to the ethmoid than the anterior method, as in the latter, unless agger cells were present, one was apt to come up against the ascending process of the superior maxilla, and did not readily enter the ethmoid labyrinth, and to enter the frontal sinus one must often burr off the nasal crest. By going in further up one was more liable to enter the ethmoid labyrinth, and so get at the fronto-nasal duct. He thought

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that one reason the operation was so successful was that in approaching the frontal sinus co-existing ethmoiditis had to be dealt with.

Mr. W. Stuart-Low said he had listened with great interest and instruction to the addresses and demonstrations. He agreed with Mr. Tilley that whether this operation was accepted or not largely turned on the anatomy. On the score of anatomy alone he had no hesitation in rejecting such procedure as this operation as unsurgical; it was impossible to know the exact anatomy, and the variations of these parts were so great that to do as suggested and push burrs and bougies about in this region was, in his opinion, reprehensible. He had shown many successful cases where a combined operation had been performed, the intranasal preparation for the Ogston's external method first being done, the middle turbinal being entirely removed, and thus free drainage from below established as a preliminary to the Ogston operation. By the external operation every step could be observed and the sinus thoroughly cleared of polypi, and a thickened pyogenic lining scraped away. He agreed with Dr. Peters in considering that it would be impossible to remove polypi through a small opening into the nose from below, as suggested in this new method. He would not adopt what he would characterise as blindfold surgery.

Dr. Cathcart considered the present meeting an epoch-making one in the Society, as it was held for the discussion of an operation, which had been done a good deal on the Continent and in America, and of which the pioneers in this country were Dr. Watson-Williams and Mr. Tilley. As a rule, a new method of operation is suggested in order to obviate the dangers of the old one, and it must be remembered that the introducers of this discussion were also pioneers of the old operation; hence it was not likely that they would take up with the new, the intranasal, operation unless they felt there was less danger from it than from the old one. The attitude of Dr. Dan McKenzie was well illustrated in the seventeenth century, when in Paris there was a celebrated friar who cut for stone so successfully that the Paris surgeons had him educated in anatomy. This taught him the dangerous region he had cut into, with the result that he was afraid to operate again. If operators were only to have in mind all the supposed dangers, no new operation would be devised or done. He had seen Dr. Watson-Williams operate, and what struck him was that the operation was done by the feel of the end of the forceps. In fact, in one case the septum was so deflected that it was not possible to see the middle turbinate bone. In the olden days the operation on the maxillary antrum was always done from the outside, because it was said the operator must see what was going on. It was now far more often done from the inside, and the success was no less great. The chief point to be emphasised was that each one, before trying the intranasal operation, should practise it on the cadaver. Anatomical variations were as likely to be met with in the intranasal as in the extranasal operation.

Dr. FitzGerald Powell said that for his part he would certainly keep an open mind and would not form conclusions as to the utility and dangers of the operation until his experience warranted it. In the past Mr. Tilley had been a strong supporter of the external radical operation, and he (Dr. FitzGerald Powell) had learned a good deal about frontal sinus treatment from him, and had seen a number of Mr. Tilley's cases which had been treated by the external method and had been successful, and he could not quite understand Mr. Tilley's statement that for two years he had not treated a single case by the external method.

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Dr. Watson-Williams, in his excellent work on "Rhinology," published in 1910, expressed himself as strongly opposed to the internasal method, which he now advocated—going so far as to say that, even if there was no danger in this operation, it was not so good a one as the external operation—and he could only conclude that with more experience of the "internasal" operation he had changed his opinion in regard to it. Consequently, he would advise the members, with Dr. Watson-Williams' experience before them, to defer their judgment until a more extended knowledge of results was obtained. There were certain cases in which he thought the internasal method could not be applicable—viz., where there were indications of diseased bone in the sinus, in cases of external fistulæ, bulging of the walls of the sinus, and, as in Mr. Tilley's case, where "loculi" were found in the sinus. In these cases he had always found that an external operation was required. In cases in which the foregoing conditions did not exist, he had been well satisfied by the results of removal of the anterior half of the middle turbinate bones, and, if necessary, the curetting of the ethmoid cells and washing out of the sinus. In one case he remembered there was complete recovery in six or eight weeks in this way, washing out the sinus three times a week. In doing the external operation experience had taught him to avoid extensive operations on the bony walls of the sinus. By opening through the floor and lower part of the anterior wall of the sinus he was enabled to explore the sinus and enlarge the passage into the nose, having previously removed the middle turbinate; in this way he got free drainage and cure of the disease.

Dr. H. J. Davis said he had always felt reticent about doing resection of the septum in suppurating noses, because of the possibility of infection. He had seen instances where, after this had been done, the septum sloughed away. He (the speaker) had operated upon fifteen, and he thought Mosher, in leaving the middle turbinal, meant it to be a landmark. By keeping external to this the cribriform plate could not be damaged. The position of the agger nasi cells varied in different skulls. The best way to get into them was to put the finger on to the lachrymal bone, pass a small Volckman spoon into the nose, and try to hit off one's finger with the spoon. If one was low down, the spoon could not penetrate; but if one was over the exact spot penetration was easy, and under cocaine one could pass a frontal sinus cannula. In washing sinuses out, tincture of iodine had a very rapid effect; hydrogen peroxide and other lotions were not, in his opinion, so efficacious. The reason that some cases which had the radical operation done did not do well was that the operator wanted to do too much and did not know when to stop. He had had two cases of death after the external operation, the skull and brain of one of which was shown before the Section two years ago. He had operated upon this man twice intranasally, but he worried to be taken into hospital again for constant pain, and he was operated upon externally by Killian's operation. An abscess in the frontal lobe was opened and drained, but the patient, a man, aged thirty, died of basal meningitis. The abscess in the frontal lobe had evidently been the cause of the incessant headaches.

Mr. Norman Patterson felt particularly interested in Dr. Peters' remark about an incision through the septum. For some considerable time past he had been trying a method of operating through the septum from the other side of the nose. After performing a submucous resection in the ordinary way, he made an incision through the muco-

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perichondrium, on the opposite side, parallel to the original incision and half an inch behind it. One could work through the gap thus made by using a StClair Thomson speculum. In this way an excellent view was obtained of the ethmoidal region. Recently he operated on a case in which a fortnight previously he had done a submucous resection. In this case both ethmoids were diseased, and he made an oblique incision through the septum and with comparative ease he dealt with the disease on both sides. Afterwards he inserted stitches into the septal incision and union was perfect. The further forward in the nose the disease the better the view. He thought this method would be useful in frontal sinus cases. He had found it of use in sphenoidal sinus disease.

The CHAIRMAN (Dr. Hill), in summing up the debate, said that, as far as he could gather, the majority of the members of the Section had come prepared to "damn with faint praise" the pre-nasal treatment of long-established frontal sinusitis in spite of the perusal of the papers of introducers. Many, no doubt, were still impressed by the *à priori* objections which had been so lucidly summarised by Sir StClair Thomson, more especially as regards the dealing blindly with hard bone in a dangerous area in the later stage of the operation and the limited nature of the surgical measures which it was possible to carry out on the diseased mucosa, compared with what could be done by the external obliterating operation. If mere, but efficient, drainage and irrigation through an enlarged infundibulum were really proved to be a curative measure in itself in many cases, then the minor operation of enlarging the fronto-nasal canal, by a small external incision at the inner angle of the orbit, as advocated by Dr. Donelan, would effect this without running the possible risk of perforating the cribriform plate or the internal table. Mr. Howarth and others were satisfied with the old per-nasal method—namely, of removing part of the turbinal, followed by breaking down the bulla and the cells above, and then inserting the bent metal sound in an upward and forward direction through the ostium; when this could be carried out, as it sometimes could rather easily, this more posterior route had the advantage over the more anterior one in that the hard bone of the nasal process and the crista had not to be dealt with, more or less in the dark, by formidable instruments; on the other hand, the operative field was in dangerous proximity to the cribriform plate, and one could not look straight into the sinus from the anterior naris, as was possible in cases shown that afternoon. The cross (×) in Mosher's diagram, which had been shown on the screen by each of the introducers, was situated over the cells immediately posterior to the fronto-nasal duct, the cells which Mr. Howarth and others still opened in some cases, according to the old posterior method, and this diagram in Mosher's paper dealing with the agger cells and the more anterior route had led to great confusion, and had probably been inserted in the wrong place; at all events, the cross was in the wrong place in the diagram if intended to indicate the point of penetration in the agger route. He (the speaker) did not think there was any mystery about these agger cells; they were, he had always understood, the maxillo-ethmoidal cells of the text-books. Two speakers only, Dr. Peters and Mr. Harty, had actually performed operations of the new type advocated by Dr. Williams and Mr. Tilley, and it was significant that whilst they both gave the method their support, those who had raised objections had not referred to any personal experiences of their own. Dr. Cathcart had called attention to a somewhat disconcerting fact, which probably many of them had in their minds—namely, that the advocates of the new per-nasal operation

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were amongst the most experienced and expert exponents in this country of the external radical operative methods, and yet they now came forward and stated, as the result of their recent considerable experience, that as far as they are concerned the per-nasal operation is the operation of choice in an ordinary uncomplicated case of chronic frontal sinusitis. Such a deliberate pronouncement cannot be ignored coming from such authorities. The method of operating adopted by each is similar in principle and differing only slightly in detail. His (Dr. Hill's) own experience had been limited to the passage of a frontal sinus cannula in a few acute cases, and in chronic cases with acute exacerbation he had occasionally removed the anterior extremity of the middle turbinal and passed a metal sound into the sinus if it would go up easily; and it was a curious fact that it often does go up easily in chronic frontal sinusitis. He had not, however, systematically washed out the sinus, nor had he ever attempted this new Ingals-Good type of operation. If, in the future, he (the speaker) came across a case in which he could easily pass a fairly large sound into the frontal sinus after the old method, he was inclined to think he would not really be running much risk in using Dr. Watson-Williams's drill with guarded burr to enlarge the opening forward.

The discussion had been a most instructive one, and showed that, in the expert hands of the introducers of this discussion, the newer per-nasal procedures advocated were safe and usually effectual; and in view of the equally satisfactory reports from abroad from an increasing number of adherents, those who had up to now been accustomed to rely almost entirely on external operations would probably feel that it was at least incumbent on them to seriously reconsider their attitude towards this question.

Dr. Watson-Williams, in reply, said he was sorry to have given the impression that he had taken up the intranasal route to the exclusion of the external operation; that was not so. The intranasal method, however good, had its limitations, and it was not suitable in a small percentage of cases. For such he had himself devised an external operation and found it very satisfactory. All he contended was, that by employing in the intranasal operation the methods of anterior entry, the sphere of usefulness of the intranasal operation would be much increased. Sir StClair Thomson referred to some of the skiagrams he had exhibited as showing the bougie in the orbito-ethmoidal cells, but that was an optical illusion. Those skiagrams were to show that the 6 mm. thick bougies were carried back by the nasal crest so as to lie against the tabula interna (the swan-head bougies had a thin neck, so the lower part did not push the tip back so much), and that for the same reason it was most dangerous to use unguarded burrs or chisels in this region. Other skiagrams showed that after removing the nasal crest one could pass the instrument straight up well into the frontal sinus. Mr. Howarth had suggested that the forceps might impinge against the frontal process of the superior maxilla, but in practice he would find that it was not so. Often agger cells were not present. Like himself, Vacher and others removed these cells long before Mosher's paper at Liverpool emphasized their importance, and helped us in so many ways by his work. Dr. Dan McKenzie appeared to be afraid of the new method, yet not so long ago he (the speaker) shared all those fears, till actual experience gradually dispelled his anxiety, and he thought his methods removed all dangers. By going through the anti-conchal cells one was in front of the cribriform plate, and the latter could not be endangered until one got further back.

In answer to Dr. Peters' question as to how a case with polypi

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should be dealt with, Dr. Watson-Williams stated he had shown a specimen with an enormous number of polypi in the frontal sinus. There was a large fronto-nasal duct, and there were no symptoms because of the size of that duct. If one imitated Nature by making a large opening there was rarely trouble from polypi in the sinus.

He could not agree with Mr. Tilley in some of the points he had emphasised in his paper. Mr. Tilley said that when acute symptoms persisted in spite of palliative measures or of mere anterior middle turbinectomy allowing of no effectual lavage, and especially when swelling and œdema appeared in the eyelids and in the soft tissues over the sinus, external operation would be called for, but he (Dr. Watson-Williams) found that the more acute cases were most responsive to intranasal operation, and clearance of the anti-conchal and fronto-ethmoidal cells should at least be tried, despite the presence of the symptoms mentioned, provided, of course, there was nothing worse. Even the occurrence of subperiosteal orbital abscess did not contra-indicate intranasal operation, and there were cases on record where opening the ethmoid cells relieved such a severe orbital complication. Mr. Tilley further mentioned, among the conditions which should influence operators in selecting external methods of operation, (*a*) when the sinus ostium was situated above the level of the cribriform plate, and when the posterior wall was so low as to closely overhang the ostium. To this the speaker replied that the sinus ostium was usually as high as, and very often higher than, the level of the cribriform plate, and he would consider that the higher the ostium the less the risk to the cribriform plate from the intranasal operation with retention of the middle turbinal plate intact, while the fact that the tabula interna overhung the ostium could not be detected by a skiagram, but if one avoided all gouges, chisels, and unguarded burrs there were no undue risks. Mosher's method of entry, which was followed by Mr. Tilley, he should consider unsafe.

With regard to his case, which subsequently died, Professor Walker Hall's, the pathologist, report showed that the frontal sinus operation had nothing to do with the death; there was no meningitis, death having been due to cellulitis of the leg and pyæmia. Still, he had thought it right to bring the facts forward.

With reference to the question of Dr. H. J. Davis, Dr. Watson-Williams considered it was better if possible to postpone operations on a deflected septum, which, except in extreme deformity, did not prevent removal of the anterior ethmoidal cells and entry to the frontal sinus.

Mr. Hope was mistaken in saying that he (Dr. Watson-Williams) had spoken of 9 mm. space as usual, and pointed out that 6 mm. was the maximum, often only 4 mm. was safely available.

Mr. Herbert Tilley, in reply, said he joined issue with Sir StClair Thomson as to the specimen he had shown; if the cells were removed, which had been referred to in the opening papers, one could drain the fronto-ethmoidal cell in the specimen, which Sir StClair Thomson said could only be attacked by the external operation. In answer to Dr. Peters' question as to polypi in the sinus he had referred to the treatment of this condition in his paper. When there was polypoid degeneration in a sinus, by irrigating and injecting warm air, and then injecting iodine or nitrate of silver, one reduced the villous condition of the mucous membrane, and little was secreted except pure mucus.

Dr. Donelan said the operator did not know where he was when operating by the intranasal method, but his (the speaker's) reply was that he knew where he was if he set out to master the anatomy of the

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parts and worked in the way which had been described in the opening paper. By removing the anterior cells one found oneself in a large cavity (the frontal sinus), and free drainage was provided from the lower end of that cavity. If there was much bleeding, and one put in strips of gauze moistened with cocaine and adrenalin, it was surprising how much one could see.

In answer to Mr. Hope, he did not bother about the depth of the sinus in the intranasal operation. On the contrary, with the external operation one would have a deep sinus and scar, and possibly a dead space, which could not be obliterated. In that kind of case the intranasal operation was a great advantage. The external operation implied disfigurement, and some six weeks' treatment, with dressing every day. These considerations had done much to determine his preference for the interior operation. Two days ago in London he operated upon a man by the intranasal method; he had double frontal sinus suppuration. That day he went to wash him out, and he asked whether he could go out within the week (three days after the operation), as he had now no headaches. Such an event was unthinkable with the old operation.

With regard to Mr. Low's combined operation he had had no experience of it.

Concerning the danger of the intranasal operation suggested by Dr. Cathcart, unfortunate cases were sure to be heard of, but the intending operator by this method should be well up in the anatomy of the part, and practise the operation on a few skulls first.

With reference to the necrosis of the frontal sinus walls, for two years he had not had such a case, and in such an event it would be recognisable by external symptoms. If such were present he would do the external operation, or for ocular or meningeal symptoms, or the escape of pus into the orbit. He thought that the majority of cases of chronic frontal sinus suppuration with polypi in the nose would be satisfactorily dealt with in the future by the intranasal method, while a minority would have to be treated by the external operation—*i. e.*, a reversal of the old procedure.

Abstracts.

NOSE.

Simpson, W. Likely.—A Method of Closing Perforations of the Septum of Nose. "Journal of the American Medical Association," July 4, 1914.

For the closure of a perforation of the septum Simpson advises a submucous operation with a transplantation of cartilage or bone, or both, to the site of the perforation, and a sewing of the overlying flaps. The transplant gives a support in place of attachment for the flaps of mucous membrane, thus avoiding contraction, which would otherwise occur.

His technique is as follows: Elevate the mucous membrane, as in an ordinary submucous operation, from the cartilage and bone, both anteriorly and posteriorly to the perforation, the edges of which must be pared. The bone and cartilage are then resected and placed in normal salt solution till required. The larger the transplant the better, and if a suitable piece cannot be obtained from the patient, one may transplant from another deflected septum, on which a submucous operation is being

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