having discovered the urethral glands (1702), which to-day bear his name, although they were previously found and described by Méry (1684), wrote several well-known works on the muscular system and a treatise on anatomy, entitled "The Anatomy of Humane Bodies," published in 1698, which he illustrated with 105 original plates, to which he added nine perfunctory ones of his own, which with a serene audacity which is not a stranger to some of our fellow-mortals of the present day, he bodily stole from the classical work of Bidloo (1685), a celebrated Dutch anatomist and contemporary. Cowper's service to laryngology consisted in bringing the main anatomical facts of sinus (antral) disease to light, in laying open, as it were, its pathological condition, in showing how it could be distinguished from other affections, how easy it was with the aid of anatomy to apply remedies direct to the cavities themselves, and finally how readily the structures could be reached surgically, thus making a giant stride from the practice which, we learn from Celsus, came down from a remote antiquity, of cutting open the face, even in cases of superficially situated ozæna and purulent discharge, and sewing it up a again.

SOCIETIES' PROCEEDINGS.

ROYAL SOCIETY OF MEDICINE—LARYNGOLOGICAL SECTION.

May 5, 1916.

President: Dr. W. Bond, in the Chair.

"The Complications following upon Intranasal Operations, and the Influence of Nasal Sinus Infection upon the Moral and Legal Responsibility of the Patient."

Cases and Specimens.

Group I.—Influence of Sinus Infection upon Moral and Legal Responsibility.

Pansinusitis with Complications—Neurasthenia, Appendicitis, Suicidal Impulses, Delusional Insanity; Operation; Complete Recovery.—W. M——, aged twenty-nine. This case is chosen as representative of several of the more important complications directly due to infection derived from sinus disease.

He came under notice in 1911 when suffering from great depression and general neurasthenia, for which he was under treatment. He had marked loss of memory for recent events and inability to concentrate his mind. He was a bank clerk, but had been obliged to throw up work. From being a remarkably cheery man and fond of mixing in society, he had become morose and miserable.

Briefly, his history began with an attack of influenza ten years previously; two years later he had appendicitis, but was not operated on till 1907, after further attacks had occurred. He suffered from insomnia for a year after that, and was sent on a voyage to Madeira, returning apparently restored. In February, 1911, he had another influenzal attack, and afterwards suffered from bad headaches and

https://doi.org/10.1017/S1755146300016516 Published online by Cambridge University Press

insomnia, becoming again thin, miserable, and depressed. He struggled with his work till he was sent on a voyage to Sweden in May, 1911, but returned with memory defective and inability to do any work. He also had much nasal discharge, but no marked headaches. He confessed that he had had suicidal impulses on his voyage, and before he was treated was the subject of delusions that he was devil-driven, and that it would be a sin to be operated on.

September, 1911: A double intranasal antral operation was performed, much pus being found in the antra. Bacterial culture showed *Staphylococcus pyogenes aureus* only. He subsequently suffered from more marked insomnia, and his delusions were more pronounced. The frontal sinuses were washed out with some difficulty, daily for a time. He then refused food and believed he was a dead man, and that it was wicked to allow himself to have any further operation, and two male attendants were required to feed him forcibly. He was quite insane, and as it was a choice between further operation and a lunatic asylum, his parents chose the former. But he steadfastly resisted any operation, because it was wicked to allow time and trouble to be wasted on a dead man.

On October 29 I performed my radical osteoplastic flap operation on both frontal sinuses, which were exceedingly large, extending to the outer orbital angles, and running far backwards, so that the orbital roof was removed to enable the whole of the polypoid mucosa to be cleared. It proved to be a very difficult and long operation. The wound healed well, although the delirious patient tore the bandages off and resisted lavage for many days, always being forcibly fed.

December 3: The wounds all healed, and there was very little discharge, but he was still full of delusions of having committed unpardonable sins, and even then often refused food for a dead man. From that time he gradually recovered, though his delusions did not disappear for some months. But he was able to return to work, and did so well that about one year later he was in charge of a branch bank and has continued to do well ever since, becoming as bright, cheery, and strong as ever. The deformity from the frontal sinus operation was scarcely noticeable, even on close inspection.

The connection between the insanity and sinus disease was too close to have been other than interdependent, and I am strongly of opinion that his appendicitis was due to infection derived from the sinus in his first influenzal attack.

Frontal Sinus and Antral Suppuration; Thieving.—Mrs. X——, aged forty-eight, came to me in 1906, complaining of severe pain in left supra-orbital region, round the left eye, and in left parietal region. She had a severe influenzal attack a year previously, and, on recovering, the severe pains began in the frontal region, continuing to recur ever since.

When I saw her she presented the usual typical signs of left frontal and antral suppuration, but it was remarkable that the pain in the head and eye would come on abruptly like neuralgia at 10 a.m. and lasted till 1 p.m. daily with almost clock-like regularity. She also had left sphenoidal sinus suppuration.

November 5, 1907: The left antrum and sphenoidal sinus freely opened per-nasally, and the frontal sinus washed out. The frontal sinus was frequently washed out, also the other opened sinuses. She improved greatly, but still suffered from neuralgia and depression.

https://doi.org/10.1017/S1755146300016516 Published online by Cambridge University Press

Shortly after this, her husband was greatly distressed because a valuable diamond ring had been lost by a friend in another county, and the police had discovered that the ring had been taken by his wife to a jeweller in Bristol to have the stones altered. There was no doubt that she had taken the ring; the evidence was conclusive, but the friends refused to prosecute. Now the patient—a lady in good social position—did not know that I had heard about it, but some weeks later in the course of a visit she herself told me of what she had done as a matter of interest, showing how absent-minded she was, saying she had gone to the room at her friend's house and picked it up with her own after washing; that she thought it was one left her by an aunt, and not liking the stones took it be altered.

September, 1908: The frontal sinus suppuration and left supra-orbital neuralgia having recurred and persisted, I performed my osteo-plastic flap radical frontal sinus operation on the left side. She made a good recovery, and was so pleased with the absence of deformity that she had a photograph done for her friends and myself. The cure has remained permanent.

Pansinusitis; Thieving.—Y——, aged seventeen. This patient was quite recently arrested for having stolen a postal order while engaged as a letter-sorter. When interviewed, she admitted the theft, but she had displayed egregious stupidity in carrying out her depredations. She had previously borne a good character, which was testified to by a medical man in whose employ she had been for some years: "She has frequently received money and receipted accounts for me at my surgery, and I have always found her reliable and trustworthy." She came of very respectable parentage.

The medical history of the case was briefly as follows: She came under my notice as an out-patient at the Royal Infirmary in 1911, and underwent an operation for antral suppuration in June of that year. In July, 1913, she had a further operation on the ethmoidal labyrinth, and in October both frontal sinuses were opened per-nasally owing to persistent discharge. After that she continued to complain of supra-orbital pain and a considerable amount of discharge. She was under observation from time to time, and in November, 1914, a septal re-section was performed. She had discharge from the left ear after scarlatina, followed by diphtheria, and which persisted at intervals for seven years. She had a left radical mastoid operation in January, 1915. It will be seen that she was an inveterate case of pansinusitis with double otitis media. I had no opportunity personally of judging as to her moral character, but there was sufficient evidence that she had been exposed to such pernicious influence as might result from infective conditions of the sinuses.

I sent an epitome of her medical history and of the operations performed to her solicitor, and in view of the fact that she had previously borne a good character, and also that she had exhibited such lack of intelligence in the method of carrying out her thefts, the justices took the view that the disease had some influence in bringing about her downfall, and that she was not normal, and therefore bound her over under the Probation of Offenders Act.

Cases illustrating the Effects of Nasal Accessory Sinus Infection.—Nasal accessory sinus disease causes baneful effects on the nervous system which show themselves in headaches, mental depression,

https://doi.org/10.1017/S1755146300016516 Published online by Cambridge University Press

slow cerebration, loss of memory, irritability of temper, moral perversion, and, in the reporter's experience, in this order of frequency. Almost every case of accessory sinus disease shows one or more of these phenomena. If there is nasal obstruction associated with the sinus disease, the effect on the nervous system is likely to be worse. The more accessory cavities there are involved, and the more chronic the disease, the more frequent and the more severe are the deleterious effects on the higher cerebral functions likely to be. These are the opinions arrived at from an examination of the reports of 200 cases of nasal accessory sinus disease taken at random from the reporter's practice. The cases comprise: Antral disease (single or double, with or without associated ethmoidal and sphenoidal disease), 143; frontal sinus disease (single or double), 7; frontal sinus and antral disease (single or double and with or without ethmoidal and sphenoidal disease), 21; ethmoidal and sphenoidal disease, 29. These cases can be divided, according to the presence, in a more or less marked degree, of the nervous phenomena already noted, into three classes—viz.: (1) Those in which these are absent or present to only a slight degree; (2) those in which they are bad; (3) those in which they are very bad indeed. Naturally, such a division is necessarily of an arbitrary nature, but as far as a standard could be set it was adhered to without prejudice. The result in tabulated form is as follows:

Cases	Class 1	Class 2	Class 3
143 antral	90	39	14
7 frontal	5	1	1
21 frontal and antral	9	8	4
29 ethmoidal and sphenoidal	22	6	1

The effect of operation is, in most cases, most satisfactory from the psychological point of view, but it is necessary to be guarded in prognosis in dealing with patients in whom signs of mental weakness or of a markedly neurotic tendency were present before the sinus disease developed. In these the sinus disease is likely to have a very bad psychical effect. Three cases of this kind are found in Class 3, two having suffered from antral and frontal disease and one from antral. The two former improved, the latter did not.

Sinus disease in young subjects retards mental development, but the cure of the disease leads to rapid improvement in this respect. The following case has special features:

S. P——, male, aged twenty-two, complained of nasal obstruction and nasal discharge of long standing. He also complained of frontal headache, great depression, loss of self-control, and it was learned he was a moral degenerate and an alcoholic, and had become unfit to attend to a good business of which he was the owner. He was convinced that his nose was the cause of his mental and moral instability. He had a double septal deflection pressing on both middle turbinates, and so occluding both infundibular regions. The septum was treated by submucous resection. This was followed by some improvement, and he disappeared from observation, though it was learnt from time to time from his doctor that there was still much room for improvement in his mental condition and his moral conduct. Two years later he came under observation again. He still complained of frontal headache, and there was pain over the right frontal sinus. Evidence of right frontal sinus disease was found, and was probably of long duration. The sinus was

https://doi.org/10.1017/S1755146300016516 Published online by Cambridge University Press

operated on by the intranasal route. The result, mentally and morally, was most satisfactory. His natural mental acuteness returned, and his habits completely changed—a result ascribed, by those who knew him, to the operation.

Mental Depression following Sinus Infection.—I had a very intractable case of suppuration of the maxillary antrum and probably of ethmoidal and frontal sinus suppuration. After a considerable time he left off treatment. A few months later I heard he committed suicide because of the continual trouble. He was always in a "depressed mental condition."

Influence of Sinus Infection on Responsibility.—In youth, aged twenty-two, with suppurating maxillary antrum, there were marked symptoms of melancholia and fear of suicide. Patient rapidly recovered after operation.

The Influence of Accessory Sinus Infection upon the Mental Condition.—A. W.——, married woman, aged twenty-eight; two children, youngest aged one year. Husband, a medical man, noticed that for about eight months his wife had become moody, irritable, and uninterested in all that she formerly loved. Sometimes hysterical and indifferent to her children, whom she formerly loved very dearly. Her husband, apprehensive, dare not leave her alone. She was seen by several eminent physicians, and intestinal toxæmia was diagnosed and treated, but without result. There was indefinite history of nasal discharge. Sphenoidal sinus found affected. This was opened freely. In three weeks she was a new woman, or rather "her old self," bright and cheerful. Three years have elapsed and no recurrence. No family history of any mental trouble.

Group II.—Complications following Intranasal Operations.

(A) Septic.

Osteomyelitis following Radical Antral Operations.—Some years ago I performed a radical antral operation (Caldwell-Luc) on a young anæmic, unhealthy woman. The antrum was vigorously curetted with a sharp spoon. She left the hospital at the end of a week and returned a few days later with swelling of the cheek and slight fever. She developed septic osteomyelitis of the upper jaw, and died a fortnight later from meningitis. I know of a similar case which was under the care of a colleague who considered the osteomyelitis to be due to the vigorous curetting.

Septic Pneumonia following a Nasal Sinus Suppuration Operation.—This case occurred under the care of a colleague, and, in his absence, was seen by me. A nurse, aged fifty, had chronic suppuration of the right antrum of a few years' duration. She also had occasional attacks of bronchitis. A simple intranasal antral operation was satisfactorily performed. The anæsthesia was a little deeper than necessary. Four or five days after the operation, the evening temperature rose to about 101° F. and fell to 99° F. in the morning. Expectoration increased and became purulent. Three to four weeks after the operation the patient died of broncho-pneumonia.

https://doi.org/10.1017/S1755146300016516 Published online by Cambridge University Press

Post-mortem : Purulent broncho-pneumonia with small abscess formation.

The antral operation was entirely satisfactory, and there was no gross nasal disease.

Meningitis following Submucous Resection.—Sergeant C——, aged twenty-seven. March 4, 1916: Complained of "a feeling of always having a cold for six months and loss of smell." March 14, 1916: Submucous resection performed and adenoids removed. March 18, 1916: Nose doing well, slight sore throat, temperature 99° F. March 22, 1916: Discharged as fit from hospital; nose in good condition.

His wife gives the following history of the period he spent at home: March 22, 1916: "Arrived home appearing well, but not so lively as usual." March 26, 1916: "Went to bed complaining of severe headache and refused food." This condition continued until March 29, when he had delusions, and a doctor was called in. He was quieter next day. April 1, 1916: He became violent and complained of pain in the back. April 2, 1916: He was admitted to hospital, and the diagnosis of meningitis was made. His cerebro-spinal fluid and blood were examined for organisms, and streptococci were found. The cerebro-spinal fluid contained much pus. April 3, 1916: He was very restless, had active delusions, and tried to seize at imaginary objects. He was partly unconscious, but could be roused to answer, though incoherently. April 4, 1916: Died. *Post-mortem :* Pus was found in his ethmoidal cells and sphenoidal sinuses, and they contained streptococci.

Septic Osteomyelitis of Maxillæ and Frontal Bone; Extradural Abscess and Meningitis.—(1) A fireman, about seven years ago. Old-standing case of polypi; operation on left antrum followed by spreading infection, many abscesses, and death from meningitis. *Post-mortem* examination showed perforation through roof of sphenoidal sinus.

(2) Corporal L——, at a military hospital in January, 1916. Old-standing case of polypi. A surgeon removed several polypi; then operated on the left antrum intranasally; later performed a submucous resection of the septum; he was then prevented by illness from further treating the case, and I saw the man. Swelling of left face and tenderness; an incision exposed necrosis of maxilla; subsequent spread of infection and several extensive operations performed, resulting in removal of most of both frontal bones and exposure of a very large extradural abscess over the frontal lobes; removal of the lesser wing of the sphenoid on the left side, both maxillæ and ethmoids; opening of both sphenoidal sinuses. At the second operation the vertical plate of the ethmoid was found necrosed and came away with the crista galli. Death eventually took place from meningitis, but not for three to four months after the first signs of the spreading osteomyelitis. Indeed, one felt that if the whole of the frontal and ethmoids and maxillæ (upper parts) had been removed at the first operation, the man might have been saved.

Complications following Intranasal Operations.—(1) Very many hospital throats after septum operations.

(2) Cases of septicæmia (mastoids, pneumonia, etc.) after septum, curetting, and sinus operations.

(i) Case of apical pneumonia after antrum operation in man. Recovery. No tubercle bacilli.

https://doi.org/10.1017/S1755146300016516 Published online by Cambridge University Press

(ii) Apical pneumonia after frontal sinus operation in man. Recovery.

(iii) Pneumonia, mastoid and lateral sinus infection after septum operation in girl. Seen in consultation.

(iv) Mastoid operation in man after septum operation. Seen in consultation. Death.

(v) Two cases of erysipelas in women, one after maxillary antrum operation, the other after ethmoid curetting. Recovery. *Both had erysipelas formerly.*

(vi) Two cases of fatal meningitis in adult girls after ethmoid curetting. In both cases onset about fifth day. One case explained by an epidemic of pneumococcal throat in ward at time, and by house surgeon having also a "throat." In second case patient was found to have been sea-bathing a week before operation and to have an acute rhinitis.

(vii) I have seen, in consultation, patients, after septum operation by an *operator with atrophic rhinitis*, suffer from septic troubles.

(viii) Influenza soon after operation on septum has been very harmful. In one case the mucous membrane sloughed away, leaving a large perforation.

Sinus Disease with Tic Douloureux due to Implication of the Nasal Nerve in the Anterior Fossa.—C. M—— had complained of severe pain darting up through the right canine tooth to the cheek and to the top of the head, and a few weeks later involving all three branches of the fifth nerve—viz. supra-orbital, branches of the infra-orbital and of the inferior dental. The violent pain recurred several times a day, and speaking and laughing, sometimes touching the cheek or nose, or blowing the nose, brought it on. Various remedies had been tried with no avail. Ocular causes were excluded. Some relief was obtained by injection of absolute alcohol in the region of the foramen rotundum, but it was partial and temporary. Patient said she had no nasal discharge, excepting "soppiness," which corresponded to an infected right ethmoidal labyrinth. Transillumination of the antra was good. An attempt was made to resect the right superior maxillary nerve, but on exposing the nerve at the exit from the maxilla, one entered the antrum through the softened bone of the nerve canal. The antrum was thereupon explored by the suction syringe and pus withdrawn; the same process on the left side withdrew muco-pus. Culture showed that this pus was due to pure *Staphylococcus albus* infection. A double per-nasal antral operation was performed. Relief was considerable but incomplete. Subsequently an operation was performed on the diseased ethmoidal cells on both sides, by cautiously clipping with small cutting forceps. Meningitis developed and the patient died on the fourth day after operation. I was at a loss to understand why the patient developed meningitis, as the operation had apparently been attended by no difficulty at all.

Post-mortem examination revealed that death was due to meningitis resulting from erosion of the ethmoidal cell on the right side, corresponding to the position where the nasal nerve crosses the cribriform plate in this part. The roof in this cell was quite eroded, and the dura mater was adherent around the opening. On the opposite side the cribriform plate was normal. That the meningitis originated in the region of the eroded cell, and that it was not due to the operation, seemed clearly shown, not only by the gross appearances, but because the dura mater was so intimately adherent all round the erosion. This could not have taken place within so short a period had it been traumatic.

https://doi.org/10.1017/S1755146300016516 Published online by Cambridge University Press

The chief points of interest in the case are: Firstly, that the tic douloureux corresponded to the right side, whereas the sinus disease was bilateral, and was probably due to involvement of the nasal branch of the fifth nerve while crossing the diseased cribriform plate.

I have never heard of a similar condition being reported, and the possibility of such a trap to the operator was unknown to me. But I am convinced that in old-standing cases of ethmoiditis, infection of the meninges may occur through lymphatic and vascular communications apart from direct injury of the cribriform plate or roof of the ethmoid cells.

(*B*) *Involving Extranasal Regions.*

Squint and other Eye Symptoms—Diplopia, "Black Eye."—(1) Miss D——. Curetting of ethmoid for suppuration.

(2) L. A——, male, aged thirty-seven. Seen in March, 1914, on account of asthma; the right eye directed upwards and outwards. Previous operation for asthma in a provincial town (? removal of middle turbinal). Operation was followed by extensive "black eye" and squint.

General Diseases. — (1) Case of scarlet fever following Caldwell-Luc operation on antrum.

(2) Case of gummatous ulceration of septum following intranasal operation. An officer on whom operation had been performed—removal of anterior end of right mid-turbinal; this was followed by adhesion of the turbinal to septum, accompanied by frontal headaches. Operation of submucous resection and division of adhesions. Some weeks after this the patient developed a typical gummatous ulcer on the left side of the septum. Twelve years previously he had a primary sore and had been given mercury for three months only.

Death after Removal of Nasal Polypi.—A man, middle-aged; in the wards about fifteen years ago. I snared an ordinary-looking polypus, and exerted a moderate amount of traction, certainly less than I have often used since. The man fell back dead without any sign. The pathologist made a *post-mortem* examination and found a gap in the cribriform plate, but could not find any trace of a traumatic fracture. It seemed to be a case of congenital absence of bone.

Ocular Complications following Sinus Infection.—A lady with old-standing nasal suppuration, chiefly ethmoidal. I curetted the latent ethmoidal cells, possibly a little too much, yet certainly not violently. Some orbital fat was noticed. Later there were adhesions which limited the movements of the eyeball on that side.

Osteoporosis of the Ethmoid in Old Age and its Relation to the Removal of Polypi.—The ethmoid bone normally undergoes a process of rarification or cancellation during nearly the whole of life, but reaches a very advanced stage in old age, rendering it extremely brittle or "biscuit-like." It assumes a morbid degree in three forms quite apart from sinusal disease:

(*a*) Pneumatic enlargement of the middle turbinal.
(*b*) Pneumatic expansion and bulging of the bulb.
(*c*) Uniform osteoporosis of all its elements.

It is the third variety which is of special interest, particularly in old people who are the subjects of polypi, since there is no gross evidence to arouse suspicion of its presence. This, however, is soon seen by the

https://doi.org/10.1017/S1755146300016516 Published online by Cambridge University Press

large amount of bone which often accompanies the polypus when snared. In one instance the cribriform plate was identified, the patient, an old woman, dying soon after with meningitis. Evidence of this osteoporosis has been plentifully seen in "out-patient" material and structures removed *post-mortem*.

Specimens: Nasal polypi removed from old patients with bone attached. Slides showing osteoporosis.

(C) Involving Nasal Structures.

Adhesions between Middle Turbinal and Septum leading to Obstruction and Rhinorrhœa.—Mrs. N——. Previous operation by a surgeon for nasal obstruction, followed by attacks of sneezing and rhinorrhœa (symptoms not previously present). Division of adhesions cured the condition.

Swelling of Mucous Membrane, causing more Obstruction than before Operation, and persisting for some Weeks.—Typical example: Fleet-Surgeon S——. Patient had long-standing deflection of septum. Alypin and hemisine used for a submucous resection.

Results of some Operations upon the Septum.—(1) Asthma.

(2) Flapping septum; therefore better results from putting back pieces of cartilage at end of operation.

(3) Falling in of tip of nose.

(4) Perforation of septum—sibilant breathing.

PROCEEDINGS OF THE AMERICAN LARYNGOLOGICAL ASSOCIATION.

Niagara Falls, Canada, June 1, 2, 3, 1915.

Papilloma of the Larynx.

(*Continued from p.* 265.)

Dr. Allen B. Thrasher (Cincinnati): I have not seen cases of papilloma of the larynx very often in adults, because these intralaryngeal growths assume a different character; in children, however, they are very frequently encountered. In these cases one should never operate without telling the patient that the operation probably will have to be repeated. The larynx must be kept clear until the child is fifteen or sixteen years of age. There is always danger of recurrence while the larynx is small. I have kept a tracheotomy tube in for four years without any trouble. It was removed in the meantime, of course, but not left out entirely. In this case I could not see the patient regularly. This patient is now perfectly well, and has had no trouble since he was sixteen years old. He wore the tube constantly from his twelfth to his sixteenth year. I have found tracheotomy more easily performed the second time than the first. I am doubtful about the advisability of massage. It seems to me that it would increase the blood flow to the larynx, and this increased blood supply would be apt to stimulate growth. I have had no experience in this regard, but it does not appeal to me as being a scientific procedure. I believe the fact that

https://doi.org/10.1017/S1755146300016516 Published online by Cambridge University Press