NASAL POLYPUS:

AND

Its Radical Treatment by Galvanic Snare.

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NASAL POLYPUS.

INTRODUCTORY.

THE attention of the medical practitioner is frequently directed to some particular study by the circumstances and surroundings in which he is placed.

The prevalence of a certain form of disease in some country or locality may lead him to investigate that particular disorder more carefully than he might otherwise have opportunity to do; and thus he gains experience and information which enable him to cope with it successfully.

It has been my lot, since the close of my medical curriculum, to reside in a district of England—midway between Devon and Cornwall—where, during a great part of the year, rain falls almost daily, mists and sea-fogs arise from the English and Bristol Channels, over-spreading the neighbouring coasts, and the climate generally is humid and relaxing.

It is probably due to these causes that one of the prevailing diseases in the two counties is chronic nasal catarrh, with, as I hope to show, the development of nasal polypus as a consequence.

Of the latter disease, numerous cases have come under my notice, both in private and in dispensary practice, affording a favourable opportunity of investigating its nature and progress, with the most advantageous methods of treatment.

With these preliminary remarks, I proceed to the discussion of the subject entitling this paper, beginning with the following

DEFINITION.

Neoplasms, of myxomotous tissue, pedunculated or sessile, varying in size from one line to one inch in length and breadth, but sometimes larger, of pinkish-grey colour,

usually, but not invariably, occurring in connection with the Middle Turbinated bone, caused by inflammation and hypertrophy of the nasal muco-periosteum, and giving rise to obstructive and other symptoms in the nasal passages and neighbouring parts.

ETIOLOGY.

The causes of nasal polypi have long been enveloped in much obscurity. They have in rare instances been known to result from injuries, such as blows on the nose, and from the presence of foreign bodies in the nasal cavity. Such causes are, however, quite exceptional. As a rule, no definite circumstance in the history of a given case can be assigned—by the patient at all events—as having given rise to the new formations.

In the majority of cases, however, there is a history of constantly recurring or *chronic nasal catarrh*, and there can be little doubt that this is intimately associated with the occurrence of nasal polypi. On the other hand, many people suffer from chronic nasal catarrh without any such result.

Climate seems to have a remarkable influence on their development. In dry localities chronic nasal catarrh is less prevalent than in damp climates, and hence polypus is a commoner ailment in the latter than in the former.

Heredity may possibly be a factor which determines their development in certain individuals who have suffered from chronic nasal catarrh; while others, also subject to that ailment, escape, or are affected by other consequences. Few writers have attached importance to such a theory, or offered much evidence in support of it. I may here refer to one or two cases which appear to furnish some support to this view.

The first instance in which I have met with nasal polypus occurring in more than one member of the same family was in that of two sisters, both of advanced years. In both their cases, the growths were confined to the left nostril.

In another family, two brothers had them, and in both they first appeared at the age of about fifty.

A cousin of these two brothers also came under my care for the same affection. This patient was a girl of twenty years of age.

These cases furnish sufficient evidence to show that nasal polypus does, at least occasionally, "run in families," though I have not yet met with any instance of its occurrence in successive generations.

Nasal polypi, in all probability, occur at all ages, from early childhood to old age. Sir Morell Mackenzie states that the youngest case in which he had observed them was in a girl of sixteen.* I have, however, had two patients under my care, both girls, aged respectively ten and fourteen years. The parents of the first stated that there had been great obstruction of the nose, completely preventing nasal respiration, ever since they could remember. When I first saw her, both nostrils were absolutely blocked, there being no breath-way whatever. The other patient had been suffering for some three years from persistent nasal catarrh, and gradually increasing obstruction. She applied for advice on account of the catarrh, and on examining the nares I discovered the presence of polypi.

PATHOLOGY.

Nasal polypus does not constitute a disease *per se*, but is a *symptom* of disease. Just as dropsy is a symptom of cardiac or renal disease, jaundice of hepatic disturbance, stone in the bladder or kidney of an abnormal condition of the urine or blood, so are nasal polypi but the outward expression of the disease which gives rise to them.

What is this underlying disease?

This is a question to which but little attention has been given till recently, and it is a part of the object of this essay to offer, as the result of clinical study, some independent observations on the subject.

In order to understand it, the course of any given case must be considered. Invariably, there is a history of constantly recurring "cold in the head," often for a long time—it may be years—before any definite obstruction is observed, the chief complaint being copious discharge from the nose. Now nasal catarrh implies congestion of the Schneiderian mucous membrane, and, if prolonged, chronic inflammation. The muco-periosteum investing the processes of the Ethmoid bone—more especially that

* *Diseases of the Nose and Throat.* Vol. ii., p. 356.

covering the Middle Turbinated bone—seems to be peculiarly liable to inflammation of this kind.

One of the first consequences of the morbid process is *thickening of the mucus membrane* over a portion of this bone. This may frequently be observed in patients suffering from chronic nasal catarrh, constituting what is known as "hypertrophied turbinated body," and characterized by a tumour, having the appearance of a mulberry-like mass, at the anterior extremity of the middle spongy bone. Other deeper-seated changes accompany this hypertrophy. When inflammation attacks the periosteum of bones in other parts of the body, *necrosis* may be looked for; and the result of inflammation of the nasal muco-periosteum is precisely the same. This necrosis, or, more properly speaking, exfoliation, may often be observed in operating on polypi, when it is not at all uncommon to find spicules of dead bone in the growths removed. Again, if the seat of the tumour be explored with a probe after removal, bare bone may in many cases be discovered.

The intimate manner in which the lamellæ of the spongy bones are invested with muco-periosteum no doubt favours necrosis, the inflamed membrane becoming detached here and there, and the subjacent bone perishing, in consequence of its blood supply being thus cut off. The resulting patches of necrosed bone now become practically foreign bodies, and, acting as such, set up a prolonged irritation, with secondary chronic inflammation of the mucous membrane in their neighbourhood as a consequence. Hence the original inflammation, arising in the first instance from ordinary catarrh, is perpetuated and increased, with a corresponding increase of thickening or hypertrophy. This hypertrophy is, I believe, the immediate precursor of the next stage of the disease; viz., MYXOMA. The prolonged irritation to which the mucous membrane is subjected stimulates its growth, but growth in an unhealthy direction. What takes place may be likened to the formation of redundant granulations in the neighbourhood of caries or necrosis of bones in any other part of the body. In both cases, morbid tissue is formed, of a lower morphological character than that proper to the part, and approaching in type to embryonic structure. In the nose, this proliferation goes on till prominent masses are formed, as before described, chiefly at the anterior extremity of the middle spongy bone. These, in

some cases, resemble nasal polypi, and have occasionally been mistaken for those growths. Let a patient presenting such an appearance be kept under observation for a time, and a change will be noticed gradually taking place in the hypertrophied mass. The mulberry-like prominence slowly enlarges, and changes in colour and texture. It is no longer bright red, but assumes a pinkish-grey hue, and, instead of being firm to the touch, is pliant and freely movable. If such a growth be removed, it will be seen that at the base it is composed of firm mucous membrane, but that as the apex is approached the tissue gradually and imperceptibly shades off into true myxomatous structure.

In cases of long standing this gradual shading off cannot be observed, for as the polypi increase in size they become pendulous, as a result of gravity, and a thin pedicle is in most cases thus formed, attaching the tumour to its original point of development. But in cases where the morbid process was in its infancy, I have repeatedly been able to recognize the phenomena above described.

The pathological changes I have attempted to follow thus far are probably analogous to those which occur in the development of tumours of different structure in other situations, as, for example, *epithelioma of the lip.* In such a tumour also there is a gradual shading off from the healthy tissue of the surrounding part to the morbid tissue of the neoplasm.

An analogy may likewise be traced in the cause of these tumours. Both result from *irritation*:—in the case of polypi, from necrosed bone; while epithelioma of the lip is often attributed to irritation—such as that produced by the use of a clay pipe.

Another illustration of the manner in which myxomata may originate is afforded by the HYDATID MOLE. Here a morbid process takes place in the chorion, or, in other words, a prolonged irritation, resulting in hypertrophy of its mucous membrane, and the formation of myxomatous tissue.

Dr. Leishman points out the *degenerative* process in the formation of the Mole, the counterpart of which is seen, as above stated, in the development of myxomata in the nasal cavity. "Although the exact mode in which the vesicles constituting the hydatiform mole are formed is not yet clearly fixed to the satisfaction of all, there is one point

in which all modern authorities are agreed; viz., that they spring from the villi of the chorion. It is also admitted that in this, as in the fleshy mole, we have no new formation, but simply an *alteration and degeneration*" (italics mine) "of previously-existing structures. . . . The villi of the chorion, as has been pointed out by modern physiologists, grow normally by a process of gemmation, bud springing from bud in successive stages of growth. Under the influence of perverted development, these buds, or the elementary cells of which each villus is composed, take on a new action, and become transformed into vesicles, which vary in size, and to which attaches the power of repeating the process of chorion development, still in a perverted sense, until the so-called hydatiform mass is formed."* The death of the embryo sets up *irritation*, resulting in degenerative changes and the development of myxoma, just as in the nose a similar result follows from the irritation produced by necrosed bone.

Another resemblance between the Hydatid Mole and nasal polypi is to be noticed in the berry-like clusters in which the latter sometimes occur. I have repeatedly seen little chains of polypi, apparently growing out of each other, just as in the Mole.

From the foregoing considerations it may be fairly concluded that nasal polypi are due to degenerative proliferation of hypertrophied mucous membrane, or, in other words, that they are a perverted development of that tissue.

Dr. Woakes, in his recent work on nasal polypus, refers to the changes above described under the name of "NECROSING ETHMOIDITIS"—a term which seems most appropriate to the morbid processes observed in these cases. As an essential step in the appearance of polypi, he describes a process which he terms "cleavage of the mass," or "vertical cleavings." This, he states, takes place in the hypertrophied turbinated body, and is followed by the egress of polypi through the cleft thus formed. "From a comparison of advanced cases," he writes, "with others in an earlier stage of the disease, it would appear that the formation of the cleft proceeds in such a way as to divide the anterior half of the turbinated body into

* *A System of Midwifery.* By Dr. LEISHMAN. Page 228.

two segments, the line of cleavage being now quite visible to anterior inspection, as it occupies nearly all the presenting aspect of the tumour. Its depths may be explored with a probe, which will come in contact with exposed bone. The cleft will be in some cases covered with purulent secretion; while in others it will afford exit to small granulations, which collect about and obscure the line of fission."*

As a classical description of the mode of appearance of these growths, the foregoing account may no doubt be verified in many cases. I have occasionally met with instances of this process, notably in a young girl I have lately had under treatment. In this case the turbinated body was much hypertrophied, and a distinct and deep cleft existed in its anterior aspect, dividing the tumour into two portions. Two or three polypi protruded from the cleft, and were removed. At a subsequent visit, I observed that some of the firm granulations on the anterior extremity of the inner division of the tumour had entirely altered their appearance, having given place to true glistening myxomatous tissue. I considered the case to be an illustration of the change already referred to; viz., the gradual degeneration of mucous membrane into myxoma.

In ordinary practice vertical cleavings are not often seen, even after the removal of the tumours which Dr. Woakes states conceal them.

The author already quoted seems to be of opinion that nasal polypi originate, for the most part, *within* the mass of the middle spongy bone. "The development of the new growth proceeds, causing distension of the surrounding osseous tissue, until a stage is reached at which the latter undergoes rupture at its weakest part. This is always that which has been indicated; viz., the outer aspect of the turbinated bone, just below the infundibulum, and where, as already stated, there is an orifice communicating with the interior of the spongy process; from this point it extends forwards and becomes visible in front."†

In the majority of cases, many polypi, more or less sessile in character, are to be found springing directly from the mucous membrane covering the exposed surface

* *Nasal Polypus.* By Dr. WOAKES. Page 16. † *Ibid.* page 15.

of the spongy bone, and constitute, as far as my own experience goes, by far the larger number of those present in any given case. That they do grow internally, however, is proved by the *post mortem* observations of Zuckerkandl, as quoted by Sir Morell Mackenzie. "In several instances, however, the polypi were multiple, so that the exact seat of attachment of forty-two distinct growths could be determined. Fourteen grew from the edges of the *hiatus semilimaris*, three from the edges of the *hiatus* and the *infundibulum*, two entirely from within the *infundibulum*, one from the *ostium frontale*, one from the *ostium sphenoidale*, one from the *ostium ethmoidale*, two from the *antrum*; ten from the *middle meatus*, three from the *upper* meatus, four from the *middle*, and one from the *upper turbinated* body."*

The pathological changes above described may be epitomised as follows:

1. Chronic nasal catarrh, causing:
2. Hypertrophy of nasal muco-periosteum.
3. Necrosis of portions of the spongy bone.
4. Irritation set up by necrosed patches.
5. Perpetuation of inflammation as a result of irritation.
6. Increase of hypertrophied muco-periosteum, with "vertical cleavings" in some cases.
7. *Gradual development of Myxomata from degenerative changes in the granulations of hypertrophied mucous membrane.*

SYMPTOMS.

These may be classed as direct, indirect, and reflex.

DIRECT. These vary in type and severity in proportion to the duration of the case. In the early stages of development, there may be little or nothing to attract the patient's attention to any abnormal condition of the nares. Usually all that is complained of is a slight, but continuous, *catarrh*. This is aggravated in damp weather, in consequence of the hygroscopic character of mucous polypi. The catarrh gradually increases in severity, is often mucopurulent, offensive, and sometimes streaked with blood.

The sensations of *smell*, and even of *taste*, are frequently impaired, if not wholly lost. The general tumefaction of

* *Diseases of the Throat and Nose.* By SIR MORELL MACKENZIE. Vol. ii., p. 366.

the nasal mucous membrane probably prevents odoriferous particles from coming in contact with the filaments of the olfactory nerve, thus interfering with the sense of smell. Where this is lost, taken in conjunction with a history of chronic catarrh, it is a symptom which may be considered as almost pathognomonic of nasal polypus.

Long-continued catarrh is at length followed by a sense of *obstruction*, in one or both nostrils, often accompanied by a peculiar flapping, as of a valve opening and shutting. The latter sensation is caused by the movement of polypi backwards and forwards as air is inspired or expired.

Gradually the obstruction increases, till, in the most advanced cases, the breath-way is completely occluded. The patient's distress now becomes great. Loss of smell and taste are among the least troublesome of his complaints; the constant discharge of mucous, and the obstruction to respiration, being those which lead him to seek advice. Of all symptoms the last-named seems to be the most annoying to the patient, and is the cause of other and more serious INDIRECT SYMPTOMS.

INDIRECT. By day matters are bad enough, but at night become still more distressing. As long as the patient preserves the upright position, the polypi gravitate forwards, and there is usually some breath-way along the inferior meatus. When he lies down, however, the growths fall back towards the posterior nares, and often completely block up the choanæ. The nasal passages being thus obstructed, respiration has to be carried on by the mouth. The tongue and throat then become dry and parched, the patient is constantly disturbed by his own snoring, and frequently awakes with a sense of suffocation, often as severe as that caused by an attack of asthma. *Loss of sleep* thus arises, and this, added to the debilitating catarrh, often results in an impairment of health apparently altogether out of proportion to the cause.

The *throat and chest* frequently suffer from the effects of nasal obstruction. The pharyngeal mucous membrane may become dry and glazed, causing constant irritation and hawking, and the voice is often rendered hoarse and grating.

A well-known function of the Schneiderian membrane is to raise the temperature of the inspired air before it reaches the lungs. When the nasal fossæ are blocked by

polypi, this function cannot be performed, and hence cold air is inspired. As a result, some patients become the subjects of *chronic bronchial catarrh,* and even of capillary bronchitis. The removal of the nasal obstruction has been known to relieve, if not to cure, such conditions.

A somewhat rare and unfortunate accident has occasionally resulted from the obstruction caused by polypi; viz., *rupture of the membrana tympani.* A frequent symptom where these growths are present is sneezing. When this act is performed a blast of air is forcibly expelled through the nostrils; but when these are blocked, the air, not finding exit by the usual channel, is often driven through the Eustachian tubes into the middle ears, the sudden rush over-distending the tympani and endangering the membrane. This symptom is often complained of as a great annoyance. One patient told me that every time he sneezed he felt as though his ears would burst, and the crown of his head be lifted off. In another case, the patient stated, that on one occasion, when sneezing, she felt something give way in the ear, and had been deaf on that side ever since. Examination showed that the membrana tympani had been ruptured.

It has been stated by some that nasal polypi, by preventing the entrance of air into the middle ears through the Eustachian tubes, have been known to cause deafness. In all probability, however, where deafness exists co-incidently with polypi, the former does not result from non-ventilation of the middle ears, but from some other cause—such as, for example, the accident referred to above. Only in the most inveterate cases is the breath-way absolutely blocked, there being usually some passage along the inferior meatus (which may be regarded as the natural prolongation outwards of the Eustachian tubes), and through this a sufficient supply of air is admitted. Even where the inferior meatus is completely blocked, however, deafness ought not to occur, the act of sneezing, as already shown, effectually ventilating the middle ears. It is only, of course, in exceptional cases, where the act is performed with unusual violence, that rupture of the membrana tympani may occur, and so occasion deafness. With the exception of the case referred to where this occurred, I have never met with a case of deafness resulting from nasal polypi.

Reflex Symptoms.—Those most commonly met with

are *sneezing* and *nasal asthma.* Neither of these can be taken as pathognomonic of nasal polypus. Paroxysms of sneezing usually do occur in that disease, but may also be occasioned by other conditions, such as *hypertrophied turbinated bodies,* before the development of polypus. Any circumstance causing pressure on a certain area, and consequent irritation to the nerves distributed to the part, may give rise to the act of sneezing. According to Woakes, that area "corresponds to the middle third of the septum, the outer wall of the nose in front of the middle turbinated bone, and to a varying portion of the latter, as well as the anterior aspect of the inferior turbinated bone."* The area thus indicated is supplied by the Anterior Palatine nerve, and its inferior nasal branches to the middle and inferior turbinated bones. These nerves convey an impulse to the respiratory centre, which results in a rapid and powerful inspiration, followed by a forcible expiration or sneeze.

Nasal asthma is not unfrequently a distressing effect of polypi, and is usually relieved by their removal; but, as in the case of sneezing, it may be induced by other means. It is sometimes met with in patients whose nostrils are contracted, so that the spongy bones come in contact with the septum. When such persons take cold, the resulting congestion of the nasal mucous membrane increases the pressure of these bones on the septum, and asthma ensues. It may therefore be concluded that the sensitive region in nasal asthma is situated somewhere in the septum, and that the afferent nerve is the naso-palatine. Where it occurs in nasal polypus, it is probably caused in a similar manner; viz., by pressure on the septum.

Other reflex symptoms of rarer occurrence are *spasmodic Dysphagia, paresis* of the *velum pendulum palati,* and *erythematous rashes.* To these I shall not further allude, but pass on to that part of the subject to which I have devoted most attention; viz.,

TREATMENT.

The operative treatment of nasal polypus had, down to very recent years, to be classed among the least satisfactory of surgical proceedings.

* *Nasal Polypus.* By Dr. WOAKES. Page 69.

The operation of *evulsion* has, ever since the days of Hippocrates, been the method usually adopted for attempting to relieve the sufferer.

By almost every succeeding generation of surgeons, however, a constantly rising note of dissatisfaction has been sounded against this method; and from time to time various new devices have been suggested to supersede an operation that had again and again proved to be as ineffectual in curing, as it was torturing to the patient.

The disadvantages attending evulsion are only too apparent. Its exceeding painfulness is what appeals most forcibly to the sufferer, and the hæmorrhage is often so great as to be not only debilitating, but even dangerous to life. A lady patient, who had frequently submitted to evulsion, informed me that she always prepared for the operation by fastening a large table-cloth round her neck, with a wash-hand basin in her lap to catch the blood, of which, she declared, she never lost less than half a pint on each occasion.

Examples of alleged fatal hæmorrhage are not wanting, though it must be admitted that the evidence of this accident having actually occurred is not sufficiently conclusive.

Another danger attending evulsion is the frequent forcible tearing away of portions of bone, such as the septum, large portions of the ethmoid, and even the nasal bones. Sir Morell Mackenzie states (quoting Lémeré) that in one case the cribriform plate of the ethmoid was broken by the forceps, this accident having been followed by the escape of cerebro-spinal fluid.*

That such disasters should happen is not surprising, considering the haphazard way in which the forceps are often thrust into the nares, to the imminent danger of tearing away healthy structures as well as new growths. Such a practice is the more reprehensible since it is possible, by suitable appliances, to obtain as clear and complete a view of the nasal cavities as of any others in the body. Michel, of Cologne, well observes, "It is intolerable to operate blindly in a cavity which lies all through open to the eye, and that too with such a violent instrument as the forceps."†

* *Diseases of the Throat and Nose.* By Sir Morell Mackenzie. Vol. ii., p. 370.

† *Diseases of the Nasal Cavity.* By Carl Michel. American edition, Detroit. Page 61.

As an illustration of the thorough manner in which the nares may be illuminated, even by the reflected light of an argand burner, I may here mention that, after clearing away all the polypi from the passage, and also in examining persons not suffering from these growths, I have sometimes, on asking the patient to swallow, seen through it the contractions of the pharyngeal muscles, as the act of deglutition was performed.

The drawbacks above referred to might perhaps be passed over, were the operation successful in extirpating these unwelcome intruders. The experience and testimony of the vast majority of both surgeons and patients is unfortunately quite the reverse. Nay more, the operation is not only inefficient in relieving, but it seems in many cases only to aggravate matters—fresh and increasing crops of polypi rapidly appearing after each operation.

The following case, out of many similar ones that have come under my notice, may be adduced in illustration of the usual results of treatment by evulsion.

Mr. J. P. R., *æt.* 55. First seen 28th September, 1886. Says that, to his knowledge, he has had nasal polypi for more than two years, and obstruction with discharge for several years previous to that.

Two years ago underwent the operation of evulsion. Several polypi were taken away on that occasion, their removal being attended by violent pain and hæmorrhage, but giving him relief for the time. A month afterwards the obstruction was as great as ever, and again evulsion was performed. The result was no better than on the first occasion, for in a few weeks he found it necessary to have a third crop removed. Ere long the nostrils again became blocked, but so discouraged was he by the results of the operations already undergone, and so greatly did he dread the ordeal of another, that he had nothing done for the next nine months. He then applied to a physician, who in eight different sittings applied lunar caustic to all the growths he could see, and dismissed him as cured. He was not cured, however, for this treatment soon proved as ineffectual as, if less painful than, evulsion; and when he called to consult me both nostrils were completely blocked.

In the foregoing instance, the patient, in common with all similar sufferers, was loud in his condemnation of the operations he had undergone, and had only submitted

to them, after the first occasion, as the only available means of obtaining relief, which he knew but too well could be merely temporary.

To the latter circumstance I desire here to direct particular attention. Not a few surgeons have already condemned the operation of evulsion, but their chief objection to it appears to have been the danger attending it of hæmorrhage and fracture of bones. They have not, however, attached sufficient importance to the chief objection; viz., the rapid return of the growths after removal. The reason for this omission is not far to seek. Recurrence has come to be regarded as, in most cases, inevitable, whether after evulsion or any of the other operations commonly practised. Hence writers on this subject, with but few exceptions, have made little or no allusion to the fact of recurrence, and much less have they proposed any efficient method of *extirpation*. Sir M. Mackenzie, it is true, gives two cases in his *Diseases of the Throat and Nose* (vol. ii. p. 379) in which no recurrence was observed, but no general rule can be deduced from these data. In both cases the patient had been repeatedly operated on by evulsion, with rapid recurrence after each operation. In the first, the writer says, "In view of the repeated occurrence, I determined to remove a portion of bone. This was easily done. The patient came to me (1880) on account of follicular disease of the throat, when I learnt that there had been no recurrence of the nasal polypus, nor any unpleasant effect from the removal of the bone."

His second case I shall quote at length, since it affords a good example of the futility of two other modes of treatment besides evulsion. "Mrs. L——, aged 59, consulted me in July, 1878, on account of polypus in the right side of the nose. Since 1871 she had been treated by seven different practitioners. Of these, five had used forceps, one a snare, and one electric cautery. The latter treatment had been carried out in 1876 and the beginning of 1877, and the polypus had been burnt sixty-four times. Mrs. L—— said that the treatment was not painful, but it caused a 'peculiar sensation, which went to her brain.' I removed a bit of the middle portion of the turbinated bone with a small polypus attached. I saw this patient again in June, 1881. The nose had remained free from any recurrence of the disease, and no

inconvenience of any kind had been experienced since the operation."

It will be noticed that in Case I. the anterior portion only of the turbinated bone was involved, and that a "portion" of this bone was removed. Likewise in Case II. "a bit of the middle portion of the turbinated bone" was taken away. The drawback to such a procedure is self-evident. If polypi in every case grew from a certain limited portion of bone, it would no doubt be easy and effectual to deal with them by removing along with them that portion of bone which, as shown in the section on pathology, is in a diseased state. But, as a matter of fact, these growths, in the great majority of cases, involve the greater part of the Middle Turbinated bone; and in some instances they may be seen growing from the Superior and Inferior Turbinated bones. In such cases it would be impracticable to remove the whole of the bony surfaces, as such an operation would necessitate the almost complete extirpation of the bone or bones involved.

Before going further it may be well to inquire into the causes for the inefficiency of the operation of evulsion. These are, chiefly, the following:

1. It is impossible, in that operation, to obtain a complete view of the polypi. Those occupying the most anterior position may be seen clearly enough by simply looking into the nostrils, and their attachments perhaps ascertained by means of a probe. The operator proceeds to seize the first visible polypus, and by a forcible wrench tears it away. Copious hæmorrhage ensues, obscuring the view of the nares behind the bleeding point, and thus preventing other polypi from being clearly seen. The forceps is, nevertheless, usually again thrust into the nostrils, in the hope of grasping more of the growths, but of course with increasing hæmorrhage and obstruction. The patient is therefore dismissed with probably the greater number of his polypi still unremoved.

2. By evulsion, polypi are very rarely removed intact. Portions only of them are torn away, the pedicles being left behind, and frequently also fragments of the tumours themselves. The imperfectly removed growths soon re-appear, and indeed seem to increase in size and number after each operation.

3. In addition to the larger polypi, there usually exist many others so small in size as scarcely to be visible

except under the strongest light, after those of larger dimensions have been removed. These are incipient growths; and when the nostrils have been cleared of their older fellows, and pressure thereby removed, they grow rapidly, and quickly attain large proportions. When a patient has been apparently relieved, the surgeon is therefore ere long called upon to deal with a new crop, as formidable as the first. Moreover, even if these growths were recognized in their early stage, they would then be too small to be seized by the forceps.

4. Evulsion deals with an *effect*, not with the *cause* of the mischief. It has been shown that a morbid process underlies the development of nasal polypus, and to extirpate the latter, the former must be reached.

Such are the causes for the inefficiency of evulsion, and under these circumstances it is little wonder that sufferers should be discouraged, and that the surgeon should seek for some better way of radically curing his patient.

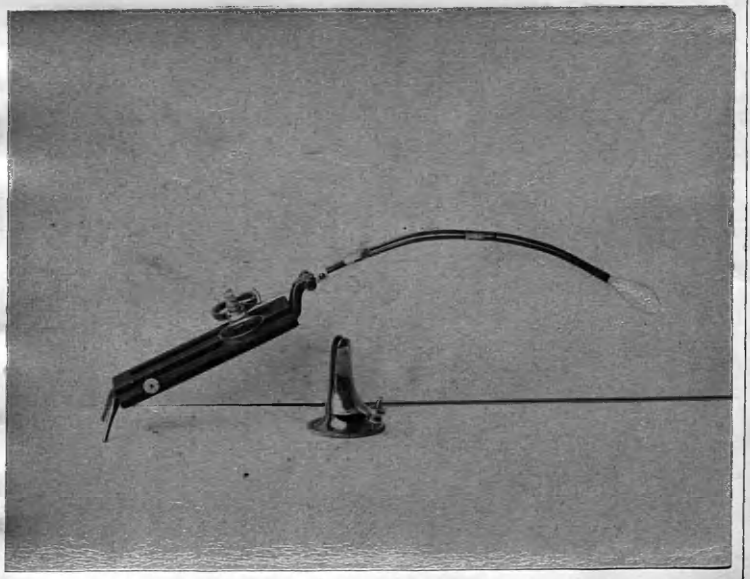
Of other operations that have been introduced, the chief are: abscission, by means of cutting or punch-forceps; the cold snare, or écraseur; and the electric cautery.

With regard to the first of these, it is apparent that the same objections apply to it as to evulsion. The pain and hæmorrhage are as great, and recurrence (except in such rare cases as those quoted from Dr. Mackenzie's work) as frequent.

The same may be said of the cold snare. It is no doubt an improvement on the two foregoing operations, inasmuch as individual polypi can be grasped intact, but the tug necessary to remove them after their pedicles have been crushed causes violent hæmorrhage, and the base not having been destroyed, return is rapid.

It may be added that incipient growths cannot be secured by the écraseur.

Treatment by the electric cautery, as described by Sir Morell Mackenzie, though it possesses advantages over the methods already referred to, is at best an imperfect operation. He says, "I employ a flat, spatula-like electrode, and endeavour to push it backwards over the surface of the mucous membrane from which the polypus grows. The cure can be most quickly accomplished by using the cautery and the punch-forceps on alternate days,



the latter being only employed for taking away dead tissue."*

This method is no doubt effectual enough where the polypi are few and near the entrance to the nares, and also for extirpating incipient growths; but it could hardly be suitable for those depending from the posterior extremity of the turbinated bone, in which situation it would be very difficult, if not impossible, to apply the cauter efficiently. The result of this operation, mentioned by Mackenzie in the second of his cases quoted, is certainly not encouraging. He says, "The latter treatment" (*i.e.* by electric cautery) "had been carried out in 1876 and the beginning of 1877, and the polypus had been burnt sixty-four times."† These repeated applications did not, however, cure the patient, and he had to cut away part of the bone before the recurrence ceased. In any case this operation is greatly inferior to the one I now proceed to describe.

In the first place, it may be well to give some account of the instruments employed.

These are as follows: A galvanic snare or écraseur, electro-cauters of various patterns, a battery, nasal speculum, probe, frontal mirror, and argand lamp. To these may be added a post-rhinal mirror, with lever for adjusting the angle as required.

A snare of convenient form and simple construction is one made by Hermann Brade, of Breslau, after Michel's design. It consists of a handle, carrying a pair of insulated brass tubes, through which a No. 3 or 4 steel or platinum wire is threaded, an oval loop being thus formed at their outer extremities, while the ends are secured to ivory pins on the handle. The loop can be drawn tight by means of a pair of brass rings working along a slot in the handle. The galvanic circuit is completed by pressing on an ivory button placed at one side of the instrument. I use steel wire for the loop in preference to platinum, which fuses more readily than steel.

Cauters are necessary for completely searing the bases of polypi, for touching incipient growths too small to be snared, and for cauterizing hypertrophied muco-periosteum and spicules of dead bone. The cauters are of various shapes—some pointed, others flat—and are carried

* *Diseases of the Throat and Nose*, vol. ii. p. 380. † *Ibid.* p. 380.

on a handle, also made by Brade, after Von Bruns' pattern.

The battery I use is a modification of that devised by Voltolini. It is fitted with four pairs of zinc and carbon plates, with an arrangement for raising or lowering the cells into which they are plunged. The latter are charged with the usual bichromate of potash and sulphuric acid solution. Each cell gives a current of 25 ampères. The force of current is regulated by means of a rheostat, with which the battery is fitted.

A still more convenient plan of heating the wires is by means of accumulators. They are efficient for daily operations extending over a month, when they become exhausted, and have to be recharged by a dynamo. When access to the latter can be obtained for the purpose of recharging, accumulators possess great advantages over the primary battery, but this, though it has to be renewed frequently, is quite as efficient for the purpose.

One of the most suitable forms of speculum is Duplay's. It is readily dilated, and gives a perfect view of the nares.

A Sugg's argand gas lamp, with bull's-eye lens, gives a sufficiently brilliant light for illuminating the nasal passages. For this purpose, however, a small Swan's incandescent lamp, attached to the edge of the speculum, after Dr. McIntyre's plan, would answer well. The oxy-hydrogen light has also been employed, but in my own practice I have found the argand burner meet every requirement.

Having described the apparatus required, I now pass on to the operation itself.

The patient is seated in a chair provided with a movable head-rest, after the fashion of a dentist's chair.

For sensitive patients it is often advisable to produce local anæsthesia by means of the hydrochlorate of cucaine. A 10 per cent. solution of this may be sprayed into the nostrils by means of an atomizer. Some patients, however, do not require the aid of an anæsthetic, as they feel little or no pain even without it.

The surgeon seats himself in front of his patient, and, having dilated one of the nostrils by means of the speculum, reflects light with the frontal mirror from the argand into the nasal cavity. On the inner side the septum, often deflected to either the right or left, is seen, and on the outer the Inferior Turbinated bone. The latter is usually

free from polypi, but the mucous membrane investing it is generally hypertrophied.

Above the Inferior Turbinated bone, a polypus, having the appearance of a greyish, opalescent, or pinkish mass is visible, in most cases occluding the passage almost entirely. On touching it with a probe, the operator finds it to be freely movable, and its attachment to the Middle spongy bone can generally be made out. If the patient be now asked to depress the chin, the inferior meatus comes into view, and the dependent parts of other polypi lying posteriorly to that first seen may sometimes be observed; while, if the chin be raised, growths attached to the anterior extremity of the Middle Turbinated bone become visible.

The position of the visible polypi having been determined, the latter have next to be snared and removed.

With the left hand the surgeon holds the speculum *in situ*, and with the right inserts the instrument carrying the snare through it. This should be passed into the nasal cavity vertically, so as to lie parallel with the plane of the septum. When opposite the most prominent polypus, by a suitable *tour de main*, the loop of wire is brought just underneath it, and then, depressing the handle of the instrument, the operator encircles it.

By a little gentle manipulation, the snare is passed up to the pedicle or base of the tumour, and drawn tightly round it. The pedicle is by this means crushed or strangled, and its capillary vessels occluded. The electric current is now completed by touching the button at the side of the instrument. A slight frizzling sound is instantly heard, as the wire becomes hot and begins to burn through the pedicle. If this be narrow, a single touch of the button may suffice to sever the growth from its attachment; but where the polypus is sessile, it is best to intermit the current repeatedly, drawing the loop tighter between each application. When detached, the polypus adheres to the end of the instrument, and is drawn out through the speculum. Occasionally, where the tumour has been very large, and attached far back in the nasal cavity, I have known it, on being severed, to drop into the naso-pharynx, whence it was coughed out by the patient.

Care must be taken not to drag forcibly on the polypus after it is snared, as such a proceedure would not only induce pain, but, by tearing the base of the tumour, cause

considerable hæmorrhage. Fragments would also be left behind which would soon sprout into new growths. Too much attention cannot be paid to this particular, the gradual and complete severance of the polypus from its base by electric cauterization being what distinguishes this operation from the mere forcible tearing away by the cold snare.

If the operation be properly performed, there ought to be little or no pain, mucous polypi being devoid of nervous elements, nor should there be any hæmorrhage. There is often a slight oozing, but I have known cases where even this was absent, not even a stain of blood appearing.

The first polypus having been removed, another lying behind it is generally revealed, and must be dealt with in the same way. In a similar manner all the growths are successively removed, the difficulty of snaring them of course increasing as the deeper portions of the nasal cavity are reached. By making the patient depress the chin well, however, even those polypi which spring from the posterior extremity of the Turbinated bone can be seen, after those lying in front of them have been removed; and, with a little practice, the operator ere long gains dexterity in snaring them. As already stated, the growths attached to the anterior extremity of the spongy bone come into view when the patient raises the chin, and can be snared and removed without difficulty.

After the operation, the nares should be cleansed night and morning for some time by means of a spray of some suitable astringent and detergent agent. A mixture of Boracic Acid and Bicarbonate of Soda in solution answers well for this purpose. The muco-purulent discharge is thus washed away, and the lotion assists in healing the wounded surfaces.

Several operations are necessary to clear the nostrils completely, the number of sittings being of course proportional to the number of polypi present.

It often happens that, after all the growths have apparently been removed, on the patient's return in a fortnight or so, several new ones are discovered, and at first sight it might be thought that a recurrence had taken place. This is not the case however. The seemingly new growths are simply polypi which, though present before, were too minute to be seen; but which, pressure from the larger ones having been removed, have quickly attained con-

siderable proportions. These must of course be extirpated, and any buds discovered touched with the platinum galvano-cauter so as to prevent their development. In order to carry out this preventive treatment, the patient must be kept under observation for several months, so that if any incipient growths should appear, they may be dealt with at the outset.

It is not sufficient, however, if a favourable result is to be insured, merely to remove all existing growths and prevent the development of incipient ones. The morbid process which gave rise to the neoplasms must also be attacked. Considerable portions of the muco-periosteum covering the middle spongy bone are in a chronically inflamed and hypertrophied condition, while here and there patches of necrosed bone may be found. All this morbid tissue must be got rid of, otherwise their irritating effects will continue and result in the development of more myxomata.

To guard against such a misfortune it is therefore necessary to cauterize perseveringly every vestige of unhealthy mucous membrane that can be discovered, and to remove all spicules of dead bone. When this has been thoroughly done, new and healthy mucous membrane springs up, and the tendency to degenerative development ceases.

The time occupied by this mode of treatment thus extends over a considerable period, and this, in the opinion of some, might be a drawback. Thus, as an argument in favour of evulsion, Sir M. Mackenzie says, "The great advantage of evulsion is not only the *facility* with which the treatment can be carried out, but the *rapidity with which relief* can always be obtained. More growths can generally be taken away at a single sitting than can be got rid of either with the snare" (*i.e.* the cold snare) "or by electric cautery."* With regard to the rapidity with which relief can be given by a single operation by the galvanic snare as compared with evulsion, I venture to opine that the former mode of treatment is at least as speedy as the older operation. On one occasion, in a sitting of little more than an hour's duration, I removed with the snare twenty-two polypi, completely clearing both nostrils, and giving perfect relief to the patient.

* *Diseases of the Throat and Nose*, vol. ii. p. 376.

Patients nearly always say that they have never had more than five or six removed at one sitting by evulsion, and then often have had to go away without any relief to the breath-way, as only the growths farthest forward have been taken out. Moreover, when it is borne in mind that, when relief is given by evulsion, it is only temporary, being quickly followed by recurrence, in consequence of the growths being only partially removed, and the *cause* not dealt with, the superiority of the more radical treatment is apparent. Most sufferers, too, would willingly submit to an extended period of treatment, with the prospect of ultimate permanent recovery, rather than undergo the most rapid operation, affording only temporary relief.

The advantages claimed for this operation may be recapitulated as follows:

1. A minimum of pain—sometimes none whatever.
2. Absence of hæmorrhage.
3. No danger of injury to healthy structures.
4. Complete removal of obstruction by extirpation of all existing growths.
5. Minimum risk of recurrence, morbid tissue giving rise to myxomatous growths being extirpated.

CASES.

I shall now give the details of a number of cases of nasal polypus treated by me in the manner described in the foregoing pages. The notes are quoted from my case-book. In a few instances some particulars have been added; while in others, to avoid repetition, unnecessary details have been omitted.

Abbreviations.

L. N. = Left nostril.	L. M. T. B. = Left middle turbinated bone.
R. N. = Right nostril.	R. M. T. B. = Right middle turbinated bone.

Case I.

Mr. J. W., *æt.* 43; shipowner. First seen 16th February, 1886. Consulted a surgeon in 1878 for nasal obstruction, when he was informed that he was suffering from polypus. In the month of December of that year several growths were removed, by means of evulsion, from the right nostril.

Two years afterwards the nostril had again become blocked, and there was also obstruction on the left side. Evulsion was performed a second time, giving temporary relief.

In 1882 a third operation became necessary, but in a few months the growths returned. So great was the pain, and so copious the hæmorrhage accompanying the operations already undergone, that the patient could not face another, and therefore had nothing done between 1882 and present date. Both nostrils now completely choked, no breath-way remaining. In six separate sittings of an hour to an hour and a half each, thirty-three polypi were removed by the electric snare, all growing from the middle spongy bone, and varying in size from a currant to a large bean. Little or no hæmorrhage occurred, and on the right side no pain was felt during the operation. The left nostril was greatly contracted by a deflected septum, and on this account considerable dilation by means of the speculum was necessary. This, together with the consequent difficulty of snaring the growths, caused the patient the only discomfort he complained of throughout the course of treatment. The relief to breathing was perfect, much more so, he stated, than after any of the previous operations. The bases of the tumours removed, and the hypertrophied mucous membrane having been cauterized as thoroughly as possible, patient was dismissed.

He was seen again in the September of the same year, when one small growth was discovered in the right nostril and removed.

On the 29th March, 1887, one polypus was removed from each nostril.

No more was seen of this patient till February, 1888, when he called, stating that he had been entirely free from all discomfort since his last visit nearly a year before, and both nostrils were quite clear.

Case II.

Mr. J. P. R., *æt.* 55; miller. First seen 28th September, 1886. For several years patient has been subject to frequent attacks of nasal catarrh, with loss of smell and obstruction for the last two years. (This case having been already quoted in part at page 15, I shall only here add the treatment carried out by me.)

Examination of left nostril with speculum and reflected light revealed two polypi depending from middle turbinated bone. These were snared and removed without difficulty.

On the right side the passage was found to be almost entirely occluded by a large pinkish tumour over the *Inferior* turbinated bone, movable, tender, and exuding a muco-purulent fluid. A portion of this tumour I removed and examined microscopically. It consisted entirely of true mucous membrane. The obstruction caused by its presence was so great that it was

impossible to obtain a view of the passage behind it. On October 1st, I therefore cauterized the tumour thoroughly with the galvano-cauter. Its surface was first painted with a 10 per cent. solution of cocaine, rendering the operation almost painless.

The passage having been thus cleared anteriorly, a number of small polypi were revealed hanging from the margin of the middle turbinated bone.

Eight of these were removed by the galvanic snare.

Another was seen growing from the anterior extremity of the same bone, but owing to violent sneezing coming on it could not be snared.

On the 7th October, the patient was seen again.

L. N. Bases of tumours already removed were now cauterized.

R. N. Part of the tumour on inferior T. B. remaining, it was destroyed by the cautery. Another polypus was seen behind it, but patient was too sensitive to bear removal on this occasion.

19th October. L. N. Three small polypi had grown up since patient's last visit, and were removed.

R. N. The polypi previously observed were at this sitting successfully removed.

On the 26th October another small growth was discovered depending from the R. M. T. B., and snared.

No others were visible, and general cauterization of the hypertrophied mucous membrane was therefore performed.

The patient then returned to his home in the country, and was not again seen. He was heard from occasionally, however; and in November, 1887, reported both nostrils quite clear.

This case illustrates the circumstance noted in the foregoing part of this paper; viz., the appearance of incipient growths soon after the removal of the older and larger ones. It will be noticed that several of these were found on various occasions subsequent to the first operation. Their immediate removal and the cauterization of the morbid mucous membrane from which they sprang were, however, attended by a favourable result, and one very different to what the patient had experienced after treatment by evulsion.

Case III.

Mr. H., *æt.* 63; optician. First seen 21st September, 1886. Has suffered from chronic nasal catarrh for the last ten years. Constant and copious discharge of yellowish mucous. Nose sometimes so blocked that he cannot breathe through it. Sense of smell intermittent; for the most part in abeyance. Dull pain over frontal sinuses, interfering with mental labour. Paroxysms of sneezing at times. All symptoms aggravated in

damp weather. Better inland, and at levels higher than the sea.

Examination of the nares revealed the presence of mucous polypi on both sides.

On September 23rd, two polypi, each of the size of a small grape, were removed from the L. M. T. B., and three smaller ones from the R. M. T. B.

On September 30th patient returned, when R. N. was found tender from effects of operation, and unfit for examination.

From the left side I removed two growths about the size of a pea, and then discovered a third depending from the posterior part of the M. T. B. This was snared, and the galvanic current having been passed, the tumour dropped by its own weight into the naso-pharynx, and was expelled by the patient through the mouth. It was an unusually large growth, measuring fully an inch vertically, and three quarters of an inch from before backwards. After its removal, the patient experienced great relief in breathing.

His sense of smell had gradually improved since the first operation.

On October 7th, I removed a small growth from the R. M. T. B., bringing away with it a lamella of necrosed bone. Three others were found behind it, and also removed.

On the 15th October, two more polypi were discovered, springing from the posterior third of the R. M. T. B. These were successively snared, and with one of them another spicule of dead bone came away.

At the same sitting a small polypus was removed from the posterior third of the L. M. T. B.

The patient was seen next on the 9th December, when no more growths were seen. The morbid mucous membrane covering the spongy bones was then cauterized, particularly in those situations on the right side whence necrosed bone had been removed.

On May 2nd of the following year, this patient was again examined, when one small growth was found on each side. Both were removed, and their bases cauterized. Since that date, patient has been frequently seen, but no recurrence has yet been noticed.

He still has some discharge from the nostrils, but the breathway is perfectly clear on both sides.

Case IV.

Miss P., *æt.* 48; schoolmistress. First seen 2nd October, 1886. States that she has been afflicted by nasal polypus since the age of fifteen years. The growths appeared first in one

nostril only, and after a time in both. Evulsion has been performed many times, the polypi soon returning after each operation. She has been in the habit of submitting to the operation periodically, as often as the nostrils became blocked, so as to get some degree of relief to her breathing. Has come to regard her case as hopeless, and greatly dreads the operative measures to which she has been obliged to submit.*

On the 8th October, I first operated on this patient with galvanic snare, and removed eleven large growths from the R. M. T. B. The nostril was completely blocked by these, and their removal gave immediate relief to breathing. The operation was absolutely painless, the nostril having been sprayed with a 10 per cent. solution of cocaine, and there was no hæmorrhage, beyond very slight oozing. The patient was greatly impressed by the contrast between this treatment and that to which she had been accustomed, and expressed her willingness to be operated on in the same manner as often as necessary for the complete clearance of the nostrils.

On the 14th October she returned, and I then attacked the left nostril, which was also blocked. Five polypi, of the size of small beans, were taken away from the anterior and middle-thirds of the M. T. B., their removal revealing larger growths lying behind them. Of the latter I removed two, each about the size of the distal phalanx of the thumb. One of them contained cavities, from which thick pus issued on pressure.

On the 28th October, I removed a large growth from the R. M. T. B., a spicule of dead bone coming away with it. Farther back, another polypus came into view, and was snared. Three smaller growths were also removed from the same neighbourhood.

From the left side, two were removed at this sitting, and both nostrils then appeared clear, though patient felt some "flapping" in the right nostril.

On the 4th November, three more small polypi were discovered on R. M. T. B. These were incipient growths, which had begun to sprout after the removal of pressure from the older ones. They were removed, and also one very large polypus depending from the posterior extremity of the bone. After the latter had been taken out, the "flapping" complained of ceased, and the breathing became still clearer than before.

From the posterior extremity of the L. M. T. B., a growth the size of a bean was also removed at the same sitting, and three smaller ones from its anterior extremity. The latter had not been seen at the previous visit, and were no doubt new

* This is the case referred to at page 14.

developments from the morbid tissue remaining after the removal of those first discovered.

On the 11th and 25th of November, several more growths of small dimension were removed from each nostril, and the surfaces from which they sprung well cauterized. This had also been done in the case of all those previously dealt with. A month later patient was examined again, but no trace of any growths could be found.

Since that date I have seen the patient frequently, the last occasion being in February, 1888, and she is still perfectly free from her old enemy, breathes comfortably, and requires no more treatment.

Case V.

Miss L. B., *æt.* 14; pupil-teacher. First seen January, 1887. This patient had been for some years suffering from deafness and nasal obstruction. The former I found to be caused by a large mass of lymphoid vegetation in the vault of the pharynx, blocking the orifices of the Eustachian tubes, and so preventing the ventilation of the middle ears. The patient having been anæsthetized by a colleague, I removed these vegetations by means of Lowenberg's forceps, and also excised the tonsils, which were hypertrophied. This operation was followed by perfect restoration of hearing, the patient being thereby enabled to retain her situation as a teacher.

On the 22nd February, I removed five mucous polypi by the galvanic snare from the L. M. T. B.

On the 4th March, two more were taken from the left, and three from the right M. T. B.

On the 17th March, and 28th April, seven other growths were removed from both sides, and all hypertrophied mucous surfaces cauterized.

Patient was not seen again till 12th August following, when the nostrils were carefully examined, and both appeared quite clear.

Case VI.

Miss F. K. S.,* *æt.* 10. First seen January, 1887. Patient was brought by her parents on account of nasal catarrh and obstruction, which they said had existed almost since the child's birth. The nose was greatly enlarged transversely, and a large swelling was visible between the eyes.

Examination of the nostrils showed that the obstruction was due to a crop of true mucous polypi. This is the youngest case

* Referred to at page 5.

in which I have discovered them, and also younger than any other recorded, so far as I am aware.

In addition to the polypi, there was great thickening of the nasal mucous membrane generally, particularly of the anterior ends of the turbinated bodies. Much of this was got rid of by the galvano-cautery, the operation in this instance being performed under chloroform, as the child was nervous and sensitive.

This having been done, I removed, at three separate sittings, five mucous polypi—three from the left side, and two from the right. Their removal relieved the obstructed breathing to a large extent, the swelling between the eyes disappeared, and the general health rapidly improved.

In July, 1887, the little patient was still free from the obstruction, and has not since been seen.

Case VII.

J. C., *æt.* 25; van-driver. First seen 22nd March, 1887. States that, to his own knowledge, he has had nasal polypi for more than seven years. They were first detected when he applied to a medical man for relief on account of discharge from the nose, obstructed breathing, loss of smell, and impaired sense of taste. Evulsion was performed, for the first time, five years ago, the operation being attended by much pain and hæmorrhage. A month afterwards the nose was as much blocked up as ever.

Two years later he again sought relief by evulsion. Several pieces were then taken away, without, however, giving any relief to the breathing. The pain inflicted by the forceps was so great that he did not again submit to any further operation.

Both nostrils now entirely blocked, and patient's distress proportionally great.

I operated on patient with the galvanic snare on the 23rd March, and removed seven very large growths from the R. M. T. B., and four smaller ones. They were all situated in a line from before backwards along the free margin of the bone.

For the first time for several years patient was enabled to breathe freely through the nostril. Previous operations had never given him more than very partial relief.

On 1st April, two more large and two small polypi were removed from the same bone, and a similar number from the L. M. T. B. Owing to great deflection of the septum towards the left, operation on that side was very difficult. The only pain complained of throughout was from the necessary dilatation of the left nostril by the speculum; no hæmorrhage occurred.

Patient was asked to report himself in a few weeks, so that some incipient growths noticed might be cauterized. Feeling

no inconvenience, he did not, however, return till January 4th, 1888. As a result of the long delay, the incipient growths left had grown up to a considerable size, and four were at once removed; one of them presented the appearance noted on page 7. A considerable portion of hypertrophied mucous membrane was removed along with it from the anterior extremity of the R. M. T. B. Between this hypertrophied membrane and the clear, semi-transparent myxomatous tissue there was no true line of demarcation, but a gradual and imperceptible merging of the one into the other. It seemed probable that the hypertrophy had ended in degeneration from true mucous membrane to a lower form of organization; viz., myxoma.

On this occasion a few small growths could be seen through the anterior chink of the L. N., and posterior rhinoscopy revealed a large polypus protruding from the left choana into the naso-pharynx.

On the 18th January, patient was seen again, and four growths were snared and removed from the L. M. T. B. The aperture of the nostril was too small to admit the instrument far enough to snare the polypus hanging into the naso-pharynx; the margins of both inferior and middle spongy bones were therefore cauterized, with a view to enlarging the opening.

On 14th March, the R. N. was found to be quite clear, and the polypus before observed in L. N. had now become visible anteriorly. The aperture being still too narrow to admit instrument, its sides were again cauterized.

May, 1888. This patient is still under treatment.

Case VIII.

J. W., *æt.* 55; foreman in gas-works. First seen 14th April, 1887. Has had nasal-polypi for twenty years in R. N., and for the last three years in L. N. also; both sides quite blocked, with usual subjective symptoms.

Evulsion has been performed in R. N. three times, but never so effectually as to give any breath-way. The growths soon returned after each operation.

From R. M. T. B. I removed seven good-sized growths, without any hæmorrhage. The only pain felt was when a spicule of bone was removed with one of them. After their removal patient breathed freely through R. N., and expressed much satisfaction in doing so *for the first time for twenty years.* The left nostril was much contracted by a deflected septum and hyperthrophied I. T. B. One polypus was removed from it on this occasion, but without relief to breathing.

On April 28th, four more were taken from R. N. At the

posterior third of L. N. there existed a deflection of the septum to the left, and the swollen mucous membrane over the spongy bones came almost in contact with it. Through the chink between, a polypus could be seen, but the space was too small to snare it; the hyperthropied mucous membrane was therefore cauterized, so as to give more room.

On June 23rd, patient reported that two or three days after last operation he was able to breathe through L. N. also. The polypus before seen through the chink had come forward through it, after the enlargement of the latter at last sitting. It was snared successfully and removed.

Another large growth, with five smaller ones, was also taken from the R. M. T. B. on this occasion.

On July 5th, three small tumours were removed from the left, and one from the right side.

On the 19th August, R. N. was found to be clear, but one or two incipient growths were cauterized.

From L. N. one of the size of a currant was removed.

On September 2nd, patient was again examined, but no growths could be discovered. General health had much improved since removal of polypi, and *he had gained 20 lbs. in weight.*

On 9th December, both nostrils remained perfectly clear, and smell had returned.

Patient was also seen in February, 1888, when no recurrence had taken place.

Case IX.

W. G., *æt.* 50; engineer. First seen 21st April, 1887. Has had obstruction of L. N. for fifteen years. Evulsion has been performed once, several pieces being removed, but without giving any relief to breathing. For the last two years, has not been able to breathe at all through L. N. Smell almost gone, and taste impaired.

I removed six good-sized polypi from the L. M. T. B. without giving pain or causing hæmorrhage.

On June 20th, three large growths and two smaller ones were taken away from the same situation. Their bases and all the hypertrophied mucous membrane visible were cauterized, and patient dismissed.

On 18th August, he returned for examination, and both sides were found to be perfectly clear.

Patient was seen again in January, 1888, when he still felt comfortable, there being no return of his complaint.

CASE X.

C. L., *æt.* 47; shopkeeper, Torquay. First seen 28th June, 1887. Complete obstruction of R. N. for five years, and loss of smell for seven years. L. N. obstructed during damp weather, but passage through it in dry. Was formerly very stout, but has lost much flesh since these symptoms began.

From L. N. I removed a very large growth, consisting of several portions, which seemed to have grown from each other by a process of gemmation. The base, which was about one inch in breadth, was attached to the anterior half of the M. T. B. The accompanying photograph was taken from the polypus some time after its removal. The tumour was somewhat larger than here represented, the spirit in which it was preserved having caused some shrinking of its tissue. From the portion of bone lying behind, I then took away seven other growths, varying in size from a currant to a small grape. From the R. M. T. B. I also removed fourteen polypi, all about the same size as those found in the posterior part of L. N. The operation took rather more than an hour, twenty-two polypi being removed without either pain or hæmorrhage. Relief to breathing was perfect.

On 17th August, patient again presented himself, when from the R. N. I removed two good-sized polypi and a few incipient growths. One small tumour was also taken from the left side.

On September 22nd, one polypus was removed from each nostril.

On November 3rd, both nostrils clear, but one or two buds were cauterized on each side.

On December 14th, one polypus of the size of a split pea was removed from the anterior part of R. M. T. B. The left nostril was quite clear.

On January 26th, 1888, another examination was made, but no growths were present on right side. Some hypertrophied tissue on R. M. T. B. was cauterized. One very small polypus was seen on L. M. T. B. and removed, and the mucous membrane around it cauterized.

On April 7th, both nostrils remained quite clear, and all discharge had ceased.

CASE XI.

Miss C., *æt.* 62; Ventnor, Isle of Wight. First seen 15th June, 1887. Two years ago became aware of obstruction in right nostril, and polypus was discovered to be the cause. Three months afterwards one or two pieces were removed by forceps. This gave partial relief, but in a few months the

nostril was again blocked. There was also slight obstruction in left nostril.

Since the onset of the obstruction patient has suffered from frequent attacks of asthma and bronchitis.

From R. M. T. B. I removed with the galvanic snare two large growths. Patient was very nervous; and though the operation gave her no pain, and was unattended by hæmorrhage, would not have anything more done on this occasion.

On the 18th, she came again, and I took away five smaller growths from the same bone.

On the 21st, I attacked the left nostril, and removed two large and two small growths from the middle and posterior thirds of the M. T. B. Three days later, another was taken from the same situation.

On the 29th, I examined the R. N. again, and, after removing two incipient growths, cauterized some hyperthropied tissue about the middle of the spongy bone.

Patient was not seen again till 11th August, when R. N. was found to be quite clear, and one or two buds on left side were cauterized.

She then returned to Ventnor, and on 26th January, 1888, wrote that a medical man there had examined the nostrils, and reported them both quite clear.

Patient also stated that since the treatment undergone she had been quite free from attacks of asthma.

Case XII.

Mr. B., *æt.* 76; ship-broker. First seen 24th August, 1887. First observed obstruction in nose about two years ago, immediately after an attack of fever and ague.

Two mucous polypi were at that time removed by forceps from R. N., and a month later a third.

Now has obstruction on both sides, there being no breath-way at all through R. N., and very little through left.

With the snare I removed two growths about the size of an acorn from each M. T. B.

On September 1st, another was removed from the right side; and on the 8th, three more from the left, and one from the right.

Patient was seen again on October 20th, when R. N. appeared clear, and one small growth was removed from L. M. T. B.

On January 11th, 1888, patient returned complaining of a choking sensation in the throat or naso-pharynx, and an obstacle to the flow of mucous. When last seen no more polypi could be discovered by inspection through the anterior nares, and

patient "gagged" so much that the naso-pharynx could not be properly examined by posterior rhinoscopy.

On this occasion, however, on examining the R. N. anteriorly, I observed the edge of a polypus very far back, and seemingly attached to the posterior part of the M. T. B. After several attempts, I succeeded in snaring it, and the growth, which was the size of a large grape, fell back, when the current was passed, into the naso-pharynx, whence the patient coughed it out.

No recurrence of the growths already removed could be discovered, and their absence had evidently allowed the most posteriorly situated polyp to come forward sufficiently to be seen and secured.

Since that date patient has been frequently seen, but no return has been noticed.

I shall conclude this paper with the following table, which epitomizes the foregoing cases. Others might be given, but those quoted are sufficient to illustrate the general character and results of the treatment here advocated.

TABLE.

No.	Name.	Residence.	Sex.	Age.	Occupation.	First seen.	Duration of disease.	Previous operations.	Condition of Breathing.		Sittings.	No. of polypi removed.			Dismissed.	Results.
									R.	L.		R.	L.	Tot.		
1	J. W.	Plymouth	M	43	Shipowner .	Feb. 16, 1886	8 yrs.	Evulsion 3 times	Blocked .	Blocked .	8	20	13	33	Mar., 1887	No obstruction, Feb., 1888
2	J. P. R.	Cornwall .	M	55	Miller . .	Sept. 28, 1886	2 yrs.	Evulsion 3 times, Caustic 8 times	Complete obstruction	Partial obstruction	5	11	5	16	Oct., 1886	Reported well, Nov., 1887
3	J. H.	Yelverton	M	63	Optician . .	Sept. 21, 1886	10 yrs.	....	Partial obstruction	Partial obstruction	6	9	8	17	May, 1886	No recurrence, April, 1888.
4	E. P.	Plympton	F	48	Schoolmistress	Oct. 2, 1886	33 yrs.	Evulsion very frequently	Blocked .	Blocked .	6	23	16	39	Nov., 1886	No recurrence, Feb., 1888.
5	L. B.	Plymouth	F	14	Pupil Teacher	Jan., 1887 .	3 yrs.	....	Blocked .	Blocked .	4	7	10	17	Apl., 1887	No recurrence, Aug., 1887.
6	F. K. S.	Devonport	F	10	Schoolgirl .	Jan., 1887 .	Since infancy?	....	Absolutely blocked	Absolutely blocked	3	2	3	5	Mar., 1887	Breathing free, July, 1887.
7	J. C.	Plymouth	M	25	Van-driver .	March, 1887	7 yrs.	Evulsion 3 times	Absolutely blocked	Absolutely blocked	4	19	8	27	....	Under treatment.
8	J. W.	Plymouth	M	55	Foreman . .	April, 1887 .	20 yrs.	Evulsion 3 times	Absolutely blocked	Absolutely blocked	5	14	6	20	Sep., 1887	No recurrence, Feb., 1888.
9	W. G.	Plymouth	M	50	Engineer .	April, 1887 .	15 yrs.	Evulsion once .	Clear . .	Blocked .	2	..	11	11	Aug., 1887	No recurrence, Jan., 1888.
10	C. L.	Torquay .	M	47	Shoemaker .	June, 1887 .	7 yrs.	....	Blocked .	Blocked .	6	20	11	31	Jan., 1888	No recurrence, April, 1888.
11	M. C.	Ventnor .	F	62	Lady . .	June, 1887 .	2 yrs.	Evulsion once .	Blocked .	Partially blocked	5	9	7	16	Aug., 1887	Reported clear, Jan., 1888.
12	J. B.	Plymouth	M	76	Shipbroker .	Aug., 1887 .	2 yrs.	Evulsion twice .	Blocked .	Blocked .	5	5	6	11	Jan., 1888	Both sides clear, Mar., 1888