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ON

NASAL COUGH

AND THE EXISTENCE OF A

SENSITIVE REFLEX AREA IN THE NOSE.

BY

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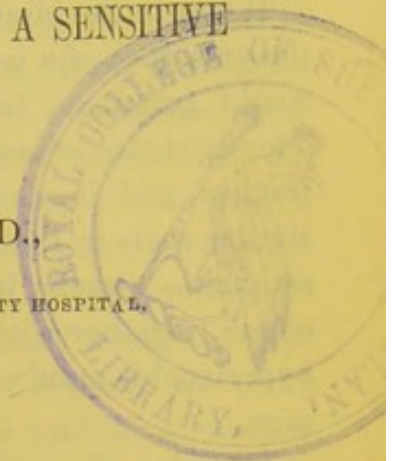


ON NASAL COUGH, AND THE EXISTENCE OF A SENSITIVE REFLEX AREA IN THE NOSE.¹

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THE object of this communication is to direct attention to the *great frequency of cough as a symptom of nasal disease*, and to indicate, as far as possible, the manner of its production.

The dependence of cough upon irritation of the external auditory meatus and pharyngo-tracheal membrane is well known, and the terms "ear" and "laryngeal" cough have passed into current use among medical men. It is also quite possible that the reflex act may originate primarily in morbid conditions of various other organs of the body, and the familiar expressions "stomach" and "liver" cough would seem to indicate that such a causal connection had been accepted as true of some of the abdominal viscera. This interdependence has, however, never been demonstrated by experiment, nor are the clinical data sufficient to warrant the unqualified acceptance of this alleged correlation.

My attention was first directed to the study of nose cough by the repeated observation, that, during the manipulation of instruments (probe, forceps, snare, Eustachian catheter, etc.) within the nasal fossæ, paroxysms of coughing were induced which only subsided upon the withdrawal of the instrument, or upon changing its position in the nasal chamber. The cough varied greatly in character, from a succession of short expiratory acts to convulsive paroxysms which interfered greatly with instrumentation. These attacks occurred, furthermore, only when the foreign body came in contact with the deeper portions of the nostril; in several cases where the snare was used they seemed to be excited only at one particular spot in its passage through the nose, and ceased when the loop entered the naso-pharynx. My clinical experience, too, furnished me with cases where distressing cough existed, whose etiology was rendered obscure by the absence of disease or irritation in pharynx, windpipe, or lungs. In

¹ Presented as a candidate's thesis to the Maryland Academy of Medicine, May 12, 1883.

this latter case, one of two conditions was invariably present, viz., either a hyperæmic or slightly swollen state of the mucous membrane chiefly affecting the turbinated bodies, or pronounced hypertrophic enlargement of these structures.

It was in the clinical study of this reflex cough that I was led to assume the existence of a certain area or areas in the nose, the irritation of which would culminate in a reflex act or in a series of reflected phenomena. The existence of such an area had been demonstrated in the larynx and trachea, and it seemed, therefore, legitimate to assume the presence of similar spots in the nasal chamber. The well-known occurrence of reflex asthmatic attacks in some cases of nasal polypus and their absence in others, together with similar observations which I had made in regard to hypertrophic nasal catarrh, lent further support to the hypothesis of a reflex area.

In order, if possible, to throw some light upon this subject, I made a series of experiments upon a large number of hospital patients, upon myself, and upon several of my medical friends, who were kind enough to place their nasal organs at the disposal of science. The experiments consisted essentially in the systematic irritation of all accessible portions of the nasal mucous membrane, the irritants used being silver and rubber probes and the steel wire, such as used in the polyp-snare.

It may be here remarked, that the nose of the negro is admirably adapted for experiment on account of the great capacity of the nasal chambers anteriorly, rendering dilatation by artificial means unnecessary, and hence eliminating a source of error which might vitiate the result of the experiment. The great width of the vestibule, too, brings the anterior ends of the turbinated bones into greater prominence, or rather, their mucous covering, which, in the black race, is much more puffy anteriorly than in the white man, giving the appearance of what in the latter would be taken for an anterior hypertrophy. It is also very flabby, collapses under the probe, and can be pressed with ease against the external wall of the nostril.

The patients experimented on presented varying degrees of susceptibility to irritation; in some instances, the slightest touch was sufficient to provoke the reflex act, whilst in others it was only excited by repeated irritation or long-continued pressure. In some cases no reflex whatever could be obtained. The results of these experiments may be briefly given as follows:—

So long as the stimulation was confined to the vestibule—to the interior of the fleshy, cartilaginous nose—the result was negative; no reflex action was obtained. The sensation created was simply that of a foreign body, or, if the stimulus was increased, a feeling of pain. So far, I have been unable to excite cough by stimulation of this part of the nose. Irritation of the membrane clothing the anterior extremities of the middle and infe-

rior turbinated bones was in some instances negative; in others a half-tendency to cough was produced which increased as the irritant was applied farther back, and finally culminated in the act when it was directed upon the posterior half of the turbinated body. Irritation of the floor of the nose was negative in result. In cases where stimulation of the remaining portions of the nose failed to excite them, paroxysms of cough were induced when the irritant was applied to the mucous membrane covering both the inferior and middle turbinated bones; but the act was most constantly obtained from the posterior end of the inferior turbinated bone and the portion of the septum immediately opposite. Indeed, my experiments seem, thus far, to show that these portions are the most sensitive spots in the reflex area. In passing along the pars nasalis of the roof, coughing was occasionally produced when the probe or wire impinged on the anterior extremity of the middle turbinated bone; but no decided results could be obtained from the upper olfactory region.

We have thus experimental proof that all parts of the nasal mucous membrane are not equally susceptible to the impression by which reflex cough is produced, and, furthermore, that the cough or reflex area is probably limited to the mucous membrane covering the middle and inferior turbinated bodies and the posterior half of the septum. Now this is the area occupied by the erectile tissue of the nose, and it is hard to resist the conclusion, that this structure is in some way connected with the evolution of the reflex act, and that the peculiar susceptibility to irritation is to a great extent intimately associated with its physiological functions, whatever they may be.

Roughly speaking, the greater the congestion or inflammation, the more constant the reflex obtained. I have succeeded, however, in producing violent paroxysms of laryngeal cough by simply touching, with the aid of the rhinoscope, the posterior extremity of the inferior turbinated bone in a person whose nose was free from disease. In some cases, stoppage of the nostril and discharge of mucus was produced, whilst in others this was not observed.

That the sensitive area is principally confined to the parts already indicated, viz., the posterior half of the inferior turbinated body and septum, is furthermore rendered exceedingly probable by the following clinical facts:—

- (1) That in cases where reflex cough exists, these are the portions chiefly, if not solely, involved.
- (2) That the act may be produced here at will by artificial stimulation of the parts invaded by the morbid process.
- (3) That it may be dissipated by local applications to, or removal of, the membrane covering the diseased surface.

- (4) That foreign bodies, such as pins, lodging in this area sometimes give rise to cough, which latter is not observed when they become impacted in other portions of the nose.
- (5) That polypi give rise to reflex phenomena only when they arise from, or impinge upon, the sensitive portions of the area.
- (6) That where complete atrophy of the turbinated structures exists, as, for example, in ozæna, reflex cough is not present, nor can it be induced by artificial stimulation.

These facts are the outcome of personal experience, and, as they represent the result of solitary observation, are, of course, open to correction. I have never seen, nor do I know of a single case where a foreign substance impacted in the non-sensitive portions of the nose has given rise to cough; but I do know of cases where that act was excited by their presence in the reflex area. In regard to *reflex asthma* from polypi, the literature accessible to me shows, that, where the position of the tumour is accurately defined by the reporter, it is always in the posterior portions of the nostril, in a situation which would lead to irritation of the sensitive tract.

The following cases may be adduced as illustrative of the above remarks:—

CASE I. Miss S., a robust, healthy young woman of fine physique, but of somewhat nervous temperament, came in December, 1881, at the solicitation of her friends, to consult me on account of a dry, hacking cough, dyspnœa on slight exertion, and occasional night sweats. The association of this suspicious triad of symptoms, with feverish exacerbations in the afternoon, loss of appetite, irregular, scanty menstruation, the occasional presence of small quantities of blood in the expectoration, and progressive deafness, had led her family to anticipate medical opinion in the matter, and to refer her ailments to consumption.

Beyond a few small mucous râles, nothing abnormal was discovered in the lungs, and the heart performed its work in a perfectly natural manner. The laryngeal membrane showed no signs of inflammation, but during the examination became congested. Both tympanic membranes were sunken, but movable; the malleus handle prominent and congested. Ordinary conversation was heard with difficulty; improved by inflation of the drum cavity. The orifices of the Eustachian tubes were swollen and filled with mucus.

The starting-point of all her trouble was finally discovered in the nose, which was almost completely occluded by hypertrophic thickening of the mucous membrane over the middle and lower turbinated bones of both sides. The osseous structure was also developed to an abnormal extent, and assisted in the occlusion of the nostrils. I explained the situation to the patient, and assured her that an operation would certainly relieve, and perhaps completely dissipate, the disorders from which she suffered. This she consented to, and the inferior hypertrophied masses were removed—seven days intervening between the two operations. Vapour of creasote, carbolized and astringent sprays, inflation of the middle ear with the vapour of the benzoate of iodine constituted the remainder of the treatment. Im-

provement at once began, and in seven days after the second operation all symptoms referable to the chest had disappeared, and the discharge from the nose had ceased to trouble her. Two weeks later she could hear ordinary conversation with ease, and by the middle of the following February the whispered voice was heard distinctly in each ear at the distance of twenty feet.

CASE II. A negro man came to my clinic at the hospital to be treated for a severe paroxysmal cough which occurred at irregular intervals, and which, together with the occasional expectoration of small quantities of mucus tinged with blood, had led him to infer the existence of some pulmonary affection. The attacks came on both in the night and during the daytime, and seemed, according to his story, to vary in severity with the amount of a discharge from a nasal catarrh from which he had suffered for a number of months. His general health was excellent, and beyond a very slightly hyperæmic condition of the ventricular bands and vocal cords, nothing could be detected in the lower respiratory organs to warrant the diagnosis of disease. The pathological appearances in the nose and upper pharynx were those of ordinary hypertrophic catarrh, affecting chiefly the inferior and middle turbinated structures and the septum, the mucous membrane over the inferior turbinated body being moderately swollen and intensely hyperæmic. A bent probe was introduced, with the aid of the mirror, behind the velum, and made to impinge on the posterior end of the lower turbinated bone. Immediately a violent paroxysm of coughing was induced, which he assured me was identical with those from which he suffered. At no other portion of the nasal membrane could the attacks be provoked. The experiment was performed repeatedly, and always with the same result. Looking upon the paroxysm as a purely reflex phenomenon, the treatment was confined to the local application of astringent solutions to the congested, swollen area. The patient was directed to use a salt and soda spray at home, followed by the insufflation of finely powdered boracic acid. No other treatment was used. After the third application the coughing-spells became less severe, and the interval between them more prolonged; at the end of two weeks they had completely disappeared, together with the hyperæmia and swelling of the mucous membrane over the inferior turbinated bones. The nasal discharge had diminished to such an extent that the patient, finding no further inconvenience from his catarrh, ceased attendance at the clinic.

CASE III. A young girl, of healthy appearance and good physique, consulted me on account of a short, dry, hacking cough, with which she had been troubled for several weeks. The cough was most severe when she laid down to rest at night. She also complained of slight sore-throat and difficulty in swallowing. She insisted that her nose had never given her the slightest inconvenience, and that, strange to say, she very rarely suffered from coryza. The lower respiratory passages presented no signs of disease; but the left tonsil was the seat of chronic follicular inflammation; the follicles were swollen and filled with cheesy deposits; the gland itself was slightly enlarged. I removed the diseased tonsil, and dismissed her, deferring the examination of the nose until her next visit, as she had denied disease of that organ, and as I was anxious to get through my work that day as quickly as possible. Moreover, I thought that the diseased tonsil might possibly be the originator of the reflex cough, and that its ablation would effect a cure.

Several days afterwards she returned to say that her sore-throat had

disappeared, and that she could swallow with perfect ease; but that her cough still remained, in fact seemed to have increased somewhat in severity. A thorough examination of the nose was now made. Nothing abnormal was detected in either side, except a hyperæmic and very puffy condition of the membrane covering the inferior turbinated bone of the left nostril. Upon touching this lightly with a silver probe, the short, explosive cough of which she complained was at once produced. The act was completely beyond her control, and could be excited only by irritation of the turbinated structure. As the swelling was obviously due to a more or less acute engorgement of the turbinated tissues, and not to chronic inflammation of the same, the treatment consisted in the topical application to the diseased surface alone of sedative and astringent remedies. Four or five pencillings caused the cough and swelling to disappear; to return, however, when the local applications were discontinued. Upon their resumption, the cough began to grow less severe, and finally ceased altogether. As she has not returned for further treatment, it may be assumed that the cure has been permanent.

CASE IV. A gentleman whom I had treated six months previously for catarrhal laryngitis, consulted me on account of a disagreeable, hacking cough, and pain in the throat, which he referred to the region of the cricothyroid space. The sensation complained of was that of a foreign body in the larynx, and was not constant, disappearing sometimes for hours at a time. There was no expectoration with the cough; but he remarked incidentally, that for some time past he had noticed an accumulation of mucus in the nose and back of the throat, and that his voice became easily fatigued in singing. It was especially after such exercise of the voice that the tickling in the larynx and paroxysms of cough were produced. Before coming to my office he had used a stimulating inhalation which I had prescribed for him the winter before, and from which he had then derived considerable benefit. On this occasion, however, it had failed to exert any influence upon the cough. As I could discover nothing in the larynx or lungs to account for the symptoms which he described, and as inspection and probing of the anterior portions of the nose revealed nothing abnormal, I had begun to suspect that the phenomena might be ascribed to a somewhat exalted imagination, when the rhinoscope revealed the origin of his trouble in a swollen, intensely hyperæmic condition of the inferior turbinated bodies. These latter were covered with a film of mucus, which extended also over the pharyngeal vault. This was carefully removed, and the reddened turbinated body lightly touched with a bent probe. Pain was at once felt in the larynx, which caused him to grasp the throat with his hand. This was immediately succeeded by a paroxysm of coughing which lasted for nearly a minute. The sensation of pain and cough produced by touching the inflamed turbinated structures was compared by him to an aggravation of his existing complaint, the pain being slightly more pronounced in the former case, and radiating into the lower part of the trachea. Local treatment of the diseased nasal mucous membrane was at once instituted with marked relief to the symptoms.

CASE V. A well-known physician of this city had suffered for over twenty years from chronic sore-throat, for which he had undergone every variety of treatment. His case, apart from a feature to be presently mentioned, presented nothing out of the ordinary run of similar cases of old catarrhal disease of the upper respiratory tract. He referred all his trouble to the larynx and pharynx, and when questioned as to the existence

of nasal disease, seemed convinced that such a condition played no part whatsoever in the production of his laryngeal catarrh. Upon retiring at night and turning upon his left side, as was his wont, he was seized with involuntary and uncontrollable paroxysms of coughing, which only subsided when he laid upon the opposite side. He also complained of a sensation, as of a heavy weight in the back of the throat, which became more pronounced toward morning. This state of affairs had lasted for a number of years, and had become a source of great annoyance to him, as he could not explain the curious relationship between cough and position, nor could those of his medical friends whom he consulted on the subject, enlighten him as to the etiology of the paroxysms. His throat had been treated after the most orthodox manner, and his epiglottis had been cauterized under the impression that its inflamed condition was the starting point of the cough. These means, had, however, proved of no avail, and he had finally accepted the cough, with philosophic resolution, as the inseparable associate of his life. Recently, however, the paroxysms had become more severe and annoying, and one day he called on me for a professional opinion.

The mucous membrane of the entire naso-laryngeal tract presented the ordinary typical appearances of chronic catarrhal inflammation of these organs. The pharynx was granular and irritable. The posterior extremity of the right inferior turbinated bone was the seat of a small grayish-white hypertrophy which had not, however, encroached to any great extent upon the lumen of the corresponding inferior meatus. The middle and superior turbinated bodies of the same side were moderately swollen and very hyperæmic. There was also a moderate amount of hypertrophic enlargement on either side of the posterior half of the septum. A similar condition existed on the middle and superior turbinated bodies of the opposite side. There was no anterior hypertrophy of any of the turbinated structures; but the posterior part of the left inferior meatus was completely blocked by a large, irregularly oval, vascular hypertrophy of the posterior extremity of the inferior turbinated body of that side. This, I assured him, was the *fons et origo* of all his trouble, and the inflammation of the pharyngo-laryngeal tract was secondary to a chronic hypertrophic nasal catarrh; that the cough was reflex in character, and depended upon the hypertrophic enlargement of the posterior end of the left inferior turbinated body, an area which was especially concerned in the evolution of reflex phenomena. I furthermore gave it as my opinion, that the removal of the hypertrophied mass would, in all probability, dissipate the cough, and proposed an operation then and there. This he refused, and I treated him under protest for several days with an astringent and alterative spray. As no effect was produced upon the cough by this treatment, he consented at last to the operation. The hypertrophy of the left turbinated body—a growth about the size of a small strawberry—was accordingly removed with ease by means of the snare, the wound allowed to bleed for some time to encourage evacuation of the erectile cells, and the nostril finally plugged with carbolized absorbent cotton.

The effect was almost magical. The next day he came to tell me that he had not coughed one-sixteenth as much as before the operation, and that if he remained in his then condition, he would be perfectly satisfied with the result. A few days later, when cicatrization was complete, the cough had almost entirely disappeared, in fact, was hardly noticeable, and he could lie upon the left side with perfect comfort and freedom from cough, a pleasure he had not experienced for many years.

CASE VI. A middle-aged gentleman placed himself under my care to be treated, as he supposed, for chronic bronchitis. He had for a number of years been subject to attacks of influenza, the disease always starting as an acute coryza and ending in a bronchial catarrh. He volunteered the information, that the cough was always most severe and harassing when the inflammatory process was confined to the nose, and abated considerably when it descended to the lower portions of the respiratory tract. The intervals between the attacks had gradually become less and less, so that the cough was almost constantly present. It was short, hacking, and unaccompanied by expectoration. In bodily operations requiring unusual exertion, he was compelled to breathe exclusively through the mouth, and became very readily fatigued. Even in walking a great distance, or in going up stairs, the dyspnoea was sufficient to give him considerable anxiety. He had consulted a specialist, who informed him that all his trouble arose from inflammation of the windpipe and bronchial tubes, and who treated him for a number of months with laryngeal sprays, stimulant inhalations, etc. No effect was produced upon the cough, which continued, in spite of treatment, with all its original severity.

On careful auscultation, a few mucous râles were discovered here and there in the chest, in not sufficient number, however, to warrant the diagnosis of chronic bronchitis. The larynx was congested. The mucous membrane lining the posterior nares was intensely hyperæmic; the inferior turbinated bone of each side swollen and hypertrophied. Well-marked hypertrophic enlargement of the cavernous tissue of the septum was also present; especially on the right side, which, together with the inferior hypertrophy, produced almost complete occlusion of the inferior meatus of the corresponding nostril. Anteriorly, the nasal fossæ presented nothing worthy of special remark. Under the assumption that the inflammatory engorgement of the turbinated structures was the most important, if not the sole factor in the production of the cough, the treatment was directed to the local nasal affection. He was given a carbolized alkaline spray for use at home, and a tar vapour to inhale through the nostrils. The nasal cavities being thoroughly cleansed, local applications of ammonio-ferric alum and zinc were made to the diseased turbinated bodies. At first the applications themselves gave rise to cough; but this tendency grew less as the congestion of the membrane began to disappear. With its subsidence the patient commenced to improve, and the cough ceased to give him inconvenience. As long as the local treatment was continued, there was a marked diminution in the number and severity of the cough paroxysms. Upon its discontinuance, both the cough and congestion reappeared. As he has never been willing to submit to an operation, I am still holding his cough in abeyance by local applications.

CASE VII. The winter before last a gentleman came to my office to have his chest examined. His history was briefly as follows: For nearly two years he had suffered almost uninterruptedly from a distressing, hacking cough, which was most severe in the early morning and when he laid down to rest at night. He was extremely subject to cold in the head, and during inclement weather his voice would become hoarse and remain so for days at a time. For six months prior to seeking advice he had been growing gradually deaf, and had begun to suffer from tinnitus aurium. At first he paid no attention to the cough; but it had finally become so harassing that he had temporarily given up his business and gone abroad. Very little benefit was derived from his European trip, and he returned home in

much the same condition in which he had left. Travel in the West was next tried, but without any effect upon the cough, which had increased rather than diminished in severity.

A careful examination of the internal organs disclosed nothing abnormal. The pharynx was congested, and its follicles somewhat swollen; but otherwise its mucous membrane presented nothing worthy of remark. During the laryngoscopic examination the partially injected laryngeal membrane became covered with a crimson blush, which faded slowly when the mirror was withdrawn. On rhinoscopic examination, the posterior ends of the inferior turbinated bodies were found greatly hypertrophied, especially that of the left side, which lay across the floor of the nostril, and almost completely precluded the passage of air through the meatus. The mucous membrane of the middle turbinated bodies and septum was reddened and turgid, the engorged condition being more pronounced in the posterior portions of the nose. The mouths of the Eustachian tubes were swollen, reddened, and filled with slimy mucus. Both drum cavities were the seat of catarrhal inflammation.

The sequence of events here was sufficiently obvious. As the patient, however, was loath to undergo an operation, it was determined to defer instrumental interference until less radical measures had been fairly tried. He was accordingly treated with sprays, inhalations, inflation, tonics, etc. In the course of a month marked improvement had taken place; the cough was much less severe, and the hearing notably improved. Upon the slightest change in the weather, however, the symptoms would recur. Especially noticeable was the sudden laryngeal congestion which would occur during the aggravation of the nasal inflammation, and which would immediately disappear when the latter was brought under subjection. This alternate subsidence and reappearance of the cough continued until the early part of last February, when he adopted my view of his case, and consented to the removal of the hypertrophied structures. In a few days after their ablation the cough had entirely disappeared. Shortly afterwards he went South on a pleasure trip, taking with him an array of medicines for use in case of a return of his original trouble. Fortunately he has had no occasion to resort to them; and he tells me that since the operation he has had no return of the cough, and that apart from the occasional accumulation of mucus in the pharynx, requiring hawking efforts for its removal, he is perfectly comfortable, and considers himself thoroughly cured.

These cases can be multiplied. Indeed, nasal cough has become so common in my experience, that I have long since ceased to regard it as a curiosity. It is worthy of remark, that in a fair proportion of cases there are few, if any, symptoms which would direct the attention to disease of the nose, and this fact emphasizes the importance of examining the nasal chambers in all cases of the kind, even though the testimony of the patient may lead to neglect of their systematic exploration.

My clinical observation leads me to the belief that reflected irritation from nasal disease plays a not inconspicuous part in the etiology of laryngeal congestion and inflammation. The short, hacking cough and hyperæmia of the larynx which occur in acute coryza are probably more often explicable on the theory of reflex action than upon the extension of the

inflammation to the laryngeal vestibule. The physiological explanation of this phenomenon may possibly be found in the doctrine of correlated areas,¹ the reflex taking place through the vaso-dilator nerves from the superior cervical ganglion of the sympathetic. In chronic coryza, on the other hand, the constant laryngeal hyperæmia induced by reflex nasal irritation, augmented, perhaps, by the frequent occurrence of cough paroxysms, may, if prolonged, eventuate in catarrhal conditions of that organ. In other words, on theoretical grounds, and clinical observation would seem to sustain them, it is legitimate to assume the existence of a *reflex laryngitis* evoked through the constant irritation of the vaso-motor centres from chronic nasal inflammation.

Clinical and experimental investigation would appear, then, to lead to the following conclusions:—

- (1) That in the nose there exists a definite, well-defined sensitive area, whose stimulation, either through a local pathological process, or through the action of an irritant introduced from without, is capable of producing an excitation, which finds its expression in a reflex act, or in a series of reflected phenomena.
- (2) That this sensitive area corresponds, in all probability, with that portion of the nasal mucous membrane which covers the turbinated corpora cavernosa.
- (3) That reflex cough is produced only by stimulation of this area, and is only exceptionally evoked when the irritant is applied to other portions of the nasal mucous membrane.
- (4) That all parts of this area are not equally capable of generating the reflex act, the most sensitive spot being probably represented by that portion of the membrane which clothes the posterior extremities of the inferior turbinated body and that of the septum immediately opposite.
- (5) That the tendency to reflex action varies in different individuals, and is probably dependent upon the varying degree of excitability of the erectile tissue. In some, the slightest touch is sufficient to excite it, in others, chronic hyperæmia or hypertrophy of the cavernous bodies seems to evoke it by constant irritation of the reflex centres, as occurs in similar conditions of other erectile organs, as, for example, the clitoris.
- (6) That this exaggerated or disordered functional activity of the area may possibly throw some light on the physiological destiny of the erectile bodies. Among other properties which they possess, may they not act as sentinels to guard the lower air-passages and pharynx against the entrance of foreign bodies, noxious exhalations, and other injurious agents to which they might otherwise be exposed?

¹ Comp. Woakes, Deafness, Giddiness, and Noises in the Head, Lond., 1880, p. 74 *et seq.*, on the Mechanism of Ear-cough.

Apart from their physiological interest, the practical importance of the above facts in a diagnostic and therapeutic point of view is sufficiently obvious. Therein lies the explanation of many obscure cases of cough which heretofore have received no satisfactory solution, and their recognition is the key to their successful treatment.

NOTE.—The following are the only references to the subject of nose-cough that I can find in the literature accessible to me. Dr. Hack, in the *Berliner klinische Wochenschrift*, No. 25, 1882, S. 381, relates a case where paroxysms of spasmodic cough, induced by a fibrous polyp which sprang from the right middle turbinated bone, were dissipated by removal of the growth. He regards the case as unique, but adds, that in the course of some physiological experiments on the normal nasal membrane, he had, in a small proportion of cases, noticed convulsive motions of the laryngeal adductors, which sometimes amounted to complete closure of the glottis, followed by an explosive cough-like sound, and suggests that this may also happen under pathological conditions of the nasal membrane.

In the *Archives of Laryngology*, vol. iii. No. 3, p. 240, 1882, Dr. Seiler reports two cases. In one, severe spasmodic cough, accompanied by a peculiar grunting or barking noise, was dependent upon a deflected septum and a large anterior turbinated hypertrophy; in the other, an excoriation of the mucous membrane of the septum gave rise to reflex cough, which was relieved by treatment of the nasal affection. Dr. S. observes, that he has not found a single instance in which the irritation causing reflex cough was seated in the nasal membrane. He seems, furthermore, to regard the direct irritation of the inter-arytenoid fold (laryngeal cough centre) by mucus dropping from the post-nasal space, as an important factor in the production of the cough in the two cases described. It is quite certain that cough may be, and is, often produced in the manner suggested; but in that case it obviously cannot be regarded as nasal, *i. e.*, due to an irritation originating in the mucous membrane of the nose.

