

Mackenzie (J. N.)



A CONTRIBUTION  
TO THE STUDY OF  
CORYZA VASOMOTORIA PERIODICA,  
OR SO-CALLED "HAY FEVER."<sup>1</sup>

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BY JOHN N. MACKENZIE, M.D.,  
SURGEON TO THE BALTIMORE EYE, EAR, AND THROAT CHARITY HOSPITAL,  
BALTIMORE, MD.

*apparet* "Nunquam ita quisquam bene subducta ratione ad vitam fuit,  
Quin res, ætas, usus semper aliquid oportet novi,  
Aliquid moneat, ut illa quæ te scire credas, nescias.  
Et, quæ tibi putaris prima, in experiundo ut repudies."  
—TERENCE, in "Adelphis," Act V.

WHEN the phenomena of a given disease or unnatural condition are inexplicable by known pathological laws, or do not come within the range of that speculation which empirical fact and scientific experiment allow, it is customary to seek in the term "idiosyncrasy" a convenient refuge for acknowledged ignorance. This applies with especial force to the affection in question, the peculiar features of whose clinical history have been submitted to this lazy explanation. The well-recognized, but imperfectly understood personal susceptibility to certain forms of local irritation, which is the sad prerogative of the sufferers from this disease, has always been the stumbling-block in its investigation and the rock upon which the various speculations as to its nature have been wrecked.

Hasty generalizations based on the study of conditions external to the organism, to the exclusion of pathological agencies within, together with deductions drawn from iso-

<sup>1</sup> A lecture delivered at the Baltimore Eye, Ear, and Throat Hospital, June 14, 1884.

lated cases, and the uncertain testimony of the laity, have given rise to a variety of names indicative of its supposed etiology, such as "hay fever" or "asthma," "pollen fever" or "poisoning," "rose" or "peach cold," etc., appellations which should be discarded and forgotten, as they not only tend to perpetuate erroneous views and to introduce elements of confusion into the investigation, but also, by a diversion of the mind from more essential conditions, have in no small measure contributed to retard progress in the therapeutic management of the disease.

While the term *coryza vasomotoria periodica*, suggested in the title of this communication, does not meet all the requirements of a logical definition, it may nevertheless be used provisionally until more exact knowledge of the affection furnishes data for the construction of a better. For, as will be shown below, the disease is essentially a coryza, showing, in most cases, a decided tendency to periodic recurrence, and dependent upon some functional derangement of the nerve-centres as its predisposing cause.

Until within the past few years clinical and experimental inquiry has been directed to the investigation of the most prominent exciting external influences provocative of the attack, and other and more important agencies have been entirely overlooked, or set aside as the general or special expressions of an idiosyncrasy, an explanation which is practically meaningless and conveys no definite or intelligible idea concerning the essential nature of the disease. While it is undoubtedly true that the inhalation of certain forms of matter—and pollen is only one of them—exercises an unquestionable irritative influence in the production of the paroxysm, it is, at the same time, equally certain that in a large proportion, if not all, careful inquiry will discover this influence to be purely secondary or accidental—to be dependent upon some local or constitutional condition.

Although a number of investigators had previously labored with praiseworthy zeal to establish a definite pathology of the disease, the first to open the way to the rational solution of the problem was the late Dr. George M. Beard,

of New York, who, by carefully collected statistics, pointed out the importance of the neurotic element as a factor in its production.<sup>1</sup> According to Beard, hay fever is a neurosis, a functional disease of the nervous system, an affection of modern life and of the nineteenth century. While he does not explain exactly in what such a neurosis consists, while his researches are open to fair criticism, and while his conclusions cannot be unreservedly accepted, they served, at least, the important purpose of lifting medical thought from the grooves to which it had been confined by the supporters of the pollen and bacteria speculations, and diverting it into newer and more fruitful channels.

Beard, and those who preceded him, not only deprecated the possible etiological importance of catarrhal affections of the upper air-passages, but went so far as to say that the very opposite state of affairs existed, and that the subjects of "hay fever," so called, were exempt from nasal and other forms of catarrh. The first, perhaps, to correct this erroneous impression and to point out the important rôle which disease of the naso-pharyngeal cavities plays in the production of hay fever, was Dr. Daly, of Pittsburg, who, in 1881,<sup>2</sup> showed that, in a proportion at least of cases, there is local disease of the nose or naso-pharynx, without which the exciting cause is innocuous; and furthermore proved by clinical evidence that the cure of the affection may be effected through the removal of the local intrinsic condition.

The following year, Dr. Roe, of Rochester, published the favorable results of his treatment of the disease by operative procedures directed to the hypertrophied membrane in the nasal chambers.<sup>3</sup> According to Roe, hay fever is caused by the contact of the pollen of grasses or flowers and other irritating particles in the atmosphere with the nasal mucous membrane, which in certain indi-

<sup>1</sup> Hay Fever, etc., New York, 1876.

<sup>2</sup> *Vide* Archives of Laryngology, April 1, 1882. Dr. Edson had previously (letter to New York Medical Record, 1878, vol. ii., p. 317) called attention to the fact that all cases of the disease presented one or more of certain symptoms referable to the nose, as great sensitiveness of the nasal membrane, coryza, persistent sternutation, naso-pharyngeal catarrh, etc.

<sup>3</sup> N. Y. Medical Journal, May 12, 19, 1883.



viduals is rendered peculiarly susceptible by virtue of disease, either active or latent, of the naso-pharynx, associated with hypertrophic catarrh of the nasal passages.

In the course of some experiments made by me on the healthy and diseased mucous membrane, with reference to nasal cough and the determination of an area in the nostril for the production of the various reflex phenomena associated with nasal disease,<sup>1</sup> the following facts were ascertained, whose application to the disease in question will, I venture to think, throw some additional light upon its pathology: 1. That in the nose there exists a well-defined sensitive area, whose stimulation through a local pathological process, or through *ab extra* irritation, 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 covering the turbinated corpora cavernosa. 3. That nasal cough is produced only by stimulation of this area, and is only exceptionally evoked upon irritation of other portions of the mucous membrane. 4. That all parts of this area are not equally capable of generating the reflex, the most sensitive spots being probably represented by that portion of the membrane covering the posterior end of the inferior turbinated body and the septum immediately opposite. 5. That the tendency to evolution of reflex phenomena 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 the reflex act, while 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.

Apart from experimental proof of such localization—

<sup>1</sup> On Nasal Cough, and the Existence of a Sensitive Reflex Area in the Nose, *American Journal of the Medical Sciences*, July, 1883. The results of these experiments were first brought before the Baltimore Medical Association in the early part of 1883, and subsequently before the Medico-Chirurgical Faculty of Maryland (April, 1883, *vide Transactions*) and the American Laryngological Association (May, 1883, *vide Transactions*).

viz., to the posterior and inferior portion of the nostril—I showed, from my clinical observation, (1) that in cases where reflex cough is present, these are the portions chiefly, if not solely, involved; (2) that the act may be produced here at will by artificial stimulation of the diseased area, and (3) dissipated by local applications to, or removal of the same; (4) that foreign bodies only excite cough when they are impacted in the sensitive area; and (5) that polypi give rise to reflex phenomena only when they arise from or impinge upon the sensitive portions of the area; and lastly, a point of importance as bearing on the treatment, (6) that where *complete* atrophy of the turbinated structures exists, as, for example, in certain cases of *ozœna*, reflex cough is not present, nor can it be induced by artificial stimulation.

These facts are not alone true of cough and asthma; my experience furnishes me with a series of cases where they could be demonstrated as true of various other reflex phenomena originating in diseased conditions of this area, and I have already called attention to the reflexes<sup>1</sup> which I have met with (cough, pain in the ear and larynx, redness of drum membrane, etc.) in the course of operative procedures in this region.<sup>2</sup>

Since I first directed attention to the posterior end of the inferior turbinated body and septum as the most sensitive spots to reflex-producing impressions, I have received several communications confirmatory of the views expressed in my paper, which have also derived support from the publications of other writers. Thus, the observation that reflex asthma arises from nasal disease only when the posterior portions of the sensitive area are in some way involved, either directly from a pathological condition of the parts or from the irritation of a polypus,<sup>3</sup> has been confirmed by Dr. Roe,<sup>4</sup> who explains the

<sup>1</sup> Trans. Med. Chir. Fac. of Maryland, 1883. American J. Med. Sc., loc. cit., Trans. Virginia State Society, 1883.

<sup>2</sup> There is one point pertinent to the subject of this paper which should not be lost sight of, and that is, that certain reflex phenomena may be awakened by stimulation of the apparently normal membrane.

<sup>3</sup> *Vide* a paper by the author on Reflex Cough due to Nasal Polypi, etc. (read April 25, 1884), Trans. Med. Chir. Fac. of Maryland, and N. Y. MEDICAL RECORD, May 3, 1884.

<sup>4</sup> Journal of the American Medical Association, September 15, 1883.

more frequent occurrence of the paroxysms at night by the gravitation of blood to the sensitive area. The same author, moreover, in his recent paper on "hay fever,"<sup>1</sup> points out the fact that, in the majority of cases, the seat of irritation during the attack is the inferior turbinated bone and posterior portion of the septum, thus furnishing additional confirmatory clinical evidence in favor of localization of the reflex area in the lower and posterior portions of the nostril.<sup>2</sup> While these observations go to show that the most sensitive spots are represented by the area indicated above, it is but fair to state that a different opinion is entertained by a German confrère, well known from his labors in this special field. In August, 1883, there appeared in Germany an interesting brochure from the pen of Dr. Hack, of Freiburg,<sup>3</sup> in which this writer maintains, as the result of independent experiment, that the anterior extremity of the inferior turbinated bone is the point from which all reflexes take their origin, and that those arising from stimulation of other portions of the nostril only occur, secondarily, through congestion of the cavernous tissue of this circumscribed locality.

Like Daly and Roe, Hack holds that morbid conditions of the nasal membrane play the most important part in the etiology of the disease. He also believes that there are two factors in the production of the paroxysm, viz., a hyperæsthetic condition of the terminal filaments of the fifth and olfactory nerves, and an increased irritability of the cavernous tissue, caused, as a rule, by local nasal disease, and inclines to the belief (also held by Roe) that the neurasthenic symptoms are secondary to the nasal affection, calling attention, at the same time, to the fact that the latter may coexist with a general neurosis without having any connection with it.<sup>4</sup>

<sup>1</sup> N. Y. Medical Journal, May 3 and 10, 1884.

<sup>2</sup> In a recent number of *L'Union Médicale* (January 22, 1884, *La toux nasale*) M. Longuet believes, with me, in the existence of a tussigenic area (*zone tussigène*) in the posterior end of the inferior turbinated bone and septum, which he compares to the hystero and epileptogenic zones of Brown-Séguard.

<sup>3</sup> *Ueber eine operative Radicalbehandlung bestimmter Formen von Migräne, Asthma, Heufieber, etc.* Wiesbaden, 1884.

<sup>4</sup> See also, *Wiener Med. Wochenschrift*, No. 24, 1883.



Finally, Dr. Harrison Allen advances the view<sup>1</sup> that "hay fever" depends solely upon obstruction of the nostrils (from deflection of the septum, hypertrophy of soft parts and bone, turgescence of nasal mucous membrane), and that the cure consists simply in removing the obstruction (or tendency thereto) in the nasal chambers. According to his experience, sufferers from hay fever and allied disorders have one feature in common—the inferior turbinated bones lie well above the floor of the nostril, an anatomical peculiarity which subjects their overlying mucous membrane to additional irritation from extraneous substances.<sup>2</sup>

It would appear, then, that the truth is irresistibly emerging into recognition that certain abnormal conditions of the nasal passages are necessary to the production of the *ensemble* of phenomena which form the classical picture of so-called hay asthma. Although the results arrived at by different observers, working independently of each other, and starting out in some instances from different standpoints, are not altogether harmonious, they present nevertheless a singular unanimity in their convergence to a common point—in their recognition of the importance of remedial measures addressed to the nasal chambers as a prime factor in the therapeutic management of the disease. While, then, it is probably true that certain states of the nasal passages are necessary to the production of a paroxysm, it is, at the same time, equally demonstrable that these are not always dependent upon well-defined local nasal disease, but that, in a number of cases, such conditions are originally brought about by abnormal excitability of the vasomotor centres from inherited or acquired disease. The problem, then, presents for consideration two important conditions: on the one hand the local nasal phenomena, and on the other the etiological relations of the central nervous system. In allotting to each its respective

<sup>1</sup> American Journal of the Medical Sciences, January, 1884.

<sup>2</sup> Allen reports several cases successfully treated by removing the obstruction to respiration. Cases have also been treated with the cautery by Dr. Sajous of Philadelphia (reported at last meeting of the American Laryngological Association), whose conclusions on the subject do not differ from those of Dr. Roe.

causative significance, care should be taken, in avoiding the Scylla of the neurologist, not to be too closely attracted to the Charybdis of another form of specialism.

Approaching the question from this standpoint, and guided by my personal experience, I believe that our definite knowledge of the etiology of the disease may be briefly expressed as follows :

1. The essential distinguishing feature of the paroxysm of so-called "hay asthma" resides in an exalted condition (erethism) of the nasal erectile tissue, and especially that portion occupying the posterior end of the inferior turbinated bone and the septum immediately opposite. This latter area corresponds to the distribution of the sphenopalatine branches of the superior maxillary nerve, as distinguished from the nasal branch of the ophthalmic, which latter supplies the more anterior portions of the nasal fossæ. The former nerves, derived through the ganglion of Meckel, probably therefore contain the vaso-motor nerves which govern the erection of the turbinated tissue, and hence the localization of the sensitive area becomes the key to the mechanism of the paroxysm and brings us nearer the solution of the pathological process that sets it in motion.

So far as my observation goes, every attack is attended with more or less swelling of the erectile tissue, which is more pronounced in the lower and posterior parts of the nostril. This swelling, occasionally inconsiderable, is often sufficient to produce absolute and complete closure of the nasal fossæ. I have moreover, so far, never seen, nor have I been able to find the record of a single case where paroxysms of hay fever occurred where this tissue was completely atrophied or destroyed by disease. In two cases under my observation, the nasal chambers were markedly capacious, but, at the same time, the erectile tissue was well developed. Finally, the cure of the affection by the artificial destruction of the erectile bodies amounts to a demonstration.

2. This exaggerated irritability of the cavernous tissue may be directly due to the constant presence of congestion or other pathological conditions of that structure,



the result of direct or indirect (reflex) irritation from *ab extra* influences, *plus* a hypersensitive condition of the vasomotor centres begotten of their prolonged excitation by the irritative influence in the nostril; or it may be brought about, in the first instance, by an exalted state of the central nervous system, leading eventually to disordered functional activity of the vasomotor nerve-centres; or, finally, a hypersensitive condition of the latter may be conditioned by other pathological states of the system as a whole, or as the result of reflected irritation from its individual parts.

I am inclined, therefore, to transfer the point of greatest excitability from the peripheral ends of the nerve-filaments to the nerve-centres themselves. While I do not deny the possibility of a hyperæsthetic condition, or even organic changes in the terminal filaments of the sensitive nerves, as an occasional factor, and while fully aware of the want of experimental proof in favor of the view advanced, still it seems to me a more adequate, a more comprehensive explanation of the varied phases of the disease. Upon this theory can be best explained, moreover, the occurrence of paroxysms from irritation reflected from various parts of the body remote from the nasal passages. The weight of clinical evidence, too, is in favor of disordered functional activity of the nerve-centres, as against organic alteration of the peripheral sensitive nerves. Finally, it is probably not at the terminal ends of these filaments, but in the centres themselves, that the perception is awakened which differentiates one form of irritant from another; that the nerves themselves are but the passive channels through which the impression is transmitted, and that the production of a paroxysm by a given irritant will depend, other things being equal, upon the, so to speak, discriminating power or peculiar susceptibility of the centres themselves.

3. There is practically an infinitude of causes, external and internal, which may precipitate the nasal orgasm, such as various forms of matter suspended in the atmosphere (pollen, different forms of animal life,

etc.), or the erection of the tissue may be conditioned by those influences that are commonly productive of erection of the nasal corpora cavernosa, such as varying meteorological relations, various forms of reflected irritation, or, finally, it may be occasioned through psychical causes. It follows, therefore, as a corollary to the above, that any one irritant is insufficient of itself to provoke the attack, the latter being only possible either from disordered functional activity of the nerve-centres, or local structural disease.

4. The power of a given local irritant to produce such impression, and the violence of the resulting attack, in all probability depends upon its physical properties and the length of its sojourn in the nasal cavities. Thus, the peculiar glutinous nature of some substances, as, for example, pollen, the irregular surfaces of others, as the golden-rod<sup>1</sup> and similar substances, will give rise to more prolonged irritation than substances of smooth contour, which are readily swept out of the nostrils.

5. Apart from its accidental occurrence with the flowering of certain plants, etc., the marked periodicity of the paroxysm in some cases, its regular appearance at a certain hour and on a certain day, so far from overthrowing its neurotic nature, points to some functional derangement as its possible cause. This tendency to periodical return of a given state is characteristic of certain morbid states of the nervous system, of which the so-called functional aphonia is a prominent example. It is not, therefore, stepping beyond the bounds of legitimate speculation to suggest this as the explanation of a certain number of cases.

6. Whatever be the original cause of such special tendency to erection and consequent evolution of reflex phenomena, the essential part of the mechanism of the paroxysm is the orgasm of the erectile area. This is the main-spring of the machinery by which it is set in motion, and without which the onset of the attack is impossible.

<sup>1</sup> The golden-rod has also been regarded as the cause of hay fever. See editorial article on the Pathology of Hay Fever, by Dr. Frank Woodbury, in the Phila. Med. Times, December 1, 1883, p. 175.

From what has been said above, it naturally follows that the rational treatment will consist (1) in diminishing the reflex excitability of the turbinated tissue; or, failing in that, (2) the partial, or, if necessary, complete destruction of the tissue itself.

The first indication must be met (1) by tonic remedies addressed to the nervous system, and by the exhibition of such drugs and methods as experience has shown control reflex excitability (the bromides, belladonna, chloral, counter-irritation to nape of the neck, etc.); (2) by the careful search for, and intelligent treatment of any pathological condition which may be regarded as a source of reflected irritation; and (3) by simple topical treatment of any existing nasal disease or irritation. In carrying out the second indication care should be taken to sacrifice as little of the erectile tissue as possible. It would accordingly be better to commence by removing or destroying that portion which covers the posterior end of the inferior turbinated bone, and, if necessary, that covering the septum immediately opposite; or, in other words, *that area which contains the greatest number of filaments of the sphenopalatine nerve*. Should this not accomplish the desired result, any additional sensitive spots should be located by means of the probe, as has been done by Roe, and appropriate treatment adopted.

The destructive agent used in any given case will vary according to circumstances. It may be said, in general, that hypertrophic enlargements of the turbinated bodies are best removed, if practicable, with the cold wire snare; swelling of the cavernous tissue over the septum is best treated with the galvano-cautery, while for complete destruction of erectile tissue, the latter agent or electrolysis is the best agent we possess.

Reference has been made several times above to reflected irritation of a distant organ as a factor in the production of the paroxysm. In order to illustrate this point, and at the same time make good the assertion of the fact, I will insert the following case:

Mrs. —, aged thirty-seven years, married twenty



years, the mother of one child, now eighteen years of age, came in the early part of April of this year to consult me on account of severe "hay fever." She has resided all her lifetime in a small manufacturing town on the banks of one of our Maryland rivers, and in proximity to a malarial district. Family history unimportant. Several of the neighbors suffer from paroxysms similar to her own. She is herself a woman of average intelligence, of spare habit, dark hair and eyes, good disposition, not inclined to be hysterical, nor easily frightened; is "dyspeptic," and suffers greatly from inability to digest her food. Without possessing a decidedly nervous temperament, in the common acceptance of the term, a more or less pronounced neurotic tendency expresses itself in a certain unnatural acuteness of the senses, and susceptibility to psychological impressions. Has never suffered from any nervous disease, with the exception of occasional neuralgic pains in the course of the fifth nerve, which have, however, of late, ceased to give her much trouble or concern. Has had malarial fever, and for the past four years has suffered from constant ovarian trouble. The left ovary is probably the only one involved, the condition being some chronic inflammatory disease. Has suffered for two years from "hay fever." Prior to her ovarian trouble, enjoyed excellent health and exhibited no tendency to catarrhal disease of the nose or throat.

The paroxysms are ushered in, as a rule, by chilly sensations, followed by violent and uncontrollable sneezing, intense redness of the conjunctivæ, increased lachrymation and spasm of the lids. During the attack she cannot see to read or write, any attempt to use the eyes being accompanied by great pain, photophobia, etc. The voice soon becomes husky and nasal, a considerable amount of mucus is expectorated from the throat, and a profuse watery and slightly mucous secretion is discharged in abundance from the nostrils. There is generally superadded to these symptoms a short barking cough, which often continues for several days after the subsidence of the attack. During the latter, the nostrils are always

completely closed, so that nasal respiration is impossible. Pain is felt across the bridge of the nose and in the frontal and occipital regions, pain in the ears and tinnitus are nearly always experienced, and the meatuses feel as if stopped up by a foreign body. The amount of asthma accompanying the attack varies greatly, being at times more pronounced than at others. During the paroxysm pain is always felt in the left ovary, and any existing pain of that organ aggravated. The ovarian pain comes on after sneezing, and occasionally continues after the paroxysm has subsided. The attacks come on at all seasons of the year, and bear no definite relation to the condition of the atmosphere as regards moisture or dryness; but are worse in spring and fall, *i.e.*, in the seasons of greatest temperature changes. They come on at all hours of the day, and she is often awakened from her sleep by the sudden accession of a paroxysm. The slightest exposure to draughts of any kind suffices to bring on the attack; the accidental unfastening of her night-dress at the neck during sleep, stepping from the bed to the floor, going about in her stocking feet, or changing her shoes for her slippers, and other equally trivial causes have frequently precipitated it. It is also brought on by physical or mental over-exertion, or by emotional excitement.<sup>1</sup> The attacks are not modified by diet, dust has little or no effect, while gas and smoke of various kinds produce a disagreeable, smothering sensation with some dyspnoea, but are insufficient to provoke the characteristic phenomena of the paroxysm. There are some plants that cause slight sneezing; but although frequently exposed to a pollen-laden atmosphere, exposure has never produced a paroxysm. The attacks invariably appear and are more severe at the menstrual period, appearing sometimes at its commencement, sometimes at its close. This latter condition of affairs has lasted for one year. They last generally for two days and one night, after which all the discomfort she suffers

<sup>1</sup> The patient attributes a great deal of her trouble to the excitement and mental anxiety which she underwent while in constant care of the wounded in her husband's factory, where accidents to the hands were constantly occurring.

from them passes gradually away. She averages about two attacks a week, during which she is confined to her room, and often to bed. They sometimes leave her in a state of nervous prostration, from which she slowly recovers.

By the protection of the nasal passages from the contact of air during the attack, the paroxysms are somewhat mitigated in severity, except at the monthly period, when this has no effect. Residence at the sea-shore invariably gives relief; except during menstruation, when the attack is as severe as when at home.

During the intervals between the attacks, she does not suffer from nasal or throat trouble, beyond the accumulation of a slight amount of mucus in the nasal passages upon arising in the morning, with occasional dryness of the throat and huskiness of the voice. These phenomena are, moreover, of quite recent development.

*Physical examination.*—Nothing to indicate visceral disease, apart from the morbid condition of the ovary. No disease of auditory apparatus, larynx, trachea, or lungs. Anterior nasal passages apparently perfectly healthy. The posterior extremities of the inferior turbinated bodies, as seen in the rhinoscopic mirror, without being notably enlarged, present an ashy gray color often seen in hypertrophy of these bodies. The nasal fossæ are perfectly free and symmetrical. The lower border of the inferior turbinated bones cannot be seen in the mirror, and are not elevated above the nasal floor in front. There is no malformation or irregularity in the skeleton of the nose or other part of the face. The mucous membrane of the nasal pharynx is congested, and covered here and there with a faint film of transparent secretion. The mouths of the Eustachian tubes are normal in appearance. The lower pharynx is congested and studded here and there with small granules (commencing granular pharyngitis). No irregularity in the conformation of the pharyngeal cavities.

The treatment adopted in this case was in accordance with the indications laid down above, with special attention to the diminution of excitability of the erectile



area. The nasal passages were kept thoroughly cleansed and protected against local irritation. Anodyne and alterative applications and acetic acid were made to the congested surfaces, with the understanding that, should they fail to relieve, the galvano-cautery was to be resorted to.

At the end of one week little improvement was noticed; but at the close of the second marked change for the better had occurred, both as regards the number and severity of the paroxysms. At the expiration of six weeks the attacks had lost their distinguishing characters, the only annoyance from which the patient suffered being an occasional brief access of sneezing. At the two menstrual periods which intervened during this time, however, she had attacks resembling the original paroxysm, but greatly modified in severity. At the present writing, the sneezing has so markedly diminished, that it no longer gives her much concern, and her last monthly period was passed without the slightest nasal discomfort, although she was convinced that it was inevitable, and had prepared herself for the attack. What the final result of this case will be I am, of course, unable to say, but from the present outlook, operative procedures will doubtless be unnecessary.

*Remarks.*—The above case shows, among other things, that the paroxysms of the disease commonly called "hay fever," may be brought on in the same individual by a variety of agencies differing entirely in origin, character, and mode of operation. At times they are produced by causes which are ordinarily provocative of common coryza, at others from the increased irritative stimulus given to a morbid process in a distant organ, or finally, they are occasioned by impressions of a purely psychical nature.

The attacks at the menstrual epoch are readily explicable by the physiological erection of the nasal corpora cavernosa which occurs at that period; for, as I have pointed out elsewhere,<sup>1</sup> in a certain proportion of women these bodies become enlarged and engorged during menstruation,

<sup>1</sup> Irritation of the Sexual Apparatus as an Etiological Factor in the Production of Nasal Disease. *American Journal of the Medical Sciences*, April, 1884.

the swelling of the membrane subsiding with the cessation of the catamenial flow. This turgescence may be bilateral, or confined to one side, may be inconsiderable and give rise to no inconvenience, or, on the other hand, the swollen bodies may include the nostrils and give rise to various reflex phenomena. In the "hay fever" sufferer, anything that tends to produce swelling of this tissue excites at the same time the tendency to the production of the reflex phenomena characteristic of the disease. In this particular case the chief, and, under certain circumstances, the sole excitant of the paroxysm was the utero-ovarian excitement of the menstrual epoch.

The history would point to a hypersensitive condition of the vasomotor nerve-centres, the result, perhaps, of constant irritation reflected from the diseased ovary, as the chief predisposing cause, or so-called "idiosyncratic" influence in this particular case. It is fair, too, to look upon the increased excitability of the erectile bodies, and the consequent repeated attacks of sneezing, as responsible for the amount of existing nasal disease.

The practical outcome of the above conception of the disease is simply this: Those who recognize in it the foundation of a rational therapeutic, and direct their treatment accordingly, will relieve all, and cure a large proportion of their patients; while those who blindly accept the traditional fallacies of the theory of external causes must continue to divert themselves with perpetual palliative experiment, and cling to the gloomy belief of the Englishman, that the only cure for the disease is patience, if removal from the British Isles is impossible, thanking God, at the same time, that there are only thirty days in June!<sup>1</sup>

<sup>1</sup> *Vide* letter to British Med. Journal, 1883, p. 4315.

