

On the influence of nasal stenosis on the general health / by W. Spencer Watson.

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Publication/Creation

[London] : [Harrison and Sons, printers], [1892?]

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THE INFLUENCE OF NASAL STENOSIS ON THE GENERAL HEALTH.

By W. SPENCER WATSON, F.R.C.S., M.B. Lond.

THERE is good evidence that many forms of disease, not
usually of nasal origin, have been cured, relieved, or prevented
by treatment successfully directed against nasal stenosis. This I
take as my text; and though I may not be able to prove the state-
ment categorically, I trust that I shall be able to show that it is
well founded and sufficiently accurate to form a trustworthy guide
to treatment.

It may be well at the outset to give a brief epitome of what is
known as to the functions of the nose as a part of the respiratory
apparatus.

The inspired air is warmed to the temperature of the blood
within 1° or 2° F. of that temperature.

The inspired air is moistened by watery vapour exhaled from
the nasal mucous membrane.

The inspired air is filtered, and to a great extent freed from
foreign particles and micro-organisms. Some of these become
adherent to the vibrissæ and some to the mucous surface, and in
these are extruded with the mucus; the more irritating vapours or
micro-organisms exciting a free flow of fluid mucus, which in
some cases is expelled by sneezing or reflex cough.

4. The temperature of the blood is lowered by the evaporation from the pituitary membrane.

5. The expired air contains some carbonic acid (an appreciable trace), due to the interchange of gases in the nose independently of those due to oxidation in the lungs. There is also probably an evolution of other animal products from the same source.

These being the chief functions of the nose as a part of the respiratory tracts, what modifications or interruptions are brought about by stenosis? This latter condition may be temporary or permanent, partial or complete, and the effects must vary according to each variety or phase of the obstruction.

a. Temporary stenosis occurs in acute rhinitis of any kind, in simple chronic rhinitis, and in congestive irritation of the pituitary membrane from any cause, *e.g.*, that of the presence of a foreign body, of rhinoliths, or of sequestra of bone. The turbinated bodies are the parts more especially liable to swelling under these circumstances by reason of the structure of their submucous erectile tissue. The stenosis due to turgescence of this part of the membrane is distinguished from that due to hypertrophy, partly by the clinical history of the case, but more precisely by the appearance and behaviour of the swollen part, which dimples easily when pressed upon by a probe, and also by the fact that it is almost always speedily reduced in extent and bulk by the application of cocaine.

b. Permanent stenosis is chiefly the result of chronic rhinitis with hypertrophy, and often of intranasal growths and polypi. Distortions and malformations of the septum, naso-pharyngeal growths, adenoid vegetations of the naso-pharynx, enlargement of the tonsils, thickening of the soft palate, congenital and traumatic deformities, are the more common causes of permanent stenosis.

c. When the obstruction is only *partial*, as is often the case, the breath channel being narrowed only, but not occluded, there is the obvious difficulty of deciding in a given case whether the supposed remote effects such as headache, migraine, asthma, cough, laryngeal spasms, dyspnoea and secondary changes in the larynx, trachea, and bronchi may not be due to irritation rather than to obstruction. A slight amount of swelling of the turbinates brings them or some point of their surface in contact with the septum, and as this part is especially sensitive and rendered still more so by inflammatory changes, the local irritation thus induced may

account for reflex irritation of the deeper parts of the respiratory tract. In some cases it is possible to put this to the test by touching with a probe the suspected area, and if, when this is done, the reflex action is induced, we have some evidence that irritation is more prominently at work than stenosis. The use of cocaine locally applied will also be an aid to diagnosis in the same direction. In the condition of hypertrophy there is no shrinking of the swollen parts as in the case of mere turgescence, and hence any marked relief of the symptoms following the use of cocaine is an indication that there is an area or point of excessive sensitiveness, the irritation of which produces reflex action. When this is the result of these tentative measures, much benefit is often derived by reducing the bulk of the hypertrophic membrane or growth. The application of the electric cautery or of a corrosive acid to the part will be generally sufficient, but if the obstructing part is very far back and involves (as it often does) the posterior extremity of the inferior turbinate, the cold-wire snare or my own ring-knife will be the preferable methods for reducing its bulk.

I here exhibit a drawing from a typical specimen of chronic hypertrophy of the inferior turbinate occurring in a young gentleman, whose life was rendered very uncomfortable by its presence (see Fig. 6, page 311). He was sometimes seized with fits of choking during his meals, and was always in terror from the feeling of obstruction. His mental condition was so depressed that his friends became extremely anxious about him. The operation by the cold-wire snare was followed by complete relief. In this case there was a difficulty in deciding as to how far stenosis alone or stenosis with hyper-sensitiveness of the parts afforded the best explanation of the symptoms. There was no obstruction of the other nostril except during the attacks of acute catarrh, which were very frequent, but the nostril (right) from which the growth was removed was completely blocked by it.

This case was one of chronic hypertrophic rhinitis. In this form of disease not only is the epithelial layer thickened, but the cavernous erectile tissue covering the turbinated bones, and sometimes the submucous covering of the septum, become permanently distended and lose the power of recovering their normal bulk. The glands occupying the submucous layer are also hypertrophied, and the surface of the membrane becomes corrugated and raised into folds or villous prominences, the posterior thirds of the

middle and inferior turbinated bodies being most frequently affected in this way. The anterior extremity of the inferior turbinate and occasionally the anterior part of the middle turbinate, when hypertrophied, are generally uniformly swollen, and when pressed by the probe do not recede. Sometimes the anterior parts have also wart-like outgrowths on their surface, but these are not frequent and occupy only one or two spots or surfaces, differing from those on the hinder parts, where they are uniformly distributed over a considerable surface.

Symptoms.—The symptoms are those of stenosis more or less complete. In the advanced cases the breath channel may be completely occluded; in less advanced stages one or both nostrils may admit of a forced snuffling respiration. There is a constant flow of mucus from the anterior nares, and a backward flow into the naso-pharynx, where the viscid secretions form adherent crusts, which are only detached with difficulty and much "hawking" and coughing. We have, in addition, the usual distress of stenosis, the habitual oral breathing, the snoring and distress of breathing at night, the nasal voice, impairment of hearing, of smell, and taste, and asthmatic attacks, with occasional implication of the larynx. The uvula and velum become thickened, and the elongation of the former gives rise to chronic irritative cough. The breath is sometimes offensive from the accumulation of the mucous secretions in the naso-pharynx, and there may be chronic pharyngitis due to the same cause.

The following cases are good illustrations of chronic hypertrophic rhinitis and of its effects on the general health:—

CASE 1.—Mrs. E——, aged 54 years, very tall and stout, and with symptoms of stenosis and prominence of eyeballs. Great mental depression and fainting fits. Much difficulty of breathing at night.

Extensive hypertrophy of both inferior turbinates.

Ether given, and inferior turbinates removed entirely from end to end at two operations.

Great relief. In the course of the next few months caustics applied and subsequently *vulcanite plugs* for reduction of the hypertrophy of the middle turbinates.

Much satisfaction expressed by the patient. The improvement remained for several years, but whenever there were threatenings of a return of stenosis, the *plugs* were resorted to, and with much relief on many occasions.

Within the last few weeks (eight years after the first series of operations) this lady has had a recurrence of the old symptoms due to growths from the outer wall of the right nostril. I removed these under the

7 Arundell Street W

Nov 17 1892

Dear W Maude

I am much obliged
to you for calling my attention
to the Case of Mrs E - in my
paper on nasal stenosis. I believe
you are right in your conjecture
as to her case being one of
Graves' disease. She had



influences of cocaine by means of the cold-wire snare, and the result has been perfectly successful, the nostril being now quite free from obstruction. The growth was polypoid with glandular hypertrophy, and arose from the middle turbinated.

It is instructive to remark that though the first operation seemed in this case to be very free, yet it is evident from the sequel that even the total extirpation of the inferior turbinated bone was insufficient, and that it would have been better to have operated still more freely in the first instance.

CASE 2.—A gentleman's gardener, aged 35 years. Symptoms of stenosis for six years. Operations for polypus, but without relief. Fimbriated outgrowth seen from anterior nares on the anterior third of the inferior turbinate. No posterior rhinoscopic view obtainable, but by digital exploration soft growths felt protruding into pharynx from choanæ.

By ring-knife operation (under anæsthetic) the growths depicted in drawings removed at two operations, Figs. 1, 2, 3, and 4. Three years after the patient remained perfectly free from nasal trouble, and immensely improved in health, the commencement of his relief dating from the time of the operations, and having steadily continued ever since.

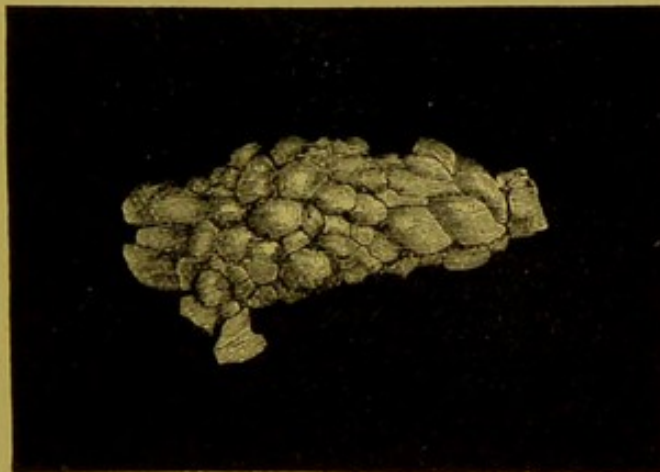


FIG. 1.

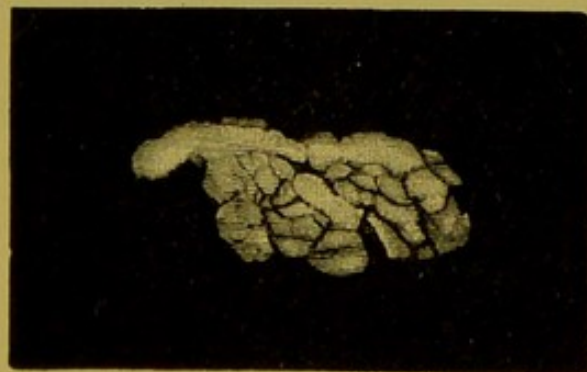


FIG. 2.

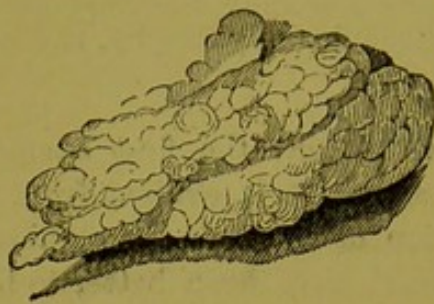


FIG. 3.

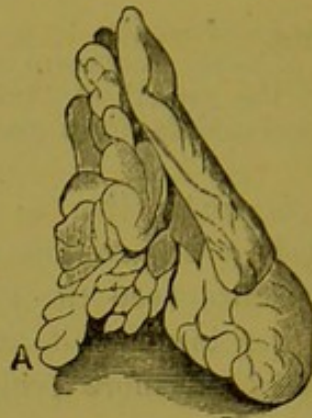


FIG. 4.

CASE 3.—Mr. H——, aged 50 years. Symptoms of aggravated stenosis for years. Cleft palate. Good rhinoscopic view of growths on hinder extremities of inferior turbinates complicated with nummular polypi.

Cocaine (20 per cent. solution) applied freely and thoroughly. Numerous polypi removed by cold wire snare. Ring-knife operation on inferior turbinates. Portion of the hinder extremity of the inferior turbinate of the right nostril shown in the drawing, Fig. 5. The size of this growth is somewhat exaggerated in the drawing. It was, however, extraordinarily large. The results of treatment were excellent and lasting. The polypi removed were some of them *nummular* in shape.



FIG. 5.



FIG. 6.

In such cases as those related, part of the distress and nervous disturbance is occasioned by frontal headache and a feeling of distension due to retained secretions in the sinuses and ethmoidal cells. The pressure of the intranasal growths obstructs the orifices of the antrum, the frontal and sphenoidal sinuses, the lachrymal sac and nasal duct, and the general hypertrophy of the membrane may even lead to their permanent closure and a large

accumulation of mucus. As a secondary result, sleep is disturbed, and the patients wake up from horrible dreams or nightmare. This deprivation of natural refreshing sleep leads to general nerve disturbance, and migraine and mental depression, so that the stenosis not only impedes free breathing, but at the same time interferes with the functions of the sinuses, and thus gives rise to secondary disturbance of nervous system.

These complications of stenosis make it the more imperative that any operations for its relief should be thorough and effective, so that *free drainage of the sinuses* may be quickly established. It is on this account that I think it very essential to perform radical and complete operations at one sitting under a general anæsthetic, and I suspect that our failures are sometimes due to the frequent repetition of partial and incomplete operations such as are much recommended by some surgeons who employ the electric cautery for the removal of polypi. Each time a small polypus or portion of a polypus is removed, a certain amount of inflammatory swelling is set up, and for a time the stenosis is increased. The patient not being under a general anæsthetic, it is impossible (except in the very rare cases of a single polypus or a very limited hypertrophy) to remove all the growths at one sitting, and few patients will submit to the numerous and repeated operations which become necessary when employing this method. The rule should be—(1) When there is complete obstruction with much constitutional disturbance operate by a single operation under a general anæsthetic. (2) When the obstruction is partial and the symptoms unimportant, the growths being small and easily reached, operate either by means of the snare or electric cautery, using cocaine and employing the frontal mirror as a guide to the instruments. Except in the simplest and most favourable cases, a repetition of the use of the snare or cautery is absolutely necessary.

When both nostrils are occluded and buccal respiration is therefore a necessity, the lungs receive the air cooler and drier, and discharge it with a smaller quantity of carbonic acid and animal excretory vapours than is the case in free nasal respiration. Unless there is a compensatory increased activity in the other excretory organs the blood becomes overheated, and as the lungs are embarrassed in their action, the excretion of carbonic acid and watery vapour is more and more difficult until the blood itself becomes overcharged with these products.

Irritation of the larynx, trachea, and bronchi follows, and in the worst cases bronchitis results.

In the generality of cases the effects of stenosis are not so severe. As to asthma, I have only had three cases in some hundreds of cases of chronic hypertrophic rhinitis. One of my cases of asthma associated with polypi and hypertrophy of the turbinates has been already briefly related in this room. A stoutish married woman, 35 years of age, had suffered from undoubted spasmodic asthma for eighteen years. When I first saw her about two years ago she had numerous polypi and advanced hypertrophy of the turbinates, but these had been previously discovered, and yet for various reasons no operation had been proposed. Here the asthma seemed to be of a confirmed type, and was, moreover, complicated with vesicular emphysema and frequent attacks of bronchitis. Nevertheless, I advised operation, and removed polypi and hypertrophied membrane freely and thoroughly by two operations.

The result exceeded my expectations and those of my colleagues who watched the case. For between five and six months there was not a single recurrence of the asthmatic paroxysms, and the general health improved so much that the woman was able to go to work as a domestic servant, though for many years before she had been incapacitated. For some months she was able to do some very hard work, but in April, seven months after the first series of operations, she had a recurrence of her old ailment. I found some broad based polypi which I have removed by several repeated operations with only partial relief of the asthma. After the last operation on November 5th, she had a severe attack of bronchitis, and great oppression of breathing with regular midnight attacks, and these were controlled only by the use of 8-grain doses of citrate of caffeine. There has been no attack now since December 10th, but she is again suffering from subacute bronchitis and the dyspnoea consequent on the vesicular emphysema. It is quite clear that in this instance of apparently confirmed asthma much benefit resulted from the employment of local treatment. In most cases, however, within my experience, brilliant results are more than can be expected or hoped for. Bosworth, of New York, indeed, and Schmiegelow, of Copenhagen, have had extraordinarily successful cases, the former having cured or relieved seventy-two out of eighty persons operated on for asthma or hay-asthma.

Hay-Asthma.—As for hay-asthma, the disease is obviously one

involving the general system and the respiratory mucous membrane as a whole as well as that of the conjunctiva and lachrymal passages. To consider it as a disease originating in the mucous membrane of the nostril would be to ignore all common experience and the outcome of the most careful inquiries by the most competent observers. The stenosis observed in some of the subjects of hay-fever is due to the effects of chronic hypertrophic rhinitis, which is itself a consequence of the repeated catarrhal attacks so characteristic of the disease. This stenosis is a great aggravation of the other symptoms, and much benefit is often derived from operative treatment, as the suffocative attacks are much mitigated by a restoration of free nasal respiration. The subsequent use of plugs is especially indicated in this form of obstruction, and should be persevered in for many months and even years; this a point not often insisted on in books; I think it very important.

The form of stenosis most interesting to the practitioner is probably that seen in newly-born infants. A poor little child comes into the world with the instinct of getting its living by suction for the first few months of its existence, and with the idea that it will not be asking too much to be allowed to breathe at the same time. But in a few days, or even in a few hours, after birth, "snuffles" of a virulent type sets in, and a cruel destiny declares that the child shall not suck and breathe at the same time—the one line of business may be carried on by itself but not the two together, and as both are essential, the suckling finds himself in an awkward predicament and begins to inquire why his environments are so unsuited to his physical potentialities—that at least seems to be the correct interpretation of the loud and frequent outcries and violent struggles that become too familiar to the mother and friends. The case is one of great urgency and danger. Not only is nutrition impeded in the ordinary act of sucking, but during sleep, the tongue in sucklings being always during sleep in contact with the roof of the mouth, the child is constantly in danger of being suffocated, and wakes up struggling for breath or falls into convulsions of an epileptoid character. Frequent repetitions of these attacks, if unrelieved, speedily put an end to the child's sufferings.

Energetic treatment, however, at the outset by frequent syringing with appropriate astringent and antiseptic solutions, and feeding by the mouth or by a tube passed into the œsophagus through

the nostrils, almost always brings about a speedy change for the better. In addition to these measures, gum-elastic tubes passed through the nostrils and retained there during sleep enable the little sufferer to get tranquil rest. Should, however, the obstruction be only partial, there is still great risk of much mischief to the chest-walls and to the air-cells from the long persistence of dyspnœa even of a mitigated kind. In the course of time the chest-walls become contracted and flattened laterally, emphysema is produced, and the growth is stunted in all parts of the organism. Early and energetic treatment may and often does prevent these disastrous consequences.

The next most interesting form of stenosis is that connected with adenoid vegetations of the naso-pharynx, occurring as they do mostly in early youth and in young adults; they give rise to a set of well marked and peculiar symptoms when the growths are sufficiently large and numerous as to cause serious obstruction in the posterior nares. When slightly developed and early treated, the only symptom noticed is a somewhat dull articulation, as if from a cold in the head, and some amount of stertor during sleep. The general nutrition, however, does not suffer, and very little notice is taken of the defect, which is, according to my experience, very common. In such slight cases, as the body generally develops the pharynx expands, the general nutrition does not suffer, and the symptoms pass off without leaving any traces or inducing any secondary changes in the thorax. In a number of cases, however, in which the obstruction is allowed to go unrelieved for years and becomes aggravated by frequent catarrhal attacks, not only is the articulation dull and indistinct, but the voice becomes habitually nasal; the *n* and *m* sounds are represented by the *d* and *b* or *l* sounds, and the hearing often suffers, the middle ear even in the worst cases being affected by the extension of catarrhal inflammation along the Eustachian tubes, the pharynx and tonsils are involved, and the latter often much enlarged. Snoring becomes constant at night, and may be associated with paroxysms of a convulsive character, the patient waking up suddenly and struggling for breath. There is mucopurulent discharge from the nostrils, and this is sometimes bloodstained, and a similar flow escapes from the mouth during sleep. The breath is offensive from the collection of puriform stringy mucus in the fauces; the breathing is laboured, and the chest often permanently

deformed by a lateral compression and narrowed also in all its dimensions. The growth is stunted; the mental faculties are, or appear to be, dull. The youth is backward in his studies, and takes little interest either in them or in his games. He goes about with mouth agape, and being often somewhat deaf, is credited with being almost imbecile. The alæ of the nose are flattened and dimpled in a characteristic manner, and some of the patients have a very peculiar way of twitching their upper lips and sides of the nostrils. With these obvious symptoms the diagnosis is easy, and is confirmed by rhinoscopic or digital examination of the nasopharynx, where the soft rounded pea-shaped or oval growths are found lining the lateral walls and roof of the pharynx and obstructing the choanæ by overlapping them. When the disease has reached this stage, the only relief obtainable is by operation for removal of the growths, and even at this advanced stage it is often possible to effect a cure of most of the symptoms, though there is much risk in allowing any of these symptoms, especially those affecting the ear, to go on to such a dangerous extent. The majority of cases, however, when treated energetically give most satisfactory results. A lad who had been considered unfit for anything becomes bright, cheerful, and intelligent, and seems quite a different being after the complete restoration of nasal breathing.

When we come to consider *syphilitic disease* in the nostrils, here the stenosis is of secondary importance, so far as the effects on the general health are concerned, with the exception of the syphilitic coryza in sucklings, in whom the obstruction to breathing becomes a matter of grave danger, not only to health but the life of the patient. It must be dealt with early and energetically, not less by local than by constitutional treatment, into the details of which it would be out of place to enter. In the syphilitic ozæna of adults with caries or necrosis, there is the increased danger of the purulent infection due to the retention of foul discharges in the nostril. Fatal meningitis may result from these causes, and the removal of obstructing pieces of carious bone is often a means of saving patients when in this condition.

The stenoses of *malformed and distorted septum* are often overlooked because though, as a rule, there is some obliquity of the nose externally, there may be a considerable twist of the septum without any visible sign externally. There is, however, a ten-

dency (especially when the twist is sigmoid) for the septum to obstruct both nostrils, and to produce all the usual effects of stenosis, laboured breathing, and snoring at night, choking fits on going off to sleep, contraction of the chest walls, and, later on, asthmatic attacks. I have seen several cases of this kind, and it is supposed by Bosworth, Hack, and many others that a form of hay-fever is one of the results of congenital obstruction due to these various malformations. Readjustment of the septum by operation is certainly very beneficial in many cases; whether such operation will cure hay-asthma, however, is, I think, extremely doubtful.

Besides congenital distortions, the cartilage or bone of the septum may be enlarged and thickened, and may cause obstruction of a serious nature, giving rise to considerable discomfort, and affecting the general health in the same way as the other forms of stenosis. Local treatment efficiently applied is always beneficial, and is urgently called for if it is exciting chronic rhinitis, as it often does, or if the respiration is exclusively buccal in character.

Traumatic, cicatricial, and congenital occlusions from other causes all require attention for the same reasons which apply to the condition already alluded to, and cartilaginous, bony, sarcomatous, and malignant tumours of the parts surrounding the nostrils are often more formidable on account of the obstruction caused by them to nasal respiration.

It would be impossible to go into details of all these forms of obstruction. My object in bringing this subject forward is to emphasise the fact that in certain cases, *not in all*, enormous benefit can be conferred on patients by the removal of nasal obstructions, and I think that it will be allowed that, if in a few only there is cure, yet in a large majority considerable relief is obtainable by suitable surgical measures, that it may be laid down as beyond dispute that (1) in young children we may thus prevent deformity of the chest with its attendant evils, marasmus, and even death; (2) that in youth and early adult life we may prevent permanent deformities of the chest, deafness, impairment of speech, and of the mental faculties; and (3) that in adult life we may prevent and even, in some cases, cure asthma, spasmodic cough, bronchitis, emphysema, intellectual hebetude, and melancholia, &c. I have omitted the consideration of many forms of stenosis, such as occur in the course of diphtheritic rhinitis, primary syphilis of the nasal mucous membrane, tubercular rhinitis, intranasal lupus, glanders,

and others, in which the disease is more important from its constitutional than from its local manifestations, because in them the obstruction is generally of secondary interest, and also because local treatment alone will be of little avail. At the same time, it is well to bear in mind that the same principles will apply to them as to the others, and the neglect of local treatment directed against narrowing of the breath passage will nullify much of the good effect otherwise to be obtained by skilfully directed general therapeutics.

In conclusion, I wish to make it clear that while I insist on stenosis being an important factor in many of the remote effects sometimes called reflex neuroses, I by no means wish to exclude the other factors. I think that in most cases of asthma, laryngeal cough, and spasms there is a clear neuropathic element, without which the local obstruction will have no effect; and I also believe that in some cases, such as those of hay-asthma, a hyper-sensitive condition of the respiratory tract (and of the nose as part of that tract) is much more likely to be the starting point of the remote effects than mere obstruction, though there seems good evidence that, even in these cases, obstruction aggravates the condition. All that I contend for is that intranasal obstruction is often an important element in the class of cases referred to. That it is often overlooked, or, if found, despised or made light of, and that it certainly should be sought for and dealt with by local treatment in a very large class of diseases in which, up to quite recently, its influence has been more or less ignored.

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