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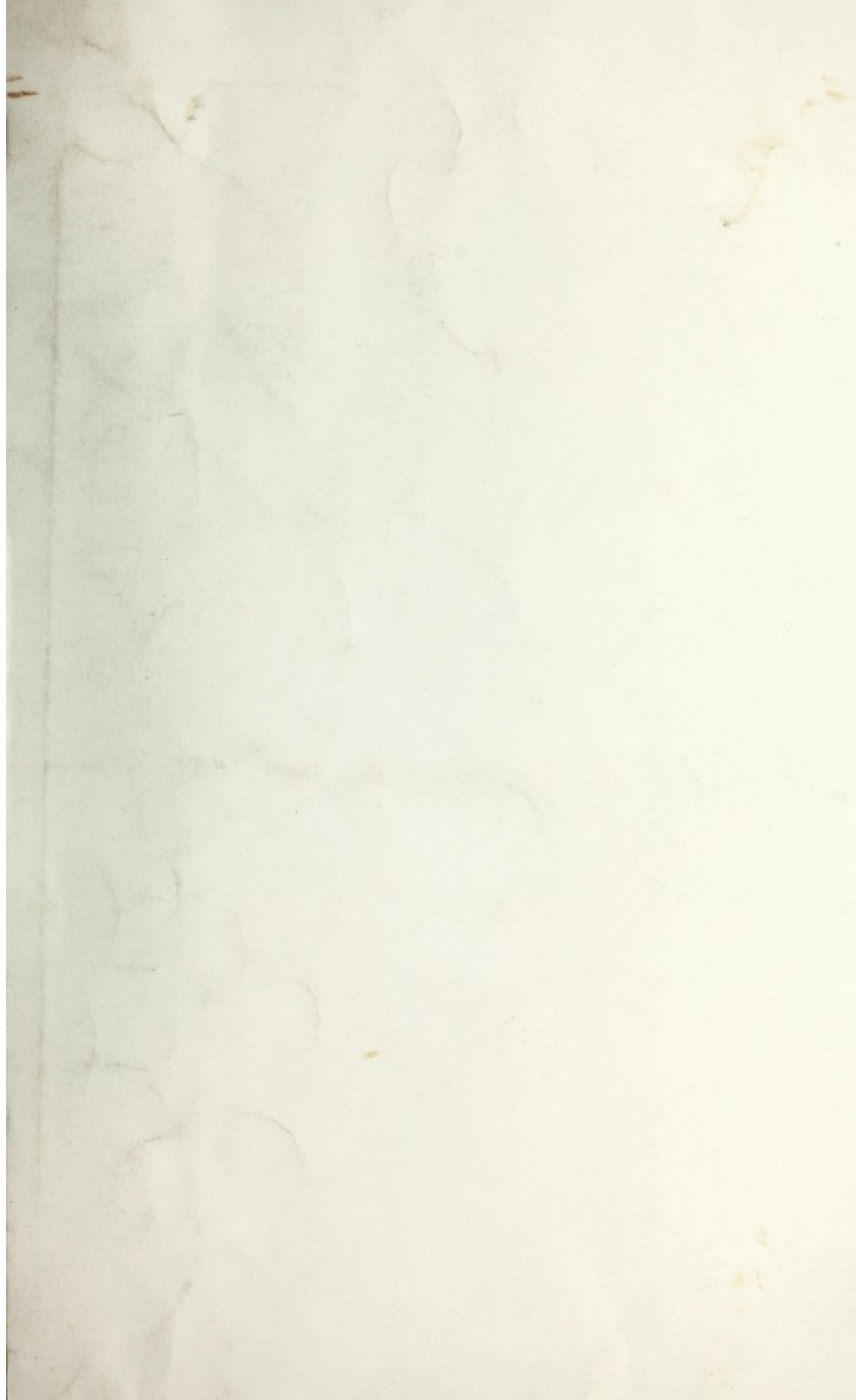
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ON SOME OF THE
NERVOUS AFFECTIONS OF THE LARYNX.

BY

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REPRINTED FROM "THE GLASGOW MEDICAL JOURNAL," JANUARY, 1874.

ON SOME OF THE

NERVOUS AFFECTIONS OF THE LARYNX.

NOTWITHSTANDING the great attention which has lately been paid to diseases of the throat and wind-pipe, comparatively little has been written upon the nervous affections to which these organs are liable. This may be due to various causes. The difficulty of making a clear and exact diagnosis in many of these cases, and the unsatisfactory results of the treatment in others, are, I believe, among the chief causes of this apparent neglect. Yet such cases are not unfrequent in occurrence; they are always troublesome and sometimes imminently dangerous in their nature, and the line of practice in not a few is by no means so definite as might be desired. On the other hand, we have in these days a means of diagnosis in the laryngoscope fitted to explain to us much that in former times was mysterious in this class of cases, especially when their phenomena are read in the light of modern physiology; and I believe that the treatment may now be made as definite in this as in any other department of our difficult and, to some extent, uncertain art.

The nerve supply of the larynx is very peculiar and complicated. The pneumogastric is its principal source, but that nerve has communicating branches with the spinal accessory, the glossopharyngeal, and the sympathetic. It seems to me that the last named branches are the most

important physiologically. These connect the first and second ganglia of the pneumogastric with the highest cervical ganglion of the sympathetic, and distribute the influence of the latter with the branches of the former nerve. To this fact I am inclined to attribute the ordinary excitability of the glottis, as well as its involuntary movements in respiration; while to the branches of the cerebro-spinal nerve I would assign those voluntary movements of the glottidean muscles upon which all kinds and degrees of vocalization depend. To these same compound nerves is likewise due the common sensibility of the laryngeal lining membrane; and I do not think it very important to distinguish between the functions of the superior and inferior laryngeal nerves, for they unite most thoroughly both at the back of the cricoid and at the side of the ala of the thyroid cartilage. Nevertheless, I do not doubt that the inferior laryngeal is the more important motor nerve of the glottis, both from its supplying all the intrinsic muscles of the larynx, and also from the result of section of the nerve in the living animal. Not many days ago, in experimenting for another purpose on the nerves of the neck of a horse, I accidentally cut one of the recurrent nerves, and immediately that remarkable change took place in the breathing which renders the animal "a roarer," as it is called; for thus paralysis of one half of the glottis had been produced. I believe that had section of the recurrent laryngeal on the other side been performed, the animal would speedily have died from paralytic closure of the glottis, unless, indeed, tracheotomy had at once been adopted.

I shall not at present enter further upon the physiology of the laryngeal nerves, but content myself with remarking on its very close and obvious connection with practice, as will be observed in the sequel. I rather proceed at once to the morbid affections of these nerves, which for practical purposes may be divided into the three following classes:—viz., 1. Affections of the laryngeal nerves from hysteria; 2. Those from obvious and external causes; 3. Those from internal or intrinsic causes.

1. The affections of the laryngeal nerves from hysteria are very various. They are "mimicries," as Sir James Paget would call them, of different diseases, thus we have choking sensations, cough of peculiar, generally of croupy character, and all different degrees of aphonia from mere weakness of voice to its absolute extinction.

I have been consulted in a good many cases of loud, barking, hysterical cough, but have nothing new to suggest in their treatment. Very few of them require or are benefited by topical applications of any kind to the larynx, and must be treated on the general principles so well known to physicians, but it is very different with cases of hysterical aphonia. Some of these remain without improvement of voice for years, even after the general health has been regained. In these nothing but internal applications to the larynx seem to produce the slightest benefit. The two local applications I have used are solutions of nitrate of silver and electricity. With regard to the first I must repeat what I have stated in other papers, that such solutions, when properly applied, are good stimulants of the nervous supply, and consequently of the nutrition of the glottis. For these two things go together. An aphonic glottis is a poorly nourished one, and to improve the nourishment is to restore the natural use of the organ. After persevering for a time with this treatment, however, great help is obtained from electricity applied to the nerves and muscles of the glottis itself, by means of Dr Morell M'Kenzie's electrodes, which are the best for the purpose. I have not, indeed, met with such rapid cures as he and some others have done, but after a few applications of the electricity a marked improvement generally ensues. I need not give the details of cases in illustration of the above remarks. They are sufficiently common, and very like one another.

2. Affections of the laryngeal nerves from lesions internal to the nerves themselves are likewise common, but demand a more detailed consideration from their variety and importance.

I should divide them into the following sub-classes, ac-

cording as they are caused by (1st) tumours in the neighbourhood or involving the walls of the larynx or trachea; (2nd) ulcers of the pharyngo-laryngeal mucous membrane; and (3rd) foreign bodies in the windpipe.

1st. Tumours affecting the nerves of the larynx are very interesting. The common occurrence of enlarged cervical glands does not generally extend so deeply as to produce this effect, but I have known several such cases. I believe that enlargement of the bronchial glands more frequently leads to this result. In the Royal Infirmary I lately examined a case of this kind, in which the marked symptoms were severe cough with considerable weakness of voice. The laryngoscope displayed to us total paralysis of the left half of the glottis, and the only appreciable cause for this was a dulness on percussion, doubtless caused by enlarged bronchial glands at the upper part of the sternum. The organs in the chest were otherwise sound.

Still more recently Dr Charteris asked me to examine a case with him, in which very husky voice and violent paroxysms of dyspnoea and coughing had arisen within three weeks, but it ought to be remarked that the patient had had chronic bronchitis for a much longer time. There was a large gland in the neck which became projected upwards at every act of coughing, and its appearance dated from the time when the laryngeal symptoms began. I therefore connected the two together, and ventured on the diagnosis that the latter were dependent on the former; that the nervous affection of the larynx was due to the pressure of bronchial and cervical glands.

The glottis was seen in the laryngoscopic mirror red and congested, and very stiff and immovable. The mucous membrane over the right arytenoid cartilage was oedematous, and I had no doubt assisted materially in producing the attacks of dyspnoea.

This case obtained relief from inhalation of amylnitrite with steam, but he soon died from exhaustion, the laryngeal spasms becoming less as he became weaker; and, on inspection, it was found he had cancer of the pericardium and left

pleura, with great enlargement of the bronchial glands, the cervical gland which we had seen before death being continuous with them. The recurrent nerve was firmly grasped by this cancerous tumour, and the lining of the larynx was exactly as I had shown it to be during life by means of the laryngoscope.

I have at present another case under my care in the Infirmary, in which there was a large cystic bronchocele, and the symptoms, besides the weight and disfigurement of the external tumour, were dyspnoea in paroxysms and very loud barking cough. The glottis was congested, and moved very irregularly. I have no doubt that it was spasmodically closed at the commencement of the fits of dyspnoea, and that the cough was in great part a voluntary effort to clear an opening for the air. In this case I tried to puncture and inject the cyst, but failed, because of its depth and thickness. I then cut down upon it and opened it freely, stuffing it with carbolized lint. Slight suppuration ensued with great diminution of size, and though the wound is not yet healed, the dyspnoea and cough have both entirely disappeared.

Abscesses in the neighbourhood of the larynx produce nearly the same symptoms as has been well illustrated by Dr. Wm. Stephenson, in the October number of the "Edinburgh Monthly Journal," p. 312. I have seen several such cases as he describes, and in one of them the operation of tracheotomy was commenced, but in its performance a considerable abscess was opened, which gave the desired relief, and the trachea was not touched.

2d. Ulcers in the laryngo-pharyngeal membrane, especially if near to the glottis, often produce very serious effects on the nerves of that organ, and these effects are strangely different in different cases. About a week ago I saw a gentleman who had been recommended to me from Edinburgh and who complained of weak voice, attacks of dyspnoea and a peculiar cough, which last was not a very prominent symptom. On examining his throat with the laryngoscope, I found numerous follicular ulcers round the base of the

epiglottis, and a very relaxed state of the glottidean valves. My opinion, therefore, was that the nervous energy was deficient, and that the glottis was in a semi-paralyzed condition from that cause, and my advice was to have the ulcers cured by appropriate treatment, and then I have no doubt the glottis will resume its proper functions.

A good many years ago a lady was sent to me from the south of England, with ulcers in the larynx, which were cured by means of topical applications, but about three years thereafter she returned to me, complaining of an intolerable feeling, as if of itching in her wind-pipe, provoking the most annoying fits of coughing, without the least expectoration. The laryngoscope showed that the ulcers were quite healed, but I have little doubt that an alteration in the extremities of the nerves produced by the former disease had left behind this very disagreeable relic. I employed a variety of topical and constitutional treatment in this case, with the effect of greatly mitigating, but not altogether removing, the symptoms complained of, and I then recommended a period of travelling abroad. My advice was adopted, and the patient returned home quite cured.

In all such cases, more or less obviously, the diseased state of the mucous membrane appears first in ulceration, and then in an alteration of the nutrition of the terminal distribution (end-organs) of the nerves of the part. This is generally exhibited rather as want of force than in increase of it, but also, as I have just shown, at times in altered or morbid sensations, as well as actions. I put this the more pointedly because I think that this class of cases explains to us others to be described in the sequel in which there is no apparent lesion, but only the nervous change. That change has occurred either without the ulcers, or these have healed without observation, and left the less appreciable effect. Then as to the nature of the change, it may be called inflammation, or by any other name that implies depraved nutrition of the affected tissue, without the presence, or, at all events, the persistent presence, of the "*rubor et tumor cum calore et dolore*"; and this leads to the rational and success-

ful treatment of these cases, by clearly pointing to the restoration of the nutrition of the part and then of its nerves, as the course to be pursued. It is no doubt true that nervous agency is one of the essentials of healthy nutrition, and therefore it may be supposed that I have mentioned them in the reverse order,—that I ought to have said we must restore the functions of the nerves, and then the nutrition of the part supplied by them, but I submit that this is seldom, if ever, accomplished in practice. We must first affect the vascular element of the inflamed membrane with our local stimulants, which, by their direct action, contract the dilated vessels and assist in renewing the current of the stagnating blood. It is only after this has been accomplished that we can hope to reach the nerves, and to stir them up to a more natural performance of their function in the nourishment of the tissues. This, however, though second in point of time, is a very important effect of local stimulants, and it must be maintained until the nerves partake in the restoration of the part and can perform their function without it. Nor is it very difficult to see the reason of all this; for it is a molecular change which we have to combat, both in the membrane and in its nerves, and therefore the means which we employ must be such as to affect the cell growth, and to bring about a more natural assimilation, till health is reproduced.

Just as in the former set of cases, so in these, solution of nitrate of silver will be found the most effectual agent for promoting the first part of the transition indicated above. I know that it has become fashionable to disparage this remedy as unnecessarily severe, and as producing nausea and spasm of the glottis; but I can assert, after much experience of it and of most of the other agents which have been recommended, that there is no local stimulant for the mucous membrane of the throat at all to compare in efficacy with the solution of nitrate of silver, and that if properly applied it does not cause spasm, or pain, or any inconvenience, but a slightly disagreeable taste for a short time after its application. I do not think that electricity is at all so generally applicable in these cases, but there is a stage in

their progress when mere weakness remains, and when it will give great assistance in hastening the cure.

I am by no means inclined, however, to lay aside general remedies in the treatment of these cases, for they, by improving assimilation all over the body, must to a certain extent improve it also in the organ specially affected, and there are likewise nervous stimulants which tell through the blood on the whole system, and which ought not to be neglected. The chief of these, of course, is strychnia, which may be used in tonic doses, and gradually increased as may be required.

3d. Foreign bodies in the wind-pipe produce great local excitement, and frequent spasm of the glottis. I do not here refer to such large bodies as obstruct the wind-pipe and call for immediate laryngotomy or tracheotomy, but to much smaller ones, which pass down, perhaps, into the bronchi, and become lodged there. As these cases are interesting in many respects, and as the practice in them is doubtful, I shall relate the following two:—

On the 1st of February last, a stout, healthy child, about four years old, in sucking a programme card, in which a small ring was fixed for fastening a ribbon to it, managed to detach the ring and to draw it into the larynx during inspiration. The immediate effect was a violent fit of spasmodic cough, which failed to dislodge the ring. Therefore the fits of violent coughing, with urgent dyspnoea, were frequently repeated. Medical advice was sought, and the child was brought to me on the day following the accident. He was breathing noisily as if he had a croupy attack, and this was made much more obvious on listening with the stethoscope. But, besides these loud laryngeal sounds, there was no abnormality in the chest except at one spot under the left clavicle, where there were fine bronchitic rales.

I examined carefully with the laryngoscope, and was wonderfully successful in getting a good view, considering the age of the child, but no ring was to be seen in the larynx or the aryteno-epiglottic folds, where small foreign bodies

often stick. Neither could I feel any foreign body with the finger, or with the bent whale-bone rod which I use as a sound in such cases. The lining of the larynx was congested, and the glottis did not move freely, but nothing else was observed.

I therefore concluded that the small ring had passed down into one of the bronchi on the left side of the chest, and that though fixed there for the time, it so stimulated the branches of the pneumogastric nerve as to produce spasm of the glottis, which was constant to a certain degree, and convulsive at times, viz., during the fits of coughing. In my opinion, then, it was hopeless to attempt to grasp the ring with forceps, since it could neither be seen nor felt, and it seemed to me unnecessary to perform tracheotomy, because the spasms did not threaten life in themselves, and if the ring became detached from the bronchus, it could easily pass through the glottis into the mouth.

As the parents lived at Crosshill, and were usually attended by Dr E. Duncan, I advised them to have the child well watched by him, and to send for me if any urgent symptoms arose.

Dr Duncan writes me that the wheezing became general, but the coughs gradually less violent within a week of my seeing the patient. About this time the patient had measles mildly, and then became quite well, but the wheezing and cough continued for a long time. These eventually disappeared likewise, for when Dr Duncan visited and examined the chest, in the beginning of this month, he found no trace of bronchitis anywhere in the chest. The child was quite well, and, therefore, I suspect the ring must have been coughed up, though it was not noticed. It may have been swallowed.

The other case was that of a boy, aged fourteen, who was admitted into the Royal Infirmary on 29th April, under the care of Dr Robert Watson, who asked me to see the patient with him. He had swallowed, or rather inhaled, a hard dry pea. By the time I saw him, it had passed down and caused bronchio-pneumonia of part of the left lung, and

the usual spasmodic cough and dyspnoea. I advised occasional emetic doses of ipecacuan and chloroform, if necessary, for the spasmodic attacks. On the 6th of May he coughed up the pea which I saw, and then the symptoms all diminished, and he left the house well in a few weeks. I have been told that he has since died, but I do not know from what cause.

Besides these cases I have seen other two—one in which a small whelk was inhaled, and in which tracheotomy was performed without relief, and the patient spat up the whelk, five months after its inhalation, and after having suffered pneumonia. The whelk passed by the glottis, and not by the tracheal opening. In the other case the foreign body was a glass bead, and by waiting it was likewise in due time coughed up through the glottis.

I think these cases ought to establish the practice proper for this accident. At least they have settled my mind on the point that when the foreign body is small, and has passed into the bronchi, so as to be neither within sight nor feeling, no operative interference is needed in the great majority of cases. We must tide the patient through a stage of suppuration of some part of the lung, and then the foreign body will be loosened and spat up through the natural passages. Therefore our aim should be to diminish the glottidean spasms by inhalation of chloroform and of moist sedative vapours, as well as by rest in a warm and moist atmosphere; while at the same time we endeavour to localize the pneumonia as much as possible, by mild counter-irritants, possibly by leeching in some cases, and in all by soothing poultices or fomentations. Of course the general health and the diet must likewise be attended to.

3. I now come to the last division of nerve affections, which, for want of a better name, I have called internal or intrinsic affections of the nerves themselves. The most of these are very obscure, both in their nature and in their origin. I cannot, however, but conclude from the cases which I have studied, that many of them arise in the organ where the nerves are finally distributed, as an exten-

sion of the abnormal nutrition, which at some time has existed in the part.

Thus, in some cases of this kind, there is the history of a common cold or an attack of diphtheria, which has lingered for a time and then disappeared, leaving behind the nervous affection of the larynx. Of this, I have met with numerous examples. Only a few days ago, Dr Lawrie, of St George's Road, sent me a little patient of his, four years of age, who after an inflamed mouth and throat, from cold caught at the coast, became affected with fits of convulsive cough, somewhat like whooping cough, which, however, the child had formerly passed through and quite recovered from. Besides, there was no distinct hoop with the cough, but only great dyspnoea, especially at night, with loud gurgling noise in breathing, and profuse perspirations. He also fell asleep very readily, night or day, when the cough ceased, showing that his blood was not sufficiently aerated. His glottis was red, but not swollen, and its valves were rigid and almost motionless during respiration.

Again, after diphtheria, it is well known that palsy of part of the velum or fauces frequently takes place, and the same thing may be said of the glottis, though I confess such a state of that organ is less frequent than spasm in some of its forms, and I have in three cases of this kind been obliged to perform tracheotomy for intractable spasmodic closure of the glottis, long after all other relics of the primary disease had vanished.

In other cases, indeed, the connection between the irritating cause and the nerve affection is of a different kind. Thus, a young lady came under my care about a year ago, for a very remarkable hoarse barking cough, which resisted treatment till she passed a large round worm, after which it quickly subsided. In all such cases the laryngeal affection is truly sympathetic, i.e., it is an irritation of the nerves supplying the larynx at a distance from that organ, and is an interesting example of nutrition altered by such a distant cause, whose influence can be conveyed to the part *only* by the nerves. That the nutrition of the glottis is really altered in such

cases to a state of inflammation, is indicated by the symptoms as well as by the appearance and action of the organ, when observed in the laryngoscopic mirror.

In very many cases, however, the mystery is not so satisfactorily solved. There is neither previous disease nor local irritation to be discovered in them, but the nervous affection of the larynx is abundantly clear and often provokingly persistent. I have now before me the notes of three cases of this kind, one that of a well-known medical practitioner in a neighbouring county, the other two seen with medical friends in Glasgow. They were all of different ages, from 15 to 60, and all had nearly the same symptoms, of which the most prominent were dyspnoea, and fits of spasmodic coughing. In fact, their symptoms greatly resembled those of the disease commonly known as hay fever, only the fever and the sneezing were absent. Yet, I believe, hay fever is just a variety of this same affection of the pneumogastric and glossopharyngeal nerves, and I would therefore make one great class of all such cases, noting, however, that in some the explosive expirations are of the nature of coughs, while in others they are sneezes, the difference being very slight and depending on the participation of the palato-pharyngei in the nervous excitability.

In characteristic examples of this disease, the glottis is seen to be red and congested. It moves with difficulty at all times, and never fully opens for the ingress or egress of air, and during the paroxysms it is firmly closed and slightly opened in rapid succession, causing the peculiar coughs or sneezes which characterise the complaint.

Here, then, is a class of cases in which the symptoms are attributable to a nervous lesion, pure and simple, but when they are compared with the cases previously related, in which the same nervous symptoms were connected with and apparently caused by some change of the mucous membrane or other obvious cause of irritation of the nerves, I think it will become clear that the former set of cases have the same origin as the latter, but that in them the primary lesion had

disappeared, leaving the nervous affection alone. Nor is this a matter of merely pathological interest; it is of much practical importance, for I am convinced that on this theory alone can such cases be treated with any reasonable hope of success.

We can only affect the extremities of the nerves through the membrane in which they are distributed, and it is, therefore, to it that we are in the first place to direct our remedial efforts. And here I must observe that though there is neither ulcer nor tumour, nor other obvious lesion to be seen, yet there will be found in most, I should rather say in all cases of what is apparently quite a pure nervous affection of the larynx, great failure of nutrition in the mucous membrane. Thus it will be seen by means of the laryngoscope to be thin in some places and congested in others; and the mucus secreted by it is both scanty and thick, coming up to the mouth in masses, and not spreading itself on the membrane as its natural protector and lubricator.

In these circumstances the best thing to do is to apply a gentle and equable stimulant to the bloodvessels of the larynx, such as solution of nitrate of silver, not too strong, perhaps gr. 10 to the \mathfrak{z} i. of water. By this means the congested spots are removed by the contraction of their dilated vessels, and the pale, thin parts are quickened to greater nutritional activity. In fact, the circulation is made more equable, and the nutrition of the tissue more full and regular. Then as an immediate consequence of this change, the mucus becomes more natural, and affords a better protection to the delicate membrane beneath, while the very topical application of the remedy, by accustoming the larynx to an unnatural stimulus at times, diminishes its excessive sensibility, and enables it to bear the natural stimulus of the air in breathing, and the motions of the glottis in speaking, without that excitement which constitutes the disease.

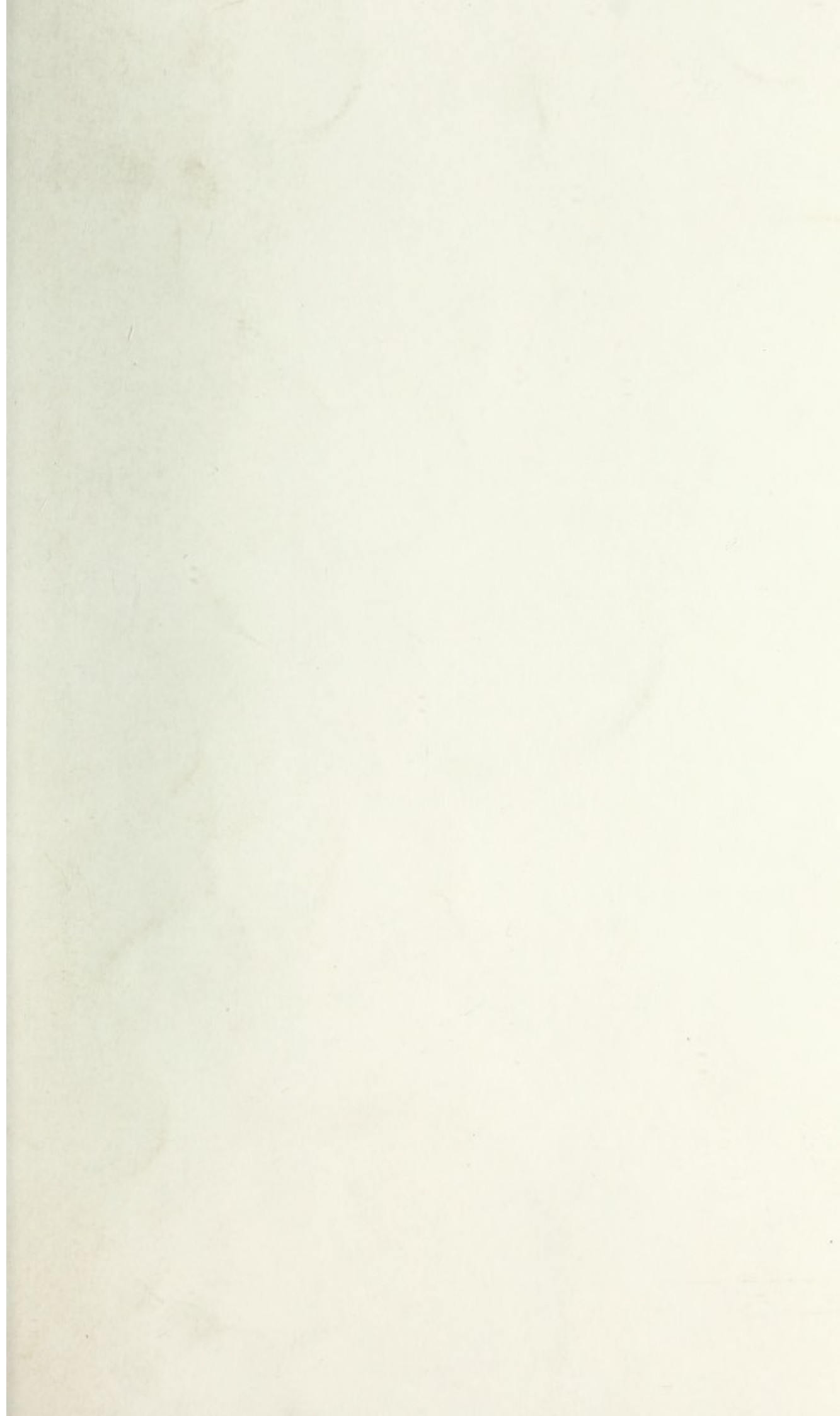
While this is being accomplished, however, other means may be employed with advantage, such, for instance, as

soothing inhalations. The most potent of these is made by adding a little chloroform and rectified spirits to boiling water, the steam of which may be inhaled; or, if this sickens, the amyl nitrite may be used, or the compound tincture of benzoin. In some cases, on the other hand, the cold spray of a solution of alum or borax is very useful in allaying nervous irritation. This is especially true of cases where there is much congestion or relaxation of the laryngeal lining, or as a protection against cold, if the patient has to go out during treatment. In these cases it is often necessary to insist on the employment of a respirator.

I have found mild and continued counter-irritation over the thyroid cartilage specially useful in this class of cases. I seldom blister, but generally prescribe the iodine liniment to be painted on the skin once or twice a day, changing the side when the pain becomes considerable.

I may mention here that the general remedies from which I have seen most benefit in the cases referred to, are bromide of potassium, and the preparations of iron, and these may often be advantageously prescribed in short, alternate courses, of two or three weeks at a time.

If all these measures fail, and they sometimes do from various causes, I believe there is nothing so likely to do good as a short residence abroad. Of course this can only be recommended in cases where it is known that the patient's circumstances permit of his complying with the advice. I do not, however, believe much in the efficacy of spas or mineral waters, but I confess that I have great faith in thoroughly changing the patient's mode of living, and in the exercise taken by him under more favourable climatic influences than our island affords, which are implied in such a recommendation.



224