

The treatment of hoarseness & loss of voice by the direct application of galvanism to the vocal cords : illustrated with cases / by Morell Mackenzie.

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THE TREATMENT
OF
HOARSENESS & LOSS OF VOICE

BY THE
DIRECT APPLICATION OF GALVANISM
TO
THE VOCAL CORDS.

Illustrated with Cases.

BY
MORELL MACKENZIE, M.D.LOND.,
PHYSICIAN TO THE DISPENSARY FOR DISEASES OF THE THROAT.

[Read at the Thirty-first Annual Meeting (and reprinted from the Journal)
of the British Medical Association.]

LONDON:
T. RICHARDS, 37, GREAT QUEEN STREET.

MDCCCLXIII.

THE HISTORY OF THE ROYAL NAVY

BY
ADMIRAL LORD NELSON

IN TWO VOLUMES.

LONDON:
PRINTED BY J. JOHNSON, ST. PAUL'S CHURCH-YARD.

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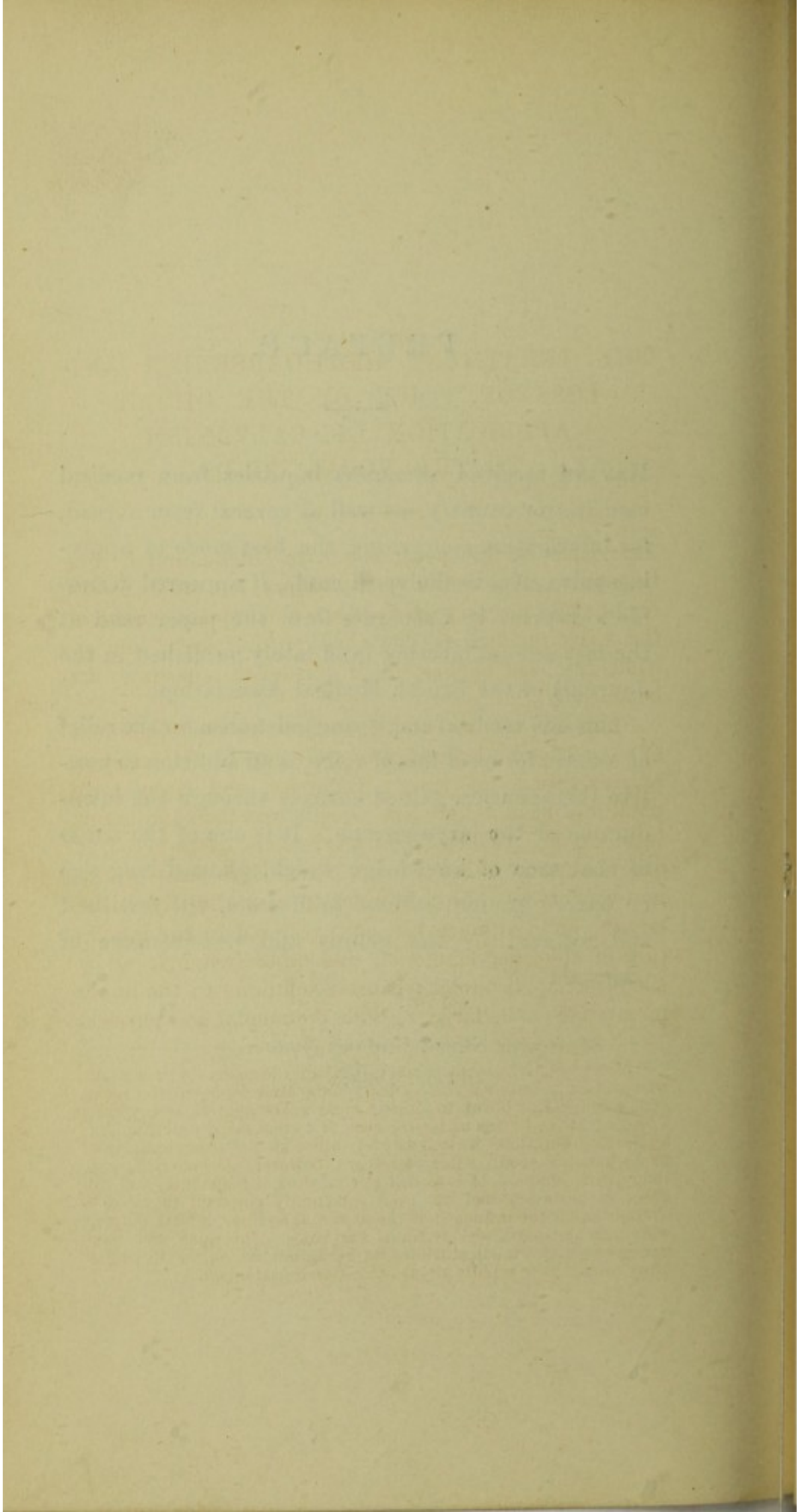
1795.

P R E F A C E.

HAVING received numerous inquiries from medical men in this country, as well as several from abroad, for information concerning the best mode of applying galvanism to the vocal cords, it appeared desirable to reprint in a separate form the paper read at the last annual meeting (and lately published in the *Journal*) of the British Medical Association.

This new mode of employing galvanism for the relief of certain forms of loss of voice, is an addition to positive therapeutics, gained entirely through the introduction of the laryngoscope. It is one of the fruits of that tree of knowledge which, planted long ago on barren ground, refused to blossom, till fertilised and fostered by the genius and perseverance of Czermak.

34, *George Street, Hanover Square,*
October 1863.



THE TREATMENT OF HOARSENESS AND LOSS OF VOICE BY THE DIRECT APPLICATION OF GALVANISM TO THE VOCAL CORDS.

THE object of this paper is not to enter minutely into the nature of neuroses of the larynx, but briefly to describe those diseases where, from abnormal innervation, the vocal function is disturbed or destroyed, and in which the local application of galvanism appears to act beneficially.

From the earliest period, patients affected with loss of voice have undergone wonderful cures. Superstition has exercised its potent influence, and many have doubtless been relieved by priestly exorcism and magic incantation. Sudden fright has in some cases cured, in others caused,* a loss of voice. In modern times, stimulant vapours have been brought to bear directly on the larynx; and the voice has been restored by the inhalation of chlorine, ammonia, and other irritants, or by the direct application of caustic solutions to the lining membrane of the larynx. Both the mental and physical

* Many London practitioners will recall the case of a young lady who suddenly lost her voice after seeing Miss Webster, the ballet girl, accidentally burnt to death, some years ago, at Drury Lane Theatre. Miss L. was under the care of a great many practitioners; and caustic solutions, as well as every other kind of treatment, failed to do her any good. After two years, however, she married; and, though the emotion of love had not affected the aphonia, and the effect of gestation had not been sufficiently powerful to cause a change, under the influence of the maternal feelings, whilst playing with her first-born, she regained her voice. This case was mentioned to me by a medical friend, as being one which, in all probability, would have rapidly yielded to internal galvanism.

remedies, however, act on the same principle; viz., that of stimulating the "nerve-force". But whilst in the former the action of the remedy is on the entire nervous system, in the latter its influence is confined to the nerves of the part affected.

It was natural that, when the power of electricity as a therapeutical agent was discovered, it should be applied to the relief of symptoms often presenting obviously nervous phenomena; and many cases are on record, where galvanism, applied to the throat, has cured cases of long standing aphonia. It was not, however, till quite recently, when the introduction of the laryngoscope enabled "the eye to direct the hand", that it became possible to apply the galvanic current directly to the nerves and muscles of the larynx. It sometimes happened, therefore, that the current, when applied externally, took a circuitous course, and failed to effect the desired stimulation, even where the use of electricity was unmistakably indicated.

For the purpose of applying galvanism directly to the vocal cords, I have contrived a very simple and efficient instrument, and with it have several times succeeded in curing cases of long standing aphonia, which had obstinately resisted the ordinary external mode of applying galvanism.

It must not be imagined that I am recommending galvanism as an universal panacea, even in all cases of nervous aphonia or dysphonia. Where there is cerebral lesion, or where the pneumogastric nerve or its branches are seriously injured or pressed upon, it is not to be expected that galvanic shocks could do any good, though they might possibly do harm. On the other hand, where there is merely a diminished tension of the nervous centres, or an exhausted or otherwise impaired excitability of the nerves of the part, electricity will probably do good.

Galvanism of the vocal cords is likely to prove beneficial, therefore, 1, when aphonia occurs as a symptom in conjunction with considerable disturbance of the

nervous system; 2, in hysterical aphonia; 3, in aphonia associated with certain blood-diseases, as chlorosis and anæmia; 4, in certain cases of blood-poisoning (arsenical, lead, and perhaps others); 5, in certain cases of purely local paralysis—*a*, in those analogous to the paralysis of the muscles supplied by the facial nerve—*b*, in diphtheritic* paralysis of the vocal cords; 6, in certain cases of muscular strain, where, after due time has been allowed for the muscles to recover their perfect contractility, there still remains a want of power; 7, in certain cases of dysphonia, where there is congestion of the mucous membrane of the larynx, and where local astringents have failed to remove the congestion and restore the voice or relieve the hoarseness. In this classification, an attempt has been made to separate those cases of aphonia caused by impaired innervation from those due to an altered condition of the muscular tissue. From the close association and dependence of the nervous and muscular systems, however, such an attempt can only be very partially successful.

The laryngoscope furnishes more simple and certain indications as regards the class of cases in which galvanism ought to be used, than the most careful analysis of the pathological conditions can possibly afford. When, on examining the larynx of an aphonic patient, and directing him to attempt to vocalise, the cords are seen to remain apart, no mechanical impediment to their closure being present, the case is probably well suited for galvanism. In some cases, the separation between the vocal cords is slight; whilst in others it is very considerable. Sometimes the vocal cords appear to approximate properly; but, on careful examination, a certain want of tenseness may be detected. They are relaxed, and bulge slightly upwards or downwards,

* In cases of diphtheritic paralysis of the vocal cords, the loss of function appears to be sometimes the result of a powerful blood-disease, whilst at others it seems due to the morbid influence which the false membrane exercises on the nerves of the part. In the former case, diphtheritic paralysis might perhaps be more properly classified with paralyses dependent on chlorosis or anæmia.

according as the air is expired or inspired. This condition would appear to depend on deficient action of the crico-thyroid muscle; and in such cases it is desirable to pay particular attention to that muscle in employing galvanism. It must be admitted, however, that in some cases of nervous aphonia, the vocal cords appear closely approximated and perfectly tense; and in these the functional disturbance must depend on some molecular change not appreciable with the laryngoscope. In most cases of nervous aphonia, the mucous membrane of the larynx will be seen to be abnormally pale, though in some it is slightly congested.

Cases as far as possible illustrative of each of the forms of nervous aphonia in which galvanism is serviceable will now be related. The history of most of them will be much abridged; but one or two of the most remarkable will be given *in extenso*.

1. Cases of aphonia dependent on considerable general disturbance of the nervous system are not uncommon; and though this description will appear, as it undoubtedly is, somewhat vague, there is a tangible reality about the following case, which shows that, in this instance at least, there is no ground for saying, with Goethe,

"Denn eben wo Begriffe fehlen
Da stellt ein Wort zur rechten Zeit sich ein."

CASE I. *Loss of Voice, of Three Years' standing, cured by Eight Applications of Galvanism internally; a hoarse Voice returning after the Fourth Application.* Miss Kate H., aged 26, consulted me in March 1863 for loss of voice. The young lady looked rather delicate, if not sickly; but did not complain of weakness. She was of a cheerful disposition, and did not appear in the least degree hysterical. She informed me that, in April 1860, she took cold, had an ulcerated sore-throat, and lost her voice. She afterwards wrote me a more detailed account of her aphonia, which I shall give as far as possible in her own words. "After recovery from the sore-throat, the voice did not return; and in October 1860,

her regular medical attendant applied caustic twice to the throat, but without any effect." She then consulted some of the leading London physicians, and, among others, Dr. Walshe, who clearly recognised the nervous character of the disease, and "recommended galvanism to be applied, first by one of Pulvermacher's chains, and afterwards, if that did not succeed, by means of a battery. Neither produced any effect." This distinguished physician then "strongly urged her to leave it to nature, which she did till April 1862, when she had the throat painted with iodine, with no other result than making it very sore on the outside." In May, another eminent physician prescribed "zinc pills, which were taken three times a day for a month, without any result. In June 1862, Dr. Blandford met Dr. Czermak, to examine the throat with the laryngoscope. Galvanic shocks were strongly advised"; and, in the following November, Miss H. placed herself under a physician who has paid especial attention to medical electricity. "He applied galvanism every day with a metallic brush, and afterwards in a stronger form for a fortnight. All this time there was not the least return of the voice."

Miss H. applied to me in March 1863; and, in making a laryngoscopic examination, the vocal cords were seen to be very pale and narrow, as if atrophied. On attempted phonation, they approximated well, but still were distinctly relaxed; and the upward bulging towards their centres was quite perceptible.

I at once applied galvanism to the cords, by means of my "laryngeal galvaniser". The operation was repeated every two or three days; and, after the fourth application of the electro-magnetic current, the voice returned. It was very gruff at first, and "came and went"; so that, though the young lady recovered her voice one evening, when she came to tell me of her good fortune the next day, she was unable to produce a sound. Gradually the voice became more constant, though its monotony was very striking; every syllable and every sentence was pronounced in the same tone, with an entire absence of

expression. After the larynx had been galvanised altogether eight times, the voice was completely restored, and perfect as regards modulation. The laryngoscopic evidence of relaxation of the cords disappeared after the third application of galvanism.

Many people would consider this case an example of hysterical aphonia; but I must again repeat, that the patient never showed a single hysterical symptom. Being anxious to investigate the case thoroughly, I wrote to Dr. Alfred J. Tapson (of Gloucester Gardens), the regular professional adviser of the young lady, and he kindly replied as follows:—"Miss Kate H. has been a patient of mine for a good many years, and I well recollect her illness in 1860. She suffered from intense headache, a remarkably quick pulse, and total loss of appetite, attended with great prostration, emaciation, and loss of voice. *She had no hysterical symptoms.* Dr. Todd saw her several times, and was quite puzzled what to make of her symptoms. We both had some suspicions that she might be going to have tubercle in the brain or elsewhere. She gradually recovered her health and strength, but never her voice (though I and many others tried all we could think of). She gave everything a fair trial, being most anxious to regain her voice."

I have entered somewhat minutely into the history of this case, because I was anxious to show that it was entirely free from hysteria, and that the aphonia was dependent on profound disturbance of the nervous system. There were, as Dr. Tapson says, "intense headache, a remarkably quick pulse, and total loss of appetite, with great prostration and emaciation." It is scarcely necessary to observe that such symptoms imply impaired innervation of the most extreme form.

Galvanism was clearly indicated in this case. Dr. Walshe from general investigation, and Dr. Czermak from special examination of the larynx, both recommended electricity. External electricity was vigorously employed by an experienced galvanist, "without the

least return of the voice". Electricity applied directly to the vocal cords succeeded rapidly in restoring the voice, which had been completely lost for three years. No comment on the superiority of the internal method of employing galvanism is required.

2. Though cases of hysterical aphonia are occasionally reported in the journals, and are to be found in the works of medical authors, they are in reality extremely rare. Where aphonia affects a young woman otherwise healthy, medical men are apt to consider the case hysterical, even though no symptoms of that disease (beyond the aphonia) are present. Such a palpable plan of begging the question obscures the real nature of the disease, and can only lead to unscientific and unsuccessful treatment. During the last six months, more than three hundred cases in which the voice was decidedly impaired have come under my notice. Of these, there was only one case which could possibly be called "hysterical aphonia". The following are the notes.

CASE II. *Loss of Voice of Eighteen Months' duration, cured by Eleven Applications of Galvanism to the Vocal Cords.* Charlotte C., aged 19, a paper-folder, was brought to me in February 1863. She was a tolerably healthy looking, though rather flabby young woman, and had latterly been overworked. The aphonia had existed for eighteen months, and came on quite suddenly, without any known cause. She had never suffered from an attack of hysterics; and the hysteria only showed itself by a strong inclination to cry (which could rarely be restrained) after being galvanised. She did not sob, however, in the usual hysterical way. I applied galvanism to the vocal cords two or three times a week; but the voice was not regained till after the seventh application of galvanism, when it returned suddenly on desisting from the operation. The treatment was gone on with a short time longer, and was not altogether discontinued till the end of March.

3. Two cases of aphonia associated with anæmia, and one in which chlorosis was present, have come

under my observation. It is difficult to tell in such cases whether the functional disturbance depends on diminished tension of the nervous centres, on lowered excitability of the nerves of the part, or on impaired contractile power of the muscular tissue itself. One case of anæmic aphonia that I had an opportunity of seeing was under the care of another physician, but in the other I was able to employ galvanism internally.

CASE III. *Aphonia, of Six Months' standing, cured by a single Internal Application of Galvanism.* Mary E., aged 22, applied at the Dispensary for Diseases of the Throat on May 19th, 1863. She stated that she had been out of health for about a year, and that she had lost her voice for the last six months. She was very pale, and complained of great weakness and depression of spirits, for which "she had been taking steel medicine for some time". The aphonia came on gradually; the voice first becoming weak in the evening, then being extinguished in the morning (while she was able to speak quite well in the afternoon); and finally she was quite unable at any time to raise her voice above a whisper. She had remained in this state for six months.

May 21st. I applied electricity to the cords, and the patient immediately spoke.

The operation was repeated first twice and then once a week for a month; but the voice was never once even temporarily suppressed after its restoration on May 21st.

In this case, after the recovery of the voice, the patient's general health rapidly improved. Though, as a rule, in these cases, the anæmia and aphonia stand in the relation of cause and effect, it must not be forgotten that the loss of voice reacts as a depressing power on the general system.*

* Independently of the influence which the muscular sensibility of the larynx exercises on the general economy, it must be borne in mind that the respiratory muscles are far more powerfully employed in vocalisation than in ordinary expiration; if, therefore, the tension of the vocal cords is not sufficient to become vocal, it is evident that the hygienic effect of the respiratory process on the system at large must be seriously impaired. Again, "the abundant spontaneous

4. One case of aphonia from arsenical poisoning, and one case of saturnine dysphonia, have come under my observation. I did not make use of galvanism in the first case, because, at the time when it was under treatment, no instrument had been invented for applying electricity to the vocal cords, if indeed the idea of employing galvanism in this way had ever occurred to any one. The case will be found recorded in the *Medical Times and Gazette* of January 11th, 1862; and those who take the trouble to peruse it will probably agree with me in thinking that galvanism would most likely have restored the voice. In the case of saturnine dysphonia, which was of twelve years' standing, there was considerable and irregular atrophy of the left vocal cord. The employment of galvanism in this case would most likely have been unsuccessful; but other cases, uncomplicated with atrophy, would probably be benefited by the direct application of galvanism.

5. In cases of purely local paralysis, galvanism strongly recommends itself. Three cases of this kind have come under my care. In two, the aphonia was soon cured; while, in the other, the patient discontinued his attendance before any result had been obtained. Two cases of this class have also occurred in the practice of Dr. Stokes, the distinguished Regius Professor of Medicine in the Dublin University, in which galvanism, directly applied to the vocal cords by my friend Dr. P. C. Smyly, rapidly cured. In one case (already recorded in the *Medical Times and Gazette*, July 11th, 1863), the etiology is somewhat obscure; but

activity of the vocal organ" causes it to exert a constant influence on the intellect; whilst as an organ of expression in relation to emotion, it is scarcely surpassed even by the features. (*Vide* Bain, *The Senses and the Intellect*, p. 307.) It is not surprising, therefore, that the loss of function should act as a powerful depressant on the general system, nor that its restoration should cause such sanative results.

In addition, moreover, to the purely psychical relation between the voice and general system, the aphonia, besides debarring the patient from many social pleasures, by interfering with his attention to business, sometimes causes serious losses and proportionate anxiety and trouble. Here then is another cause of depression.

in the one which will presently be related, the aphonia seemed to be closely connected with an affection of the pneumogastric nerve.

CASE IV. *Loss of Voice, of Eight Months' standing, cured by Ten Applications of Galvanism to the Vocal Cords.* Mr. Charles E., aged 35, applied to me on the 11th April, 1863, on account of loss of voice. He stated "that he had suddenly lost his voice in September 1863, whilst eating an ice." He had tried various remedies, and had worn one of Pulvermacher's chains for some time. At Christmas he had fallen into the hands of the Philistines, and a well-known homœopathic doctor had promised to cure him. The disciple of Hahnemann, however, after four months trial (notwithstanding that he had given the most powerful globules), failed to bring about the most infinitesimal improvement in the voice; and Mr. E. applied to me in April, a wiser, if not a happier man.

On examining the throat with the laryngoscope, no evidence of structural disease could be detected. The lining membrane of the larynx was of normal colour; but, on attempted phonation, the vocal cords only very partially approximated, remaining at least a quarter of an inch apart posteriorly.

I did not see the patient again till a month later, when I applied magnetic electricity to the cords. The operation was repeated seven times, at intervals of one, two, and three days, before any effect was produced; but the patient then regained his voice—if, indeed, the harsh discordant sound produced in the larynx could legitimately be called by that name. After three more applications of galvanism, the voice became tolerably clear and strong; and, when last seen (July 1st), the patient stated that "his voice was as good as it ever had been".

CASE V. *Aphonia, of Nine Months' standing, cured by Five Applications of Galvanism to the Cords (the First Application partially succeeding).* Henry D., aged 40, a working engineer, applied at the Dispensary for Dis-

eases of the Throat on June 24th, 1863. He stated that, one cold night in November 1862, he was aroused from his sleep by an alarm of "fire". The next morning, he could not sound his voice. He had never had any pain in the throat, nor had he ever suffered from cough.

On examining the larynx, the vocal cords appeared to approximate properly; and there was no appreciable relaxation. The mucous membrane was pale, and there was not a trace of structural disease.

This case was considered to be one of purely local paralysis, caused, probably, by an impression of cold in the neck externally, or perhaps by cold air brought to bear (by inspiration) even more directly on the larynx. It might, however, have been due to the impression of sudden alarm acting on the general nervous system.

The vocal cords were first galvanised June 8th, and the operation gave rise to considerable local irritation; the patient coughed continuously, in a peculiar shrill way, for at least twenty minutes; and, an hour afterwards, expectorated a little blood. Two days later, he was able to speak, though it required a great effort. On examining the larynx then, the lining membrane was seen to be very much congested; and, in spite of the desire of the patient, I did not think it advisable to repeat the operation that day. At the end of a week, I again galvanised the vocal cords, and the same violent irritation was again caused. This time, however, the symptoms of irritation soon passed off; and, after three more applications of galvanism, the voice became natural.

One other patient, suffering from this form of aphonia, was also under treatment. The loss of voice came on suddenly, after travelling to London in a night-train from the north of England. After four applications of galvanism, no effect having been produced on the voice, the patient, getting tired (I suppose) of the treatment, discontinued his visits.

One case of paralytic dysphonia, occurring as a sequel of diphtheria, has been successfully treated by the direct employment of electricity.

CASE VI. *Diphtheritic Dysphonia, of Fourteen Months' Duration, cured by Twenty-five Applications of Galvanism to the Vocal Cords.* Patrick O., aged 19, was sent to me in April; but I first commenced treatment in the middle of May. The patient stated that, in March 1861, he had an attack of diphtheria; that, since that time, he had always found great difficulty in speaking aloud; and that, when he did succeed, his voice was always very squeaky. On looking into the throat, the pillars of the fauces presented a peculiarly atrophied appearance; and on the posterior wall of the pharynx there were several lumps of inspissated mucus. On using the laryngoscope, and directing the patient to say "Eh", it was seen that, whilst the right vocal cord advanced well to the centre, the left vibrated slowly, without moving at all towards its fellow. The sound produced was in the falsetto register, and he was unable by the most violent efforts to produce a chest-note. He stated that, before he suffered from diphtheria, he had a remarkably loud and strong voice.

On the application of galvanism to the cords, he at once spoke in the chest-register. The high-pitched squeaking voice soon returned, however—according to the patient's account, "directly he got into the open air". Galvanic shocks were continued first every day, and afterwards every two or three days for two months; when, the voice having been restored for more than a fortnight, and the left vocal cord acting perfectly, it was not thought necessary to continue the treatment.

CASE VII. *Aphonia, of Ten Months' Duration, cured by Three Applications of Galvanism to the Vocal Cords.* The following case of aphonia was associated in its origin with an attack of hooping-cough. It is well known that, when adults are affected with pertussis, they generally suffer much more than children do under similar circumstances; and it is now a common opinion that the disease, as Dr. Watson observes, depends "on some morbid influence exercised upon the pneumogastric nerve". I therefore consider this case of aphonia

to be dependent on a distinct local paralysis of the muscles in connexion with the vocal cords. This case occurred in the practice of Dr. Stokes; and the patient was galvanised by Dr. P. C. Smyly, by whom the following notes were taken.

"Mrs. —, a tall, handsome woman, mother of seven children, rather anæmic, but not thin. At each confinement she had severe floodings. Eight years ago, she had hooping-cough. Since then she has suffered from loss of voice every winter. Last August, however, she lost her voice after a slight cold, and has not since recovered it. I saw her for the first time on the 22nd of June, 1863, with Dr. Stokes. I examined her with the laryngoscope, and expressed my opinion that the affection was nervous; for, in fact, there was not a trace of disease, and nothing abnormal, except a slight redness of the mucous membrane. The vocal cords lay quite flaccid. She said, 'Were the house on fire, I could not cry out.' I applied the electric current by means of Dr. Mackenzie's instrument, using a very feeble current. After this application, Dr. Stokes thought he heard a faint sound, at the end of a violent effort on the part of the patient to say 'Eh'.

"On the 24th, I applied a much stronger current than on the first occasion. After this, she could sound several words, but with a great effort.

"25th. I again applied the galvanism, using a very strong current, and repeating the application several times in an hour. This was necessary, as she had to leave town next day. After this application, she could count with ease, and speak whole sentences without effort.

"26th. She called this morning to say that her voice was quite restored, and quite natural, with the exception of a slight huskiness, scarcely perceptible.

"July 13th. Dr. Stokes had a letter to-day from the lady, saying that her voice was as perfect as when she left town."

6. I have had an opportunity of applying galvanism

to the vocal cords in two cases of functional disease of the larynx, dependent on muscular strain. In one, there was complete aphonia; but in the other the voice was not entirely suppressed.

CASE VIII. *Aphonia, of Two Months' standing, cured by Six Applications of Galvanism to the Vocal Cords.* The Rev. Philip S. applied to me early in June, on account of loss of voice. The aphonia came on one evening in April, while he was preaching in a large London church. While in the middle of a sermon, he felt a sudden pain in the throat, and was obliged to finish almost in a whisper. Since then he had never been able to speak out loud. Mr. S. stated that he had lost his voice on two previous occasions, but that hitherto he had always regained it in a day or two.

On looking into the larynx, the vocal cords and other parts appeared healthy, and there was no trace of follicular disease. The cords approximated, and appeared tense; nevertheless, the patient could not emit a sound from the larynx. He had a slight suppressed cough.

June 1st. I galvanised the vocal cords, and repeated the operation on the 3rd, 5th, 8th, 10th, and 12th. The voice returned after the sixth application of galvanism. I did not see the patient again for a week, and the voice was then perfectly natural. Mr. S. has visited me once or twice since, and I am happy to say that the restoration of voice has been permanent.

CASE IX. *Aphonia, of Four Months' Duration, cured after Five Applications of Galvanism to the Vocal Cords.* John M., aged 41, a fish-hawker, applied at the Dispensary on May 11th, on account of loss of voice. Aphonia came on suddenly after making great efforts one Saturday evening; but he afterwards partially recovered his voice. It was now so weak, that for four months he had been obliged to give up his *vocation*. On making a laryngoscopic examination, the larynx looked healthy; but, on attempted vocalisation, the cords exhibited a strong tendency to remain apart, though by violent straining they could all but be brought

into a state of approximation. The mucous membrane was not particularly congested. Galvanism was applied internally every other day for rather more than three weeks; and the voice was fully restored after its fifth application, when the man resumed his occupation. To prevent relapse, the galvanism was repeated several times after the restoration.

7. Finally, there is a class of aphonic cases, not by any means clearly dependent on nervous causes, which may nevertheless be sometimes relieved by internal galvanism. These are cases of chronic congestion of the larynx. I originally tried this remedy in such (apparently unsuitable) cases on two patients affected with a chronic congestion of the larynx, which had entirely resisted ordinary topical stimulants. I have since employed galvanism in three other such cases—in two with partial, and in one with complete, success.

It is probable that, in chronic congestion of the larynx, galvanism acts as a strong organic stimulant on the local circulation, either by its direct action on the coats of the capillaries, or indirectly by causing strong muscular contractions. It is not pretended that, in ordinary cases of chronic congestion of the larynx, galvanism is the most suitable remedy. There are other agents which yield most satisfactory results, and are far less troublesome to employ. It is quite possible also that, in the instances in which I have employed galvanism successfully in chronic congestion of the larynx, the hyperæmia might have been an accidentally superadded condition upon, or a sequence of, impaired innervation. The following extracts from more copious notes will perhaps give an idea of the value of galvanism in the class of cases now under consideration.

CASE X. *Loss of Voice, of Ten Months' standing, cured after Six Applications of Galvanism.* Henry P., aged 40, a watchmaker, applied to me in January, on account of loss of voice. The aphonia had come on suddenly in the previous spring.

With the laryngoscope, the vocal cords were seen to be

highly congested, their colour being bright red. Strong solutions (3j to ʒj) of nitrate of silver were applied to the larynx every other day. This treatment was continued for a month; and, it not being successful, a solution of sulphate of copper was used, instead of the silver salt. After employing this stimulant for more than three weeks, the voice still being entirely suppressed, it was determined to try the effect of galvanism. After three applications of electricity to the cords, the voice returned. It was rather hoarse at first; but, after three more applications of the electric current, it became perfectly natural.

CASE XI. *Dysphonia, of One Year's standing, cured by Fourteen Applications of Galvanism Internally.* Thomas D., aged 53, a pensioner, applied at the Dispensary for Diseases of the Throat in March. He was suffering from hoarseness, which he said had affected him for more than a year, and sometimes he had no voice at all. There was considerable congestion of the larynx; the cords were seen, in the mirror, to be of a bright red colour. The patient was under treatment for three months; and various local astringents (including nitrate of silver, sulphate of copper, and a solution of tannin) had failed to produce any effect.

Galvanism was first employed on June 15th, and repeated every two days till the 29th, when the voice had greatly improved. To prevent relapse in such an obstinate case, the galvanism was continued till July 15th, when the patient was discharged cured. The congestion of the mucous membrane had also disappeared.

CASE XII. *Aphonia, of Six Months' standing, partially relieved by Galvanism applied to the Vocal Cords.* Wm. J. F., aged 37, a painter, applied at the Dispensary in April. He was suffering from complete aphonia; and congestion of the larynx, as seen with the aid of the laryngoscope, appeared to be the cause of the loss of function. After giving a fair trial to nitrate of silver, no effect having been produced, I resolved to employ galvanism. After electricity had been applied to the

cords three times, the patient was able to speak in a very hoarse voice. Notwithstanding the prolonged and persevering use of galvanism, the voice did not at all improve after this. I again had recourse to nitrate of silver, and in a fortnight the voice was clear and healthy.

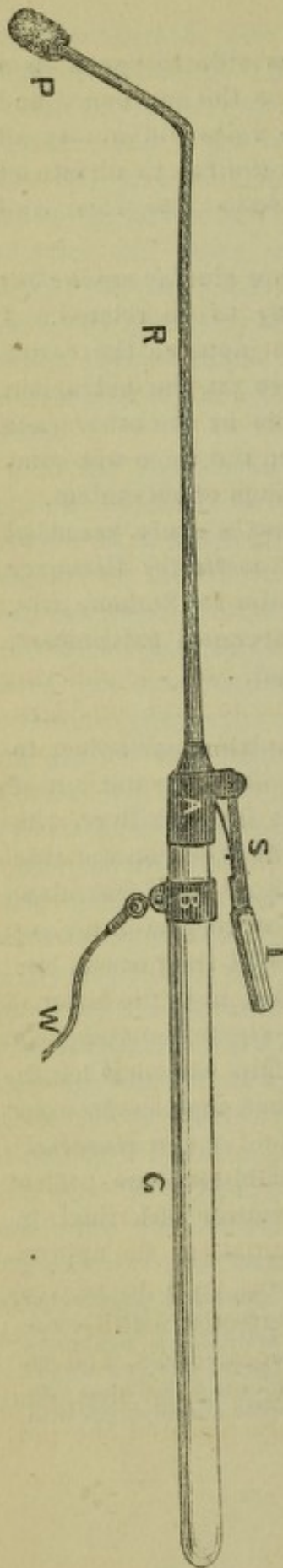
I have used galvanism in two other similar cases; but they are not sufficiently interesting to be related. I may observe, however, that in one instance the result was very much the same as in Case XII, the galvanism being only partially successful; while in the other case of chronic congestion of the larynx, the voice was completely restored after three applications of galvanism.

In addition to these cases, I have already recorded two* in the *Medical Times and Gazette* for February 1863; and the history of a patient under Dr. Stokes's care, on whom Dr. Smyly used my "laryngeal galvaniser", will also be found in the same journal.

A few words on the method of applying galvanism to the vocal cords will perhaps be considered as not out of place. The operation requires but little skill on the part of the operator, and still less fortitude on the side of the patient. Whether magnetic or chemical electricity be employed is not a matter of any importance; for, although I have invariably employed the former, Dr. Smyly, in his two very successful cases, used the latter.

To employ magnetic electricity properly, an assistant is required to turn the electric machine with one hand, and with the other to hold one sponge against the side of the neck, either over the situation of the pneumogastric nerves, or directly on the thyroid cartilage. The operator should hold the laryngeal mirror with the left

* I have lately ascertained that, in one of these cases, the effect of strong solutions of nitrate of silver (applied by means of Mr. Thompson's ingenious hydropneumatic injecting instrument) was more beneficial than I had previously supposed. The "diffusive method" of employing caustic seems in this class of cases to be attended with much more decided effect than the ordinary mode of applying it with a sponge or brush.



hand, and with the right introduce the laryngeal galvaniser below the epiglottis. He now touches the spring on the upper part of the instrument with his index finger, and the current passes directly to the cords.

The woodcut shows the instrument* very well; and it can be seen that the current does not pass beyond the metal ring (B) till the operator touches the ivory handle (I), when the spring (S) connects the two rings (A and B); and the current then passes on to its destination. The irritation of a foreign body in the larynx causes the vocal cords to become tightly approximated, and thus it renders it easy to touch their upper surfaces. By placing the point of the laryngeal galvaniser on the arytenoid cartilages, both branches of the pneumogastric may receive the electric impression.

In conclusion, I may observe that I have employed galvanism to the larynx in more than thirty cases, and that no bad effect has ever followed its use. Most patients feel the electric action more acutely externally than in the larynx, though some have told me that they felt an agreeable sensation of warmth passing down from the larynx to the scrobiculus cordis. Others, again, have described a choking and pricking sensation in the throat.

The success attending the application of galvanism to the cords in aphonia will depend entirely on the proper selection of cases

* The "laryngeal galvaniser" is made by Mr. Krohne, 241, Whitechapel Road.

suitable for treatment. The absence of any structural disease or inflammatory changes, on the one hand, and a state of impaired innervation on the other, are, of course, the features which promise the most satisfactory results from this method of treatment.

APPENDIX. The following two cases came under my care only the other day; and as they both illustrate very remarkably the value of the direct application of galvanism to the vocal cords, they are now added to the other reported cases. They both belong to that class in which "aphonia occurs as a symptom in conjunction with considerable disturbance of the nervous system."

CASE XIII. *Aphonia of Eight Months' Duration cured by One Application of Galvanism to the Vocal Cords.* Jane R., aged 23, a tall stout young woman, from Frencham, was brought to the Dispensary for Diseases of the Throat on August 24th, 1863. She was suffering from complete aphonia, loss of appetite, and considerable constitutional debility. She was not at all hysterical according to her own account, nor did she appear to be so. She whispered to me that twelve months previously she had a very severe sore-throat, which had been lanced and burnt with caustic by Mr. Knowles, of Farnham, under whose care she remained for five months. In December 1862, being then extremely depressed and weak, and having scarcely recovered from her bad throat, she lost her voice; and since then she had never been able to speak a word out loud. Mr. Knowles recommended change of air; and the same advice was given to her by Dr. Cobb (formerly of the London Hospital). After a fortnight's residence in London, the patient applied at the Dispensary in the condition described.

On making a laryngoscopic examination, the approximative action of the vocal cords was seen to be very feeble; otherwise, the larynx was perfectly healthy.

August 25th. I galvanised the vocal cords, and the voice immediately returned. It was weak at first, but soon became full and strong. I only repeated the gal-

vanism once (on the 27th); but the voice was really restored by the first application.

CASE XIV. *Aphonia of Five Months' standing cured by One Application of Galvanism to the Vocal Cords.* Miss Gertrude S., a pretty child, aged 10, suffering from loss of voice, but otherwise healthy, was brought to me, on August 27th, by Mr. Taylor of Guildford. Mr. Taylor gave the following account of the little patient's aphonia. He was called to see her in March, when he found her sitting up in bed, and breathing excessively quickly. The physical signs did not at all explain the rapid respiration; and he was struck with its remarkably nervous character. An attack of bronchitis, in which the nervous symptoms predominated, afterwards developed itself; and on recovery it was noticed that the child had lost her voice. Various tonics were tried in vain; and change of air to Brighton (where a laryngoscopic examination was made by Dr. Ormerod) failed to restore the voice.

Finding that the larynx was quite healthy, with the exception of a relaxed state of the vocal cords, in the presence of Mr. Taylor and the child's parents I applied galvanism to the vocal cords. The voice was then and there perfectly restored; and when the little girl left me, she was able to speak in her natural voice.