

From what we really know, then, of the influence of the nerves in the animal economy, and seeing that they are the first formation in the embryo state, a doubt can scarcely arise that it is to their influence that the various tissues of the living animal mainly depend for their existence; and that the same influence seems absolutely necessary in order to give that vital constitution of vessels and blood requisite to the development of an organic and animal system. It is admitted, too, that the blood contains all those ingredients necessary for the construction of the various tissues of the body, consequently, it must possess the requirements in the formation of the nerves, and, on this account, the blood will always be less or more impregnated with the nervous influence, which will, in some degree, be distributed to the various tissues through which the blood circulates.

Having made these observations, it now remains to inquire into the source of that nervous influence which operates in the production of those creative processes requisite in the construction of the fœtus, previous to its possessing a nervous system of its own; and from what has been already noticed, it is pretty evident that the nervous influence emanating from the nerves and blood of the parent, and operating on the fecundated ovum, must be equal to the requirements, in the formation of nerves, vessels, and blood in the embryo; and from what is admitted in the processes of endosmose and exosmose, as well as of the fœtus receiving its nutriment from the mother, there can be no difficulty in admitting that the nervous influence of the mother plays an essential part in conveying that energy to the ovum, which is absolutely necessary to its full and perfect development.

Thus I have endeavoured to exhibit the origin, growth, and influence of the nervous system, and from pretty extensive opportunities for observation, I entertain no doubt that it is to the integrity of this system that sound health, both of body and mind, depends.

In many, if not in all, paralytic and apoplectic complaints, the cause may be traced to derangement of the nerves, and as long as moral management is principally depended upon in the treatment of the insane, the recoveries will be protracted and uncertain, and the number of incurables will be greater than in any other form of disease of ordinary occurrence.

So far an attempt is made to shew the pre-eminent position which the nerves hold in the animal frame; and that, in the production of disease of every description, they are the parts first implicated. Assuming, then, that these statements are founded in truth, it follows that the nerves, in idiopathic gangrene, are the parts first affected, and afterwards the vessels and circulating fluids.

This view of the subject may seem of no essential importance, seeing that inflammation is the primary indication to be corrected, but a more accurate and scientific inquiry will place the matter in a different light, for although pain, inflammatory and congestive symptoms may be recognised, yet the morbid nervous condition may remain unascertained as the distinctive primary cause of the disorder. But when it is duly ascertained that excess of morbid sense is capable and is the principal cause of arresting the action of the vessels, and consequently of disturbing the salutary condition of the blood, an especial aim of the practitioner will be to arrest the original and prominent disordering cause. For although bleeding and other antiphlogistic means may be necessary in almost every case, in order to subdue inflammation, and relieve the congestive state of the vessels, yet excess of sensibility is equally necessary to be corrected, it being the principal cause which arrests the action of the moving powers on which the circulation of the blood depends. Thus, it is evident, that as soon as the depletory means have been carried to the proper extent, the morbid sense must be combated by opium and such means as tend to alleviate this condition.

It is to be hoped, then, that in cases of this description, when seen early, as they generally are, either the member affected will be entirely saved, or so small a portion of it only destroyed as to render the loss but a comparatively small inconvenience. So far as my knowledge extends, the above mode of treatment will be found the best for the speedy alleviation of the patient's sufferings, as well as the successful issue of the case.

Only one isolated case has come under my notice in which extreme pain seemed to arrest the power of the circulation, for by the use of means for the relief of pain only, the complaint was subdued. The patient was about eighty years of age, and had been labouring under cough and oppression at the breast for a short time only; he was suddenly seized with extreme pain of one of his feet, which, in a few hours, became quite cold, and of a dark, livid tinge. Opium was administered internally, and a strong solution of the same in vinegar and water was kept constantly applied to the foot. In about twenty hours the heat and colour were restored, and the pain subdued.

Jan. 1845.

CHOLERA THE RESULT OF INFLAMMATION OF THE SPINAL CORD.

By WILLIAM REEVES, Esq. Surgeon, Carlisle.

DURING the last four months a great number of cases have presented themselves to my observation, the collective symptoms of which have been as follow:—

A load at the stomach; pain in the epigastric region, occasionally over the whole abdomen, simulating, in no inconsiderable degree, peritonitis; nausea, retching, and vomiting, often a sour water, resembling "rice water;" diarrhœa with tenesmus, passing downwards a fluid resembling that ejected; numbness and pain in the limbs and in various parts of the body; a sensation commonly termed "sleep" in the extremities; occasional cramps; faintness, accompanied by extreme depression of the vital powers, and depression and flagging of the heart's action; profuse perspiration, in some cases attended by a pungent heat of skin, in others, with coldness and shivering of the whole body; intense thirst; extreme restlessness; a moist and clammy tongue, red at the edges, somewhat furred in the centre; scanty, high-coloured, and offensive urine.

The disordered sensations led me to examine the spine, and in all the cases more or less expression of pain was elicited by pressure or percussion over the vertebræ. I treated these cases as inflammation of the spine, and with the most marked benefit, for oftentimes the entire symptoms were checked, or considerably alleviated, on the appearance of vesication over the spinal region. I accounted to myself for the various symptoms in the following manner:—

The spinal cord is connected with the sympathetic system of nerves: were it not for this connexion, our passions, emotions, and sensations—which are comparatively healthy actions—would probably have no influence over the functions of organs supplied by this system of nerves, but through this connexion they undoubtedly have influence over these functions. How much more probable, then, is it, that actual disease, involving a considerable portion of the cord, should influence, through this connexion, the functions of the various internal organs. The cardiac nerves have connexion with the cord high up in the neck, and where I find this portion of the cord diseased, to my mind, the depressed action of the heart, in a great measure, is accounted for. The gastric nerves have connexion with the fourth, fifth, sixth, and seventh cervical nerves. (Vide Dr. Baly's 2nd edition of Müller's Physiology, vol. i. p. 780.) What more natural to conclude from this, than that disease affecting this portion of the cord will give rise to gastric symptoms. And so we may, reasonably enough, at times, account for disordered functions of any internal organ where such disordered function is attendant on disease in the spinal cord. I did not seek any nosological arrangement or name of the above symptoms till I heard of individuals dying from such disease as I have described. Then it struck me that there was more connected with these symptoms than I thought of at the time; and after considerable reflection, came to the bearing that the prevailing disease was a modified form of malignant cholera. I examined more minutely, and am now quite convinced that such a conclusion is founded on fact, and, as such, exhibits the pathology of this scourge in a somewhat novel yet correct light. What is the cause of all the disordered sensations and motions in cholera? If not attributable to mischief in the spine, to what source can they be traced? If, in this affection, we find the spine giving evidence, by external examination, of mischief seated there, are we not, in a great measure, warranted in the conclusion, that, more or less, it is a spinal affection? At the same time, we confess, with Mr. James George Davey.—(LANCET, vol. i. p. 121, 1842-43.)—that the solar plexus is greatly at fault, though, to our mind, not solely so, as he believes. On the other hand, the solar plexus, and all the sympathetic ganglia, are influenced through their connexion with the diseased spinal cord. Thus, I look upon disease in the cord as the chief source of all the symptoms in cholera, and that the sympathetic system of nerves play a secondary part, though most important, in the manifestation of the symptoms. I give the following case to illustrate the pathology and treatment of the disease above mentioned:—

CASE.—Anne B—, aged seventeen, a house-servant, on the 21st of October, 1844, was seized with a pain in the stomach, which extended down to the lowest part of the abdomen; was sick, and ejected all ingesta; had a pain down the back, and her limbs felt heavy, numb, and pained; could not rest in one position, she felt so generally uneasy, yet continued to work about the house. On the 23rd, was obliged to give up work, as she got worse. Diarrhœa, accompanied by tenesmus, and pain all over the abdomen, were very distressing, and as she continued

daily to get worse, sent for medical advice on the following date.

Oct. 25th.—I saw her about eight o'clock in the evening; she was tossing about in bed, complaining of very severe pain in the abdomen, constant, and aggravated by the slightest touch; had a load at the stomach; retched almost in a continuance, and vomited a sour water, like "rice-water;" was much lax, voiding stools something similar to that she vomited; has a most distressing numbness and pain in the limbs; feels faint and depressed; cannot sit up, because she falls away in a faint; the surface of her body is quite cold, and she feels chill and shivery; has an intense thirst; and a small weak pulse; pressure over any vertebra causes her to shrink and cry out. Ordered to apply a blister, five inches wide, over the whole course of the spine, and to take a pill, as follows, every four hours:—℞ Calomel, three grains; opium, a quarter of a grain: mix, for a pill. Also to apply eight leeches over the abdomen.

26th.—After I left her last evening, she vomited "a quantity of something very black and thick, like tar." The leeches bit, but did not remain on a minute, nor yet did any blood escape from the leechbites. She continued through the night sick, retched much, was faint and cold, though every available artificial means was tried to bring about the heat of the surface. Towards morning, the blister took effect, and then the retching, pain in the abdomen, and general uneasiness, considerably abated, though some nausea, the coldness, depression, numbness, and pain in the extremities, continued in a mitigated degree. Ordered to continue the pills, and to have the following ointment applied over the blistered surface:—℞ Mercurial ointment, two drachms; lard, six drachms; compound iodine ointment, one ounce: mix.

27th.—Retching has not recurred since the blister took effect. Some numbness and pain in the limbs remain; diarrhoea, with tenesmus, still troublesome; stools dark and foetid; says that the ointment irritates the blistered surface very much, and complains of sore gums; heat of skin considerably restored, though the extremities are still cold; cannot sleep at night. Ordered thirty-five drops of laudanum at bedtime; the ointment to be continued to the blistered surface, and the following mixture:—℞ Nitro-muriatic acid, thirty minims; tincture of opium, two drachms; water, eight ounces; for a mixture. Take two table spoonfuls after each painful dejection.

28th.—Much improved in every respect. Numbness and pain in the limbs considerably abated; diarrhoea lessened. Mouth very sore; slept after the draught. Continue the mixture when necessary.

29th.—Continues to improve, though the limbs are occasionally affected as before. The diarrhoea is unattended with pain, and two or three times in the twelve hours; stools pretty natural in appearance. Continue the mixture, and to use a chloride of lime gargle, as her mouth continues very sore.

30th.—All the symptoms abated; natural heat restored; can sit up. After this the convalescence hourly advanced, and she is now quite well.

It is unnecessary to repeat such cases, yet I have numbers noted down, some less severe, others considerably more so. Perhaps it will be apparent to all that the above case is a modified type of malignant cholera, which disease is now of daily occurrence in this neighbourhood. In some cases there is no diarrhoea, in others, no cramps; in fact, the cases vary exceedingly, from simple pains all over the body, sometimes only in the face, which the sufferers refer to rheumatism seated there, to the lowest typhoid form of the disease compatible with life. Most of the symptoms in the cases I have treated have invariably yielded to vesication over the spinal region. The good of such treatment argues a host as to the pathology of the affection. The symptoms also argue much. What will morbid anatomy say? "Careful post-mortem examinations are required to elucidate this subject." Cholera, in many instances, contains within itself the indications of its own cure; and probably, more than any other disease, has a claim to be treated on the expectant method; instance the spontaneous recoveries in this disease, as compared with those rigorously treated. Are not the diarrhoea and vomiting effects, or efforts of nature calculated to subdue the disease, if it is an inflammatory affection? and if so, they ought not to be hastily interfered with, unless we can adopt a less evil and more effective treatment. Now, I look upon bleeding, (where it can be had recourse to, sometimes the collapse is so extreme as not to admit of this treatment,) on counter-irritation over the spine, (the more speedy the better,) and on mercurialization, as this less evil and more effective plan of treatment. The good effect of this treatment, I may say, I have amply experienced. As to the question, whether all the symptoms arise from an inflammation of the spine, I answer, in the language of Dr. Copeland, who, when treating of inflammation of nerves, in

his "Dictionary," writes, "Although it is not manifest that several affections of nerves, such as neuralgia, cramps, partial loss of sensation, or of motion, sciatica, and the severe attacks of pain usually termed neuralgia, proceed from inflammation implicating a trunk or branch of a nerve, yet there is much reason to infer that such is actually the case in some instances, and more frequently than has been admitted, although the inflammation may not be seated or manifested exactly as it is in the more unequivocal instances of the disease to which the term has been generally conceded."

November 6, 1844.

CASES OF SLOW PULSE.

ILLUSTRATING THE DEPENDENCE OF RESPIRATION ON THE SUMMIT OF THE SPINAL MARROW, WITH SOME REFERENCE TO THE USE OF A SAFETY-VALVE.

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Some lesion of the upper end of the Spinal Marrow the only known cause of Slow Pulse—Cases, exceptions.

NERVES of sense and motion, originating, so to speak, in the organs they endow, prolong their centripetal radicles into the brain substance in mysterious but rigid and indispensable order. Consciousness and volition are the results of this, and excitation and reaction alone are also results.

We understand that the senses must be linked together and motions combined, and that voluntary acts and unconscious re-actions require to be co-ordered for concurrent and consecutive efforts, and every one of these processes, and those of the mind, appear to be duly bound up together in the healthy cerebral mass. Every step carved in this mountain of wonder brings us, though almost imperceptibly, a little nearer to a useful comprehension of its powers and of its disorders.

The following, I think, tends to confirm and to confine the idea of respiratory tract or centre. Perhaps it may do more.

It is well known that pressures towards the centre of the base of the brain make the breathing laboured.

Dr. Whytt described remarkably slow pulse in the second stage of acute hydrocephalus.

Andral makes the pulse of apoplexy oftener slow* than quick, and the pulse with brain softening was found retarded fifteen times, and quickened seventy-two times.†

The respiration and pulse of narcotic poisoning and of jaundice are probably both slow.

A weak voice and slow speech are characteristic of injuries to the cervical medulla, and I think it will not be difficult to establish the facts, that a slow respiration, an infrequent pulse, and a cold surface, are peculiarly dependent on a certain moderated or impeded function in the upper end of the spinal marrow. These points, if true, should have no little import in physiology and pathology.

I am not aware that any described disease of the heart induces slow pulsation. Dr. Hope relates thirty-one cases of heart disease, and in no one was the pulse retarded. Slow pulses are, without doubt, of rare occurrence. Sir John Floyer never met with a pulse below fifty-five: recorded instances are decidedly rare. Dr. W. Guy found the pulse of a lady thirty-eight, and in all postures it was the same. Dr. Bright knew an aged active gentleman, a great hunter,‡ who had for very many years a still slower pulse.

I have elsewhere shewn that the safety-valve increases through life, and through a series of animals, and that the frequency of pulse decreases in similar ratio.

After some attention given to more certain pathological instances, I cannot but think that retarded respiration and an unusually free safety valve—or means of reflux from the right ventricle—are almost necessary elements of the simpler cases of slow pulse; and a difficulty in the respiratory tract or centre, either in the way of motor impulse, or of excitor impressibility, seems to me to be the best explanation of mere tardy respiration.

The following cases explain my meaning, as well as enforce each other in a degree almost beyond what I had anticipated on first setting about their collection. I do not, however, expect that a great deal can be safely built upon them. The means of estimating the proportion of respiration and of safety-valve action are wanting, and as yet disregarded; but I scarcely hesi-

* Spillan's Andral, p. 119.

† Ibid. p. 172.

‡ As in the last case, which I shall here record. I have not learned how near this gentleman may have been to breaking his neck. For a case of slow pulse, with softened cervical medulla, in the horse, see *Medical Gazette*, vol. xx. p. 254.