CLINICAL LECTURE ON HYPERÆSTHESIA.

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BESIDES the classical disorders of the nervous system, which well instructed students like you are supposed to know all about—such maladies, for instance, as epilepsy and tetanus—there are a great many forms and varieties of morbid action which are less recognised and described, and scarcely find a place in a regular nomenclature, with which yet it is very desirable for you to be acquainted. Many of these belong to that debatable ground where it is difficult to decide whether we have to do with diseases or with symptoms. I shall now proceed to notice sundry instances of one very common kind of morbid action, as it manifests itself in different localities; and conclude with some remarks on its nature, relations, and treatment.

I. In the *cutaneous surface* we very often meet with a condition which betrays itself by no objective change yet discovered, but solely by an abnormal sensitiveness. The tactile faculty of the skin is not really increased; it is not a more efficient organ of touch than it was before, but quite the reverse, as its nerves are incapable of tolerating the necessary contact with bodies presented to them. Such a condition is conveniently termed hyperæsthesia; and this name I shall continue to use in what I have further to say about it. This state of hyperæsthesia is met with very frequently in sufferers of the quasi-hysterical class, both male and female. One poor fellow assured me that his skin had been so sensitive that he could not bear the least touch anywhere; the pressure of a stethoscope in auscultation was intolerable; and the touch of a crinoline-hoop against his leg in a railway-carriage caused him terrible pain. These complaints were made quite gravely; and though we can hardly avoid smiling at them, yet we must admit that to the sufferer himself such a state of things was no joke. Think what you would endure yourselves, if all ordinary contact were a cause of continual pain. The reality of such suffering is materially confirmed by the fact that, in some cases of structural disease of the cord, certain parts of the cutaneous surface manifest intense reflex excitability, though ordinary sensibility is much impaired. In a most workmanlike report in the *Transactions of the Clinical Society*, vol. i, p. 102, on a case of locomotor ataxy, it is mentioned that an area of skin on the outer side of the right leg, about two inches and a half square, was, and had been for about two years, in a condition of extreme sensitivity to impressions capable of exciting reflex movements—such that the patient had frequently been thrown into convulsions, and had dropped down in the street, from the mere brushing of a woman's dress against this part. Even when he touched this spot himself, either with his hand or his trousers, whilst dressing, slighter convulsive movements often took place. At these times he felt an odd kind of sensation in the part, which then diffused itself rapidly throughout the body. In such hyperæsthesia as this the sensorium is but little concerned; but there is evidently no improbability that the cerebrum might be the seat of such disorder, as well as the cord. In fact, this is actually the case in many instances of arachnitis. If you object, that I am now speaking of coarse structural lesions, this will not apply to the case of rickets, where the nervous centres are often exempt from evident lesion, and yet the general tenderness is such that the child cries if he be but touched.

The hyperæsthesia which affects the region of the spine, or, more exactly, the line of the spinous processes, needs to be somewhat specially noticed, because it has been much dwelt on, and is often accepted as a sign (with others) of meningitis or myelitis. Brown-Séquard speaks decidedly on this point; he says that "it is almost always found that pressure upon the spinous process of the vertebrae (sometimes even a slight one), when made at the upper limit of the inflammation, causes an acute pain" (*Lancet*, July 14th, 1860). Dr. Radcliffe, on the other hand, is inclined to the view that this pain is mostly absent, at any rate, in uncomplicated myelitis. My own experience leads me to look for it as a nearly constant symptom, but not in that degree of acuteness which characterises the neurotic disorder. This, at any rate, is certain: that pain in the back *per se* is no evidence whatever of inflammation being present in any of the component structures, any more than headache is of the cranium and its contents being so affected; and, indeed, the two dysæsthesiæ are in many respects homologous. Spinal hyperæsthesia extends sometimes over the skin on one side, and

not at all on the other; sometimes light pressure is painful, and firm relieves; sometimes the latter is the worse. In some cases, I believe, the bones are involved in the neuralgia, without being at all inflamed.

2. The *lingual and buccal mucous membranes* are sometimes the seat of extreme and most distressing hyperæsthesia. The affected parts may appear quite natural, or at most there may be undue redness and insufficient development of epithelium, giving a "beef-steak" appearance, but not at all more than I have often seen in patients who were quite free from this hyperæsthesia. The following case is a good example of this happily infrequent disorder. Mrs. C., aged 73, was seen August 28th, 1866. She had been suffering the last five weeks with her mouth, which was so tender that she could bear nothing in the way of food but lukewarm milk and sopped bread. Cold things gave her pain, as well as hot. The buccal membrane was very red, especially that of the lower lip. The whole surface, including that of the tongue, was extremely tender; but I saw nowhere any breach of surface, nor anything resembling an ulcer. There were certainly some superficial fissures on the dorsum, but they were no more than often exist without causing any suffering, and they did not appear to involve the corium. The tongue was perfectly clean and moist. Pressure on the mucous membrane did not render a spot pale even for an instant after its removal. The bowels were regular; pulse 84, of good force. The appetite was very good, but she felt quite exhausted from being unable to take food. She got very little sleep, from the distress caused by her mouth. She had suffered much from rheumatism, and felt the changes of the weather very much. My notes extend over more than four months, and show scarce any change to have occurred during the whole of that time; and I am tolerably certain that she continued to suffer in the same way, though less severely, to the close of her life, or till about April 1869. She constantly kept a piece of soft rag in her mouth, which afforded her some solace. On one occasion, I took the temperature of her mouth, and found it as high as 100.4 deg. F. The membrane of the buccal cavity always presented the same appearance of considerable hyperæmia. At one time, a little eczematoid eruption appeared at the margin of the lips, but it never extended internally. The suffering she endured must have been terrible; she described it as that caused by a burning fire, and declared she was enduring a living death. Her temperament was by no means excitable, and I do not think she exaggerated her griefs in the least. Many remedies were used; but none were of material efficacy, except a nightly opiate to procure sleep. The pathological condition was, I believe, one of neuralgia and hyperæsthesia, blended, as sometimes happens, with vasomotor paralysis, which latter produced the hyperæmia. The neurosis may have been of gouty origin.

3. The *throat* is liable to suffer with such disorder as we are considering, which it is important not to confound with common inflammatory, as the treatment required is materially different. The following case is an illustration. Mrs. N., a young-looking, recently married woman, was seen by me on September 8th. She had been suffering four days with swelling and neuralgia of the right side of the face. Her throat had become sore, so that she had much difficulty in swallowing. On the previous day, she could not get down a piece of sopped bread. There was some nausea and vomiting. The throat appeared normal, but with the laryngoscope I could see that the laryngeal membrane was much congested. Her voice, however, was not altered. She had soreness and tenderness at the sides of the neck, lower down on each side than the tonsils. She expectorated a little reddish mucus. She had some difficulty in getting her breath. Her sleep was disturbed; she woke up restless and feverish. She felt very weak. The urine appeared normal. I advised diligent steaming of the throat, sinapisms to the sides of the neck, fifteen grains of chloral at bedtime, and two grains of iodide of potassium and an ounce of effervescing mixture of citrate of potash three times a day. On the 9th, she slept two hours with the chloral, then woke in great uneasiness, and only dozed the rest of the night. At noon, I found her suffering much. The throat was very sore. She had not been relieved at all by the steaming; swallowing was very painful. She had much pain and tenderness in her neck; more, however, at the sides of the muscular part than in the larynx, which I could handle and move pretty freely. Her throat felt dry. Tongue coated; pulse 93. I ordered twenty grains of muriate of ammonia with ten minims of tincture of belladonna in water every four hours, hot fomentations to the neck, and aconite liniment. She also had immediately fifteen minims of chlorodyne, which gave her two hours' sleep; and at 9 P.M. I found her decidedly better, though she had a good deal of strange pain, hardly describable, on both sides of her head. The dose of chlorodyne was repeated at 10 P.M., and in the course of the night she had fifteen grains of chloral; but she was in high fever and delirium all night long. The room seemed whirling round; she felt as if she must get up and go out—as if she should fly.

She saw numbers of persons in the room, with great heads and little bodies; etc. At 9.30 A.M. on the 10th, when I saw her, her throat was much better; she took some toast. The catamenia had reappeared, which had stopped, after a day of normal continuance, on September 3rd. I ordered a drachm of tincture of cinchona flava four times a day. On the 11th, the throat was much better; she had still dysæsthesiæ about the head, and a large patch of urticarious erythema had appeared about each elbow. On the 12th, she was so well as to call on me and take her leave before setting out for the North. She had sweated copiously the preceding night, had a good deal of eruption on the legs and thighs, but made no complaint of her throat. The attendant neuralgia, the peculiar distress, the nocturnal delirium, the urticaria, and the "juvantia", all go to prove the neurotic character of the disorder, and that it was no common sore-throat, but one where the hyperæsthetic greatly predominated over the inflammatory element. The abrupt cessation of the catamenial flow may have had to do with the supervision of the disorder; but I think the most essential factor was influenza.

4. From the throat we descend to the *stomach*; and among the woes of this much-enduring organ we may well expect to find hyperæsthesia. In fact, this condition, in a greater or less degree, is of very frequent occurrence, and constitutes the chief disorder in those cases to which the term "irritative dyspepsia" is appropriate. In many of these, hyperæmia and catarrh exist also, but as secondary complications, rather than as primary maladies. The hyperæsthesia, I believe, as a paralytic neurosis, is prone to implicate the vaso-motor nerves, and impair the tone of arteries and the retentive power of capillaries. Such disorder may be simple—i.e., dependent on the state of the general nervous system; or it may depend on reflex irritation, as in pregnancy. In some of these states, pain is the more predominant symptom; in others, vomiting; in others, both are present in a marked degree. Andral relates a case where the tongue was natural, and the patient distressed by a very acute hunger; but the lightest food given to her was thrown up by vomiting, or, if it was retained, caused indescribable suffering. The hyperæsthesia was overcome by cold affusion and persevering administration of food. Here the disorder was simple; and such seems to be generally the case, though in some instances, as in the hyperæsthesia of pregnancy, the influence of reflex irritation is evident. Nitrate of silver is a really valuable remedy in cases where pain is distressing; and, as it need only be given for a short time, you run no risk of spoiling your patient's complexion. It may be seconded, however, or replaced, very frequently, by subcutaneous opiates. I have employed them myself with the best effects. Dr. Clifford Allbutt writes strongly in their praise. One of his cases was that of a merchant who regarded himself as a hopeless dyspeptic, dreaded his meals, and especially his nights. He was cured (at least for the time) by one-fifth of a grain of morphia subcutaneously at 3 P.M. and 10½ P.M., followed by rest, during ten days, with one-fourth of a grain at night only for ten days more. I prefer myself to make these injections at the epigastrium, but this is not necessary. When the hyperæsthesia expresses itself in immediate vomiting without severe pain, I have great faith in strychnia, administered in doses of one-twentieth of a grain in not more than half an ounce of water. Let me cite the following instance. A slight-made female, aged 22, married four months, subject to indigestion, and weakened by a miscarriage, was brought to me with severe sickness of ten days' duration, no food having been retained the last three. I gave her, in my room, one-twentieth of a grain of strychnia, and made her lie down. After she had retched a few times ineffectually, she became much better, "did not feel at all sick", and took successively four teaspoonfuls of milk before she left. I saw her again in ten days, when she was greatly better, had only been sick once, and was able to take chicken.

6. That the *tracheal* and *bronchial* mucous surface is liable to hyperæsthesia, cannot be doubted. There are coughs of the most vexatious and obstinate character, which are either unattended with *râles* or expectoration, or where these are out of all proportion insignificant to the severity of the cough. Some of them are of reflex origin, as in Graves's case, where the expulsion of a tænia put an end to a most violent cough, that went on night and day, and resisted all remedies. Some are due to toxic matters in the blood, as is probably the case in pertussis, and in some cases of gout, where, as Graves says, the cough is dry, annoying, and often very obstinate. Some, again, are simple neuroses, as in the case related by Trousseau, of a young lady who was of a hysterical constitution, but was exempt from catamenial irregularity, and from other nerve-disorders, except a continual cough, which proved refractory to all remedies, but yielded immediately to change of air. The treatment which appears to me most rational and satisfactory in pertussis is that recommended by Dr. E. Smith, of producing and maintaining moderate narcosis by means of small doses of morphia;

and this is quite accordant with the view that the paroxysms depend upon a specific toxic hyperæsthesia. There is another form of bronchial hyperæsthesia with which it is very important for you to be acquainted—viz., that which occurs in certain instances of pneumonia, where after a time the respiration becomes inordinately frequent, perhaps 80 in the minute, without any corresponding increase in the pulmonary lesions or lividity of face. In these cases, the hurry of respiration is a mere neurosis, and yields to opium and a due amount of support.

7. The *heart* enjoys no exemption from hyperæsthesia. Cases are not at all rare where there is more or less præcordial uneasiness or pain, with rapid, vivid action of the heart, unduly forcible impulse against the chest-wall, and loud sharp sounds. The radial pulse may be small and weak, contrasting strongly with the apparently forcible efforts of the heart. Such diseases are often seen in young persons, and are sometimes mistaken for instances of cardiac hypertrophy; from which, however, you may easily distinguish them by observing that the dulness-area is not increased, and the apex-beat not lowered nor displaced to the left. Toxic agents, such as tea and tobacco, reflex irritations, as of the gastric mucous surface, and primary failure or disorder of nerve-force, may all be incriminated in different instances as efficient causes. In the latter group, it seems most probable that the nervous filaments distributed to the endocardium are unduly impressible, and, being thus over-stimulated by the moving blood, keep the muscular fibres in a state of rapid action. Anæmia, though a very common cause, is by no means necessarily present. In Da Costa's account of the curious cardiac malady frequent among American soldiers in the late war, he mentions, as symptoms, constantly recurring attacks of palpitation and pain, whose chief seat is near the apex of the heart, and combined very commonly with excessive cutaneous sensibility. In some of his cases, the disorder supervened on fatiguing marches; in others, it occurred after fevers or diarrhoea. He tells us in his recent paper (*American Journal of the American Sciences*, Jan. 1871), that digitalis or digitaline had more influence on the cardiac disorder than any other drug resorted to. Belladonna internally he also found a most efficient agent, particularly valuable in instances of irregular action. Aconite reduced the force of the heart, and lessened the tension of the pulse; it was most suited to cases of commencing hypertrophy. No special commendation is bestowed on other sedatives; and gelsemin, which is reputed to be a cardiac sedative, disappointed him much; for the most part, it had no effect at all. Morphia hypodermically relieved the cardiac pain almost invariably, and so did atropia; but the effect was only temporary. Tonics were often most excellent adjuncts to treatment, but availed little by themselves. Zinc and iron accomplished most. Da Costa's experience has convinced him that there is a real connexion between the functional disorder, cardiac irritability, and the organic one, cardiac hypertrophy; that, in fact, "the one grew out of the other." Dr. Walshe admitted the same connexion several years ago. I cannot refuse to admit the doctrine held by these high authorities; but my own experience would not lead me to rate this cause of hypertrophy highly. I am sure that a weak and irritable heart may simulate very much a condition of hypertrophy, and yet, under suitable treatment, subside into a condition apparently healthy. A belladonna plaster is a remedy that generally does good service, and is to be preferred, I think, in most cases, to the subcutaneous opiate, which, in two cases where I tried it, produced more syncope than was at all agreeable to witness. Dr. Clifford Allbutt, however, assures us that subcutaneous injection of morphia in small doses is very valuable in so-called irritable heart, whether this be due to weakness of the organ or instability of its nerves. The first dose administered in this way should not exceed one-tenth of a grain.

8. A sort of diarrhoea, which I have occasionally met with in elderly persons, seems to me attributable with much probability to hyperæsthesia of the *mucous lining of the rectum*. The *feces* appear natural enough in all respects; but the lower bowel is intolerant of their presence, and, in a fidgety petulant manner, insists on expelling them much more frequently than is at all convenient. Belladonna has appeared to me of some service in this condition of things, and still more, perhaps, cold sponging of the anus directly after defæcation.

9. Nocturnal incontinence of urine is an instance of hyperæsthesia affecting the *bladder*, to which it may be sufficient to allude. Let me, however, add that recently Dr. Barclay has praised syrup of iodide of iron as unfailing in this disorder. Belladonna in gradually increasing doses, you know, is the most approved remedy; but there is no reason why both should not be employed. A tonic will sometimes quell hyperæsthesia better than a sedative. Hyperæsthesia of the *urethral lining* is a marked feature in many cases of spermatorrhoea, and its removal by means of repeated catheterisation is reputed beneficial.

10. Hyperæsthesia of the *testis* is a very distressing neurosis; it reacts very injuriously upon the mind, and has in several instances in-

duced sufferers to insist on the removal of the affected organ, which in three cases was found healthy by Sir A. Cooper. He considers it of centric origin; but it may be of reflex peripheral origin, as in the following case. A. C., aged 23, was admitted Nov. 13th, 1870. He was in good health until five days previously, when he was suddenly taken with pain in the left testis; it was severe, and the testes began to swell. In a day or two the right became painful also. These symptoms were succeeded by pain in the loins and head. The pain now affected him only when he stood up, or when the testes were pressed. There was very little swelling of either testis. He had some tenderness of the hypogastric region, and a good deal of straining at stool. He had no sleep at night. Temperature 103.5 deg.; pulse 80. He had thirst and anorexia. On the 15th, he experienced a kind of tearing sensation at both external abdominal rings, going down into the testes. On the 16th, the temperature was 97.2 deg.; pulse 60, weak. The bowels had not been open since admission. His extremities became very cold the previous night; and he then became very hot and burning, and afterwards perspired profusely. He could not stand without support; the room and everything appeared to turn round with him. His testes were small, soft, very tender when touched, and the pain shot up along the cords. The bowels were now well opened by castor-oil, and afterwards an opium suppository of one grain was introduced. The testes ceased to be painful about four hours after the bowels acted, before he had the suppository. On the 17th, they bore handling well; he was also less giddy, could walk, but not very steadily. He had no pain anywhere. He was now taking tincture of cinchona and carbonate of iron, and by the 23rd was getting quite well. The hyperæsthesia and pain of the testes in this instance were mainly dependent on the irritation caused by fæces in the lower bowel; but the action of this cause was probably much promoted by the existence of influenza enfeebling the nervous system.

11. We should be disposed, *à priori*, to expect that an organ with such extensive and powerful sympathies as the *uterus*, would be prone to suffer from sensory disorder, and such appears to be the case. The affection originally termed "irritable uterus" by Dr. Gooch is regarded by him, Churchill, Mackenzie, Tilt, and Ferguson, as essentially a neurosis. The latter expressly says "the local changes have been the fluctuating, the nervous affection the constant, element". The tenderness is so great and constant that great suffering is experienced if the patient incautiously sit down upon a hard seat, or if coition be attempted. One of the seats of this neuralgic malady is the vagina itself, which is so exquisitely tender as to render intercourse intolerable. Here I think we cannot fail to recognise hyperæsthesia as the essential morbid element—at least if we accept the *dictum* of Dr. Ferguson above cited, confirmed as it is by Churchill's authority, to the effect that in the cases seen by him there was no ground whatever for the supposition of inflammatory action. Associated with hyperæsthesia, there may be, as we have before seen, more or less of hyperæmia and inflammatory congestion; but this is not in any degree the cause of the sensitiveness. Dr. Mackenzie's statement is of practical importance, that this neurosis may be of reflex origin, and dependent on gastro-intestinal irritation. In most cases, however, it seems to be primary, and to result from some cause of nerve-exhaustion, as great fatigue, acting no doubt on a weakly organised nervous system. The *retentissement* of this neurosis on the higher centres seems to be very pernicious; the natural emotions and faculties become miserably perverted, and all nobility of character is lost in absorbing selfishness. Sedatives, locally applied by pessary or enema, subcutaneous injections, and tonics, are our best pharmaceutical remedies; but change of scene and place, and a suitable climate, may be still more important.

12. Hyperæsthesia of the *female breast*, attended with more or less enlargement, is a well known phenomenon. It may suffice for me to have named it, and to cite Mr. Erichsen's authority for its not being unfrequently dependent on uterine irritation.

13. Hyperæsthesia of the *joints* is well known to surgeons since the publication of Sir B. Brodie's work on local hysterical affections, which I advise you all to read. The most constant symptom is morbid sensibility of the joints and adjacent parts, which is associated sometimes with more or less general tumefaction, apparently from a turgid state of the small vessels. I have known a condition of this kind, attended with sanguineous vomiting, yield to carbonate of iron, after an offer of amputation had been (fortunately) declined. I hope none of you will ever make such a *faux pas*.

14. As regards the nerves of special sense, I cannot doubt—taking first the *optic*—that, even putting aside the case of strumous ophthalmia, where it might be contended that the photophobia was dependent on irritation of the filaments of the fifth nerve distributed to the cornea, there is really such a disorder as retinal hyperæsthesia. Mr. Soelberg Wells states that in this affection there is intense photophobia, though

the eye is quite normal. There is often great ciliary neuralgia, the pain extending to the face and corresponding side of the head. One point which he mentions appears to me of especial interest—viz., that the peripheral portion of the retina is anæsthetic, while in the central vision is perfect and hypersensitive. This is very indicative of the true character of the disorder, of its affinity to paralysis. The causes are such as impair the general health or strain the retina; and the correct treatment is to rest and soothe and recreate nerve-power.

The *auditory nerve* also is liable to hyperæsthesia. Sir T. Watson mentions having observed this in a man moribund from cholera. Dr. Russell Reynolds affirms that hysteric girls do sometimes seem to hear through stone-walls. Intolerance of sound is an occasional symptom in the early period of meningitis, and is not unfrequent in nervous headache, and in azoturic sufferers. The only thing common to these various conditions is a lowered degree of vital power.

15. That the *cerebrum*—the great centre where impressions are consummated into perceptions—is liable to pass into a state closely analogous to that of a tertiary centre and sensory nerve when these are hyperæsthetic, seems to me not doubtful. Gooch mentions the case of a deranged lady, whose prominent belief was that her husband was unfaithful to her. The notion, so far from being unreasonable, was, he believes, true, and she had known it for many years without any unnatural disquietude, but now it engrossed all her thoughts: she neglected her ordinary pursuits, took a dislike to her friends, felt no interest about her children, and sat silent and motionless from morning to night. After continuing deranged several months she recovered, although she retained the same opinion. Gooch justly says her insanity consisted not in her ruling idea, but in its overwhelming influence over her feelings and conduct. A modern pathologist would probably express this by saying that her brain had become enfeebled and hyperæsthetic, and was, therefore, intolerant of the idea it had previously endured. The following occurrence is similar. A religious student, who was much harassed by petty scruples and fancies, and well aware of their pernicious effect, observed after a time that he was always more plagued by them while preparing for an examination; i.e., when his cerebral power was most exhausted. The essence of hypochondriasis seems to be a special hyperæsthesia to corporeal impressions emanating *ab interno*. How much the tyranny of these may depend on enfeeblement of the great centres, is shown by P. Frank's account of his own sufferings from the dread of aneurism, induced by mental exertion, and removed by recreation. This is much too large a subject for me to attempt to handle now: all I can do is to commend to your attention the notion of cerebral hyperæsthesia as essential to the due comprehension of many common phenomena.

How far the *seat* of the action giving rise to hyperæsthesia may be purely peripheral, is difficult to say. In the great majority of instances, some nervous centre is probably engaged; but some facts—such as the removal of severe neuralgia for some months after section of the nerve, and the cessation of suffering after amputation of the testis—incline me to believe that the morbid action may have its chief *locus* at the periphery, and that without any apparent structural change in the affected part.

Pathological Change in Hyperæsthesia.—You may be disposed to ask me what this is. I wish I could tell you; but our knowledge of this matter is very scanty. All that we can say is, that it is undoubtedly a condition of imperfect nutrition, inasmuch as it may be generated by deprivation of blood, by injuries to nerves, by miasms in the blood, by remote irritation—in short, by all sorts of things that are injurious. Some particulars under these heads deserve to be mentioned. Hyperæsthesia of the most intense kind is produced sometimes by obstruction of the arteries with fibrinous deposit. Dr. Fuller describes a case where the first symptom was acute pain, associated with such exquisite tenderness of the whole limb that the slightest touch caused intolerable suffering. The hyperæsthesia continued until mortification set in. At the necropsy, all the larger arterial trunks, from the iliacs downwards, were found blocked up by firm light-coloured coagula of long standing. No other cause existed for the hyperæsthesia in this case, except the deprivation of blood. In Dr. Waller's experiments on refrigeration of the ulnar nerve, the ultimate effect produced was anæsthesia in the course of the nerve, but this was preceded by hyperæsthesia. It can scarcely be thought that the latter was, under the circumstances, anything but the first stage of the former; and, therefore, the conclusion seems necessary that it implies not an exaltation, but a deterioration of vital power. Again, there is a case on record where, during the gradual recovery of the brachial plexus from an injury, the skin of the upper part of the arm possessed natural sensibility, another (probably the mid part) was morbidly sensible, while that immediately beyond was quite insensible. Here, again, the conclusion seems inevitable that hyper-

æsthesia implies a damaged state of nerve-tissue, though not so severe as that which exists in anæsthesia. Much other clinical observation is to the same effect; the same morbid alteration of sensibility (cutaneous) is met with in typhus and typhoid fever, in influenza, in rickets, and in epidemic cerebro-spinal meningitis. On the other hand, there is not the least proof that real increase of functional energy renders an organ less tolerant of its natural stimuli: in fact, the evidence tends quite the other way. A vulture's eye, which can discern a carcass at an extraordinary distance, can easily endure the full blaze of tropical daylight, and is evidently altogether in a different condition from the eye of a photophobic invalid. Several similar instances might be cited; and, on the whole, the general truth of the view here taken seems to me established. In a recent lecture on Experimental Physiology in the *Lancet*, February 11th, 1871, Dr. Rutherford has noticed this point without explaining it. He says, "the curious point, is that a nerve whose nutrition is to some extent defective should discharge its energy more readily than one whose nutrition is perfect." In what respect defective nutrition changes the nerve-tissue, I have said we cannot tell; but we may, I think, exclude oedema; for Buhl affirms as the result of his observations of continued fever, that the presence of much fluid in the subarachnoid and ventricular spaces corresponds with stupor or unconsciousness. Patients dying of delirium tremens have commonly wet brains, and they die for the most part in stupor. However, if we adopt, as I am much inclined to do, Dr. McDonnell's theory of nervous action, the detection of some material change may not perhaps be the most important matter. He assumes that the various impressions are propagated by undulations, the wave-length of which varies, so that the same conductor may be able to transmit several impressions. Now, on this view, it might be that undulations of a certain length and rapidity produced normal sensation, those of a less extent gave rise to hyperæsthesia, while a still further reduction of the undulations caused pain, and their total arrest anæsthesia. This may seem the more probable, as there is undoubtedly a close connection between the three just-mentioned morbid states. They often occur together, acknowledge the same causes, and are removed by the same remedies. Another connection of hyperæsthesia is less frequent, but is extremely well marked in rickets, viz., that with vaso-motor paralysis. I use the latter term hypothetically, for the phenomena actually observed are hyperæsthesia of the cutaneous surface and profuse sweating. The latter, however, as I have argued elsewhere, seems to be distinctly traceable to defective contraction of vessels from a parietic state of their nerves; and if this be so, then the connection is as I have stated. Admitting this, it is difficult to see in the hyperæsthesia anything else than a species of paralysis very similar to that which affects the vaso-motor nerves, and which may itself depend on defective molecular movement.

Allied, however, as these morbid states are, there are differences between them, which are important as regards treatment; thus anæsthesia is more connected with prostration, and is more benefited by stimulants than hyperæsthesia is. The latter is sometimes intolerant of these, and yields better to remedies of the sedative class. Thus in a case of pain with anæsthesia, bark, ammonia, and wine suggest themselves; whereas if hyperæsthesia be in the ascendant, bromide of potassium or chloral, or subcutaneous opiates, seem more hopeful remedies. Yet we must not strain this rule, for it admits of numerous exceptions. Neither must we ever omit a careful inquiry into the cause of the hyperæsthesia, for the knowledge of this may be all important. It is idle to go on administering tonics or sedatives if a focus of irritation need to be removed, or if the disorder be dependent upon poisoned blood. Here is much room for the exercise of *real* diagnostic skill, not that which contents itself with affixing a name to a given case of disease.

VACCINATION.—Several persons were summoned on Monday at Dartington. In the cases of the Rev. T. H. Gordon, Messrs. G. S. Gibbs, T. B. Spence, Alexander Wheeler, and James Metcalfe, orders were made to have vaccination performed. The summons against Mr. M. Fooks was adjourned for two months. Mr. Spence refused compliance because three of his children had, he said, died from vaccination.

REQUESTS, DONATIONS, ETC.—Mr. Richard Dixon, of Brighton, has bequeathed £200 to the Hospital for Diseases of the Chest, Victoria Park, £200 to the Asylum for Idiots, and £100 to the Royal Hospital for Incurables, besides legacies to numerous non-medical charities.—Mr. William Lord, of Clapham Road, has bequeathed £200 to the Hospital for Consumption at Brompton, and £200 to the City of London Hospital for Diseases of the Chest.—Mr. William Peckover, of Wisbeach, has given £100 to the Norfolk and Norwich Hospital.—The Queen's Hospital, Birmingham, has received £100 under the will of Mrs. Smart.—Mr. Giuseppe Silvani, of Brighton, jeweller, bequeathed £50 to the Sussex County Hospital, Brighton.—"A. B." has given £100 to the Salisbury Infirmary.

SEWAGE-IRRIGATION CONSIDERED IN CONNECTION WITH PUBLIC HEALTH.*

By WILLIAM HOPE, ESQ., V.C.

It was with great pleasure that I responded to the invitation of my friend, the President of this Section, to read a paper on this branch of the sewage question, as I have no doubt that in the discussion which follows I shall receive much instruction and assistance in the practical carrying out of a reform which, I venture to think, will do more for the public health of this country than almost any other which has yet been suggested; and this I feel no hesitation in saying, because, although a very ardent advocate for sewage-irrigation, I do not of course profess to be in any way its originator; but I should say that I have come here also from a sense of duty, because sewage irrigation, or sewage utilisation, in whatever form, is a problem which not only demands the co-operation of chemists, engineers, and agriculturists, but ought to receive both the assistance and the jealous supervision of those members of the medical profession who more especially devote their attention to questions of hygiene.

I do not propose on this occasion to trouble you with a long dissertation on sewage utilisation by means of irrigation as distinguished from all the other methods which have from time to time been suggested to effect the same end; but I may perhaps be permitted briefly to allude to the other methods suggested, because I feel sure that there are certain fundamental considerations involved, which have only to be mentioned in order that the other systems may be condemned by every student of hygiene.

All other systems of dealing with the sewage question may be classed under two heads. First, there are the suggestions similar to that of an indefatigable and most praiseworthy reverend gentleman, whose name must be familiar to you all—Mr. Moule—who proposes to deal solely with the solid excreta of human beings, together with that small portion of urine which can be simultaneously dealt with. I am aware that there are many persons enthusiastic enough to believe that the average British housemaid, or the average working man's wife, could be trained to carry out a duplicate system of slop-collection with two kinds of slop-pails—the one for the reception of urine *only*, and the other for the reception of dirty water *only*. Possibly when all the various branches of physical science which have been suggested by the different school-boards as *extra* studies shall have become *compulsory*, and shall have been taught for several generations, such subjects as we are about to discuss will be as well understood by Mary the housemaid, and Mrs. Hodge the ploughman's wife, as they are at present by the British Medical Association. But it is obvious that, until Professor Huxley and Mr. Ruskin shall have completed Mary's education and that of Mrs. Hodge, no system for the disposal of sewage ought to receive your sanction which does not make due allowance for the present imperfect intellectual development of the instruments through whose agency the system has to be carried into effect; and even when we, or rather when our great grand-children, shall be blessed with scientific housemaids, I doubt whether the British Medical Association of the future will even then be disposed to sanction any of the systems coming under this first head, because none of them make any attempt to deal with the vast, most noxious, and fever-producing refuse of other kinds coming from human habitations: I mean soapsuds from bedrooms and washhouses, slops from the washing of floors and passages, and kitchen-refuse, including the water in which fish and vegetables are boiled, waste vegetable and animal fibre, grease, etc. It is true that Mr. Moule talks about a small area of land for subterranean irrigation as an adjunct to his system for the disposal of this part of the sewage; but it is perhaps impossible to conceive anything much more thoroughly mischievous and thoroughly unscientific than such a suggestion. A very large area might perhaps lead to no actual mischief, if to no good; but a small area, intersected by porous pipes, through which the stuff has to percolate under pressure, is, looked at physically and chemically, simply a series of small elongated *leaking* cesspools, which would eventually silt up, and by which, until choked up, the subsoil would be kept continuously saturated with unoxidised solutions of animal and vegetable matter, containing all those vibrios, bacteria, and other suspicious organisms which Dr. Bastian believes to originate spontaneously in such a pabulum, which Dr. Crace

* Read before the Public Medicine Section at the Annual Meeting of the British Medical Association in Plymouth, August 1871.