CLINICAL LECTURES

ON

NERVOUS DISEASES.

By A. HUGHES BENNETT, M.D., M.R.C.P.,

Physician to the Hospital for Epilepsy and Paralysis, Regent's Park, and
Assistant-Physician to the Westminster Hospital.

I.

CASE OF COMPLETE ANÆSTHESIA OF THE RIGHT AND PARTIAL ANÆSTHESIA OF THE LEFT SIDE.—EXPERIMENTS ON METALLOSCOPY AND METALLOTHERAPY.—COMMENTARY.

THE report of the following case, which has been for upwards of a year under my observation, is of great interest, first, on account of its rarity—at all events in this country—and of the many very remarkable features connected with it; and, secondly, because it affords illustrations of an extensive series of experiments on metalloscopy and metallothrapy: subjects which, at the present time, are exciting much attention both at home and abroad. The conclusions derived from a careful analysis of this case appear to me to definitely settle the most important and conflicting questions on these doctrines.

Elizabeth Crandell, aged 44, single, a needlewoman, was admitted August 20th, 1877.

Antecedent History.—The patient stated that her family was phthisical; her father, mother, and five sisters and brothers having died of that disease. She herself had been a perfectly robust person all her life till nine years ago. At this time, and without obvious cause, she had general *malaise* for a few days, and, after going to bed one night in her usual health, she found, on rising next morning, that her right arm and leg were numbed and almost powerless. She had no fit of any kind, and her intellect was in no way affected. A few days afterwards, during the night, her face became twisted to the right side. With these symptoms, she remained in bed a week, after which she rapidly recovered, and, in the course of a month, was perfectly restored to health. She remained well for four years, when, very gradually, her right side became numbed and weak, so much so, that after a time, she was obliged to resign her place as a domestic servant. This continued to increase, till, in November 1876, she had a similar attack to that above described. In a month or so, she recovered sufficiently to walk about and to follow the occupation of a needlewoman, but the right side remained feeble. Her sight and hearing also became so defective that she could with difficulty earn her living. Hence her application for relief.

Condition on Admission.—The patient was a healthy-looking woman, with all her functions and organs in a perfectly normal condition, with the exception of the nervous system. She was intelligent and straightforward, and there was no appearance of a nervous or impressionable temperament. She had not had any psychical or physical distress except that resulting from her present illness, for which she could assign no cause. Menstruation was regular; she suffered no pains, headache, globus, indigestion, uterine or ovarian disturbances, or any of the minor symptoms usually associated with a nervous disposition.

Motion.—The right limbs were weak. She walked slowly and unsteadily, and had a tendency to stagger, especially towards the right side. The right foot was lame, and was dragged as she walked; the toes scarcely left the ground, but scraped along the floor, pointing outwards. Thus the foot was advanced with the inner aspect forwards, and a slight rotatory sweep was made with the whole leg. The movements of the right arm were not so active or complete as those of the left. The grasp of the hand was weaker, as indicated by the dynamometer, 10 lbs. of pressure being registered, to 30 lbs. of the other. The muscular sense was completely lost on the right side, and the patient could not tell the difference between an ounce weight and half a pound. The fingers were extremely awkward, and she had the greatest difficulty in buttoning and tying her clothes, in sewing, and in performing any delicate manipulations. When she did not look at her fingers this clumsiness was increased. The mouth was drawn slightly to the right side, which was more apparent when the patient smiled or opened her mouth; but there were no other signs of facial paralysis. The tongue was protruded in the middle line, and there was no disturbance of speech. The rectum and bladder were normal.

Sensibility.—There was almost complete loss of cutaneous sensibility extending over the entire right side, sharply defined from the left by

a vertical line drawn exactly through the centre of the body. If, for example, a pair of compasses, the points of which were an inch apart, were made to touch the head, back, chest, or abdomen, in the middle line, only that point on the left side was felt. No ordinary touch or handling was felt; very hard pressure was indistinctly appreciated. The skin was also almost totally analgesic. A needle passed through any portion of it on the right side was not felt, neither was the strongest pinch or the most powerful current of the faradic battery. Heat could not be distinguished from cold. In short, the skin of the right side was insensible to any stimuli; the most severe being appreciated only as a touch, or an indefinite but not painful sensation. Amyosthenia of the right side was also complete; and every means of stimulating the muscles, such as needles thrust into their substance, pressure against the bones, and electricity, failed to give any evidence of pain. Their electric contractility was, however, normal, as they contracted actively both with the continuous and the induced currents. No reflex phenomena were observed. The right conjunctiva was insensible to the touch, and there also the reflex action on the eyelid was apparently absent. Mr. Laidlaw Purves kindly furnished me with the following report. "Eyes: Amblyopia, but without observable tissue-change or anomaly of refraction to account for it. The power of accommodation is about .75 less than normal; but this cannot be exactly determined, on account of the great amblyopia (D=24). In the right eye, there is a small white atrophic spot external to the optic disc. In the left, there is a pigment-patch on the retinal side of a small artery, resembling the patches seen in retinitis pigmentata, also external to the disc." Achromatopsia existed to a considerable extent. A number of coloured papers were shown the patient; but she could not name any of them with the right eye, but said they all looked of a dirty white or grey colour. With the left eye, she readily told all the colours. The right external ear was completely anæsthetic and analgesic. Mr. Laidlaw Purves reported: "Ears: Affection of the right acoustic nerve, causing loss of sensation for both high and low notes, with slight secondary affection of the conducting apparatus." The mucous membrane of the right nostril was insensible to the touch, and to the strongest snuff, ammonia, and other stimulants. In the same way, the interior of the mouth, tongue, and fauces were affected. If the pharynx were tickled with a feather on the right side, no reflex phenomena took place; but, if the other side were touched, the usual spasm ensued. Taste was abolished on the right side, as tested by a variety of sapid and other substances; as well as ordinary sensation of the whole of the right side of the mouth. Over the whole of the left side of the body, the sensibility was slightly but markedly diminished. Touch or pain was felt, but not so acutely as in an average healthy person, two points being detected by the æsthesiometer at two-and-a-half inches. The sight, hearing, and taste were all also somewhat impaired on this side. There was a general feeling of numbness and tingling over the whole body, but much more marked on the right side. As before stated, the general health of the patient was excellent, her digestion and other functions being normal. The temperature under the tongue being 99.4 deg., that of the skin, as ascertained by Dr. Dupré's surface-thermometer, varied in different places, but the anæsthetic portions were from one to three degrees lower than those of the opposite and nearly normal situations. The effects of pricking and even incising the skin showed that its vascularity was diminished, the hæmorrhage being slight over the body, but less marked on the right side. Inhalation of nitrate of amyl flushed the face very slightly, and apparently equally on both sides.

Treatment and Progress of the Case.—From August 1877 till April 1878, the patient was treated with tonics, and her skin and muscles were repeatedly faradised, but without any amelioration of her condition. On the contrary, the paresis and anæsthesia became more marked. About this time, the observations on metallothrapy by M. Charcot appeared in the *Lancet*, and it was determined to repeat his experiments in this case. Accordingly, discs of various metals were constructed, an inch in diameter and an eighth of an inch in thickness. The general rule adopted in all the following observations was, before commencing the *séance*, to carefully blindfold the patient, and to take every precaution to say or do nothing in her presence or hearing which might give her the slightest clue as to what was going on around, and leading questions and suggestive ideas were studiously avoided. In short, all possible means were adopted to avoid deception, either on the part of the patient or the experimenter. A pair of iron discs was then tied on the anterior aspect of the right forearm (which was completely anæsthetic), and the results carefully watched and tested, but in an hour no effect whatever had taken place. On subsequent days, the same experiments were made in turn with gold, silver, copper, lead, zinc, brass, and tin, and all without effect. These observations were repeated, and the metals applied in different combinations; but none of these were followed by any results. On April 13th, I invited

several medical men to a demonstration of these negative phenomena. To begin, the right arm being as before completely anæsthetic, gold was applied for half an hour, and, as usual, there was no effect. Then zinc was tested, and in twenty minutes the patient stated she felt a pricking sensation in the hand and elbow; and, on investigation, to our astonishment, there was found by those present to be most marked return of sensibility over the skin of the whole limb. A firm touch was felt, so also was the prick of a needle and a moderate pinch. In ten minutes, the sensibility had so increased that the condition of the arm in that respect was almost normal, the slightest touch or prick being acutely felt. This condition was now found to have extended over the entire body, and practically the sensibility of the skin was everywhere natural. Indeed, on the left side, there was hyperæsthesia, and this more marked on the upper arm, where the slightest touch or prick caused the patient to cry out. The two points of the æsthesiometer could be felt at two inches and a half on the right and at two inches on the left arm. Locomotion was not improved, nor were sight, hearing, and taste altered. The grasp of the right hand was increased from 10 lbs. to 40 lbs. and of the left from 30 lbs. to 35 lbs. The temperature of the right side being previously 90.2 deg., and the left 91.8 deg., were respectively raised to 93 deg. and 94 deg. (the temperature under the tongue being 99.2 deg.) On pricking the skin, drops of blood followed the punctures, and on both sides equally, but not to any great extent. Fifteen minutes later, all these conditions remained, but scarcely so well-marked as before. Next morning, her original anæsthetic state had returned. This experiment was repeated on six or eight subsequent occasions, in the presence of various medical witnesses, with identically the same results. It was, however, observed that, as these experiments were constantly repeated, the right side never became so completely anæsthetic or analgesic as before, and that the reverse occurred on the left side, which had now become markedly less sensitive than formerly. This daily treatment had, therefore, the result of effecting a change in the sensibility, not only at the time of experiment, but in her condition during the intervals: namely, the sensibility of the right side gradually increased and that of the left diminished, so that, on April 23rd, it was found that the permanent condition of the two sides was almost exactly equal. Their position may be explained by saying that the sensibility to pain, touch, etc., in both were between total absence and normal acuteness. This condition remained a few days, and the treatment was discontinued; but, without apparent cause, the sensibility was found to fluctuate, the right side sometimes being more anæsthetic than the left and *vice versa*. On investigation, it was found that the patient could name all colours correctly with both eyes. The various metals—iron, copper, tin, etc.—which had previously failed to produce any effects, were now in turn all applied to the skin of different parts of the body, and all and each of them were now followed by precisely the same phenomena as those already described as occurring after zinc. It was then observed that the metallic applications no longer affected the whole body, but only the limb to which they were applied. On April 30th, Mr. William Murrell kindly assisted me in the following observation. We ascertained first that the right arm was that day almost totally anæsthetic, the usual painful stimuli being scarcely appreciated. Two discs of wood were tied on the forearm; in half an hour the sensibility of the skin was normal, and the rise of temperature, increase of grasp of the hand, and all the other phenomena following the application of metals were observed—the slightest touch, prick, or pinch being acutely felt. Four hours subsequently, this condition still continued. These wooden applications were made on several occasions with similar results. Finally, the patient was made to wear these wooden discs for twenty-four hours; after which the whole of the right arm, from the shoulder downwards, was found to be perfectly normal as regards sensibility, and has remained so ever since. On May 5th, the right arm remained in practically a normal condition. The slightest touch, pinch, and prick were readily felt; the points of the æsthesiometer could be detected on the forearm at two inches. The grasp of the hand, as determined by the dynamometer, was 40 lbs., and the temperature of the skin was 90.8 deg. (that under the tongue being 99.2 deg.) The left arm was now anæsthetic to a considerable extent, but not completely so. Two points of the æsthesiometer were detected at three inches and a half; the hand's grasp is 31 lbs., and the temperature 89.2 deg. Two wooden discs were applied, and in forty minutes the patient stated that she felt tingling and pricking over the limb. Sensibility to touch and pain had become normal, and 35 lbs. were measured by the dynamometer. The temperature of the skin had risen to 92 deg., and she could detect two points with the æsthesiometer at two inches. The right arm remained, as before, normal. On May 9th, both arms continued of healthy sensibility from the shoulders downwards. With this exception, the right side of the body was anæsthetic, as before. For example, at the back of the neck, the demarcation was sharply

marked in the middle line. On the right side of this, was anæsthesia; on the left side, sensation was apparently normal; and the temperature, taken at points two inches apart, was in the former 95.1 deg., and in the latter 96.1 deg. On August 10th, the calf of the right leg being anæsthetic, discs of iron were applied, and in half an hour the sensibility of the limb had slightly increased, and the other leg had become more anæsthetic than before, so that both legs were now about equal in that respect. Upon another occasion, the left leg being sensitive, wooden discs applied produced complete anæsthesia of both. A variety of different metals were from time to time applied to anæsthetic portions of skin; sometimes a return of sensibility followed and sometimes not. The agent which effected this one day would not another. Latterly, the results of external applications became very irregular; the patient became tired of the constant pricking and pinching, which, she said, did her no good, and frequently no manner of treatment effected any change. She was sent for a month to Brighton, and returned, she said, feeling her general health much impaired. Her condition as to sensibility was much the same as on her original admission, only the right arm from the shoulder downwards remained normally sensitive. The left side, which formerly was only slightly anæsthetic, was now greatly so, and, although not quite so complete as the right, is very nearly so. A variety of further experiments were conducted with many metals and other substances, and all the above phenomena were again and again confirmed.

Commentary.—1. What is the pathological diagnosis? Is this a case of organic central disease, or is it a so-called functional lesion? In favour of the former theory are the absence of all nervous and hysterical symptoms, and the illness commencing with an attack which, although somewhat indefinite in character, was followed by hemiplegia and partial paresis of the face. In support of the latter are the nature and extent of the anæsthetic condition, the variable and changeable nature of the symptoms especially under treatment, the complete possession of the intellectual faculties, the want of muscular wasting, and the absence of other symptoms usually associated with destructive lesions of the brain. The present state of our knowledge of the functions of the nervous system does not enable us to say what is the exact nature, extent, and position of the primary lesion in such a case as this. It is true that MM. Türck, Charcot, and others, have published cases of hemianæsthesia in which they found disease of the posterior third of the internal capsule. If a destructive lesion in this situation be maintained to be the source of all the symptoms, there remains to be satisfactorily explained many features of the case before us, and more especially the rapid and complete changes induced by expectant attention. Although doubtless the anæsthesia is due to central changes, its peripheral origin would also seem to be indicated by the fact, that all forms of stimuli applied to the extremities of the sensory nerves failed to induce any evidence of reflex action, whereas the voluntary and the electric contractility of the muscles were not totally suspended.

2. Anæsthesia of the skin is associated with a pale, cold, and bloodless condition of the surface. The temperature is one, two, or even three degrees lower than that of normally sensitive integument. Punctures with a needle, or even the small incisions of a bistoury, bleed scantily. This indicates alterations in the calibre of the blood vessels, and a diminished flow of blood to the anæsthetic parts. The sympathetic ganglia are therefore apparently influenced by some unknown irritation, which through the vasomotor nerves contracts the capillaries; and as a result of inactive circulation, thus produced, there is imperfect nutrition and consequently perverted function in the form of anæsthesia. That there is a close relation between the vascularity of a part and its sensibility is made evident by the fact that anæsthetic skin being restored to sensibility the temperature rises and the part becomes more vascular, as indicated by increased redness, heat, and hæmorrhage on puncture. It is, however, to be observed, that the prick of a needle is not by itself to be depended on in testing the amount of blood in the skin; and relying on this alone may be a source of fallacy. If a needle be deliberately thrust through healthy integument, as a rule no blood follows, and the existence and amount of hæmorrhage will entirely depend on the nature of the wound inflicted. This is shown by lightly touching the skin with the point of a sharp instrument, when small spots of blood make their appearance.

3. By means of the dynamometer, we find that the grasp of the hand is much impaired in anæsthesia of the skin and muscles. This does not prove that the muscular force is diminished; for when the integument is normally sensitive, the instrument is nicely adapted in the hand and can be accurately placed so as to exert the full force of the muscles; but when there is anæsthesia, the patient is unable to adjust the dynamometer, and he is therefore incapable of properly applying and utilising his existing strength, and hence the amount of pressure marked is limited. That the disordered movements are due to want

of co-ordination of muscular force, and not entirely to loss of power, is further evidenced by the fact, that if the patient use the dynamometer without looking, the pressure indicated is much less than if he be permitted to follow the operation with his eyes. In the same way, on walking, if the patient pay attention to his gait and watch his feet, he progresses fairly well; but let his attention be taken away, let the light be shut off, or let him close his eyes, and at once the inco-ordination becomes apparent. The muscular sense is in anæsthesia also impaired or destroyed, the patient being unable to tell the position of his limbs or to appreciate the distinction of different weights.

4. Although certain forms of anæsthesia are permanent, there are others which are characterised by extreme instability and changeableness. It is common to meet with nervous women who complain of numbness and total or partial insensibility of a part, accompanied with pallor and coldness of the skin, coming on at intervals. After remaining for variable periods, this state disappears, leaving the skin in its normal condition. Frequently, no obvious cause can be found for such sudden and well marked changes; at others, impaired general health, emotional disturbances, such as fright, grief, and other psychical derangements, may be assigned as predisposing or exciting causes. The mere direction of the attention to a part, or a suggestive idea, may totally alter the sensibility of the whole or any portion of the body in nervous subjects. Without instancing the witches and martyrs of old, the religious and other epidemics of past and present times, this cannot be better illustrated than by mesmerism, where in certain nervous constitutions the mind may be so impressed by suggestions from another, and the attention so forcibly directed to a part, that almost any change of increase, diminution, or perversion of sensibility may take place in apparently healthy persons. I have frequently observed that patients being asked if any portion of their skin were numb, and a negative answer obtained, which was found to be correct, that, on a subsequent occasion, they declared that there was a loss of sensibility, which was ascertained to be the case. The idea suggested by the question of the physician makes an impression on the mind, this influences the centres and through them the local nervous system, the circulation is modified, and anæsthesia induced. Thus an objective symptom is produced by a subjective impression. I have myself had recently under my care a girl whose leg I could render completely anæsthetic at will by simply tying a handkerchief round it, she believing that some application was being made for a definite purpose. Cases are too numerous to require detailing, where anæsthesia has been removed by almost as simple a process.

5. After the foregoing remarks, the result of metallic treatment in this case need scarcely be commented on. That these results were genuine I and those who witnessed them can testify, and that they were not due to any specific effects of the metallic treatment is apparent. The sequence of events is briefly as follows. A woman with anæsthesia is blindfolded and so conditioned that she has no clue to the treatment to which she is subjected. Different metals are applied in turn to the skin without the slightest effect. Her mind having been gradually directed to the parts on a certain occasion when, a number of persons being present, she doubtless overheard remarks about her case and what might possibly occur, discs are applied and sensibility is restored. This excites astonishment and interest, and the phenomena subsequently always recur, no matter what substance is applied, whether it be metal, wood, bone, or even simply a handkerchief. After a prolonged series of trials, no permanent benefit resulting, the patient becomes tired of the constant pinching, pricking, and electricity, which are painful, and then the phenomena become irregular and uncertain, and applications which were at first effective were afterwards followed by negative results. This seems to me to establish the fact that all these phenomena are due, not to any special virtues, electrical or otherwise, derived from the metals, as then their effects would be constant, but rather to the influence which the mind exerts over the body. I have conducted, in this and other cases, a large series of experiments, which a desire to be brief forbids my describing in detail, all tending to the same conclusion, and further reflections on which have been published elsewhere. (*Brain: a Journal of Neurology*, October 1878.) That such a theory is not impossible or improbable there is abundant evidence in the history of medicine to show. It is doubtless a remarkable fact, and of influence of explanation, that the influence of the mind should not only restore sensibility, but should also augment the muscular power and increase the vascularity and temperature. But it has been already pointed out that these last are a natural accompaniment of altered sensibility, and may be accounted for by the well known influence of the imagination over the vaso-motor system. The recent researches of Charcot and others have shown that these and other still more astounding effects are produced by magnets, solenoids, and homœopathic doses of galvanism, and a demonstration of these has

lately been most graphically described by Professor Gamgee. (BRITISH MEDICAL JOURNAL, October 12th, 1878.) These observations would lead us to infer, although they do not profess to explain why, that there is some direct and special relation between the cause and the effect. The case before us seems to me alone to completely upset this doctrine, as has already been insisted on in a most excellent critical discussion on this question by my friend and colleague Dr. Horatio Donkin. (BRITISH MEDICAL JOURNAL, October 28th, 1878.) In a thesis recently published (*Comparaison des Effets de divers Traitements dans l'Hystérie*, Paris, 1878), Dr. Oscar Jennings comes to similar conclusions with myself. There are always those who, either from an involuntary bias of mind, or from a natural credulity in what appears marvellous, seem to think that what is difficult of explanation must of necessity be true. Thus does the spiritualist and electro-biologist pledge his faith to what his reason cannot comprehend, and what he perhaps honestly believes to be genuine. As well might one credit the reality of the trick of a conjuror because it baffled all our efforts to appreciate the steps by which he deceives us. In all these hypotheses, the more we eliminate sources of error, the more that unprejudiced observers investigate the subject, and the more that stringent tests are applied, the more easy and simple do we find these "inexplicable" phenomena become. It may be that metalotherapy, the most recent doctrine which has fluttered the psychological world, will be before long, like all its predecessors, doomed to an early grave, to be resuscitated in the future in some other novel and more attractive form.

CASE OF POLYPUS OF THE OESOPHAGUS SUCCESSFULLY REMOVED.

By THOMAS ANNANDALE, F.R.S.E.,

Professor of Clinical Surgery in the University of Edinburgh.

IN February last, I was asked by Professor MacLagan to see with him the Rev. Mr. C., who was seventy-six years of age. The history of our patient was that, about five years before our visit, he noticed for the first time, during a fit of coughing, "a lump come out of his throat on to his tongue". When the coughing ceased, the tumour disappeared; but, after this, the growth constantly protruded from the throat whenever he coughed or was sick, so that he became quite accustomed to its appearance. The tumour never caused him any inconvenience, except by its protrusion; and, when it did not pass back into the throat spontaneously, he could easily return it by pushing it down with his fingers. During the last year, the protrusion was not so frequent; but the tumour had increased in size and length, and, when it did protrude, it could be drawn out through the mouth and examined. There was no interference with swallowing or with respiration.

Before visiting our patient, it was arranged that I should bring with me the necessary instruments, in case the removal of the tumour was decided upon; but a difficulty was encountered at the very commencement of our meeting, for the tumour declined to protrude, notwithstanding the administration of a strong emetic by my colleague in the case. A second dose of the emetic succeeded, and the growth showed itself, and was at once seized and drawn out of the mouth. When examined, it was found to be a fibrous polypus, measuring four inches in length and about one and a half in breadth, gradually tapering to its peduncle, which was fully two inches in length and about the thickness of an ordinary lead-pencil. On passing the finger along the peduncle, it was felt to be attached to the left side of the oesophageal tube, at a point immediately below the commencement of the canal. The tumour having been drawn out of the mouth to its full extent, and a gag inserted to keep the jaws separated, I passed round the peduncle the chain of an *érasur*, and slowly divided it, as low down as possible. The peduncle was divided in this way about an inch from its attachment to the oesophageal wall, so that the whole length of the tumour removed was five inches.

The structure of the growth was fibrous, resembling in appearance that of the dense fibrous polypus which grows in connection with the nasal cavities and base of the skull. Its external surface was covered by mucous membrane. There was a slight oozing of blood from the stump of the peduncle for a few hours after the operation; but this soon ceased, and the patient suffered no further inconvenience, and was able to return home in a fortnight.

REMARKS.—Cases of polypus growing in this situation are rare, and therefore I have considered a note of my case worthy of record. The fact that the growth gave rise to no inconvenience, notwithstanding its size, is an interesting feature in the case. The operation was of the simplest nature, and requires no special reference.