diagnostic value of these reactions is derived from certain changes produced in their amount, order, and character, by different forms of motor paralysis. For the purposes of electro-diagnosis, paralyzes may be divided into two primary divisions: 1. The electrical reactions are unaltered; 2. The electrical reactions deviate from the normal. The last division is subdivided into: (a) cases where electro-irritability undergoes simple increase; (b) cases where electro-irritability undergoes simple decrease; (c) cases where qualitative, as well as quantitative, changes occur.

1. Paralyzes in which *electro-irritability is unaltered*. Cerebral: from apoplexy, embolism, or tumours. Spinal: from chronic myelitis. Peripheral: rheumatic, slight facial, and slight traumatic paralysis.

2. (a) Where there is *simple increase of electro-irritability*. (This deviation is of rare occurrence.) In the early stage of hemiplegia, in locomotor ataxy, and in the early stage of some peripheral paralyzes, *ex. gr.*, facial paralysis.

(b) Where there is *simple diminution of electro-irritability* (more frequent than the last). In bulbar paralysis (rare); in spinal paralysis, accompanied with muscular atrophy; in progressive muscular atrophy.

(c) Where there are *qualitative, as well as quantitative, alterations in electro-irritability*, called by Erb "the reaction of degeneration". This deviation is characterised by quantitative changes in the electro-irritability of nerves, and in the farado-irritability of muscles; and by both quantitative and qualitative changes in the volto-irritability of muscles. The following is an epitome of the changes produced by an acute attack of average intensity. About the third day after the onset of the paralysis, there is diminution in the electro-irritability (faradic and voltaic) of the nerve; about the twelfth day, it is entirely lost. In cases of recovery, nerve electro-irritability gradually returns. The farado-irritability of muscles also diminishes, and eventually disappears. The volto-irritability of muscles falls during the first week; but, in the second week, it undergoes a remarkable increase and qualitative change. The feeblest current, slowly interrupted, produces a sluggish contraction, differing from the rapid movement of healthy muscle; a state of muscular tonus, more or less marked, persists as long as the current flows; rapid interruptions, even with a powerful current, fail to produce any muscular reaction. The anodal closure contraction equals, and occasionally exceeds, cathodal closure contraction; and cathodal opening contraction tends to equal, or surpass, anodal opening contraction. After a variable period, the opening contractions disappear, and the volto-muscular irritability diminishes (in cases of non-recovery) progressively to extinction. The inverted order of the reactions persists to the end; the last contraction is that caused by anodal closure. In cases of recovery, when a certain stage of diminished irritability is reached, regeneration sets in, and is followed by a rise of volto-irritability towards the normal. The improvement in muscular volto-irritability, and the restoration of the other normal faradic and voltaic reactions, do not take place until after the return of motility. These changes in electrical reaction are due to degeneration of the intramuscular nerve-fibres, and to certain histological changes undergone by the minute muscular structures. The stage of degeneration may be deduced from the degree of abnormal reaction present; when the reactions tend to resume their normal order and character, regeneration has commenced. The following paralyzes are attended by the reaction of degeneration: severe traumatic paralyzes; paralyzes produced by pressure on a nerve, sufficiently severe as seriously to interfere with the performance of its functions; acute polio-myelitis anterior (infantile paralysis); hæmatomyelia; medullary paralysis; progressive muscular atrophy; and saturnine paralysis.

For the practice of ordinary electro-diagnosis, the disk electrodes, supplied with medical batteries, suffice; much more delicate reactions, however, may be obtained by the use of small olivary electrodes furnished with current-interruptors, by which the circuit can be closed and opened without changing the position of the electrodes. A pedal interruptor is a convenient accessory for producing slow interruptions with the induction apparatus. The following conditions are to be observed. The patient should be placed in a well diffused light; the limbs under observation should be arranged symmetrically, in an unconstrained position; and the patient should allow the muscles to be perfectly passive. If the paralysis be unilateral, care should be taken to apply the current equally to the two sides, both as regards strength and localisation.

As an illustration of the method employed in the practice of electro-diagnosis in its simplest form, take a case of infantile paralysis of one limb—say, the arm—a few weeks after the subsidence of the acute stage. Place a flat disk electrode, connected with one battery terminal, on the cervical spine, and fix it there. To the other battery terminal, by means of a double or branched conducting cord, attach two small electrodes, with current-interruptors; and, having selected a muscle, place

the electrodes on corresponding points on the two arms. See that the electrode covers are well moistened with water, acidulated with a few drops of acetic acid; and, if the skin be very dry, pass over the arms and neck a sponge squeezed out of hot water. Let an induced current first be used. Complete the circuit with the interruptor on the sound arm, and gradually increase the current-strength until a well-marked contraction is produced; now, try the effect on the paralysed limb: there is no response. If the current-strength be increased to the highest bearable limit, and the interruptions be made to succeed each other very slowly, still there is no manifestation of faradic irritability. Change the induced for the constant current; commence with the paralysed limb; and, by means of the battery commutator, make the electrodes applied to the arms alternately positive and negative; add cell after cell, opening and closing the circuit, with the interruptor, several times after each addition to the current-strength, until a slight muscular contraction is seen; this is first produced, probably, by closing the circuit with the anode, though in many cases it is not easy to decide the priority of A. C. C. over C. C. C. If the same current-strength be now applied to the healthy limb, no reaction is perceived. As previously stated, the volto-irritability of the paralysed muscles is exalted at this stage; a much weaker current suffices to evoke contractions in them than is required in the case of healthy muscles. If the current-strength be increased until the opening contractions are produced in the paralysed limb, it will be found that C. O. C. is coetaneous with, if it do not precede, A. O. C. A medium current, producing, with slow interruptions, well-marked contractions of the affected muscles, with rapidly succeeding interruptions, fails to produce any muscular reaction. When the paralysis is paraplegic, there is obviously no opportunity of comparing the diseased muscles with the corresponding muscles of the opposite limb; in such cases, experience is the only guide. The operator must, therefore, draw upon his memory for the requisite data wherewith to make comparison.

In cases of partial motor paralysis, especially when restricted to isolated muscles, a more minute investigation is required. The localisation of the electrodes must absolutely correspond on the healthy and on the diseased limbs; more than one examination will probably be necessary for the formation of a reliable opinion.

CÆSAREAN SECTION.

By ARTHUR PERIGAL, M.D., Barnet.

A. S., aged 20, unmarried, fell in labour with her first child at 9 A.M. on February 9th, 1879, at the union hospital. I saw her at 11 A.M., and found pains at long intervals, and weak; the head was very high up, the pelvis much contracted antero-posteriorly, and the sacral prominence markedly developed. Her general state was comfortable. At 10 P.M., I was called to her; the pains were then strong, but not frequent; the head had descended slightly; the cranial bones felt very hard. There was no bleeding. As no advance was made during the next hour, I applied the long forceps, thinking thus to overcome the obstacle; they were adjusted with difficulty, traction was used for an hour and a half, but no advance made. I now introduced my hand to endeavour to turn (which I should have done at first had the membranes not been so long broken), but the sacral prominence so jammed my hand, that I could not get my wrist past it; and, although I got hold of a foot, I was obliged to desist. I then asked Dr. Livingston (whose case originally it was) to help me. He, too, tried the forceps, then turning, but failed. We now evacuated the head, and applied the forceps and hook, but to no avail. The patient being a good deal exhausted, we gave a full opiate, and left her at 6 A.M. in charge of a qualified assistant.

At 11 A.M., we met in consultation with Mr. Carter, who suggested a final trial. The parts were hot and painful, the discharge offensive. She had slept; there was no delirium; pulse 120, weak. She had taken plenty of beef-tea and milk. After a fair trial, all hope of delivering *per vias naturales* was abandoned, and we decided on hysterotomy as giving the only, but slight, chance of saving her life.

The patient having been put under chloroform, and the bladder emptied, Dr. Livingston sponged the abdomen with carbolic acid water, and made an incision from the umbilicus of five inches and a half, cutting through the abdominal walls, and dividing the peritoneum on a director. The mesentery being gently pushed aside, and some dark serous fluid sponged away, the uterus was divided for about four inches and a half, and the child exposed. The child, which was very large, was easily removed; the placenta, though slightly adherent to the left wall, coming with it. I may add that its position was noted before the operation. The uterus at once contracted, no blood escaping into the abdominal cavity. Some fluid was sponged therefrom

the wounded peritoneum and abdominal walls were accurately closed with wire sutures; a drainage-tube was inserted at the lower angle of the wound; carbolie gauze-dressings were applied; and a binder completed the operation. The vagina was washed out with carbolised water, and a tube fixed in the uterine cavity. The hands of the operator and those assisting, as well as the instruments used, were all washed in carbolie water. A full opiate with ergot was given. At 4 P.M., the pulse was 130, regular; no vomiting. She rallied during the evening, and passed a fairly good night, taking fluid nourishment; but tympanites and prostration came on towards the afternoon of the second day, after the administration, contrary to all orders, of solid food by the nurse at the patient's urgent request; and, although there was no vomiting nor complaint of pain, she gradually sank and died comatose on the morning of the 12th, thirty-nine hours after the operation.

Necropsy, thirty hours after death. The body was fat. The left leg was two inches shorter than the right. On opening the wound, there were no signs of inflammation; the edges were in close approximation, and showed signs of healing. About half a pint of serous fluid was found in the cavity of the abdomen, having no foetid odour. The uterine wound was closely approximated, and the body well contracted; it contained a clot of the size of a small apple, quite free from fœtor. There were one or two small lacerations on the cervix. On removal of the pelvic viscera, the malformation became very apparent. The right ilium was higher than the left; the bodies of the third and fourth lumbar vertebrae projected forwards to a remarkable degree, the intervertebral substance being three quarters of an inch thick, and the whole line of the true pelvis very irregular. The distance from the promontory of the sacrum to the pubes was two inches and a quarter; the transverse diameter hardly four inches, the right oblique being four inches and a quarter, and the left oblique half an inch less. At page 25 of Churchill's *Midwifery*, fifth edition, fig. 13 represents very much what we met with.

This case illustrates, if the operation is to be successful, it should be performed early. We certainly should have operated earlier, were it not for one of the Poor-law orders, which provides that, in all major operations, there must be a consultation with an independent medical man.

ON THE INDIA-RUBBER DRAINAGE-ANCHORS, FOR THE TREATMENT OF ABSCESS.

By RICHARD DAVY, M.B., F.R.C.S.,
Surgeon to the Westminster Hospital.

IN surgery, as well as in agricultural improvements, no principle is more thoroughly admitted than that of good drainage, for the reformation of boggy areas; any improvement, therefore, in the neatness and facility of practically carrying out such a principle is worthy of the attention of practitioners. At page 3 of *New Inventions*, 1872, I have illustrated some retentive drainage-wires and a hastate knife, for the treatment of abscesses; the drainage-anchors that are now under consideration are but modified drainage-wires. Experience proves that the projecting wire causes some inconvenience to patients, by reason of its non-flexibility, and by its catching in the dress, or causing pain on inadvertent motion. All the benefits of the wire, and none of its inconveniences, are secured by the use of India-rubber anchors.

The diagrams show well the India-rubber anchor expanded, and the wings depressed by the sides of the silver introducing cylinder. The whole appliances may be bought at Messrs. Wright and Co.'s, 108, New Bond Street, W.

Any abscess-sac may be laid open by the hastate knife, and the anchor immediately introduced inside the silver cannula; directly the wings reach the sac they expand, and the cannula withdraws itself from the India-rubber shank; leaving the anchor dropped, removable or not, at the surgeon's discretion. The wings must be clipped proportionately to the size of the abscess-sac.

The pliability of the rubber shank gives no trouble; the pus drains

by its side freely; I am sure that in my own practice no mishap has ever occurred through its use. I have seen many hundreds of these anchors in abscess-cavities—in the face, neck, and other exposed quarters; the cicatrix that results is almost unnoticeable.*

Repeatedly have these anchors lain at rest, acting as drainage agents, for one, ten, to twenty-one days; a quick pull of the surgeon's hand on the shank, with a finger on either side of the wound, as counter-resistants, will weigh the anchor, and allow the wound to readily close.

ON THE USE OF IODOFORM IN THE TREATMENT OF DISEASES OF THE SKIN, AND OF CROTON- OIL FOR PORRIGO DECALVANS.

By W. FRAZER, F.R.C.S.I., M.R.I.A., Dublin.

THE favourable results obtainable from using iodoform, as an external application in the treatment of cutaneous diseases, attended with excessive secretions, are so decided, that I feel convinced it will soon come into general use. It has been employed by me extensively, in private practice, for upwards of a year; and I am assured, by continued observation, of its safety, and the great advantages resulting from its action. It may be easily applied in ointment of any desired strength, mixed with either lard or vaseline; and it appears impossible to claim for either a decided preference. The strength of the ointment made use of has ranged usually from ten to thirty grains of iodoform to the ounce of cerate, but double this quantity can be applied. It has proved a most useful remedy in healing local eczematous eruptions, occurring in strumous children and young people, and in cases of impetigo; and I have also treated with it several unhealthy ulcers with fair success. The strong peculiar odour of the iodoform is seldom objected to, by some even liked; and in only one instance, that of a young lad attending school, was any obvious dislike shown to its continued application. He said he did not wish to use it during school-hours, on account of playing with his schoolfellows, who remarked the strong scent; but he admitted it was healing his eruption, and was quite willing to continue it if permitted to apply the remedy when at home in the evening.

I feel also desirous of directing special attention to the properties it possesses of promoting the cure of that very troublesome affection, porrigo decalvans. The best results that I have, as yet, obtained in this disease, have followed the application of vesicating collodion over the affected spot, and for a short distance around it. Previous to this it is well to epilate all diseased hairs over the spot; and, when the blister is healing, the ointment of iodoform should be applied night and morning, or oftener; and, by this treatment, the hair soon reappears in a healthy condition. A few weeks since, a case came under my charge, where croton-oil had been applied with exceptionally disastrous results, and which may serve as a caution against its use. The little sufferer, a strumous child of about six years of age, had some diluted croton-oil rubbed into the spots of porrigo scattered over her head; it produced violent local irritation, which extended over the entire scalp and the face, where confluent patches of exudation formed, and much of the back of the neck was also affected, the glands of the neck becoming swollen. The entire body and limbs became of a deep red colour, like scarlatina or erysipelas, and studding this were numerous suppurating points. This affection may have originated through the child applying its hands to the scalp saturated with the croton-oil, and then transferring the irritant to the rest of the body; but I am inclined to think this would only explain some of the results, and that there was an outbreak of cutaneous rash, like what we see in acute eczema. At all events, the condition was one of extreme misery; and the poor sufferer was equally distressed in mind, declaring she would go "mad" with the constant burning pain, tingling, and irritation. I applied vaseline over all the body, as in a case of extensive burn; and, after a fortnight, the attack subsided, the cuticle desquamating. The ointment of iodoform was then used for the eruption of porrigo, which, it may be stated, was still increased and extending, dispersed through the hair in scattered patches; the result, after a time, was all that could be desired. It is needless to describe the constitutional treatment which was employed at the same time. It is well to be cautious in applying croton-oil, unless with great care and discrimination; some skins possess an exceptional degree of sensibility to the action of this irritant, which is quite capable not only of affecting the special parts to which it is applied, but, in such individuals, of originating an acute dermatitis over the entire body, as it did in this girl.

* In the wards of the Westminster Hospital at present is a case of submaxillary abscesses; two anchors are introduced, within two and a half inches of each other, for the perfect drainage of two distinct sacs.