Six months after he had commenced this mode of living, I met him, and asked him how his sight then was. "Nearly well", he replied; and, to my surprise, on examining the eyes, I found that the nystagmus had almost entirely disappeared, the right iris answering freely and the left slightly to the stimulus of light. The left pupil was also less dilated. I may summarise the after-history of the case by saying, that I have seen this man frequently since, and that the eyes have continued to improve, so that, at the present time, he can read small print fairly well. I will not weary you by relating any more cases of the kind, of which I have several, but will merely make the following remarks in conclusion.

1. *Pathology*.—I have examined the optic disc with the ophthalmoscope, but do not feel sufficiently satisfied in my own mind to record my opinion here. I will just remark that the history of the above case shows that there is probably no grave permanent lesion of the retina which would lead to there being visible anatomical changes, else the rapid improvement of vision described would not have taken place.

2. *Cause of the Disease*.—The miners themselves give the credit of it to the insufficient light cast by the safety-lamp. This may be the case; but, since we do not find the disease mentioned as occurring in other classes of miners who work in almost as dark places, I am inclined to attribute it to the inhalation of the poisonous gases which are found in the coal, which probably alter the composition of the blood; and thus not only interfere with the nutrition of the eye, but also produce a local venous congestion. This question is of importance; for, if the complaint be produced by insufficient light, it is the duty of Government to encourage the invention of a lamp as safe as, and more effective than, the one in use at present. If, on the other hand, the disease originate in the cause I have suggested, better ventilation seems to be urgently required.

3. *Treatment*.—Little or no treatment appears to be necessary. In all the cases I have observed, very marked improvement took place on exposing the patients to free light and air; in many, complete cure was effected; in all, a great improvement was perceived.

NOTES OF A CASE OF INTRA-UTERINE AMPUTATION.

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CASES of intra-uterine amputation, although by no means common, yet present features of interest sometimes that have more direct relation to the cause of the accident. The following example has been thought worth recording, as an opportunity was afforded of dissecting the parts, so that the condition of the muscles after a period of many years was examined.

A female subject, aged 55, was brought to the anatomical rooms early in the session 1880-81. The left upper extremity presented no variation from the natural condition as far as the middle of the arm; below this point, a constriction existed; and in the region of the stricture the skin was darkly pigmented. A large cutaneous fold extended from a point six inches above the elbow to a point four inches below. It was two or three inches in breadth at the elbow-joint, and consisted of two portions of skin placed back to back. The distal phalanx of the thumb, and all the metacarpal phalanx except the base, were wanting. The proximal phalanx of the index finger was all that remained of that digit. The flexor profundus digitorum in the index finger was inserted a little above the flexor sublimis, near the distal extremity of the first phalanx. The flexor longus pollicis was inserted into the base of the metacarpal phalanx. The middle, ring, and little fingers were entire; the latter, however, was bent, the second and third phalanges being placed at right angles to one another. The tendon of the extensor communis digitorum to the index finger was attached to the distal extremity of the first phalanx. The extensor secundi internodii pollicis was attached to the remains of the proximal phalanx of the thumb. Nails were not present on the first and second fingers.

In the right upper extremity, the second phalanx of the thumb and a portion of the first phalanx had been removed. The last phalanx, and the middle, except the base of the index finger, the third, and three-fourths of the middle phalanx of the middle finger, were absent. Nails were absent on these; a nail was present on the ring finger, at its extreme end its distal phalanx had disappeared. The little finger was perfect. The flexor longus pollicis was inserted at the distal extremity of the first phalanx. The tendons of the flexors were inserted together into the base of the second phalanx of the index finger, that of the superficial flexor splitting. The tendons of the same muscles to the middle finger were inserted into the base of the second,

that of the flexor profundus being placed between the two parts of the sublimis. The common extensor tendon was inserted into the base of the second phalanx, and the arrangement in the case of the third and fourth was similar. The extensor primi internodii pollicis was inserted into the base, the extensor secundi internodii into the distal extremity of the first phalanx. A slip from the tendon of the extensor primi internodii passed to that of the latter muscle, and was inserted with it.

The right lower extremity presented few features of interest. An almost complete web extended between the fourth and fifth toes; a less marked cutaneous fold was present between the second and third.

The left lower extremity presented an interesting case of talipes varus. The toes had suffered as in the case of the hands. The inner aspect of the gastrocnemius was composed largely of fibrous tissue, and was much smaller than the outer. The other parts did not differ materially from the condition usually found in similar cases.

In a case referred to in the *Medico-Chirurgical Review* (vol. xix), a constriction existed above the elbow. The parts were atrophied and oedematous. The radial side of the wrist was bent, and the fingers contracted. In the case above recorded, the parts beneath and in the neighbourhood of the constriction were not much affected, showing that the constriction, if it were ever present, must have passed away. No constrictions were present in the lower extremities, as in Frickhöffer's case, where, with a talipes varus, a constriction occurred at the left knee-joint.

In volume xxxii of the same journal, an abstract of G. Braun's views is published, with cases. The abnormal growth of the amnion produces definite bands, that are carried to the back of the embryo, and the bands, extending from both sides, coalesce. These bands produce a very marked effect on the development of the embryo. In one case given by the above-mentioned observer, there was a fissured palate. The frontal and occipital bones were undeveloped, and fibrous bands extended across the cranium. In another, the nose and upper lip were fissured.

ELECTRO-DIAGNOSIS.*

By J. DIXON MANN, M.D., M.R.C.P.

THE rapid progress recently made in the pathology of diseases affecting the nervous system, by demonstrating the relation between organic lesions and the resulting train of symptoms, has greatly enlarged the field of diagnosis, and has developed the use of systematic methods of investigating the physical conditions to which such diseases give rise. In seeking to ascertain the essential nature of a neurosis, many methods are used to test the functional activity of the affected muscles and nerves; and, by comparing the results with those obtained from an examination of corresponding and healthy structures, to localise the causal lesion, and to gauge its intensity. In investigations of this kind, much information is derived from comparative observations of the immediate effects produced by electricity on nerve and muscle, in health and in disease. The diagnostic powers of electricity are largely used by those specially engaged in the treatment of diseases of the nervous system; but, owing to an exaggerated estimation of the technical skill required for its practice, electro-diagnosis has not yet received the general attention due to its importance. The time approaches when the diagnosis of many diseases of the nervous system, hitherto considered obscure, will be a matter of ordinary routine; every practitioner, therefore, should be conversant with all the recognised methods of investigation.

The application of the constant, or voltaic current, to a healthy muscle, produces contraction only at the opening and at the closure of the circuit—that is, at the moment the current begins, and at the moment it ceases to flow; whilst the current is flowing, the muscle is passive. Different degrees of current-strength are required to evoke muscular contraction, in accordance with the fourfold manner in which the contraction may be produced—namely: at the closure of the circuit, and at its opening, with either the positive or negative pole. Beginning with a mild current, and gradually increasing it, the first normal reaction which occurs is that produced by making contact with the negative electrode—cathodal closure contraction (C. C. C.). Next comes the contraction produced by breaking contact with the positive electrode—anodal opening contraction (A. O. C.). Almost synchronous with the last is the anodal closure contraction (A. C. C.); and, last of all, requiring a most powerful current, is the cathodal opening contraction (C. O. C.). When the current is very strong, the cathodal closure contraction assumes a tetanic character; if the current be still further augmented, the anodal closure contraction evinces a like tendency. The

* Read at the annual meeting of the Lancashire and Cheshire Branch.