whole structure soon destroyed. Recovery is perhaps impossible from the first. One has only to see a strong coolie enter hospital with slight cedema, weakness of muscles, and sensory disturbance to observe the rapid progress of the paralysis and wasting of the limbs and often of the diaphragm, with sudden death from respiratory or heart failure in spite of all symptomatic treatment to feel that only a specific will be of use in such cases.

The dislocation of the nuclei and slight breaking down of the chromophilic granules in the cells of all these cases is probably a pseudo-degeneration and the cause, so far as the afferent side of the nervous system is concerned, of the hyperæsthesia, paræsthesia and algesia constantly observed in this and other forms of peripheral neuritis.

Probably the atrophy of the fibres accounts for the total and partial anæsthesia, and the changes in the cells by modifying the incoming impulses accounts for the hyperæsthesia and paræsthesia and delayed sensation.

The important point here, however, is that in beri-beric neuritis there is more or less change in the bodies from which the atrophied nerve fibres take origin. This is true of both spinal and bulbar neurons.

REFERENCES.

¹ Die Beri-beri Krankheit, Jena, 1894. ² Die Krankheiten der warmen Lander, Jena, 1900. ³ Beri-beri, trans. Jas. Cantlie, 1893.

FARADISATION OF THE HEAD IN THE TREATMENT OF CHRONIC INSOMNIA AND ASSOCIATED NEUROSES.*

By SAMUEL SLOAN, M.D.,

Consulting Physician to the Samaritan Hospital for Diseases of Women, Glasgow; and to the Glasgow Maternity Hospital, etc.

HITHERTO electric treatment applied to the head has practically always been by the galvanic current. All drugs, even tonics, are to be stopped during the treatment here recommended. For a few hours after each *séance* all mental excitement and mental work should as far as possible cease, and no physical fatigue should be permitted. The cause of the symptoms, if known, should be, at least in part, removed. Tobacco and alcohol, except in rare cases, need not be wholly omitted; but no excess should be sanctioned. In cases where the cause is in acute operation at the time, and cannot be removed, I have found very little benefit result. Patients must be discouraged from talking while the current is in action, and must sit quietly for a few minutes after the electrodes are removed from the head, otherwise alarming, though not dangerous, symptoms are apt to follow. Nearly all my cases—46 in all—have been not of disease, but of disordered cerebral function. Coexisting disease has sometimes materially modified the result, since the insomnia has been in some of these cases what Sir James Sawyer has called secondary insomnia, as distinguished from psychic or emotional insomnia.

Amongst the neuroses associated with the insomnia are what patients have called nervousness, headaches, a nervous fear, lightness in the head, fearful dreams, night startings, a feeling of confusion when adding up figures, a feeling of thickness in the head, creepy feelings in the head, etc.; whilst in nearly every one of them the primary complaint has been loss of sleep or imperfect and unrefreshing sleep: in all the cases the insomnia had lasted for a considerable time, from a month to a year or two.

The results I have tabulated under five heads:

1. Cases in which the patient—he or she being judge—has been absolutely cured or practically cured, 21 (45.5 per cent.).
2. Cases in which the improvement has been so great as to make the treatment well worth the trouble, 15 (32.5 per cent.).
3. Cases in which improvement, though present, has been slight or of short duration, 5 (11 per cent.).
4. Cases in which no appreciable result of any kind was obtained, 4 (9 per cent.).
5. Cases in which some harm was done, though this was of a temporary nature, 1 (2 per cent.).

Under column 1 are included cases in which the sleeplessness,

* Extracts from a paper read at a meeting of the Glasgow Medical-Chirurgical Society.

or other nervous distress, has never returned since the treatment, or has returned only after a considerable time, and its return has been due to a return of the primary cause; and even then only when the cause has been in operation over a considerable time. The more pronounced the coexisting conditions, such as pain, the less satisfactory has been the result; whilst in the purely psychic cases every one was either absolutely cured or had so materially improved as to make the good result well worth the trouble involved. Some of the unsatisfactory cases had only one application.

No "shock" is felt by the patient, only a soothing feeling being experienced. In some cases the improvement has remained, but has not increased when the treatment was stopped, and the patient has come back anxious to have it resumed. The first application has been sometimes attended with unfavourable results, but a smaller dose at the next sitting has proved successful as a sedative. In one case the treatment was unsuccessful on account of the patient taking large doses of quinine for influenza. A successful result followed when the quinine was omitted.

No result followed in neurasthenia without the Weir-Mitchell treatment; but where the latter failed to relieve the insomnia faradisation was followed by most satisfactory results.

Regarding the probable *modus operandi* of this treatment, I believe that the influence is only temporarily due to the action of the current on the vessels of the brain. As in the case of shampooing of the head, however, the action of the current on the scalp would, I think, cause some transient contraction of the vessels, and thus induce a sleepy feeling whilst the faradisation was in operation. I believe that the real influence arises from the restful action induced in each molecule of the brain substance by the gentle rhythmic impulses of the current, reckoning these at over 100,000 during each sitting, and resembling the calm cerebration following change of scene and of occupation. These impulses are numerous enough to produce more than a mere transient improvement in the metabolism of the molecules; and the alternations are slow enough to give time for this trophic action to take place, by which the finer nutrition of the brain is improved.

An essential to this treatment is an instrument for measuring the amount of the current employed. For this purpose I have been lately using the newest form of my faradimeter. I exhibited the original instrument at the Glasgow Philosophical Society.¹ The instrument is now more sensitive, more reliable, occupies less than one-fourth of the bulk of the one then shown and described, and is perfectly portable.

Dosage of current alone, however, is not sufficient for success or even for safety. A special kind of secondary coil must be used, and a means of completely controlling the current in series with the patient is essential. The coil used in these recorded cases has eight to nine thousand windings; the greater the number of windings the coil has the greater being its sedative effect. Coils with fewer windings I have found are more stimulating; those with still fewer being relatively irritating. The patient should be under the influence of the current, as evidenced by the faradimeter, before it is possible to feel it; and the amount should be very gradually increased. The maximum amount of current given is 1 milliampère.² The dose at the first sitting should not exceed one-third of a milliampère. Not only must the secondary current be controlled by powerful rheostats, but the battery current to the primary should also have a rheostat controlling it, say of 50 ohms. The faradimeter is of course in series with the patient. The electrodes are soft, and are applied to the brow and to the nape of the neck. The former electrode should be about 15 square inches in size, and should be connected to the positive pole, that to the nape of the neck about 10 square inches.

The vibrations of the rheotome should be the fastest obtainable. The current should be applied for fifteen minutes each time; three times a week for two weeks, or twice a week for three weeks; six applications in ordinary cases generally proving sufficient.

NOTE AND REFERENCE.

¹ Transactions, 1897 and 1898. ² By 1 milliampère faradic current is meant the electromagnetic equivalent of an amount of sinusoidal alternating current, the galvanometric measurement of whose sinusoidal galvanic equivalent is 1 milliampère.