STATIC ELECTRICITY IN THE TREATMENT OF NERVOUS AND MENTAL DISEASES.*

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Static electricity, although long known to the medical profession, has received less attention and study than its valuable services in the alleviation of suffering and cure of disease would seem to warrant. Long before, and for some time following the discoveries of Galvani and Volta, it remained prominent in the field of electrotherapeutics, but it gradually fell into disuse, and was superseded by the galvanic and faradic currents. Notwithstanding its antiquity as a remedial agent, it seems to be but now upon the threshold of its successful introduction to the medical profession. Improvements in the construction of the machine have modified and tempered the irritating qualities of the current to such a degree that, after an application, an expression of satisfaction from the patient is the almost universal reward of the operator. Its pleasant, soothing effect, the gentle stimulation of the circulation—indirectly affecting nutrition—and the readjustment of metabolism, as well as the favorable psychic effects, are desiderata more readily attained in many cases by the static current than any other therapeutic measure.

In many cases beneficial effects are immediately obtained. In others, patient and long-continued application extending over a period of weeks, and sometimes months, is the only means to the end. When galvanism and faradism have been faithfully applied, and fall short of the desired effect, the use of some form of static current will frequently prove of the greatest service, and I should never consider a case as incapable of benefit by electric treatment until static electricity has been thoroughly tested. The application of static insulation is far more agreeable than either general galvanization or faradization. The inconvenience to the patient of having to disrobe almost completely, and the distaste which many naturally feel to having a wet electrode rubbed over the skin for from ten to twenty minutes, is entirely obviated. However, many cases require galvanism and faradism, and the therapeutic value of these agents will continue to hold for them a prominent place in medicine.

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Endowed with high potential, deficient in volume, and possessed of an enormous electro-motive force, static electricity is enabled to affect the entire system in a limited degree. It affects the functional processes, glandular secretions, the circulation, nutrition, sleep and sensation.

In the melancholias, neurasthenia, and kindred neuroses, in which the nutrition of the nerve cell is primarily at fault, a toxic condition is established through the inability of the cells to rid themselves of the results of physiologic activity. This toxicity is responsible for many of the mental and physical manifestations, and the discomfort to which these patients are subject. Our aim in treatment is to prevent undue waste of nervous energy, and to aid in the elimination of self-produced toxic substances. To this end we establish and maintain the highest degree of nutrition possible. To my mind, the single agent of greatest value in this work is the static current. Its use is rational, and there is nothing of the occult about it; nor can its influences in any sense be attributed to hypnotism, or some subtle influence upon the nervous system, for the same effects can not be produced by such means. The function of all electric treatment is to improve nutrition, and the most efficient of the several manifestations of electric energy is the static current. Deficient nutrition and deficient elimination — aside from heredity — are the two factors which enter with greatest frequency into the etiology of all neuroses. Our need, therefore, in therapeutics is an agent which will promote a more nearly normal metabolism. A high degree of nutrition and cell activity in any organ is indicated by an increased circulation of blood in that organ. The ability of high potential currents to accelerate the circulation and to improve nutrition has been demonstrated in physiologic laboratories and in clinical work.

In all cases where nutrition of the tissues, and especially the nerve structures, are below par from any but an organic cause, it is a tonic of the greatest efficacy. It not only stimulates tissue formation by acceleration of the circulation, but, as Dr. Monell has said, "by a direct mechanical effect upon the protoplasm of the cell, whereby its molecular arrangement is changed and latent energy is liberated."

Aside from the relief of symptoms to which it is especially directed, there has also been observed improvement in remote visceral disturbances, such, for example, as indigestion, habitual constipation, vertigo, etc.

The positive static breeze, which in reality is a succession of infinitesimal sparks, which passes into a continuous stream between the insulated patient and the administering electrode, is a soothing application, and may be applied to the head, spine, or any part of the body, with little fear of irritating the patient. It is best adapted to the relief of local pain. Neuralgia, nervous headaches, muscular rheumatism, and various other forms of pain will be rapidly controlled by it. So often have I seen severe and obstinate headaches completely relieved by this agent that I now seldom prescribe other remedies. Not always, but frequently, a quiet, natural sleep, continuing from one-half to one and one-half hours, follows the treatment. The patient awakens rested, and with no trace of the headache.

Dr. Curran Pope, in speaking of the treatment of neuralgia, says: "Nearly every case needs constitutional treatment, and to secure a powerful tonic sedative I use negative insulation from three to ten minutes, followed by a positive breeze to the painful nerve. The results are often startling. Patients that were before irritable and excessively nervous become quiet, and often drowsy. Where neuralgia is limited to the limbs or trunk, a mild positive direct breeze or spark gives excellent results."

The static spark, a most energetic form of electrical discharge, is a powerful therapeutic application, but, except in a few cases demanding heroic treatment, will be found too irritating, and will not be cheerfully borne by many patients until tolerance is established. In chronic and deep-seated neuralgias, especially of the sciatic nerve, the application of heavy, indirect sparks will be found to be in the nature of a specific. Dr. Monell has recently reported a series of cases of sciatica treated with the static spark, in which he obtained most favorable results. Short, fine friction sparks, obtained by holding the ball electrode in close proximity to or in contact with the clothing, are indicated in altered peripheral sensations, anæsthesias, myalgias, and cases requiring the effect of a counter irritant.

The long, thick spark may be called into requisition in restoring tonicity to enfeebled or paralyzed muscle, relaxing contractures, resolving exudations, promoting absorption, and relieving pain in deep-seated organs.

The static induced current, first described by Dr. Morton in the *Medical Record* of January 24, 1891, is similar to all induced currents, and a description of its action and uses would be but a repetition of what might be said of the faradic induced current.

The frequency of application must be governed by the condition of the patient. In cases of serious nervous disturbance — neurasthenias, neuralgias, chronic headaches — daily application will be found most effectual; in less severe cases three applications a week will be productive of good results. For the relief of severe pain, as sciatica or persistent headache, two or more applications may be made daily. The duration of the application will depend upon the form of current used, the susceptibility of the patient, and the end to be attained. In our practice the time has varied from five to twenty minutes. With a nervous, apprehensive patient, taking the first treatment, five minutes in the chair will be as much as she will endure without complaint. As timidity is overcome, and confidence in the treatment established, the time can be gradually lengthened.

Under treatment, the pains, the weariness, and the morbid fears gradually become less intense, and finally disappear, but the disappearance is at first only temporary. The changes at first set up are not sufficient to endure for any great length of time, perhaps not more than a few minutes, an hour, or perhaps several hours. More work must be done before nutritional changes are thoroughly established. With each treatment the period of comfort will be prolonged. As improvement takes place, and there is an increase of strength and energy, a patient may be able to pass a period of two or perhaps three days without treatment. Only with experience is it possible to reach definite conclusions as to the manner, length, and frequency of applications. Personal idiosyncrasies as well as the manifestations of disease must be considered. No accurate and satisfactory means of measuring the dose has yet been discovered, but it may be regulated in two ways: By the directness of the connection between the patient and the active pole of the battery, and by varying the revolutions of the glass plates. To augment the dose, we make a direct metallic connection between the machine and the patient by placing his foot upon the connecting rod or chain, or permitting him to hold it in the hand; also by increasing the revolutions. The reverse procedures hold good in diminishing the dose.

Notwithstanding the opinions of many to the contrary, I am a firm believer in the differences of polar action. I have been led to this opinion, not only by my observations in the treatment of patients, but by repeated experiments upon myself. Positive static insulation is invariably an agreeable application, and, as a rule, brings quiet and

comfort. Not so with negative insulation. In the majority of cases, restlessness and discomfort supervene. While the positive breeze is a comforting application, bringing ease and relief from the majority of headaches in from ten to twenty minutes, the negative causes a prickling, unpleasant sensation, often accompanied by unexpected sparks, which, in many cases, but aggravate the suffering from which relief was sought. The difference in polarity is still more striking in the static spark, and will best be appreciated when personally experienced. The spark, at best, is not an agreeable application, but the indirect spark, drawn with the positive pole, will be cheerfully endured by the majority when they are aware of the relief it will afford, while the negative is so stinging and painful that its use is, as a rule, impracticable.

"Some six years ago, Damian of Paris made a series of observations upon temperature and pulse and the urine, to determine what, if any, difference there was in the different insulations. The published statement showed that with the positive insulation there was a regulation of the temperature and heart's action, and increase of urea and diminution in uric acid; while with the negative insulation, these changes were less marked in so far as temperature and pulse were concerned, and that the volume of the urine was increased, but no change occurred in its organic constituents."

Moral effects must not be lost sight of. That in many cases treated with electricity much of the improvement is due to properties of a psychic character, is denied by but few. We are all familiar with the value of suggestion and employ it daily in our work upon the wards. We are sometimes at a loss for some effectual means of inspiring hope, and increasing its buoyant influence, so essential to the successful treatment of states of nervous and mental depression. Hope and confidence bridge over many a crisis, and faith in the physician and the value of his efforts is a therapeutic power that should never be carelessly shattered. As an agent for inspiring hope and establishing confidence in treatment, we find the use of the static machine of great service.

In conclusion, let me repeat that static electricity is a tonic deep-acting and far-reaching in its effect. As a muscle stimulant it is unsurpassed; as a soporific it will be found useful in many cases; as a reliever of pain it is a most potent agent. However, the possession of a static machine is no sure road to success. Neither is the static current a cure-all. It is not able to restore degenerated nerve cells, or to stimulate to action a dead muscle. Indis-

criminatedly used, it will often prove disappointing, but, with careful selection of cases, a successfully operated machine, a skillful administration, and conservative expectation as to results, static electricity stands the peer of any other single therapeutic agent.