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STATIC ELECTRICITY
IN MEDICINE

BY


DR. L. L. AUGER



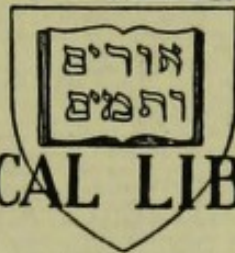
Read Before the Worcester District Medical
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DECEMBER 12TH, 1900



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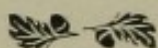
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STATIC ELECTRICITY

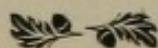
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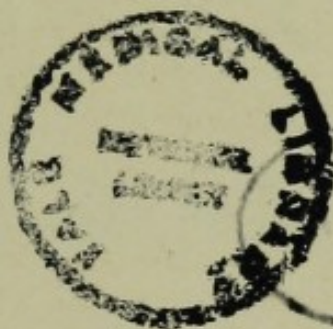
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Static Electricity in Medicine.

Mr. President and Gentlemen :

When I chose this subject, which I thought would be of benefit to others because it seemed of such paramount importance to my own self, I foresaw the pleasure of dilating upon a favorite line of work, of endeavoring to make converts to a very widely, but equally vaguely known, therapeutic agent. But the first effort stirred up unusual difficulties. Should I, or should I not take it for granted that my audience of physicians was well acquainted with the anatomy and physiology, so to speak, of the subject? Should I make a clinical report (concluding well for the goods I praise,) or should I mix up with it an undergraduate lecture? Would one help the other, or both suffer by the necessary incompleteness of the work. I have not settled these doubts to my own satisfaction, but shall nevertheless give my best efforts for a good cause.

Electricity as a therapeutical force is far from being as well known as the remarkable results which it has obtained in the last few years would naturally lead to believe. This is undoubtedly due to the education the average doctor has received. He is suffering from a kind of reasoned indifference. Either he has gotten into the habit of looking upon electrical applications as harmless but useless pastimes, or else he has been puzzled by biased, exclusive, or too mathematical authors, who have claimed everything for Franklinization, or galvanization, or Farradization, etc., putting the general practitioner in an unfavorable frame of mind.

The truth lies in the combination, in the simultaneous or successive use of different electric modalities. The exclusiveness of some authors is responsible for the still prevailing idea that electricity is only a specialty, whereas it should be part of the armamentarium of every physician. Perhaps must we confess

that we affect to disdain electricity, because it would be rather disagreeable to be called upon to apply a remedy about which we know so little theoretically and practically.

A few words, first, concerning the several generators of electricity and their respective physiological reactions.

1st. The Thermo-electrics, whose feeble intensity makes them practically useless. 2nd. The hydro-electric cells, in which the current is developed by chemical reaction. These machines give out directly a constant and continuous current, or better, the galvanic current, the distinctive character of which is to produce great intensity and little tension. It can also be obtained with accumulators and by the use of dynamos. Applied to the patient this current gives no shock nor pain, unless artificially interrupted with an interrupting handle called Rheotome. If the current is weak the patient hardly feels anything; when strong it creates a sensation of burning. It may be superfluous, but I will mention in parenthesis that the chloride of silver cells, called dry cells, which have considerably superseded the other mixtures, are dry only in this way, that they are hermetically sealed metallic jars, which renders them portable and prevents evaporation. 3d. Induction machines. These sometimes unite the electro-motive power of static machines with an intensity greater than that furnished by liquid batteries. The numerous machines of this sort can be classified into three groups: A. The Volta-Faradic, including most of the Faradic batteries. B. The Magneto-Faradic. In these the current is either continuous or alternating, varying with the manufacturers. It is the type of Faradic machines with handle power. Faradic machines are those mostly in use by physicians, and the most frequently mis-used. C. Dynam σ -electric machines, which differ from the magneto-electric machines by the use of electro magnets instead of permanent magnets. And we reach the heart of our subject: The Electro-Static Machines.

These produce little intensity, or amperage, but on the other hand furnish a strong electro-motive power — 50,000 to 60,000 volts.

Franklinization is the application of static electricity, in any form, to the human body, as a medical agent. This form of electric energy was the first one known or tried on the human body. But it was looked upon as a universal panacea, suffered the usual reaction, and was neglected. It now seems to have found its right place, and a solid one, in the list of useful remedies.

We must go back 150 years to find the first application of static electricity, but it did not become well understood or studied till the days of the illustrious Charcot at the Salpetriere and of Doctor Vigoureux.

As machines, I shall merely mention those of Ramsden and Nairne, found in physical laboratories, but of little medical use. Those of Holtz and Carré are much superior; but undeniably the best today is the Wimshurst machine.

It would be useless to describe these machines, but I may mention some of their most important requisites: They should be ready to operate at any time. They must not be affected by hygrometric variations of the atmosphere; they must not require a great expenditure of mechanical energy, and they must have a great output and furnish its conductors with a high potential.

It must not be forgotten that the therapeutic effects produced by Franklinization are dependent upon the quantity of electric energy applied to the patient. The effort must be to obtain sparks of considerable length and yet not microscopically narrow. These electric discharges are exhibited in two forms, the spark and the breeze, both of which are frequently used, but not always with sufficient discrimination. I shall pass over all the mechanical details which can only be understood with the aid of the machine itself and shall say but a few necessary words about the technique of Franklinization.

This includes several modes of application differing widely in their physiological and therapeutical properties.

The patient must first be isolated by preventing as completely as possible all electrical connections between himself and the ground. This is obtained by the use of a chair fitted with glass tips, naturally poor conductors, and joined to one of the poles of the machine by a metallic rod called Shepherd hooks.

The sparks are applied mediately or immediately, that is by a direct current or a transmitted one. Lack of time prevents me from insisting further on this subject.

The principal methods of application of Franklinization are: A. The static spark. B. The breeze. C. Electrical friction. D. The static bath.

A. The sparks produced by a good machine for medical treatment cause only a slight pricking and burning sensation and contraction of the electrified muscles. When they are very energetic they leave on the skin small red marks, but never any vesication or burning. This kind of electricity increases pulse rate, makes respiration and diaphoresis easier. The use of sparks

is well adapted to the treatment of some forms of paralysis paresis, muscular atrophy, general atomy, and as a dissolvent of some swellings. We are sometimes obliged to use it in nervous troubles when they have resisted the breeze and other applications.

B. For the production of the breeze the point is placed at a little distance from the subject opposite the part to be sprayed. The static breeze possesses a sedative action used to advantage in some neurasthenias and in migraine. The negative breeze produces a lowering of local cutaneous temperature greater than the positive spray; This lowering of temperature continues quite a while after cessation of treatment. Therefore important vasomotor changes take place. It is interesting to note that the odor of ozone remains for hours over the affected surface. The throwing of this spray from above the head is called the static douche.

C. Electric friction consists in the production of small sparks between the skin of the subject and a spherical exciter, through one or several layers of wool or cloth. A rain or sparks is produced which has a local exciting effect, and a remote or reflex one of a sedative nature. It stimulates cutaneous sensibility and is of much benefit in several forms of anesthesia.

D. In the static bath, the patient is saturated with electricity, permeated by a current of high tension. Its action is manifest. Pulse rate is increased and this increase is maintained after a number of treatments. Arterial tension and dynamometric power are greater, combustion is accelerated probably on account of the ozone absorbed. The functions of the skin, digestive organs are quickened, anemia is much improved where ferruginous and other drugs have failed. Calm and well being, with a tendency to sleep, follow the bath. It is found that either has the same effect, though some authors claim a sedative action for the positive pole and an exciting one for the negative.

Some physicians are utilizing the eminently antiseptic properties of ozone in the treatment of some diseases of the respiratory organs. We may mention the method of electrization adopted by Dr Monnell of New York, and which bear his name, Potential Alternation of Monnell. In this the patient is subjected to an oscillating current of considerable frequency. These currents have thus a high tension and a great frequency, but they correspond to a feeble quantity of electricity. American electrical physicians appropriately call these "static currents". The electrolyzing can be done with the currents in three ways :

First: by placing the subject in an oscillating field.

Second : At a distance, by sparks.

Third : By contact of the electrode with the integument.

These inductive static currents render great services in electrotherapy. A point that must never be forgotten is dosage. As Monnell says : "There is that to learn about electro therapeutics that there is about opium, aconite, mercury, strychnine, iron, belladonna, arsenic, etc., indication, contra-indications, preparations (type of current), polarity, choice of electrodes, regulation of dosage, method of administration, duration of seance, frequency of treatment, idiosyncrasis, by effects, control of conditions, mechanism, influence of superficial and deep complications, physics, physiology, pathology and therapeutics."

Static Electrotherapy.

I have thought it most practical to group particular diseases most amenable to the kind of treatment we are dealing with, avoiding those troubles about which conclusions are still uncertain

The effect of electricity on general nutrition makes it valuable in anemia and chlorosis. Frictions or sparks are used with the bath, the sitting being repeated every two or three days and lasting 15 to 20 minutes. In amenorrhea and dysmenorrhea static electricity produces highly satisfactory results. The effect in such cases is so marked that care must be taken in the event of pregnancy, of proximity of menstrual period, as hemorrhage or abortion may result from electric treatment. No one denies the favorable influence of electricity in neuralgia. In sciatica, sparks are drawn along the course of the nerve, in ten-minute sittings repeated every second day. In "tic douloureux", the local application of the spray and even sparks in rebellious cases. Of course, the cause of neuralgia must be ascertained. In compression of the nerve, for instance, it is evident that no electric treatment will be of any use, but success almost invariably attends other cases. In cases following chlorosis, it is remarkable, curing both the chlorosis and neuralgia by its action on blood cells. In that persistent and discouraging trouble "migraine", static electricity is often beneficial. The vaso-constrictor effect is more pronounced with the negative spray, which is used with the bath.

Fifteen or twenty treatments with the static bath succeed

usually in ameliorating and often controlling chorea. Writers' and telegraphers' cramp is intimately associated with neurasthenia. The source of the localized weakness is in the central nervous system. Monnell has had remarkable results with Franklinization in such cases and I have myself witnessed some of the cures he has obtained. The treatment is similar to that of chorea.

It is sometimes difficult, in hysteria, to rightly divide the credit between electric influence and the psychic, but the experiments and conclusions of Charcot and Vigoureux point to the supremacy of electric treatment in a majority of cases. The general bath is usually sufficient.

NEURASTHENIA. In this trouble, Franklinization is certainly at the head of the list of curative agents. The electrostatic bath is first in line of efficiency. Let it be understood that the physiological and therapeutical effect of the electrical bath cannot be judged by its action on the well individual. On neuro-pathic cases it is really sedative at the very first sitting; it is the basis of treatment of neurasthenia and can be said to be the whole of it. However, the electric spray is usually added to it. The positive spray is here used, as it is milder than the negative and more disseminated.

In the nervous depression that follows the grippe, and more especially infectious diseases, nothing can equal the curative effect of the static bath. Used over the head as a static douche, the spray will eliminate in neurasthenia the habitual feeling of embarrassment, of heaviness, of depression, of painful tension. Electric friction also has a local exciting effect and a deep reflex sedative action. When the lower half of the body is submitted to electric friction, the symptoms of spinal congestion, such as spasm, exaggerations of reflexes, spermatorrhea, etc., are attenuated. Its use must therefore be frequent in the different forms of neurasthenia.

Two or three applications with the machine reduced to its lowest capacity are sufficient to cure lumbago—when it is not assumed for society benefits.

That very troublesome affection, cutaneous puritus, is now often cured with the aid of electricity. Here is what Monnell, who first suggested and used it for this purpose has to say: "I have used with the most unexpected results the electrical spray in twenty-five cases of localized or generalized puritus of the most tenacious type, which had resisted all treatment. The eczematous or lichenoid conditions also disappeared under the same influence."

Moreover, Monnell has applied static treatment to eczema with marvellous results. Of 50 cases of various types of acuity, of form, of locality, 48 were cured. The treatment consists simply in applying over the eczematous areas spray points, with a high electrical power. No results can be expected from a weak machine.

The duration of a sitting of Franklinization must vary to the nature of the disease, the age and constitution of the subject, etc.

A sitting of three to five minutes is sufficient for a child; 15 to 20 minutes is a good medium for the adult. Prolongation beyond that time is of no advantage.

A few words, before giving a report of personal observations in the use of electricity as a therapeutical agent, concerning the X-ray. Much has been said and written about the harmful effect of this precious means of examination. As a matter of fact, the guilty party has been, not the machine, nor the process, but the physician. His technique has been faulty and bungling. He has experimented with cases that required previous experience. Rightly applied, the X-ray, can be used with impunity for a considerable length of time. There may exist idiosyncrasies, but I have still to meet such a patient, after an experience extending over two years.

ASTHMA. Mr. F. G., Orange street, has been suffering with Asthma for 4 years; has attacks daily, especially at the approach of evenings. One year ago September 21st I was called at 10 o'clock in the evening. He was suffering with a very severe attack of suffocation. After giving him the ordinary treatment he was able to retire at 2 o'clock a. m. I talked with him of static electricity, and a week later he commenced taking the treatment, which consisted of 15-minute seances of the breeze and general electrization, small sparks on the breast and spine. After 22 treatments he was discharged, feeling well. I recently saw the patient and he told me he has not been troubled since.

GASTRALGIA. Mrs. W., age 49. Of a very nervous temperament. She consulted me last January. Her troubles dated back 7 years, but for the past 4 years her sufferings have been only spasmodic, never passing more than two weeks, however, without an attack. She has a distention of the stomach, an aversion for food and also obstinate vomiting, which forced her to a strict diet. She suffered excessive acidity, acid eructations, severe pains in the stomach and from insomnia. After having tried several physicians and all kinds of medicine, she heard of

static electricity through a friend of hers. She came to me for treatment and I applied it in accordance with the nervous nature of the case, brought about by its long standing and the inefficiency of all the ordinary remedies. From the third sitting a very noticeable improvement was manifest. The patient could lie down and sleep for 10 hours. She was able to go over three hours without taking any milk. After ten sittings the improvement was more pronounced, and finally at the end of 10 weeks' treatment Mrs. W. found herself cured. I have treated a number of similar cases with great success.

RHEUMATISM. Mr S., age 62, was in the following state when he came under my care on October 7, 1899: Firstly, rheumatic pains in all his limbs and lower part of back, with marked lameness. The pain was particularly severe in the upper extremities, especially on a level with the scapula and humeral articulation. The moving of his arms was very painful and it was only with the greatest difficulty that he could draw on his overcoat or move his arm upward or behind him. Secondly, his vision was weakened. He wears strong glasses, but even with these his eyes become red and lachrymose when he goes out-of-doors. Thirdly, for about a year he has been subject to melancholia. After taking my treatment for a month, he said to me: "Doctor. I am entirely cured of all my infirmities and I exaggerate nothing when I say that I believe I am 20 years younger mentally as well as physically.

AMENORRHEA. Miss T., age 19. Very healthy looking young woman. Menstruated first at the age of 17. Menses returned at irregular and short intervals, altogether suppressed for the last eight months, since which time she has suffered from confusion and oppression of the head. She has been under treatment with iron, aloes, etc., without effect. Sparks of static electricity were applied on October 22 last and repeated on alternate days. The menstruation appeared on November 2nd and lasted three days. She has been regular ever since.

CONTRACTION OF MUSCLES. Mr. P. suffered with contraction of the muscles at the posterior part of the thigh, which prevented extension of the limb. It had a curved form with an anterior convexity. A pronounced lameness resulted from this contraction. Aggravating pains, having their seat in the lower part of the thigh and upper part of the foot, acute especially on a level with the knee articulation, and becoming worse when exposed to cold and dampness. This was the pa-

tient's state when he came to me February 1st, 1900. Owing to imprudence the pains in the knees at that time were very severe, he having been hunting in the rain. After three months' treatment, all symptoms disappeared and the patient was free from all pain and infirmity.

HEMIPLEGIA FOLLOWING A FALL. M. James Harrington, age 37, was affected with Hemiplegia of the right side. He came to me on May 2nd, 1900, and said he had been feeling this way since his fall, in which he struck his head. The paralysis was but partial, for he could walk, though with considerable difficulty, and when the side was touched he felt as if pressure was applied through a folded cloth. After two and one-half month's treatment, consisting of electric shocks passed from the spine down the leg and from the spine and arm, twice a week, he was cured.

PARALYSIS OF LEFT LEG DURING EARLY DENTITION. March 18, 1900.—S. M., age 26 months. Paralysis of left leg came on suddenly at least without any previous symptoms being observed. When she was 14 months old the symptoms were as usual in such cases. April 2nd, the child was electrified by sparks drawn from the spine and the affected leg had improved so that she could take three or four steps alone. On April 22nd, she was still improving, and on May 2nd, after taking ten treatments, she ran about freely, fully recovered.

CHOREA, WITHOUT EXCITING CAUSE. Miss M. D., age 10 years, a scrofulous child with large head, dark complexion and long eye lashes. She has been well and enjoyed general good health, with the exception of a headache, of which she has long and often complained. The bowels were regular, tongue clean and moist, and appetite good. She was troubled with ascarides, heart rhythm rather irregular with an occasional mitral sound. Her father had chorea when he was a child. November 8, 1899, ordered rhubarb and calomel, and sparks of electricity drawn the entire length of the spine 3 times a week. On the 24th she had improved but little. December 7, improvement more marked; electricity continued. On the 11th, quite better. Jan. 2nd, she was cured.

Mr. P. M., after being under the care of several physicians, consulted me on November 10th, 1898, for neuralgia of the right arm with irregular contractions of the muscles of the left arm. He had been afflicted since July 2 of the same year. He suffered greatly and could not sleep. He could rest but a few hours

with the aid of sedatives. I began at first the application of the breeze, then sparks and finally the friction. Treatment was given daily and it was but after the 22nd treatment that he felt fairly relieved. When he had taken his 40th treatment he was cured.

Mrs. C. W. G., consulted me in December, 1898, for neuralgia of the right arm. She was sent to me by Dr Nichols. She suffered a great deal and was also troubled with menorrhagia. Forty-two treatments, consisting of the breeze, sparks and frictions, perfectly cured her.

Mr. H., a well known musician, called on me suffering from a severe attack of lumbago. The slightest motion would cause terrible pain. After two treatments with the sparks, he said he was feeling quite well.

Mr S., called on me after a fall on the ice and suffered terribly. After a diagnosis I found a peri-neuritis. I gave him 12 treatments with breeze, sparks and friction. Now he is perfectly well.

Mr. T. R., after a fracture of the tibia, suffered so much pain in the same leg that he could hardly walk. It was with much difficulty that he could even move the muscles of the leg. After 14 treatments, this old gentleman (who is 80 years old) said he felt as alert as when a young man. He felt no more pain and possessed more vitality.

I have selected these cases as most typical, most often recurring in general practice, to show that electricity should be more generally applied and not looked upon as suitable only in a very limited number of diseases. This idea is altogether too prevalent to the detriment of both physician and patient, and if I have succeeded in modifying it a little, in diffusing a little more knowledge on the subject, I shall feel that I have been of some use, tonight.

The subject of this paper is rather dry, and I feel all the more thankful for the attention that has been given to it. I am also pleased to acknowledge my indebtedness to those physicians who have honoured me with their confidence in trusting their cases to my care. Perhaps, before many years have passed, a good electric static machine will become part of the armamentarium of every progressive physician. I hope so.

Dr. L. L. AUGER.

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