

DIRECTIONS FOR THE MACHINE.

ATTACHED to the conductors are small wires, which must be introduced into the holes at each end of the box. By drawing out the brass knob (which is attached to the armature) at the left hand of the box, the power may be increased to any required strength. After having used the Machine, it is best to leave the armature on the magnet. When applying the poles to the tender or diseased parts, it is better to have the end of one of the conductors filled with a sponge or flannel wet with water. Care should be taken not to put the conductors in the box until dried. All the bearings should be occasionally oiled with the *best* clock oil. The spring on the side, as also the one above the shaft on which the spools turn, should touch upon the shaft, or the current is lost.

INSTRUCTIONS

FOR THE USE OF

DAVIS & KIDDER'S

MAGNETO-ELECTRIC MACHINE,

IN THE

ENGLISH, GERMAN, AND SPANISH
LANGUAGES.

16 MAGNETO-ELECTRO MACHINE.

2. A Magnet introduced within a coil of wire, as it

[Fig. 1.]

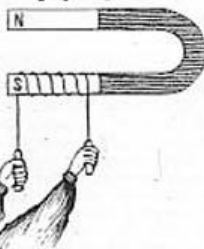


Fig. 1, excites a current of electricity during its passage in or out, which will pass through a person connected with the coil by metallic handles.

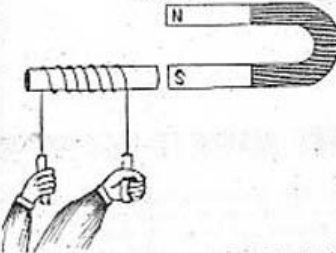
3. A bar of soft iron is made a magnet by induction, when a magnet is brought near it, as represented in Fig. 2, and it loses its magnetism when the magnet is removed from it.

If a coil of wire is wound around the bar of iron a current of electricity is induced within it, when the bar thus either acquires or loses magnetism.

4. The induction of magnetism is greater when the bar of soft iron is bent as represented in Fig. 3, so that both ends or poles of the magnet may act upon it, as in Fig. 3.

Should, however, under these circumstances, a straight bar be placed across the legs of the magnet, near its poles, it would nearly neutralize its inductive power upon the revolving armature or pieces of bent soft iron. By means of such a straight bar of soft iron, or flat armature, which may be placed in contact

[Fig. 2.]

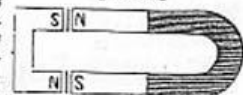


MAGNETO-ELECTRO MACHINE.

17

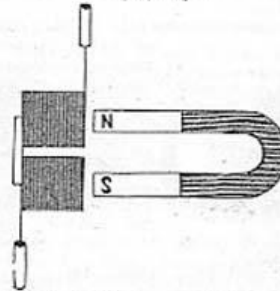
with the magnet, partially or wholly withdrawn, it is obvious that we have a means of regulating the inductive influence of a horse-shoe magnet over a bent bar of soft iron in front of it. It will be observed that the North and South poles of the magnet, N. S., induce opposite polarity in the part of the revolving armatures near to them.

[Fig. 3.]



5. Fig. 4 represents two spools of insulated wire (wound with cotton or silk) on each arm of the armature. Each additional spire of wire increases the amount of electricity produced when the armature is brought near, or removed from the poles of the magnet, N. S. The spools of insulated wire thus become a battery for Magneto-Electricity.

[Fig. 4.]



6. Instead of moving the magnet to and from the revolving armature on which the spools of wire are placed, the armature is made to revolve before the poles of the magnet, as represented in Fig. 5. Here the magnet is seen behind the armature, also a train of gears, pulleys, &c. By turning the crank the armature is made to revolve rapidly on an axis of its extremities, passing close to the poles of the magnet, become charged with magnetism, which they lose as they leave the poles, and become charged with the opposite magnetism, as they approach the opposite poles at each half revolution. The electricity thus induced is powerful in proportion to the rapidity of the revolution, but is not directly available to give shocks, without a break

piece, or spring, on the axis which alternately breaks, and completes the circuit of the coils, at which moments a very energetic reactive current is excited, which is amply sufficient for all medical purposes. The apparatus thus described, is precisely the same as used in *Davis & Kidder's Patent Magneto-Electro Machine*.

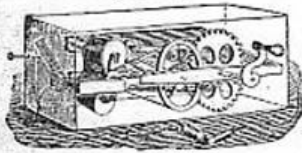
Fig. 6 represents the machine in the box. At each end of the machine are the conductors; at the farther corner of the box on the left is represented a sliding rod which controls the position of the straight armature, in relation to the poles of the magnet. By moving this on or off the poles, the strength of the shocks may be regulated.

Notes on the medical application of Electricity by Dr Wm. F. Channing, page 29, the advantages of the *Magneto-Electro Machine* over the Electric Magnetic apparatus, requiring a battery to drive it, are fully stated. This is qualified, however, by the objections, that the *Magneto-Electro Machine* is more expensive and less portable from its weight and size. These objections are now entirely removed by the construction of *Davis & Kidder's Patent Magneto-Electro Machine*, which thus becomes the cheapest and most useful apparatus for the treatment of the large classes of diseases to which Electricity applies.

[Fig. 5.]



[Fig. 6.]



CERTIFICATES.

The Manufacturer submits the following (among many) eminent testimonials to the public:—

From Professor Silliman, of Yale College.

Dear Sir: Dr. Walter Kidder has exhibited to me a Magneto-Electric Machine, invented by you. For neatness, compactness, and facility and energy of operation, it is far superior to any instrument of the kind which I have seen. For medical application, it possesses very decided advantages.

B. SILLIMAN, Senior.

New York, April 28, 1854.

From Professor Page, of the Smithsonian Institute, Washington.

Washington, March 27, 1854.

Dear Sir: Upon examination and trial, I find your Magneto-Electric Machine more efficient for its size than any I have ever seen. The improvement you have made is one possessing much scientific interest.

Yours respectfully,

CHAS. G. PAGE.

From Dr. Chilton, the eminent Chemist.

DR. W. KIDDER, Astor House. I have examined the Magneto-Electric Machine invented and made by you. They are the simplest and most effectual I have seen. The mechanical arrangement reflects great credit upon the inventor.

JAMES R. CHILTON, M. D., Chemist.

New York, April 29, 1854.

From Walter Burnham, M. D., Professor of Surgery and Obstetrics in the Worcester Medical Institution.

MR. W. H. BURNAP. Dear Sir: Having employed Electro-Magnetism in the treatment of all that class of nervous diseases, dependent upon general debility, and undue irritability, with great advantage for many years; and having used machines, for that purpose, of various constructions, I unhesitatingly recommend the Magneto-Electro Machine, manufactured and sold by you, as superior to that of any other that I have ever seen or used.

I have found it of great value in allaying that severe pain dependent upon an irritable state of the nervous system, which sometimes follows capital operations in Surgery, and also in the immediate relief of internal hemorrhage after child-birth, caused by inertia of the uterus; indeed I have never failed to produce instantaneous contraction of the uterus, and consequently an immediate relief.

Yours truly, WALTER BURNHAM, M. D.

Lowell, February 29, 1854.

From the Report of the Second Exhibition of the Middlesex Mechanical Association, held in the City of Lowell, Mass., September, 1857.

CLASS 15. No. 957. W. H. BURNAP, Lowell. A case of Magneto-Electric Machines. A compact apparatus, by which the subtle agent, electricity, is made available for philosophical, medical, and amusing purposes, for which it is extensively used and generally applied.

DR. J. C. DALTON,
THOMAS TALBOT,
DR. JOEL SPALDING,
DR. NATHAN ALLEN,
CHARLES T. CARNEY, } Judges.

GENERAL REMARKS

RELATIVE TO THE MANNER OF APPLYING THE

MAGNETO-ELECTRO MACHINES.

DIFFERENT diseases require different modes of applying the Magneto-Electric Machine. Strong diseases, such as Rheumatism, Dropsy, Paralysis, etc., require a strong power. In some cases the application should be of short continuance; in others it should sometimes be protracted for hours. Sometimes once in two or three days is sufficient; in others once or twice a day would be more beneficial.

The manner of applying the machine, which is the most agreeable to the patient, and probably the most beneficial, is for the operator to take one of the handles of the conductors into his own hands, and thus letting the electric fluid pass through his own body, to communicate it to the patient by the instrumentality of his other hand. In this manner of applying the machine, the stinging, burning sensation attendant on the application of the conductors alone, is greatly diminished. In operating on the eye, face, or head, this is decidedly the best way. In some cases, as will be made evident when treating on the particular mode of application, the hand, or rather the ends of the fingers are almost indispensably necessary to effect the object in view. This occurs, when, for instance, we want to reach some of the deep-seated nerves and muscles. Some recommend the Electrical bath, and no doubt but in some diseases, such as chronic rheumatism and a debilitated system, great ad-

vantages might be derived; in very many cases I think it would prove prejudicial. In most cases the patient can apply the machine to himself without any assistance; it is preferable, however, that the machine should be applied by another person, both for the advantage to the patient by the operator's passing the electric fluid through the medium of his own body, as well as for the more complete and proper manner in which he can apply it. Every facility should be afforded the operator for applying the machine properly and thoroughly. Care should also be taken to avoid catching cold during the operation. If a considerable surface of the body is to be operated on, it would be desirable to have a blanket thrown over the parts, or something to prevent a chill.

When a person is not accustomed to operating with the Magneto-Electro Machine, it is best to commence with a very moderate power. Let him go over the parts to be operated on with a moderate power, and increase it by degrees till he ascertain how much the patient can bear in the different parts to be operated on. In some parts of the body a much stronger power can be borne than in other parts. Towards the root of the tongue a considerable power can be borne, whilst, on the contrary, at the end of the tongue the same intensity would be insupportable. A strong power can be borne when applied to the back of the neck, whereas a comparatively weak power applied to the mastoid muscle on the side of the neck, produces very sudden and violent contraction. Hence, in operating, the armature at the end of the box has occasionally to be moved backward or forward as the power may be required. This is easily regulated by a little care and attention.

As a diagnosis of disease, the Magneto-Electro Machine is unrivalled. By the aid of this invaluable auxiliary, we not unfrequently find that pain may be felt in a part remote from the true seat of the disease, in which case, when the conductor is placed on the part where the pain is felt, the usual indication of disease is wanting, but by passing the conductor over different parts, the true locality of the disease and the real origin of the pain will soon be discovered.

MAGNETO-ELECTRICITY

MEDICALLY APPLIED.

ANY one who will take the trouble to examine the periodical medical literature of the present day, will find it prove a very *placet*, in which many gems may be gathered, in regard to Magneto-Electricity as a therapeutic agent in every disease to which humanity is liable. The great mass of people, however, even if they had the inclination, have not the leisure or opportunity to delve into the rich mines of medical science recently developed, and must, therefore, be content to receive such few grains of intelligence in regard to Magneto-Electricity as may be incidentally thrown in their way. Accordingly, I deem it advisable to present, in this connection, the opinions of a number of the most eminent of the medical profession who have thoroughly tested the value and efficacy of Magneto-Electricity in the treatment of a large variety of diseases. I at once refer to the action, effects and phenomena of this agent as developed on the animal economy.

The world-celebrated Dr. Abernethy, in his lectures, after lauding this agent highly in a great variety of diseases, remarks: "Electricity is a part of surgical practice that may be considered *unique*. All other means operate on the surface, but electricity will pervade the very centre of the body."

E. W. Tuson, Esq., F. R. S., in the London Medical Times, says: "Medical agents will do much in the treatment of disease, but Magneto-Electricity will do more, and produce a more decided result, while a much more

permanent advantage may be looked forward to from its proper application."

M. Matteucci, as translated by Dr. Pereira, in the Edinburgh Medical and Surgical Journal, makes the following observations: "Of all irritating agents the electric current is the only one which possesses, for a long space of time, the power of exciting the excitability of the nerves when they have become much enfeebled by excessive stimulants."

Dr. Tracey E. Weller, in the Medical Times, says: "In that common and most distressing complaint, *prolapsus uteri*, I have found Magneto-Electricity a highly useful agent."

Professor Wilson Philip believes that "Magneto-Electricity is capable of performing all the functions of the nervous power, properly so called."

Pfaff, Ahrens, Humboldt, Davy, Faraday, and others, found, by their curious experiments, that chemical affinity and electricity are identical powers, and that in Rheumatism the electricity of the body is at zero, but becomes manifest again as the disease subsides.

Dr. Dewees, of New York, remarks: "In the most frightful cases of *tonic spasm*, from utero-spinal causes, the continued current has in my hands proved a perfect charm, as witnessed by our distinguished townsmen, Drs. Mott and F. U. Johnson."

In regard to paralysis of the bowels, and the means proper to be used to overcome the constipation that results therefrom, the views of M. M. Emery, Cloquet, and Dubois, as embodied in their reports to the French Academy, are too important to be overlooked. They state that by passing the current from the mouth to the anus, there was produced a sensation of *heat* at both ends, and *motion* through the whole extent of the alimentary canal, which motion continued after the cessation of the current, followed quickly by a fecal evacuation.

Other physicians have produced similar results.

But it were useless to cite cases in proof of the value of Magneto-Electricity as a Curative Agent in any disease whatever. There is probably not a solitary excep-

tion, where this agent may not be applied with signal benefit. I would, however, not be understood as proposing Magneto-Electricity to the exclusion entirely of other curative means, but I do certainly hold it preferable not to punish, by *internal* drugging, a man's stomach for his bodily infirmities, if an *outward* application of Magneto-Electricity will answer the same or a better purpose.

Certainly, then, it is the duty of every friend of his race, every Christian, humanitarian, and philanthropist, to do all that can be done to hasten on the millennium of joy and comfort to the millions of people who suffer and groan from the ten thousand maladies incident to their ignorance of the elementary principles of animal life, and of the means to keep all life's functions in harmonious working. *Medical Electricity* seems to be the means God has designed for such glorious results.

Accordingly, the author need make no apology for an honest effort, however feeble, to introduce to the community and to his co-laborers in so noble a profession as the Healing Art, a more extended application of an old remedy or agent, in a new form, in many cases of diseases wherein its efficacy may have been considered doubtful, by reason of the *faulty* construction of the Magneto-Electric Machines formerly employed—inasmuch as by the instrumentality of improved facilities in applying the Magneto-Electric current, there is no remedial agent that can be substituted of equal efficacy, or certainty of relief and cure in every form of disease.

LIST OF DISEASES

In which Magneto-Electricity may be applied with Beneficial Results or Certainty of Cure.

MANNER OF APPLYING THE MACHINE.

Asphyxia.—Where life is held in suspense or persons appear as dead—from whatever cause, as drowning, poisoning, a blow on the head or stomach, dead drunkenness, &c.

Apply the current from the nape of the neck to and over the stomach and heart, under a moderate power at first, gradually increasing it until signs of life are observed. No measure should be neglected calculated to keep the patient warm and dry. When the patient recovers sufficiently, give him a tablespoonful of warm water and brandy every few minutes until the skin becomes warm and moist, when entire rest and quiet will only be further necessary for his recovery.

Apoplexy.—Wet the hair of the head to the skin, and then apply one pole to one side of the head, and the other pole to the opposite side. Begin with the weakest power of the machine, and increase to what the patient can properly bear. Repeat the operation fifteen minutes three times a day.

Asthma.—Magnetize the chest by placing the positive pole (the one containing the weakest force) over the cartilage of the seventh rib, and the other about the middle of the left side of the neck, under a moderate power of the machine, from five to fifteen minutes, several times a day.

water, if convenient,) then apply the left hand conductor over the liver, the whole belly, and down the back. A moderate power, half an hour every day.

Ague and Fever.—The patient, just previous to the hour of anticipated attack, should place himself under circumstances to induce sweating. Place the feet and drop the right conductor into warm water; then move the other conductor over the whole body, taking care it is not chilled by the air, for half an hour.

Arthrodynia.—See Rheumatism.

Bronchitis.—Place the right conductor to the back between the shoulders, and pass the other over the whole surface of the chest and throat, under a gentle power gradually increased.

Bilious Complaints.—Apply the left conductor over the liver, stomach, and belly, generally, and pass the right conductor for a minute or two down the back. Afterwards place the right conductor under the feet, and pass the other over the back, liver, and stomach for several minutes longer. Operate once a day with a moderate power.

Bruises.—See Sprains, &c.

Barrenness—Impotence.—“The same reason,” (says Smee,) “for which Electricity is valuable in Amenorrhœa, might lead us to expect that it would tend to rectify the state of barrenness in the female; for, by causing it to act directly upon the uterus, it is calculated to increase the supply of blood, and thus remedy the deficit.”—*Elem. Electro-biol.*, p. 152.

In Barrenness, the right conductor to be applied to the lumbar vertebra, the lower part of the spine, and the left to be introduced into the vagina so as to touch the os uteri, the mouth of the womb. This conductor may be made of a piece of silver or copper wire of proper thickness, covered with cotton thread, and varnished with sealing-wax varnish, or with gutta-percha. A small piece of fine soft sponge is to be firmly fastened to the end of this in contact with the bare wire, which, at the point where the sponge is to be attached to it, is not to

Aphonia, or Loss of Voice.—Hold the positive or weakest pole in one hand, and with the negative pole, or the strongest power, pass the current in all directions through and over the throat.

Angina Pectoris.—Place one pole on the nape of the neck, or on the spine just below the shoulders, then pass the other pole over the chest, with a moderate power gradually increased and continued some little time after the spasm has ceased.

Abortion.—To arrest the flow of blood where abortion has been practised, place one conductor to the small of the back at the point where the pain or aching is felt, and introduce the other (insulated) into the vagina immediately into the cavity of the womb. A cautious application of a weak current will be found of great value. Pregnant women should be cautious never to allow the current to traverse the uterus, as a miscarriage would take place.

Anæsthesia, or Loss of the Sense of Touch.—Hold the positive pole, or weakest power, in one hand, and apply the other to the opposite foot. After turning the crank a few times, reverse the position of the positive conductor to the other hand, and the negative pole to the other foot.

Anasarca.—For Dropsy, there must be a general application of the current to the system. Begin by placing the right conductor under the feet, then pass the left conductor over the stomach, liver and bowels, down the legs and back, the latter being done by an assistant holding the left conductor in his right hand. Use a moderate power, about half an hour every day.

Amenorrhœa.—*Interruption or Retention of the Menses.*—Introduce one conductor, covered with India Rubber or some insulating substance, into the vagina in a manner to act only on the uterus: then move the opposite pole gradually over the lower part of the stomach, to the thighs, loins, and surrounding parts.

Affections of the Liver.—Place the right hand conductor under the feet, (the feet in a dish of warm

be insulated or covered with the thread, otherwise, the electro-magnetic fluid could not pass from the conductor to the sponge. The sponge to be wet. The power to be moderate, and to be applied at short intervals during half an hour, once a day. The left conductor may also be applied externally over the lower part of the abdomen.

For Impotency the right conductor is to be applied to the genital parts and about the lower part of the abdomen. The left one to be applied to the organ of Amative-ness, or on the neck near the back part of the head. Then vary, by applying the right conductor to the genital part, and the left to the lumbar vertebra. Power moderate, from ten to twenty minutes—once a day.

Chorea, or St. Vitus's Dance.—Place one pole in both hands of the patient, then take the other pole and apply it to the spine, chest, and abdomen. Finish by placing the feet of the patient in warm water, the operator holding one pole in the water and the other to about the middle of the back of the patient. Application fifteen minutes every day, with a power gradually increased in strength.

Catlepsy.—Apply one pole to the nape of the neck, and the other over the stomach and to the soles of the feet.

Chlorosis, or Bloodlessness.—A general application of the current should first be made. The patient should then hold the conductors, one in each hand, and let an assistant pass the current over the stomach, lungs, bowels, and organs whose actions may be deranged.

Constipation.—Place the left conductor over the spinal nerves, or about the middle of the back; then with the other conductor make downward passes from the pit of the stomach over every part of the bowels, or intestines. Application as strong as can be borne, once or twice a day.

An immediate fecal evacuation may be produced by placing the left hand conductor (which is the negative or strongest power) to the end of the tongue and the other to the anus, beginning with a very gentle current and increasing it gradually to what can be easily borne.

The effect of this mode of application is sometimes instantaneous—the paralysis being at once removed by increasing the electrical action on the alkaline secretions of the mucous membrane.

Critical Periods, or turn of Life in Females.

—Place the right hand conductor on the middle of the back, or over the tender or aching spot, then pass the other over the groins, the forebone, between the front limbs, and by an insulated conductor to the womb itself. Place the feet then in water as hot as can be borne, with the strongest pole dropped in the same, the other being held in both hands. Application from five to fifteen minutes a day, under a power to suit.

In Leucorrhœa, Fluor Albus or Whites, magnetism is applied as above, except that the vagina conductor should not be insulated.

This method is also to be pursued in Immoderate or Painful Menstruation and Uterine Floodings.

In Hysterics and Spasms from Uterine irritation, place the feet and the left hand conductor in a hot bath, and hold the other conductor in both hands, the power being strong as possible.

If the spasms affect the spine, place the right hand conductor to the nape of the neck and pass the other down the whole length of the back. If this application should seem to increase the spasms, reverse the conductors and proceed as before till the spasms are soothed.

If the muscles of the abdomen are much contracted, carry one pole over the bowels, after having passed it down the spinal column, holding the right conductor in the left hand. Reverse the action if immediate effect is not perceived. Power to be strong but not violent, for a few minutes.

Colic.—Magnetize as in Constipation.

Cancer.—Place the positive or weakest pole to the nape of the neck and the other to the swelling, using a strong power several minutes, each application once a day.

Catarrh, Chronic.—Place the right hand conductor to the hollow of the neck and the other to the top and side of the nose.

stomach and bowels, under a moderate power, twenty minutes twice a day.

Dropsy.—See Anasarca.

Deafness.—For Deafness and other diseases of the ear, let the patient hold the negative conductor in his hand. The operator should then take the positive conductor in his right hand, holding the metallic part of it between his thumb and fore finger. Let him, while holding the conductor in this manner, introduce the ends of his two little fingers into the patient's ears. Power light, during three minutes, once a day.

Erysipelas.—Wet the part with salt water or muriate of ammonia dissolved in water; then let an assistant carry the right hand conductor, with a good power, over the location of disorder, while the other pole is held in both hands. Operate from five to fifteen minutes once a day.

The same method is pursued in every eruption considered Serofulous or Erysipelatous.

Epileptic Fits.—Let the right hand conductor be placed with the feet in a dish of warm water, while the operator, holding the other conductor in his left hand, applies his right on the patient's head, the hair being wet with diluted spirits. Power moderate, and for a few moments only. Then let the left conductor be applied generally over the spine, stomach, liver, and abdomen. If the patient be a female, and there should be any apprehension that the cause of fits proceeds from any uterine derangement, obstruction, or irregularity, the left conductor is to be applied to the mouth of the womb, while the right conductor is to pass from the neck down the spine. Power moderate, a quarter to a half hour every day, during the interval of fits.

Eye, Diseases of.—In some of the diseases of the eye, especially those which depend upon a weakness of the nervous or absorbent powers, electricity as a remedy is invaluable. One of these is Amaurosis, which consists in an impairment and loss of sensibility of the optic nerve and its ramifications—a most dreadful disease, as it renders the patient perfectly helpless, and de-

Croup.—Place a pole on each side of the neck under the jaws. The larynx will then expand with great force. After which place the left hand conductor on the one side of the larynx, and make passes down the neck with the other.

Cholera, Asiatic, &c.—Place one pole along the spine and move the other over the abdomen, in strong power. This will generally soothe the spasms and promptly reduce the inordinate discharges from the abdomen.

Cholera Infantum.—Place the negative or left hand conductor to the middle of the back, and the other over the entire surface of the abdomen. If there be tenderness in the small of the back, reverse the poles.

Consumption.—Let the patient hold the right hand conductor in both hands while an assistant passes the other covered with a wet sponge from the nape of the neck down the whole length of the spine under as strong a power as can be borne, for five minutes, after which carry the same pole over the stomach, chest, and bowels, for about the same length of time. Operation once or twice a day.

Diabetes.—Apply the current directly to the kidneys, and across the small of the back, and all about the hips. Then apply the left hand conductor to the region affected, holding the other pole in the right hand. Afterwards reverse the poles. Operate fifteen minutes every day.

The same method is pursued in the treatment of Bright's Disease of the Kidneys.

Debility, Genital.—See Genital Debility.

Delirium Tremens.—Apply the poles under a very gentle power to the head for a few moments, having first thoroughly wet it to the scalp. Then place the right hand conductor to the nape of the neck, while the other is made to pass down the spine, and over the chest, bowels, and limbs, under a power gradually increased to the fullest strength the operator (not the patient) can bear.

Dyspepsia.—Place the right conductor on the spine at the middle of the back, and move the other over the

pendent upon others. If, in its forming stage, some application could be made directly to the diseased nerve, which would stimulate it to renewed action, and aid it in recovering its pristine strength, vision, the most valuable of all the senses, might be preserved. Such a desideratum we believe we have attained by means of our *Eye Bath*, an instrument invented by us for this purpose. By filling this bath with water, and holding it to the eye, and applying the opposite pole upon the back of the neck, we can cause a magnetic current to pass directly through the optic nerve. The operation is a perfectly painless one, and the improvement is rapid.

ATHENOPIA, or weakness of the eyes, is of somewhat similar origin with Amaurosis, and, as usually treated, is very difficult of cure. We can confidently recommend our method of treatment as the best, safest, and surest. The application is to be made in the same way as the preceding.

CATARACT consists in an opacity of either the crystalline lens, or of its capsule. It is of two varieties,—the soft, which usually attacks young and middle-aged people, and the hard, from which elderly people most commonly suffer; it is of very slow growth, and its first symptoms are a dimness and cloudiness of vision, and, as the disease progresses, a total inability to distinguish objects. In the forming stages, electricity is a valuable means for effecting a cure. The manner of applying the machine the same as in Amaurosis.

Fistula in Ano.—Let the patient hold a pole in each hand, for ten minutes, to produce a general effect upon the system. Then apply the poles directly to and around the part in every direction for ten minutes more. Once a day.

Genital Debility.—Take the poles one in each hand, and turn the crank of the machine about forty revolutions. Next hold the right pole in the right hand and place the other under the testicles. Turn the crank thirty times more. Change the pole in the right to the left hand, and turn the crank the same number of times. Take now the pole from the testicles and place it under

the left (naked) foot, and change the pole in the left hand to the right, and turn the crank as before. Change again the poles, the one from the left foot to the right, and the other from the right to the left hand, and turn the crank thirty times. And so alternate the poles in the same manner over again, from hand and foot to foot, &c., two or three times. Finish by placing the right conductor under the testicles and carrying the other down the spine and over the chest. Power mild at first, the strength increased gradually to as much as can be borne. Operate every morning on rising from bed.

Gangrene.—Pass a moderate current through the whole system—particularly about the seats of vitality, as the stomach, heart, lungs and spine. Repeat several times a day.

Headache.—Wet the hair thoroughly with water, then place the right conductor under the feet, and apply the other to the crown of the head, under a very gentle power, for a few moments only. Once a day.

For Headache arising from a disordered stomach, place the right conductor on the spine directly back of the stomach, and move the other over the stomach, with a moderate power. Finish by placing the right conductor under the feet, and passing the other over the head, the hair being wet with water.

Observe. In all applications of magneto-electricity to the head, it is best for the electric fluid to be communicated to a patient through an operator's hand.

Hemorrhage from the Lungs.—Place the right conductor to the spine below the nape of the neck, and with the left make quick passes all over the chest, in a downward direction, under a gentle power gradually increased to a good strength. Let the patient drink freely of salt or alum water. Salt water will act on the bowels and carry the circulation through its proper channels. Also bandage slightly the arms above the elbows and the legs above the knees with handkerchiefs or towels. The hemorrhage will usually cease in a few moments by this treatment. Give an aconite powder or pill to soothe the nervous system.

arm. After this let the left conductor be placed on the facial nerve, where it passes across the under maxillary bone, and the right conductor be passed over the face. In other words, let the left conductor be placed on the under jaw-bone near the ear, and the right one be passed over the face. Let this be done alternately on both sides of the face. Power pretty strong; to be continued for a few minutes or longer. Finally, let the operator pass both his hands over the patient's head, face, neck and arms, during ten minutes. The passes to be made downward. Operations once or twice a day.

Neuralgia.—Place the right conductor under the feet, and let the operator take the left conductor in his left hand and apply his right hand to the part affected, under a moderate power. Afterwards let the left conductor be carried down the whole course of the spine, the other conductor being held in both hands of the patient, under a strong current. Operate for half an hour once a day.

Paralysis Partialis.—In this species of Paralysis the left conductor should be applied below the affected muscles, and the right conductor above them. If, for instance, it be in the arm, the patient should have the left conductor applied alternately to the palm of his hand, to his wrist, and to the back of his hand; while the operator should apply the right conductor, first on the neck just back of the clavicle or collar bone, then on the brachial nerves on the under part of the arm, a little distance below the shoulder joint.

This method is to be adopted at each time the machine is to be applied. Operation once a day. In some cases not a very strong power is required. In other cases not quite so strong, varying according to circumstances, as spoken of in the General Remarks on the manner of applying the Machine. Time—from ten minutes to half an hour.

Paralysis Hemiplegica.—Left conductor to be applied to the soles of the feet. Right one to the whole course of the spinal column, beginning at the neck and making the passes downward. Let it also be applied to

Hip Disease.—For the hip disease (*coxalgia*), let the right conductor be placed under the feet, and the left one be applied down the spine, over the liver, and over the affected parts; power moderate, during from ten to twenty minutes, once a day.

Joints and Limbs, White Swelling.—Move both poles over and around the swellings, whether in a sound or ulcerated state. A magnetic plaster should also be applied to the swellings.

Labor, or Parturition.—Magnetism may be applied by putting a wet sponge in the hollow of the handle of the right conductor, and placing it (the sponge) to the lower part of the spine, or to where the pain is felt in the back; then place another wet sponge in the left conductor and pass it over the pubes, or front and lower part of the abdomen. The current may also be passed over the womb or uterus, the right conductor being placed to the lower part of the spine. Be careful and pass only a very weak current through the head of the child. Begin the general application by a weak power and gradually increase it to a tolerable strength.

Locked-Jaw.—For the Locked-Jaw, let the right conductor be placed under the feet. Operator takes the left conductor in his left hand, and first applies it on the crown of the head, and the temples of the patient, with his right hand, the hair being made wet with a sponge dipped in spirits and water. Make the passes from the head down the whole course of the spine, during a few minutes. Then make them from the back of the neck down the spine, with a much heavier power; also over the liver, spleen, and stomach. After this, let the conductor be taken from the feet and be placed in the patient's left hand. The left hand conductor is then to be placed immediately behind the clavicle or collar bone, for a few minutes. It is then to be passed over the brachial nerves on the neck near the cervical vertebrae. As soon as the Electro-magnetic fluid touches these nerves, it will be known by the strong contractions which will agitate the arm. This may be continued for some minutes. The same operation is then to be performed on the other

the liver, stomach, spleen, and over the whole of the parts affected.

Operation once a day. Power strong. Time—from twenty minutes to three quarters of an hour.

Paralysis Paraplegica and Paralysis Venenata.—The conductors to be applied in the same manner as for Paralysis Hemiplegica.

Rheumatism.—Rheumatism is distinguished by the terms Acute and Chronic. The Acute is preceded by shivering, heat, thirst, and quick pulse, succeeded by pain, which soon settles in the joints. The Chronic Rheumatism is characterized by pains in the joints, unaccompanied by heat. Of this kind is the Lumbago, or Rheumatism in the loins; Sciatica, seated in the hip; Arthrodynia, in the joints.

In Acute or Inflammatory Rheumatism, place the feet and the right hand conductor in a bath of warm water, and let the other be applied generally over the stomach, liver, spleen, and down the spine, at a moderate power for half an hour.

In Chronic Rheumatism, place the feet and the right pole in warm water, and apply the other to the parts affected and the body generally, under a strong power, half an hour, three times a day.

Sore Throat.—Under this head is included the croup, the quinsy, inflammation of the pharynx, of the œsophagus, the mumps, and putrid sore throat.

Apply the conductors generally to the throat; then place the right conductor under the feet and the other to the part affected, the power quite moderate, five minutes, once a day.

Scrofula.—Apply the right conductor to the part affected, and the other to the spine, at a point nearest to the disease, at a moderate power for fifteen minutes, once a day. Meantime the application may be varied, by placing the right conductor under the feet, and applying the left to the seat of disease during five minutes.

SPINAL DEFORMITIES.

Lateral Curvature. — FIG. 1 is the form of a cast taken at the commencement of treatment of Miss M. E. V. S., aged 13 years. This cast was taken May 24, 1846, showing a Curvature of three years' standing, in



FIG. 1.



FIG. 2.

which there was a thin muscle, and all the physical forces in a low state, and flesh thin, as will be observed by the projections of the spinal column and shoulder blades.

FIG. 2 is the form of a cast taken of the same case, after eight weeks' treatment, on the 25th of July following, showing a perfect form, good chest, and plump muscle. This case forcibly illustrates the advantage and benefits of an early attention to and treatment of these cases of deformity, at a time when a cure may always be looked for with confidence.

A Case of Angular Distortion. — FIG. 3 is a profile or side view of a case of Angular Distortion of the spine, drawn from a cast taken at the time the case was received for treatment. This distortion originated



FIG. 3.



FIG. 4.

FIG. 4 is a back view from the cast taken of the same case, A. B., at the same time, these two cuts showing the entire shapelessness of the body to the human form.

FIG. 5 is a drawing of a back view of a cast taken from the same case, A. B., after three months' treatment by the author, showing very evident improvement in form and figure, with a good beginning to the development of muscle.

FIG. 6 is the form of a cast of the same case, A. B., taken after the patient had been with us about seven months. Two and a half months of that treatment was interrupted by illness, and the spinal treatment and exercises had to be suspended on account of it, so that

there were, in fact, but four and a half months of spinal treatment spent on this case, to bring about the changes of form, developing a figure of human shape, and some



FIG. 5.



FIG. 6.

strength of muscle. We are not able to show a cast of this case as cured, because the patient and family were in very low circumstances, and depending on the charity of their friends, and when we came to this city, the patient could not come with us.

Lateral or Bilateral Curvature of the Spine. — FIG. 7 is the form of a drawing of the first cast taken of Miss M. B. B., of this state, aged sixteen years, when she came for treatment. This is a Latetal Curvature of seven years' standing, and the following truthful delineation shows how thin and emaciated is the figure in this form of Scrofulous disease, and how attenuated are all the muscles, giving evidence of great vital and physical debility of the whole system, and all its organs and apparatus.

FIG. 8 is an engraving of a cast taken after four and a half months' treatment of Miss M. B. B., showing a beautiful form, full and strong figure, well developed

chest and muscle, and these results are always accompanied with good vigorous health. These physical changes, that are so obvious in this case, are absolute essentials to a permanent cure that will remain, with



FIG. 7.



FIG. 8.

good health; and any thing short of such a result, is comparatively good for nothing, for it only raises the patients up for a time, to let them fall again into hopeless despondency and misery, if the treatment be not persevered in until a cure is effected.

Spinal Complaints. — For Lateral Curvature, let the right conductor be placed to the part that is swollen, and the other to the emaciated part. For instance, if the spine curves toward the right shoulder, its lower part will be found curved to the left. In such case, apply the right conductor to the right shoulder, all over the raised or swelled muscles, and the left conductor to the left shoulder, and to the back between the shoulders. Vary by placing the right conductor to the left side of the curve of the spine in the lower part of the back, and the left conductor on the right side of the back or curvature. Operate half an hour daily, beginning with a moderate power, and increasing to what the patient can bear.

In other diseases of the spine, the right conductor should be placed under the feet, and the left one passed down the whole curve of the spine. The liver should also be operated on, by applying to it the left hand conductor, the right one under the feet, at a moderate power during five minutes.

Strains, Sprains, &c. — Place the feet and the right conductor in warm water, and apply the other to or near the lameness or swelling. Or let both poles be applied to the part in a manner to pass the current through it in all directions. Gentle power gradually increased, and the operation from ten to twenty minutes, once a day.

Toothache. — Wrap a silk handkerchief, a piece of dry muslin, or any insulating substance round the largest end of a teaspoon, and hold the uncovered smaller end directly on the tooth; then place the right conductor to the part of the spoon over the tooth, while an assistant places the other on a facial nerve, on the lower jaw, just below the ear. Power moderate, from five to twenty minutes. Sometimes a cure is effected instantly; at other times it may require a strong power for more than an hour to ease the pain.

Ulcers. — Take the right conductor in both hands, and let an assistant apply the other over and about the ulcer. Or place the feet and the right conductor in a bath and carry the other over the ulcer. Moderate power, fifteen minutes daily.

Verzeichniß der Krankheiten,

in

welchen Elektro-Magnetismus mit wohlthätigem Erfolg oder Gewißheit der Heilung angewandt werden kann.

Art und Weise die Maschine anzuwenden.

Asphyxia. — Wenn der Lebensodem stockt oder wenn man wie tobt aussieht — sei es aus irgend einer Ursache, als Ertrinken, Vergiftung, durch einen Schlag auf den Kopf oder Magen, totale Betäubtheit, u. s. w.

Applicire den Strom vom Gesichte aus nach und über den Magen und das Herz, zuerst mit gemäßigter Kraft und nach und nach stärker, bis sich Lebenszeichen bemerkbar machen. Kein Mittel darf verjätzt werden, welches darauf hinführt, den Patienten warm und trocken zu halten. Wenn der Patient sich hinlänglich erholt hat, gebe man ihm einen Eßlöffel voll warmes Wasser und Brandp, jede paar Minuten, bis die Haut warm und feucht wird, wo also dann nur häufige Ruhe und Stille zu seiner Genesung erforderlich sein wird.

Apoplexy (Schlaganfall). — Bewege das Kopfhaar bis auf die Haut und dann applicire einen Pol an die eine Seite des Kopfes und den andern auf der entgegengesetzten Seite. Mit der schwächsten Kraft der Maschine fange man an und verstärke dieselbe bis zu einem Punkte wie der Patient es wohl möglicher Weise ertragen kann. Wiederhole die Operation fünfzehn Minuten lang, dreimal des Tages.

The Wonders of Magneto-Electricity.

A LUMINOUS LETTER

From D. G. Green, of Philadelphia.

Philadelphia, April 12, 1852.

My Dear Sir: Having for a number of years instituted experiments with Magneto-Electricity, both on the human body and on some of the lower animals, I have had abundant opportunities of testing a number of the various machines that have been devised for therapeutic purposes, in many forms of diseases. I have found the use of them all more or less complicated with difficulties, some to a degree that rendered them of comparatively little value to physicians as an adjunct instrument of the Curative Art. Without designing to exhibit any egotism or professional display, allow me to allude briefly to the Physiology of Magneto-Electricity as a curative agent, and to explain something of the impractical nature of the electrical machines formerly employed, in contrast with the simple and safe, yet highly philosophical apparatus recently introduced by you to the materia medica of our country.

Although electricity and magnetism are physical forces which have been known from time immemorial, it has been left to the philosophers of modern times to develop, in some degree, the marvellous properties of these two

imponderable substances. One illustration of this is in the wonderful utility of the Electro-Magnetic Telegraph: now so familiarly known.

The Leyden battery and electrical machine were the first instruments employed for therapeutic purposes in various diseases, and for the resuscitation of persons apparently dead, from drowning, or asphyxia otherwise produced. Their cumbrous form, however, rendered them impracticable to be carried by the physician from patient to patient, while the violent effects of their operation soon drove electricity out of the materia medica altogether.

The discoveries of Prof. Galvani, of Bologna, in 1790, and those of Prof. Volta, at a subsequent period, led to a gradual elucidation of the phenomena of electricity and magnetism, and caused them again to be resorted to for therapeutic purposes.

The Italian naturalist Matteucci, was the first to demonstrate the existence of electricity in the living organism. According to his doctrine, however, it is the *muscles*, and not the *nerves*, that are the vehicle of electric action.

Dubois Raymond, on the contrary, has triumphantly proved that electricity is contained in every part of the nervous system.

The experiments by this philosopher, and also those by Professors Wilson, Ure, and others, all show that the nerves are capable of producing all the known phenomena of electricity, even the deviation of the magnetic needle by means of a multiplier. Hence their rational conclusion that the nervous influence of the animal economy is identical with electricity.

This electrical action is not simply an indifferent adjunct, but an essential element or cause of the internal movements or operations of the animal organism.

According to Professor Hassenstein, the central organs of the nerves are the immediate causes of such action, and the nerves are the carriers of electricity throughout the whole organism. Hence, the body has come to be regarded as a *Voltaic pile*, the *surface* of the body constituting the *negative* and the *central* or *anterior* organs of the *positive* pole of the pile — the first

yielding an acid and the other an alkaline fluid or substance.

Of course, if the equilibrium of the electric or nervous influence can be kept up, or regularly maintained, there will be neither pain nor disease. In other words, in the same manner as the action of these electricities which now attract and then again repel each other, is kept up in the human pile in a definite or natural polar direction, so is the electrical action maintained in the central nervous organs and in the nerves themselves. This equilibrium of the electric force is what constitutes vigorous and regular health. When this regular action or flow of the electric or nervous influence is interrupted or impaired in any manner whatever, there must necessarily be diminished vitality, and, by consequence, more or less pain, indicative of disorder or disease. This action ceases after death, for the reason that the positive and negative electricities unite, and being thus neutralized of their antagonistic principles, the central organs are no longer able to separate them.

Magneto-Electricity, when properly applied, is found of great value in bringing back or restoring any diseased organ to its normal condition; yet it will not do to employ it of such power as to destroy the organ from which we wish to remove any abnormal accumulations. Care must always be observed never to carry the action of the organ beyond the condition of health.

There is one important matter that lies at the foundation of all correct and scientific use of this agent, that seems to have been entirely overlooked. This is the kind of galvanism, or magnetism, or electricity, proper to be employed — whether of the intense kind, or that which is comparatively without destructive force. As those who are not practically acquainted with the subject may not perceive wherein this distinction consists, I will briefly refer to the views of a few leading chemists on this point.

Prof. Silliman, speaking of quantity and intensity, states the remarkable fact, that no matter how much we may increase the number of members of the voltaic circle, the quantity of electricity passed in the current, is

equal only to that evolved by a single cell; although the current which passes through a number of cells acquires an intensity exactly proportionate to the number. Thus, no single cell, however large, would ever afford electricity of a tension sufficiently high to decompose water, or even give the slightest shock to the animal frame.

Prof. Smee says that a hundred batteries may be conjoined, but no more electricity is obtained; for the same amount of electricity will pass if only one cell is used.

The intensity, as shown by Faraday, is in proportion to the number of plates, while the quantity is dependent upon the extent of the plate. This same position is taken by Sir Humphrey Davy.

Dr. Gray says that quantity refers to the amount of electric fluid set in motion; tension, or intensity, to the energy with which the fluid is impelled.

While authors have been thus plain in pointing out the source of the destructive element in galvanism, &c., those who have invented, manufactured, or professionally used electric or magneto-electric machines have not kept such distinctions clearly in view. Hence, every apparatus has been found powerful to destroy or decompose. Of course they could impart no healthy energy to the part to which they were applied.

In the selection of an apparatus for medical purposes, the object is to secure one that has but one element, and that element capable of being diminished or increased at pleasure. It should be so arranged that the part to be acted upon may be kept under the continued influence of the agent, for any desired length of time, in order to avoid the reaction and exhaustion which follow when a stimulant has been powerfully applied for a short time and then suddenly withdrawn. The apparatus, moreover, should be so simple in its construction as not to be liable to become deranged when not under the eye of a physician.

Thanks to the scientific progress of our age, and the intelligence of clever mechanics, we have at length a Magneto-Electric Machine so simplified as to be entirely available for therapeutic purposes, and which no sensible or judicious physician can object to employ in most forms

or emergencies of disease. I allude, of course, my dear Dr. Dickinson, to the admirable apparatus recently introduced by you to the community. I unhesitatingly say that it is literally the long-wished-for desideratum of the Medical Art discovered at last. The curative effects of this new Magnetic Machine surpass entirely my expectations. I find it applicable in nearly every form of disease. Indeed, the most gratifying results are being daily developed in my professional employment of the machine — particularly in cases of paralysis, rheumatism, nervous affections, &c. I find that it may be employed with the utmost safety to the tenderest infant as to those of extreme nervous sensibility. The electric current passes so uniformly in one direction that no pain or disagreeable feelings are experienced. It has also the advantage of being without the dangerous complication of batteries and acids — which fact alone renders it superior to all others, while, on the score of neatness and cleanliness, safety and utility, I can cheerfully commend its use by every physician and family in the land.

Your friend and well-wisher,

D. G. GREEN, M. D.,
No. 156 Arch Street, Philadelphia.