AN INAUGURAL DISSERTATION

ON

Electricity

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BY

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There is no science, in the early history of which, the unknown science will rise more of profound mystery or dash and forbidding superstitious, than in that of Electricity. While at the same time, there is none other claiming in the history of its exhibitions or phenomena, as exhibited at the present day, or much of remarkable beauty, or contrives with so great show of succe for the palm of victory, when contracted with it, in the race for utility. Nor are there many departments of science which can lay a more just claim, or speak with more just pride of its benefits, than that of Medicine.

In other, though, that we may even get at the true present position and
most of the subject, it will be necessa-
ry to sketch hastily some points connec-
ted with its early history.

"The ancient Book philosophers were, I suppose, with the primary truth, that
Amber when subjected to friction, gave
forth a peculiar set of phenomena,
which from the Greek word ἀέρμος or for
Amber, friends wished our name Elektron
is derived. Speaking of Amber and its
genealogy, Tacitus remarks that the an-
cient inhabitants of Germania, from
whom the Romans procured it—i.e.,
qua natura, quaee ratio cognita, ut bas
basis, quaestione conclusiurum...... Di-
emus turne arborem esse intelligis
quia turne quaedam at quae alia
voluaria annamaliora palunque inter-
cent qua, implicata tumescere, nunc,
These first observations, recorded by Thales of Miletus, were soon followed by the observation that a stone called 
Sincere, the scouts of Acheron possessed the power to attract to it certain substances. With a few theories 
added to these facts, the knowledge of the ancients ended.

From this point, the history of Electricity begins with men finding from the charge of dull minerals, until the beginning 
of the sixteenth century; in the close of which, evidence was given by Otto von Guericke in the first Electrical machine. It was 
though in the eighteenth century, that the science was divested of its mysticism and brought to some useful aid in the 
acting of human affairs. Then, in 1700, 

England, in day of France and to her prince Franklin of America, entered first into a practical investigation of all its abstruse, and then upon absolute knowledge of fundamental facts, built up theories which have ever since divided at the same time they have claimed the admiration of the world.

The first general propositions upheld by numerous facts, were that this electric principle, fixed, or whatever it might be, dwelt in every possible of matter, and was produced alike in all by friction, it being exhibited more in one than in another, on account of the different conductive powers of bodies. At the same time these bodies were divided into two classes, producing different kinds of electricity, and receiving the name of positive and negative,
or vitriolic and inflammable, as one of the

other theories of the states in which it ex-

ists, was received. The hypothesis being

at last admitted, that the phenomena

connected with electricity, arise to be

attributed to the existence of a fluid, the

philosophic world was then divided by

another difficulty. Franklin and De Gay

each promulgated theories with reference
to the cause of its diverse actions, the

forms assisting the existence of one fluid,

the surplus abundance, or absence of which

was enough to account for these differ-

ences, while the latter contended for the

existence of two fluids, professing contrary
qualities. As space will forbid us entering

into the reasons accorded by each for his

opinion, we will be compelled to pause

here by. But a proper understanding
of the subject under investigation, will compel us to notice the necessity for the formulation of these theories. To be as succinct as possible about this necessity, we simply state the fact, that "bodies electrified in the different ways, attract, and in the same way, repel each other." This fact was one developing itself early in the history of the science; for we find in the earliest instinctial attempts, the fact recognized, that in the body rubbed, and in the rubber, two entirely different states of force produced, or developed.

Future investigations, much too numerous to be even glanced at here, authorized finally the including under this general term, the principle, giving to the Lord True its peculiar properties, that which affords the thunder storm its peculiar
attributes, as well as that recognized in
the highest inexplicable effects produced by
the actions of several animals. The sub-
ject thus occupying so much compli-
cated and extended territory, for purpose of
a philosophic investigation may well
be divided into five heads or subdivisions.
First, Magnetism; second, Frictional
Electricity; third, Chemical action or
Radiations; fourth, Thermal-Electricity;
fifth, Animal-Electricity.

The two classes to which we will be called
on to confine ourselves principally, if not
entirely, are Chemical and Animal-
Electricity. The latter requiring only
but a patient investigation at our hand
connected with which, will naturally
follow the stream of notice which the
former demand, at least as related to
the case of the present treatise. On making this decision and proposed separation, between Chemical and Animal Electricity, we are perfectly aware of the fact, that we treat upon Actions grounded, and propose a distinction, which many seeming positively deny. Let us search for truth, and then hold to it.

The great question to be decided is the commencement is, what part does Electricity play in the affairs of the Animal Economy. Does it, upon the whole, simply shine as in many objects of nature, picture in an animal's equilibrium? I would assert, with reference to those animals, in which electricity is exhibited in the most tangible form - The Horses, The Pythonus, and the Ostrichs Electricity. That the phenomena seen in those animals are
The effect of a principle, identical with that denominated by me, when proceeding from other sources, electricity, may now be considered a demonstrative fact. Since two of the most prominent features distinguishing Electricity—the shock to the animal frame, and the spark, have been completely and satisfactorily made out. As to whether these phenomena are consequent upon chemical action or proximal activity of the peculiar organ, immediately connected with them, is a question, which for the present, we choose to pass by without special discussion. As also the question, whether the organ superadded to these animals, so for the generations, or the mere accumulation of Electricity, it may be added also with reference to the source of the
identity of this, with electricity in general, that it has been found capable of producing the same chemical decompositions and sequins. It has been long admitted that electricity serves an important part as one of the four vital elements, both in the growth and development of plants and animals.

It will probably be left to future experiments to determine whether it does or does not perform some higher office in the animal economy; yet these can be no objection urged against citing here the results of such experiments already made. The attention of electricians was first directed to the connection of this subject with the ancient kingdom, from the accidental discovery of the effect of an electric machine upon the muscles of
a spok leg. It being known that the
motion of these muscles, being voluntary,
was solely dependent upon the stimuli-
us given them by the nerves, the question
immediately arose in the mind, as to the
utility of this fluid with the nervous
fluid. This led to further experiments, the
result of which, pointed even more strongly
to an identity. Animals have been
at various times fed on food appropriate
to their digestive organs, and then after
the lapse of several hours, the para-
or eighth pair of nerves, have been se-
ced, and the result was that the ani-
mal died, and examinations showed
the food in an undigested condition.
On the contrary when, after the sur-
ving of the nerve, electricity was bough
to bear upon the end of the nerve, an
examinations disclosed the digestion, and proper appropriation of the whole mass of ingesta. We have the experiments carried on with such transient results as these. The nerves supplying various limbs have been divided, and the members kept in their proper relations to the other parts of the body, by the passage of a current of electricity through the distal extremity of the cut nerve, and the same result has been attained, with reference to the nerves of sensation, as has just been shown in connection with those of motion. We have seen by means of this so-called fluid, satisfied the demands of the two sets of nerves, which perform such an important office in the animal economy. We ought to have alluded here, and not without utility too, to the effect of
the passage of an electrical current through a growing plant; the adaptation of the negative force to particular plants, and of the positive to others, with the probable analogy to the different and efficient arrangement and action in the nervous system. The fact has long ago been pointed out, that the rapid motion of any muscle in the animal frame, was the cause of the evolutions of Electricity; though the manner of accounting for it, has been to make the muscle itself entirely accountable for it.

With these facts we leave the imagination to inquire whether the cause may not be complicated. The luminosity as well as the sounds occurring in the animal frame, strikingly similar to the same exhibitions of electricity, are...
probably, as yet, too obviously made out, to justify us in setting them down as un-
mistakable evidences of identity. Yet we
have upon record at least one case, in
which sparks were constantly under fa-
orable circumstances from the body; when
within the motion of the muscles, nor
friction of the clothes of the patient was
conspicuous to account for the occurrence.

One other point of similarity, as our
means of investigation are capable of elevat-
ing, it may not be improper to briefly all-
vert to—the time of the passage of the
two priests. In neither case had any re-
finement of art been sufficient to dis-
cover that their influence, no matter how
great the distance, is not instantaneous.

The enumeration of these combined
facts, unless some counterbalancing wi-
A scheme can be brought forward to rebut these, would, to say the least possible, produce in the mind a strong suspicion of identity, between electricity and animal vital fluid. Justice, though, requires that the difficulties in the case should be allowed their appropriate bearing.

In reference to muscular contractions, it has been contended, that their sole cause resides in the opposite electrical states, excited in different parts of the muscle. The means of realising this action it might cause more trouble to satisfactorily explain, consistently with the known principles of induction, than might appear, at first view of the subject. But this objection is totally silenced by the second fact stated.

The opposite electrical state of the
different portions of the nerves might be made to account for the contraction of the muscles, but never, for the supply of the required nervous impulse in the digestion and appropriation of nourishment.

Again it has been said that the tying of a nerve, as electrically destroys its utility, as the separation or division of it. This it will be admitted, in accordance with the course of Electricity outside of the animal frame, ought not to be so. Yet how can one tell, what peculiar molecular conformation the passage of the current here is dependent upon, or what change the simple ligature may cause to transpire. The same course of reasoning is equally applicable to the objection, that Electricity can never
section to the nerves their power, after it has been once lost in death. Yet we think experiments show that it accomplishes little short of this. Obje-
cions arising from diseases, to which the nervous system is subject, in the present state of our knowledge, prove to be of little more avail than shooting straws against the wind.

We are perfectly aware that in leaving this subject loose at this point, there are remaining to be investigated fields totally unexplored by us. We are further conscious that the facts presented, great, in their legitimate ramifications, have been not only much more fully carried out, but at the same time much more scient-
tifically treated of, especially as relates to the somnolent and technicalities.
of Physiologic.

On passing from animal to chemical electricity, we do not claim to pass to a division, in its production entirely, or at all varying from the primary production of the department of the subject already treated of. Two objects have prompted this division. First, an acknowledgment of ignorance with reference to the absolute generator of animal electricity, rather than a wish to assert any particular theory or belief. Second, a wish to place the therapeutic effects of this agent in the most convenient form to be treated of. It is true that electricity derived from the machine, acts the same identical influence, as a seminal agent, in the multifarious diseases of the animal constitution, as Galvanism.
And the only reason for confining our investigations to this one source, arises from its being the one most conveniently assisted to by the musical man; and in fact the one in which is to be found the greatest number of apparatus prepared for his use.

It will be entirely useless and unnecessary for us to enter into any description of the many complicated machines in use for the production of the Palmarie or Voltaic current. The primary law upon which the conduct of the whole of these is founded, is that, "Whenever any two dissimilar metals are brought in contact, as copper, silver or platinum, in the time or issue, in an acid or saline fluid, a Voltaic current or current is produced..."
cly establishe.

to the Physiologist and scientific
Pathologist, the statement of the principle already referred to, would be sufficient
to settle in his mind at once, the character of disease to which this agent is
properly applicable. And indeed it would indicate but a poor attractive power in
the brains of any man, who would not see at once the propriety of its use in
certain forms of disease, even though he had never heard of its application to
any of the numerous effects to which human nature is heir. Thus,
while it has been used as a panacea, the destructive effects of it have not been
seen, nor of a thoroughly trivial nature.
Yet the refusal of the scientific medical man to use it, on this account,
alone, acquires him in point of philosophic observations, and some judicious applications, to a love with the contemptible quack, who is willing to rush his remedies into all sorts of diseases, totally unaware of their nature or strict requirement. In truth, by such conduct as this, the professedly regular practitioners often convert himself into the mere quack. For it is the strict adherence to the principles of reason, as guided by scientific observations and experiments, and not an over-suspicious following of ancient formula and prescriptions which makes the regular physician.

If experiment has shown the capability of electricity to supply in any degree, even one of the multifarious departments
of the nervous fluid, these to this point must the mind of the intelligent practitioner be at once discoursed, with the expectation of securing it available to his art. How much more, when would this duty be demanded, yea insensibly demanded at his hands, when not only one, but a plurality of its offices are clearly demonstrated to be amply filled, and their duties satisfied, in its use.

Any disease dependent on nervous weakness, comes there directly and properly under the remedial effects of this agent: Such affections too, as are essential to the enjoyment and prolonging of life, in their requirements for relief or removal. Among which are to be numbered almost all those symptomatic diseases, consequent upon a functional...
in contrast with, and organic derangement of the important organs of life; that is, the understanding of functional derangement be correct, such as dyspepsia, indulgence, certain kind of corpulency, and probably some species of failure of action in the heart, and loss of any of the senses from want of nervous activity. Nor can we see any want of philosophy in the application of this agent to ease prisoned by opinion; all pathologists agreeing, so far as we are aware, that it is by a cessation of the vital organs to perform their appropriate offices, rather than any positively poisonous effects of the astride administration, which causes death. Such diseases as belly, dyspepsy, &c., come under the general rule mentioned, of course.
It is well worthy of note that the most of the diseases mentioned, are but slight ly under the systematic control of agents usually employed by the profession. The exchastic power of this agent, well established as it is, is worthy of record.

Having been in possession of an treatise bearing directly upon this subject, our ideas have necessarily been colored, and to a great extent ill-advised; yet while we feel that the subject adorns a more higher stage of investigation, we are at the same time persuaded that the facts mentioned may not be inapplicable to the points discussed.

It will be observed that our division of animal electricity, has been in many parts, entirely different from what that department has
been usually made to embrace, and that we have paid no attention to
memories, an important ingenuity in it. We have done this more for
the convenience of the arrangement of our dilatory ideas on
the subject, than because we held it to be strictly accurate, or proper
in any work which might be intended to be instructive upon the subject.
The glories of this science are but yet concealed in the bud. Future
investigations are yet to startle, by their splendor, the profession from its apathy
with deference to it.