

lady may have the like train of obstructions confined to her nose.\*) The same applies to any old gentleman's prostatic difficulties, if there is truth in humoralism, as I think, and as I shall endeavour to show more at length.

Bedford-square, Nov., 1843.

ON THE EVIDENCES OF  
TWO ELECTRIC FLUIDS  
PRODUCIBLE BY  
FOUR ELECTROSCOPES,  
THROUGH THEIR MANIFESTING THE INTENSITY  
AND NATURE OF EITHER FLUID WHICH MAY  
BE CONTAINED IN A BODY.  
WITH DEMONSTRATIONS OF  
PRIMITIVE MUSCULAR NERVOUS  
FIBRILS,  
AND  
REMARKS ON LIGHT.

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IF No. 1 of four electroscopes be excited by a piece of sealing-wax and a piece of silk, the gold leaves of the electroscope will diverge from one another. Let an electroscope No. 2 be excited in the same manner as the first, and the result will be the same.

Let the electroscopes No. 3 and 4 be excited by means of a glass tube and a piece of silk, the gold leaves will diverge from one another in both of them.

Now, by taking a discharging-rod, fully opened, so that one end shall touch the first, and the other end the second electroscope, the gold leaves of both will remain diverged; and if the same be done to the third and fourth electroscopes, the result will be the same.

But, if the discharging-rod be made to touch with one end the first and third, and then the second and fourth electroscopes, the whole of the gold leaves of the four electroscopes instantaneously collapse, thereby showing that the two electric fluids have neutralised each other in all the four electroscopes by their perfect union.

*The Evidences of the Two Electric Fluids by another Experiment.*—A very large electrical jar being highly charged, the contents were passed through the centre of an octavo volume of about one hundred leaves. Upon close examination of each side of the volume and of the centre leaves, it was found that several of the first outside leaves were completely bored through, but the holes diminished gradually as the approach towards the centre took place, at which point the leaves were perfect. But, upon examining again the outside leaves of the volume, they

had the appearance as if two opposite powers had rushed with great violence to meet each other, and that that violence had gradually diminished in strength as the force came nearer the centre to neutralise themselves by their immediate contact. In the year 1810 I made this discovery, and in 1841 the Professor at the Royal Polytechnic Institution did me the honour to repeat this experiment twice, and each time before company, and it was then acknowledged to be astounding.

On the Continent the existence of two electric fluids has, for a long time, been admitted. For, according to the theory of Messrs. Canton and Dufay, made perfect by M. Symmer, the two electric fluids have been proved to exist, for they can be separated from each other by chemical action, friction, compression, distillation, and change of temperature; indeed, they are made the moving powers in several manufactories on the Continent.

*Nature of each Electric Fluid.*—When the cylinder of an electrifying machine is made to turn, there is a decomposition of the several parts in immediate contact with the glass plate or disc,—first the atmospheric air, then the water which is in it, and the latent heat. The turning of the cylinder promotes the decomposition of the atmosphere accompanied with light and caloric; one of the electric fluids sinks into the earth, and the other is collected in the electrical jar.

I believe the composition of each electric fluid to be latent heat and light, and when they both unite together caloric and light are evolved by their perfect union.

The velocity of the electric fluid, according to the opinion of Professor M. E. Wheatstone, is estimated at 288,000 miles per second; and if this number were raised to the third power for a cube, that body would represent a mass equal to 23,887,872,000,000,000 of English cubic miles, either of positive or negative electric fluid; and if these two bodies were brought together, a perfect union and neutralisation would take place in one second of time, destroying every interposing body between them, proving their mighty chemical and mechanical powers.

#### THE MUSCULAR NERVOUS FIBRIL.

I now proceed to the minute anatomy of a primitive nervous fibril, and that of a primitive nervo-fibrous fasciculus, demonstrating—when it is possessed of vitality by means of the arterial circulation—the correct explanation of the eighty-four electro-chemico-nervo-fibrous actions of centres which terminate in ganglions or in the ventricles of the brain.

From microscopic examinations of the minute anatomy of a primitive muscular fibre, it may be thus described:—1st. The primitive muscular nervous fibril consists of

\* It is singular that it has not been thought to be spasm that "stops up the nose."

a fine thread inclosed within an oblong vesicle-sheath; each of these has two nerves, that is, two for sensation and two for motion or resistance, making two distinct nervo-fibrous parts and four nerves.

This primitive muscular nervous fibril is for the foundation and support of the four circulating vessels, viz., the terminal ramusculi of the arteries, the minute radicles of the veins, the exhalents, and the absorbent vessels.

The union of these several parts to form a muscular nervo-fibrous arterial fasciculus, is as follows:—1st. There is the primitive fibril, which is for the purpose of uniting, supporting, and inclosing, the extreme vessel of an artery, which is itself inclosed in an oblong, thin, nervo-fibrous vesicle-sheath, constituting, altogether, four distinct parts. And, again, to keep the whole closely united together, they are covered by an additional nervo-fibrous vesicle-sheath, which completes (if I may say so) a primitive nervo-fibrous arterial fasciculus, composed of five distinct nervo-fibrous parts and of ten nerves.

And in the same manner in which the primitive nervo-fibrous arterial fasciculus has been composed, so I define the minute radicles of the veins to be formed, as well as the extreme branches of the exhalents and absorbent vessels. So that these four circulating vessels are finally inclosed in one additional and general oblong sheath, to keep the whole bound securely and close together, thereby adding one more distinct nervo-fibrous part and two nerves, which will make the twenty-one distinct nervo-fibrous parts in a perfect muscular fibre or fasciculus, having forty-two nervo-fibrous actions in the same, which will correspond with a similar number in the ventricles of the brain to complete the eighty-four actions of centres.

The extremities of a nerve in a perfect muscular fasciculus are composed of three infinitely thin, spreading pellicles, parallel to each other, which act as doublers and separators, to convey the two vital fluids which are evolved during the arterial circulation as a matter of necessity. For the formation of a very thin nervous filament, is always by fibrils double and separately covered or inclosed in a thin membrane, and then again covered and secured by a membrane to prevent immediate contact, which would destroy the separate actions of each, one being for sensation and the other for motion or resistance. But when several of these double nerves unite together and form a knot, or small hard swelling, without giving out any further branch or nervous filament to the spinal cord, there is formed a ganglion, completing and neutralising all the electro-chemico-nervo-fibrous actions of centres which may have taken place below that part, and which have no feeling and are not influenced by the will.

Should, however, the ganglion allow a single nervous fibril to pass out of its substance into the spinal cord, then sensation and volition will be in full force, and neutralise all the electro-chemico-nervo-fibrous actions of centres in the ventricles of the brain.

In the description of the minute anatomy of a complete muscular fibre or fasciculus, with its nerves and ganglion, I have correctly kept close to the truth; but I have allowed these to possess, in the state of vitality or arterial circulation, the power to evolve the two vital fluids with their reunion or neutralisation, either in a ganglion or in the ventricles of the brain, by corresponding actions of centres, and I cannot help believing that it is one of the most admirable pieces of human machinery that has ever come to the knowledge of mankind.

When the circulation is established in the arteries, a series of similar actions must follow in all the other circulating vessels, because those actions are involuntary; the fluids are impelled forward and new chemical actions are the results, as a matter of necessity, which no power can prevent.

For as the arterial blood, in passing through the microscopic network to enter into the minute radicles of the veins, completely changes its chemical nature, caloric is evolved, the colour is changed with the evolutions of the two vital fluids, which are in a direct ratio to the chemical decomposition which has taken place in the electro-chemico-nervo-fibrous muscular fasciculus; the two vital fluids pass along the nerves, ganglions, and stages of the spinal cord, and neutralise each other, either in ganglions or in the ventricles of the brain, where they complete the eighty-four actions of centres at the rate of 288,000 miles per second.

#### LIGHT.

I shall next describe the chemical composition of light, with its mechanical powers, and its effect on the retina and the whole of the nervous system.

There are two theories concerning the evolution of light from the sun; the first is by the undulation of its particles. I give the preference to the theory of the compound rectilinear, tangent, and centrifugal rays, in a chemical and mechanical point of view, as they evolve from the sun's periodical motion upon its axis, which takes place in twenty-five days six hours from west to east.

The chemical composition of a ray of light is known by the prism, which divides it into seven different coloured bands, each of which acts differently upon material bodies.

It is impossible to know the exact chemical composition of a ray of light in any other way, as its particles repel each other from the sun's centre at the rate of 200,000 miles per second, and that in all directions,

so as to increase the diameter of its lucid atmosphere 400,000 miles per second; or if that number be raised to the third power to form a cube, it would be the true atmosphere of the sun for the first second, &c.

As the light from the sun is supposed to be produced from combustion, its composition appears to include the two vital fluids with latent heat, so that the repulsive particles of light and of the two vital fluids are in some measure equal to produce the diameter of the lucid atmosphere of the sun, which is equal to 400,000 miles per second continuously, and so forth.

With regard to the materiality and mechanical power of light, the first proof will be by a delineation of a cone of light from the sun, of one inch in diameter at the base, which should be made to pass through a lens of the same dimension, the focal distance four inches, and the diameter of the focus one-tenth of an inch; so that when the light is passing through the lens the rays of the sun will converge and diverge at the focus itself at the rate of 200,000 miles per second, which concentrated light produces ignition of an inflammable body at the focus, by which mechanical and chemical actions the evolution of caloric and light, with the two vital fluids, will take place.

From this single experiment with a lens I value the materiality of concentrated light from the sun in the latitude of London as flowing in a continued stream at the rate of 200,000 miles per second, a velocity equal to a weight of ten pounds.

The non-concentrated stream of a column of light of 200,000 miles long, per second, will press on our atmosphere with a pressure equal to 768 grains upon every square inch, that is nearly the hundredth part of that concentrated light which was made to pass through the focus of the lens to ignite a piece of German-tinder or gunpowder; and this simple flow of a column of light is only an approximation of the rectilinear mechanical power of light; but if the tangent propelling power of light be also taken into account—which is produced by the sun's motion upon its axis from west to east—then every vector-radii or semi-diameter of the orbit of any planet, either real or nominal, shall have a real propelling power, striking their western side, and making them perform their annual motions in their several orbits.

It is evident that the power of all the vector-radii is as permanent as the sun itself moving upon its axis, but still they diminish in their intensity as the square of their distances increase, because the intensity of the propelling powers of the sun's motion upon its axis diminishes in that ratio.

The second mode of proving the materiality of light is by the crystalline lens of the human eye, through which is made to pass a column of light, which is concentrated

into a focus by the crystalline lens upon the retina under the influence of the arterial circulation, ready to enter into the minute radicles of the veins, when and where the arterial blood changes its chemical nature and alters its colour; caloric is also evolved with the two vital fluids, which vital fluids pass through the nerves to cruciate in the optic nerve or optic ganglion, which is for the purpose of concentrating in one general channel or one action, all the electro-chemico-nervo-fibrous actions which may have taken place in the retina. These actions are conveyed and neutralised in the ventricles of the brain as a general centre, by which the whole nervous system is made conscious of the same, so as to complete the eighty-four normal electro-chemico-nervo-fibrous actions of centres.

Should any person doubt the evolution of the two nervous fluids by the electro-chemico-nervo-fibrous actions of centres in a muscular fasciculus during the act of arterial circulation, I feel confident to be able to explain upon such principles or actions the two following most extraordinary experiments, as related in *THE LANCET* of September 2nd, 1843, No. 1044, page 815:—

“**POWER OF GALVANISM.**—A contemporary foreign journal has the following:—Weinhold cut off a cat's head, and when its arterial pulsation had ceased took out the spinal marrow and placed in its stead an amalgam of mercury, silver, and zinc; immediately after this was done the pulsation recommenced, and the body made a variety of movements. He took away the brain and spinal marrow of another cat, and filled up the skull and vertebral canal with the same metallic mixture. Life appeared to be instantly restored; the animal lifted up its head, opened and shut its eyes, and, looking with fixed stare, endeavoured to walk, and whenever it dropped tried to raise itself upon its legs. It continued in this state twenty minutes, when it fell down and remained motionless. During all the time the animal was thus treated the circulation of the blood appeared to go on regularly, the secretion of the gastric-juice was more than usual, and the animal heat was re-established.”

I am confident that the faculty will hereafter be able to explain and cure most diseases and deformities of the human body with more certainty, as the proximate cause of most diseases may depend upon spinal affections, from pressure upon the spinal cord preventing the two nervous fluids from being neutralised in the ventricles of the brain; for I view the spinal cord as the general channel to convey the results of all the united expressions of the electro-chemico-nervo-fibrous actions of centres which take place in the human body, evolving the two vital fluids to concentrate and neutralise themselves in the ventricles of the brain.

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