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ELECTRICITY.

For the Magnet.

EXPERIMENTS IN ANIMAL ELECTRICITY.

Dear Sir,—I notice in the second number of the Magnet, to which I am a subscriber, a letter from Professor Henry, of Princeton, N.J., in reply to one of yours, making inquiry in reference to Animal Electricity. As I have chanced to make what, perhaps, may be called a discovery with regard to the evolution of electricity from the human body, the following account of it will scarcely fail to be acceptable.—A knowledge of the phenomena below described, may possibly aid you, somewhat, in multiplying your magnificent discoveries in human magnetism. At all events, an explanation of the sources of the appearances which I have observed, will be more likely to come from yourself, than from any less experienced operator.

What I have ascertained is this—viz. That a comparatively large amount of electricity can be developed in *all* persons, I may say, of both sexes and all ages, by muscular contraction in a certain position, and *only* in such a position, together with a proper dryness of the surrounding air. If these conditions are not observed, no electric manifestation occurs.

In the 5th volume of Tilloch's Magazine (old series) a copy of which is in the Franklin Library at Philadelphia, there is an article on animal electricity with original experiments, by a Mr. Hemmer, of the Electoral Academy of Sciences at Manheim. From these experiments, which were made in 1786 on thirty persons, of different age and sex, and amounted to upwards of 2400 in number, Mr. Hemmer came to the following conclusions:—That electricity is common to all men; that it is sometimes negative, oftener positive, and sometimes wanting; that it is produced without friction of the clothes, and is evolved from the naked body; that its quality is altered by certain circumstances, and changed from the one to the other kind by sudden and violent motion—from positive to negative by cold, or lessened in amount by it; that continued mental exertion increased the positive electricity, &c. &c. If I am not very much mistaken, it was stated in the account that Hemmer employed an electrical condenser. If he was obliged to use this instrument, it proves, that the quantity he was able to obtain at any time, must have been exceedingly small. His great number of experiments, also, shows that this was most probably the case.—They must, also, have required no little care in their performance, or have been somewhat difficult to repeat, or he would not have confined himself to thirty

persons, in performing 2422 experiments. The results, however, which I have obtained, are so striking, and so quickly and easily performed, that no doubt can be entertained, both that the source of the electricity is the human body, and that with, perhaps, a few exceptions, it can be developed in every individual. I was led to the discovery in the following manner, in January, 1841.

I had several times attempted, with a common gold leaf electrometer, to verify the results of Mr. Hemmer's experiments, by standing insulated for a length of time, with, and without, clothing, and then touching the electrometer, but I never found any indications of electricity. I at length thought I would try, whether any was evolved from a limb when in that state of numbness called "asleep." My electrometer was on the mantel-piece; I sat before the fire on a chair, with my arm over the back, so that the nerves were pressed upon. When it had become numb, I rose hastily, and applied my finger to the cover of the instrument. The gold leaves flew instantly to the sides of the glass, and I thought my theory fully verified. I was mistaken as to the cause, however, for on rising again, and applying the other hand, which was in its natural state, the same phenomenon occurred. I soon found, that this depended on my rising from a sitting posture. I then tried this with other persons—some succeeded at the first trial, others failed in the first or second attempt, but succeeded as soon as they placed themselves in a proper position. I have given this experiment a fair trial with about thirty persons of different age and sex, in different rooms, and with complete success. A little girl of seven years, has shown very strong electric powers. To cause a movement of the gold leaf of half an inch from the perpendicular, is but a weak manifestation. In a properly warmed apartment, I can, by partially rising from a chair, and sitting down again alternately, cause a continual and violent vibration of the gold leaf to and from the side of the glass: there is often force enough to tear the leaf, causing it also to adhere to the side of the glass. It is not necessary for me even to *touch* the cover of the instrument—nearly as striking results will follow if I but bring my hand *near* the cover—say within an inch or more.

Before mentioning more particularly the conditions to be attended to for a successful trial of the experiment, I must state, that this evolution of electricity is entirely independent of any friction between the clothes and skin. That, so far from this being the case, not the smallest appreciable quantity can be produced by any friction that can be made by the clothes against the skin, though the body and limbs be moved slowly or quickly in every direction. I have, also, when undressed and insulated, with one

hand on the electrometer, rubbed the surface of the body with flannel or cotton, without causing the slightest movement of the gold leaf.

The conditions spoken of are as follows:—First, a proper dryness of the air,—hence a situation in front of a good fire is preferable. As very cold air is generally very dry, also, the experiment has succeeded at an open window, when the thermometer stood at 38°; but as here the air soon derived moisture from the room or the body, the electricity of the latter was so soon carried off, that it was gone before I could touch the electrometer twice, after rising from the chair. But, before the fire, I could count slowly forty or fifty, after rising, before I had parted with the electricity evolved by the act of rising. It was for want of attention to having the air dry, and to my overlooking a cause of moisture, that I was, at first, in doubt whether the electricity did in fact arise from the body without the aid of clothing. I had succeeded once or twice, perfectly, I thought, in affecting the electrometer, when trying the experiment before the fire, undressed; but I afterwards failed continually, until I ascertained that by walking a few moments in the cool side of the room, and then trying the experiment before the fire—it succeeded completely. I repeated this often, and always with the same result. The cause of my former failure was owing to the increased evaporation of moisture from the skin, produced by the heat of the fire; by cooling the surface, and then trying the experiment before the fire, where the air was dry, I could affect the electrometer each time I rose and sat, until the heat had produced a too copious exhalation from the skin to allow the electricity to remain on the body. For the same reason, I have very rarely been able to affect the electrometer after returning from a walk, the cutaneous exhalation carrying off the electric fluid as fast as it was formed—Secondly, The position requisite. This is as follows: place the electrometer over the mantel-piece, over a good fire. Take a common sized chair, of such a height that the feet resting on the floor, the thighs shall be horizontal. Sit toward the front edge of the chair, and lean back, so as to have the trunk of the body quite relaxed; then rise quickly, and touch the cover of the electrometer. The leaf or leaves will scarcely fail to indicate the presence of electricity. If the first trial should fail, it will be owing to the non-observance of some of the above mentioned conditions. A second or third attempt *must* succeed. The electrometer may also be placed on a table before the fire; the experimenter, seated as described on a chair near it, may place his hand on the cover, and then, after leaning back, he should lean a little forwards, and rise quickly, or but partially assume the erect position. At the instant of rising, and very often at that of sitting again, the electrometer will indicate a large amount of electricity. I have charged a jar with as much as could be detected by the instrument, by thus alternately rising and sitting. By the application of the jar, however, the leaf has never moved more than half an inch, while, by keeping the finger on the electrometer while I thus rose and sat, I could, as before stated, cause a continual flight of the leaf to and fro through an inch or more. I have hitherto found my own electricity positive, and I have a suspicion that the electricity is different according as I rise up or sit down. This shall be decided in future.

It is indispensable, that the chair be neither too high nor too low. If the chair with which I succeed when in its proper position, be turned on its side, making it lower, and I then sit down and rise, the electrometer is not affected. Neither have I succeeded by rising from a rocking chair. At the suggestion of a friend, the effect of sitting upon pillows

as upon non-conductors, was tried, and it was found that, insulation aside, the *yielding* nature of the articles diminishes the indication of electricity. If the chair be placed upon pillows, and also the feet, or if the experimenter sit on a pillow placed in the seat, or against the back of the chair, the effects on the electrometer are irregular, or for the most part small. Any position, in short, which does not call into action the proper muscles, or impedes their complete action, entirely prevents or lessens the development of electricity. Lowering the body, so that it rests upon the heels, and then rising and touching the instrument, will be as void of influence on the leaf, as movement from any other position than the one described. Complete insulation, by placing the legs of the chair in glass tumblers, and the feet on pillows, seems to increase the electricity.

Such, then, are the results of my experiments, which I believe are entirely novel; for, although it is generally known that electricity is, nay, *must* be, evolved both in animals and vegetables by the vital processes, especially by the formation of carbonic acid gas, and may be detected under ordinary circumstances by delicate instruments; and though Prevost and Dumas, of Geneva, think that they have proved electricity to be produced by muscular contraction, and Edwards has shown that bodies which conduct electricity conduct the nervous power also, and vice versa (see his work on “Influence of External Agents,” &c., Appendix); yet, no one has, to my knowledge, ever yet observed the relation that exists between bodily motion in a certain direction, and the copious evolution of electricity. Upon the ultimate cause of this phenomenon, you are more able to throw light than myself. I will merely throw out the suggestion, that if, according to Dr. Buchanan, there be an electric organ in the brain, it must like all other organs have some portion of the body over which it presides. This organ (perhaps the spleen) may be influenced in such a manner by the muscular motion above described, as to excite the cerebral organ into a higher degree of activity, and thus produce the electric manifestation. If there be an organ in the brain by which the mind takes cognizance of the heat of the body, there should certainly be one adapted to its electric condition, for that large quantities of electricity are generated within the animal economy cannot admit of a doubt to any one who is aware of the circumstances under which electricity is developed. But chemical action is a chief source of electricity as well as of animal heat. A French chemist, Pouillet, states that all gases in combining with other elements, give out a certain amount of electricity. He illustrates this proposition by the case of *carbon*, 15 grains of which, in becoming carbonic acid gas by union with oxygen, give out enough electricity to charge a common sized Leyden jar; and hence, that by a surface of vegetation 100 metres (about 300 feet) square, more electricity is produced in a day than would charge the strongest electrical battery. By this estimate, how much electricity would be formed in the body? Let us see:—it is estimated that 17,811 grains of carbonic acid escape from the lungs in 24 hours; then, by calculation, enough electricity would be generated by the formation of this gas, to charge 333 common sized Leyden jars, which average two square feet each of coated glass. If we assume but half of this, we shall still have a very large quantity of electricity, formed by the union of oxygen with carbon in the various tissues of the body traversed by good arterialised blood. Now, what becomes of all this electricity? None can be detected in the breath, or escaping in any other manner from the body, except in the peculiar manner that has been described. The only conclusion we can come to, is the follow-

ing (one which I advocated in a Thesis on the "Nervous System," written for the degree of M.D. in the University of Pennsylvania in 1840, and which Liebig, I see, also maintains in his work on Organic Chemistry), viz. That the electricity (vital force Liebig calls it) which is generated by the processes of nutrition decomposition, i.e. by union of carbon with oxygen and other elements in the tissues of the body, is conducted away by the nerves to the nervous centres, where it may undergo various modifications, and thence pass along the motor or centrifugal nerves to the muscles, or wherever nervous energy is required.

Before I close I must not omit to mention, that besides the peculiar motion above described, by which electricity is evolved, there has been noticed *one* other:—this consists in a sudden drawing of the *arm* and bent elbow backwards, then forwards, and touching the electrometer. It was manifested by accident by a gentleman to whom, with others, I was showing the other experiment. He did it afterwards several times, and with success; I also succeeded two or three times, but have always since failed. I am not certain that it could be done without clothing.—As electricity is produced by some action which takes place when the *thighs* are moved on the trunk in a particular manner, it is not improbable that a similar action occurs when the *arms* are moved on the trunk also; for it is well known, or ought to be, that there exists a remarkable sympathy between corresponding parts of the upper and lower extremities; as between the knee and elbow, the thigh and humerus, the fingers and toes, and leg and fore arm—and between these and the surface of the trunk, especially the skin of the abdomen around the umbilicus, and, also, the surface of the chest. I may, perhaps, in a future paper, send you some curious observations which I have made on this subject. The electric organ in the brain may thus have two portions of the spine, or two organs of the trunk, over which it presides—one in the lumbar spine, or in the abdomen, and one in the cervical spine, or in the chest. Whatever may be the use of such organs, may not their existence aid us in explaining the phenomena of stretching and yawning, after sleep following fatigue? The vital force, or electricity, or magnetism, which is restored during sleep, we may with probability suppose excites the electric organs by its accumulation in them: that this excitation is identical with the desire to stretch or yawn, and that during the gratification of this desire the accumulated electric fluid is sent rapidly into the muscles from its three central reservoirs, the brain, the chest or cervical spine, the abdomen or lumbar spine. Into the muscles of the face, causing yawning; into the muscles of the arms and chest, and into the muscles of the abdomen and lower extremities, causing the extension of all these parts.

Yours with respect,

WM. H. MULLER, M.D.

Pittsburgh, Dec. 2, 1842.

P A T H E T O L O G Y .

For the Magnet.

REMARKABLE PHENOMENA.

MR. SUNDERLAND,—Since I have been in Kentucky, my exertions in promoting a knowledge of Human Magnetism have created considerable excitement, and developed many singular facts. Among the rest, there is one of so remarkable a character, that I am induced to think an account of it in the

Magnet might interest your readers, as it may afford a very salutary caution to those who are attempting experiments, for the sake of amusement or curiosity, without being acquainted with one of the first principles, or laws, that govern these wonderful phenomena.

During a visit to Danville, in this state, a few months ago, I magnetised successfully some half a dozen persons, and produced a general conviction of the truth of this subject, in the minds of almost all its citizens. Several persons were relieved of nervous headaches and other afflictions; and even the deaf and dumb yielded to its influence. Two mutes, in the Asylum, were magnetised, and exhibited many of the phenomena developed upon others. They were susceptible of taste and feeling through the operator; exhibited some of the phenomena in phrenology; and communicated with us by means of their usual signs. As the defect in the sense of hearing was organic, of course, it did not relieve them from this affliction.

Among others, a lad, the brother of Dr. Van Camp, was thrown into the magnetic sleep, and became very susceptible of the influence of this secret agent. He was magnetised several times by myself, without any injury either to his mental or physical powers. The phenomena exhibited by him were the more satisfactory, inasmuch as he was wholly ignorant of phrenology; and yet, the different organs in his brain were excited with great success. He was made to laugh, sing, pray, exhibit anger, affection, pride, vanity, and many other emotions of the mind, by touching successively the different organs by which these feelings are manifested.

I may here be permitted to mention, what is, probably, a new discovery in this interesting branch of physiological science. When this lad was in the magnetic state, it was found that a few passes made over the temples, in a transverse direction from the organs of order, backwards, produced natural sleep. Whether there is an organ in this region of the brain that governs the phenomena of sleep, I am at a loss to conjecture: some of the facts that have fallen under my observation, certainly lead to such a conclusion. That there should be an organ of this description near the lower range of the perceptive faculties, seems to me not unreasonable. In sound sleep, the observing powers lie dormant, and remain chained in slumber by this "little regulator," till the organ of time, located near by, knocks for admission, and warns them to arouse from their inaction, and be "up and doing." It is only in partial sleep that we dream, and see visions of the material world, according as these faculties are prompted by the feelings and sentiments; and while the judgment sleeps they roam at large beyond the control of their "little keeper."

If such an organ exists, I think it is located just below the organ of Tune, and on the borders of Calculation. Its existence might enable us to account for the fact, that many persons can retire at night, and set the time in their own minds when to awake in the morning, without ever failing to wake at the very minute. I have tried the experiment on two or three others, besides the lad at Danville, with the same results. One of my subjects, as I pass my fingers over the organ, falls immediately into a natural sleep, and commences dreaming. In this state he gets up of his own accord, like a natural somnambulist, and walks about beyond my control; does not seem to hear me when I speak to him; and walks in the most difficult places with ease and safety. When I wish to restore him to the magnetic state, I am obliged to reverse the passes, and again he is under my influence, the same as before. It is quite remark-

able, too, that I cannot wake him from this induced natural sleep without restoring him to the magnetic, and then employing the usual means. But a day or two since, I attempted an experiment upon a gentleman awake, who had never heard of the organ; and without informing him of its existence, I pressed on it about five or six minutes, and had him nearly snoring, when he roused himself up, and said that I was putting him to sleep. From these considerations, I am induced to think that such an organ exists.

But the object for which I commenced this communication, was to relate an incident that occurred with the lad already alluded to, of quite an alarming character, and one that will serve as a caution to persons unacquainted with the nature of this mysterious influence. After I left Danville, the lad was magnetised by any one that felt the inclination or curiosity, notwithstanding the warning I gave in my public lectures, of the danger of meddling with it without a knowledge of its principles, and of the human system in general. The consequence was, that in a short time he was very much injured. Persons were allowed to magnetise him on various occasions; and many of them, in exciting the different parts of his brain, handled his head very roughly. His mind became considerably affected, and disturbed him in his sleep; and to conclude the amount of injury done to him, he finally became DEAF AND DUMB.

Several days after this occurrence I happened to be in Danville again. I saw the lad, and he could neither hear nor speak. He used a slate, and communicated with me in writing. He seemed very much grieved about his affliction, and had already learned the deaf and dumb alphabet, and was beginning to learn the signs; he had not lost the memory of words, but his organs of hearing and speech had become paralysed. I persuaded him to sit down and let me magnetise him properly, and told him that it would probably cure him. He consented, and in a few minutes he was fast asleep. I spoke to him, but received no answer. I then made some passes, gently, over his head and ears; and afterwards, by means of this new organ already alluded to, threw him into this natural, or more properly this preternatural sleep. He sat for a few minutes, apparently dreaming, and then suddenly threw himself back in his chair, as if frightened. I immediately restored him to the magnetic state again, spoke to him, and he answered me promptly; but his voice and manner exhibited much agitation. I asked him what disturbed him, and he said he had just experienced a sudden ringing in his ears, as if some one had struck him a blow upon the side of his head. He then, while in this condition, gave an account of the cause of his deafness, stating that a physician of Lancaster, by the name of Dr. H. had enticed him from home, while his brother, Dr. Van Camp, was at Louisville, by false representations to the rest of the family, notwithstanding his brother had expressly forbidden that he should leave home or be magnetised in his absence; that Dr. H. magnetised him on several occasions for the amusement of his friends; and in experimenting in phrenomagnetism had injured his brain, by the rough manner with which he handled his head. He also attributed the injury, in some measure, to similar treatment from others, who had been in the habit of experimenting upon his brain.

This statement was confirmed by his brother, Dr. Van Camp; and without learning any thing more of importance from him, I waked the lad up. As he opened his eyes, he was perfectly astonished to see me in the room, asked me when I came to Danville, and talked with us freely as though nothing had happened. We soon discovered from his conversation, that he was perfectly unconscious of the time he had been in the deaf and dumb state; and upon

asking him what day of the week it was, he named the very day on which he fell into this remarkable condition. He had no recollection of having been deaf and dumb, and was astonished at our inquiries. It was supposed by some, that he had been feigning all this for several days; but the circumstances were such that it was utterly impossible. A lad of his age would have betrayed himself; and besides this, his brother had whipped him very severely, from the same suspicion, without a noise from his lips, while the tears rolled down his cheeks at what must have seemed to him such cruelty. The state he had fallen into was not that of the ordinary magnetic sleep;—his natural sight remained the same, he took his food in the same manner as usual, and learned the signs and alphabet of the deaf and dumb with great facility. For some time previous to this event, he had been in a very disturbed state of mind; but since I restored his hearing and speech, he has enjoyed his former regularity of mind and body.

J. G. FORMAN.

Lexington, Kentucky, Dec. 1842.

For the Magnet.

TRANSLATIONS FROM PUYSEGUR.

Dear Sir,—Accompanying, I forward you some translations from Puysegur. Some of his ideas are opposed to present theory, yet they may assist us in our investigations of the science of human magnetism; and every thing which may be able to throw light upon the subject, must be valuable and interesting.

Yours respectfully,

JOHN KING, M.D.

New Bedford, Dec. 1842.

* * * * Glass is, among unorganized bodies, one of those which exhibits in a high degree the phenomenon of electricity; or, in other words, it is more susceptible than any other body of retaining in itself and at its surface the universal fluid in the greatest motion; for this is what we ought to mean by the word electricity.

My mind has pondered much on this definition of electricity; for it is necessary to understand the sense of the words we use, before we can clearly explain our ideas. I will suppose, for instance, a glass tumbler filled with water, which we place quietly on a table: in this state there is *no motion*, or *no electricity* in the water; but if I stir it with my finger carefully, so that I spill none, a marked *motion* is thus produced in the fluid, which was not there previously. This motion is precisely what I understand by the word *electricity*; and the repose which ensues shortly after having removed my finger, corresponds to the electrical discharge, which is only a re-establishment of its equilibrium.

Let us carry the comparison still farther, and we will observe, that wherever any motion is produced, the same effect takes place as in the glass of water, and it is as transient. For example—I strike on a bell: now what takes place? Is not this an increased motion of the universal fluid, which the blow has determined in the interior of the metal, which motion manifests itself to our hearing by the sound, and to our feeling by the vibration of the bell? But gradually, as in the glass of water, the universal fluid resumes its ordinary tranquillity, which cannot be disturbed without deranging its general equilibrium; the noise and vibration cease, and the bell remains in the same condition as before it was struck.

We have yet a clearer explanation of electricity. While the bell was vibrating, we say that it was electrified; then, if we approach the hand as we would an electrical conductor, we do not elicit sparks, but

will experience a vibration at the end of the fingers, and the sound will entirely cease, when we discharge all the electricity in the bell by touching it, or in other words, when we have *re-established the equilibrium* in the universal fluid.

As I have given many examples in another place, I will dispense with more at present; but let us see what takes place in common electrical experiments. With a glass plate I determine an increase of motion in the universal fluid in the interior of my conductor; the larger my plate the more considerable is the motion produced, as the revolution which it makes extends to a greater distance around the conductor. Is not this effect absolutely the same as in the above example of the bell? When my conductor is thus charged, or, in other words, when it has received the amount of motion to which it is susceptible, if I approach my hand to it, the motion or vibration of it immediately ceases. It is true, that instead of a trembling at the end of the fingers, I feel a little commotion manifested by a spark; but this discharge, styled electricity, is nevertheless, as in the glass of water, a very simple result of the repose and equilibrium of the universal fluid.—Understanding the word *electricity* as I have explained it, let us return to glass.

If this body so easily manifests the phenomena of electricity, that is to say, if it is susceptible of retaining for so long a time the universal fluid in an increased motion on its surface, ought we not to conclude, that it has this faculty because even when in a state of rest, the fluid circulates more actively in it than in any other body? It is this last property which, I believe, constitutes the electrical glass body. The more motion there is in a body, the more electrical we may say it is, and consequently susceptible of exhibiting the phenomena of electricity. A man is more electrical than a tree, this more than a glass tube, this last more than a magnetised bar of iron, and so on.

Glass, notwithstanding its electrical properties (¹), can never of itself have any influence over our nervous system. Its tone of motion not having the requisite acceleration, is not tenuous nor penetrating enough to assimilate with our organization; but as soon as it is magnetised, its electricity becomes in analogy with ours, and it then becomes a much better conductor of animal magnetism, as, owing to its own motion, it preserves the acceleration which it has received for a much longer time.

Next to glass, there is another substance which indicates a still greater force, or impulse of motion: these are the nerves. We know that a *plateau* which is formed of them, produces an electricity still more active than glass; this is, then, proof of an intrinsic motion of the universal fluid in the nerves, greater than in any other body, and also of the capability which they have of accumulating more of it at their surface. We may say, then, that the nerves are electrical, and that no other body in nature manifests this property to such a high degree. Then, if I am not mistaken, we have here the true key to the physical phenomena presented by animal magnetism.

The only effect that we have the power of producing, is that of accelerating motion in bodies, by striking them in any manner whatever. It is by blows and friction that we produce sound, that we obtain fire, from whence we derive flame, and consequently light. It is also by an acceleration of motion that we imitate two of the most wonderful phenomena of nature—that of the loadstone, and that of aerial electricity, known as *thunder* and *lightning*. The only kingdom in which we have not yet exercised our accelerating power, is the animal; where, in like man-

ner, by an effect of motion on the nervous system, we can produce in organised beings a number of new and useful phenomena. But no: contented and satisfied with our superiority to all inanimate nature, we limit our enjoyments, never dreaming of springing a mine which abounds in phenomena.

Man is at the head of his kingdom; this being, whose nature is still a problem,—man, as the direct head of all animated nature, ought in his material organisation to be as susceptible to the acceleration of motion, as all other bodies; his nerves, electrical in a high degree, are the canals which are susceptible of receiving and propagating this prodigious acceleration of motion; we must merely *will* to employ a part of our *physical* and *natural* power, in order to put it in action.—The first cause of *general motion* is, I believe, inexplicable; we know that there must exist one, and that should suffice

After this incontestible position, it is clear that this motion vivifies all nature; but the manner of its action in the animal and vegetable kingdoms, differs from that of the mineral. In this last, there does not appear to exist any motion from the centre to the circumference; all is the result of diverse modifications—juxtaposition, or aggregation of parts, as we see in the phenomenon of chrySTALLIZATION; on the other hand, in the other kingdoms there truly exists a source of life, a particular focus from whence flows the expansion of motion; and it is this which is generally known as the *vital principle*. In the vegetable kingdom, the vital principle may be easily recognizable; we know that it exists in the germs of plants, and that it is from this focus as a centre, that all the extensions of motion commence which give birth, increase, and strength to all vegetable productions. In the animal kingdom, the vital principle is likewise contained in a germ; and it is likewise from this that all the extensions of motion favorable to life and to the preservation of animals, emanate.

The vital principle is, then, the *radiating focus* of motion in all organised bodies; and the fibres in vegetables, like the nerves in animals, are the passive conductors of this motion, or *natural electricity*. As long as the vital principle in a body is sufficiently furnished with electricity, we are aware that it communicates to those bodies which inclose it, all the strength and vitality to which they are susceptible, and no other power whatever can either increase or strengthen it; but if from some secondary cause the vital principle becomes impoverished, then an apparent disorder takes place in one of the parts of these bodies, and disease makes its appearance. Now, if by proper remedies, or other means, we cannot give to the vital principle the *quantity of electricity* necessary for maintaining all its branches, the equilibrium of the animal system becomes totally destroyed, and death is the consequence.

Strictly speaking, disease in man originates only from this defect of the equilibrium or circulation of the animal electricity. To restore this equilibrium, there are two modes to adopt: the one by removing from the diseased part those obstacles which impede the circulation of the *animal electricity*; and the other, by acting directly on the vital principle, strengthening it, and imparting to it the power of removing, itself, the obstructions to its course. The first method is that which is generally employed by physicians; their internal remedies act most frequently on the obstructions only, and if they ever extend their action to the vital principle, it is accidentally, and merely in particular cases.

The second method is that pursued by magnetisers. The vital principle being a focus or centre of electricity, it cannot be strengthened except by an electricity analogous to it, and it is this which takes

place during the application of animal magnetism. From a well-organised vital principle, there passes through the nerves an active and penetrating animal electricity, which is conducted through the nerves of a patient; these eagerly take possession of it, and in their turn direct this action through the vital principle which requires strength. If the patient is not emaciated, if the duration of his disease or improper medicines, have not too much impoverished this principle, then it has the power of re-acting the effect which it has received, and, in a longer or shorter time, the circulation of electricity thus established terminates by subduing and totally driving out the obstruction to its course, and health ensues as soon as the *electrical equilibrium* is established between the magnetiser and the magnetisee.⁽²⁾

All living bodies are susceptible of thus communicating their electricity. If trees and vegetables increase more actively when kept near each other than when apart, it is only because of the circulation of *vegetable electricity* which they establish between themselves. It is the same with animals in herds, and living at liberty. This animal law is even extended to man in a natural state, living by hunting in the woods and forests; their strength and activity are incomparably stronger than those of men, who, although assembling together as they do, in society, live nevertheless confined in houses and under roofs, and are fettered by the laws of fashion, &c.

This circulation of motion in the crude and natural order of things, is absolutely passive, and depending on the *first generating influence of universal motion*: all matter blindly acknowledges its influences, and has not the power of changing its laws.

Man, alone, appears to oppose this general law.—Far from implicitly obeying it, with the rest of nature, he is constantly deranging the universal equilibrium by his irregular movements; thus he has need, physically speaking, of a power capable of balancing the evil effects of his morality on his organisation, and this power he enjoys in a supreme degree. We perceive, in his sympathy for the sufferings of others, in his sorrow for the loss of friends, faculties much superior to all other animate beings.

What other being in nature is susceptible of this sympathy for the misfortunes of its kind? We do not know. From the earthworm to the dog, who, on account of his noble instinct so well deserves our attachment, we find that all animals pass away the time of their productive necessities, being indifferent to each other, abandoning one another in sickness, and some of them even devouring the rest of their species. Man alone possesses this desirable sensibility; if, therefore, instead of endeavoring to suppress he yields to his gentler impulses, he will undoubtedly recognise the power of augmenting his *vital principle* at his will, and of restoring, by its action, that of his fellow man.

What is the nature of this *will*, the sole agent of the artificial action of his vital principle? Is it not the union of the two natures which we can neither see nor appreciate? In tracing it back even to the vital principle, I can only conceive it to be the last step (*echelon*) of *matter*,* and electricity gives to me a kind of perception of it; ⁽³⁾ but what exists even beyond this last step of matter?—The *will* exists, however; its action on the vital principle is plainly seen; but what is its nature? If its first cause is beyond matter, we must absolutely recognise in ourselves the existence of an immaterial principle, emanating from the fountain head, and from the original creator of the universe.

* Probably he means matter reduced to its primitive state.—Translator.

The strongest argument of materialists must necessarily fall, when it is proved that man is endowed with a *free will*, capable of acting at his pleasure on matter. “A body,” say materialists, “can receive an impulse only by the blow or action of another body; if, then, that which we call *spirit* or *soul*, can produce an action on matter, we must conclude that this soul itself is matter.” This is, without doubt, a very plausible argument; but we can triumphantly reply to it. If all in man is matter, there should exist no liberty in his actions. Matter, of whatever tenuity we suppose it, is submitted to invariable laws, which it cannot counteract. If, then, man has the power of counteracting these laws, that he may, so to speak, become master of the modifications of matter, there must exist in him something more than matter—because, he cannot be at the same time active and passive, nor become alternately cause and effect, acting, as he must if it is matter only, blindly and fortuitously, and in consequence of the inherent laws of matter.

But of what nature, is this *immaterial principle* existing in man? Here my researches close. Contented with recognizing this principle, and of seeing it made manifest by *my will*, I restrain from assigning a name to it, and from classing it among my ideas; for all the names that I should apply to it, would never express the sentiment which I have of its existence.

The direct communication of the *will* and the *vital principle* is no longer a matter of doubt; and what has been said in regard to electricity, clearly explains the remainder of the phenomena which follow the application of animal magnetism.

If man, then, as we see him when in perfect health, possesses in himself a fruitful source of motion, and the best possible conductors to convey his *beneficent electricity* upon his fellow beings, then, from him alone must we expect the greatest assistance in diseases; by means of his *nervous electricity* he can act victoriously over them, and the science of employing this electricity, is what we term *animal magnetism*.

When, in my first journal, I stated that we might consider ourselves as perfect electrical machines, the above is what I desired to have understood, and which many magnetizers clearly comprehend.—Those who can thus account for the effects they produce, doubly satisfy their heart and soul; but we must be aware, that it is not absolutely necessary to understand all the above, to magnetize well. The man of limited knowledge who is convinced of his power of relieving his fellow creatures, and ardently desires to do it, will be able, if sustained by a strong confidence in his means, to produce as happy results as the most faithful physician. This explains many of the practices of the people in superstitious phenomena, which are sometimes very efficacious in curing certain diseases. Who has not heard of the art of curing by charms, or by words accompanying a touch? Certain countrymen believe that they have the power of curing sprains, another continued fevers, others intermittent fevers; their faith being thus limited to a single disease, prevents them from going beyond their pretended power. We can easily imagine that they often fail, in effecting the cures which they undertake, but they sometimes make truly astonishing cures, which ought to ensue, after the greater or less degree of opposition, which the universal fluid presents in order to recover the equilibrium to which it is constantly tending. Sometimes a disease very serious in appearance, needs the smallest *animal electrical commotion* to arrest all its fearful symptoms.

Whatever it may be, when we fully understand

the cause of the surprising and healthy effects, which result from the *electrical power* or *animal magnetism*, we will naturally conclude that the confident imagination of the magnetizer may add much to them, while that of the magnetizee but little, if any. For, whether we account or not for the reality of our means, we must, in some form or another, firmly believe that we have the power of producing an effect, before we attempt to exercise it; and as soon as we acquire this implicit faith or reason, the same results will follow.

The only efficacious magnetism being that which flows directly from us, we know that that from any other body, cannot be of any well marked utility to us; but when, so to speak, we assimilate these various bodies to our own, it is different, for then we make them conductors of our electricity.

All bodies whatever, may equally serve us as conductors, but some are better than others; the most certain rule to discover the best conductors, is to endeavor to distinguish those in which there is the most motion or electricity. Among this class, are animals, the trees of the vegetable kingdom, and in the mineral kingdom, *glass*, and the *magnet*.—The electricity of these bodies is surely inferior in strength to that which we possess.

When I magnetize a tree, for example, I communicate to it my *tone of motion*, and I place it in equilibrium with myself, the same as the electrical plate places a metallic conductor in equilibrium for a moment with itself. As long as this equilibrium between the tree and myself, is maintained, the same results nearly, as I produce myself, should take place on approaching it, and experience has proved it to the letter. The tree at Buzancy, has the power of placing in magnetic crisis, and of restoring to the natural state, all those persons upon whom I had already occasioned this effect; this is a very simple result, which I will establish. As this equilibrium between the tree and myself, absolutely depends upon *my will*, it ought, then, to continue as strong, and as long as I *willed* it so; which, on my part, exacts but little effort, seeing the passive state in which it exists with regard to me, and the kind of analogy which naturally remains between its vegetable electricity and mine.⁽⁴⁾ I may say the same of glass and the magnet, and in fact, of all bodies which can serve as conductors of animal magnetism, and whose influence will be more or less active, as their electricity is more or less in analogy with ours.

I will extend these observations no further, at present; for I know that at this day it is impossible to resolve a thousand difficulties which occur to me. In fifty years, probably my reflections will become obsolete. But it is necessary to make a first step; it is the way with all knowledge; new phenomena will bring new ideas. The art of war, physic, and poetry, have all had some rules before they acquired their present perfection. May my observations, limited as they are, place us in the way of making more profound and correct ones, that animal magnetism may hold that true and sublime station which belongs to it, and that it may be viewed as the source of a rapid progress in perfecting all human knowledge.

* * * The above details of the sickness of M., the Count Louis of Rieux, very much resemble those of the little Aine, who was cured at Buzancy; they both positively designated the manner in which to magnetize them, and both stated that nothing passed into their systems when they were magnetized, except the relief they experienced. In our explanations on the existence of the magnetic fluid, internal vision, &c., we remarked that all the peasants habitually used the word *voir*, to see, while the

Count of Rieux, appreciating the true sense of words, expressed the same idea by *sentir*, to feel. In proportion only to the magnetic cures which we effect among persons of his rank, or persons instructed in medicine and anatomy, will we be able to enlarge our ideas on the singular state of somnambulism.—For we can never have a conventional language by which to express these sensations to which we are not susceptible.

After the benefit which the Count derived from the application of a bottle, together with his statement, that when we magnetize him, there escaped from him, instead of passing into, a vapor or perspiration, an idea has occurred to me which subsequent experience will confirm or destroy; it is, that glass may serve as a certain indicator of the state of electricity in a somnambulant patient, whether it is plus or minus in quantity. I have several times remarked this same attraction for glass in certain patients, while others absolutely rejected it when the magnetizer did not hold it in his hand.

Glass, next to its electrical properties, is an excellent conductor of animal magnetism. Then, when after having magnetized a bottle, we place it in contact with the patient, the acceleration of motion occasioned by the fibres of the glass, acts continually on him as long as the magnetizer holds it; but when after having operated sometime, with the bottle, we abandon it wholly to the hands of the patient, then one of two things occur, depending upon the plus or minus quantity of electricity existing in the patient. If minus, the bottle will quickly discharge all its animal electricity, and as soon as it ceases to be in relation with him, it will be useless, and he will promptly remove it from him. On the contrary, if the patient has a superabundance of electricity, the bottle will always retain that which is disengaged from him; it will perform exactly the office of a siphon, and as long as he considers it useful to continue this effect, so long will he guard it with care. I believe that this phenomenon will most commonly occur among children and young persons. Nevertheless, this observation is worthy of a thorough investigation; I present it merely as a probability; I believe my views are correct, according to the premises on which I base them, but if there is a want of exactness in them, what will become of my conclusions?

In order to obtain a correct idea of the state of magnetic somnambulism, we must assimilate this state in the human kingdom, to that of the magnet in the mineral. The phenomena which the latter present, are analogous to those which we obtain from a person in the magnetic state.

Mesmer has often stated, that a person in the natural state has poles, an equator, and was naturally magnetic; that the aim of the magnetizer was to place this human magnet on its pivot, and then we immediately recognized in man the same phenomena which a magnet presents, when likewise upon its pivot; experience proves this assertion to the letter. Man in the natural state, may be compared to a compass needle, which is removed from its point of equilibrium; if placed on a table, it still continues to be a magnet, but will not exhibit any sign of direction until replaced upon its pivot.

It is true, that the magnet under any circumstances, will always give certain indications of cohesion, attraction and repulsion, with the iron or filings presented to it, while man has need of being, as it were, on his pivot to present these phenomena; nevertheless, friendship, love of country, sympathy, antipathy, anger, &c., may, with him, be the result of these physical effects, moderated and directed by his morality. As soon, therefore, as one person is

placed by another, in the state of magnetic somnambulism, he should be in communication with his magnetizer only, and should, *to the letter*, present to him the same phenomena which a magnetic needle exhibits to any bar of iron whatever; and without this similarity of effects, he is not in a complete state of magnetic somnambulism.

Mineral magnets, as well as artificial electricity, have some action on inanimate beings, but only as stimulants or accelerators of the proper motion of these beings. Their effects are transient, rarely useful, and often highly injurious, particularly if they are too powerful, or repeated too often. The reason is simple; the mineral magnet not having any direct analogy with our systems, causes only transient emotions without ever communicating its tonic movement, from whence follows, in its application, the same effects and the same dangers which I have before remarked to result from a treatment by artificial electricity.

* * When I state that artificial electricity can be of no service to us, I mean that its *motion* has no perfect analogy with any body in nature, except to act only as a stimulant. The numerous cures of Messrs. Dru, Andry, Mauduit, &c., do not change this opinion; their success has been only among those nervous diseases, the causes of which are attached to an organ so easy to act upon, that the least internal motion is sufficient to re-establish the harmony. Besides, I am disposed to believe that this re-establishment of the equilibrium, can only exist for a certain time, in many patients, because I see in artificial electricity only a transient effect, which leaves nothing behind it to sustain and perfect the good which it has produced.

We may compare electricity in its effects, to a sharp instrument, which is used for the purpose of cleansing from a wound some foreign body, which instrument produces pain as it enters the flesh: this preliminary may be necessary, but if we continue to irritate the wound with this instrument, instead of applying the suppurative and healing remedies which are required, we know how few would be the cures ensuing from such a proceeding; although the first operation was necessary and healthy. It is the same with electricity;—I am certain that we can cure all nervous diseases without it; I, also believe, that in many cases, it may be useful as a preliminary; but it is always much better to consult NATURE herself as manifested through patients in somnambulism, who will always indicate in an affirmative and certain manner, the necessity which such or such patient has of this accessory means; experience will probably, sooner or later, teach us, that in certain nervous diseases it is highly dangerous to employ *electricity*.

Magnetic somnambulists are not always capable of knowing the diseases of others; this property being only a sensation which is injured or perfected, according to the various circumstances under which they are placed. All those whom I have made use of as *indicators* have experienced this alternative; in consequence of which, it is with the utmost reserve that I question them on this subject. A somnambulist is not always an *indicator*; he may be very correct in prognosticating for himself, and fail in doing it for others. Sometimes, after having been able to detect diseases, they may lose their power and not recover it for some time. It is of importance, that those who manage somnambulists should reflect upon this observation. How many times have their answers dissatisfied us, and how often have persons placed in communication gone away discontented with their consultation! from whence will always follow doubts as to the reality of the

existence of this state. Alas! it is not to the somnambulant patients that we must lay the blame of all the incoherences and absurdities which are often met with in their conversation, but to the magnetizers, who suffer themselves to be led away by an idle curiosity, in their experiments. They think that because a magnetic patient can see and judge correctly of a thing to-day, he will likewise to-morrow, and invite witnesses to judge of the extreme sagacity of the somnambulist. What, then, often happens? The circumstances of the patient having varied, a corresponding variation is produced in his sensations; nevertheless, the magnetizer being anxious that he should speak, that he should reply, by his blind enthusiasm compels this magnetic being to yield to the power of his will, and who consequently, utters a quantity of idle talk merely to oblige him.

But, it may be asked, if somnambulists are so liable to be mistaken, how are we to believe a word they say? I answer, that without confidence in a magnetizer, it is impossible to have any in the being under his care. The same judgment that rules our conduct in the common order of things, ought, much more, to rule us in our magnetic operations, where we know the dependence of others is certainly the greatest.

Governed by enthusiasm, envy, or interest in proving any thing which we have advanced as certain, the will necessarily bears a manifest impulse, and I always distrust results determined under these sensations; while I place all confidence, even at the risk of being daily deceived, in the man in whom I recognize only a desire to do good, because his will can never be to surprise me by wonders nor deceive me by appearances.

Why should we desire to have sybils, prophets, physicians, oracles, and even somnambulists? This is not the glorious end at which a magnetizer should aim; he ought only desire to cure, and to do good; the effects of all other *will* can only be false and deceptive; and it is truly a great blessing for men to have philosophy sufficient to protect them against all the chimeras which boasters and lovers of the marvellous have given to the simple and sublime phenomena of magnetic somnambulism.

NOTE 1.—Aerial electricity acts truly upon our nervous system, but it is in a crude, unhealthy manner; the electrical molecule as we will term them, can never unite nor assimilate with ours; they produce only a shock or trembling, more or less considerable, the effect of which is as transient as sound, unless the vibration given to the nerves is very strong, or the disease with which we are afflicted is serious. But if we repeat these vibrations for some time, we may easily conjecture the dangers which would necessarily result throughout the nervous system.

Animal electricity, on the contrary, infinitely more penetrating than aerial electricity, by its analogy with our system, unites with our humors, and vivifies them as long as its action lasts; far from escaping and leaving behind it only a vibration more or less injurious to our nerves, it takes possession of our faculties in such a manner, that we are capable of becoming with respect to it, the same as the Leyden jar is to aerial electricity. And when we cease to feel any effects from its happy influence, it is a proof of the most perfect equilibrium with nature.

NOTE 2.—I do not believe with many magnetizers, that there are various means of charging one's self with electricity that we may act more powerfully on a patient; I know of no means for it, and I have never thought it a duty to find them.

A magnetizer does not impoverish his vital principle when he magnetizes: he may fatigue his resources by magnetizing too long a time or in painful positions, the same as he would fatigue himself in any kind of exercise whatever; but we are strong in imagining that it is at the expense of our own electricity which we impart to a patient. We may compare the magnetic operation to that of a wax candle,

whose flame may kindle twenty others without losing any of its heat. An inflamed body conveys its action, only on another body in which the phlogiston or vital principle is enclosed. The more easily this phlogiston passes off, as in a wax candle, and generally in all bodies not very dense, and whose cohesion is not very powerful, the more readily will the flame present itself; so when we magnetise, the action which we present upon the vital principle of a patient, causes it to react as soon as it is ready to develop itself from him, and in all cases, without the magnetizer losing any portion of his strength or activity.

NOTE 3.—The ancients had the idea of two natures in man, spiritual and material. The ancient theology of the Hebrews spoke of man in three relations—MENS, ANIMA, ET CORPUS, mind, soul, and body. The Egyptians, likewise, believed that man partook of three distinct parts, mind, soul, and terrestrial or mortal body. They regarded mind as the SPIRITUAL PART OF THE SOUL; the soul as the SUTILE BODY WITH WHICH THE MIND WAS CLOTHED; and the terrestrial body as animated by the soul, or subtile body.

Pythagoras, who draw largely from the Egyptian philosophers, taught that the intelligent soul was clothed with a subtile body, which he named CHAR DE L'AME, which united the two natures. He pretended that this intermediary was luminous; and that, moved by the intelligent soul, its action was capable of extending throughout nature. This CHAR DE L'AME, this luminous intermediary resembles very much, it seems to me, that which we designate as animal magnetism; and I doubt whether the Grecian sage could have explained himself more clearly, had he known the new phenomena which this discovery presents to us.

Pythagoras saw only man endowed with an intelligent and judged that the sensible soul or principle of sensations, and of instinct in animals, was of the same nature as the animal soul, or the subtile CHAR DE L'AME of man. These ideas, as simple as they are sublime, were assuredly in opposition to the doctrine of Metempsychosis; therefore, it is untrue to hold forth the opinion that Pythagoras ever taught this doctrine in the manner represented by the poets, and we cannot find any vestige of this absurd notion among the SYMBOLS which we have of him, nor in the precepts which his disciples have collected and left to us as the substance of his doctrine.

I am not certain but that our philosophers of the present day would gain considerable by returning to the Pythagoric school, and that they would find in this subtile intermediary, this CHAR LUMINEUX, the means of reuniting their various systems on the nature of beings.

NOTE 4.—The continual relation which existed between the tree of Buzancy and myself, was proved to me by this fact. Last summer, while I was at Strasburg, several patients whom I had formerly placed in the magnetic crisis, fell into this singular state, every time they went under its shade. I can give no reason for this phenomenon, except by comparing the state of a magnetized tree to that of a magnetized bar of iron, which as long as it undergoes no alteration, preserves its magnetic property and manifests it every time that we place in contact with it any analogous body; so, when a tree is ONCE ANNUALLY MAGNETIZED, it is likely that it preserves its magnetic properties in a similar manner, and that on account of their analogies it is capable of evincing them on the approach of persons who have previously been.

For the rest, I no more comprehend this phenomenon in the tree than I do in the magnet; but I can testify that it is as evident in the one as in the other. As to the time in which the magnetic property of a tree should exist, I can conceive of no other than the death or total neglect of the magnetizer; yet I think that it ought always to exhibit its influence on the many persons, who, continuing to be patients, have once been sensible to its effects.

EGYPTIAN ANTIQUITIES.—We learn from a London paper that a pamphlet has been written by G. R. Gliddon, late U. S. Consul at Cairo, denouncing Menemet Ali for what Mr. Gliddon conceives to be a sacriligious desecration and demolition of the pyramids, the temples, the tombs, the sculptures, and the paintings which record the glories of Pharaonic epochs; and in which consists much of the romance which now attends the wandering footsteps of the intellectual visitor of Egypt. The destruction of the monuments of Egypt by its present Government is visited by Mr. Gliddon with the fiercest anathemas of an enthusiastic devotee in antiquities.—Boston Evening Journal.]

THE MAGNET.

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NOMENCLATURE.

Every person familiar with the phenomena described in this work, has felt the want of suitable terms, by which to designate them; and some terms we have been in the habit of using, have not been understood by all, and others, it is well known,—such, for instance, as “*somnambulism*,” have been used in a sense widely different from what their radical meaning would justify.—*Somnambulism*, from *somnus* and *ambulo*, properly signifies walking in a state of sleep; but it is often incorrectly used to signify a state of sleep, merely, and without any reference to its peculiar nature, or the manner in which it may have been brought on. But, as there is manifestly a marked distinction between natural sleep, and that which is artificially produced, we want some term suitable for designating the state of *induced* sleep, to distinguish it from any other. And, so of the *process* for producing sleep by *sympathy*: the term “*magnetising*” has been used for this purpose, to some considerable extent, but all have been agreed that this was not, by any means, so appropriate as could be desired. The truth is, many of the phenomena common to a state of induced sleep, are so new and unaccountable, that language does not seem to have afforded the necessary terms for designating them all: and, though we offer the following, we must confess that these do not, by any means, cover the entire field. Some of these may not, perhaps, be quite “*classical*,” yet they will, we are persuaded, answer a good purpose, till better terms can be found.

There can be no doubt, but the *agency* by which we operate in producing sleep, is what has generally been known by the term *sympathy*, from two Greek words, which signify fellow feeling, or a like feeling with another,—as *sumpascho*, it is well known, was used among the Greeks in this sense. And hence the use which has since been made, in the science of medicine, of the term *pathos*, or *pathema*, which signifies not only disease, but *passion*, *feeling*, *excitement*, *emotion*; and *pathetikos*, *passion*, *suffering*, *susceptible of emotion*, that which *produces emotion* or *feeling*. No term, therefore, so well expresses what is really meant when speaking of the *agency* by which one person is enabled to operate on the mental or physical organs of another, and for the production of all those phenomena peculiar to the induced sleep, as one which gives the idea of *sympathy*, and a state of *susceptibility*, which renders this influence efficient and successful in producing the desired results in any part of the system on which the operation is performed. Every physician knows, that disease is often communicated by *sympathy*; and it will appear on examination, we think, that this same *agency* may be equally efficient in its cure.—But the results brought about in this way, amount to nothing, more nor less, than what has so long been known under the term “*animal magnetism*.” Hence our authority for the adoption of the following terms; and we may add, that they have not, heretofore, been *appropriated* to any other use, and hence there is, there can be, no rea-

sonable objection to their application, in the sense here proposed.

Pathetism.—The *agency* by which one person, by manipulation, produces *emotion, feeling, passion*, or any physical or mental effect, in the system of another. *Susceptibility* of emotion or feeling, of any kind, from physical contact, or *sympathy* with the *influence* or *will* of another.

And we respectfully submit it to all concerned, whether this be not a far better term for the thing *signified*, than either “magnetism” or “mesmerism”?

Pathetology.—The science which teaches the laws of *pathetism*.

Pathetise.—The act, or process, of manipulating the human body, for the purpose of inducing sleep, and the cure of disease; or for the production of any mental or physical phenomena.

Somnipathy.—Sleep from *sympathy*, or the process of pathetising.

Somnipathist.—One in a state of *somnipathy*.

Somniloquist.—One who is made to talk in a state of *somnipathy*.

Cephalogy.—From *kaphale*, the head, and *logos*; the science growing out of the editor's discoveries, which teaches the *influences* and *susceptibilities* of the human brain, and the method of controlling the separate mental and physical organs by *pathetism*, produced by placing the fingers on different parts of the *head*, and by which their action is *suppressed* or *controlled* at the will of the operator.

When we first made a discovery of the susceptibility of the separate cerebral organs, for the want of a better term we called our experiments “Phreno-Magnetism;” and Dr. Engledue, of Portsmouth, England, has appropriated to them the term “Ceribration;” but we prefer the above, for the reasons already stated.

PROCESS OF PATHETISING.

Though the process of pathetising for the cure of disease was quite fully detailed in the second number of the Magnet, yet we have been frequently requested to give the particulars again, somewhat more minutely.

The following summary of directions were written as a private letter to a gentleman in Warrenton, Dallas co. Alabama, some three months ago; but failing of an opportunity to send it in manuscript, as we anticipated, we now give it a place in the Magnet, under the conviction that others may wish the same information, and will be as much gratified on reading these remarks, as the friend for whom they were at first intended.

We design to prepare a work on this subject, should nothing prevent, which will fully answer all the purpose of those who may wish to test the efficiency of *pathetism* or *sympathy*, in the cure of disease. But, for the present, the following must suffice.

We have before stated, that every thing will depend upon the *susceptibility* of the subject, even supposing the operator to be of sound health and a good heart. And, then, it should be remembered, that it is by *no* means necessary to produce sleep, in order to relieve one from pain and disease. One of the most successful operators in Paris, it is said, has never been known to produce a state of *somnipathy* in any one of his patients.

But, before we state our own process, it may be well to give a brief account of the old method, which still obtains in France, Germany, Russia, and generally in this country. We should state, however, that we scarcely ever observe the old method, and do not in any case depend *much* upon what are usually called the *passes*.

The subject should be seated in a comfortable chair, where he will feel perfectly easy, and where he can recline the head, if he wishes to do so. Seat yourself in front or by the side of him, and so near that you can easily reach, with both hands, the top of his head. Grasp his thumbs with considerable force, and bring the ball of your own thumbs directly into contact with his. Hold his hands in this way some five or ten minutes, looking him directly in the eyes all the while, and exert your *will*, firmly, to cause him to go to sleep. As soon as you perceive any signs of sleep, raise your hands and carry them *from* his, outward in a circle, to the top of the head; and with the fingers gently extended, pass your hands slowly down the sides of the face, over the shoulders and down the arms, over the inside of the hands; and then carry them off from him in a circle, outwards, up to the head again.

To wake him up—put your thumbs over his eyes, and pass them upwards *quickly*, over the forehead. Put your hands on the sides of his head, and pass them off, upward, *quickly*, as if you would brush away some noxious vapour from the surface. Then put your hands down to his, and pass them up his arms and off, *quickly*—that is, make the passes, backward and upward, along the arms, and continue this process till he is relieved.

Remember, that if you succeed in producing sleep, your patient will usually tell you what to do in case of any difficulty; and, also, how you may operate in his case, either to produce sleep or to relieve pain. And this is the reason why it is not necessary to go into details here, as to the *many ways* in which we have been enabled to succeed with various persons.

Bear in mind, that all persons are not alike *susceptible*, and the same directions for the *relief* of one, may not always apply to the case of another, afflicted in the same way. The great law of *sympathy* is the same in all; but it is not alike accessible to all.

We usually produce sleep in the following manner:—The patient is seated, as above described; and *standing* by his side, we place one hand over the whole of the forehead, and the other directly over the front and top part of the head. Or thus: stand directly behind the patient, and put one of your fingers of each hand on the space of the head directly back of the centre of the organ marked by Gall and Spurzheim as *caution*. Or, you may cover these two points with the thumb and finger of one hand, and with the other hand press upon the whole of the forehead; or, place one finger over the space between individuality and eventuality. If the subject be susceptible, this process scarcely ever fails of producing sleep. And, when you perceive he is quite composed and more or less subdued, you may pass the hands gently from the top down the sides of the forehead and face, and down the arms to the ends of the fingers, as above described. —If your subject should become convulsed, do not be alarmed: keep calm, and indulge no unkind or impure

feeling, if you would not involve yourself and subject in difficulty.*

To wake your patient up, place one hand directly over the back part of the head, covering from the organs of philoprogenitiveness down over the cerebellum; or, place your two fingers directly on the organs appropriated to *causality*; or, pass your hands, quickly, up and over the frontal region, as if you wished to brush away something collected there.

But it often happens, that persons succeed in putting others to sleep, and they find it impossible to wake them again. What shall be done in such cases? Answer,—learn to be more careful how you meddle with such an efficient agency, and of which you know so little. We have known serious results to follow the operations of persons, when the motive has been mere curiosity.

But in cases of difficulty, do not be *alarmed*: let the patient alone. If left entirely to himself, the influence will, in time, disappear.

The following is our usual method for relieving headache, when the pain seems to be located in the frontal region. Let the patient lean his head back, so as to rest it firmly in your hand, your hand being sufficiently low to cover the cerebellum. With your other hand, make the passes down and over the forehead and temples. If the pain is located in the back part of the head, cover with your hand the front part, and make the passes over the occipital region.

To relieve the toothache, pass your hand gently over the face and the part affected.

These operations must, of course, be continued from ten minutes to half an hour, or longer, and repeated from time to time as the case may require.

THE MEDICAL EXAMINER.

A scientific gentleman of this city has put into our hands three numbers of this work, containing what purports to be a philosophical explanation of mesmerism. Though we do not, by any means, admit the assumptions on which the so called explanations are given, yet, we find in these articles considerable that is worthy of notice, and which must tend, in some degree, to throw light on this important subject.

The principal article is made up of quotations from a lecture delivered before the Philadelphia Medical Society, last November, by Dr. R. Coates. He says:—

“The existence of the cataleptic condition, as occasionally produced, apparently by certain manipulations, or by certain exercises of individual will, is no longer a legitimate object of debate among well informed physicians. I know of no such individual who has the hardihood to express a positive disbelief in it, though there are many who smilingly or fearfully decline all expression of opinion on the subject, well knowing that an affirmative avowal would produce a loss of influence with

the vulgar or the ignorant, and limit the immediate emoluments of practice.”

The Dr. uses the term *cataleptic*, in a borrowed sense, to signify the somniphatic state; but he assumes, and seems to think he has demonstrated, that this state is not produced by the power of the will at all. It is evident, however, that Dr. Coates has not seen much of the phenomena, said to have been produced by pathetism; for, if facts demonstrate any thing, we have seen and published enough to convince any candid mind, that this state may be induced, by the power of the will, over the nervous system. Dr. Coates and the editor of the Examiner, seem to have drawn their conclusions from one or cases; but it is a fact, of which they do not seem to be aware, that no two cases have been known, in which all the results were, in all respects, exactly alike.

Dr. Coates describes two cases, which occurred in and near Meadville, Pa., in 1829 or 1830, produced by the exercises at a camp meeting, and which he pronounces *identical* with that resulting from manipulation. And it may be remembered, that we, more than two years ago, stated the very same opinion. Indeed, we have always believed, that the state of the nerves observed in persons who are said to lose their strength, under religious excitement, was precisely the same as that produced by pathetism. We have seen and examined scores of cases; and our familiarity with these cases some twenty years ago, brought us to the conclusions we have already published in relation to the power of the mind over the nervous system.

We agree with Dr. Coates, that there are good reasons for believing that we are on the eve of the discovery of a law (not a “new” one, however,) of Physiology; and Phrenology and Pathetism will lead to that discovery. He mentions the following as a curious fact, which he thinks may probably admit of physical explanation, viz. the aptitude of minds, in society, to assume a common train of thought or feeling, grave or gay, as if by contagion. But this fact has already been satisfactorily accounted for by Phrenology. Every intelligent Phrenologist knows, for instance, that the exercise of one organ by one person, will excite the same organ in another. Thus, for instance, combativeness will excite combativeness, mirthfulness will excite mirthfulness, and so of the other organs. This is according to a law of the human mind which all acknowledge, and the fact is worthy of more attention than it has hitherto received.

But as for these new discoveries of theories, we have always been jealous of them. Theories are very easily built, and as easily demolished. We have expected to hear of one and another, in different parts of the world, who will be coming forward, from time to time, with explanations and theories in relation to Pathetism.

ASTRONOMICAL PHENOMENA.

But few persons have any idea, as to the great misapprehension that prevails with regard to the comparative magnitude and distances of the innumerable bodies which compose our solar system. The little instruments called *orreries*, have contributed, in no small degree, to this misapprehension. The following comparison is from the work of Sir John Herschel:—

* The following case has just been stated to us. A physician of the city of B. wished to pathetise a lady. She consented; and on her finding herself in the somniphatic state, she refused to hold any intercourse with him. She finally directed him to send for another gentleman, whom she named; and when he arrived, she stated to him, that on going into that state, she discovered that her operator was actuated by improper feelings, and hence she would on no account consent to hold any conversation with him.

Choose a well leveled field, or bowling-green. On it place a globe, two feet in diameter, to represent the sun. *Mercury* will be represented by a grain of mustard seed, on the circumference of a circle 164 feet in diameter, from its orbit; *Venus*, a pea, on a circle 284 feet in diameter; the *Earth*, also, a pea, on a circle of 430 feet; *Mars*, a large pin-head, on a circle of 654 feet; *Juno*, *Ceres*, *Vesta*, and *Pallas*, grains of sand in orbits from 1000 to 1200 feet; *Jupiter*, a moderate sized orange, in a circle nearly half a mile across; *Saturn*, a small orange, on a circle of four-fifths of a mile; and *Uranus*, a full sized cherry, upon the circumference of a circle more than a mile and a half in diameter.

Such are the relative dimensions of our solar system; but it is with the amazing distances of some of the stars that the mind struggles in its attempts at comprehension. A method has been proposed for estimating the distances of the planets, by comparison with the velocity of a cannon ball, rated at 1 1-2 German miles per minute.—With this velocity, a cannon ball fired from the sun would reach the planet *Mercury* in 9 years and 6 months; *Venus* in 18 years; the *Earth* in 25 years; *Mars* in 38; *Jupiter* in 130; *Saturn* in 228; and *Uranus* (Herschel) in 479 years. With the same velocity a shot would reach the moon from the earth in 23 days, little more than three weeks.

It takes a ray of light eight minutes to travel from the sun to our earth; but from one of the nearest fixed stars it takes more than ten years!

The white clouds, perceived by powerful instruments, are called *Nebulæ*. They consist of innumerable stars clustered together, as in what is called "The Milky-Way." They develop some of the most extraordinary phenomena, in regard to the immensity of creation and the formation of worlds. Various astronomers have estimated their numbers at three or four thousand.

But, light from one of these *Nebulæ* requires 30,000 years to reach this earth; consequently, they must have been in existence during this length of time, and how much longer, who can tell?

LOVE OF OFFSPRING.—How strikingly the goodness and wisdom of God are exhibited in the love which parents generally feel for their offspring! Indeed, we all know, that it is a faculty not at all peculiar to the human species. Without it, children would be considered an intolerable burden; but with it, they become the dearest of all earthly objects, and sources of the purest delight. See how plainly this affection speaks out in the following lines. They are from a father, who recently announced the death of his little one in the *South-Western Christian Advocate*:

"We miss our babe when evening gathers round us,
Thy place is vacant on thy mother's breast;
We wake no more to feel the spell that bound us,
When once to ours thy infant lips were press'd.

To that deep life God's love hath surely borne thee,
Dear, cherish'd babe; nor seek we to reclaim.
How much we love, how much we miss and mourn
thee,

He knows alone—and "Blessed be His name."

The heart from which these lines emanated, must feel

some pity for the poor father and mother, whose feelings are expressed in the following lines:

"And when I seek my cot at night,
There's not a thing that meets my sight,
But tells me that my soul's delight,
My Child is gone!

I sink to sleep, and then I seem
To hear again his parting scream:
I start and wake—'tis but a dream—
My Child is gone!

PHYSIOLOGY.

LECTURE ON PHYSIOLOGY.

BY ROBERT NELSON, M.D.

Late Professor of Physiology and Surgery, and Chief of the Hotel Dieu Hospital, Montreal.

The following is a brief report (from the *New-York Lancet*) of the first of a series of Lectures, commenced in this city a few months since by Dr. Nelson. The reader will find some important ideas in the following sketch; and we could hope that some means might be used to induce Dr. Nelson to favour the public with an account of his experience, and views at large, on this subject.

1. Before we inquire into the laws and functions of the body, we must become acquainted with the elements of which it is composed. After learning this much, we may venture a step further, and examine the structure of parts, a knowledge of which naturally leads to the discovery of their use; but, as the various parts of the body are designed for two purposes only—the preservation of the individual and the perpetuation of the species—they are more or less related to, and dependent upon each other; hence flow a multitude of accidental influences which interfere with the pure function of an organ, and which are the agents that disturb health. Here lies the proximate cause of disease.

ELEMENTS.

2. *Matter* is said to be something which is *impenetrable*, consequently occupying space; which is *extensible*, consequently it is divisible.

3. *Impenetrability*, is proved by this—that one body cannot be made to occupy the space which another fills without displacing it; for if matter were penetrable, one body might be forced into another, and the two would fill no more space than one did; in this way the whole universe would become infused into a mere atom. We need not pursue the doctrine of impenetrability any further, as it may be dispensed with on the present occasion.

4. *Extensibility*, or divisibility, which is the same property, is deserving of our greatest attention; for it is this property of matter which lies at the bottom of all the phenomena manifested in all the works of creation.

5. To illustrate the palpable extensibility or divisibility of matter it is customary to refer to the art of gilding, or even that of making gold leaf; 282, 000 of which leaves laid upon each other will make a pile only one inch in height; and 1500 will equal a thickness no greater than that of a leaf of paper. Another palpable example of the vast extensibility of matter without losing any of its properties is afforded by the spider, a thread of whose web, four miles long, weighs only one grain.

6. Another example of the divisibility of matter

is seen in the diffusion of color. A grain of indigo will tinge a large quantity of water.

7. A still greater example of the wonderful divisibility of matter is recognizable by the sense of smell. It is said that one grain of musk will scent a room twenty years without perceptibly losing weight. The cedar of a common pencil will continue to exhale odoriferous particles for many years, and scarcely diminish in weight.

8. These several palpable, ocular, and olfactory examples of the vast divisibility of matter, not only prove how minutely it may be reduced, but also how wonderfully acute is the power of perception; for, to be conscious of the presence of matter, it must strike a sentient part of our body. We recognize the gold leaf and the spider's thread by feeling, the tinge of bodies by the color they reflect, and the odor of substances by the small particles of their bodies which they continually exhale, and which come in contact with the olfactory expansion.

9. Another example of the extent to which matter is reduceable without losing its sensible properties, and one which is more applicable to the illustration of structural formation, is found in animalculæ. We are astonished, not only when we contemplate the diminutive size of these animals, but still more so on beholding that they are possessed of viscera and limbs; and that even these lower parts are complicated as to structure, since they perform movements which our knowledge of the higher animals shows are effected by special agents. Thus:—

10. The motive organs in serpents consist of a set of intercostal muscles, which, connecting rib to rib, by their contraction draw the ribs together, from the tail towards the head, alternately on one side and then on the other; in this way, drawing their body undulatingly forward. If we descend in the scale of creation one degree lower—to the eel or water serpent—we shall find that progression is effected by the same mechanism as in the serpent, because both these animals are of the same type; but in this species the ribs have stopped short of their completion—they have advanced only as far as a cartilaginous structure. Descending still lower in the scale of creation—to lumbrici, at first sight the whole structure appears homogeneous; but on closer examination, we discover the very same mechanism that was so striking in the serpent—striking because he has grown to the ultimate point of perfection which appertains to the type of animals of which he is a species. But, in descending to the water serpent, we found that the ribs were imperfectly formed, only rudimentary; for the same reason, because all the laws of creation are only progressive links or degrees of the same generic power, we now find in the worm; that the ribs which were disappearing in the eel, have now quite vanished—that is, the creative power has not yet attempted their formation. Having gradually followed the form of the agents of locomotion in the ophidian type down to animals of so primitive a step in creation as are the lumbrici, we find ourselves prepared to understand that it is by a similar agency to the one already described, that the vibrio performs his locomotion. How infinitely small must not the *agency* of a segment be! to say nothing of the parts which compose that segment! But the contractile substance—for we cannot call it muscle—of one of these little animals, is yet infinitely smaller in almost all the infusoria, than in the vibrio we have just contemplated. We need see but once the rapid, yet regular and designed movements of the cilia of the Leucophrys, to be struck

with amazement at the wondrous hand of the Creator.

11. If we turn to another type of animals—insects—and observe them as we have the ophidian, we shall meet with farther proof of the integrity of matter, although it be reduced infinitely small. Commencing with the lobster, and going through the species of crab, of ephemeris, of grasshopper, pediculus, pulex, and the acarus scabei et casei, we cannot fail to be struck with the generality of form and movement which prevail through the whole type; and as we have positive truth that the agents of motion are muscular fibres in all those species which are large enough for demonstration, we must infer that the same agency prevails through the whole type, even to the smallest species. These remarks and demonstrations prepare us for the consideration of the next subject.

12. *Atom* is a particle of matter which cannot be further divided. We may form some conception of the diminutive size of an atom of matter by what has been said of animalculæ; for it is evident that their smallest organs are made up of an assemblage of whole atoms of matter.

13. We need not trouble ourselves with the abstract consideration whether or not there is a term to the divisibility of matter, or whether the theory of atoms be correct or not, since it is a subject that can never be discovered. We must still cling to the theory of atoms, for we know of no other that can afford us an equal facility of expressing our ideas concerning the elementary condition of matter to others, and of comprehending theirs on the same subjects, and on the formation of bodies.

14. *Inertness*. Ponderable matter is absolutely inert by itself, its properties being always inherent and essential. Any power it may manifest is derived extrinsically—that is, from the action of some other body. If a solid body become fluid, or a fluid one become a solid, they do so by receiving or parting with caloric.

15. *Permanence* of matter. Although the extensibility (4) of matter is almost infinite, and the theory of atoms (12) is more an abstract than a physical truth, neither of them can lead us to believe in the destructibility of matter, for every attempt at annihilation, even of the smallest particle, is vain; and if there were no other proof of permanency than that of impenetrability (3), it alone would be quite sufficient. We must therefore feel convinced that whatever is will continue to be and doubtless ever was; at least as regards any theory or matter of reasoning in relation to *us*.

16. Matter is subject to three great powers. 1st. Inertia; 2nd. Attraction; and 3d. Repulsion. Although these permanent truths are commonly called physical laws, to distinguish them from what are called chemical and vital laws, they are nevertheless constantly present and contending against each other even in living bodies. It is barely necessary to mention them in this place, although a thorough knowledge of them is so essential to the surgeon, and the ignorance of them is the cause of so much false and superficial reasoning, bad practice, and consequently undue suffering to the patient.

17. Our power over, and our knowledge of matter, show that it is not all of one kind, but of several kinds, each of which chemists have called an element, from the permanence of its character. By destructive analysis they have not been able to reduce all manner of substances to which they have access to a less number than fifty-five varieties, always possessed of identical and invariable properties, and hence called simple or elementary bodies. All known bodies, however diversified they may be,

consist of one or more of these elements variously combined.

18. Physicians have divided the consideration of matter into two great classes, the ponderable and the imponderable. The latter is often treated of, not as matter but as *condition* of matter. Whatever doubts may exist on many points of fact, it is certain that the imponderables do incorporate themselves with the ponderables, and when this happens a very perceptible alteration in the ponderables is made manifest.

19. Of the whole number of ponderable elements only nineteen are alleged to enter into the composition of organic bodies. These have been variously classified by different physiologists; and by Tiedemann thus:—

- 20.
- | | | | |
|-------------------|----------------------|--------------------------------|----------------|
| | | A. <i>Non-metallic.</i> | |
| Animal vesicle. { | Vegetable vesicle. { | Water { | 1. Oxygen. |
| | | | 2. Hydrogen. |
| | | | 3. Carbon. |
| | | | 4. Azote. |
| | | | 5. Phosphorus. |
| | | | 6. Sulphur. |
| | | | 7. Iodine. |
| | | | 8. Bromine. |
| | | | 9. Chlorine. |
| | | | 10. Fluorine. |
| | | B. <i>Metallic substances.</i> | |
| | | } Alkaline metals. | 11. Potassium, |
| | | | 12. Sodium, |
| | | | 13. Calcium, |
| | | } Earthy metals. | 14. Magnesium, |
| | | | 15. Silicium, |
| | | | 16. Aluminum, |
| | | } Proper metals. | 17. Iron, |
| | | | 18. Manganese, |
| | | | 19. Copper, |

21. Out of these 19 ponderables, 15 are only accessory, but are not essential, to organization, while the remaining 4 are indispensable in the construction of even the most insignificant animal; and only 3 to the rudimentary vegetable. They are—

- | | | |
|-----------------------------|------------------------------------|--------------------------------|
| 1. Oxygen, | } in the proportion to form water, | } Elementary vegetable tissue. |
| 2. Hydrogen, | | |
| 3. Carbon | | |
| 4. Azote | | |

22. None of these ponderable elements, however they may be mechanically combined, or chemically united, are capable of forming either a vegetable or an animal. It is certain, then, that some other element, or elements, should unite with them in order to create an organic being.

23. *Imponderable* elements. These are admitted by physicians to be four in number. 1. Electricity; 2. Caloric; 3. Light; and 4. Magnetism.

24. After treating of the material properties of these four elements, I shall venture, for the sake of Physiology, to add a fifth to the number. In doing so, I may excite surprise, perhaps alarm; but I trust that the advantages it will yield to us will be such as to excuse me and to outweigh ancient prejudices.

25. Some philosophers do not consider these imponderables in the light of bodies, but rather as phenomena produced by certain alterations in the state or condition of matter; and this view of the subject has recently received some support by the late brilliant discoveries in electro-magnetism.—They even go so far as to suppose that the whole four are identical, and that the apparent difference between them is only another form in which they are made manifest. This hypothesis may or may not be true;

but if true, it will be an instance of a violation of the law of analogy,— a fact which seldom happens. Inertness, attraction, and repulsion, are doubtless '*conditions*' of matter; but we never find them producing such strikingly diversified phenomena as distinguish the properties of one imponderable from another. Whatever may be the reality of this subject, I shall consider these elements as if they were substances; for in this light we shall find less difficulty in conveying our ideas to others, and in receiving theirs. For instance,

26. We are made sensible of the existence of imponderables only when they are united with palpable matter; for, in their independent or separate state, they escape our notice. But that they do possess an existence apart from matter is presumable from what we know of light. Light is emitted from its source in straight lines, but is not perceptible unless its rapid flight be arrested by an opaque body, or that it darts immediately into the eye. A stream of light passing through the etherial space, cannot be seen. We may look through it and not see it, though we see objects beyond it. This fact is verified to us every night and during eclipses, when we look at the stars and planets. It is also verified to us in many other ways, even in the day time; for we can look through a large stream of light without seeing it, and yet be able to see the letters in a book placed beyond it, exactly as if no such light intervened. If there were no opaque matter to intercept the rapid flight of light—to retain it long enough for the eye to *feel* it, the sun himself would shine in vain, and we be plunged in utter darkness, although swimming in a flood of light.

27. The above facts show that light possesses the substantial property of matter; the daguerreotype—even the direct accumulation of light on bodies which are hermetically closed, support this idea. The same facts, but in a stronger degree, hold good of caloric; for we cannot add it to one body without taking it from another one, nor can we banish it from one body unless there be another to receive it. It must then appear even that the imponderables, like the ponderables, are *indestructible, and consequently have a permanent existence some where*, but are not always perceptible to our senses, the latter being comparatively of too gross a nature to perceive the former unless accumulated in a sufficient quantity to act upon us.

28. When a solid body becomes fluid, it does so by absorbing caloric from some other body. When it loses its fluidity and becomes solid, it does so by yielding up the caloric it possessed to some other body which has less. When a fluid body becomes gaseous it does so by absorbing a further quantity of caloric, *vice versa*. What has just been said in regard to light and caloric is applicable to electricity.

29. When bodies combine, electrical phenomena are set in evidence. The electrical states of bodies differ from each other, and this difference must cease, must be brought to a common term, when they combine, else the new body could not be a unity.

30. It is evident that these imponderables both associate with ponderables and depart from them. It is also known that caloric exists in a *latent* state, that is, in a passive state in bodies; and although we cannot say the same thing, with as much evidence, of light and electricity, there are too many instances where this is the case to leave a doubt on the subject.

GENETIC OFFICE OF THE IMPONDERABLES.

31. Without the influence or presence of the imponderables, the ponderables will persist in their in-

ertness. It is their presence which marries brute matters together, making one out of many.

32. It was the first four imponderables that engendered out of chaos the sea and the land—the rock and the ruby; and to all appearance these four alone rioted in undisputed power for ages ere their fifth brother claimed his share in the strife. They preside at and control the *brute* unions, of all ponderables.

33. Examples. Oxygen and hydrogen may remain forever in company—mixed with each other, but will not unite unless one or more of the imponderables effect the bans.

34. Even sugar does not dissolve in water, nor can the simplest union take place without the intervention of an imponderable.

35. Water itself cannot pass from the solid to the fluid, and *vice versa*, without such presence, without the intervention of both caloric and electricity.

36. The electric interference has been strikingly shown by Faraday. When one end of a rod of iron is heated, its electrical state varies and during this time nitric acid will not act upon the other end. While the wire is a positive *electrode*, the acid cannot act upon it; but when wire is placed at the negative end of the battery, it is acted upon violently. These facts are additional proof of the axiom that ponderable matter is absolutely inert.

38. Let us now advance one step further before we inquire into Life. Chemists have long since established it as a doctrine, that bodies unite with each other in definite proportions: as 1 A with 1 B; 1 A with 2 B; 1 A with 3 B, &c. This theory implies that these unions cannot take place in any variable proportions.

39. A second doctrine is—these unions are effected directly, as

1 sulphur with 1 oxygen makes hypo-sulph. acid.
1 . . . “ . . . “ . . . 2 . . . “ . . . “ . . . sulphurous acid.
1 . . . “ . . . “ . . . 3 . . . “ . . . “ . . . sulphuric acid.

Whether this doctrine be true or false, it has answered the most exact calculations in the arts; but as regards organic chemistry, it has been the source of great limitation.

40. The latest and most important doctrine regarding definite proportion in unions is that which is called the compound Radical Theory, thus:—

Sulphur . . . = A 1 + Ox. 1 = B Hypo-sulphurous acid.
Hypo-sul. ac. . . = B 1 + Ox. 1 = C Sulphurous acid.
Sulphurous ac. = C 1 + Ox. 1 = D Sulphuric acid.

Professor Graham has extended this theory even to the formation of the various salts, but it is unnecessary for me to do more than mention it.

41. Whether this compound radical theory be correct, it certainly gives us greater facility in conceiving the operations which take place in organic chemistry, than the old method did.

42. An additional doctrine relative to chemical unions, is that which has reference to the operation of the influence which the presence of certain bodies exert on each other. This is called Catalysis. An example of it is found in the effect which spongy platinum exerts on hydrogen with oxygen, at a temperature in which no union could otherwise take place.

43. This catalytic action is supposed to be very common in the organic kingdom. The fermentive influence of yeast has been attributed to this power, because none of the yeast appears to be consumed in the process of converting the saccharine matter in a fluid into the alcoholic or acetous fluids.

44. Since it is demonstrated that the union and

separation of ponderable matter cannot happen independently of the intervention of one or more of the admitted imponderables, analogy suggests that a higher order of union will require the aid of another and a higher order of imponderables. When one brute body combines with another, the presence or aid of an imponderable is always seen; it is either caloric, electricity or light, but such a combination leaves the product *brute* matter.

45. When a higher order of creation is worked out of brute matter, Nature employs not only the imponderables mentioned, but further calls for and employs the assistance of a higher element—Life.

LIFE.

46. Whether life be a distinct element, capable of union and separation from matter, and consequently of an independent existence, like the four imponderable or incoercible elements—Electricity, Light, Caloric, and Magnetism—or is only a condition to which matter is sometimes subject, I shall not stop to contest; for, on the one hand, if we consider life to be only ‘a condition’ of matter or a peculiar state of being of matter, we shall find ourselves puzzled at each step we take in the pursuit of physiology; but, if we contemplate the phenomena which take place in living matter, as the effect of an adventitious element acting on it—that is, look upon life as a *substance* added to matter, as we look upon light, caloric, electricity and magnetism in regard to matter, we shall be able to *formulize* physiology with some of that certainty with which physicians formulize any other physical phenomenon.

47. By possessing a comprehensible idea—as it were—a tangible one, regarding life, we are able to reason *sensibly* on the phenomena which living matter manifests, and thus discard whole libraries of metaphysical physiology, which is the soul, the essence, the basis of all medical discrepancies, and the bane of medical practice.

48. Captious persons and such as are wedded to their previous education may say, ‘before you assert that life is a distinct element, accessible to and separable from matter, *show us some.*’ This reply is easy, and is to be found in the analogies which belong to the four admitted imponderable elements. If this do not satisfy the stubborn, they can accept the assertion as they would any hypothesis in the absence of fact, and use it as a theory. In this way, they may get rid of that which is offensive to them, and at the same time acquire possession of an instrument wherewith to reason satisfactorily.

49. The early promulgation of the theory of ‘the vacuum,’ though denounced as a damnable heresy, was silently accepted by many of the faithful, because it afforded them a more easy mode of treating the subject of pneumatics than any other. The same as regarded the theory of attraction. Every body knew, long before the birth of Newton, when a body lost its support it fell to the earth; but no one was able to reconcile *all* the phenomena attendant upon the descent of the body until he said that it was due to the attraction of the earth—that the apple was drawn down—that if there were no power to *draw* it down it would remain where it was though unsupported. Now he could not *show* the *form* of this power; but once that the hypothesis was admitted, it became easy to reason upon the facts which accompanied it, and to declare what were its laws, and to calculate their force with exactitude. If the same credit be given to the hypothesis that life has an independent existence, it will afford facilities in the study of physiology which we shall seek for in vain elsewhere.

50. As far as our observation extends, we know

that all finite things are incapable of change by themselves; and when they are altered even in appearance only this alteration is the effect of something else which has acted on the body, or ceased to act on it. Therefore, when matter assumes a living state, or loses that state, it has necessarily received, or lost something, different from itself.

51. We must admit then, we know, that there is such an element as life; and that, like the other imponderables, light, caloric, and electricity, it has two states of existence, the *passive* and the *active*.

52. The passive state must be believed as a consequence of the active state, for this is subject to cease; and when the active state of a body ceases, that power which gave it activity, having departed from its abode, must find one elsewhere; for we know, by comparison, that what is will continue to be (15), for nothing can be destroyed; therefore,

53. Life has two states of existence—1st, the passive state, which, like that state of the other imponderables, is diffused in and around bodies—ambient about the surface of this planet, and perhaps a little way within its surface. 2d, in the active state, which is too patent to require elucidation.

54. There is no more impiety in this view of life than there is in the theory of attraction; for are they not both of infinite creation! and are they not means employed by Omnipotence? If life be not an instrument of Omnipotence, what else is it?

55. The active existence of life is only seen when it is combined with matter; and in this state it acts in obedience to laws which are invariable as are any of the physical laws.

56. In its marriage with ponderable matter it dissolves *almost* all the brute affinities which belong to ponderable matter, and produces a new being—a vegetable or an animal—possessed of properties, and subject to new laws which are very different from those which previously appertained to the materials out of which the new structure is raised.

APTITUDE.

57. There is an aptitude and affinity to union ever prevalent between certain combinations of ponderable matter and life. The moment a particle of such a combination is favorably disposed to combine with life (that it is moist and warm enough) it assumes a new form, a lichen or a zoophyte is created; so that the hypothesis of Malte-Brun is in truth more of a reality than a poetical assertion.

58. As an analogy of the aptitude of ponderable matter, when favorably disposed, to combine with an imponderable, we may look to the spontaneous detonation of the ioduret of ammonia. [It must be borne in mind that both these substances are abundantly obtained from living bodies.]

59. Mould, mucor, fungi, and lichens appear to spring to existence, under certain circumstances—[the three first in the dark.] It is asserted that all these bodies are the product of seed or sporules, in contradiction to the assertion of spontaneous birth, because they are seen to produce seed, or sporules which grow into their similars. But this argument will not bear a stricter scrutiny than that of spontaneous birth, for do not these beings die, and revivify? Even highly organised beings die, and revivify.

60. Examples of revivification, which is an analogous action to spontaneous generation. 1st, Will not a moss dry so as to be capable of being reduced to powder and be sifted, in which state can it be supposed to be living? an absolutely dry body to be living? Now this is a common occurrence to moss. It alternately dries for months at a time, when its

growth is dull, and again is wetted by rains or dews when it grows again. So inversely of the ioduret; it dries to a certain point, at which it struggles for a time, receives an atom of caloric, and explodes. While the lichen is wet it grows; but losing its moisture it parts with life, and of course ceases to grow; but if again moistened, it regains life and grows again. These alternating states of life and death play with low organizations many changes. What occurs to the moss occurs to the fungus, which grows on decayed wood.

61. The same thing happens to the *eggs of some butterflies* deposited on the twigs of trees in high latitudes, where the most intense frost does not 'kill' them, though it dries every atom of moisture out of them, in which state they may be kept for years, and resume life when exposed to moisture and heat.

62. This 'suspension of vitality,' or rather destruction of vitality, is even more remarkable in seeds. If they be dry the most intense cold will not injure them; but if they contain any moisture, and are exposed to cold in this state, it will expand by freezing, and as this expansion takes place in a great many parts of the seed, this last will be in consequence torn in its panchyma in so many places that, when it thaws, it will consist of many particles divided in part from each other like flour, though still contained in a common envelope; now it is well known that a seed, which is the ovum of a plant, will not grow if much injured in its texture—flour will not sprout. Besides the lacerating power of frost, the changes which the ice undergoes when it thaws are of a chemical nature, and tend to the saccharine, and are followed by the alcoholic and acetous fermentations.

These remarks must be sufficient to refute the belief which some people have that seeds may remain many years a few inches under ground without perishing. It is in this way they attempt to account for the fields of mustard, clover, and even forests which suddenly spring up, after the arrestation, by fire, or the plough, of the previous growth.

63. If the seed be kept dry, it will sprout and grow as vigorously, after a lapse of thousands of years, as the wheat found in Egyptian mummies proves.

64. Not only vegetables die and recover life, but highly organized animals do the same as the *Rotifera*, may die and be kept in this state for years, and when moistened will quickly recover life. Some of the *Aunelides* will also act in this way as the *Vibrio tritica*, Gordious Aquaticus, or hair worm, and the *Filliaria*, or thread parasite, which infests the horse's eye.

65. Life acts on health like caloric. When caloric is added to an appropriate imponderable, it will vanquish the inertness of the latter; but to be able to do this it must, in the first instance, be in sufficient quantity to *saturate* the imponderable to a certain point, or else its power will fall short.

66. Examples. If a live coal, containing a large quantity of caloric, be brought into contact with a combustible, it will first part with so much of its caloric as will saturate the combustible to a certain point; after this is attained, if it has more caloric to spare, it will continue to impart a further quantity to the combustible, until the latter has reached the point of ignition. But if the quantity of caloric be less than these degrees, it will fall short of igniting its neighbor; and by having diminished its own quantity, that which remains will be inadequate to continue its dominion over the coal, and this also will cease to burn, or die. Having so saturated its neighbor and produced ignition, a new movement is

created in the latter—it has acquired life, and this, if in sufficient quantity, will feed on all the carbon within its reach, increasing in strength as it draws more food within its rapacity, increasing from a spark to a conflagration—from an atom to an oak—from an albuminous organic atom to a whale—to an elephant—to man. Such has been the progressive march of nature from the moment that organization was called out of chaos until now. And what reason have we to suppose that the creative fiat of God has ceased? None!

67. The quantity of life, as well as that of caloric, must therefore exceed a certain amount, or it cannot exceed the inertness of matter. Place a shovelfull of live coals on a cold hard floor—they will die; on a soft warm floor, they will not only live but give life to the floor;—on splinters of the cold hard floor, it will also enliven these, because the portion of dispensable caloric is sufficient for both parent and associate; a soft wood coal will not ignite cold gunpowder. In high latitudes, and in cold weather, the spark from a flint is not proportionably hot enough to ignite the powder in the pan of a gunlock.

For the Magnet.

CURIOUS PHENOMENON.

Dear Sir,—I noticed an article in the November number of your interesting work, taken from the "Winthrop Farmer," relating to Hair-Snakes, popularly so called. I had, for some time, been thinking of publishing my own observations upon the same subject, as I had never before seen any thing of the kind in any literary journals, or any where else.

Three years ago I had a *scarlet tanager* (fire bird) in a cage; and as it proved to be an *anti-Grahamite*, preferring an animal to a vegetable diet, I fed it principally during the summer months on grasshoppers, they being the insects most easily obtained. My boys were in the habit of putting them into an old tin pot with a cover as fast as they caught them, and often would have enough on hand to last the little pet a day or two.

On feeding him myself one morning on the last of the insects left in the vessel (they were all dead, from having been kept so long,) I was surprised to find at the bottom a large number of these worms. I had never before seen any, except in standing water. After this I took particular notice, and almost every morning I would find a greater or smaller number of the same species of *vermicelli*, and some of the grasshoppers would be dead. I also observed the same circumstance in relation to the common black or field cricket.

From these observations I infer, that this species of worm is not, naturally, a water animal; that whenever it is seen in water, a grasshopper or cricket has been drowned there; and that it escapes from the body of the insect it infests near the time at which that insect dies.

Query. Are these worms, then, necessary to the life and health of those insects? and if so, shall we hence infer that intestinal worms are necessary to the life and health of all animals?

E. G. WHEELER, M.D.

New-York, January, 1843.

NEW REMEDY FOR HYDROPHOBIA.—Dr. HELLER, member of the Royal Academy of Medicine, (Paris,) lately communicated to his society, that in Greece it is the practice to observe the tongues of those who have been bitten by dogs, because at the end of eight or nine days there appears on each side of the tongue

and near the upper part, pustules called *lysses* by the Greeks. These pustules contain the whole rabid matter, and they are immediately cut and the wounds cauterised, which prevents hydrophobia.

ANTHROPOLOGY.

MAN AND HIS DISEASES.

BY P. CUNNINGHAM, ESQ.

INFLUENCE OF HAIR.

The hair being the chief medium through which electro-magnetism is supplied to the human body, hence the superior hairy structure of man gives him a muscular as well as intellectual superiority over woman, whose silkier hair and downy covered skin precludes a sufficiency of electro-magnetism being received or emitted when great intellectual or muscular efforts are demanded. Indeed all women of powerful understanding or strength are remarked to approximate man in this respect, having a stronger hairy development of face or body than the more effeminate portion of their sex, and from which, as relates to the face, they derive a greater advantage than man by their not pruning it down, and thereby curtailing its power of electro-magnetic introduction. The different colours and constitutions of the hair in different people must necessarily have an important influence upon the mind and the temperament, on account of the different proportions of electricity and magnetism which the above coloured hairs transmit, and the different rapidities with which they transmit them. In the woolly head of the negro, the Creator has drawn a distinct line of intellectual difference between the black and white races; for wool being a bad electric conductor, his brain is therefore supplied with but a bare electric sufficiency to make the mental line between him and the next order of animals broadly visible, while the abundance of straight regularly constituted hair over his body shows his corporeal powers to equal at least those of the white, inferior though his mental powers be. The curly state of his head hair is attributable, I conceive, to the above more difficult electric introduction, the electricity naturally twisting it about in the efforts to effect an entrance, and thus eventually regulating its form. If the negro race, therefore, are ever to be elevated much above their present state, it must be by submitting themselves to the tutelage of less woolly and curly heads than their own, as the better-haired Indians of Peru found it their interest to do with the golden-haired children of the sun, the value of whose hair they so highly appreciated as to endeavor to preserve it by severe laws prohibiting their incas intermarrying with any but the golden haired stock. Black bodies having a strong electric affinity, by means of which they transmit electricity more readily than any other species of colour; hence dark-haired people, as well as animals, are observed to be hardier than the white-haired, from their bodies being kept in a more equable temperature, in consequence of the readiness with which electricity can be acquired and parted with; while the tardy escape of it through the white hair, is apt to throw the body into an inflammatory fever when any violent bodily exertions are made. The black-haired race will thus, also, be enabled to rouse their mental energies and passions more suddenly and to a higher pitch of excitement, as well as to cool them down again more rapidly than the white-haired, who receiving electricity slowly, are slowly excited, and by also parting with it slowly, are slowly cooled.

The Celtic and other straight dark-haired races are therefore, I conceive, capable of excitement to higher pitches of intellectual energy than the Gothic fair-haired race; but then the electricity exciting these being as readily parted with as received, renders this excitement to be as easily dissipated as it was conjured up, preventing them thus from mastering any great object requiring a continued effort of the mind, like the fair-haired Goths, who, when once excited, can keep this excitement more steadily up, from the greater power they have of retaining the electricity on which it depends. As white hairs however, progressively grizzle the heads of the dark-haired man, his judgement and perseverance progressively increase also, until the white hairs gain too great an ascendancy over the dark; while the minds of the fair-haired are generally at the highest pitch of energy when middle age commences. A mingling of the blood of the two races must naturally, therefore, generate a cross breed blending the qualities of the two, and I believe it will be found that to this cross breed we are indebted for the greater portion of the highest works in literature, science and arts. On the Continent, the authors of the above have been principally born at no great distance on either side of the Rhine, where these two races have mingled most; the far north or far south on either side (except in Spain, from Gothic invasion) having produced few men to compare with the medium between, and even those few might be cross breeds. In England, nearly all the eminent men have been natives of the country south of the Trent, where the Celtic or Roman blood has been more intermingled; while in the northern parts, where the purer Gothic prevails, although there has been more general good sense, good judgment, and prudential peaceful behaviour than in the south, until of late years, when the greater Celtic intermixture in the manufacturing parts has engendered a more combustible spirit among them. Wales has produced no very eminent original genius; Ireland cannot boast of one with an initial of Celtic O' or Mac, and nearly all the Scottish men of note have Saxon names. While, however, the improvers of the inferior animals have already benefited them immensely by scientific crossings, the improvement of the first of all, man, has been left wholly to chance, by which his mental and muscular powers have not been advanced in proportion to those of the brute creation over whom he rules. Speaking more nationally, were the dark-haired Celts of the United Kingdom but whitened with a dash of the fairer Saxon, and the latter again embrowned with a dash of the former, a great improvement would be effected in both; the Saxon would have more life infused in him, and the Celt more judgement and prudence; the former would be less easily trodden upon, while the latter would be less easily excited by cunning and callous fair-haired demagogues to outrage and rebellion.

The effects of intense electric transmission causing an early whitening of the hair of those addicted to much mental thought, or in whose minds grief or anxiety have sown their cankered seeds, is curiously exemplified by the head hair of man insulated by the hat retaining its colour longer than the hair not so insulated; thus the hair upon the temples and other parts not covered by the hat becomes grey much earlier than that over the places covered by it: the hair upon the latter, however, falling off much sooner, on account of the electro-magnetism which retains it in vigour, and for whose transmission it was solely formed, no longer obtaining a passage in sufficient quantity through it. In woman, on the contrary, grey hairs not only make their appearance

less early, but are nearly equally diffused, at the commencement of the blanching, over every part of the head; on account of their more porous and airy head-dresses admitting a freer electro-magnetic access to every portion of the head hair. But this is not the worst as regards man, for as reason leads us to believe that the brain is divided into different parts performing different functions, which parts must necessarily receive as well as emit the electro-magnetism on which their excitements depend through their immediate hairy coverings, so by the insulation (imperfect though it may be) of these cerebral parts, they will not only be prevented from attaining that puberty, if I may so term it, which they would otherwise have arrived at, but have their functions impeded and weakened whenever covered by the hat. Every man must have felt how much clearer his ideas flow when his head is uncovered than when his hat is on, which he instinctively finds necessary to lift up every now and then and give his hair a rub, in order to make them glide brighter and smoother along. Oily substances, by their electric attractions and magnetic repulsions causing electricity to prevail over magnetism in the bodies conducting the latter, hence the benefit which the hair derives by unctuous applications to it when it begins to dry up through long continued or intense electro-magnetic transmission, which, fitting it to be a better magnetic conductor than an electric one, enables it now to conduct in greater quantity the very substance eventually destined to effect its destruction.

Bodies are good conductors in proportion to the continuity of the particles: an iron wire being a good conductor, but the same wire converted into filings, a bad one, even when these filings are placed in a continuous row, so that many substances which attract electricity strongly may not be able to conduct it well on account of the want of continuity in their particles.

Dry wood, a bad electric conductor, which is converted into a conductor by being moistened, affords an exemplification of the superiority of moist hair over dry in electric conduction.

PHRENOLOGY.

The science of phrenology is of old date, though never attempted to be carried to the minuteness it is done now. We see that the ancients always moulded their heads in statuary and painting of that for which they perceived most nearly embodied the species of intellectual perfection they endeavoured to represent: a good head and a bad head, a poetical and intellectual one, having been long common expressions among artists, doubtless derived from observing that the more prominent qualities of the mind, were usually indicated by a particular mould of head. I had taken little interest in phrenology until proceeding with the present essay, when I saw that as electro-magnetism always occupied the surface of bodies, it must consequently occupy the surface of the brain, and that as according to the views into which I had been led, electro-magnetism was the immediate exciting cause of all the mental and corporeal functions, the cerebral superficies must therefore require an extension corresponding to the amount of the electro-magnetism it had to contain, or in other words to the amount of activity in these functional parts.

But as it is consonant to reason that distinct functions should have distinct portions of the brain allotted for them, hence these cerebral functional parts will necessarily require an extent of cerebral superficies, corresponding to the proportioned intensity of the action they are called upon to perform; for as

increase of healthy action operating upon any part causes an enlargement of that part, (as we see exemplified in the muscles,) so the increased activity of any particular cerebral function, by causing an enlargement in the superficies thereof, will necessarily cause also a corresponding enlargement in the cranial superficies covering it. As parts, however, yield readiest at the point where there is *least* resistance, so the skull therefore, will yield more readily in an *outward* than in a *lateral* direction, to a force pressing from within, and hence cranial projections will naturally be produced, corresponding to the form of the cerebral functional parts which they cover. Of this development of cranial protuberances, even in manhood, I am well convinced by that of one in my own head, in the line of the sagittal suture, whose increase was for a time so rapid as to excite an uneasy sensation in the part, and which occurring at a period when my mind had been kept for a considerable time in constant agitation, in consequence of the deceptions practised upon me in a quarter where I had placed confidence, I therefore conceive the above enlargement must be some way connected therewith.

Nature indeed sufficiently portrays, in the head formation of those born with defective intellects, the truth of the general principles of phrenology, by the marked difference of cranial formation between these and the more favoured of the human race, as well as between the stupid idiot, and the crafty; the former having, almost uniformly, large puffy heads and faces, while the heads and features of the latter assimilate, like their manner, very closely to those of a monkey. Indeed I never knew even an approximation to a monkey form of head or feature, which did not indicate a monkey disposition—cunning, trickiness, revengefulness, callousness, all even to the minutæ of muscular attitude and expression being developed in the person's conduct. Knaves, in fact, (as far as my observation goes) possess no natural intellectual developments that would ever be turned to high account by any course of schooling, however judicious, and therefore society would suffer no loss by a total extinction of the breed; but if you can only restrain the *increase* of their *noxious* developments, so as to make them less pestiferous, you will accomplish a great good; an aim which may hereafter be much assisted by the lights that phrenological science seems destined to throw upon the subject.

The common reproachful terms of thick-skull and big-head, have some foundation in reason; a thick skull necessarily retarding inflow and outflow of electro-magnetism to and from the brain, by the greater mass of substance it has to pass through; while a big head indicates a similar retardation somewhere, by which the electricity received is applied toward the cranial enlargement; which electricity being more generally applied to the enlargement of the *animal* than the *intellectual* portions of the brain—hence the general justice of the remark. It is, however by this enlargement that larger heads of the fair-haired race are enabled to compensate, for the tardier electric introduction into them, in consequence of the larger reservoir *within*, from whence they can draw electro-magnetism, without being always dependent upon *extraneous* supply. Those whose hair readily emits and receives electro-magnetism can better dispense, therefore, with large heads; but I think it will be found that men of great talents have almost uniformly large heads, storing up electro-magnetism, in order that, when occasions call for it, there may be enough at hand to prevent grand conceptions from being mutilated by a deficiency of supply from without.

NUTRITION.

The analysis of human food shows it to consist, generally speaking, of nearly equal proportions of oxygen and the inflammable matters, carbon and hydrogen; from which it might be inferred that magnetism and electricity must be attracted inwards through the skin, for the purpose of decomposing, or, in other words, of digesting it. Should, therefore, magnetism and electricity in equal proportions neutralise each other, no increase or decrease of temperature would take place in the human body from the digestion of the greater portion of the food made use of; this food requiring oxygen in excess over combustible matter to cool the body, and inflammable matter in excess over oxygen to heat it. Now as certain species of food and drink are heating, and others cooling, they must, I conceive, contain either mass-electricity in excess or mass-magnetism in excess, in order to produce these heating or cooling effects, because, during their decomposition, the mass-magnetism and mass-electricity which they contained would be in all likelihood set free from them in the atomic state, and thereby increase the body's temperature or diminish it according as either preponderated. But as electricity and magnetism in equal proportion may be capable of exciting the sensation of heat, and as a body which is the heaviest in the northern hemisphere may be lightest in the southern, so the conclusions relative to the above must remain in a great measure speculative until farther experiments enable more correct results to be drawn. That electricity and magnetism are attracted inwards through the skin to assist digestion is not only borne out by previous illustrations, but by our own sensations. When digestion is going on, we feel uneasy if our clothes are tight about us, consequently are instinctively led to slacken them, thus admitting the atmospheric air, and consequently the atmospheric electro-magnetism, to have a freer access to the skin. Again, hot drinks do not produce such lasting heating effects upon us as cold drinks, because the electric heat they contain passes only from *within* the body to *without*; while the cold drinks, on the contrary, attract their electricity from *without* to *within*, and as it will have to pass *outward* again, it will thus by the *double* course it has to pursue, increase the body's temperature for *double* the time at least that the hot drink can so increase it. The cold drink occasions a genial glow upon the surface the moment it is swallowed, at the very instant, in fact that the internal parts are chilled, which can be accounted for only by the rush of electricity through the skin.

Food, therefore, that supplies electricity in excess over magnetism to the human body (by whatever means it supplies it) must be heating food; and that which supplies magnetism in excess over electricity must similarly be cooling food; and as I have previously demonstrated that electricity in excess over magnetism tends to increase the solid contents of the body, and magnetism in excess over electricity to diminish them, so therefore electricity must excite the recrimentionitious vessels of the body to action, viz. the vessels *increasing* the solid contents thereof, and magnetism the excrementitious vessels or those *decreasing* the said solid contents; consequently the equilibrium of the bodily solid contents being kept up by the equilibrium maintained between these two classes of vessels, a preternatural action in the first must tend to an *increase* of these solid parts, and a preternatural action in the second to a *decrease* of them.

The recrimentionitious vessels, as I have previously exemplified, are characterised by the coloured tints of the fluids which they convey, and the excrementi-

tious by the pale tint thereof; corresponding in fact, in opposition of colour, to the opposite nature of the bodies (viz. electricity or magnetism) chiefly abounding in them. Animal food being heating, therefore it must be an electric or recrementitious food; while acid fruits being cooling, they must consequently be excrementitious. Thus animal diet is of a constipating and fattening nature, while acid fruits are laxative and impoverishing; and hence the prevalence of excrementitious bowel complaints during the fruit season: complaints, no doubt, of a sanative nature, in the first instance, tending to check the previous excessive recrementitious action engendered during the hot season, but which frequently end in a diseased or excessive excrementitious action of the intestinal excretories.

Digestion being simply a galvanic decomposition of the ingredients taken into the stomach, food will consequently be digestible, or, in other words, decomposable, in proportion to the weakness of its constituent affinities; and hence, what are called indigestible substances are made more easily digestible by being kept until their constituent affinities are weakened by incipient putrefaction. Salt, sugar, alcohol, and the bitter principle are all fattening substances, therefore their action must be electric or recrementitious; while vegetable acids are impoverishing substances, and consequently their action must be magnetic or excrementitious. Yet the above substances, wheter electric or magnetic, are equally capable, in large quantities, of preserving from galvanic decomposition, or in fact of rendering indigestible every species of animal or vegetable matter to which it may be applied; while again small quantities of them render the above more decomposable or digestible than if none had been used at all; a circumstance well known to cooks, who frequently sprinkle with salt, or dip in vinegar, flesh and fish previous to being cooked, with a view of making them tender, a fact indeed which our own feelings convince us of by the necessity we are in of taking a moderate quantity of spirits, salt, sugar, or vinegar with what we eat, to render its digestion more easy. Too much of any of the above, we see, therefore, must impair digestion, and hence the injurious consequences of using any of them in excess. The greater portion of human food being (as I have previously remarked) constituted of nearly equal parts of oxygen and combustible matter, it may therefore be supposed to contain nearly equal proportions of electricity and magnetism in chemical union with its particles, so that it would seem to require a small excess of either the one or the other to facilitate its decomposition, and hence the utility of the electric and magnetic substances supplied by the internal viscera for the purpose of digestion; the gastric juice being an acid and consequently a magnetic substance while the bile is bitter, and the pancreatic juice sweet, showing these on the contrary to be electric. The food seems thus destined to undergo two species of galvanic processes before being resolved into nutritious chyle, that in the stomach being probably assimilated to what is called the acetous fermentation, from an acid or magnetic substance being the cause of it, and that in the small intestines to the spirituous fermentation from the cause of this being an electric substance. The first process of digestion should be of a magnetic nature seems evidenced not only by the conclusion we may draw from the primary acid action upon food in the body, but from analogy by what we see take place in food out of the body, when left to the decomposing galvanic influences of the atmosphere. Thus both animal and vegetable matter becomes gradually putrescent when so exposed; the offensive odour which it ex-

hales showing the magnetic action going on, from all excrementitious matter possessing an offensive odour, doubtless from the magnetic excess therein, as well as from electric inflammable substances, such as charcoal, quickly dispelling this odour, evidently by their electricity neutralising the magnetism of which the above odour is constituted.

Thus a healthy digestion, and consequently nutritious process, must depend as much on a due portion of acid or magnetic matter being secreted by the stomach, as on a due portion of bitter or electric matter being secreted by the liver. Hence, in post-mortem examinations of many diseases the bile is found to be insipid, and in some of the most malignant, such as cholera, altogether wanting. Bodily health must therefore be in a great measure dependent upon the capabilities of the above secretions to excite the requisite galvanic action in the food, from which the chyle is to be extracted, for the excrementitious and recrementitious purposes of the body. In youth recrementitious action has the ascendancy over the excrementitious, because the bulk of the body must not only be sustained, but further increase made thereto. In manhood again, the health is best when they are equal to each other; corpulency ensuing from the ascendancy of the one, and emaciation from that of the other; while in old age the excrementitious action gradually gains ground until the body is wasted to feeble decrepitude, and life eventually extinguished. Were all this left solely to chance, the animal body would soon be destroyed by the alternate, powerful, electric and magnetic actions to which it is subjected; but it is one of the most beautifully harmonious of nature's laws, that when electric action is carried to excess, the appetite's cravings are for magnetic food and drink, viz. fruits and acids; while when magnetic action is carried to excess, electric food and drink, viz. salted or peppered substances, are on the contrary craved for, so that the equilibrium of action in the system is not only thereby preserved, but the very cravings of the appetite made to designate the species of action that prevails. Thus, after a dinner party, if electric action is in excess, cooling fruits and drinks are craved for; but if magnetic action be in excess the craving is for salted or well peppered food, and stimulant beverage; the same holding good in youth, when the electric is the prevailing action, and in declining life when the magnetic is so: cooling fruits being more generally relished in the one and heating regimen in the other.

When the acid juice of the stomach is insufficient to complete the acid fermentation in the food before its passing into the intestines, the above acid fermentation will consequently go on in the latter, thereby giving a tendency to bowel and other excrementitious complaints. To insure bodily health therefore, food should not only be taken in moderation, but well masticated before being swallowed, so as to admit of a speedy and equable fermentation taking place throughout it. Vegetable acids in moderation are useful when the gastric juice is deficient, and bitters when it is too abundant, the first assisting the deficiency of acid fermentation, and the second checking the excess of it, each, however, in excess counteracting the galvanic action of the gastric action, or, in other words, the digestive powers, by acting as preservatives (as before illustrated) to the food. Persons are found to require, generally speaking, food and drink in proportion to the mental or bodily labours to which they are exposed, which requiring an increased amount of electro-magnetism to carry them on, consequently require an increased demand of food and drink to supply that electro-magnetism to the mind and the

body—the above law, though generally applicable, being subject of course to exceptions. Men, therefore, that think hard, or work hard, require a greater amount of food and drink to keep the body in health than the thoughtless or the lazy; the smaller the amount however of the above supplying the requisite electro-magnetism, the less injurious to the constitution on account of the excrementitious matter to be evacuated being less. It is thus that excess in eating is infinitely worse than excess in drinking, though both are sufficiently deleterious; the medium being of course the best when the body is never over excited by excess, or enervated by a deficiency of requisite stimulus.

It is curious indeed to contemplate the different effects of the excitement of wine upon a thoughtful and a thoughtless man—the electricity evolved being principally directed toward the head in the first, while in the second it is equally divided between the head and the feet, so that though the thoughtful man may be striking out the most sublime conceptions, his legs may be unfit to support him; while the thoughtless, though walking with a firm and steady step may not have an idea brooding in his head to break through the foggy atmosphere within. Pitt, Fox, and Sheridan, delivered, it is said, some of the ablest speeches ever heard in the British senate, when they could with difficulty stand upright. Indeed a thinking man is, at all times, an unsteady walker, being liable to trip at every stone, or to be pitched off his perpendicular by even the slightest push, for having less electricity in his heels than his head; while the less thoughtful trips nimbly along, without a stumble, from having more electricity in the former than the latter.

That the greater portion of the food and drink made use of is serviceable only so far as it attracts electro-magnetism through the medium of the skin, for the supply of the mental and bodily wants, seems borne out by the diminutive dimensions of the thoracic duct, the sole channel through which the whole of the nourishment extracted from the food is conveyed into the blood; its small crow-quill size seems quite inadequate to convey above a tenth of the substance of the food and the drink, daily swallowed, into the circulation, showing consequently the small portion required for nutrition, in proportion to that for electro-magnetic purposes. Could any substance in smaller compass therefore be discovered capable of furnishing the requisite electro-magnetic supply, not only would better health be enjoyed, from diminishing thus the amount of the excrementitious mass to be expelled from the body, but a greater amount of population would be capable of being sustained in a given space, from the diminution thus made in the amount of food consumed. The Peruvian Indians, for this purpose, chew the leaves of the cocoa shrub with an alkaline cake made from the ashes of a tree, and by means of the juice swallowed from a few mouthfuls of this daily, are enabled to perform the most extraordinary labours, with scarcely more besides than the substance of a good English meal a week; enjoying at the same time a state of robust health not generally found among the solid food-eaters of Europe. Were some such substances as the above but generally made use of for furnishing the body with electro-magnetism, how many more extra millions might not the earth be made to maintain, with less risk of their numbers being thinned by the multitude of diseases to which the present diet gives rise. All the substances composing human diet remaining undecomposed when closely excluded from the atmosphere; hence it is evident that their decomposition, in the digestive organs, cannot be owing to causes within the

latter, but to causes existing in the atmosphere, indirect though the communication may in this case be; for if the food previously attracted, the electro-magnetism decomposing it from the body, the latter must eventually replenish its loss from the atmosphere.

The idea of the sensation called heat being produced by the motions and not by the amounts of atomic electricity and atomic magnetism, seems strongly borne out by this sensation being often experienced when the mercury in the thermometer is contracting, and that of cold when it is expanding, showing that the decrease of heat, or increase of cold in the atmosphere, produced no decrease in the one case, or increase in the other, in the sensations which they respectively excite.

GROWTH AND DECAY.

On man being thrust naked from the womb, a new world is opened before him. That nutrition hitherto drawn from the mother's internal uterus, and *directly* introduced into his circulation, is now drawn from her external mamma, and *indirectly* introduced through the medium of his own digestive system; while his blood formerly purified by the lungs of the mother, is now purified by his own. The dark juicy softness of his hair rendering it a good electric conductor, thereby enables the recriminatory action hitherto going on to be maintained; while the increase of the excrementitious secretions, and the occasional vomitings induced when growth proceeds too fast, by checking the latter, thus tend to check the formations of imperfect structure in the body. When, however, this growth still progresses too rapidly, the intense electro-magnetic introduction by which it is sustained frequently blanches the hair of pale colour, thereby moderating the intense electro-magnetic excess, and consequently the too rapid growth of the body; reverting usually however, to its former color toward the period of adult age, when the electro-magnetic introduction through it is diminished, from the body's growth being perfected.

As puberty approaches the generative parts become gradually covered with hair, and as soon as there is enough to transmit a sufficiency of electro-magnetism to excite the seminal and menstrual secretions, these secretions are poured forth and man enters into a new state, his beard now budding rapidly forth, and new passions taking possession of his breast, thereby effecting a complete revolution in his ideas, and consequently in his conduct.

The long continued electro-magnetic transmission, by rendering hairs drier and harsher, consequently diminishes eventually the amount of electric transmission, while increasing that of the magnetic, until the two actions become eventually equalised, and thereby terminate the growth of man; the same transmission, however, by the gradual change thus effected in the hair, at length enabling the magnetic transmission to gain upon the electric, until the former so far prevails as to gradually blanch by its action the color of the hair which conducts it. Excrementitious action would consequently now be more powerful than recriminatory, and the body thereby made to decrease in bulk, did not nature prompt to counteract this, by increasing the stomachic call for stimulating regimen, by which the body's bulk and activity is for a longer period preserved. In youth, cooling acid fruits are craved for, because the recriminatory process greatly exceeds the excrementitious, and so rather requires restraint than encouragement; but as white hairs make their advances, nature prompts a gradual advance in the stimulating nature of man's regimen; the one cup that would

have intoxicated before, being now no longer sufficient to keep up his animal spirits or his body's bulk, and consequently requiring the number to be increased for the due sustainment thereof.

As new hairs, however, continue to be blanched, and the old ones to be ejected by the excessive excrementitious action in them, the electric stimulants had recourse to are at last no longer able to contend against the overwhelming magnetic introduction, all the softer parts now progressively decreasing in activity, heat, and bulk, until the magnetic influence eventually so far exceeds the electric as to extinguish vascular action; when the soul or mind, the supreme director of all the electric energies of the brain, takes its flight to render its account to the Being who installed it.

That white hairs are the cause of old age, and not old age the cause of white hairs, is a theory, I conceive, fully borne out by the laws of electro-magnetic action, by a constancy of which it eventually pulls down the very parts it built up, if no counter-acting influence places it in check. In identifying electro-magnetism with life, and the mind with the soul, I have differed as respects the latter point from the impression somewhat entertained, founded upon the deduction, that as the mental functions are so imperfect, the soul, being a perfect body, could not be consequently identified with the mind. Conceiving, however, the soul to be the supreme director of all the functions, both corporeal and mental, and that the human form is but a piece of animated mechanism, if any portion of the latter should be rendered imperfect through casualty during its construction, it would be as unjust to blame the Director of it for not producing perfect results, as it would be to blame the director of a piece of man's handicraft mechanism, for not producing perfect work, when any portion of the above was imperfectly constructed at the outset, or impaired in after times.

NEUROLOGY.

THE NERVOUS SYSTEM.

The following paragraphs are from the Parisian work, from which we have before drawn so largely, written by a lady, and published in 1835. We have at command, one of the best works ever written, probably, on the science of Human Life, in which we find the most clear and satisfactory account of the nervous system we have seen, and which we design to lay before our readers in due time. These extracts form the concluding notes to the Parisian work, above named.

The "Exposition of the Natural System of the Nerves," published by that most acute of physiologists, Charles Bell, in 1824, has shewn that the operations of sensation and motion are not carried on by the same part of a nerve, and that the nerves form *four* different systems in the body. And first with respect to a texture of a nerve;—"It is," says Mr. Bell, "a firm white cord, composed of nervous matter and cellular substance; the nervous matter exists in distinct threads, which are bound together in the cellular membrane; they are supplied with arteries and veins, and derive their sensibility from the blood. A nerve then consists of distinct filaments; some serve the purpose of sensation, some of motion, and some go to the muscles of respiration. The same filament does not serve two purposes." Mr. Bell asserts, "a great part of the nerves are not single nerves possessing various powers, but bundles of different nerves the filaments of which

are united for the convenience of distribution, but yet as distinct in their office as their origin; that the perception of an idea depends on the part of the brain to which the nerve is attached, and that the functions of the cerebrum and cerebellum are different."

As to the division of the nerves Mr. Bell states that, "Besides the nerves of vision, smell, and hearing, four different systems are distributed through the body, namely, those of sensation, voluntary motion, and respiratory motion, and those which, neither conveying sensation in the ordinary meaning of that term, nor volition, nor causing respiratory action, unite the body into a whole, and are essential to *nutrition*, and generally to animal existence." Mr. Bell describes the spinal marrow as being composed of six columns—three in each lateral portion; an anterior column, which is the function of voluntary motion; a posterior column for sensation, and a third between them for respiratory functions. (The division of the nerves into four systems, instead of two, which I had adopted from Bichat's "Physiology," does not in any way affect my subject of discussion.)—It seems that the regular nerves are double; i.e., contain filaments for the purposes both of volition and sensation; but there are irregular nerves, which are superadded to these, and which are single in their root and in their operation; two of these must be united in their course or final destination to cause both sensation and volition. It is of importance to know that the nerves of the brain are single, except the fifth, which is the sole nerve of sensation for the face—for if the seventh pair, which is allotted only to motion, be divided for the tic douloureux, it will produce loss of motion in some parts, causing deformity, without the desired object, viz. destroying sensibility.

Mr. Bell has shewn that the ganglions were necessary appendages to the roots of all the nerves whose office is to bestow sensibility. He shewed that thirty-one nerves went off in regular succession from the brain and spinal marrow, similar in their composition and in their functions; that each had two roots; one bestowing the power of motion, and the other sensibility; that the *tractus motorius* was a column extending from the origin of the third nerve to the spinal marrow, and that all the nerves that went off from it were muscular nerves. He proved that the fifth pair of nerves was the source of sensibility to the head and face, and to all the interior parts of the head; that the two nerves to the face were different in functions, one being a branch of this fifth, and therefore the nerve of sensibility; and the other a nerve without a ganglion, or muscular nerve, and by decisive experiments, he proved that when the one was cut, sensation was taken away, and when the other was cut, the parts were deprived of motion.

At the time that I wrote this Essay (begun in 1818), my conviction that any surmises respecting the existence and electric nature of a nervous fluid would be treated as visionary, made me fear to let them see the light. My expectation that new discoveries would tend to remove this prejudice has since been realised; but my anticipations will doubtless share the inglorious fate of prophecies made after the event: it has, however, given me courage to make them known. The French physiologists, Messrs. Prevost and Dumas, have expressed their opinion, supported by a number of delicate experiments, that muscular contractions result from the action of a *nervous fluid*, which, if it be not the electric fluid, possesses at least the same properties, and the analogy that exists between the phenomena of secretion and those produced by the action of an

electric pile is, they say, very remarkable: for when an electric current traverses a liquid containing salts and albumen, serum for example, an acid will be produced at one end of the pile, and an alkali at the other; and the animal substances the liquid contains change their natures. Now this is precisely what takes place in the organs of secretion; though secreted entirely by the blood, the liquid these organs contain differ from it in their chemical properties.—If it could be ascertained that some organs acted as the positive, and others as the negative pole of the electric apparatus, many exceedingly remarkable phenomena could be easily accounted for, they say; “but of this,” says Mr. Milne Edwards, in his excellent elementary work on Physiology, “proofs have not yet been obtained. The recent experiments of Mr. Becquerel on the influence of electricity upon the vegetation of plants, support the opinion at present entertained by physiologists, that the nutritive, as well as the muscular movements of the living body, are carried on by a nervous influence analagous, and perhaps identical, with the physical force that produces the electro-chemical phenomena.” To these surmises I can now add the fact, that the hand of a remarkable personage (of the name of Moltano), now operating in Paris, pours forth *electricity*, which being, as it appears, modified in the human frame, cures by friction all diseases caused by a deficient or irregular action of the nerves. The remarkable power of imparting an electricity thus adapted to the human constitution enables him to restore the equilibrium of a disordered nervous action; to renovate the capability of moving to limbs completely paralyzed; to relax contracted muscles; to impel the blood in its proper direction, and to impart the strength that results from a sufficient supply of nervous energy, or, I should say, of nervous fluid.

In tracing effects to their causes, I would ascend another step, and hazard a conjecture on the nature of electricity itself; but the subject being still more remote and obscure, the hypothesis is presented with even more diffidence. The element of *fire*, the only element which, it should seem, remains in its perfectly pure state, appears to me, in its various *known* forms of light, heat, and electricity, to be matter in its subtlest state, producing its phenomena by the laws of *gravitation reversed*—its distinguishing attribute being that, while all other matter tends from the circumference to the centre this tends from the centre to the circumference—but with a velocity, and, consequently, a force immensely superior to gravity—which can perhaps be calculated by the time which the sun’s rays take in reaching the earth, viz. eight minutes.

Whatever phenomena seem to oppose this explanation result, in my opinion, from the attraction of the two electricities for *each other*. On this point I would add the conjecture, that one object in the existence of *two* electricities (the combination of which is required to produce caloric) is to allow an element so dangerous from its force to remain latent when in a divided state. This appears to be an indispensable precaution; for it is evident that fire exists in all bodies, and though the causes which draw the particles of matter towards each other are in constant operation, were an impulse so far exceeding them in power permitted to act in a contrary direction without restraint, the decomposition of the material world would ensue.

* * I do not consider the mind as an assemblage of powers or ideas, but as an unknown essence, *possessing* powers, and perceiving the impressions made upon it; in like manner, as matter is not an assemblage of properties, but a substance *possessing* prop-

erties and qualities, which, I will here observe, are quite opposite to those exhibited by the immaterial principle—a sufficient reason, among many others, I should have thought, to have preserved us from materialism; for if we give the name of matter to that which is tangible, inert, divisible, and cognisable to the senses, why give the same name, and consider as the same principle, that which is distinguished by possessing the *reverse* of these qualities to that which differs from it in its *very essence*—i. e. in its existence of *solid* particles, by which solidity it can produce a conclusion on the senses that reaches the mind, and there makes its presence known? Why, may it be said, cannot the qualities that we ascribe to spirit be *superadded* to matter? But how are we to *superadd* qualities which are of a contrary kind—activity to inertness, for instance? How are we to add the power of commencing a movement to the incapability of moving without an impulse, which impulse must at last be traced to an independent power—and this power, which can overcome the inertness of matter, can it belong to an inert substance?

MISCELLANEOUS.

EVOLUTION OF LIGHT IN THE HUMAN SUBJECT.—It was ten day’s previous to L. A.’s death that I (Sir Henry Marsh) observed a very extraordinary light, which seemed darting about the face and illuminating all around her head, flashing very much like an aurora borealis. She was in a deep decline, and had that day been seized with suffocation, which teased her much for an hour, and made her so nervous that she would not suffer me to leave for a moment, that I might raise her up quickly in case of a return of that painful sensation. After she settled for the night, I laid down beside her, and it was then that this luminous appearance suddenly commenced. Her maid was sitting up beside the bed, and I whispered to her to shade the light, as it would awaken Louisa. She told me that the light was perfectly shaded: I then said, “What can this light be which is flashing on Miss Louisa’s face?” The maid looked very mysterious and informed me she had seen that light before, and it was from no candle. I then inquired when she had perceived it; she said that morning, and it dazzled her eyes, but she had said nothing about it, as ladies always considered servants superstitious.—However, after watching it myself half an hour I got up, and saw that the candle was in a position from which this peculiar light could not have come, nor indeed was it like that sort of light; it was more silvery, like the reflection of moonlight upon water.

I watched it more than an hour, when it disappeared. It gave the face the look of being painted white and highly glazed, but it danced about, and had a very extraordinary effect. Three nights after, the maid being ill, I sat up all night, and again I saw the luminous appearance, when there was no candle, nor moon, nor in fact any visible means of producing it. Her sister came into the room and saw it also. The evening before L. A. died, I saw the light again, but it was fainter, and lasted but about twenty minutes. The state of the body of the patient was that of extreme exhaustion. For two months she had never sat up in bed.—Many of her symptoms varied much from those of other sufferers whom I had seen, but the general outline was the same.—Her breath had a very peculiar smell, which made me suppose there might be some decomposition going forward. The young lady about whose

person these luminous appearances were manifested I had seen several times before her return to the country; her lungs were extensively diseased; she labored under the most hopeless form of pulmonary consumption.—*London Medical Gazette.*

EXTRAORDINARY DISCOVERY.—At a late meeting in Manchester, of the British Association, the following facts were communicated by Professor Bessel, said to have been discovered by Professor Moser, of Konigsburg:

“A black plate, either of horn or agate, &c. placed before a polished surface of silver at a distance of 1-20 of an inch, and remaining there for ten minutes, the latter receives an impression of figures, &c. engraved on the former which may be rendered visible by exposing the silver plate to vapor, either of water or mercury, &c. The image made by the camera obscura may be projected on any surface whatever, (glass, silver, a smooth cover of a book, &c.) without any previous preparation; and these will produce effects of the same kind as those observed on a silver plate covered with iodine. Vapors of *different* substances are of *equal* effect (without pretending that the effect will always be permanent.)

“The wonderful, secret and silent operation takes place at mid-night as well as at mid-day, in the dark as well as in the light. There on the silver surface, the picture is becalled into sight, by a breath. Can this be photography? The image is of the same character and as perfect as that of the early daguerreotype: but it is produced as well in the absence of light; and therefore Sir W. Hamilton suggested facetiously, that as a distinction it be termed Scotography. But Sir J. Herschel asked, might it not be terminology? He had obtained impressions at the heating end of a spectrum beyond the extreme red ray!”

HYDROPHOBIA.—The Buffalo Commercial contains the following rules, which are extracted from the Paris papers under the auspices of the “Committee of Salubrity.” They may not be out of place in this latitude.

1st. Any person bitten by a mad dog or any other animal, should immediately press with the two hands all around the wound, so as to make the blood run freely and extract the saliva.

2d. Wash the wound with a mixture of alkali and water, lye, soap, salt water, urine, or even pure water.

During the time of washing and pressing the wound, warm a piece of iron in the fire, and apply it deeply to the said wound. Mind that the said piece of iron is only heated so as to cauterize—that it must not be red hot.

These precautions being well observed, are sufficient to preserve from the horrid effects of hydrophobia, and every one should keep them in their mind.

HEALTHY RESIDENCE.—There is no circumstance connected with health concerning which the public are in my opinion, so ill informed, as the requisites of a healthy residence, both as regards local position and internal construction. In this Island we have chiefly to guard against humidity, on which account our houses should not be built in low, confined situations, nor too near water, especially when stagnated, and still less, near marshes. Neither should a house be too closely surrounded by trees or shrubs. Trees at some distance from a house are both an ornament and an advantage, but become injurious when so near as to overthrow it, or prevent the air from circulating freely around it and through its va-

rious apartments. The atmosphere of a building overhung by trees, or surrounded by a thick shrubbery, is kept in constant humidity except in the driest weather; and the health of the inmates rarely fails to suffer in consequence.—*Sir James Clarke on Consumption.*

MICROSCOPIC PHENOMENA.—Grains of sand appear of the same form to the naked eye, but seen through a microscope, exhibit different shapes and sizes, globular, square, and conical, and mostly irregular; and what is surprising, in their cavities have been found, by the Microscope, insects of various kinds. The mouldy substance on damp bodies exhibit a region of minute plants. Sometimes it appears a forest of trees, whose branches, leaves, flowers, and fruits, are clearly distinguished. Some of the flowers have long white transparent stalks, and the buds before they open, are little green balls which become white. The particles of dust on the wings of the butterfly, prove by the Microscope to be beautiful and well arranged little feathers. By the same instrument the surface of our skin has scales resembling those of fish; but so minute that a single grain would cover 250, and a single scale covers 500 pores, whence issues the insensible perspiration necessary to health; consequently, a single grain of sand can cover 125,000 pores of the human body.

THE MAN WITHOUT ARMS.—At Harrington’s Museum in this city, there is a man on exhibition, the singularity of whose appearance, without arms, strikes the visitor with strange sensations. But being minus the upper extremities, does not by any means, constitute the whole curiosity of the show. He uses his toes with about as much facility as common people do their fingers, and far more industriously than some make-weights in society, since he earns his own living. Mr. Nellis, the unfortunate individual, now about 22 years of age, is a native of Pennsylvania, and thus far has succeeded in obtaining an honest income by exhibiting himself. This is perfectly justifiable, since there is no other mode by which he could procure the necessaries of life. With his toes, surprising as it may appear, he readily *handles* a pair of scissors, shaves himself, writes, and to crown the list of improbabilities, performs delightfully on the accordion. This is only another evidence in the long chain of proofs that might be adduced, to show the extraordinary capabilities of certain muscles, when regularly trained to the performance of vicarious labour.—*Boston Medical Journal.*

SOCIETY OF ANTIQUARIES.—On Thursday evening, Mr. Godwin, jun., drew the attention of the Society to the fact, that many stones, both inside and outside various ancient buildings in England, bear a peculiar mark or symbol evidently the work of the Freemasons. Similar marks are found on French buildings, and Mr. Godwin exhibited a series of diagrams, showing the similarity which exists between those of the two countries. Gloucester Cathedral, Furness Abbey, Cheethams Peirre, at Poitiers, in France, and the Radegonde in the same city, were among the chief examples.

BENEFIT OF A POTATO DIET.—A potato diet is found greatly to improve the quality of blood. Hence roasted or baked potatoes are successfully employed as a specific against the sea scurvy, when other remedies have failed. This discovery was made in France. It is singular that boiled potatoes do not have the same effect.