THE MAGNETOSCOPE.

A

PHILOSOPHICAL ESSAY

ON THE

MAGNETOID CHARACTERISTICS OF ELEMENTARY PRINCIPLES,

AND THEIR RELATIONS TO THE

ORGANISATION OF MAN.

BY T. LEGER,

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Quid verum atque decens curo et rogo et omnis in hoc sum.

HORAT. EPIST., lib. i. epist. 50.

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TO SIR DAVID BREWSTER, K.H., F.R.S., D.C.L.

SIR,

It is owing particularly to your indefatigable and delicate researches in those departments of Physics which relate to Polarity that Sciences connected with imponderable agencies have acquired the splendour which they have lately attained, not only in England, but over all Europe. Consequently, it is to you that the "PHILOSOPHICAL ESSAY ON THE MAGNETOID CHARACTERISTICS OF ELEMENTARY PRINCIPLES, AND THEIR RELATIONS TO THE ORGANISATION OF MAN," ought to be dedicated.

Formerly, the study of the Human Mind was the subject of vague meditations—of merely speculative notions, under the various names of Metaphysics, Ideology, and Psychology. But real Sciences require means of direct investigation and positive observation, in order to deserve their title. They require Philosophical Instruments to ascertain the actual condition of the Existences which are the object of Scientific Knowledge. Thus it is that the Chemist has his Laboratory and Re-agents; the Naturalist, his Museum and Specimens; the Astronomer, his Observatory and Telescopes; but the Metaphysician, Ideologist, or Psychologist, heretofore deprived of any appliances for actual investigations, was reduced to conjectural, and more or less fanciful, hypotheses; and thus the name of Science could not be applied properly to the results of his meditations.

The discovery of the Magnetoscope has presented him with a proper instrument for studying the Mental Faculties; it allows us

to consider them as Natural Forces, which do no longer escape the inspection of our senses; we can now ascertain their various characteristics; their vicissitudes; their relations. We can make them the subject of real, positive, permanent, and repeated observations. Thus supplied, at length, with the necessary implements for cultivation, we enter fairly into a new and truly scientific field, teeming with the most important results, and promising the richest harvest.

With that ardent love for Truth, which is the special feature of your character, you have condescended to examine attentively several of my experiments. You have been kind enough to encourage me, and direct my efforts to enlarge the sphere of my researches. To you, consequently, with the warmest gratitude, I dedicate this Work, in the hope that you will be induced to make those allowances for me which, in my relative position, I may claim from your kindness.

I have the honour to be,

Sir,

With much respect,

Your obedient Servant,

T. LEGER, M.D.

20, *Gerrard Street, Soho.*
15*th May*, 1852.

THE MAGNETOSCOPE.

PART I.

INTRODUCTION.

Discovery of the Magnetoscope by Mr. J. O. N. Rutter.—Its Modification.—Instructions on its general Use.

1. The importance of the discoveries connected with the introduction of the Magnetoscope into the scientific world is too obvious not to call all our energies into action, in order to vindicate that instrument from the numerous unfair attacks, as well as serious objections, that have been raised against the genuineness of its results. By giving minute instructions on the use of the instrument as modified by me, I hope to popularise it, and thus to enable every one to ascertain the correctness of the observations and experiments already made, which tend to prove the actual existence of one force at least, and very likely of several others, distinct from those generally heretofore known, and the study of which opens a new field for the investigation of many phenomena as true, in my estimation, and as interesting as any of those which, at the present moment, constitute the realm of physical science.

2. As far back as three centuries ago, the fact of very remarkable oscillations of a ring suspended by a thread was placed on record. In a book entitled "*Les Bigarrures du Seigneur des Accords*," published at Paris, in 1582, we read the following passage in the chapter "*Des Faux Sorciers et de leurs Impostures:*"—"Autres ont une ruse, qu'ils semblent d'attacher un anneau d'or ou d'argent a un petit filet, qu'on suspend dans un verre a demy plein d'eaue, et puis, l'ayant trempé par trois fois, disent bellement ce verset du Psalme autant de fois: 'Ecce enim veritatim dilexisti, incerta et occulta sapientæ tuæ manifestati mihi.' L'anneau bat contre le verre, et sonne autant d'heures qu'il en peut estre."

We scarcely need observe that, although the oscillation of the ring be a true physical fact, it must not be mixed up with the

caution and contrivance said to be necessary to cause it to strike the hour.

3. It is known by all persons who have heard of "Magnetoid Currents," that Mr. J. O. N. Rutter, of Black Rock, Brighton, a gentleman of considerable scientific acquirements, having directed his attention to some experiments analogous to the one alluded to in the book "*Du Seigneur des Accords*," and shown to Dr. Herbert Mayo by Herr Caspari, an account of which appeared in *Chambers' Edinburgh Journal* (No. 375, March 8, 1851, p. 155), delivered a lecture, in April, 1851, before the members of the Brighton Literary and Scientific Institution, "*On certain Phenomena in connexion with Human Physiology*," which he considered as "*dependent on what is analogous to magnetic or electric currents or influences.*"

To illustrate those phenomena, he constructed his Magnetoscope, the design and description of which we take from the little book he published on the subject, in November, 1851:—

Fig. 1.

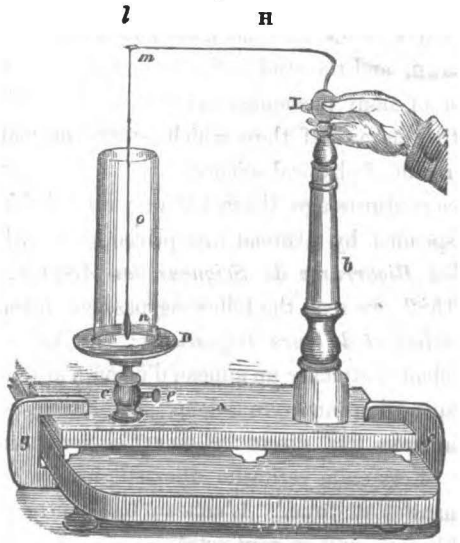
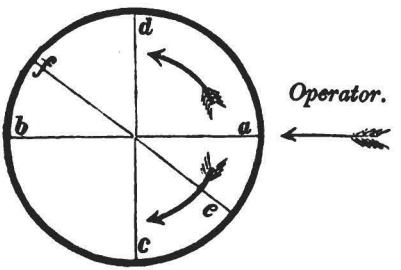


Fig. 2.

"A, B, C, D, respectively refer to the platform, the pillar, the support for the disc, and the disc itself. These are made of well-seasoned Spanish maho-

gany, and are French polished. The disc D is supported by a turned pivot working through the centre of C, and is adjusted by a set-screw *e*. To give stability to the instrument, it should be secured by clamps *f g*, to a firm and perfectly level table, placed in a room the floor of which is free from vibration. H is a brass arm, passing through the brass cap I, and fitting a hole drilled in the centre of the pillar, as shown at *K* (Fig. 2). The arm tapers towards its extremity *l*, which is formed into forceps, the tension of which is assisted by a sliding ring *m*. The arming of the Magnetoscope consists of a piece of red sealing-wax warmed over the flame of a spirit lamp, and moulded by the hand in the shape indicated—[viz., that of a fuchsia]. It is suspended from the points of the forceps by a single thread of the finest silk. On the disc D is placed a piece of plate glass *d*, about four-and-a-half inches in diameter, with its centre immediately under, and about half an inch below, the sealing-wax *n*. Underneath it is placed the following diagram :—



"To protect the pendulum from the currents of air in the room, and from the breath of observers of the experiments, it is advisable to surround it by a glass *o*, say three-and-a-half inches in diameter, and ten to twelve inches in height.

"In using the Magnetoscope, the principal conditions are, that the operator should stand at the side of it, placing the thumb and finger of the right hand (one on each side) in contact with the brass cap, as shown in Fig. 1, his attention being fixed on the pendulum *n*.

"Let it be observed that the instrument must be held loosely. If it be grasped too tightly, no current will pass. The hand should be kept open ; that is, the unoccupied fingers should not be closed upon the palm of the hand."

4. Mr. Rutter's instrument, his way of experimenting, and consequently the whole of the discoveries connected with it, have been the object of not only some fierce and scurrilous diatribes, unworthy of notice, but also of some serious objections, made even by persons who, at the outset, had admired and proclaimed the results as most

important and satisfactory. Dr. H. Madden, an homœopathic practitioner, at Brighton, after advocating, at first very warmly, and at length performing publicly a series of surprising experiments, declared subsequently that he was not satisfied about their genuineness. His recantation went very far to counteract the interest that the subject had already created, and has furnished ample scope to the persons whose sense of the ludicrous is largely developed to exercise their natural propensity. But, in justice to him, I will give here in full his statements, as published in No. 122 of the *Homœopathic Times*, Nov. 29, 1851, p. 274.

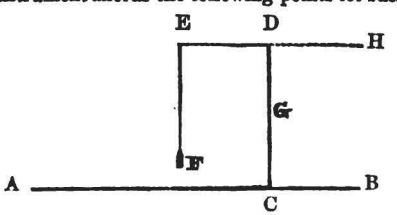
"1. The muscular system being an organ and helpmate of the will, acts in accordance to its dictates with a precision and alacrity which often cause the resulting motions to appear spontaneous or involuntary.

"2. Mere attention and anticipation influence the whole nervous system to such a degree, that various subjective phenomena occur as a consequence, in a manner which exactly simulates the effects produced by various external or objective causes.

"Thus the attentive and expectant ear will hear sounds during the deepest silence. The watchful and anticipating eye will see imaginary figures. Mere attention to a given part of the body will call forth unusual sensations; and, lastly, an anticipated movement is unconsciously helped forward by the muscles, by whose action such motion can be voluntarily effected. Bearing all these points in mind, it is obviously essential that slight muscular movements should be incapable of influencing the pendulum, ere we can accept of any results obtained by the Magnetoscope as proofs of the existence of magnetoid currents in and through our bodies.

"Moreover, so long as such an imperfect instrument is made use of, it is essential that we should carefully compare the points wherein the magnetic and mechanical laws oppose each other, and ascertain with which of the twain the instrument accords, seeing that in the event of the results agreeing with the magnetic laws, and going counter to the ordinary laws of mechanics, we should thus obtain strong presumptive evidence in favour of the movements having a magnetic origin.

"Mr. Rutter's instrument affords the following points for such a comparison:



"1. According to the second magnetic law referred to, it appears that the amount of effect upon the pendulum should be in an *inverse* proportion to the length of the arm D E (see diagram); whereas, according to ordinary mechanical laws, the effect would be in a *direct* proportion to the length of the arm, seeing D E is a lever, and the moving force is applied at the point D, and hence the maximum effect will be evidenced at E, and be in direct proportion to the distance between these two points. Now, I have procured several arms of different lengths, which can be used with the Magnetoscope, and, having tested them, I find the result *invariably in direct proportion to their length*. In this case, therefore, the instrument follows the mechanical and not the magnetic laws.

"2. According to the first magnetic law referred to, the nature of the material constituting the arm D E would influence the result, in consequence of the different powers of conduction possessed by different substances; whereas, mechanically considered as a lever, the nature of the material will not influence the result, unless there is at the same time a difference in the physical character, of rigidity. According to the magnetic law, therefore, one would anticipate very different effects from arms made of metal, wood, and bone, the more especially as Mr. Rutter states that bone at once puts a stop to all motion of the pendulum. I find, however, that bone, wood, and brass act equally well when employed as the arm D E, and that the only detectable difference between them is, that which is traceable to difference in length. Here again, therefore, the mechanical and not the magnetic laws are obeyed.

"3. According to the third magnetic law, which I stated on Mr. Rutter's authority, a complex arm D E, that is to say, an arm formed of different pieces, especially if not firmly united together, should produce a much less sensitive machine than one manufactured of one solid piece. I accordingly had an arm constructed of three pieces joined together like the parts of a lazy tongs, and so arranged that, when attached to the upright in the usual way, the three portions mutually supported each other, and in this position I found the arm equally sensitive with one of the same length constructed out of a single piece of metal. To test the point still further, however, I changed the position of this compound arm, and fixed it to the upright portion C D, in such a way that two or three pieces projected behind, in the position of the dotted line D H, and one long piece occupied the position D E. The separate portions between the points D and H were jointed, so that any slight muscular motion communicated to H would not be transmitted to D; whereas, the fact of the whole arm forming a sensitive instrument when fixed in the first position, proved that the magnetoid currents, if such exist, could readily traverse the whole arm. Now, in this position I found that when I touched the instrument at the point D, the pendulum at once was set in motion; whereas, when I touched the arm at H *no effect was produced*, nor could I in this position move the pendulum by any voluntary effort. I am aware that some will suggest that this experiment failed

on account of the magnetic fluid passing from my hand down the upright D C, and thus escaping to the earth, seeing that wood is not a perfect non-conductor. Although, however, there is much improbability in this view, seeing that if the magnetoid current possessed any strong tendency to descend the upright stem, it would do so equally well in all the experiments, yet I modified the instrument by simply rendering the junctions between the points D and H rigid, which was done by binding a small brass rod over the flexible portion, and I there found that the pendulum could be equally readily set in motion, either by voluntary or unconscious muscular movements, from the point H as from the point D, excepting only that the motion was proportionally less from the point H, in accordance with the ordinary laws of lever-power.

"4. Once more I rendered the arm D E much more fixed, by substituting a short bracket, firmly fastened into a wall, for the upright stem D C; in this position all moderate voluntary efforts were insufficient to move the pendulum, and, in like manner, none of the so-called magnetic phenomena took place. Here again, however, I may be told that the proximity of the wall presented an easy way of escape for the magnetic fluid. I therefore modified the bracket so that its condition as respected conduction remained unaltered, while it no longer remained so rigidly inflexible, and I then found that the so-called magnetoid currents reappeared, while at the same time I could of course voluntarily produce all the various movements of the pendulum.

"It has, however, been suggested to me, by a friend who has adopted the will theory, that the fact of my experiments appearing to coincide exactly with the mechanical theory might be explained by the fact that I had anticipated the results, and hence they occurred in accordance with my expectations. A little examination, however, into this hypothesis will, I believe, prove it to be groundless. If by the will theory the propounders simply mean that the will, or rather in this case the mental functions of attention and anticipation, influence my muscular system, and give rise to automatic movements, I fully agree with them. But if, on the contrary, they wish it to be understood that the movements are truly magnetic, but that these magnetoid currents are entirely under the control of the will, that they only pass in certain directions, in obedience to its mandates, I would then direct them to the following particulars:—1. If the currents are magnetic, they must, on passing the body to inert matter, obey the ordinary magnetic laws. 2. That if this were the case, in the third series of experiments detailed above, when the compound arm was made to project behind the upright stem C D, nothing should have interfered with the passage of the currents beyond the condition of my will, which is assumed to have anticipated a failure. Now, it so happens that numerous experiments of an exactly similar character were performed both by myself and Mr. Rutter, at a time when neither of us had the smallest doubt about the magnetic nature of the currents, and hence at times when the will operated altogether in our

favour, and yet these experiments uniformly failed. At that time the failure was always explained by detecting some infringement of the laws of induction; but my experiments have proved that much more serious infringements of these laws do not in any way influence the results of the experiments, provided only the mechanical laws are adhered to.

"It has been two or three times asked by your correspondents, how it is possible that the same muscular power which is supposed to set the pendulum in motion can also bring it to a state of rest? a remark equally sage as if it had been observed, how is it possible that the same arm which can strike so heavy a blow can also hold a weight steady? The remark, however, affords me an opportunity of mentioning a significant fact, whose full meaning I was at a loss to comprehend, until the mechanical theory suggested itself to my mind. It will be remembered by those who were present at my lecture, that I referred to a striking difference between Mr. Rutter and myself with regard to the stopping of the pendulum—viz., that while ivory, bone, dead animal matter, opium, arsenic, &c., at once stopped the pendulum, when placed in his hands, they did not produce the same effect on me; for while the movements of the pendulum certainly became less vigorous, yet the changes occurred so slowly, that I had never had the patience to wait until it actually came to a stop. Nevertheless, if I took any of these articles into my hand before touching the instrument, no movement of the pendulum occurred during the experiment. Now, when I began voluntarily to imitate these various movements, I found, to my surprise, that *I was just as incapable of stopping the pendulum voluntarily as the ivory, opium, arsenic, &c., had been to do so magnetically*; or, in other words, that those movements alone were elicited by the so-called magnetoid currents which I was capable of producing voluntarily with the greatest facility. Lest, however, it be suggested that the stopping of the pendulum with Mr. Rutter is a direct proof of magnetic action, seeing that I cannot imitate this effect, I may mention that I know at least one gentleman who can voluntarily bring the pendulum to a stand-still; thus showing that it is perfectly possible to imitate this effect also. I shall only add, in conclusion, that I have now read Mr. Rutter's pamphlet, but regret to find that no attempt is made to satisfy our doubts on this most important source of fallacy; and I may also mention that the Hahnemann Medical Society have appointed a sub-committee to meet with me and examine fully into my experiments; so that I trust, ere long, the above statements will not rest upon individual testimony.

"I wish it to be distinctly understood that in all my experiments, excepting those voluntarily imitated, I am still utterly unconscious of any movement of my arm or body which could influence the pendulum; so much so, indeed, that I seldom touch the instrument without reiterating to myself the question, Is it possible that this can be muscular and mechanical? Nevertheless, I am so fully alive to the possibility of self-deception in these and

similar experiments, and it is so clear to my mind that *demonstrative* evidence must be attainable, if the agency is truly magnetic, that I hold it as a positive duty to rest satisfied with no experiment which falls short of this; and until the pendulum can be made to move in its various characteristic ways, *when placed beyond the possibility of muscular influence either direct or indirect*, I maintain that we are bound to return a verdict of '*not proven*.'"

5. At nearly the same epoch, W. Sharp, Esq., F.R.S., published in the same journal (No. 120) the following letter, which I reproduce also in full :—

"As my name appears in your columns as one of those who were engaged in examining Mr. Rutter's instrument, perhaps it may be proper that I should give you the results of my investigation.

"Through Mr. Rutter's kindness, I received, a few days ago, the instrument upon which he had been for some time experimenting, and I immediately commenced the following series of experiments, in company with a non-professional friend :—

"1. I repeated successfully all the experiments I had seen Mr. Rutter perform, and also many which Dr. Madden had shown me.

"2. Having received a note from Dr. Madden, in which he tells me that the *will* can influence the result, I repeated all the former experiments, and obtained or altered them, as I willed them to be. In the first series, for instance, standing upon an isolating stool, stopped the movements; but in the second they were all obtained, and that without any *conscious* voluntary effort of my own.

"3. I found that by touching the pillar or base of the instrument, or even the table on which it stood, either with my finger or with any solid substance, I could obtain all the results. Thus far I was willing to believe that there *might be* some truth in Mr. Rutter's explanations of the phenomena—namely, that there being an electrical arrangement between the plate of glass and the wax bob of the pendulum, when the earth's electricity could pass freely through the body of the operator, 'magnetoid' currents were produced, which were the cause of the oscillations; though it seemed evident, from Dr. Madden's discovery of the influence of the will, that the vital force was also concerned in their production.

"4. I began to take the instrument to pieces, first removing the plate of glass away from the wax bob of the pendulum, which made no perceptible difference in the movements produced. Next I took away the wax itself, and substituted a wooden bob, which, making a little allowance for its less specific gravity, acted just as well as the wax; lastly, I connected various *flexible* sub-

stances, some metallic and others not, with the brass ball, but I could produce no motion in the pendulum, unless I stretched these connecting links so as to make them *rigid*. For these trials the glass and wax were restored as at the first.

"These last experiments banished from my mind all remaining ideas of electrical or other currents, and obliged me to conclude that the phenomena are simply *mechanical*. Why, if otherwise, in order to produce them, must the connection between the hand and the instrument be *rigid*, seeing that the same material when in a *flexible* condition fails to accomplish anything?

"If this conclusion should prove to be correct, of course the instrument can be of no value in reference to homœopathy.

"I have been thus particular in describing my experiments, because, having written to Mr. Rutter respecting them, I find from his answer, which I have received to-day, that he still adheres to his original opinions."

6. The remarks and observations of Dr. Madden, and the trials of W. Sharp, Esq., made in a true philosophical spirit, are not to be passed by unnoticed, or looked upon as unfair attacks. On the contrary, I consider them as well grounded, and perfectly correct in many respects; yet I am convinced that they arrived too hastily at their conclusions. They did not separate carefully enough the wheat from the chaff. Had these two gentlemen, or any others, who declared, on account of failures, that the whole was unworthy of scientific investigation, bestowed on the subject a little more time and care, and studied more perseveringly all the conditions necessary for the production of the phenomena, they would ultimately have been struck, as I have been, with the fact, already noticed by Dr. Herbert Mayo (third edition of "Popular Superstitions," July 24, 1851), that, in the hands of a careful operator, the phenomena succeed nearly equally well, when managed in perfect ignorance as to the substance upon which he himself or his assistant may be experimenting. I am informed that such is the case also with Mr. Rutter; and as for myself, in eleven cases out of twelve, I am able to detect any metal previously placed by another person, without my knowledge, in a closed pasteboard box. In my public lectures on the Magnetoscope, delivered in December and January last, at Hungerford Hall, I have repeatedly made this experiment. I will say, moreover, that the causes of the occasional

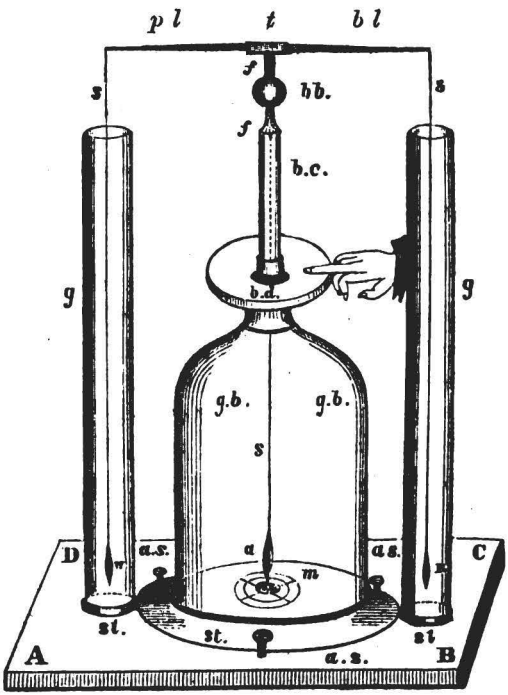
failures are generally obvious; and even in that respect I agree again with Mr. Rutter in his remark, that those same failures, by eliciting a deeper attention to the analysis and appreciation of all the circumstances, prove eventually more instructive than successful experiments.

Consequently, I am fully convinced that the subject is really pregnant with the most important results. But the first point to be gained, in order to induce scientific men to pay to the subject the attention that it so richly deserves, was to make the genuineness of the phenomena absolutely unquestionable, not only by them, but by any person who possesses a knowledge of the first elementary principles of Mechanics.

It was with this view, and in order to overcome the most serious objection, that of a conscious or unconscious jogging, as the true and sole cause of the motions of the pendulum, that I thought of constructing an instrument which would reveal unmistakably even the slightest voluntary or involuntary mechanical impulse in the production of the phenomena.

7. After many unsuccessful trials, I succeeded at last in solving to my complete satisfaction, and, I venture to say, to the satisfaction of even the most sceptical antagonist, the difficult question I was so anxious to elucidate. One of the first discoveries of Mr. Rutter, that dead animal matter not only does not transmit the force which sets the pendulum in motion, but even stops it when moving, enabled me to accomplish my task. It occurred to me that from the point where the operator puts his hand, if one single brass rod should emerge, and support two levers of the same length, extending in contrary directions, and each holding a thread equally of the same length, with a pendulum of the same weight, the result would be, if one of the levers were brass and the other dead animal matter (ivory, whalebone, or porcupine quill), that the pendulum suspended to the brass lever would move, and the other remain motionless, if no mechanical impulse were resorted to in the production of the motions. Both would unavoidably, and must necessarily, move in the same way, and to the same extent, if such an impulse be requisite, even in the slightest degree.

8. Previous to this, and in order to meet some of the objections to which I had conceived the instrument of Mr. Rutter to be liable, I had already modified it, by placing the pendulum under a large glass bell, the top of which supported some brass work, consisting chiefly of a disc, a column, and a ball. To this first modification I added the two levers I had planned, and I constructed thus the following instrument:—



A, B, C, D. A firm table, supporting the instrument, in a room as free from vibrations as possible.

a. Central or active pendulum, chiefly made of sealing-wax, suspended by a silk thread, *s*, to the brass wire, *f*.

r. Lateral and repeating pendulum, of sealing-wax, suspended by a silk thread, *s*, at the end of the brass lever, *b l*.

w. Witness pendulum, of the same matter and weight as the latter, and equally suspended at the end of a porcupine quill, *p l*.

g g. Glass cylinders, to protect the repeating and the witness pendulums.

t. Small brass tube, receiving and holding the brass and porcupine levers.

f. Brass wire, about two inches long, at the upper end of which the tube *t* is screwed, whilst at the lower end the thread of the central pendulum is fixed. This wire passes through a piece of cork inside of the brass ball, *b b*, and does not extend farther than the top of the hollow brass column, *b c*, elevated in the centre of the brass disc, *b d*, where the finger of the operator rests.

g b. Glass bell, to the top of which the brass work is firmly fixed, protecting the central pendulum.

m. Circular card board, on which twenty-five small concentric circles, each distant from the next one-fifteenth of an inch, are drawn with diameters in the various points of the compass, corresponding to N. and S., E. and W., N.E. and S.W., N.W. and S.E.

st. Stand supporting the glass bell and the glass cylinders, *g g*.

a s. Adjusting screws, supporting the stand, and susceptible of being raised or lowered, to keep the pendulum, *a*, over the centre of the card board, *m*. *

9. The most remarkable feature of the Magnetoscope so prepared is that it has three pendulums instead of one; and that all of them are supported by the same wire, *f*, situated at the top of the instrument. To use it, in lieu of taking hold of the brass ball with the thumb and forefinger, according to the mode of operating recommended by Mr. Rutter, I use only the middle finger of the right hand, which I put on the brass disc, *b d*, at a point corresponding with the one marked East on the card board in the centre of the stand; the other hand must be free and open. It will be perceived, then, that the central pendulum assumes a circular motion, in the same direction as the hands of a clock, and which we call Normal Rotation. If, instead of the middle finger, we use the thumb, or the little finger of the same hand, the same motion is manifested, but rather on a smaller scale; by substituting the forefinger or the ring-finger to any of the others of the same hand, the motion is altered from Normal to the Inverse Rotation. Again, if we use in succession the same fingers of the left hand, all the motions are reversed; that is to say, the middle finger, thumb, and little finger give the Inverse Rotation, and the forefinger and ring-finger the Normal Rotation. These motions and changes of the central pen-

* To answer the demand of the persons anxious of experimenting by themselves, several instruments, the construction of which I have directed, can be obtained at my residence, at the cost of from 2½ to 3½ guineas each.

dulum are repeated exactly, and nearly at the same instant, by the brass-supported or repeating pendulum, but to a lesser extent, whilst the porcupine-supported or witness pendulum remains absolutely motionless during the whole of the experiments.

Every one, unless out of his senses, will admit that this result is perfectly conclusive, and settles the question in the most satisfactory manner; for, if a mechanical impulse were necessary to produce the motions of two pendulums, how could the third one, suspended as nicely at the same point, and in precisely similar circumstances, escape the shock, or refuse to obey it?

10. In ordinary experiments, I suppress the repeating pendulum, as being rather in the way, and as giving no further useful information, besides putting at naught the possible suspicion that the difference in length of the thread, weight, and position of the pendulums might be the cause of the one moving and the other remaining motionless. But in all cases I preserve the witness pendulum, for it is a very useful tell-tale, giving, by its inexorable facility of being set a going, a constant warning to the impatient operator, whose anxiety of bringing a more rapid change, or of increasing the motion, might incline him to help, voluntarily or involuntarily, the natural manifestation. The least attempt of this sort is met by immediate and unavoidable evidence of a wrong course being pursued. Indeed, I am so fully alive to the importance of this test, that I do not consider that experiments have any value, however beautiful or interesting they may be, if they are not obtained without moving the witness pendulum.

11. It remains for me to explain why I prefer using only one finger, and particularly the middle finger of the right hand, whilst making experiments; and why I apply it to a disc, instead of using the ball, as the original inventor does.

By using the thumb and forefinger, applied to the brass ball, two forces are used instead of one, and in consequence of it several substances, although very different, present the same motion; as do, for instance, gold and silver, which give both inverse rotation, and consequently cannot thus be distinguished from each other. Whilst, by using the middle finger alone, it will be seen that both

have a different manifestation, and consequently can no longer be mistaken one for the other. The same occurs in many other cases, which proves evidently that my way of proceeding, being more severe and particular in its information, deserves the preference. Then, again, the applying but one finger to a disc is less liable to the possibility of imparting voluntary or involuntary impulses to the instrument; and, before the addition of the conclusive evidence afforded by the witness pendulum, I had already adopted it, as more satisfactory. Moreover, the middle finger resumes the special action of the right hand, as the only symmetrical and most extended part of it. It may fairly be considered as the extreme end of a pole of a kind of magnetic apparatus, the other extreme pole of which is similarly situated on the left hand. This view will be more fully developed in the sequel, where I propose to indicate its relations to philosophical anatomy.

12. The brass column is used to try experiments with the whole hand; by grasping it with the right hand, the pendulum assumes the normal rotation, and the inverse rotation takes place if the left hand is used. Lastly, those who would like to ascertain the correctness of the numerous and beautiful experiments related in Mr. Rutter's book can do so by using the ball in the way he recommends. It will be seen, thus, that if some of the results recorded by him apparently differ from those obtained by me, the discrepancy proceeds from our following different modes of operating. He uses two fingers, each of which causes a contrary motion, the one partially counteracting the direction imparted by the other; and the form itself of the spherical body that he takes hold of influences the results in a manner no less remarkable. I take here the opportunity of again paying a tribute due to Mr. Rutter. He has proved himself to be a most ingenious, correct, and conscientious observer, and to him the world at large is indebted for having opened up this new and most fertile field of scientific investigation.

13. Nothing at first seems to be easier than to use the Magnetoscope; the fact that the putting of one's finger on the disc causes the pendulum to move, is so simple in itself, that everybody is led to believe the instrument not only will, but *must* produce in his hands,

and *immediately*, all the results which it is seen to do in mine. Yet this is an egregious mistake; for no instrument is perhaps more difficult to use properly, and none requires more attention and care. The chief cause of the dissatisfaction of all beginners arises from this circumstance. Without knowing any of the numerous and very delicate conditions absolutely necessary for the correct manifestation of the phenomena, and many of them even unwilling to listen to any explanation, try at once the most delicate experiments; and failing, of course leap hastily to the conclusions that there is no truth in the reality of the discoveries announced. But let them reflect that even those persons who are in the habit of making scientific investigations very often fail in their first attempt. It is only after some study and practice that they succeed. Is it not preposterous then for any one to expect full and complete success from the very first beginning? Is there any instrument, any tool whatever, that, in order to obtain a proper use of it, requires no previous acquaintance with its mode of manipulation? Why should the most delicate one be denied any claim to so reasonable a request?

14. Let us now proceed successively and minutely in the enumeration of the conditions which experience has taught me to be necessary for the correct manifestation of the phenomena.

Is is needed, first, to see that all the conditions in relation to the instrument are well observed, as stated above. Then the operator will try his power of affecting it, by putting the middle finger of the right hand on the disc, at the point corresponding to the one marked East, on the card at the centre of the glass bell, as stated before. The operator may be either in a sitting or erect position; he may have the left hand free, and the legs not crossed. The time for making the first trials is not indifferent. Early in the morning, or too soon after taking a meal, are decidedly unfavourable times; using snuff, or habitual smoking of tobacco, are conditions of decided failure; chewing it, or any other aromatic substance, are again to be carefully avoided.

The attention must be undivided, the eye constantly fixed on the lower point of the pendulum, and the will exerted as in the practice

of mesmerising mentally, but without actually shaking the instrument. This condition of the will is the most important, and at the same time the most difficult, point to obtain, or to explain. It consists of a peculiar state of the nervous power, which the instrument acquires the property of obeying, and which, when well developed, accounts for the importance of the recommendation of not allowing any one indiscriminately to touch it; for this not only prevents the instrument from being so sensitive, but eventually interferes with the correctness of its indications.

After several trials, repeated with perseverance, the pendulum will assume the normal rotation; the extent of the motion will increase subsequently, and reach a certain degree, without further progress. As soon as that degree is ascertained, consider it as *par;* that is to say, as the measure of your own power over the instrument. Divide it into five concentric spaces, at equal distances, separated from each other by concentric circles, the diameter of which acquires each time the same additional extent. Add in the same manner twenty more concentric circles, and you will thus have a card for your own use, which will obtain for you the same results in figures as I obtain myself.

15. When the middle finger of the right hand has produced its full manifestation, try to reverse the rotation, by using the forefinger of the same hand; adopt the same precautions, the same spirit of perseverance, and watch always the indications of the tell-tale, or witness pendulum, in order to ascertain that in your anxiety you have not, even unconsciously, resorted to muscular action to quicken the results. You will, after a period more or less protracted, obtain the desired success, and ultimately the phenomena will require much less time for their full development. Then, and only then, you may try other experiments; but it is unwise to use haste in trying them too soon.

16. Before proceeding any further, let us explain as much as possible the part that the will plays in the production of the phenomena. Nothing can demonstrate more positively than the Magnetoscope does how the will of man is in itself a natural force, possessing actual influence over inert matter. The central pendulum of the

instrument, under the influence of will alone, powerfully exerted, and without any mechanical impulse besides mere and slight contact, will move in any direction you please, without the tell-tale pendulum being affected, and consequently without any muscular action being resorted to.

Yet, it would be a gross error to conclude from this fact that the will is in all cases the only cause of the motions of the pendulum, and consequently that there can be no other indication given by the instrument but that of the will of the operator. Let me insist again on the undeniable fact that, in the hands of an attentive and careful operator, it matters not if he does not know beforehand what is the substance he experiments upon. The results will be the same as when he knows it. But, to succeed in this most important experiment (for I know of no other that will give to the operator a perfect conviction that he uses the Magnetoscope properly), instead of substituting the force of his own will to the particular and special force possessed by the substance he tries, a man must acquire a severe control over his will, and reduce its power to the mere influence of setting the pendulum into action, and commanding it to receive and obey, as to the direction and the extent of the motion, the foreign force emanating from the unknown substance. That power of control over the suggestions of the will is in some persons a natural gift, and those use the Magnetoscope without any difficulty. But, with those who do not at first possess it to the proper degree, like all our faculties, it may be more or less completely acquired by frequent trials. It is the ignorance of that *sine quâ non* condition which causes beginners to bring on results so irregular and so widely different, and it is to enable them to arrive at correct results that I advise them to follow regularly the course of experiments hereafter described.

17. As soon as the proper motion of each different finger is obtained, let the following metals be placed in the palm of the left hand, and notice if the results be the same as those indicated here, using in all cases the middle finger of the right hand on the

disc, and ascertaining that the witness pendulum is not put in motion :—

Gold produces	Normal Rotation,	extended to the	3rd circle.
Silver	Inverse Rotation,	do.	3rd do.
Platina	E. and W. Oscillation,	do.	4th do.
Plumbago	N. and S. do.	do.	3rd do.
Zinc	N.E. and S.W. do.	do.	4th do.
Sodium	S.E. and N.W. do.	do.	3rd do.

Arsenicum stops any motion, and produces a dead stand.

The extent of the motion is always the same for each metal, so long as it is in immediate contact with the palm of the left hand.

18. Let the same metals next be enclosed in a small pasteboard box, or wrapped up in a piece of paper, and then placed in the left hand, the operator remaining in ignorance of the contents. The motions will be considerably diminished, and hardly extend beyond the first circle; yet they will be distinct enough to allow any one to recognise them, and pronounce as to the nature of the unknown substance. Repeat those experiments till they succeed to your satisfaction before attempting new ones. Success will give you a confidence in your own power and in the accuracy of the Magnetoscope, which will make failure a very rare occurrence.

19. The next experiments to be tried are the motions occasioned by different liquids, one drop of which is poured into the palm of the left hand. You will find thus that—

Claret or French Brandy gives	the Normal Rotation.
Salt Water or Rum	Inverse Rotation.
Sherry or Port Wine	E. and W. Oscillation.
Arrack or Ether	N. and S. do.
Coffee or Tea	N.E. and S.W. do.
Gin or Marsala Wine	S.E. and N.W. do.

Ale or Milk stops the motion of the pendulum.

When those experiments will have been successfully repeated, trying them at different times, and taking care to wash the hand each time, so as not to let any of the previous liquid counteract the manifestation of a subsequent one, let the aura or mere emanation

coming from the uncorked bottle of each liquid be put in contact with the palm of the left hand, and the different motions just recorded will take place in the direction proper to each liquid, with the only difference of their extent being smaller. Again, try to remain in perfect ignorance as to the nature of the liquid, and the same effect will take place.

20. Let us notice here some remarkable phenomena connected with the experiments on the liquids.

Pure water alone does not change the Normal Rotation imparted by the middle finger. But as soon as any substance is dissolved in water, the motion proper to the substance dissolved in it manifests itself, even when the aura only reaches the palm of the hand.

Dip in pure water either pole of a small magnet during fifteen or twenty seconds, and that water will bring the pendulum to a dead stop. The same result will occur if, instead of the poles of a magnet, you dip in water either of the conducting wires of an electro-magnetic battery. Water, mesmerised by an efficient mesmeriser, produces the same phenomenon. Let it be understood that it is not necessary that the operator should know which one out of a dozen glasses filled in the same manner has been so prepared; he will eventually find it out with wonderful accuracy.

It would be too long to record here all the different motions that each liquid I have tried has caused the pendulum to assume. But there is one of which the effects are so surprising, that it deserves decidedly a particular notice. I mean Chloroform. The aura emanating from it, when in contact with the palm of the left hand, produces, as soon as the middle finger of the right hand touches the disc, an oscillation of the pendulum from East to West, but which at every subsequent oscillation varies towards S.E. and N.W., and goes on round all the points of the compass in succession, till it arrives at the point from which it started; it assumes then the Normal Rotation; diminishes its circles by degrees, till it comes to a rest of less than a second duration; starts again with the Reverse Rotation, till it reaches the extent where the Normal Rotation had begun; and from that point it changes again the circular motion into an oscillation, first East and West, and runs over the

same course towards all the different points of the compass, as before, to go on the same way *ad infinitum*. This I have repeatedly tried, without the slightest change occurring during the whole experiment.

21. Another series of experiments present themselves now, illustrating not only one of the results already recorded in the remarkable work of Baron von Reichenbach*—viz., that all cristalline substances are subject to the law of polarisation; that is to say, that they possess proper forces, manifesting evident Dualism in their opposite direction, but generalising that same law, and extending it to all organised matter, vegetable or animal, provided the substances do not belong to that class which stop the action of the pendulum, or are not brought to a peculiar condition, in which the same result of rest takes place.

In order to give to this most important fact in physical science the proper development that the subject requires, it becomes necessary to present here, summarily, and under the form of aphorisms, some considerations of a high order, upon which the philosophy of the Magnetoid condition of all the Elementary Principles is founded.

* Physico-Physiological Researches on the Dynamics of Magnetism, Electricity, Heat, Light, Crystallisation, and Chemism, in their relations to Vital Force. By Baron Charles von Reichenbach. 2nd edition; with the addition of a preface and critical notes, by John Ashburner. London: H. Baillere, 219, Regent-street. 1851.—[This work has acquired, by the truly philosophical and exceedingly interesting notes of its highly-gifted translator, an immense additional importance. Few, very few, men are better calculated than Dr. John Ashburner to give to Truth more winning attractions; and I avail myself very gladly of this opportunity of giving him a public testimony of my admiration and respect.]

PART II.

General considerations.—"Immateriality" and "Matter."

22. The first fact that strikes us in the study of Nature; the one that by its constancy and generality appears as the most evident is, that the Universe is conducted according to a plan of gradation, in which every thing is in MOTION and HARMONY.

Any work conducted thus, implies necessarily in the condition of its existence, that of an illimited *Power*, without which eternal motion could not be, with that of an infinite *Intelligence* which has regulated the relations of all the parts to each other, and distributed the movement according to the phenomenon to be produced.

That Omnipotence, that Supreme Intelligence is GOD.

Search, reason, and discuss as much as you like, you will always come to this unavoidable conclusion, that HE alone is the primitive source from which all emanates—the ultimate analysis to which all is reduced.

GOD, like every other axiom, is known to us only by revelation; but can neither be demonstrated nor defined.

23. The Unity of GOD reigns in the Universe. All existences, all phenomena are connected in HIS unity. The prodigious distances between the moving and luminous spheres, that fill the immensity of Heaven; their incalculable number; all those bodies, all those movements that we perceive around us, so infinitely diversified, form, notwithstanding their individuality and their apparent isolation, an *ensemble*, an indivisible whole, by the perfect accordance of all their component parts: they have a common point of support, a real centre of action in the very Power that causes them to move in the eternal groove from which they cannot swerve. All of them acknowledge the same origin; all have a tendency to the same end; all obey the same laws—MOTION and HARMONY.

24. It does not enter into the plan of this Work to draw the admirable picture of the Harmony of the Universe. Many more eloquent writers have accomplished that task. The one which comes within our range is to investigate the conditions of this Harmony, and to ascertain, as far as possible, the means that God resorted to, as well as the end that He proposed to himself in the Creation.

It would seem, at first, that such an enterprise is presumptuous, and that there is a kind of impiety in trying to unravel the secrets of the works of God. But we ought not to be misled by this fear. He has endowed man with a degree of Intelligence superior to all other animals, in order to let him know better, appreciate better, forward better, his views. This sacred study is then necessarily our first duty, and it constitutes the true worship that he claims of us.

25. In the harmonious whole of the entire world, every thing is composed of Elementary Principles. It is then with the study of those Principles that we must begin our researches.

This investigation embraces all the facts that compose human knowledge. We must interrogate, by turns, Mathematics, Physics, Natural History, Medicine and its numerous branches; we must consult Religion, Morality, Politics, History, Letters, the Fine Arts, Industry, and Commerce. All will furnish us with their respective amount of evidence; all will bring to us precious documents which are connected with, and dependent on, each other. Classified with method, those documents form a body of new views on the nature of Elementary Principles; on their number, their forces, and the laws that govern them. They acquire thus a very high degree of importance, and are calculated to increase to an immense extent the dominion of the conquests of man.

26. For chemical examination, we never can isolate the Elementary Principles from each other, on account of the common, reciprocal, and indestructible dependence that binds them together—a tie from which results Universal Harmony.

But it would be an error to believe that, on account of this, there exists an insuperable barrier, which prevents us from ascer-

taining their nature and their laws. We should be sorry to pretend that material analysis is not an excellent source of solid information, of rigorously true knowledge. It is on account of the superiority of its means of analysis that Chemistry has become the first science of our age ; but the scanty resources of our laboratories compel us to stop at certain limits ; to take such limits for those of Nature itself would be an egregious blunder. The Principles or infinite agents, misunderstood or unknown yet, that the Deity employs in the formation of beings have an extent of division, action and reaction in comparison of which our scientific means and appliances are but vanity. Although we give Chemistry its due, we openly profess that it is yet far from possessing the alembic of Nature. In order that it could emerge from the narrow sphere which holds it in bondage, Chemistry ought to master some of the agencies analogous to those of the ETERNAL, and begin to invade the realm of "*Immateriality*." Acknowledging, then, with frankness, that in the study of the Elementary Principles it has kept an account of only one part, and neglected the other, which actually presides over the whole of its operations, Chemistry would thus tend to destroy "*Absolute Materialism*," of which it may be considered as the main source.

27. To contest the rigorous certainty of the results of abstraction would be to refuse mathematical evidence; for the Point and the Line in Geometry, as well as all the Formulæ of Algebra, are nothing but abstractions.

On the other hand, is it not evident that the analysis of most natural phenomena, although not chemical, gives, nevertheless, results not less correct from having been afforded by abstraction alone? This is because abstraction is in itself a true analysis, as superior in its processes as "*Intelligence*" is over "*Matter*." It is the continuation, the necessary complement of material analysis, to which, in scientific studies, philosophers too long confined themselves. Anything that can be ascertained, either by material analysis or by abstraction, is necessarily a mathematical truth; for nothing can be more rigorous than that which is logically and evidently derived from an axiom.

The idle and ridiculous speculations of obscure and absurd Metaphysics on the one hand, and the golden dreams of a mystical spiritualism on the other, brought on, as an unavoidable reaction, the error of "Materialists." In viewing material analysis as an excellent source of true information, they were induced to admit of no other; and all which they could not put to the test of their re-agents was consequently considered by them as chimerical.

In this instance, like every other, when reaction carries a Principle to extremes, it goes beyond truth; for it loses sight of the real worth of the primitive action that gave it birth.

Thus it is that, notwithstanding its undeniable influence over "*Matter*," "*Intelligence*" could not exist, according to the doctrine of Materialists, on the sole ground that it baffles material analysis.

28. When we find in the existence of "*Intelligence*" that of an "*Immaterial Principle*" which influences "*Matter*," we are compelled to acknowledge, as a first consequence, that there exists at least one Elementary Principle different from those that material analysis points out; and, as a second consequence, that there is in "*Immateriality*" a positive power.

But, after this first step, are we to limit to the Intelligent Principle all Immaterial Existences? Are the characteristics of "*Materiality*" actually to be found in Light—in Heat—in Electricity—in any of the so-called *subtle fluids?*

If weight is not to be considered any longer as the only essential character of "*Matter*," if the "*Materiality*" of a natural existence should be admitted on account of the possibility of dividing it, and by the construction of some instruments calculated to prove its actual presence, and to measure it to a certain extent, or even by the evident influence it has over solid bodies, then "Materialists" ought to pretend that *Space*, *Time*, and even *Vacuum* itself, are *material substances*. Have we not, in fact, measured each of them in a more or less complete manner? Have we not the Meter for Space—the Chronometer for Time—the Barometer, which shows us to what extent Vacuum is obtained? Just as we have the Photometer for Light, the Thermometer for Heat, and the Electrometer for electricity? Have they not also on our organisation an immense

power ?—Does not the want of Space stop the motion and the growth of beings ?—Without Time could anything be born or decay ?—In Vacuum, is life possible ? What claims, then, more or less forcible, do Light, Heat, and Electricity possess to be considered as *Material ?* What are those to be urged in favour of the Principles of Sound—of Odour—of Savour—to such a qualification ?

Is the distinction between "*Moral Principles*" and those which we have just named well grounded with respect to their origin, their special characteristics, their conditions of existence, their positive power over matter—in a word, their proper nature, and the laws that they obey ? Is the condition of "*Immateriality*" to be their exclusive attribute ? Have they no other existence but the one that Religion gives to them by prescribing them as duties ? Have they no other basis but that silent or written contract between man and man in order to secure public welfare ?

To all these queries our studies compel us to answer without hesitation : No !

29. In every Principle, without any exception whatever, we acknowledge a real, positive, and natural existence, actually to be found in Space, in the same manner as Light, Heat, Electricity, Sound, Odour, and Savour. All our motives of action possess that existence. Their essence is the same ; they proceed from the same source ; all aim at the same end ; they have the same characteristics ; they resume all the forces which cause motion and life ; and, although "*Immaterial,*" on account of their origin, they obey, nevertheless, in the most explicit manner, the eternal rule of HARMONY, to which Science has emphatically given the name of "*Physical Laws.*"

Axioms like GOD, from whom they emanate, the Elementary Principles are not, more than HE is, to be considered as chimerical, on account of their being not susceptible of material demonstration and analysis. It is abstraction alone which allows us to be aware of their existence ; an existence which we find engraved in imperishable characters at the foundation of our soul, together with our knowledge of GOD. The natural laws they obey

overpower with their fully-tested reality the frivolous exceptions and subtleties which the "*Ergo*" school would put forth in support of its pitiful and contemptible doubts on the subject.

30. It is time that a Philosophy, worthy of such a name, should find in the conditions of the actual existence of Principles, the natural and undeniable basis of the truths that religious revelation prescribes as duties. It is fully time that our Legislators, enlightened on the true constitution not only of primary elements, but of man himself, would look into Nature for the model of a charter, the importance of which should not consist in the fugitive interests of the present moment, and could ground upon the indestructible laws of Universal Harmony the wisdom of those which are to govern society.

That period will arrive only when Physicists and Chemists will cease to consider as "*Essential Properties of Matter*" that which is only the manifestation of "*Immaterial Principles*," to which it merely gives palpability. Then, and only then, Truth will banish from the realm of Science "*Absolute Materialism*," that is not to be admitted there more plausibly than in Religion, and "*Matter*," reduced at last to its real worth, will descend from a throne which it has but too long occupied.

31. Materialists avail themselves of the proposition: "*Nothing can be made out of nothing*," as being an incontrovertible truth. But let us understand each other.

According to you, Materialists, "*Matter*" is everything, "*Immateriality*" nothing. According to us, "*Matter*" is not everything, and "*Immateriality*," for being imponderable, is, nevertheless, something. According to you, God cannot exist, on account of being "*Immaterial*." According to us, God does exist, although "*Immaterial*." According to you, there is no "*Power*" but in "*Matter*." According to us, there is no "*Matter*" without a primary "*Power*" necessarily out, and distinct from it.

In your fallacious, uncertain, and inconsistent doctrine, you misplace the Principle of Activity—"*Power*," to enclose it, of your own private authority, in brute matter, and you reduce it to the

limited proportions of the latter. Then, again, granting that "*Matter*" is passive and blind in its nature, you, nevertheless, endue it with a kind of spirituality, with a powerful something, to which you give the names of "*Physical Forces*," "*Chemical Affinities*," and "*Essential Properties*."

According to our doctrine, the absolutely incontrovertible truth is:—That, in nature, nothing is really "*Powerful*" but that which does not need a foreign impulse to cause, continue, or suspend motion; and that which is consequently entirely free, and possesses *Consciousness* of its liberty. Here we are arrived at the solution of the question; for of the two things one must be true:—

Either the "*Physical Forces*" of "*Matter*" are free, and possess *Consciousness* and *Will*, or they are not free, and consequently blindly obey certain laws which they are not at liberty to change, and have neither *Consciousness* nor *Will* at all.

In the first hypothesis, free forces, possessing *Consciousness* and *Will*, form a Polytheism as absurd as impossible. How could they be free, and at the same time imprisoned in "*Matter?*" How could Harmony be the consequence of different Wills and Powers in constant opposition, and still in perfect liberty? It is too ridiculous to deserve even the slightest attention.

In the second instance, "*Power*" is placed necessarily out of and above "*Matter*." It commands, gives the laws, enforces obedience, and preserves with "*Matter*" the relations existing between Master and Slave. Such a "*Power*" has of course the knowledge of its liberty, and its supreme Will is manifested in the admirable Harmony of the Universe.

32. From the moment you admit—(and how could you not admit it?)—that *Intelligence* exists in the Universe, the question is at an end; it would be useless to contend any longer; you must submit to the unavoidable consequence, that "*Immateriality*" and "*Matter*," which co-exist in the whole, will necessarily co-exist in any of its constituent Principles.

Effectively, in the gradation of natural existences, from the inorganic substance, the most simple and the most reduced in volume that we can conceive, to man, whom we find at the head of

organised beings, who could trace the subdivisions of Matter, and point out where they stop, and how they begin? Who could find out the precise point where Life takes hold of Matter, and where *Intelligence* commences its manifestation? No one could, no one will ever tell. For, the primitive material Atom, as the exact line of demarcation between Inorganism and Organism, and the precise point between life and no life, exists in the way of the geometrical line and point. Calculated, in the same manner, to give consistency to undeniable truths, even when they cannot be grasped by material analysis, nor detected by the most powerful microscopes, Abstraction still finds them as the necessary basis of all Elementary Principles; and to that degree of existence in which everything escapes our senses, the Power of GOD is still manifest; for in HIM are resumed the finite and the infinite, the known and the unknown; and alone HE exists yet in the unlimited space, when Matter, essentially limited, no longer exists.

Thus it is that our *Intelligence* follows GOD beyond and above HIS works, and detects the rotten foundation of the temple where the unholy worship of the "*Essential Properties of Matter*" was retaining its votaries. But the whole edifice will necessarily tumble down, in spite of vain repairs and useless scaffolds. Thus it is that the heretofore styled Elements, or Primary Principles, were neither Elements nor Principles at all, on account of the insuperable wall that Science had unwisely built up between "*Matter*" and "*Immateriality*." This truth had always been taught by Religion; Philosophy, although she called her doubts wisdom, suspected it; Science would not acknowledge it, and still her future progress depends upon it. Already Chemistry, in declaring that the Principles known as Light, Heat, and Electricity are the chief agents in all the transformations of "*Matter*," has been aiming unknowingly a mortal blow at "*Materialism*," the most ardent supporters of which had heretofore borrowed from her their best arguments. It is from her now that reform will come. She will bring forth the truths that will regenerate Science, and awake her at last from her long lethargy.

33. The Immaterial Elementary Principles may be considered

as composing a formidable army, although little known as yet in its number. Under the rigorous and eternal laws of the admirable discipline imposed upon it by the CREATOR, this army attacks "*Matter*" in a thousand different ways; takes hold of, models, modifies, moves, transforms, and animates it, to give birth to the numberless natural productions, with their characteristics so various and all their stupendous metamorphoses.

Under the impulse of Immaterial Principles, man himself becomes a Creator. Thus it is that, a vassal of the Heavens, he becomes a King of the Earth. Thus it is that, rival of Nature, he takes hold of the Elements, combines them at his Will, and, directing over them the *Intelligent Power* which animates himself, he succeeds in creating the mighty works of Art and Industry.

34. What can be the cause of the apparent war between Immaterial Principles and Matter? The battles fought by the Principles, are they the efforts of Angels to conquer evil spirits? Is Matter the enemy of GOD? Is it the Principle of Evil as HE is the Principle of Goodness?

At first we could think so. When, under the action of Heat, and even more of Electricity, Matter is defeated, and loses its peculiar characteristic of resistance; when, from a solid substance, it becomes liquid; when, from the liquid form, it changes into an aerial state, does it not appear less and less "*Material*," and consequently nearer GOD, the type of "*Immateriality?*" When the rays of Light overcome darkness; when a vivifying Heat conquers the numbness of cold, and reanimates Nature; when vitreous Electricity attracts resinous Electricity, and that, by their contact, the equilibrium which no longer existed between several bodies is suddenly restored, does it not appear that good Angels counteract the doings of evil ones?

The great image of the war between good and evil spirits is certainly an ingenious allegory—a mystical personification of natural phenomena. But it cannot be the correct expression of actual truth.

If Matter was to be the enemy of GOD, why should HE have created it? How could the source of Omnipotence wage an eternal

war against a powerless enemy without a possibility of reducing it? Is it not absurd to attribute the infinite malice, the tremendous power, the profound schemes of the Evil One to Matter, a substance which Natural Philosophy describes as essentially inert, passive, and limited?

It is evidently somewhere else that we must look for the causes of the antagonism we notice, and natural phenomena require a more rational explanation.

We have already said (29 and 33) that all natural forces are to be considered as characteristics of Immaterial Elementary Principles; everybody will readily grant this axiom. But how are those forces distributed? How do they act? What law presides over the manifestation of their extent, and regulates their intensity and action according to the phenomenon to be produced?

These are precisely the questions we must now investigate, and upon which the proper use of the Magnetoscope throws a new and most important light.

PART III.

Philosophy of the Magnetoid conditions of the Elementary Principles, and of their combinations.

35. All Principles are essentially Magnetoid; that is to say, they exhibit necessarily two contrary modes of manifestation, each of which possess an attractive and a repulsive force, with a tendency to equilibrium.

In order to elucidate better the truth of this first proposition, to appreciate more fully all the particulars which constitute the Magnetoid condition, let us in a rapid sketch sum up all the characteristics of the Magnet itself.

36. More than six hundred years before the Christian era, Naturalists had noticed in a mineral which the Greeks called "*Magnes*" the property of attracting Iron. This mineral is that which the Chemists know as the Sesquioxyde of Iron, or Magnet.

When we plunge a piece of Magnet into iron filings, these filings are attached to the Magnet in such a manner as to form a kind of head of hair at each end; the middle part retains no filings, or hardly any, whilst the quantity and the particular hairy disposition of them becomes the more evident the more you consider it towards each end.

The middle part of the Magnet is called the Neutral Line; one of the extremities receives the name of Boreal or North Pole, on account of its constant direction towards the north, when the Magnet is suspended by its neutral line in such a manner as to have freedom of motion. The other extremity, consequently, points to the south, and receives the name of Austral or South Pole.

If we break a Magnet in two pieces, each piece has its two poles and its neutral line. However numerous and however small those fragments may be, each exhibits the same particularity; only, the larger the piece, the more considerable is the quantity of iron filings attached to each Pole.

When we present to each other the Poles of different Magnets, we perceive that there is attraction between the contrary Poles, and repulsion between the Poles of the same name.

Iron is not the only metal attracted by the Magnet. Nickel, Cobalt, and Arsenic obey in the same manner, only not quite to the same extent.

The various substances which obey Magnectic attraction are equally attracted by the one or by the other pole, so long as they remain in the neutral state; that is to say, so long as their contact with the Magnet has not rendered them a secondary focus of Magnetic force, by the development in them of the attractive and the repulsive property. But contact will have necessarily this result in any case, and the attracted substance will show that it acquires thus two Poles and a neutral line. Let the contact be of short duration, the imparted Magnetic force will cease very soon, and be of small power. But, in other circumstances, this Magnetic force will increase till it arrives at a certain degree, which is called the point of saturation. To effect this, the contact must be protracted, and accompanied with a rubbing made in a north and south direction, from the middle part towards the extremities, by the north and south Poles of two different powerful Magnets. You will form in this manner artificial Magnets, which will preserve their power in a more or less durable manner. This acquired power varies according to the nature and the volume of the substance you try to render Magnetic. Iron is generally preferred, for it is more evidently and more regularly susceptible of Magnetisation. A soft iron bar becomes so easily Magnetic, that it is sufficient to place it in a north and south direction to develop in it the characteristics of a Magnet, which, however, it loses nearly as soon as the direction is changed. A steel iron bar is not so readily affected, but it retains much longer the Magnetic properties. When placed in a north and south direction, a violent blow struck with a hammer in the centre of the bar will have the desired effect of rendering it Magnetic. An electrical current passed round the whole length of a steel bar makes a permanent Magnet of it, whilst the same process round a soft iron bar renders it a Magnet only during the time of the experiment. It is called then an Electro-Magnet.

The practical advantages of the Magnetic Needle, although most important, are too remote from our subject for us to dwell on them; neither are we to investigate whether, as it is asserted, the Chinese used already the Magnetic Needle more than a thousand years B. C., whilst its general importance became known in Europe only towards the year 1300. It becomes us to notice only the circumstances in which this instrument offers more or less considerable variations.

In an horizontal plan, the Magnetic Needle makes with the terrestrial meridian an angle of declination, which varies according not only to different places, but even to different times, at the same place. Thus, for instance, at Paris, before 1663, the needle, instead of having exactly the North direction, declined some degrees towards the East; in 1663, it was just North; in 1818, the declination was 22° West; and ever since it has been diminishing.

In a vertical plan, the Magnetic Needle makes with the horizon an angle of inclination, which varies according to latitudes; in the polar regions it is nearly 90°; and it goes on decreasingly towards the Equator. Nevertheless, the succession of points which form the Magnetic Equator—that is to say, where the needle's inclination is *nil*—is not exactly the same at the Terrestrial Equator. It coincides with it at two opposite points only, to reach by degrees on both sides a distance of from 15° to 16° at its maximum. But inclination, like declination, will vary in a like manner at the same place in different times. It diminishes now throughout Europe, and is about 67° at Paris.

Besides those variations, which could be called insensible, on account of their slowness, the needle manifests some sudden perturbations more or less violent. Of all those perturbations, that which by its constancy may be considered as infallible is the continuous agitation and considerable deviation which it experiences during the ten or twelve hours that the phenomena called the Aurora Borealis lasts. Whatever be the actual distance from the Poles, the observer, even in the retirement of his study, is made aware of what occurs in the northern regions by the disordered motions of the Magnetic Needle. Volcanic Eruptions and Earth-

quakes act similarly on the needle. When Lightning falls near to it, it changes sometimes the magnetic disposition, and the Poles are reversed.

Heat, when carried to redness, destroys the properties of Magnets, which they lose in proportion to the increase of temperature.

Lastly, Magnetism does not change the weight of the substances which acquire this peculiarity.

37. Had the Dualism of the forces characteristic of the Magnet arrested sufficiently the attention of Philosophers, they would have acknowledged long ago that all the Elementary Principles are in a Magnetoid condition. Yet, the importance of this fact, and the truths connected with it, have been mostly misunderstood, or remained entirely unknown. To admit simply, as it was done before, that all Principles have their opposite, is to consider as two different Principles the two necessary and constitutional modes of one sole Element. It is to remain completely in ignorance of the two Poles, of the two forces and of their neutral point, and of the degree of saturation belonging properly to all bodies, and that accounts for all the phenomena in which any principle is involved.

It would not have been difficult, however, to find out this fundamental truth, if Philosophers, after having noticed that our Globe is nothing but an immense Magnet, had concluded also that it must possess in a like manner all the properties of natural or artificial Magnets. Is it not evident that each and every Principle entering into the composition of the whole Globe is nothing but a portion of it in a state of division more or less advanced? And since the smallest particle of a Magnet possesses all the magnetic characteristics, all Elementary Principles must necessarily possess them, if not exactly in the same manner, on account of their different nature, at least in a degree of similitude sufficient to authorise us to call them properly Magnetoid.

On the other hand, the study of Heat has demonstrated that the negation of it is sufficient to explain Cold, without implying the existence of a Frigorific Element. This occurs again in relation to Darkness and Light. But it is the phenomena of Electricity, the

positive Pole of which shows itself by extensive rays of a dazzling light, whilst the negative Pole has hardly a single luminous point; it is the force of attraction and repulsion, much more perceivable, as also the irresistible tendency towards equilibrium and the different degrees of saturation exhibited by all bodies in their relation to Electricity; it is the concurrence of all those circumstances, much more strikingly developed than in any other Principle, which confirms the truth of the general Magnetoid Dualism. It is henceforth a primary fact in Natural Philosophy, and we will find that it holds good in all circumstances; not only when the Principles are examined separately, as in the cases of Magnetism, Light, Electricity, Sound, &c., but even in their endless combinations with MATTER; and the more evidently so as we proceed higher in our researches from inorganised to organised bodies, from vegetables to animals, and arrive lastly at the study of man.

EXPERIMENTS.

38. Take a specimen of Rock Crystal in such a way as to have the basis of it in contact with the palm of the left hand, and try then the Magnetoscope in the usual manner; you will perceive that the pendulum will oscillate in a line East and West.

Reverse the position of the Crystal, having the apex instead of the basis in contact with the palm of the left hand; the oscillation will change from East and West to North and South.

Take hold of the Crystal between the thumb and middle finger of the left hand, at about the middle part, between the apex and basis, and the pendulum will stop. The same effect will be produced if you hold the Crystal by the apex and basis with the thumb and the middle finger.

Let for a few minutes an electrical current pass round the the Crystal, in a direction from the basis to the apex, and try it again with the Magnetoscope. You will perceive that the polarity is reversed; the basis will cause a North and South oscillation, whilst the apex will give it East and West.

If you break the Crystal in several fragments, each of the fragments will offer the same results as the whole Crystal.

Take a vegetable, with its root and leaves entire—say, for instance, a Radish, or a Carrot; the lower part, which goes deep into the ground, being in contact with the palm of the left hand, will cause the Reverse Rotation of the pendulum; the green part, or leaves, produce the Normal Rotation; and the exact point between the root and the leaves will stop the pendulum. Cut the leaves, and try the point which caused the pendulum to become stationary; you will perceive that Reverse Rotation will take place, and that the middle point of the green part will prove to be then the neutral line, and consequently stop the pendulum. Precisely similar results manifest themselves if instead of the leaves you try the root; the upper part causes Normal Rotation, and the middle part renders the pendulum motionless.

Again, cause a current of Electricity to pass round the vegetable, as you did with the Crystal, and the polarity of the vegetable will be reversed in the same manner as that of the Crystal.

I have tried successively a great variety of vegetables, and all those which do not belong to the class which causes the pendulum to become stationary present phenomena similar to those which I have just recorded; only the motions of the pendulum vary according to the difference of the vegetable, some producing oscillations in differents points of the compass, others Normal, Inverse, or Elleptical Rotations. Amongst the vegetables which stop the motions, I will name—Potatoes, Caulifiowers, Chicory, Tomatoes, Tobacco, Chestnuts, Apples, Belladona, Stramonium, Nux Vomica, &c. &c. All the narcotic and poisonous substances, with very few exceptions, produce the same effect.

39. Therefore, we acknowledge as firmly established this first law of Nature with regard not only to Elementary Principles, but also to their more or less complicated combinations; that they all possess two opposite Poles, each of which is endued with attractive and repulsive forces, and has a neutral point, where these forces are not perceivable, on account of balancing each other exactly.

From that point of equilibrium, each Principle may be considered as having its *ascendent line*, all the points of which advance more and more towards the Positive, Powerful, or Superior Pole; and its *descendent line*, all the points of which tend more and more

towards the Negative, Resistant, or Inferior Pole. If we look upon the point of equilibrium as being the mathematical Unity of each Principle, the successive points which compose the ascendent and the descendent line will form as many degrees to measure the positive or negative intensity of that same Principle by their respective distance from Unity.

40. Let me explain here why I preserve the denomination of "*Positive and Negative*" to designate the two Poles of the Principles, with the addition, nevertheless, of Powerful and Superior, as a comment of Positive; and of Resistant and Inferior, as a comment of Negative.

Strictly speaking, all existences are "*Positive.*" A "*Negative*" existence would be nonsense, if we should understand it differently from what Mathematicians do when they use the same words. They teach us that, in the same equation, two quantities of opposite qualifications are to be substracted, the one from the other. When they are unequal, the strongest preserves a "*Positive*" rest, the other has only a "*Negative*" effect. If they are equal, they destroy themselves and each other, and both are "*Negative.*"

The story of an Algebraical equation is precisely the story of the forces existing in all Elementary Principles and their compounds. If, then, rigorous Algebra, without any danger of error, uses the expression "*Negative*" applied to quantities, why should we reject the same word used in the same acceptation? Is not any dispute about words useless and nugatory, when the import and signification of them are well known.

If I have not preserved in like manner the name of "*Imponderable Fluids*" in lieu of "*Immaterial Principles,*" it is because a higher motive is involved in the change; and, on the other hand, it shows more evidently the inconsistency of Physicists, who come forth at first with Weight, Form, and Limits as essential characteristics of "MATTER," and then again call "MATTER" that which has neither Weight, nor Form, nor Limits, and resort to childish subtleties to mask the palpable absurdity.

41. The law of Harmony allows to the contrary forces of the Principles but a certain degree of distance from the point of

equilibrium towards which it will carry them back incessantly. This limit is determined by the special point of saturation all the bodies of nature are susceptible of in their relations with the different Principles that influence them.

Therefore, in spite of their constant tendency towards equilibrium, the opposite forces of the Principles only occasionally balance each other, but never for a permanency, because *Motion* in nature is as indestructible as *Matter* itself; and if the condition of general equilibrium should be complied with, *Motion* would stop suddenly, and the Universe come to a dead stand. The substances which, tried by the Magnetoscope, cause the pendulum to stop, are in the condition of temporary equilibrium of their Magnetoid forces. Cause a current of Electricity to pass round or through these substances, and the proper manifestation of an evident Dualism will take place in any of them, as I have repeatedly ascertained, precisely in the same manner as a current of Electricity renders Magnetic a bar of soft iron or steel which was not previously in that condition.

42. Do not confound Force and Power. For there can be but one Power whilst there exist necessarily at least two Forces, the equilibrium of which must be prevented by Power, in order to create Motion. Thus it is that Forces obey the dictates of "*Power*," and compel "*Matter*" to a passive submission to the wisdom of those laws that Harmony governs. But, in order to preserve that Harmony, it becomes necessary that there should be an alternative predominance between the action and the reaction of the contrary forces which belong to all Principles; consequently, the more remarkably a Principle has been manifested in a superior or inferior degree, the more the contrary manifestation will be unavoidable.

However, it would be an error to believe that Harmony requires at each period of reaction, from the Resistant or Inferior Pole, a degree precisely equal to the one arrived at by the Powerful Pole. If this should be the case, Progress would be impossible; for Resistance being then equal to Power, equilibrium by way of symmetrical action would be established, and Motion would cease.

which we know to be against the laws of Nature. Moreover, without Progress, Motion would be useless. Retrograde Motion is merely a possibility that may become at times a necessity, in order to show which is the wrong way, and to render a change more desirable. Whilst constant Progress is the final necessity of Motion, for Time, which marks its succession, never goes back.

43. It is the tendency to an equilibrium of the Magnetoid forces which causes attraction between contrary, and repulsion between similar Poles. Should the reverse be the case; should, for instance, a body already saturated with the Negative Force attract and unite with another similarly saturated, their united forces, instead of verging towards equilibrium, would evidently increase the sum of the Negative degrees, which prevented it already, and rendering it thereby more difficult to be established; and, consequently, far from assisting it, it would more and more oppose the end of Harmony.

If there existed but one force, Attraction only, as some Physicists will have it, equilibrium, on account of its constant tendency, would ultimately prevail, since nothing could counteract it. And how could you explain the phenomenon of Repulsion? One single case of Repulsion would be sufficient to annihilate this theory; and cases of Repulsion are just as numerous, just as evident, as those of Attraction.

What becomes, then, of the law that "all Bodies attract in direct ratio of their mass, and in inverse ratio of the square of their distances," since we perceive that if they attract according to it in some cases, they repel also in the same manner?

Look into it attentively. A chemical substance in presence of several others attracts this, repels that, and remains indifferent to a third. Call it Chemical Affinity, if you like, but it is evidently nothing but a Magnetoid phenomenon, absolutely similar to those that the Magnet, or electrised bodies, offer. We perceive Attraction between the various substances when the Magnetoid forces developed in them are contrary; Repulsion, if they are of the same nature; and no action whatever if the Principles in contact have no relation to each other. Could you pretend that, in all

cases, it is Attraction which causes the differences? Is it Attraction which prevents Water, Oil, and Mercury from mixing? Is it Attraction that violently projects in the surrounding space the fragments of a phial which contained a mixture of the lightest of gases (Hydrogen) with the heaviest (Chlorine), as soon as a solar ray comes in contact with it? Is it Attraction which causes volcanic eruptions? Is it Attraction, again, which forces the rays in all directions from the focus of all Elementary Principles?

44. From the circumstance that there is Attraction between contrary, and Repulsion between similar Poles, in the same Element, it would be wrong to suppose that there must be also Repulsion between Poles of the same name, but in different Elements; and Attraction between opposite Poles, in different Principles. It is precisely the reverse which takes place. The superior Pole of one Elementary Principle calls for the superiority of another, as inferiority of the Pole of any Element seeks for the inferior Pole of another. Superior or inferior Poles in different Principles are so intimately connected, that, after the manifestation of one Principle in one mode, you may consider the manifestation of another Principle in a similar mode, almost as a necessity. Thus it is, for instance, that Light, Heat, Positive Electricity, Sound, Motion, and Life go together hand in hand; whilst Darkness, Cold, Negative Electricity, Silence, Repose, and Death are to be found in close union. Thus, the popular saying, "*Extremes meet*," proves to be correct, when speaking of different Elements. But, in regard to extremes of the same Principle, the saying would require "*Extremes attract each other*."*

It does not result from this that there is an impossibility in the union of a Superior Pole of one Principle to one or several Inferior Poles of different Elements. Just as a retrograde movement is sometimes necessary, so this union may become useful in allowing

* Let us remark here, "*en passant*," that opposite extremes of the same Principle cause on the human frame similar effects. Dazzling Light blinds, as surely as Profound Darkness; Extreme Heat causes mortification exactly as Extreme Cold; Positive Electricity kills instantly, as well as Negative Electricity, &c. Should Physicians of the *contraria cantrariis*, and those of the *similia similibus* schools reflect, and take this in proper consideration, they would not be so far apart from, and consequently far less hostile to each other.

the production of some transient phenomena which the law of Harmony may require. But this is a mere possibility, like retrograde motion, and it never becomes a general rule.

In the study of nature the difference between Rules and Laws is never doubtful. Rules admit of exceptions which confirm them as Laws; for they permit transitory possibilities necessary to establish the gradual differences in the chain of natural beings. Laws admit of no exception.

45. Elementary Principles emanate from their central focus each in the same manner, that is, by way of irradiation constantly moving in straight lines and in every direction. Their rate of speed varies from the extreme torpor which belongs to the inferior degree of Magnetic attraction and repulsion to the extreme rapidity which characterises the peculiar attraction and repulsion of Electricity.

The speed of the rays has been the object of exact calculations with regard to some of the Principles; thus, we know the speed of the transmission of Sound, of Light, of Heat, and lastly of Electricity, which manifests the maximum of it.

46. Matter forms an obstacle to the progress of the Elementary Rays; this obstacle offers results which vary according to the mass and the Magnetoid state of the bodies that the Principles meet with in their way, and according to the nature and intensity of the rays of the Principles themselves. Let us examine successively what are the variations that those conditions produce.

The obstacle encountered by Elementary Rays is necessarily with them in a Magnetoid relation Negative, Positive, or Neutral.

Is that relation of the Negative kind? The obstacle repels the Negative Force of the impinging Ray in making the angle of reflexion equal to the incident angle. It combines itself with the Positive Force of that Principle, till it arrives at the degree of saturation that its mass allows it to acquire, and in direct ratio of its peculiar affinity, which depends mostly on the nature of the other Principles already existing in combination with the obstacle, for these elective affinities, as all likings and dislikings in the world, are subject to many changes. For instance,

a substance which in ordinary circumstances would attract but indifferently, becomes suddenly very attractive by its union with another substance, or will manifest a strong affinity for the ray if that ray has but a weak intensity and the mass of the obstacle be considerable. This illustrates the remarks on the one hand, that union increases strength, and on the other, that the mass will make up for the deficiency of true force. As soon as the obstacle has arrived at its point of saturation the reaction begins, and the obstacle becomes to be itself a secondary focus of Positive Force. The more complete the degree of saturation, the more readily the obstacle parts, with its surplus of the principle which it attracted at first, and even will transmit it to other bodies, which in general are less susceptible of it; this reaction goes on till the body arrives at the inferior point of negative saturation before it experiences again the need of the Positive Force.

The reverse takes place when the relation between the obstacle and the ray are Positive. Should this relation be Neutral, the body remains indifferent, and lets the rays pass through it causing only a deviation more or less decided according to the peculiar density of the obstacle itself.

47. Every Principle on account of its proper nature exerts a special action which modifies the obstacle that it meets with. This very speciality of action gives to all bodies those characteristics known by Physicists and Chemists, as *Essential Properties* of *Matter*, but so called from having misunderstood their origin and their causes. We explain the immense variety of the bodies, and of the phenomena they exhibit, not only by the distinction between the Principles themselves, but by their action, sometimes simple, at other times with endless differences in the degrees of intensity, now in their superior, now in their inferior mode of manifestation. Hence under the various heads of Force of Attraction and Repulsion, extent of Concentration or Expansion, facility of Absorbtion, Rapidity of Transmission, Speed of Emission, Quantity of Reflection, Degree of Refraction, arise the many characteristics of Colour, Form, Solidity, Elasticity, Divisibility, Mobility, Taste, Odour and Sound, of the various substances known by the general name of MATTER. It

would be impossible for us in this sketch, calculated only to give a general view of the subject, to enter into all the particulars of the expanded researches that it embraces. We will only describe in a summary manner the most important phenomena produced by the mode of contact between Elementary Principles and MATTER.

48. When contact takes place in consequence of the peacable, moderate, constant, and regular attraction which characterises Magnetoid influences, the transformation that the Principles cause in the Bodies which enter into combination with one of their Poles, assumes symmetrical proportions in perfect accordance with the laws of Harmony that presided over the elementary approach. In some cases only, the slowness of the results will not always allow us to fully trace and test their Origin, Progress, End, and Import.

This contact is sometimes accompanied by friction; it is when the result requires for its production some degree of Electricity and even Light combined with Motion; for those Principles are necessarily developed under the action of rubbing. This mode of contact is eminently creative; all the fine works of art show it in their formation; all pieces of machinery in action exhibit it; it gives to steel bars the Magnetic power; it produces Electricity in Glass and Resin; it develops Heat and even Flame from the wood that the savages know how to choose in lighting their fire; it characterises at last the reproduction of the animated beings, and in this act of primary importance, the Magnetisation of the Elementary Principles caused by friction necessarily plays a part which has not been yet sufficiently appreciated.

Lastly, the contact may be sudden as the consequence of the violent, irresistible and instantaneous attraction and repulsion which characterise Electricity. Then, the results obtained are more rapid, more evident, more appreciable; but they retain something harsh, irregular, and excessive, which shows the extreme force called into play in their production. They form thus those sublime but terrible scenes, where horror and admiration are blended together.

We have already noticed that the law of Harmony does not allow of perturbation unless in extreme cases as possible exceptions, but

never as a general rule. By its nature itself, Harmony requires habitually the constant and progressive march of Magnetoid influences. Electric Shocks become unavoidable only in case of excessive resistance from the part of the Inferior Poles of elements in order to maintain the supremacy of the Superior Poles.

49. It would appear at first that Tempests, Storms, Floods, Conflagrations, Volcanic Eruptions, Deformities and Diseases of the Body, Excesses of Passion, Revolutions, and Moral Monstrosities imply contradiction with the laws of universal Harmony; but this is an error of judgment, which reflexion will redress.

Effectively, those who may entertain this opinion not only misunderstand that such inferior extremes are the necessary opposites of Superior Poles, which own their extreme excellence and attraction to that very repulsiveness; but, on the other hand, it is to call to the tribunal of our inferior reason the acts of Omnipotence, and to measure according to the foolish pride of our limited mind the high wisdom of Supreme Intelligence.

The more a man is subdued by the inferior mode of the Principles, the more forcibly he is struck with the appearance of local evils and disorder. The more his mind is endued with the force of the Positive Poles, the more he becomes elevated in the superior regions of Intelligence, and the better does he understand the importance of phenomena necessary to the maintenance of the general harmonic order. Should this order require the complete destruction of our Planet, he would submit to it with unabated admiration and respect; for he would know that, in reference to the Immensity of the Universe, our Globe is less than a grain of sand compared to its own bulk, and that any natural destruction is just, by being necessary; for it becomes the infinite justice of God alone to appreciate the importance of a new order of things.

50. Now that we have found out the immaterial essence of Elementary Principles, and explained by their Magnetoid condition the manner in which natural forces act in the production of the various natural phenomena, let us examine if we are not arrived at a satisfactory account of the essence of Matter and the existence of Man.

51. As Principle of all Principles, as Primary Element, in virtue of the very Harmony which the Universe proclaims, God has given to himself his Inferior Pole. This He deemed necessary, to constitute a basis to his own work, and he began thus the first manifestation of the great law of *Dualism* in Elementary Principles.

Nothing can illustrate better the truth of this law than the acknowledgment of Matter as being the Negative Pole of the Deity. Thus it is that, although contrary and opposed to Him, it is not on that account His enemy. Thus it is that, in combination with its material resistance, this Inferior Pole remains, nevertheless, under the absolute control and dependence of the Superior Power.

To Him, then, as necessary attributes of the Primary Positive Pole of the Great Whole, Supreme Intelligence, Omnipotence, Infinite Wisdom, Unlimited Immateriality, Absolute Liberty, and Perfect Consciousness.

To Matter, as His Negative Pole, the negation of His Supremacy, Inertness, Blind Resistance, Passive Obedience, in yielding only to the irresistible laws of Attraction, Repulsion, Concentration, and Expansion, in order to assume endless metamorphoses, under the action of forces which it has neither created nor understood.

Thus it is that in God begin all the Superior, Powerful, and Positive Poles, as it is to Matter, that end all the Inferior, Resistant, and Negative Poles of all Principles.

Matter, then, is not an Element by itself; it is only an Elementary Pole, and would be nothing without the Superior One, to whom it owes its existence.

Work at Matter; divide it, torment it endlessly; you will find in it nothing but the resisting and solid point, the primitive skeleton which gives support to Principles, and assumes accordingly all imaginable appearances.

I will repeat it again. At a period more or less remote, Science will ascertain that every substance, however simple or composed, is corresponding to and significative of actual Elementary Immaterial Principles, existing in Nature in the manner of the so-called *Subtle Fluids*, let them be moral or otherwise.

52. From the foregoing Aphorisms, is it not evident that Man

is the medium terminus—the point of imperfect equilibrium, where the two Poles of the Divine Essence struggle incessantly to balance each other? Is not thus Man a true "*Microcosm*," in which by his Intelligence he belongs to GOD, and by his organs to MATTER?

The necessary developments of this truth, and the laws of Organic Dynamics, will form the last part of this Philosophical Essay.

PART IV.

Magnetoid condition of the Constitution of Man.

53. There exists in the whole range of Nature nothing more harmonious than the human body. We have two Eyes, two Ears, two Nostrils, a Tongue, Larynx, and Pharynx, each with two symmetrically disposed halves; and not only two Hands and two Feet, but two symmetrically correspondent halves of the whole surface; a duality in the bony system and in the apparatus of voluntary muscles. The Brain, and its connexion with the Spinal Chord, the nerves of Sensation and Volition, are likewise double and symmetrical.

Wherever an harmonious whole, or merely a symmetrical part, however small, appears, we may be sure that there dwell Magnetoid Forces, the presence and energy of which are revealed by the Magnetoscope. Identity of Elementary Principles in organised and in inorganised Matter, implies necessarily identity in the Forces manifested in the one and in the other. From this it follows evidently that terrestrial or inorganic Magnetism, Electricity, and influences analogous to them, exhibited in inorganised Matter, must alike be found in living bodies, with the increased energy that Life imparts to all the Elements that it seizes and unites. We have demonstrated their existence in all substances of a crystallic form, in all kinds of vegetable Matter; and, since there is no being whose composition offers so complete, so symmetrical, and so harmonious an assemblage of Elementary Principles as the human system, there is no wonder that there should be nowhere a more abundant focus of Magnetoid Forces.

54. The Magnetoscopic examination of our different organs fully confirms this expectation, and gives the following very remarkable results:—

The Arm, in the superior Right limb, from the shoulder to the elbow, causes the pendulum to assume the Normal Rotation.

The fore-arm, from the elbow to the wrist, imparts to the pendulum the Inverse Rotation. The hand gives again the Normal Rotation. The proper motion of each finger has already been noticed (9), but a more minute investigation proves that the three parts of the different fingers cause an alternative in the Rotation.

The most striking circumstance in this experiment is that each joint or articulation, situated between the opposite Forces, stops always the motion of the pendulum; so that the whole limb is actually a Magnetoid chain, exhibiting conditions absolutely analogous to those of any Electro-Magnetic battery, the Elements of which are separated from each other by a neutral line, in the successive manifestation of its Forces.

In the superior Left limb, we perceive the same particularities, with the only difference that the motions are all the reverse of those in the Right limb.

Consequently, when used at the same time, those limbs form an extensive Magnetoid apparatus, presenting in the corresponding fingers of each side two extremes of a different Polarity. Such a disposition renders it necessary that the action on the left should be transmitted to the right Pole, in the same manner as one end of a conducting wire transmits to the other end the Electric shock.

The inferior Right limb presents all the conditions of the superior Left limb, and the Left inferior exhibits those of the Right superior one.

It shows that the *Magnetoid living apparatus* is complete not only in the similar limbs of the right and left sides, but also in the superior and inferior limbs of the same side. Thus, perfect Harmony and sympathetic transmission is the necessary consequence of the equal alternative opposition in the repartition of the Magnetoid Forces. A current of Electricity, a Magnet or Electro-Magnet, in contact with any part of the living Magnetoid chain, suspends for a more or less protracted time the natural Magnetoid manifestation. Mesmerisation, or natural sleep, produces the same effects. But when this result is obtained, a change in the very means of causing it is sufficient to restore immediately the natural manifestation which a longer contact will cease again to stop.

55. When from the Limbs we pass to the examination of the different points of the Chest and the Abdomen, corresponding to the most important organs, we find the following results:—

The region of the Heart	produces	Normal Rotation.
„ the Stomach	.....	Inverse Rotation.
„ the Spleen	.....	do.
„ the Bladder	.....	do.
„ the Right Lung	...	S.E. and N.W. Oscillation.
„ the Left Lung	.....	N.E. and S.W. do.
„ the Liver	.....	N. and S. do.
„ the Intestines	.....	E. and W. do.
„ the Genital Organs.		Elliptical Motion N. and S.
„ the Right Kidney .		S.E. and N.W. Oscillation.
„ the Left Kidney	...	N.E. and S.W. do.

Any point perfectly on the median line stops the pendulum.

The organ of the Voice or the Larynx being situated on that line, offers a remarkable singularity. If the person remains silent, the pendulum does not move. As soon as the person begins to speak or to read aloud, the pendulum moves in a linear direction, North and South. Should the person sing, the motion is altered into the Normal Rotation.

56. After having examined the viscera of the Chest and Abdomen, if we study in the same manner the motions of the pendulum, according to different parts of the head, we perceive that—

The Right Eye	gives	N. and S. Oscillation.
The Left Eye	.....	E. and W. do.
The Right Ear	.....	do. do.
The Left Ear	.....	N. and S. do.
The Right Nostril	.....	Inverse Rotation.
The Left Nostril	.....	Normal Rotation.
The Right Corner of the Mouth.		N.E. and S.W. Oscillation.
The Left Corner	.....	S.E. and N.W. do.
The Upper Part of the Tongue	...	N. and S. do.
The Lower Part	.....	E. and W. do.
The Right Side of the Tongue	...	S.E. and N.W. do.
The Left Side	.....	N.E. and S.W. do.

Press your finger on the Nostrils, the Eyes, or in the Ears, so as to prevent their natural functions, or put it on the Mouth, so as to touch both lips, and the pendulum stops.

So long as the above-mentioned organs are in a healthy condition, the different motions I have indicated do not extend, for any of them, much farther than the fifth circle, which I consider on that account as the indication of *par*, or unimpaired condition. But in cases of disease I have seen them reduced to a dead stop in some instances, and in others reaching as far as the twentieth circle. I have seen them also presenting abnormalities, now in one sense, now in another, according to the different ailments that fell under my examination.

Those results afford very important and entirely new data in the Diagnosis of maladies; and I intend to publish, at a later period, the observations I have already collected. In the meanwhile, I call the attention of my medical brethren most earnestly to that highly interesting study, and I will, with heartfelt gratitude, receive their communications on this subject.

57. Before passing to the application of the Magnetoscope to the different Phrenological Organs, and describing the unexpected facts which confirm at the same time, and most victoriously, the truth of Phrenology, Mesmerism, and the unerring accuracy of the Magnetoscopic indications, it would be well, perhaps, to present a general outline of the actual state of those sciences, in order to make more evident their intimate relations to the subject of this Essay. But my limits are too circumscribed to allow me to do so. To those persons who may feel anxious to know more on those matters, I cannot recommend too strongly an attentive perusal of the "Zoist," a most admirable, conscientious, and philosophical record of Cerebral Physiology and Mesmerism. I will name, also, the important work of Gall, recently translated by the highly talented and indefatigable Dr. Symes. Yet, some considerations on the Vital Dynamics appear to me indispensable, as affording a natural basis in explanation to the phenomena I am about to relate.

58. If the *Soul* of Man is in itself a real Principle, it must possess its two different manifestations, its two Poles, one of which is Superior, the other Inferior, with their tendency towards Equi-

librium, the Neutral Line, and, in a word, all the conditions of the law of Polarity, the unfailing constancy of which I have demonstrated in any Principle. (See Part III.) Can we, then, carry the consequences of a rational argument too far, when we acknowledge that such are, in fact, the relations existing between our "*Intelligence*" and our "*Power*" of action, forces which constitute our actual "*Consciousness*," or *Soul?* Who could deny the superiority of our "*Intelligence*," which reaches the remotest parts of the Universe, and extends to the conception of God himself, whilst our "*Power*" remains trammelled by its Material limits? Why should we refuse to see in our "*Intelligence*" the Superior, and in our "*Power*" the Inferior Pole of the *Soul?* Our "*Will*" is the neutral line—the necessary link which unites the one to the other. "*Intelligence*" conceives, calculates, combines, commands, and directs the elements and means of action; "*Will*" transmits the order to "*Power*," which, by its proper material resources, or by borrowing those of other existences, performs the mandates and actions which "*Intelligence*" has resolved upon as proper to arrive at the desired end.

59. Inorganised Matter does not appear to attract the Principle "*Consciousness*," or to combine with it. Yet, Chemical Affinity might perhaps be considered as its shadow in the Mineral Kingdom.

Vegetable Matter, although organised, yet does not present the characteristics of "*Consciousness*." No one, I suppose, would consider as a result of "*Consciousness*" the action of the plant *Drosera Muscipula*, which contracts instantly, imprisons, and smothers the imprudent fly which touches it.

Even the lower animals, such as Acephali, Polypi, Infusoria, the organisation of which is still devoid of any decided appearance of nervous Matter, exhibit but a numb and passive obedience to the general laws of such Magnetoid Forces as preside over the manifestation of "*Instinct*," and cause involuntary motions; but in superior animals nervous substance is the *Material* instrument which establishes, with *Immateriality*, their high and incessant relations.

In ascending the Zoological scale, and comparing constantly the

manifestation of the Principle "*Consciousness*" in its relations to organisation, we find that its Superior Pole, "*Intelligence*," becomes more and more evident, according not only to new forms, but also to proportional increase and development of the Nervous System. We ascertain, likewise, that the functions of this System are not the same in every part. Thus it is that the Optic nerve does not perceive Sounds and Odours. The Acoustic nerve is not affected by Colours. Each different part has not only a different function, but its development is in direct ratio with the energy of the faculty of which it is the seat. When *Smelling* is acute, the *Olfactory nerve* is large; when *Sight* is weak, the *Optic nerve* is slender. The same remark holds good for each part of the brain. Wherever a Cerebral circumvolution is more conspicuous, there also the moral faculty corresponding to it has a greater intensity in its manifestation.

60. To acknowledge, as I do, that Phrenology possesses a true and mathematical basis, is not to teach that the Brain is the only seat of "*Intelligence*," and that nowhere else in Nature does "*Intelligence*" dwell. It would be to consider "*Intelligence*" as a kind of organic secretion, resulting from the *Essential Properties of Cerebral Matter*, as "Materialists" pretend. Far from it; I contend that if the Principle "*Consciousness*," or Soul, and consequently the Forces which belong to it, were not existing in a free state, out of us, spread in Space in the same manner as Light, we could not receive it into us, assimilate it to us, and cause it to radiate from us through the working of peculiar instruments.

Again, the individual perfection of the Eye or the Ear does not cause a greater perfection in the external Principles, Light or Sound, of which they give us cognizance; it gives only a more perfect appreciation of it, in rendering more complete and easy its combination with the Principle "*Consciousness*." In like manner, the perfection or greater development of the different organs of the Brain shows only a more or less complete absorption of a special Moral Principle, by that special point of the Cerebral mass; and thus, also, in each particular nervous organ "*Consciousness*" enters only as one of the constituent Elements, carrying with itself all its

attributes, namely :—*Sensibility*, *Attention*, *Reflexion*, *Judgment*, *Memory*, *Desires*, and *Preferences*.—It is worthy of remark that those attributes given generally by Philosophers as characteristics of the *Soul*, and which I acknowledge to belong to the Principle "*Consciousness*," are seven in number, as seven are the colours of the Principle *Light*, and seven also the musical notes of the Principle *Sound*. Could not the Principle *Savour* and the Principle *Odour* be likewise referred to, and actually present seven different principal divisions, with their innumerable shades, analagous to those offered by Colours and Sounds, and resulting from the predominance of one, or a partial combination of some, of the primitive distinctions? Be this as it may, it is remarkable again that the motions of the pendulum present also seven different directions in the examination of the Head, viz. :—Elliptical Motion, Normal Rotation, Inverse Rotation, and the four different Oscillations, N. and S., E. and W., N.E. and S.W., and lastly S.E. and N.W.

61. The seven attributes of the Principle "*Consciousness*" present themselves, when considered separately by abstraction, an evident Polarity. The study of each would swell this Essay to an extent which I wish to avoid at present. I will confine myself to a few remarks on the first attribute, *Sensibility*, as affording an illustration of the correctness of my views, reserving larger developments for a more considerable work, which I have it in contemplation to write at a future time.

In our System, the two Poles of *Sensibility* are manifested by *Pleasure* and *Pain*. *Health* is the consequence of an habitual predominance of the Superior Pole, *Pleasure*, as *Disease* is the result of the decided predominance of the Inferior Pole, *Pain*. Yet, for the maintenance of the law of Harmony, an alternative succession of predominance between the two Poles is necessary. Without this condition, we should arrive at a state of complete *Insensibility*, which would render Life sterile and useless. Thus it is that Nature has refused a long duration not only to violent agony, but also to exquisite and delightful sensations, and even to the comfortable and pleasurable normal state of that plain vital uniformity which constitutes *Health*. As soon as we arrive at the

enjoyment of it, after the predominance of "*Pain*," we feel fully the pleasurable sensation that it creates; but, if it lasts, we lose more and more the vivacity of the first feeling; *Indifference*, or the neutral line, succeeds, and portends a necessary reaction. Properly speaking, the oscillations of the vital forces between the two Poles of *Sensibility* are perfectly represented by the oscillations of the pendulum. The latter moves incessantly towards the vertical line, the seat of perfect equilibrium: it reaches it, but extends farther; comes back, and goes beyond again, so long as the movement lasts; and when it stops ultimately all the machinery loses its power; everything is suspended, concluded, ended. In a similar manner, during our existence, we advance towards, or we recede from, the state of perfect equilibrium, without ever reaching it. We experience *Pleasure* in its approach, we experience *Pain* in receding from it.

Our *Sensibility*, in a well regulated succession of its numerous scopes, succeeds sometimes in securing for us, during a more or less protracted period, the advantages of the enjoyment of the Superior Pole, and then *Health* is apparently good. Yet, our vital condition resembles only that of the atmosphere, which, beautifully serene for a long while, does, nevertheless, increase incessantly those accumulations of forces which bring on storms. It progresses towards them silently, but steadily, and with that sameness and uniform tendency, which we find monotonous, which blunts our *Sensibility*, because it ceases to afford new food to its need of excitement. "*Pleasure*" recedes, "*Pain*" approaches, and the reaction begins. The Inferior Pole, *Disease*, assumes gradually the predominance, which will continue to increase till it reaches the maximum of its extent, limited by the point of saturation. As soon as the latter is attained, a contrary reaction restores us to our primitive state. But the Constitution of man is so complicated, so rich, so teeming with relations between itself and the surrounding objects—those objects themselves are so different in their influences—that our internal as well as external economy is necessarily interwoven with innumerable vicissitudes. Thus it is that we never can arrive at a permanent general uniformity.

There is never in the atmosphere of our life a constant serenity. Now and then clouds will gather; they disappear for a moment, to come again more appallingly. Too often, alas! the storm bursts, roars, and destroys ..... But when it subsides, at last, it brings back the fugitive moment of calm and happiness.

62. Habits of "*Pain*," provided the distance from equilibrium be not too considerable, by their repeated and monotonous recurrence, blunt "*Sensibility*" with a result opposite to that of habits of "*Pleasure*." Whilst the latter enervates necessarily our constitution, and becomes thus the forerunner of disease, the former gives us an additional power of resistance, renders us less liable to be affected by noxious influences, and eventually secures the return of equilibrium.

But whilst we see that constant habits diminish the keenness of the attribute "*Sensibility*" in our "*Consciousness*," we perceive at the same time that they have a contrary effect on the Pole "*Power*." Practice causes not only a readier and more perfect absorption of the Principles with which "*Consciousness*" enters into combination in our different nervous organs, and the consequent increase of size of the latter, but also it augments the capacity for saturation, and the consequent energy of emission or irradiation of the special Magnetoid forces which characterise the organic differences. It is this irradiation of Forces which causes the Magnetoscopic pendulum to move in different directions, according to the different organs, and naturally the extent of the motion is in direct ratio with that same energy.

Thus it is that we possess in the Magnetoscope an instrument as true and as inexorably correct in the portraiture of our *Immaterial Being*, as the Daguerreotyping apparatus proves itself to be little flattering in giving our *Material Likeness*.

63. It would be superfluous to relate here how the immense genius of Gall led him to the localisation of our different faculties, and how his pupil Spurzheim and many others, amongst whom I will mention Combe, in this country, contributed to the consolidation and enlargement of Phrenological Science; for my purpose, it is sufficient to say that the generality of the Phrenologists of the

present time acknowledge in the Brain thirty-six different organs, the situation of which admits no longer of any reasonable doubt.

These thirty-six organs, tested by the Magnetoscope, offer the following motions on the right side of the Head:—

Amativeness	Elliptical, N. and S.
Philoprogenitiveness	Inverse Rotation.
Concentrativeness	E. and W.
Adhesiveness	Inverse Rotation.
Combativeness	do.
Destructiveness	N.W. and S.E.
Constructiveness	N.E. and S.W.
Acquisitiveness	Normal Rotation.
Secretiveness	N. and S.
Gustativeness	do.
Self Esteem	Normal Rotation.
Love of Approbation	do.
Cautiousness	N. and S.
Firmness	Normal Rotation.
Conscientiousness	E. and W.
Veneration	Inverse Rotation.
Hope	E. and W.
Ideality	do.
Benevolence	Inverse Rotation.
Wonder	N.E. and S.W.
Individuality	Normal Rotation.
Eventuality	E. and W.
Form	Inverse Rotation.
Size	do.
Weight	N.E. and S.W.
Colouring	E. and W.
Locality	Inverse Rotation.
Order	do.
Time	N. and S.
Tune	Normal Rotation.
Number	N. and S.
Language	do.
Comparison	N.E. and S.W.
Causality	Inverse Rotation.
Wit	do.
Imitation	N. and S.

The left part of the Head shows the reverse motions in all cases, if tested alone; but when both sides are tested simultaneously, using the thumb and middle finger of the left hand, in order to embrace the double organ, the motion of the right side

only takes place, as well as when the middle finger alone is put across the Organs situated on the median line.

In every individual, with very few exceptions, which I will indicate, the same Organs cause the same motions. Out of two hundred examinations, a record of which I have preserved, the Organ *Amativeness* in three instances went Elliptically in a direction E. and W. instead of N. and S.

The Organ *Wonder*, in fourteen different cases, went in a direction S.E. and N.W. (direction of the Organ *Destructiveness*), instead of N.E. and S.W. In those persons I ascertained that the facts which attracted their particular attention in the reading of a newspaper were always those of an appalling character, such as Murders, Dreadful Accidents, Loss of Life, &c.

The Organs *Locality* and *Order* appear to assume indifferently the Normal or the Inverse Rotation.

64. I have already stated that the extent of motion varies considerably in the same Organ according to different persons. The comparison of the figures obtained by each Cerebral Organ of the same person enables me to draw a correct estimate of the Mental Forces at the command of every individual. I have elsewhere explained my reasons for considering as *par* the figure 5, which represents the motion of the pendulum extended to the 5th space of the central card. Thus, in ordinary cases, the total value of the Mental Forces may be represented, as *average*, by figure 180, product of the multiplication of our thirty-six Phrenological Organs by the figure of *par* 5.

In that respect, the lowest amount I have recorded as yet is 130, which presents, consequently, a difference of 50 below the *average*; but the subject, although a tall, strong, and healthy lad of sixteen, born in excellent circumstances, cannot be considered as fully developed; his intellect is hardly above that of a child three years old. I will give here the particulars of the case.

The appearance of the lad is very prepossessing; his regular and mild features announce modesty and timidity; but no one unacquainted with him, as I was when I made the examination, could guess at his mental condition, which his friends had been very

cautious in concealing from me. The Magnetoscope gave the following order in the figures obtained by each Organ :—

Fig.		Total.
9 for	Gustativeness	9
8	Comparison	8
7	Conscientiousness and Firmness	14
6	Combativeness, Secretiveness, Benevolence, Order, and Wit	30
5	Adhesiveness, Ideality, Colour, Tune, and Imitation	25
4	Constructiveness and Love of Approbation	8
3	Amativeness, Destructiveness, Veneration, Eventuality, Time, and Causality	18
2	Acquisitiveness, Cautiousness, Wonder, Individuality, Weight, Locality, and Language ...	14
1	Philoprogenitiveness, Form, Size, and Number ...	4
0	Concentrativeness, Self-Esteem, and Hope... ...	0
	General amount	130

The highest amount of Mental Forces has been furnished by a gentleman, of whose name, fortune, and position in life I remain in complete ignorance. Here is the result of his examination :—

Fig.		Total.
20 for	Conscientiousness	20
19	Comparison and Benevolence	38
18	Firmness	18
14	Constructiveness, Order, and Wit	42
13	Combativeness and Language...	26
12	Ideality, Wonder, and Adhesiveness	36
11	Love of Approbation and Causality	22
10	Secretiveness	10
9	Philoprogenitiveness and Number	18
8	Concentrativeness, Acquisitiveness, Weight, and Colour	32
7	Gustativeness, Self-Esteem, Form, Size, and Time	35
6	Cautiousness and Amativeness	12
5	Hope, Individuality, Eventuality, and Locality ...	20
4	Tune	4
3	Veneration...	3
1	Destructiveness	1
0	Imitation	0
	General amount	337

The middle term between the two above extremes is 233.

The statistical review of my examinations gives 230 as middle term. The distribution is as follows :—

From 230 to 220	— 34 cases	From 230 to 240	— 35 cases
„ 220 to 200	— 32 „	„ 241 to 260	— 33 „
„ 200 to 180	— 18 „	„ 261 to 200	— 19 „
„ 180 to 160	— 12 „	„ 281 to 300	— 5 „
Under figure 160	— 5 „	Above figure 300	— 7 „
Total	101 cases	Total	99 cases

But although figure 230 appears actually to be the middle term in the present table, yet that amount cannot be considered as the *exact average* of the Mental Forces in the generality of cases. It is true that I have here but seventeen instances of figures inferior to 180; but the class of persons which furnished those figures is by far the most numerous in society. If the low amounts are here few in numbers, it is only owing to my having had but few occasions of making examinations amongst the immense majority which composes that class. I persist accordingly in my opinion that if the whole human family were examined by the Magnetoscope, this same figure 180 would prove to be the correct *average;* for it must be taken into consideration that nearly the whole amount of my examinations has been furnished by the superior class of society; and that in every instance of uneducated persons being examined the figure was nearer the mark, and even below it.

In reference to sexes, the ten lowest and highest figures obtained by either run thus :—

LOWEST.		HIGHEST.	
Males.	Females.	Males.	Females.
130	140	337	286
157	148	311	275
169	156	309	274
173	157	308	259
175	168	307	259
179	168	306	258
180	174	301	258
181	175	300	254
186	177	285	253
190	177	284	252
1720	1620	3048	2628

65. I need scarcely remark that the amount of Mental Forces does not give evidence of the moral worth; this latter and most important point results from the harmonious distribution of the Forces. An example will illustrate this remark.

I was in need of a female servant. One of the persons who made application for the situation, being tested by the Magnetoscope, gave the following result:—

Fig.		Total.
11	for Secretiveness	11
10	Acquisitiveness and Gustativeness	20
9	Amativeness	9
8	Language	8
7	Destructiveness, Combativeness, Cautiousness, and Firmness	28
6	Locality and Comparison	12
5	Concentrativeness, Adhesiveness, Hope, Ideality, Individuality, Eventuality, Time, Tune, and Number	45
4	Love of Approbation, Benevolence, Wonder, Causality, Wit, and Imitation	24
3	Philoprogenitiveness, Constructiveness, Form, Size	12
2	Self-Esteem, Conscientiousness, Weight, and Colour	8
0	Veneration and Order	0
	Total amount	177

Another, tested under the same circumstances, presented a smaller amount, but the combination was as follows:—

Fig.		Total.
8	for Conscientiousness	8
7	Benevolence and Constructiveness	14
6	Adhesiveness, Comparison, Order, Love of Approbation, Wonder, and Eventuality	36
5	Amativeness, Concentrativeness, Philoprogenitiveness, Self-Esteem, Cautiousness, Veneration, Individuality, Form, Size, Weight, Colour, Locality, Time, Number, Causality, Wit, and Imitation	85
4	Acquisitiveness, Secretiveness, Gustativeness, Ideality, and Language	20
3	Combativeness and Firmness	6
2	Destructiveness and Hope	4
1	Tune	1
	Total amount	174

Who could balance between those two different characters, and give the preference to the higher figure?

In the first, what Mental Force could check the evil propensities? Religious Principles are *nil* (*Veneration* at 0); Love of Order, *nil* again. Love of Truth and Justice and Self-Respect are exceedingly low (*Conscientiousness* and *Self-Esteem* at figure 2); Habits of Sloth and Slovenliness are evinced by *Constructiveness* at 3, and *Order* at 0. To what purpose then could *Comparison*, or Judgment, and *Cautiousness*, or Prudence, above par, be used by such a person?—Only to carry to the fullest extent the power of Dissimulation which is the leading qualification (*Secretiveness* at 11), and to gratify Theft, Gluttony, and Lust; and then Lying, Cruelty, Quarrelsome Disposition, and Obstinacy?

In the second case, Love of Truth and Justice predominates; a Benevolent Disposition and Habits of Industry and Order are evident. Religious Feelings are good; and, if the Mental Forces are not very elevated, at least *Comparison*, or Judgment, above par, will in this instance be used for good purposes, and the general mildness of temper is shown by the low figures of *Combativeness*, *Firmness*, and *Destructiveness*. The smaller amount, by a better distribution of the Forces amongst the Organs, evinces an honest and deserving Girl; whilst the other, in spite of a higher figure, indicates the very reverse of it.

I took the trouble of making most minute inquiries, in order to ascertain the accuracy of the data furnished in those two cases, and I found them perfectly correct in every particular.

66. Those two instances are sufficient to demonstrate some of the advantages to be derived from the use of the Magnetoscope. But it is chiefly for educational purposes that the importance of the indications which it gives becomes more worthy of attention. The natural aptitudes and propensities of children are thus ascertained perfectly, and can consequently be counteracted with much more efficacy, when some evil tendency is detected. Special predispositions will no longer remain dormant, awaiting an opportunity of showing themselves; they will at once claim and receive their proper care. The progress and changes are clearly perceived, as I will prove by the following case: A young lady, eighteen years of age, of very prepossessing appearance, and the daughter of a schoolmistress,

was examined by me, on the 4th of January last. This is the result given by the Magnetoscope :—

Fig.		Total.
11	for Wit	11
10	Comparison and Imitation	20
9	Conscientiousness and Self-Esteem...	18
8	Combativeness and Firmness	16
7	Secretiveness, Love of Approbation, Locality, and Language	21
6	Amativeness, Destructiveness, and Wonder ...	18
5	Gustativeness, Ideality, and Time	15
4	Philoprogenitiveness, Constructiveness, Adhesiveness, Individuality, and Causality ...	20
3	Concentrativeness, Cautiousness, Veneration, Benevolence, Eventuality, and Size	18
2	Acquisitiveness, Hope, Form, and Colour	8
1	Weight, Number, and Tune	3
0	Order	0
	Total amount	175

As I perceived that in this case Judgment and Conscience were pre-eminent, I took an interest in it; and strongly recommended a particular course, which I thought would improve both the moral worth and the Mental Forces. After two months of untired perseverance, she was examined again, and the Magnetoscope indicated the following improvement :—

Fig.		Total.
12	for Wit	12
10	Comparison and Imitation	20
9	Conscientiousness	9
8	Hope, Constructiveness, Benevolence, and Love of Approbation	32
7	Language, Adhesiveness, Combativeness, and Locality	28
6	Self-Esteem, Wonder, and Amativeness	18
5	Philoprogenitiveness, Concentrativeness, Cautiousness, Firmness, Veneration, Ideality, Time, Causality, Secretiveness, and Gustativeness	50
4	Individuality, Eventuality, Weight, and Order ...	16
3	Destructiveness, Form, Size, Colour, and Number	15
2	Acquisitiveness...	2
1	Tune	1
	Total amount	203

Thus we perceive a very favourable difference obtained in a remarkably short time by a judicious direction given to the Mental Forces. From a decidedly inferior being, in every respect, she rose above vulgarity, and grew evidently better. The change was so striking, that all persons acquainted with her perceived and noticed it. I have no doubt that by perseverance she will improve much more, and arrive at a considerable degree of true superiority.

A gentleman of literary and scientific acquirements of the highest order, who was at the time of his examination a perfect stranger to me, presented the following distribution of his Mental Forces :—

Fig.		Total.
20	for Ideality and Colour	40
19	Imitation	19
15	Comparison	15
13	Causality	13
12	Adhesiveness and Benevolence	24
10	Constructiveness, Form, and Size	30
9	Firmness, Wonder, and Locality	27
8	Self-Esteem, Veneration, Conscientiousness, Number, and Wit	40
7	Amativeness, Philoprogenitiveness, Combativeness, Secretiveness, and Gustativeness ...	42
6	Language	6
5	Concentrativeness, Love of Approbation, Cautiousness, Eventuality, Order, Time, and Tune	35
4	Destructiveness and Weight	8
1	Acquisitiveness and Individuality	2
	Total amount	301

He had never attempted drawing, or the use of colours; but he told me, after the examination was over, that he had always felt a great inclination so to do. I pointed out to him the extraordinary extent of his natural aptitude for such a pursuit, and strongly advised him to begin forthwith. He did so, and in less than three months acquired a skill seldom arrived at after three years of constant labour.

I could have multiplied those extracts from my book of records, and have proved still further how, not only the Study, but also the Culture and Medicine of the Mind find in the Magnetoscope an invaluable auxiliary; but I lack both time and space, and I hasten

to arrive at my statistical observations. Few as they are, I hope that their novelty will not fail in eliciting some interest.

My two hundred complete observations have been furnished by 140 Males and 60 Females. The 10 superior and inferior cases, in each sex, furnish the following differences in the distribution of the Mental Forces amongst the different Cerebral Organs :—

ORGANS.	MALES.		FEMALES.	
PROPENSITIES.	Highest.	Lowest.	Highest.	Lowest.
1. Amativeness	103	67	122	78
2. Philoprogenitiveness	76	36	85	47
3. Concentrativeness	81	34	73	36
4. Adhesiveness	141	65	110	54
5. Combativeness	90	62	70	62
6. Destructiveness	25	44	21	47
7. Constructiveness	116	49	85	44
8. Acquisitiveness	42	50	37	51
9. Secretiveness	73	51	82	61
10. Gustativeness	56	60	51	63
SENTIMENTS.				
11. Self-Esteem	65	38	57	48
12. Love of Approbation	116	64	100	58
13. Cautiousness	85	52	85	44
14. Firmness	97	41	59	51
15. Conscientiousness	140	60	117	61
16. Veneration	59	34	37	21
17. Hope	70	46	76	38
18. Ideality	134	68	120	53
19. Benevolence	139	71	112	46
20. Wonder	99	62	88	53
INTELLECTUAL FACULTIES.				
21. Individuality	34	40	45	41
22. Eventuality	62	49	59	41
23. Form	64	29	48	26
24. Size	65	31	49	26
25. Weight	71	29	33	21
26. Colour	67	30	65	20
27. Locality	63	40	68	47
28. Order	86	39	64	23
29. Time	73	33	62	45
30. Tune	58	36	74	29
31. Number	74	40	54	27
32. Language	110	52	96	53
REFLECTIVE FACULTIES.				
33. Comparison	166	67	105	61
34. Causality	117	41	72	32
35. Wit	100	58	105	62
36. Imitation	53	48	75	51
Total	3048	1720	2628	1620

The Mental Forces, considered in the whole amount of 140 Males and 60 Females, give the following classification of Organic Predominance, according to the difference of sex :—

140 MALES.				60 FEMALES.			
ORGANS.	Total.	Highest Figure.	Middle Term.	ORGANS.	Total	Highest Figure.	Middle Term.
1. Comparison	1540	21	11.00	1. Amativeness	663	25	11.25
2. Amativeness	1457	21	10.40	2. Ideality	526	20	8.75
3. Benevolence	1393	18	9.95	3. Adhesiveness.....	521	16	8.75
4. Conscientiousness	1362	20	9.75	4. Wit	519	14	8.65
5. Adhesiveness.....	1299	16	9.28	5. Comparison	510	14	8.60
6. Ideality	1204	20	8.60	6. Conscientiousness	485	18	8.05
7. Causality	1157	15	8.25	7. Love of Approb.	452	14	7.55
8. Language	1129	15	8.07	8. Benevolence	445	18	7.40
9. Wit	1121	15	8.00	9. Wonder.....	424	16	7.06
10. Love of Approb.	1108	14	7.95	10. Constructiveness .	413	22	6.85
11. Constructiveness	1089	23	7.70	11. Language	398	16	6.65
12. Cautiousness	1080	13	7.70	12. Combativeness ...	397	12	6.60
13. Wonder.....	1070	18	7.60	13. Cautiousness	396	11	6.60
14. Combativeness ...	1058	17	7.50	14. Gustativeness ...	370	9	6.16
15. Number.....	881	18	6 30	15. Hope	365	14	6.05
16. Hope	873	14	6.25	16. Secretiveness.....	362	11	6.05
17. Imitation	847	21	6.05	17. Imitation	357	18	5.95
18. Gustativeness ...	841	14	6.05	18. Philoprogenit. ...	345	13	5.75
19. Firmness	826	18	5.90	19. Causality	344	14	5.75
20. Concentrativeness	813	12	5.80	20. Concentrativeness	337	10	5.60
21. Order.....	808	14	5.79	21. Order.....	323	11	5.35
22. Secretiveness.....	798	12	5.60	22. Time	319	9	5.30
23. Time	793	11	5.60	23. Eventuality	315	9	5.25
24. Philoprogenit. ...	787	10	5.50	24. Number.....	314	9	5.25
25. Eventuality	770	10	5.50	25. Firmness	309	13	5.10
26. Self-Esteem	757	12	5.45	26. Self-Esteem	306	9	5.10
27. Veneration	727	19	5.25	27. Locality.....	305	10	5.05
28. Locality	726	12	5.25	28. Tune	291	14	4.95
29. Tune	707	20	5.05	29. Acquisitiveness...	288	10	4.80
30. Form	636	20	4.62	30. Veneration	283	11	4.75
31. Size	634	20	4.62	31. Colour	268	20	4.45
32. Weight	614	12	4.50	32. Individuality.....	267	10	4.45
33. Individuality ...	610	10	4.35	33. Form	239	18	3.95
34. Acquisitiveness...	608	9	4.30	34. Size	238	18	3.95
35. Colour	588	22	4.10	35. Weight	191	7	3.20
36. Destructiveness...	444	15	3.15	36. Destructiveness...	171	8	2.89
Total	33175		236	Total	12956		216

This last table shows that, in Males, "*Comparison*," or the Anterior Pole of the Brain, is the most powerful organ; whilst, in Females, "*Amativeness*," or the Posterior Pole, has the predominance. Attraction between Males and Females is the necessary

consequence of this organic disposition, according to the Magnetoid law that opposite Poles of the same Element attract each other. We remark again that Nature, in order to strengthen that Attraction, has not allowed the superior faculties of one sex to be the same as those of the other, according to that other Magnetoid law we have noticed (sec 43, 44), that superiority in one Principle seeks for and unites with superiority in another Principle. Should superiority have existed in the same faculties, Aversion, instead of Attraction, would have been the natural and unavoidable result. The simple knowledge of the Magnetoid laws unshrouds all the mysteries of every sympathetic or antipathetic feeling in the world. Thus it is that "*two of the same trade never agree.*" A great Poet will never be on terms of real intimacy with another great Poet; nor an eminent Musician prove himself the bosom friend of another equally celebrated Musician, especially if their talents are on the same instrument. But the great Poet and the eminent Musician will seek each other, and remain united.

Another Magnetoid result presents itself in this same table. By making the sum of "*Amativeness*" in Males and Females, we perceive that it obtains the highest amount of any other organ in the different sexes. It occupies accordingly the first rank of importance in the manifestation of the Principle "*Life,*" as its Superior Pole; whilst "*Destructiveness,*" or its Inferior or Negative Pole, is found at the other extremity.

It will be objected, perhaps, that those conclusions require more experiments and observations, made on a larger scale, before being considered as perfectly satisfactory. However, as far as they go, they are already well worthy of serious attention.

But I must here conclude this roughly sketched and hastily written Essay. Imperfect as it is, I hope, nevertheless, that every candid inquirer after Truth will acknowledge that I have strictly followed the right path of experimental Philosophy to arrive at the explanation of phenomena hitherto without any solution. Far from me the ridiculous pretension of attempting to remodel the admirable edifice which the *savans* of so many ages have reared to Science by their long and useful labours; I have endeavoured only to contri-