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MAGNETOID CURRENTS,

THEIR FORCES AND DIRECTIONS;

WITH A DESCRIPTION OF

THE MAGNETOSCOPE:

A SERIES OF EXPERIMENTS.

BY

J. O. N. RUTTER, F.R.A.S.

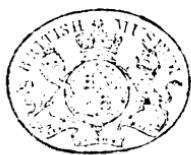
TO WHICH IS SUBJOINED, A LETTER FROM

WILLIAM KING, Esq., M.D. CANTAB.

LONDON:

JOHN W. PARKER AND SON, WEST STRAND.

M DCCC LI.



IV

“AND NOW WE MIGHT ADD SOMETHING CONCERNING A CERTAIN MOST SUBTLE SPIRIT WHICH PERVERADES, AND LIES HID IN ALL GROSS BODIES, BY THE FORCE AND ACTION OF WHICH SPIRIT THE PARTICLES OF BODIES MUTUALLY ATTRACT ONE ANOTHER AT NEAR DISTANCES, AND COHERE IF CONTIGUOUS; AND ELECTRIC BODIES TO GREATER DISTANCES, AS WELL REPELLING AS ATTRACTING THE NEIGHBOURING CORPUSCLES; AND LIGHT IS EMITTED, REFLECTED, REFRACTED, INFLECTED, AND HEATS BODIES; AND ALL SENSATION IS EXCITED, AND THE MEMBERS OF ANIMAL BODIES MOVE AT THE COMMAND OF THE WILL, NAMELY, BY THE VIBRATIONS OF THIS SPIRIT, MUTUALLY PROPAGATED ALONG THE SOLID FILAMENTS OF THE NERVES, FROM THE OUTWARD ORGANS OF SENSE TO THE BRAIN, AND FROM THE BRAIN INTO THE MUSCLES. BUT THESE ARE THINGS THAT CANNOT BE EXPLAINED IN FEW WORDS, NOR ARE WE FURNISHED WITH THAT SUFFICIENCY OF EXPERIMENTS WHICH IS REQUIRED TO AN ACCURATE DETERMINATION OF THE LAWS BY WHICH THIS ELECTRIC AND ELASTIC SPIRIT OPERATES.”

SIR ISAAC NEWTON.

MAGNETOID CURRENTS,

ETC. ETC.

A FEW words are required—more by way of explanation than of introduction.

In the month of March of the present year (1851), my attention was directed towards some curious experiments, an account of which had then been only very recently published. Soon afterwards, the account referred to came into my hands.* Following its directions, I tried some of the experiments, and with complete success; and notwithstanding the numerous doubts, and vast amount of disbelief, which prevailed respecting them, I soon perceived that they were perfectly genuine. Subsequent investigations have confirmed these views. The phenomena I shall by-and-by describe are entitled to take their place alongside of any of the facts in physical science.

* *Chambers's Edinburgh Journal*, No. 375, March 8, 1851, p. 155.—In a lecture delivered, 29th April, 1851, before the members of the Brighton Literary and Scientific Institution, on *Certain Electrical Phenomena in connexion with Human Physiology*, I gave an account of the experiments, as shown in the first instance to Dr. Mayo, by Herr Caspari; and also several illustrations, devised by myself, and which had not then probably occurred to other operators.

Is it asked, How were these experiments performed, and what were the results presented by them? Take the following as examples:—

1. If a gold ring suspended from a piece of silk or cotton thread, say, about eight or ten inches long, be held steadily between the thumb and forefinger of the right hand, about half-an-inch above the bowl of a silver (table) spoon, with most persons the ring will soon show signs of motion, and, in a few minutes, it will rotate from left to right, that is, in the direction of the hands of a clock.
2. If the operator be a male, and his left hand be touched by either hand of a female, the ring will immediately become unsteady in its movements, and, after a little time, rotate in the contrary direction, that is, from right to left.
3. Tie a loop at the end of the thread, and suspend the ring on the first (nail) joint of the thumb. It will now oscillate backwards and forwards like a pendulum, and in the direction towards which the thumb points.
4. Hold the hand in the same direction as before, suspending the ring on the first (nail) joint of the forefinger. It will again oscillate, but its plane of oscillation will be at right angles with that caused by the thumb, that is, across the line of direction in which the finger points.

These experiments, trifling as at first sight they appear, are connected with, and furnish illustrations of, a remarkable law. They admit of almost endless variations, but with exactly the same results under

the same conditions. Scarcely any two dissimilar substances can be placed near to each other, in the way just described, without in some degree exhibiting the motions which take place when a gold ring is held over a spoon. There are some curious exceptions (p. 17), but it is not necessary here to enumerate them.

An old-fashioned device, by which children are easily amused, and sometimes admonished that it is bed-time, must here be noticed.

5. If a shilling be suspended by a piece of thread, and held between the thumb and finger inside a glass tumbler, the coin will oscillate like a pendulum. The exercise of a little skill, on the part of the operator, will make it strike against the side of the glass, any number of times that may be required to agree with the hour of the day or night. The oscillation of the shilling is a true physical fact; and must not be mixed up with the caution and contrivance for making it strike the hour.

Reminded of this experiment, by those previously mentioned, I had no difficulty in connecting them as having a common origin. On analyzing the motion of the shilling with a tumbler, the sphere of inquiry was immediately enlarged, and I became more and more convinced that the subject was not one of mere curiosity or amusement. Many new facts were elicited. Some of these, probably from their being new, appeared not only extraordinary, but truly wonderful. Difficulties, however, continued to increase, and, in about an equal ratio, a feeling not very much unlike

that of dissatisfaction. When we are unable to please ourselves, there is but little prospect of succeeding in pleasing or satisfying others. Effects were visible enough; but so strange and unexpected, that I could neither reconcile nor understand them. A connecting link was wanting—an equivalent or corresponding cause. *That I have now obtained.*

Thoughts do not come all at once. They must be allowed time to arrange themselves. If they move quicker than words, they are not always so impressive. The right thought came at last. A single experiment proved it to be so. Difficulties were then made easy and mysteries became intelligible; and although enough that was wonderful still remained, it was no longer associated with perplexity, conjecture, and a vague expression of surprise. With a good foot-hold every step has since been safe, because in the right direction. In their proper places (pp. 21, 22, 23) these matters shall be more fully, and, as I hope, satisfactorily explained.

In the further prosecution of these researches I have been greatly encouraged by Dr. King.* To that gentleman I am indebted for assistance in recording the principal part of the experiments; and, by his kindness, I have been placed in communication with many practised observers of natural phenomena, whose attainments qualify them to act as guides and counsellors. My acknowledgments are also due to numerous friends (chiefly medical) who have taken the trouble

* William King, Esq., M.D., Brighton.

to watch and to verify the phenomena. In doing this they have freely offered advice; enabling me to guard the experiments, many of which are extremely delicate, against every apparent source of error.

Next to the pleasure of discovering, or of doing, something new one's-self, is that of imparting a knowledge of it to others. The instrument hereafter described (p. 11) will be a great assistance to those who may take an interest in the phenomena of Magnetoid* currents and wish to repeat the experiments. I hope the instructions, as respects manipulation and the required conditions, will be found sufficiently plain to ensure success.

The following pages contain only a register of facts. I am more anxious to supply materials for thought and action, than I am to express opinions. There is plenty of work for heads as well as hands. If it be set about in a right spirit, although aims may be different the end will be the same. The prevalence of truth must do good; and the establishment of what is to us a new truth, is almost always accompanied by the displacement of an old error. We believe many things we do not understand, and cannot explain. In this case, we had better keep clear of theory until we are more familiarized with practice. By reference to the known laws of electric, magnetic, and electro-magnetic dynamics, I can explain, to my own satisfaction, the various phenomena. Let others try their hands. Theory will come by-and-by as

* Greek, *eidos*—like, *i. e.* resembling, magnetic currents.

some of the teachings of experience. It will then be at the right time, and exactly in the right place.

Now I must refer again to the experiments with a gold ring and silver-spoon, (1, 2, 3, 4). This is chiefly for the purpose of describing some other conditions, and the results which accompany them; so that we may not have to go over the same ground a second time.

6. Hold the ring between the forefinger and thumb, and it will rotate as already mentioned (1). If the operator be a male and one of the same sex place the forefinger on his (the operator's) left hand, the ring will oscillate across the line of direction in which the finger points.

7. Continue the experiment, but with the assistant's thumb instead of the finger. The ring will change its motion, and oscillate in line with the direction of the thumb.

8. Proceed as before, but with the hand of the assistant laid on the operator's. The ring will again change its position, and oscillate in a plane diagonal to that in which the thumb and finger point.

9. Repeat 6 and 7, with a female as an assistant. The motions will in each case be reversed; the finger of a female producing motion in the same direction as the thumb of a male, and the thumb the same as that by the finger of a male. The effect of the hand of a female has been shown (2).

10. Repeat 1, 3, and 4, and when the proper motions have been obtained, touch with the thumb and

finger of the left hand a piece of glass, silver, copper, or brass. In each case the motion of the ring will be reversed, as in 2 and 9.

These are a few, and only a few, of the motions producible by different parts of the hands of each sex, and by substances dissimilar from one of those with which the operations are performed. If we now examine a little more closely the properties exhibited by a glass tumbler,* we shall find them equally extraordinary, and quite as unexpected, as those with a ring and spoon. To simplify the experiments, and, as much as possible, to preserve their identity, it will be advisable to retain the use of the ring.

11. Repeat experiment 5, the ring being held in the centre, and about an inch below the edge, of the glass. It will oscillate across the line of direction in which the hand points.

12. Hold the hand in the same position as before, and gradually raise the ring to about three-fourths of an inch above the edge of the glass, when the oscillations will cease, and the ring will rotate from left to right.

13. Move the hand steadily towards the right side of the glass, holding the ring about half-an-inch above its edge. There will be rotation as before.

* This experiment does not appear to have been known to Herr Caspari, or to Dr. Mayo. (See—*On the Truths contained in Popular Superstitions, &c.* By Herbert Mayo, M.D. Second edition. Blackwood and Sons. 1851.) The analysis of the movements which occur with this simple apparatus, first revealed to me the general law which influences the phenomena, and which I had in vain sought to discover amongst the experiments, so carefully recorded, by the author of the work above mentioned.

14. Observe the conditions as in 13, changing the position to the left side of the glass. The ring will rotate from right to left.

15. Move the ring towards that part of the edge of the glass, exactly in front of, and most distant from, the operator. It will oscillate as in 11.

16. Change the position to the edge nearest to the operator. It will oscillate as in 15.

17. Repeat 15, holding the ring about three-fourths of an inch above, and an inch in advance of, the edge of the glass. The ring will be stationary.

18. At the same distances on the right and left sides of the glass the ring will oscillate diagonally, and at the side nearest the operator it will rotate from left to right.

19. In the centre of the glass, close to the bottom, the ring will be stationary.

It is unnecessary to multiply examples, by enumerating the various motions which are produced by the fingers and thumb of each hand. These will be explained further on.

A little practice gives great command of the hand. Many persons, who are at first obliged to support the arm by leaning the elbow on the table, in a few days dispense with all such aid; holding the arm in the proper position without experiencing the least sensation of fatigue. A careful operator, with a steady hand, can always perform the experiments to his (or her) own satisfaction. There is a consciousness that the motions are involuntary, that is, perfectly independent of the hand as regards their directions. It is not so easy to satisfy an observer that the motions

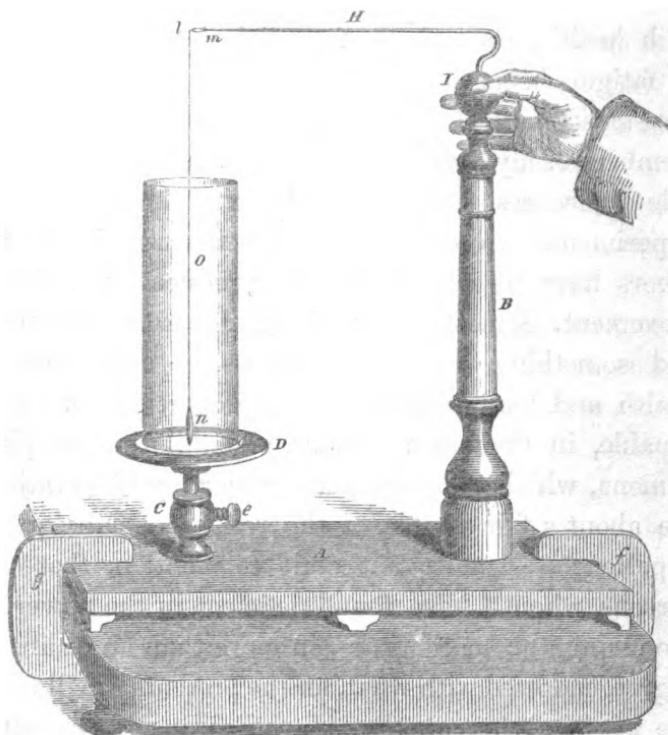
are not produced solely by the hand. This is more especially the case when it happens that, by the same means, the person looking on is not able to produce similar motions and thus realize the same results.

Other conditions being the same, each hand of both sexes is capable of producing the same kind of motions. There is, however, a deficiency of power in the left hand. All persons do not possess the power in an equal degree; and there are some who appear to be entirely without it. It varies in the same person at different times, and seems to be closely connected with health; the effects of medicine, of anxiety, and of fatigue being easily discoverable. Beginning, as was most natural, by testing the capabilities of the members of my own family, I soon discovered remarkable differences. Some of each sex could perform the experiments successfully at the first trial; whilst others have never been able to produce the slightest movement. Something is probably due to organization, and something may also, perhaps, be attributed to health and temperament. The proportions of those capable, in their own persons, of exhibiting the phenomena, which thus first came under my observation, are about a fair sample of the results of subsequent experience. I must not omit to mention, that the persons whom I have found deficient in the power of producing the motions are, in more than an ordinary degree, endowed with what, for the present, I shall term the *negative* current, that is, the means of changing and reversing the motions developed by others.

As the interest in the subject increased, I perceived the necessity for a fixed instrument:—a means

of illustrating the force, directions, and changes of magnetoid currents, without connecting them with the uncertainties, which exist between operators and observers, when the experiments are performed entirely by the hand. It was easier to wish for than to obtain such a means of illustration. On looking back, I should be ashamed of my numerous failures, only that the failures have eventually been even more instructive than the successes.

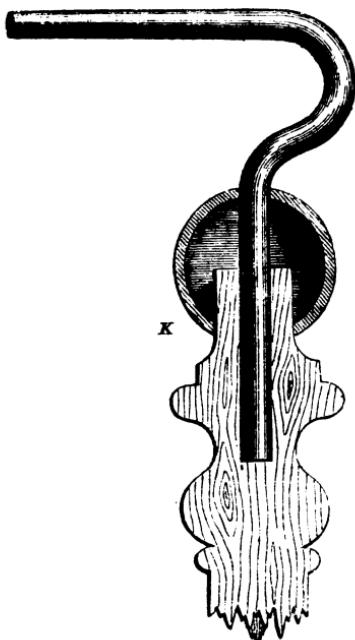
Fig. 1.



An instrument was constructed, made up of detached parts of apparatus which happened to be at

hand, and, with only a few trifling alterations, it is the same as the Magnetoscope represented at p. 10.*

Fig. 2.



A, B, C, D, respectively refer to the platform, the pillar, the support for the disc, and the disc itself. These are all made of well-seasoned Spanish mahogany, and are french-polished. The disc, *D*, is supported by a turned pivot, working through the centre of *C*, and is adjusted by the 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,

* Manufactured by Horne, Thornthwaite, and Wood, 123, Newgate Street, London.

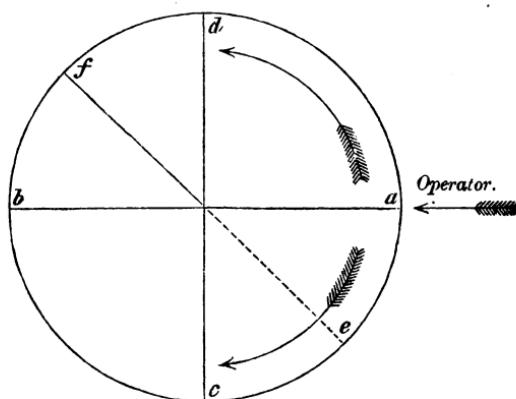
the floor of which is free from vibration. *H* is a brass arm passing through the (brass) cap *I*, and fitting a hole drilled in the centre of the pillar, as shown at *K*, (fig. 2.) The arm tapers towards its extremity, *l*, which is formed into forceps, the tension of which is assisted by a sliding ring, *m*. The arming of the Magnetoscope consists of a piece of red sealing-wax, *n*, warmed over the flame of a spirit-lamp, and moulded by the hand to the shape indicated. It is suspended from the points of the forceps (*l*) by a single thread of the finest silk. On the disc, *D*, is placed a piece of plate-glass, *d*, say about $4\frac{1}{2}$ inches in diameter, with its centre immediately under, and about half-an-inch below, the sealing-wax, *n*. To protect the latter from 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 $3\frac{1}{2}$ inches in diameter, and 10 or 12 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 the figure, 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, the circulation in the finger and thumb will be impeded, and 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.

The several directions of the pendulum will be better understood, and more easily remembered, by

reference to the following diagram; a copy of which, without the arrows and letters of reference, should be drawn in pencil on a piece of paper the size of the glass, d , and placed underneath it.

Fig. 3.



Having said thus much about the Magnetoscope, and the method of using it, let me next explain the meaning of the terms which I have adopted in describing some of the motions most readily produced by the instrument.

Direct rotation.—Circular motion from left to right; that is, in the direction a to c .

Reverse rotation.—Circular motion from right to left; that is, in the direction a to d .

Direct oscillation.—Pendulum motion, in the line of direction in which the thumb and finger point, a b .

Transverse oscillation.—Pendulum motion at right angles with the last-mentioned, c d .

Diagonal oscillation.— e f .

I have already mentioned that many persons do not possess the power of illustrating the effects of what, for convenience, may, for the moment, be designated *positive magnetoid currents*. If they are incapable of doing this with an apparatus of the simplest kind, a ring and silver-spoon, or glass tumbler, for example, it is useless to attempt to influence the Magnetoscope. Strictly adhering to my purpose, not at present to encumber a sufficiently difficult subject with any theoretical opinions, I mention this by way of warning, and to prevent disappointment. It is not to be expected that a person who sees, and takes hold of, an ordinary tool for the first time, should be able to use it with the facility acquired by long practice. In the case before us, something more is required than mere manual skill. The molecular arrangements produced by the transmission of electric and magnetic currents, in metallic wires, is not to be denied. When working with constant batteries of low intensities, and with the means of measuring with extreme accuracy the amount of duty performed, I have invariably found that the current, when passed only in one direction through a definite quantity of wire, say 2000 feet, would do a vast deal more work, with a given battery power, than when the current was occasionally reversed. Magnetoid currents are subject to a similar law. At first they pass feebly through the body and hand of the operator; the motions produced being remarkably slow, the directions indistinct, and the various changes with difficulty effected. These con-

ditions and analogies must not be overlooked. If they are, the experiments hereafter described will be things only to be wondered at, instead of being better understood, and turned to some good account. That which is worth doing at all, ought to be done well. Let no one be dissatisfied, or consider his own an exceptive instance, until he has given the process a fair trial.*

The motions produced by magnetoid currents are more distinct with some persons than with others; and slight differences will, in this respect, be perceptible in the operations of the same person at different periods of the day, or on first touching the instrument, as contrasted with the effects of half-an-hour's practice. In some instances, although the motions are easily distinguished, and are perfectly true to their respective directions, they are influenced so feebly as not to form circles of more than one-eighth of an inch in diameter; whilst in other cases they are from an inch and a half to two inches in diameter. Let it be remembered that every person, without exception as to sex or age, has the power of changing the direction of the currents, by contact with the operator.

* A fair trial. This expression will be differently interpreted by different persons. Take my explanation. No one need give up the experiments as impracticable, because the motions may not be produced in a few minutes, or even a few hours. Have patience. Try for a few minutes at a time, three or four times a day, and for several weeks in succession. This is what I mean by a fair trial.

EXPERIMENTS.

20. Touch the Magnetoscope with the thumb and finger, as already directed (p. 12). The motion produced will be direct rotation.*

21. Thumb only, same position as 20.—Direct oscillation.

22. Finger only, same position as 20.—Transverse oscillation.

23. Thumb and finger, as in 20, the left hand of the operator being touched by the thumb of a male.—Direct oscillation.

24. Continue 23, touched by the forefinger of a male.—Transverse oscillation.

25. Continue 24, touched by the hand of a male.—Diagonal oscillation, *e f.* (fig. 3.)

26. Continue 25, touched by the thumb of a female.—Transverse oscillation.

27. Continue 26, touched by the forefinger of a female.—Direct oscillation.

28. Continue 27, touched by the hand of a female.—Reverse rotation.

29. Conditions as 20, direct rotation of the pendulum being fully established. If gold, platinum, silver, copper, or iron (not magnetized) be held in the left hand of the operator, the results will be as follow, namely, gold, silver, and copper,—reverse rotation;

* To avoid the necessity for repeating, or varying, the instructions, it must be understood that the operator is always supposed to be a male.

platinum, direct oscillation; iron, reverse rotation, but elliptical instead of circular, in the direction, *g h.* (fig. 6, p. 32.)

30. Conditions as 20, with direct rotation.—If a bar magnet, a piece of ivory, a feather, or a dead fly, be held in the left hand of the operator, the motion of the pendulum will cease.*

* The experiments are more interesting, and the conditions more easily understood, if, between each, the pendulum be allowed to return to its normal condition; as, for example, in 20—direct rotation. The changes occupy considerable time; but the time is well employed in thus examining the force and direction of the currents. Some cautions and further instructions must, however, be given, and they may very appropriately be introduced here.

It is of importance that the operator, as soon as possible, familiarize himself with the effects of different substances, as a means of most readily bringing the pendulum to rest. There is a difference with different persons, and sensibility to one substance, as contrasted with another, is sometimes immediate, whilst in other cases it comes on slowly, as the result of constant practice (p. 14). Let it be remembered that negative effects upon the pendulum, that is, preventing its movements, are just as much dependent on the polarizing influence of magnetoid currents, as promoting or altering their force or direction, in other ways, regulate its movements. Bringing the pendulum to a dead stop, in a few seconds, is a great convenience. It is also a remarkable experiment; and supplies a tolerably fair test of the relative force of the current in different operators, and the facility of using the Magnetoscope. I can best illustrate this by an example: When the pendulum has acquired a certain momentum, either rotatory or oscillatory, as the case may be (31), if it be left to itself it will be from five to seven minutes in coming to what might be considered, even an approach to, a state of rest. Perform the same experiment, observing exactly the same conditions, and if the operator be readily influenced by ivory, or bone, a dead fly, or some other kind of dead animal matter, or by certain vegetable and mineral substances (the effects of which had been previously ascertained), he will be able to bring the pendulum to a state of absolute rest in from twenty to thirty seconds.

31. Conditions the same as 20.—If a number of persons, male and female, arrange themselves in such a manner as that one of each sex shall alternately join hands (one by one, and left hand to right throughout the series) beginning at the left hand of the operator, the motion of the pendulum will change to diagonal oscillation, *ef*, with each male, and to reverse rotation with each female; the sex of the person last in the series, that is, most remote from the operator, determining the motion, without regard to the number of each sex.

32. Conditions as 20. Vary the preceding experiment by a number of persons joining hands, one by one, at intervals of about five or ten seconds, say, females first, when the pendulum will be seen to acquire additional force as each individual adds her influence; constituting in reality a magnetoid battery. Similar results will, of course, follow when persons of the male sex in like manner join hands. When the pendulum has acquired its greatest force, by a number of persons joining hands, if the person most remote from the operator touch the right hand of the latter, the circuit will be closed, and the pendulum will become stationary. In performing these, and many analogous, experiments the experienced operator will easily distinguish the persons most sensitive to the influences of these phenomena. The Magnetoscope will give remarkably accurate indications of the relative forces of the currents in different individuals.

33. Conditions as 20. If a female with her fore-

finger point at the hand of the operator, say, at the distance of two or three inches, the result will be the same (reverse rotation) as if she had touched his hand. If a male point with his finger in the same manner, the result will be diagonal oscillation, *e f.*

34. Vary the preceding experiment; the hand of the assistant, in each case, being clenched, (forming a fist,) and the knuckles placed in contact with the hand of the operator. The pendulum will not be affected. So also if both the forefingers, placed in a line with each other, be pointed at the hand of the operator, the pendulum will not change its direction. Further, if a female, standing at a little distance, point with her forefinger at the hand of the operator, producing reverse rotation—and another person then point in the same manner exactly across the line of direction, the pendulum will become stationary.

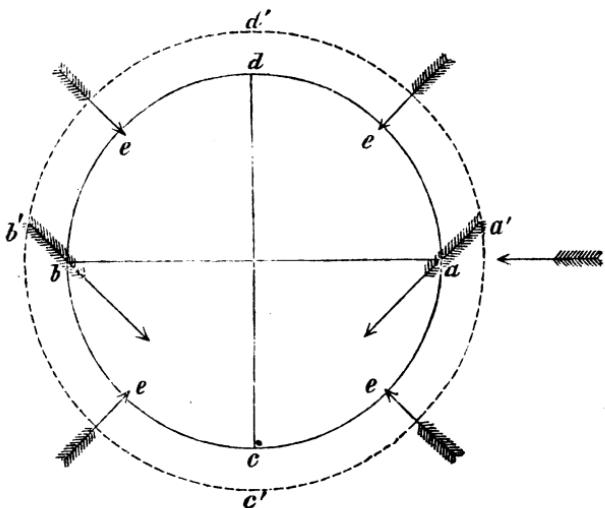
35. Conditions as 20. A hair from the head of a female, laid on the hand of the operator—reverse rotation. From the head of a male—direct rotation. Similar characteristic results are produced by a hand-kerchief which has been carried about the person by either sex respectively.

36. Conditions as 20. A letter which has been kept separate from others, (folded in its own envelope,) although written several weeks previously, if laid open upon the hand of the operator, will indicate the sex of the writer—that written by a female causing reverse rotation, that by a male producing no change.

37. (13, 14, 15, 16, 17, 18, 19.) Remove the glass,

O, and change the position of the piece of plate glass *d*, until its edge at *a* (fig. 4) be immediately underneath

Fig. 4.



the pendulum. Other conditions as 20—direct rotation; at *b*, reverse rotation—*c* and *d*, transverse oscillation. Change again the position of *d*, so that the pendulum be about three-fourths of an inch beyond the edge, as represented by the dotted line. At *d'*, rest—at *a'* and *b'*, diagonal oscillations in the directions of the arrows, and at *c'* direct rotation. At the intermediate parts of each quadrant, *e e e e*, the motions of the pendulum will be oscillatory, converging to the centre, as indicated by the arrows.

38. Remove the pendulum *n*, and the glass *d*, substituting for the former a small bar-magnet, about three inches long, and one-fourth of an inch in diameter, with its south pole downwards; and for the

latter, a piece of (unmagnetized) plate iron of the same shape and size as the glass *d*. Conditions as 20. Repeat any of the experiments, 20 to 36, and the results will be the same.

39. Vary the conditions of the preceding experiment by changing the position of the magnet; suspending it with its north pole downwards. Repeat any of the experiments, 20 to 36, and the various motions will be reversed—direct rotation (20), becoming reverse rotation; direct oscillation (21), transverse oscillation, and so on with all the rest.

40. Remove the magnet, using a bar of unmagnetized iron, of the same shape and size as a pendulum. Conditions as 20. Over the centre of the plate the pendulum will be stationary; but at other parts it will exhibit precisely the same motions as described in 37.

41. Magnetize a glass of water by dipping into it, for an instant, one of the poles of a small magnet. Repeat 40, the (iron) pendulum being over the centre of the plate. Dip the forefinger in the magnetized water—direct rotation. Vary the experiment, by placing a drop of the water on the hand of the operator, and the result will be the same. Hold the hand just above the glass containing the water, and the aura from it will cause direct rotation, as before.

42. Restore the (sealing-wax) pendulum *n*, and the glasses *d* and *O* to their proper places. Conditions as 20, the operator standing on an electrical insulating stool. The pendulum will remain stationary. Fasten one end of a piece of silk, or cotton, thread to

the left hand of the operator, the other end being in contact with the floor. The current will be immediately restored; the pendulum assuming direct rotation. Remove the thread, and let the left hand of the operator be held successively by a male and female. The result in each case will be direct rotation; the assistants acting only as conductors of terrestrial electricity to the operator, and possessing no polarizing influence upon him, so as to change the direction of the magnetoid current.

43. Vary the last experiment, by insulating the assistant instead of the operator. The result will be as before, direct rotation; the person insulated having no power over the direction of the current in the operator. Extend this method of illustration by placing the hand of the (insulated) assistant in contact with that of a male or female standing on the floor. The direction of the pendulum will not change.

44. Repeat 42, the left hand of the operator communicating by a chain with the conductor of an electrical machine. Set the machine in motion, and a very feeble current of (positive) electricity will cause direct rotation of the pendulum. Vary the experiment, by wrapping the end of the chain, held by the operator, in the handkerchief of a female—reverse rotation.

45. Repeat 42—the operator holding in each hand a conducting wire from an opposite pole of a small (insulated) voltaic battery. When the silver (or copper) plates communicate with the right hand of the operator—direct rotation. Reverse the poles;

the zinc plates being in communication with the right hand—reverse rotation. Vary the experiment, by placing the extremities of the conducting wires in a glass of water. Hold the hand over the water (41), and direct rotation will follow.

46. Proceed as directed in the first part of 45, but instead of holding the conducting wire in the right hand place it under the right foot—direct rotation. Reverse the arrangement of the poles—reverse rotation. Proceed as before, placing the wire in the mouth, on the upper side of the tongue—direct rotation. Change its position, putting it under the tongue—reverse rotation.

Of this class of experiments, which cannot fail in interesting the scientific manipulator, the number is too great to admit of their being more particularly described. Nor is this necessary. Those I have recorded are sufficiently illustrative of a general principle; and, as I wish to set others to work, rather than lead any to suppose the work has been done for them, I shall purposely omit many modified forms of the experiments, in which the results are equally conclusive as in those enumerated. Enough has been said, even if no more remained, to indicate the direction in which these phenomena are conducting us. Here are the proofs, if we obtained no other, that what I have designated magnetoid currents do exist; and their intimate relations with all the known forms of frictional, voltaic, and thermo-electricity, with electro- and dia-magnetism, with magneto-electricity, and with magnetism in its more extensive application, can be

as easily demonstrated as any of the most familiar facts in any of these branches of natural science. With these impressions, I prefer suggesting illustrations, instead of minutely detailing them; thus leaving the greater number of the experiments, which have been satisfactorily worked out under my own hands, to receive their further verification in the hands of others.

47. Provide a coil of about 500 feet of copper wire, covered with cotton or gutta percha to prevent contact. Conditions as in 20, the operator holding one end of the wire in his left hand—direct rotation. Change to the opposite end—reverse rotation. Repeat the first part of the experiment—the opposite end of the wire being held by a male—diagonal oscillation; by a female—reverse rotation. Vary the experiment, by each person in succession pointing with the forefinger at the end of the wire—the result in each case the same. Illustrate still further, a female holding her (open) hand within any part of the coil—reverse rotation; the hand of a male in the same position—diagonal oscillation. Again—return to the first part of the experiment, and, direct rotation being established, place a dead fly, a piece of ivory, bone, or a feather within the area of the coil, and the pendulum will soon become stationary.

48. Conditions as 20.—Roll a sheet of writing-paper around a ruler, or other cylindrical substance, so as to form a paper tube of about an inch in diameter. If an assistant blow gently through the tube upon the hand of the operator—direct rotation; reverse

the tube, and blow through it in the same manner from the opposite end—reverse rotation. Repeat the experiment, by blowing on the hand directly from the mouth, if a male—diagonal oscillation; if a female—reverse rotation.

49. Repeat the preceding experiment, placing in the left hand of the operator the smallest perceptible particle of common table salt or of sulphur—reverse rotation. Vary the experiment, stopping the motion of the pendulum by holding in the hand a piece of ivory, and then observe how readily salt or sulphur will impart to it motion, in the direction opposite to that which is produced by the normal current. Extend these illustrations, by previous arrangement, in such a manner that the ivory or sulphur, for example, may be placed in the left hand of the assistant by a third party. The Magnetoscope will indicate the usual changes with unerring fidelity, and detect errors which may be committed by those engaged in the experiments.

50. When the operator is insulated, the means of restoring to him the normal current, by that which is equivalent in its effects to terrestrial electricity, are simple, yet very instructive (42). Without actual contact with any part of a magnet, or electro-magnet, the aura from the south pole of a very small one is sufficient for the purpose. So, also, if one end of a coil (about three feet) of copper wire, be held in the hand, whilst the coil itself is unequally heated by the flame of a spirit lamp, the same results will follow. Equally effective is the aura from the hand of an

assistant, from either pole of the primary axis of a rock crystal, from water magnetized by the hand, or the breath from the lungs, of another person.

51. Conditions as 20. If the operator stand on the right foot only, direct rotation will continue. On the left foot—reverse rotation. Cross the legs, and stand on both feet, and the pendulum will stop. Apply the thumb only (21) to the instrument, the left hand of the operator being touched by the thumb of a male, the pendulum will stop. Vary the experiment, by using the forefingers instead of the thumbs, and the result will be the same.

52. Conditions as 20. When the pendulum has acquired the proper motion, if the operator shut his eyes, the motion will continue, but with less force than before. Stop the pendulum. If the operator's eyes be now shut, he will not be able to set the pendulum in motion. Vary the experiment, with conditions as 20, the eyes of the assistant being shut. If the palm of the hand of a male be placed upon the back of the hand of the operator, the direction of the pendulum will not be changed; but on placing both palms in contact—diagonal oscillation, *e f.* Repeat the experiment, just described, with a female assistant, and when the palms of the hands are placed together, there will be reverse rotation.

These experiments (20 to 52) have been arranged, with only a few unimportant variations, in the order in which they were worked out, as so many distinct illustrations of phenomena intimately related to each other. Where everything was so new, and much of it so

unexpected, I had only patiently to watch the conditions, and wait for their effects. By frequent repetition, the laws which influence the phenomena seemed to develop themselves. It would be wrong to suppose that all these laws are to be known at once. The Magnetoscope has been the teacher. I have manipulated, varying the operations, as will have been seen; but the instrument has had all the rest of the work to do in indicating results. Many experiments are omitted (p. 23), because they would be more likely to weary, than to supply the reader with any additional instruction. They are, necessarily, such modifications as may be expected would present themselves to every inquirer, and which may be greatly multiplied in the hands of a skilful manipulator.

We must now enter upon new ground; a class of experiments closely allied to those already described, but greatly exceeding them, if it be possible, in interest and in value. In making this distinction, let it be understood as only an arrangement of convenience. The phenomena are identical and inseparable; held together by the mysterious agencies of

The electric chain wherewith we are darkly bound.

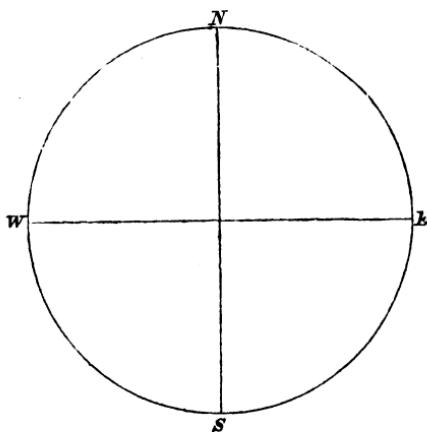
BYRON.

The separate parts of this chain may be at present only imperfectly seen, and their properties still more imperfectly understood. Let us not be discouraged. Dawn precedes sunrise. A little light is a blessing; and when it is of the right kind, it is sure to become brighter. If there be in us a willingness to learn, there will be no difficulty in obtaining suitable lessons.

We are oftentimes dull scholars; not so much from want of ability, as from want of a teachable disposition. When the pupil fancies himself wiser than the preceptor, there is an end to improvement. True philosophy is associated with great humility.

53. Provide a sheet of card-board, cut it into a circular form, and inscribe upon it the following diagram:—

Fig. 5.



The size of the card-board is not material, but it will be most convenient if the circle be from fifteen to eighteen inches in diameter. Place the card upon a table, near the left hand of the operator, the line *N S* being in the (terrestrial) magnetic meridian, and a bar-magnet laid thereon in the same direction. The length of the magnet is not important; care being taken that its centre correspond with that of the diagram.

If the operator hold his left hand in the aura of the

magnet, about an inch and a half or two inches above the centre (within the range of the magnetic curves)—direct rotation. At the same distance above, and a little beyond the south pole—direct rotation. At the same distance from the centre, on the line *E*—diagonal oscillation (*a'*, fig. 4); and at the same distance on the other side, on the line *W*—diagonal oscillation (*b'*, fig. 4). Over, and a little beyond, the north pole, the pendulum will become stationary.

54. Repeat 53, the hand of the operator being held, as there directed, on the line *E*. If a female place her forefinger within the limits of an imaginary sphere, radiating in all directions from the centre of the magnet, and bounded by its length—reverse rotation. If the same be done by a male—diagonal oscillation. (47.)

55. An assistant of either sex, sitting or standing, within convenient range of the left hand of the operator, if the latter touch the assistant, the direction of the pendulum will be changed, according to the sex of the person; but if he place his hand about two inches above the right shoulder, directly over the head, or in the same line, about four or five inches beyond the back of the head, direct rotation will occur, and its force be greatly increased. Change the position of the hand to the left shoulder—reverse rotation; to the back of the neck, immediately over the spine—direct oscillation; to the front of the head, about four or five inches in advance of the forehead, and the pendulum will stop. Hold the hand over the right

leg or foot—reverse rotation; left leg or foot—direct rotation.

56. Repeat 55, the assistant being placed in a recumbent position. If the hand of the operator be held over the head, in advance of the forehead, over the left shoulder, or over the right foot—direct rotation; over the right shoulder or left foot—reverse rotation; and over the diaphragm, the pendulum will stop.

57. Repeat 55, the assistant standing with his arms extended. If the operator receive the aura from the right hand of the assistant—diagonal oscillation (a' , fig. 4); from the left hand—diagonal oscillation (b' , fig. 4).

58. Repeat 53, but instead of a magnet, place a bar of (unmagnetized) iron, or of copper, or any other metal, on the line NS , in the magnetic meridian, and if its length be exactly equal to the diameter of the circle $NESW$, it will be all the better. Proceed as directed in 53, and precisely the same results will follow; a bar of iron, copper, or other metal, exhibiting the same magnetoid phenomena as a permanent magnet.

59. Repeat 58, but instead of placing the bar upon the card, let it be insulated, in the magnetic meridian, by standing it on two tall drinking-glasses, or by other means, as may be most convenient. Proceed as directed in 53, and the result will be direct rotation at all parts of the circle; the polarizing effects being interrupted by insulation.

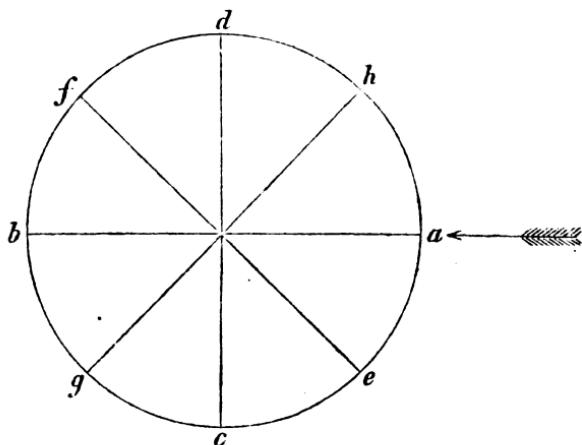
60. Repeat 58, a number of persons joining hands (31), and the last holding his or her left hand over the various parts of the circle *N E S W*, as directed, when the motions of the pendulum will be changed as in 53; showing that the polarizing effects of the metal are more powerful than those of the persons through whom the currents are passing.

61. Provide two rings, say about eighteen inches in diameter, of strong iron or brass wire, and have them soldered together at right angles to each other, so as to form the outlines of a sphere. Arrange this sphere with its imaginary axis in the magnetic meridian, and proceed as directed in 53. At the various parts of the interior of the sphere, corresponding with *N E S W*, the same phenomena will occur as have been already described.

62. These experiments may be varied by showing the effects of placing the hands of assistants in different parts of the sphere, and the greater force communicated to the pendulum at some parts, as compared with others, as well as the sudden changes which occur according to the sex of the parties.

63. Hold a specimen of rock-crystal in the left hand, the apex of its primary (longitudinal) axis being in contact with the palm of the hand—oscillation in the direction *e f.* See fig. 6. (p. 32.)

Fig. 6.



64. Change the position of the crystal, its base being in contact with the hand—oscillation, $g\ h$. Lay the crystal across the hand, with its base towards the operator—reverse rotation; change its position again, so that its apex be towards him—direct rotation.

These experiments are exceedingly interesting, and admit of many variations with perfect crystals, and native crystalline formations of the various metaliferous ores.

Passing from these to the metals themselves, I soon perceived that, tested by the Magnetoscope, the various motions produced by them on the pendulum were irrespective of quantity; the smallest particle which could be identified, of each kind of metal, causing its characteristic motion with unvarying constancy. At an early period in these investigations, I had proved the effects of very small quantities of

salt, sulphur, and some other substances; and I had also noticed the changes in the directions of the magnetoid currents produced by certain kinds of medicine, for several hours after they had been administered. On mentioning this to a Homœopathic physician, we immediately tried if any of the homœopathic medicines (globules) would influence the instrument. The experiments were successful; demonstrating the physical effects of certain substances in quantities which are said to be so exceedingly small as to be far beyond the reach of any known methods of chemical analysis.*

65. Procure unalloyed specimens of some of the metals, and ascertain the direction which each metal imparts to the pendulum. The conditions throughout each series of observations should be exactly alike, say thumb and finger (20) to the instrument, the metal laid on the palm of the left hand, and each experiment commencing with the pendulum at rest. Having noted, by reference to the diagram, fig. 6, the indications which accompany each specimen of metal, the experiments should be repeated, commencing with the pendulum in motion, that is, direct rotation.

66. Repeat 65, proceeding precisely in the same manner with homœopathic globules, containing the corresponding kinds of metals, and the result in each case will be the same as with the larger specimens.

* I am no Homœopathist. Having never made myself acquainted with the doctrines held by the followers of Hahnemann, I am unable to express any opinion respecting them.

These experiments are very interesting, as are those with chemical and pharmaceutical preparations; in which the antagonistic and neutralizing influences of certain poisons and narcotics, in conjunction with their respective antidotes, are easily shown.

The few examples here given are intended only as illustrations of the method I have pursued in conducting the experiments:—

Gold	Reverse rotation.
Platinum	Direct oscillation, <i>a b.</i>
Silver	Reverse rotation.
Copper	Ditto ditto.
Iron	Reverse ellipse, <i>g h.</i>
Belladonna	Stops the pendulum.
Ditto, with coffee . .	Direct rotation.
Nux vomica	Stops.
Ditto, with coffee . .	Direct rotation.
Coccus	Stops.
Ditto, with camphor .	Direct rotation—feeble.
Sulphur	Reverse rotation.
Jalappa	Ditto ditto.

67. Repeat 63, 64, carefully noting the various directions taken by the pendulum, as the position of the crystal is changed on the hand of the operator. Proceed in exactly the same manner, with a globule of *silicea* laid on the palm of the hand, and, by changing its position, all the motions, exactly corresponding with those produced by the large crystal, will be obtained. It is scarcely necessary to observe, that in operating with so small a quantity of silex as

that contained in a medicinal globule, it is impossible to predicate the positions of the axes. These can only be found by repeated trials; but, move the globule whichever way you will, and one of the four directions already described is sure to follow.

68. Dissolve the globule, used in the last experiment, in a wine-glass of distilled water. A drop of the water laid on the hand of the operator, will cause the pendulum to oscillate in the direction *e f*, and in no other way. This effect is, probably, due to the polarizing influence of the primary axis of the crystalline matter.

Many hundreds of experiments have been performed with various substances—such as articles of food, both solid and liquid, fruits, condiments, medicines, growing plants; insects—alive and dead; wood recently cut, and thoroughly dried; decaying vegetable, and putrefying animal, matter, and mixtures of both. The indications are very decisive, and sufficiently significant to encourage further observations. The field is a large one—much too large to warrant, at present, any attempt at classification. A greater number of facts should be carefully stored up for future use. We must be willing to work even if we may not yet see the issue of our labours.

Abnormalities, that is, slight variations in the directions of the currents, and the different effects produced by similar substances on different individuals, presented themselves at the commencement of these investigations. I have never attempted to explain them, because I believe that, by the exercise of a little

patience, they will, eventually, explain themselves. It is better to go on observing and recording than to waste time in leaping hastily at conclusions. These matters are not in my way. Let them be pondered over by those whose education, and experience, and habits of thinking, qualify them for the task. That the human body is sensitive to, and influenced by, certain imponderable elements (conditions of matter?) analogous to those which, in our thoughts, we are accustomed to associate with magnetic or electric currents, can easily, and at any moment, be proved. Ought it to create surprise that organism, idiosyncrasy, disease, diet, drink, medicine, temperament, mental relations with the physical, &c., should affect, control, derange, subvert, or otherwise alter the directions of such currents? If the breath from the lungs, or the aura from the hand, of a by-stander, be sufficient at the moment to produce a change, need we wonder that some are more sensitive than others to telluric or atmospheric influences, or that the effects of food, or of medicine, should vary in different persons? Has locality no influence upon health? Are the benefits accruing from change of air always in accordance with our ordinary notions of change to a purer air? Is there no difference between a dry and a damp situation—a well-drained, well-ventilated, sunny hill-side, and the shade of overhanging woods, amidst the perpetual reekings of vegetable decomposition? Take to the open country in its most elevated parts—are all persons, even there, equally insensible to atmospheric phenomena? Does the east wind bring along with it

pleasurable sensations? Is it only a question of temperature from which point of the compass the wind blows, or is there anything specific in these respective influences on certain persons? Is it only fancy that one person experiences the effects of a change of wind whilst in bed, and another never notices such changes when out of doors? So with regard to atmospherical electricity, as concentrated in the phenomena of thunder-storms—are the distressing sensations and functional derangements, which some experience, entirely imaginary? How is it that every flash of lightning is felt when it cannot be seen? Is it a mere whim that particular kinds of food and of medicine, innocuous to some, are poisonous to others? Why are odours, agreeable (perfumes) as well as offensive, so hurtful to some and scarcely noticed by others—and how is it to be explained that the effluvium from an animal, or insect, a cat, or a spider, for example, is instantly detected, although the particular object of aversion may not be seen?

These hints must suffice. There may be a broad substratum of truth where there is much that appears, to an ordinary observer, to be very fanciful, or very mysterious, or what, in his haste, he may be disposed to sneer at as beyond the pale of common sense. A great deal that is apparently mysterious has been made so by neglect. Careful investigation would clear up many difficulties. But who will undertake to investigate, in hope of satisfying those who make up their minds before they hear the evidence? If all persons, on first touching the Magnetoscope, could

influence it alike, I should have less confidence in the accuracy and delicacy of its indications. When I find that those most anxious to set the pendulum in motion, after frequent trials, have no power over it; whilst others impart to it the proper motions, although feebly, in a few minutes, I feel convinced that wishing is one thing and realizing another. The conditions are exceedingly simple. There is no special virtue in any particular piece of wood, or brass, or sealing-wax; six several instruments having passed under my hands, and with exactly the same results. If, in total defiance of the laws of electric and magnetic induction, attempts be made to illustrate magnetoid phenomena, and such attempts fail, the failures ought neither to occasion surprise nor excite regret. It is just as reasonable that pointing the finger at the dome of St. Paul's should set the great bell in motion, as that some of the contrivances, which have been communicated to me, should realize the expectations of the operators.

Most heartily shall I rejoice when a more effective Magnetoscope than that I have described shall have been invented. Until that be done I am content to go on with my own instrument.

The experiments recorded in the preceding pages were not originally intended to be made public. At the solicitation of others, to whose judgment I have deemed it right to defer, they appear in their present form.

Many of the illustrations, which for reasons already stated (pp. 23, 27) are not described, have pre-

sented themselves most unexpectedly as incidents in other experiments, and are, therefore, in a certain sense, entirely accidental; but for that reason immeasurably the more valuable. In this way I have been taught a great deal, unknown to me before, as to the different effects of sun-light and of moon-light upon metals, crystals, plants, wood, meat, fish, and the human body. The polarizing influence of the earth (terrestrial magnetism and electricity) is also a subject intensely interesting; the proofs of which are much nearer to us, and much more abundant, than may generally be expected.

There has been no unnecessary haste in preparing these pages. This has had its advantages. The experiments having been witnessed by hundreds of persons, it is probable that I have received more hints, and have listened to a greater number of objections, than are likely to fall to the share of any other operator. Practicable suggestions have been thankfully received, and objections have naturally caused greater caution and watchfulness. The subject is, confessedly, surrounded by difficulties, and from what has already been said about it, I think there are some persons who are more likely to increase the difficulties than diminish them. Whatever be the cause of the various motions of the pendulum, it is sufficient, for the present purpose, to have shown the results of my own experience. I have not troubled the reader with theories, and it is well that I have not done so. Contrary to my intentions, some of the experiments have already been made public. There are plenty of theories—

diverging in all directions—the mechanical, the muscular, the mental, and combinations of all; but still leaving the most remarkable, and, by far, the most interesting incidents in the phenomena, wholly untouched and unexplained. A fact is no less a fact, although by some it may not be understood, or satisfactorily explained, or even believed. I have referred to these phenomena, as dependent on what is analogous to magnetic and electric currents, or influences; because, on that principle, there appear to be fewer difficulties and discordances than on any other with which at present I am acquainted.

[The foregoing pages were in type when I received the following unexpected, but truly interesting, letter, the writer of which has already been mentioned at p. 4. It can scarcely be necessary for me to say that, I have great pleasure in thus making public the sentiments and opinions so ably expressed by one, who has carefully watched the results of my experiments, and who is, therefore, so well qualified to understand their true character, and form a correct estimate of their value.]

23, *Montpellier Road, Brighton,*
7th November, 1851.

MY DEAR SIR,

I have taken so warm an interest in your experiments, from the time that you gave your Lecture at the Albion Rooms, (Brighton,) that I should like to be permitted to add a postscript to your little book; in which I may express some sentiments and

views which my profession has suggested to me, and which, even if they occurred to you, you might not wish to bring before the public at present. A few words from me would not implicate you in my opinions, and they might be suggestive to others, who may be inclined to trace the consequences of your primary facts to their legitimate conclusions.

To me, no scientific truth is interesting unless it has, directly or indirectly, a moral bearing. It has been usual to separate science and morals, as if they had no real connexion with each other, but to me it has always appeared impossible to do so. The moment creation is viewed as the work of mind and personality, it becomes a question of good and evil ends, of right and wrong; and every new discovery in the laws of physics raises our ideas of the spirituality of man, and of the high moral position he is some day destined to occupy by his benevolent Creator. When Volta first saw the dead frog leap from the table, by its contact with two metals, he little supposed the sublime inferences to which that circumstance would lead, by furnishing a new instrument for interrogating nature, and in forming, by the electric wire, a new mode of communication in civilized countries, by annihilating space and time. Undoubtedly, the order and harmony of creation were always a proof to reflective minds of power, intelligence, and omnipresence; but there is something in uniformity which has a tendency to conceal from us its cause, to deprive it of free-will, and to ascribe it to a necessity and a fate. But when we discover new modes of operation in this will, and view

discoveries as new modifications of the same will, we are not only impressed with the novelty, but we are disposed to argue back to old facts and laws as manifestations of that will, and to wonder at our previous insensibility to such stupendous phenomena.

It is the same with the discoveries which you have been permitted to make in the influences of magnetic and electric currents and energies, as connected with every object in nature, and with the human body in particular. We have long known the wonderful properties of the true magnet, and we have considered its applicability to navigation as one of the grandest discoveries of science; but there we stopped. Of late years, the magnetism of the earth has been a subject of curious and interesting research; and the late discovery of the relation of oxygen to the magnet opened still sublimer views of the economy of nature, and of our intimate dependence upon the physical world. We imagined we were upon the threshold of greater truths, drawn from the infinity of nature, and more closely touching upon our moral constitution. The discovery of double electric currents along insulated wires, having different properties, and called, for convenience, positive and negative, paved the way to our comprehending how the human body might be the subject of similar currents. The road had also been prepared by Bell's discovery of the true anatomy of the nerves and their double formation. We are now enabled to comprehend how the vitality of the body may be closely dependent upon magnetic and electric currents, both inherent in the body itself as a vital

structure, and as a recipient of such agencies from the earth.

Of the truth of these facts your experiments leave us in no doubt. The human body, when insulated, has an inherent independent vitality, but this is then confined to itself. In order to operate upon other bodies, it requires to be in connexion with the earth. In this state it becomes a real magnet, surrounded by a magnetic aura, and possessing magnetic polarities, by which it influences and is influenced by other living bodies. To what extent these influences act, and in what way they modify our physical and mental phenomena, must be left for further investigation. What you have already discovered is of great importance in a medical point of view, and seems to promise an abundant harvest for the future. You have discovered that the body has a point of rest and repose in the upright posture, and that this point changes in the recumbent. The electric or magnetic currents pass through the limbs in the upright posture in one direction, and in the recumbent posture in a different one. They pass in one direction in the upper extremities, and in an opposite direction in the lower extremities, and so insure the unity of the body. When the hands and feet are closed, the currents circulate without interruption, and the body is in a state of quiet and repose. When the hands and feet are separated, they are analogous to the poles of a Voltaic battery, and the energies of the body are in full activity. These are important physiological facts, now for the first time demonstrated. They harmonize with

medical observations which have often been made, but never before explained. In seeking rest after fatigue, we always sit with our legs crossed. In sleeping, we lie on one side of the body, because then the legs are in contact. Infants always cross their feet in sleep, when they are free to do so, and are always restless when they cannot do it. They instinctively seek the position of repose. That repose which we vainly seek for by opiates in fevers and severe illness, would probably be obtained more naturally and effectually upon the principle of these currents. I have known cases where rest has been produced by the accidental application of the principle; but from ignorance of the law, the example has not been followed out in its other applications. Your discoveries will encourage us to do so, and probably become an important accession to the medical art.

Another wonderful circumstance in this discovery, is the susceptibility of the Magnetoscope to the electric influences upon the body of the operator. It is the most delicate test hitherto contrived of electric actions upon the human subject. We have long known that the body is a peculiar electric mechanism, but we were ignorant of its nature and laws, or how its actions were to be ascertained and tested. We now possess in this instrument a subtle electrometer, from which nothing can escape. Whatever is applied to the left hand of the operator, while his right hand holds the Magnetoscope, will indicate its presence by a corresponding motion of the pendulum. Every substance, mineral or vegetable, crystallized or amor-

phous, will give its own proper motion. How far these motions may be found to indicate the medical properties of substances will appear hereafter, when sufficient investigations have been made. At present, we can clearly see that each substance has its own specific action on the Magnetoscope, and that the actions are constant.

The last observation I wish to make is more of a moral nature. We have always been accustomed to look at man as the most wonderful work of divine power, both in body and mind. His body has occupied men of the greatest talents in studying its structure, and his mind is full of thought, feeling, and sympathies, which excite our love and admiration; but we never suspected that each one of us exercised a silent positive influence upon all around us, by that magnetic aura which you have proved to envelop us. We have hitherto supposed that contact with the human body was necessary before its influence could be exerted, but you have proved the reverse, and lighted upon a far sublimer truth, and one which cannot be contemplated without awe and wonder. Thanks to you, we now know that the body is the centre of an active magnetic sphere—of a power which originates in the head of the body by some mysterious law of which we are unconscious, and, forming curves at various distances from the body, concentrates itself again towards the lower extremities, and returns to the head through the infinite fibres of the nervous system. It is said in a certain place, ‘in Him we live, and move, and have our being.’ These words have hitherto been

received as a dictum, as applicable to man in no higher sense than to a dead stone. But the discovery of the magnetism of the body enables us to give them a much higher signification—it raises man as a living being above mere matter, and approximates the corporeal to the incorporeal and the spiritual; at the same time that it makes more intelligible and demonstrable that divine power, immaterial, incomprehensible, and omnipotent, by whose fiat and volition all these wonders are performed.

Many are accustomed to talk of man's responsibility and a future judgment as of something abstract, distant, and uncertain. But here, in this magnetic aura, we possess a present reality, and a proof that responsibility is bound up with all our actions and principles. For we may now say with truth, that as a man's mind *is*, so will be his circumambient aura, in its influence upon himself and others for good or for evil.

I may be thought too fanciful in the vi w I take of your beautiful, and, as I think, sublime discovery : but no reflecting mind will deny that we stand in need of some new principle or truth, to enable us to turn to full account those which we have already received. The disunion which pervades those who ought to be of one heart and one spirit, and the language used towards each other by those who profess to be in search of common truth, are painful spectacles to a considerate mind, and for which I see no remedy but in the development of some new principle of a moral, more than of a scientific nature, which, by its superior influence, shall give the passions of man that

rest which they can never hope for from the bitterness of controversy.

The many delightful hours which you and I have spent over your experiments, calling forth common feelings of wonder and thankfulness that we were endowed with faculties capable of comprehending and appreciating such mysteries, fortify my habitual hope that a time may come, and will come, when all who are engaged in the pursuit of truth and excellence may be actuated by a kindred spirit, and that as truth is one, so the hearts of those who seek it may also be one. When I first saw your machine prove the polarity of a decillionth of a grain of silex, and when I first saw it respond to the billionth of a grain of quinine, I was seized with the same kind of awe as when I first studied the resolution of the nebulæ, and when I first saw the globules of blood and the filaments of the nerves through the microscope. Truly, as Paley says, 'in His hands great and little are nothing.'

I have often asked myself what was to be the next new wonder after the electric wire across the Channel? Surely we have found it in the magnetic aura of the human body, acting on the aura of other bodies, impregnated with the spirit of the mind within it, and upheld and actuated by the eternal mind in which it has its being.

I am, my dear Sir, yours most truly,

W. KING, M.D. Cantab.

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