

On a theory of sleep / [John Ashburner].

Contributors

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FACTS AND OBSERVATIONS
ON THE
MESMERIC AND MAGNETIC FLUIDS,

BY
JOHN ASHBURNER, M.D.

ON A THEORY OF SLEEP.

THE sensitive plant exhibits, under two different conditions, the opposite states of sleep and vigilance. Its contracted leaves are in a state of spasm,—a grasping, active, apparent quiescence; and when its leaves are open and expanded, it is awake. These two opposite states are quite analogous to the sleep and vigilance of man.

The phenomena of sleep have been so often noted, and so many definitions have been proposed as to its characteristics, that it would be difficult to find one which offered novelty. Yet the facts daily coming to light are so full of physiological interest, that to dive into the depths of what appears so very occult need not be despaired of. When I first learned to believe that in the practice of mesmerism was to be found the cure for most of the intractable and hitherto incurable spasmodic diseases we are liable to, and when I found absolutely that by its aid more than epilepsy, hysteria, chorea, spasmodic asthma might be remedied,^a I devoted my ingenuity to the means of discovering an agent which might assist us in obtaining the deep sleep so essential for our objects. To produce sleep by the ordinary means was a process, in many cases so tedious, that often sufferers had

^a It would not be too much to say that cancer and other malignant diseases have been wonderfully alleviated. Tubercular diseases, by which I mean consumption, scrofulous tumors, scrofulous caries of joints, have been arrested in their progress and brought nearer to a perfect cure than by any other treatment of which I know any thing. If medical men would study *The Zoist* instead of studying their privileges, they might learn to advance the knowledge of their profession.

no patience to go through the requisite course of manipulations. In one case I mesmerised a lady 238 times, averaging an hour each time, before I succeeded in the induction of sleep: afterwards her sister could put her into a mesmeric sleep in three or four minutes. I have had patients who were so difficult to render somnolent, that I have repeatedly failed in my object up to about 120 times, and then deep sleep has come on. Several have taken me at least 60 *séances* of an hour each. If the difficulties of putting to sleep be so great in some instances, people get it into their heads they are not susceptible of being affected, and give up the pursuit after a few trials. Convinced that mesmerism was the most important remedial agent ever yet made known to us, I braved the flood of disgraceful slander which the envy of many medical men had so often poured out upon me, and ceased not to study a subject I conscientiously believed would one day be acknowledged as a blessing to mankind. I could not help being struck with the analogies which this subject held towards magnetism. Evidently attraction and repulsion were the leading phenomena, and the conditions of sleep and vigilance are susceptible of being referred to these agencies for their existence; and it can be shewn that they are the powers which operate to produce the respective states. In reflecting upon the more extensive relations of this subject, I was led to conclude that it had a very close relation to the philosophy of the mind. The disagreeable, the unpleasant, and the unamiable feelings of our nature are found to be the results of a condition of the mind influenced by repulsive agencies.

Mr. Faraday may exert his vast ingenuity in discovering how far the diamagnetic powers are in operation in determining the presence of attractive and repulsive agencies on the human system, and his deeply interesting researches tend to the discovery of more than analogous states of electric action between the influences productive of motives to mental operation, and the powers which actuate the interminable combinations of matter. The Baron von Reichenbach has indicated with logical precision the great probability of the existence of a new imponderable agent. It may be permitted to point out the corroborations to his views in a paper I contributed to the last April number of *The Zoist*.^b But amidst the great advances which men of transcendant science are making on subjects admitting of more close and exact experiment and reasoning, it shall be lawful to vindicate with energy the truths that physiologists ought to respect, and

^b When I wrote that paper I had not seen the Baron von Reichenbach's book.

that, for the sake of their honour and of humanity, physicians ought to investigate.

It is useless to ask why in this world the retarding principle acts upon men who pretend to scientific taste, as well as upon the ignorant and brutal. The desire to keep back one's neighbour—to feel delight in his misfortunes—to be envious of his renown, has been shewn by La Rochefoucault and other moralists to be of wider extent than the area bounded by the paltry feeling of a few in a profession; but the probabilities have not yet been pointed out that the antecedents to these consequents are dependent upon the presence of certain repulsive agencies operating upon mind and matter. It is proposed now to shew that man is constantly influenced by certain attractive and repulsive agencies, and if this be made out it must follow that these in some way promote the tone of his feelings, the temper of his mind, the activity or indolence of his manners, as well as the diurnal changes in his condition of being.

The illustrious Gall long ago indicated the true path to the examination of the phenomena of mind. The convincing nature of the facts corroborative of his philosophy afforded by mesmerism, has not failed to excite the repulsive agencies of certain organs of the brain in various individuals, and the result has been repetitions of illogical efforts to prove that fact is not fact,—that events overwhelming in their progress are impossibilities,—and that truth is satanic agency! The organs of the brain established by the phrenologists, may be divided into those which for the most part are excited to action by attractive agencies, and those which are influenced by repulsive powers. In what manner these operate to produce the multifarious combinations of mental phenomena, is not now the question. It is sufficient to indicate the law by which the great divisions of the mind are regulated, and to point out how sleep and vigilance are dependent upon it, and how the opposite conditions of tonic and clonic spasm, the signs of some of the most serious diseases to which living beings are subject, are in fact but continuations of phenomena dependent upon attractive and repulsive forces.

There can be no doubt of the fact, that to the well-constituted minds of mankind the exhibition of the contempt flowing from Self-esteem, or of the defiance of Combativeness, or of the mean cunning of Acquisitiveness, or of the furious anger of Destructiveness, however amusing in some few exceptional relations, may always be said to be distasteful. All our unamiable dispositions, specially directed to any individuals, are repulsive to those persons; and, in like manner, the exercise of our amiable dispositions is attractive to our

neighbours. This is so not only morally speaking ; but it is a physical fact, susceptible of proof to those who diligently seek for true reasons. I think there is abundant proof of the mental operations of mankind being attended by the emanation of a fluid from the brain. To those who *cannot* bend their faculties to the belief of such a fact as this, promulgated in my paper of last April in *The Zoist*, it is useless to address the train of reasoning in the present essay ; but the progress of knowledge will not wait for their belief.

The fluid from the brain of the individual labouring under the agency of repulsion is disagreeable to the individual affected by it, and, on the contrary, the amiable or attractive fluid is very agreeable. There is a physiognomy of action and of expression in the individuals actuated by attractive or by repulsive agencies, not to be mistaken. The expression of the attracted person is benignant, and the action tends to a forward progress ; while the person under the influence of repulsive feelings has a tendency to retrogress, and the action is indicative of a desire to stand off. These two opposite conditions are in a state of extreme spasmodic disease, curiously reversed ; and as if the polarities were exchanged when a transition took place from health to disease, the physiognomical expressions and actions are likewise affected. If a continued state of attraction be kept up in the brain, the phenomena of sleep supervene, and sleep, it must be understood, is not a condition of absence of all action. Dr. Elliotson long ago remarked that the mesmeric condition by no means implied the absence of action. In all sleep the eyelids close, and the muscles continue in action to close them. It was a remark of Sir Charles Bell's, that the eyeballs were *drawn* upwards into the orbit. Mesmeric sleep, which some ignorant persons have confounded with hysteria, but which in fact is the sleep the older writers have so often described as that of somnambulism, is but a degree of intensity further prolonged beyond common sleep. Facts have brought me to the conclusion, that in every case common sleep may be artificially excited to become the deeper sleep of mesmerism ; and if this be farther prolonged into a stage beyond the first of mesmeric sleep, insensible coma is the result ; and if the process be pushed still further, a state of rigidity supervenes. If the causes directing the prolongation of such a condition into a still further stage continue to operate, the disease tetanus, characterized by the most intense form of tonic spasm, results. Now the tendency is no longer one of forward progression. Let Sir Charles Bell's *Anatomy of Expression* be consulted, and his beautiful gra-

phic delineation of the disease will convince any one that the tendency of the spasm to produce a drawing backward, is decided in the case of tetanus. Whereas in the clonic spasm of hydrophobia, the body has a forward tendency: clonic spasms result from a repulsive agency in diseased action, the polarities probably having been reversed. It is not pretended that diseased states present no complication of phenomena, nor is every symptom to be strictly scrutinized as necessary to establish the tendency contended for, but the most philosophical mode of investigating such a subject is to regard it in its most primitive and simple aspect, and in this point of view it will be seen that all clonic spasms belong to the series of events of which wakefulness, vigilance, or activity form the commencing links. These are accompanied by a tendency to the backward start, and if they be prolonged into diseased action, become productive of slight restlessness, complete insomnia, jactitation, or hysteria, epilepsy, or some of those diseased actions which, occasionally complicated with sleep and tonic spasm, are for the most part attended by forward progress. That sleep and vigilance are dependent upon two different electric or magnetic conditions of the system, the attractive and the repulsive, is an hypothesis susceptible of powerful support by some striking facts. In the mesmeric manipulations, the passes producing sleep in most common use, are alternate repetitions of the downward passage of each hand slightly curved at the distance of half an inch from the crown of the head to the pit of the stomach. These have a soothing effect upon the patient, and gradually inducing a closing of the eyelids, bring on sleep. If the hand be passed even in contact with the skin of the patient, the effect is more comforting than the upward passing of the hands; an action sure to produce the state of vigilance instead of sleep. All the methods by which sleep is brought on, have more or less a relation to the soothing of those mental organs which come under the division of attraction; and, on the contrary, as repulsion gives energy to the opposite organs, all that is productive of the higher states of vigilance, is likewise related to activity and energy of mind, whether it be in exercise of thought, in liberation to emotions, or to the indulgence of the angry and low passions of our nature. If the will be exerted by a mesmeriser, either in aid of manipulation or by itself, and if it be directed to the function of any repulsive organ, the effort to induce sleep will be in vain even with a person addicted to it. In operating with the will, the attraction is easily seen if it be properly directed. With susceptible patients, the leading characteristics of the

attractive powers are very strikingly marked. But the most curious new facts, regarding the induction of sleep, relate to the presenting of certain crystals to the face, or to the pit of the stomach. Baron von Reichenbach refers to the experiments of Dr. Petetin, of Lyons, on the attraction of the hand by a magnet (pp. 12, 13, et sequentes, of Gregory's *Abstract of Reichenbach's Researches*), and after stating certain facts on this subject relating to the cases of Mdlle. Nowotny and Mdles. Reichel and Sturman, admits that in certain diseases, especially catalepsy, an attraction exists between the hand and a magnet; and subsequently having observed, after a great number of experiments, that magnetized water attracted the hands of Mdlle. Nowotny, he was induced to try numerous crystalline substances, and he observed that in these resided a certain attractive "power not previously noticed, and of a peculiar nature." He had observed that this power was concentrated in two poles, which were always diametrically opposite, and constituted the poles of a principal axis.

In repeating the experiments of Baron von Reichenbach with various crystalline bodies, I was enabled to extend them, and to obtain very curious results.

A lady called upon me one morning, who had heard much of mesmerism, but had never been mesmerised. I shewed her some fine large rock crystals, and explained to her that with such materials the Baron von Reichenbach had obtained some curious results. After trying the Baron's experiments with the hands, I held the pyramid of the crystal to her forehead for nearly three minutes; she regarded the sensation from the crystal as "cooling and agreeable," and soon sunk into a delightful sleep.

A large horse-shoe magnet applied to the pit of the stomach or to the palms of the hands or held before the face in the cases of Mary Anne Douglas and of Jane Love, produce instant rigidity and simultaneous deep sleep. If the magnet be presented to them at the distance of two or three feet in a dark room, they see a beautiful blue light, which instantly vanishes if the armature be applied. These corroborations of Reichenbach are so numerous, that they are hardly worth repeating, were it not for the purpose of shewing that the conditions being the same, the truth of the fact is established by multiplied examples. The light is emitted from the magnet, although the sceptic cannot see it; the light is emitted from the human brain in the act of mental volition, though the sceptic cannot see it; the pointer does scent the partridge, although the sceptic may not be able to do the

same; and the fox-hound does smell out reynard, although the sceptic may not have the same quick power of smell in his nose. Nature will not arrest the progress of philosophy to please the slow-headed doubters of the age.

Mary Anne Douglas, a slight-built small person, aged 21, is of a highly nervous temperament. She first came under my care at the Middlesex Hospital, on the 16th of March, 1845, and was for some months under the treatment usually had recourse to in such cases as her's. She was affected with fits, which were, in fact, a severe form of hysterical epilepsy. Valerian and a range of so-called remedies were adopted with apparent good effect for a time, but ultimately she had a recurrence of her disease, and was as bad as ever. In the month of August I tried mesmerism in this case. She fell into a heavy sleep on the second trial, and during two months more exhibited no phenomena more remarkable than common deep sleep. Her disposition in the waking state is very quiet, and very amiable. She is characterized by strong good sense, and having been strictly brought up by a very worthy mother, is morally an excellent person. She is habitually truthful, and though not wanting in intellectual power, is very remarkable for her benevolent and affectionate feelings. This case offers, from her high and delicate nervous temperament, an example of very quick susceptibility to mesmeric influence. Gold, platina, nickel, magnetized iron, antimony and bismuth, or one of the poles of a common galvanic battery of very small power, each instantly produce sleep with rigidity, though the moment before she had been wide awake. The touch of a person who had been for ten minutes under the influence of a galvanic current passed through 300 feet of thick iron wire, suddenly induces in this case a deep sleep with rigidity. Iron or zinc applied to the nape of the neck quickly dissolve the rigidity and finally the sleep. Their agency being repulsive, Mary Anne Douglas becomes awake. A middle-sized rock crystal held with the pyramidal termination to her face, induces a very calm placid sleep; the opposite pole of the crystal being held near her forehead, she wakes up suddenly. The pyramidal end of a rock crystal being offered to her hand, she grasps it with delight, and soon sleeps; but if the other pole or butt-end of the crystal be applied, she complains of its burning her. And if it be held long enough to the palm of her hand, it always wakens her suddenly. This very remarkable effect of rock crystal to induce agreeable sleep or sudden wakefulness, according as the attractive or repulsive end of the crystal be held to the face, to the pit of the stomach, or to the palm of the hand, I have verified on sixteen cases with various modifications; but I hold

that in mesmeric investigations, in order to establish a law, a selection should be made of very delicate susceptibilities, as experiments on these afford results more clear and more decided. Harriet P—— was repeatedly submitted to the influence of the pyramidal terminations of rock crystals, and one morning she was put to sleep by the presentation to the face of the pyramidal pole, and wakened by that of the opposite pole twenty times in four minutes. Mary Anne Douglas and Jane Love are so susceptible, that if one lens belonging to a pair of crystal spectacles be held before the eyes of either of them, one side of it is repulsive or disagreeable and wakens; the other is attractive or agreeable, and induces sleep. Mrs. H—— has often gone into a gentle sleep, in the duration of which she expresses by her gestures great delight in approximating or touching the pyramidal end of the crystal; but if the pole be reversed at the distance of a foot from her, she expresses a disgust and horror at the repulsive agency of the crystals; and if it be persevered in, though she may be standing, she falls flat upon her back perfectly insensible. This alarming experiment I have seen unwittingly performed three times. The repulsive pole in her case does not waken, but produces the retrogressive action of the body—a fall backwards, and insensibility. If the disagreeable repulsive end be continued to be held towards her, a subsultus and jactitation supervene, which appear very alarming; but she has always recovered from them, on the application of the attractive pole of the crystal; and has expressed herself refreshed and strengthened beyond measure. The more usual effect in well-marked healthy cases of nervous temperament, is the sleep alternating with the wakefulness according to the end of the crystal which may be presented.

Dr. Bunnett requested me to try the effect of hazel-wood upon some of these cases. He brought me a couple of bits of hazel-stick from the Countess de Salis' property: these were recently cut and fresh. Mary Anne Douglas took one of them into her hands, and said it felt warm. In two minutes she was fast asleep, insensible to external impressions, and strongly grasping the stick in both hands. A gold chain was wound round the stick, in the space of it between her two hands. She complained of a burning from the stick, and with evidently uncomfortable feeling relinquished her hold. A piece of white thorn or a piece of fir, which Dr. Bunnett sent me, produce similar effects. The stick from an ash tree produces no apparent effects. These experiments with precisely similar results, have been tried upon nine cases, and have been very often repeated.

Mary Anne Douglas can for a long time resist the will of

her mesmeriser, but the determination to do so is attended always by severe head-ache; and if she be cross-mesmerised, the meaning of which is, if she receive the influence of two different mesmerisers at one and the same time, or at different times within a short interval of each other, she becomes heavy, stupid, and occasionally insensible to all external objects. On one occasion she slept eleven hours after having been cross-mesmerised, and awoke with an intense head-ache, which notwithstanding the adoption of all the mesmeric expedients, it was very difficult to remove. I have repeatedly witnessed such bad effects from cross-mesmerism, that I cannot too strongly warn ignorant and rash and unreflecting persons from practising it. Some fool-hardy Irish surgeons have, it is said, incurred an awful responsibility, by each, within a few hours, mesmerising a poor nervous girl.

Mary Anne Douglas responds to the will of any one who can sufficiently concentrate and intensify his thoughts. She sees a blue fluid emanating from the eyes and brain of the operator while he is thus exerting his mind. From the abundant evidence I have had on this subject, I am clear in the conclusion that man influences his fellow man by the agency of a fluid which emanates from his brain during the slightest operation of the mind;^c and if the ideas be of a repulsive or

^c Mr. Thompson of Fairfield has been kind enough to address me the following letter on this subject.

“My dear Ashburner,—You asked me to put on paper my *method of willing*, I comply with your request, but think the operation can be more easily practised than described. As nearly as I *can* describe it, it is thus:—When I try to put a person to sleep by the mere will, I concentrate my whole attention upon them, allowing no idea or thought to enter my mind in fact, I rivet my attention upon the person and think of nothing else. When I desire to convey an idea or thought to another by will, I fix my attention upon the person, but at the same time keep the idea or purpose that I wish to communicate steadily and unwaveringly in my mind until the effect I desire is produced, or I find that the experiment fails.

“From experiments and observations, I am more and more convinced that we are continually and unwittingly affecting others by our thoughts and feelings. I have tried an amusing experiment two or three times very successfully; I have taken a party (without informing them of my intentions) to witness some galvanic experiments; and whilst submitting myself to continued slight galvanic shocks, have fixed my attention on some one of the party. The first time I tried this, I was much amused by the person soon exclaiming, “well it is very strange, but I could fancy that I feel a sensation in my hands and arms as though I were subject to the action of the battery.” I found that out of seven persons, *four* experienced similar sensations more or less, none of them showed any symptom of being affected before I directed my attention towards them, after that they were made acquainted with the experiment. I found their imagination sometimes supplies the place of my will, and they fancied I was experimenting upon them when I was not so. This we so often see in other cases. I hope to be in town for a day or two the week after next, when I shall have much pleasure in calling upon you.

“Fairfield, near York.
“June 15th.”

“Yours very truly,
“H. S. THOMPSON.

disagreeable nature, they will produce corresponding impressions on the mind influenced. Anger! how often it engenders anger in another. The hasty, impetuous, and irritable, how soon are they influenced by the repulsive agencies of other men's repulsive thoughts. The illogical opponent tells me that I am a materialist. He chatters, and knows not what he says. I speak of the agency of physical causes operating upon material organic matter. The enquiry is not how the central spring—the immaterial essence—acts upon this organic substance and produces the effects—the emanations we are recording. Once for all, he who *will* talk of things understandable is the real bother-headed materialist; for he is always eager to reduce things we never can comprehend into things we can touch and weigh, and to which *he* can give the characters of matter.

If Mary Anne Douglas enters the room in which my large helix of primary electro-magnetic iron wire is in action, she becomes quite rigid and insensible in a moment, and, if she be not supported, falls to the ground. It will be seen that the fluid from the primary wire when properly directed is an attractive current. I wish it to be borne in mind, that when the fluid of the human brain excited to existence and excited to leave that brain by the *operation of the mind*, produces sleep, it is analogous to the attractive force which induces sleep.

We have then, evidence as far as it goes that the attractive will of man, the attractive power of Electro-Magnetism, the attractive power of Magnets, the attractive power of Rock Crystal^d, have all a tendency to produce sleep, and having adduced facts to shew that the repulsive agencies of some of these powers produce vigilance and an active state of mind, it is time to state the results of some experiments made with an Electro-Dynamic Coil Apparatus invented by Mr. Noad of New Millman Street, Foundling Hospital; whose ingenuity and kind liberality are equalled only by his charming zeal for the science to which he devotes himself. Mr. Noad was obliging enough to come to my house with his machine on the 13th inst., when I had collected some very susceptible patients for the sake of trying on them the effects of the Direct and of the Inverse Currents from the positive binding screw of his new Coil Machine^e. Besides ourselves and the

^d Crystallized Carbonate of Lime or of Sulphate of Lime act with still more attractive power: in Mary Anne Douglas they produced a sense of heat which was quickly followed by deep sleep and rigidity.

^e I take the liberty of making an extract of a letter from Mr. Noad, not only because it is in itself interesting in relation to his own invention, but because it gives us clearly a late physiological view of the influence of the electro-magnetic current on certain diseases.

patients the persons present were my ancient friend and fellow-student Mr. Lloyd Williams, of Denbigh, Mr. Wass and Mrs.

“My object in arranging the coil in this form was to endeavour to provide myself with an instrument with which I might apply the electrical current in cases of paralysis in the manner recommended by Matteucci.

“It was concluded by this indefatigable electro-physiologist, that in some cases of paralysis the nerves of the diseased limb are altered in a manner analogous to that which would be produced by the continuous action of the electric current; and as, to restore to a nerve the sensibility it has lost by the passage of a current, we must act on it with a current in a contrary direction so to restore a paralyzed limb, we must pass along it a current in a direction contrary to that which occasioned its paralysis. If the disease be paralysis of motion, it is the *inverse current* that should be applied, if paralysis of sensibility the *direct current*, but in cases of complete paralysis it does not seem material whether the current be direct or inverse.

“Now it is clear that with no form of the coil machine can we administer what may be strictly called a current of electricity, for the philosophy of the action of these beautiful instruments necessarily implies a series of shocks, the electricity being derived not directly from the voltaic battery employed, but by an action of induction, and it is, as every electrician knows, not during the time that the current of electricity is rushing through the coil that the shocks are obtained, but at the moment contact between the battery and the coil is broken and renewed. I now speak of the electro-magnetic coil machine as it is usually constructed with a secondary coil of thin covered copper wire surrounding the thick primary wire, through which the electrical current from the battery is caused to circulate: with these machines there are produced two shocks, one when contact with the battery is made and another *in a contrary direction* when contact with the battery is broken; if therefore the object of the operator be to give a series of shocks in one uniform direction, it is clear that he cannot do so with an instrument arranged with a secondary wire, and this consideration induced me to fit up an electro-dynamic coil, dispensing with the secondary wire, and after numerous experiments I have succeeded to my own satisfaction in arranging an apparatus which not only enables me to administer to a patient a series of shocks continued for any length of time in one invariable direction and to regulate the intensity of these shocks with the greatest rapidity and nicety, but which places it in my power to arrange with the utmost precision the number of shocks passed in a given interval of time; and although it is true that I do not with this instrument get a continuous current of electricity, increasing experience serves to confirm my anticipation that it is a valuable improvement on the electro-magnetic coil machine as a therapeutic instrument, indeed the experiments of Matteucci show satisfactorily that if we had it in our power to apply to a patient an uniform and continuous stream of electricity, no useful result could be expected, as he always found that after the passage of a current had been continued for a certain time along the nerves of an animal, those nerves lost their sensibility to the action of the current, and that to restore their sensibility it was necessary to suspend for a time the action of the voltaic battery, in other words it was necessary to *intermit* the action of the current.

“I would rather defer any account of the apparatus until I have perfected it, and you must allow me to rest satisfied with merely stating that, in my experiments I have found that the length of the wire, its size, and the length and thickness of the coil, have all had considerable effect in modifying the shock: that all who have been exposed to the action of the new machine have noticed the peculiar softness of the shock, so different from the harsh, disagreeable feeling of the common secondary coil. The expression of one of my patients was so characteristic, that I will mention it: he said, after experiencing the shocks from both forms of apparatus, that the shock from my new machine was like that from the common coil ‘filtered through cotton’—and when it is considered that in one case we have a series

Holmes. Mary Anne Douglas was placed in a chair and a disc of copper in communication with the positive wire being held to the nape of the neck and the negative wire around the instep, the current passed and in an instant there was deep sleep with rigidity. The arrangement was reversed; the positive wire was placed near the foot and the negative wire at the nape of the neck. The patient the instant before was in a deep sleep, at that moment she became wide awake; similar results were obtained in seven cases. The attractive current producing sleep, the repulsive, instant vigilance. Being myself a very difficult person to put to sleep by mesmeric passes, I got Mr. Noad to try the direct and inverse currents on myself; I could have borne the direct current with great satisfaction; it was producing on me a sense of calmness and an indolent, comfortable feeling, which might *in time* have ended in sleep, but the inverse current was so repulsive and disagreeable to me, that I could not bear it for many seconds. It was as if a small hammer had been percussing the posterior part of the head and behind the ears especially. Since these experiments I have arranged a coil which enables me to give the direct and inverse current like Mr. Noad's, but not so complete, though it answers the purpose of experiments. I had three patients who were so obstinate in constitution, as not to yield readily to the mesmeric sleep, but being subjected one hour each to the direct current, could not resist the calming power and dropped into a light slumber.

These facts are of vast importance, and I believe Mr. Noad's machine is destined to promote an extraordinary change in the mode of regarding disease, as well as in the whole range of therapeutics. Such ideas cannot be understood by those who have arrived at the conclusion that the word *Hysteria*, derived from *Ἵστερα*, the womb, is a sufficient explanation of the great majority of nervous diseases, whether it be a pain in the knee or ankle, resulting from abnormal dentition, or any other neuralgic or spasmodic inconvenience, and who, practitioners of medicine, shroud their apathy for the improvement of science, and their ignorance of nervous diseases in the mantle of privilege and position: albeit, some

of shocks passing uniformly in one direction while in the other the shocks are alternately *direct and inverse*, it may easily be imagined that the sensations communicated by his instrument, must differ very essentially. I will not enter into the experiments we made at your house with this machine; to me they were of a most surprising nature; and, cannot help thinking that something of a valuable character will be elicited from them.

"I remain, my dear Sir,

"In great haste,

"Very truly yours,

"Henry M. Noad."

"Dr. Ashburner, &c., &c.

of these are prejudiced and obstinate, and like men of small minds, wait for the bidding of their leaders, others indulge in paltry pride or envy, and some few are sincere, but, like timid hares, are frightened at consequences that may result to them if they stop to enquire. Charity must teach us to forgive them, for their feelings blind some of them, while with others the sordid care of their own interests absorbs the higher and more philosophical—the purer and more elevated sense of their sacred mission!

Mr. Noad's ingenuity in divising a new instrument, has enabled me to come to the conclusion that, however the minute structure of the cerebral and nervous tissue may be arranged to produce results analogous to electricity, a direct current passed from the brain to the extremities tends to soothe the individual, to induce a sense of quietude, somnolence, sleep or rigid spasm; that an inverse current passed from the extremities to the brain establishes the reverse; wakefulness, restlessness, inquietude, pain. The direct current is attractive, the inverse current is repulsive. In mesmerism, the downward passes are analogous to the direct current, and produce quietude, sleep, and its natural sequences, while the upward and all other dispersing passes are like the inverse currents, their effects being similar. The phenomena offered by the magnet, by certain metals, by crystals, by the exertion of the will, bear out the conclusion, that sleep results from the attractive agencies of the brain, and that vigilance is owing to a repulsive power exerted by that organ.

It is very interesting to read back into Locke,^f and to observe the wanderings of his great mind on the subject of sleep. Had the phenomena of mesmerism been studied in his day with the lights that shine so brilliantly now from the labours of Faraday and of Von Reichenbach, I think he must have arrived at the conclusion that the phenomena which so much puzzled him were produced by attractive agencies, and that even indolent quietude of thought with costive emission of ideas were dependant upon the same cause, while wakefulness and activity of thought were dependant upon repulsive agencies. His vast powers of "reflection" would have cleared up during his study of somnambulism all the questions as to the identity of Socrates awake and Socrates asleep. The best respect that can be paid to his great genius, is to suppose that he would not have spurned the use of any of those torches that are lighting us to the Temple of Truth. It will easily be perceived that the agencies of attraction and repulsion have a very wide range in explaining difficult questions

^f *Essay on the Human Understanding*, b. ii., cap. i., § 11, 12, 13, 14.

touching life. The part which these forces play in the formation and in the cure of disease, leads to wide speculation, and I start the conjecture that at some future day the explanation of arterial energy and of venous congestion,—the two great sources of inflammation and of fever,—will rest upon the same grounds as the production of sleep and of vigilance.

F I N I S.



