opportunities of showing how Sophocles could delineate insanity, and my next task will be to analyse the account of Orestes as given by Euripides. It has been well said that "Euripides alone had the courage to lower tragedy, if we may so speak, to the sphere of purely human action," * and it is therefore natural to expect that he would dwell at considerable length upon a subject so much within his scope. But so abundant is the material afforded by his tragedies, that I must reserve its examination for a separate paper.

(To be continued.)

Illustrations of the Influence of the Mind upon the Body in Health and Disease, with especial reference to the Imagination. By DANIEL H. TUKE, M.D., M.R.C.P., late Visiting Medical Officer to the York Retreat.

(*Continued from vol. xviii., p.* 31.)

III.—THE INTELLECT.

(I.) *The Intellect may, by its action on the voluntary muscles, cause* (*a*) *regular contraction and relaxation;* (*b*) *excessive contraction: Spasms and Convulsions;* (*c*) *loss of power: Paralysis.*

Before proceeding to illustrate these several states, we wish to refer to the term Imagination, which, in its various significations, is directly or indirectly concerned with the greater part of the phenomena comprised under the Influence of the Mind upon the Body.

The term is often used simply in the sense of active memory—Recollection. Thus we sometimes speak of a certain taste being imagined, that is recalled; but more usually it is applied, as by James Mill, to those ideas or clusters of ideas which, in their combined form, have not at any time been present to the senses; or to the separation of classes of facts into their constituent elements, and combining them afresh, so as to form unreal representations, or scenes which have no existence—the sense in which Abercrombie employs it. If we combine Memory, the faculty by the operation of which we form an idea or image which is, and Imagination, the faculty by which we form an idea or image which is not, a copy of a previous impression, we

* Paley. Preface to Æschylus.

may conveniently speak of recollective and creative Imagination. In the former, to employ Professor Laycock's terminology, "substrata are re-awakened into activity by affinitive impressions, and it follows the law of association of ideas;" in the latter, "forms and successions of events, not to be met with in the external world, may be developed." Common to both forms is the presence of an idea not immediately excited by any material form answerable thereto. As contrasted with the wide medical use of the word to which we shall shortly refer, this state might be termed Imagination proper. Nor would this be inconsistent with its derivation. Imaginatio, or Imago, a re-presentation to the mind, really means an imitation (*imago ab imitatione dicta*, Festus), and is traced back to εἴγμα (from εἴκω, to resemble), an image. Tacitus uses imaginatio in the above sense. Imago is employed by Virgil to signify a mental image or likeness:—

"Obstupui: subiit cari genitoris imago."

Both imago and imaginatio are used in the sense of dreams, the former by Ovid, "imago noctis," and the latter by Suetonius, "imagines somniorum." As a form, it is employed by Virgil:—

"Ubique pavor et plurima mortis imago."

Imago is used by Plautus to signify the impression made upon a seal: a favourite metaphor for mental images.

The Greek synonym of imaginatio, φαντασια, from which our words Fancy and Phantasm are derived, signified the beholding of objects by the power of Fancy, or creating new objects by the imagination. Quintilian, interpreting the word as used by Aristotle, says "per quas, imagines rerum absentium ita repræsentantur animo, ut eas cernere oculis ac præsentes habere videamur." This is Hallucination, answering to our Phantasm, and not Fancy as now employed, which does not go beyond an exaggerated degree of imagination—creating what is "furthest removed from nature, fact, or sober reality" (Bain).

The Imagination, which in its broad medical sense is, when properly understood and guided, a complex mental power of the greatest interest and importance, must be considered under this section, although passing insensibly into emotional states.

With this form of Imagination are closely associated Expectation, Belief, Faith, Imitation, Sympathy and Hope, some of these states involving the feelings more than others. The

most superficial examination of the sense in which the term "Imagination" is employed by metaphysicians on the one hand, and popularly and medically on the other, will reveal the wide difference which exists between the two. In truth, as regards the present inquiry, it signifies, in popular and medical language, that a man imagines certain (bodily) phenomena to have occurred which have not; or it is meant that certain bodily phenomena which really have occurred, are due to no other cause than that he imagined they would. The signification of the term contained in the first clause is too often assumed to be the whole truth. That of the second clause is almost, if not altogether, lost sight of. Because effects are produced and cures performed by means of a mental condition called the Imagination, it is constantly assumed that these results are imaginary, in other words, that they are "all fancy." This is much to be deplored, and one of the objects we have in view is to dispel, as far as possible, so mischievous an error. It is generally implied that these phenomena are of a merely functional, subjective character, more or less dependent on the state of the mind, more especially the Will, and that a change of mental condition has been naturally followed by a change in the phenomena, although apparently physical. Such is the broad definition of the Imagination, as it presents itself to the mind, when employed in reference to medical facts of every day occurrence. This is what the orthodox medical practitioner means, as he complacently smiles, or is indignant, when the success of his heterodox rival is dinned into his ears, and he asserts that it was all the effect of the Imagination; and, in this sense, he is understood by his assailant. But the fact remains, and because it remains, and cannot be really explained away, it must be explained. The essential must be separated from the accidental, and utilised for therapeutical purposes. It matters little to the patient by what name the remedy is called, whether "Imagination," or some of the many "pathies" of the day. It is emphatically a case in which "a rose by any other name will smell as sweet." But to the philosophical practitioner it ought to matter a great deal; it ought to be a question of exceeding interest.

It is obvious, then, that such signification of the term is widely different from that in which it is employed by metaphysicians and (yet more so) by writers like Mr. Ruskin, who assigns to it a deeper meaning. On analysing the mental states comprised under the medical and popular use of the

term, it will be found that the Attention is strongly directed to a part of the body with which certain phenomena are associated, that the ideas most vividly presented to the mind are in direct relation to them, and that the force of these ideas is intensified by accompanying states of mind already referred to—Expectation, Hope, or Faith. When a person on swallowing a bread-pill, in the belief that it possesses aperient properties, is purged, it is said to be Imagination; the mental condition present yielding, on analysis, a definite direction of thought to the intestinal canal; such leading idea exciting the same peristaltic action as would have been induced by castor oil. The force of this current of thought is augmented by Expectation. The other day a lady nurse at the Plymouth Hospital told me of a patient in one of the female wards, who was much disconcerted at the doctor having left the hospital without ordering an aperient pill, as he had intended to do. The nurse procured a bread-pill, and satisfied her mind. Next day she found, on inquiry, that it had answered its purpose satisfactorily. Again, I hold a ruler in my hand, and point it to a painful region of the body of a patient, who entertains the opinion that I am about to relieve the pain. The patient imagining that the ruler will be the means of curing her, believes in a force which does not exist—a curative power passing from the ruler to the body, and is relieved. That she is relieved is no Imagination. What cured her? Merely to say it was the Imagination is no solution of the problem. What really happened was that her attention was arrested and forcibly directed to the part, the prominent idea being the firm conviction that the morbid symptoms would pass away. In other cases the fixed idea may be, on the contrary, that certain phenomena will occur; that there will be pain, or redness of the skin, or loss of muscular power, and should these supervene, we say, as before, it was due to the Imagination. This medical use of the term has for its basis that thinking upon an object which, as Dugald Stewart points out, is used by Shakespeare as synonymous with the Imagination, when he speaks of "thinking" on the frosty Caucasus, the "apprehension" of the good, and the "Imagination" of a feast. It is the "conception" of Stewart himself. "The conception of a pungent taste produces a rush of saliva into the mouth; the conception of an instrument of torture applied to any member of the body, produces a shock similar to what would be occasioned by its actual application." This is recollective

Imagination, and merely involves the presence of a mental image of an object not present to the senses, but in the wider medical use of the word it becomes, as already stated, more complex, although by no means embracing the Imagination of those metaphysicians, with whom (Stewart, for example) it includes, not only conception or simple apprehension, but abstraction, "which separates the selected materials from the qualities and circumstances which are connected with them in nature, and Judgment or Taste which selects the materials and directs their combination." To these powers the above-mentioned metaphysician adds, Fancy.

Mr. Ruskin pronounces this definition meagre, and says the very point is missed, for he omits from it the power of prophecy, which is the essence of the whole matter. The composition which Stewart regards as Imagination has no part or lot in it. Such a composer only copies the remembered image; with Ruskin, it is a penetrating faculty, reading truths discoverable by no other faculty, as well as a combining associative power, which creates new forms, and one which regards simple images and its own combinations in peculiar ways. It is greatly dependent on acuteness of moral emotion. In its highest form, it is "altogether divine," and out of an infinite mass of things, seizes two that are fit for each other, and are together right, although disagreeable alone. "It is the grandest mechanical power that the human intelligence possesses, and one which will appear more and more marvellous the longer we consider it." It is an operation of mind "altogether inexplicable," and can only be compared with chemical affinity. But it is not necessary to refer further to this aspect of the Imagination; enough has been said to show that the various significations attached to the term must not be allowed to mislead us, and that we are not concerned with the faculty understood in the Ruskinian sense, that in which it is used in reference to the painter, the faculty "necessary for the production of any great work of art." Fancy a country practitioner who has had a truant patient cured by a globulist, and has retorted that he or she was relieved only by the Imagination, being informed that it was by the "power of prophecy;" that the method, so far from being contemptible, was "altogether divine," and, in short, the "grandest mechanical power" belonging to man's intelligence! The only point in which he could agree with Mr. Ruskin would be that it was, indeed, "altogether inexplicable."

With these remarks on the Imagination, we proceed to consider the influence of the Intellect upon the Body in causing—

(*a*) *Regular Contraction and Relaxation.*

The influence of an intense and exciting idea or thought in inducing well-marked movements, is admirably illustrated in the description of two characters—one real, the other, indeed, fictitious, but sketched by the hand of a master, equally true to nature.

Sir Philip Francis is described by his biographer as "pacing rapidly forward *as if to pursue a thought.* He would then suddenly turn short round, draw himself up to his full height, and 'with a sweeping of the arm' evolve some epigrammatic sentence or well-rounded quotation. Even his own family, habituated as they were to the sudden interruptions of the measured tread, with which he loved to pace up and down the utmost length that a small suite of rooms would allow him, were sometimes startled by the vehemence of the outbreak, and strangers were absolutely electrified" ("Life," vol. ii., p. 454).

The other character, Felix Holt, is thus graphically described:—"His small, nervous body was jarred from head to foot *by the concussion of an argument* to which he saw no answer. In fact, the only moments when he could be said to be really conscious of his body were when he trembled under the pressure of some agitating thought." To some extent, no doubt, in both these instances, the intellectual element was followed by emotional excitement, which intensified the character of the external commotion.

The influence of Expectation (or Expectant Attention) upon the facial muscles, is well exemplified in the appearance they assume when a gun is about to be fired. The person so affected does not expect that anything is going to happen to himself, but there is a certain involuntary nervous twitching the Will endeavours to repress, which anticipates the instinctive contraction of the muscles around the eye, actually occurring when a sudden explosion or shot suggests danger.

We see a different form of Expectation exhibited in the common experiment of discovering the time of day, by holding a coin or ring by a hair or silk thread suspended between the finger and thumb in a glass, against the sides of which it is expected to beat the time of day. As is well known, it

often proves successful, the unconscious action of the digital muscles responding to the Idea or Expectation present in the mind of the person making the trial. I was not aware that this, with a slightly different object, had been an old experiment, until looking recently at Lord Bacon's Works I found the following:—"It is good to consider upon what things Imagination hath most force; and the rule, as I conceive, is that it hath most force upon things that have the lightest and easiest motions. . . . . Whatsoever is of this kind should be thoroughly inquired into. . . . . There would be trial made of holding a ring by a thread in a glass, and telling him that holdeth it, before, that it shall strike so many times against the side of the glass and no more." He adds an experiment depending for its success on the same principle, that of "holding a key between two men's fingers, without a charm, telling those who hold it, that at such a name it shall go off their fingers." Bacon concludes thus:—"Howsoever, I have no opinion of these things, yet so much I conceive to be true: that strong Imagination hath more force upon things living, or that have been living, than things merely inanimate; and more force likewise, upon light and subtile motions than vehement or ponderous" ("Nat. Hist.," 957).

From the time of Bacon to that of Chevreul no one, so far as we know, investigated the subject in a philosophical spirit. The latter, finding that a pendulum composed of a flexible wire and heavy weight, would oscillate when held by the hand over certain bodies (*e.g.*, mercury), although the hand was fixed and motionless, placed a sheet of glass between the mercury and pendulum when in motion, and found its oscillations uniformly impeded and at last arrested. Feeling that he had not discovered in the quicksilver the real cause of the motion of the pendulum, he fixed the hand from which it was suspended, instead of merely the arm. The result was that the pendulum did not move at all, whether, or not, the glass intervened between it and the mercury. He justly concluded that an unconscious muscular movement explained the oscillations which had puzzled him, and had a vague remembrance of being in "*un état tout particulier*" when his eyes followed them. He next took the precaution to have his eyes bandaged, and found that this also had the effect of preventing any action of the pendulum.

His careful investigations resulted, therefore, in the conviction that, although a pendulum suspended from the hand

over certain bodies, moves, and performs oscillations which increase more and more in extent, this motion is diminished and at last arrested, if glass, or anything else, be interposed between the pendulum and the body over which it oscillates, with the *expectation* that it will have this effect. Further, it is arrested the moment the hand itself is supported, or if the eyes of the experimenter are bandaged; the reason of the latter being that the guiding sense of sight, so essential to motion when the Will is in abeyance (as exhibited in paralysis), has been taken away.

Nothing can more clearly illustrate than the above experiment the influence of what is popularly called the Imagination, and which resolves itself in such cases into Expectation. It forms an *experimentum crucis* which demonstrates the true principle at work in a large number of the cases given in this book; a principle which, when called by its right name, is by no means to be despised. For the pendulum substitute a limb contracted from functional disorder, and the application of the same law becomes practically useful. The operation of the Imagination is reduced to what we may call simple *imaging*, and can be intensified by other psychical forces.

The sympathy of the whole frame with the prominent ideas of the Mind, by which one muscle or organ, when aroused to action by mental states, excites other muscles or organs, should not be overlooked. The term so applied has the authority of John Hunter, who lays down the law that "every part of the body sympathises with the mind, for whatever affects the mind, the body is affected in proportion" (Works, vol. iv., p. 167). This homogeneity between the actions of the muscles is exhibited whenever one muscle is excited by mental activity. When ideal, it follows the course which would have been pursued in reality. As in presence of an actual scene, so in Imagination, when a person vividly imagines another in danger—say from the fall of a heavy weight—how the entire attitude assumes the form of averting the impending danger! Reason tells him it is altogether useless to move a single muscle, but not only does the law of Sympathy impel him to gesticulate, but forces the whole system into harmonious action—the eye, the facial muscles, the arms, and the legs, are thrown into violent action. When the scene is purely the work of Imagination the effect is ordinarily feeble in character; but when a real scene is witnessed at too great a distance to render assistance, while the horror depicted in the countenance is merely the facial ex-

pression of the emotion, the motions of the arms, trunk, and legs are the automatic representations of the forms they would actually assume if rendering help on the spot. Thus, from the wonderful fellow-feeling established by nature between mind and mind, body and body, or between the various parts of the mental and bodily constitution of an individual, the Imagination, "sending electrical thrills through every nerve of the body," stirs, through the operation of Sympathy, the whole being to its depths; the nearest stations being in communication with the most distant outposts, and the frame changing now with its own and now with another's condition, as reflected in its own chambers of imagery.

The influence of Attention, pure and simple, upon the voluntary muscles (usually muscular sensations) is not so striking as that of some of the foregoing mental states. Directed to the pharynx, it usually occasions deglutition. If we are engaged in swallowing food it does not assist the regular action of the muscles, but disturbs it; the impression made by the presence of a morsel in the gullet, and that derived from the Attention, not being necessarily consentaneous. Attention or the direction of thought to a part does not affect the muscles under the control of the Will so easily as those which are not; and it is the semi-voluntary character of the pharyngeal muscles which renders them, among the striped muscles, the most susceptible to its influence. The muscles engaged in articulation are also markedly influenced by Attention, though not so much so as by Emotion. In the pronunciation of words, the embarrassment caused by too long prolonged Attention to the emphasis and the aspirates is familiar to all; and the only remedy then is to pronounce them with as little thought as possible as to their correct enunciation. Thus, a school-boy becomes frequently "pottered" by the teacher's method of tuition, ignoring the operation of this principle, and the more he is ordered to attend carefully to minute shades of difference in his mode of reading or speaking, the more difficult does it become. In stammering, the influence of Attention is well known, apart from those occasions in which it is mixed up with emotional excitement.

Other examples might be given, but these, with the illustrations already brought forward under Expectant Attention, are proofs of the influence of the Attention, directed in a definite manner. In truth, as regards the voluntary muscles, it almost requires the guiding influence of an expectant idea

to induce any well-marked action. Simple Attention to the finger or the foot seems, however, to render it more difficult to keep it motionless. A certain fidgetiness is begotten in the muscles of the part.

(*b*) *Excessive Muscular Contraction; Spasms and Convulsions.*

Few are the illustrations which will be given of the influence of the Intellect in causing spasms and convulsions. When we treated of the Emotions our cases were abundant, and the difficulty then was in selection rather than collection. A cold and abstract idea, before it generates an emotion, is not calculated to cause excessive muscular contractions.

Mental application, even of a very slight character, may cause a fit of epilepsy. Marshall Hall observes—"Dr. Tyler Smith has related to me an instance of an epileptic girl who experienced an attack whenever she tried to undo a difficult knot in her work, which was tapestry" ("Obs. on Med.," p. 24). Galen mentions a young man, a grammarian, who had epileptic fits whenever he studied hard.

It is, however, when a powerful Expectation is excited that we are most likely to witness spasm or convulsion. To obtain cases in which there is Expectation of the phenomenon only, without the emotion of fear, is, however, a difficult task.

We conclude that in the statement of the French Commissioners on Animal Magnetism that "upon persons endowed with sensitive nerves we have produced convulsions, and what are called crises," the effect was brought about by leading the subjects to expect a certain result. They add, "Animal Magnetism alone, employed for thirty minutes, has produced no effect, and immediately the Imagination has produced upon the same person, with the same means, under circumstances absolutely similar, a very severe and well-characterised convulsion."

The confident assertion that a person (subject to epileptic fits) will have an attack has frequently proved sufficient to produce one. Madame de St. Amour attained great reputation in France within the last half century for the power she exercised over nervous diseases. It is related that on one occasion a young woman was brought to her, when she demanded, "What is your complaint?" "Epilepsy," replied the girl. "Then, in the name of the Lord, have a fit now!" exclaimed Madame de St. Amour. The effect was instantaneous. The patient fell backwards, and had a violent

attack of epileptic convulsions. Without Expectation, the simple thought or remembrance of previous attacks suffices with some epileptics to cause a recurrence of the fit; and still more potent is the recollection of the cause, if the cause has been of an alarming character. Ideal Emotion simply takes the place of the original feeling. In Van Swieten's works is recorded a case of epilepsy which may be referred to this principle; that of a boy who, having been frightened into epileptic fits by a great dog, had a recurrence of the attacks whenever he heard a dog bark.

The mischievous influence of sympathy or imitation is exemplified in the following case which occurred at Lyons. The "Journal des Connaissances Médico-Chirurgicales" (16th February, 1851) treats such occurrences as "excessively rare in the annals of physiology." They certainly are not very frequently reported, but occur more frequently than would be supposed from this circumstance:—In a workshop where sixty women were at work, one of them, after a violent altercation with her husband, had a nervous attack. Her companions pressed round her to assist, but no sooner had they done so than first one and then another fell a prey to the same kind of attack, until twenty were prostrated by it. The contagion appeared likely to spread through the company, but was checked by clearing the room. The reporter in the above journal, in adding that there are few precedents, remarks that history, in fact, scarcely presents more than two, the famous scenes in the Cemetery of St. Médard, and the occurrence in Boërhaave's practice, which is so well known. Illustrations of the pernicious influence of this principle in connection with witnessing or reading the reports of atrocious crimes will occur to the reader, and need not be detailed here, as they do not constitute such good examples of bodily effects from sympathy as those just referred to, though striking evidences of a blind instinct depending for its beneficial operation upon the contest of reason and the moral sense, but, lacking these, leading simply to a mischievous reproduction of acts, the images of which are impressed on the Mind through one or other of the senses. From what but the unreasoning operation of the law, exerted by an association of ideas, could it happen that, when a sentinel of Napoleon's army committed suicide by hanging himself in his sentry-box, several immediately followed his example when they became his successors in the same box? What a practical commentary on this imitative principle of the mental constitution, that, to

prevent further mischief, Napoleon found it necessary entirely to destroy the box by fire. Such facts demonstrate in strong colours the duty of not neglecting the idiosyncrasies of men and women as regards the association of external forms and internal images. Often what we call idiosyncrasies are the workings of a universal principle acting exceptionally in consequence of the absence of certain modifying influences—a principle underlying a thousand acts, unsuspected or unrecognised until exposed by the removal of its ordinary safeguards.

Cases of spasmodic action of the pharynx, more or less assuming the form of hydrophobia, and of mental origin, are more likely to arise from a powerful emotion than an intellectual act, and have been given under that head, but it is important to remark here that, as pointed out by many medical writers, but by no one so forcibly as by Rush, the mere *mention* of water will in a hydrophobic person induce the recurrence of the symptoms. The image—the Imagination—causes the same effect as the attempt to swallow water. Professor Laycock would say that this effect may be produced whether there is or is not an Idea present in the Mind, that is to say, whether or not the changes by which Ideas are presented to the consciousness reach it or not; that which immediately precedes the hydrophobic gasp being the *ideagenous* and *kinetic* changes in the cerebrum. "The cerebral nerves being analogous to the posterior spinal nerves, and the encephalic ganglia analogous to the spinal ganglia, the spectrum of the cup of water will traverse the optic nerves and enter the analogue of the posterior grey matter in the brain, causing changes (*ideagenous* changes) corresponding to the idea of water; thence the series of excited changes will pass over to the analogue of the anterior grey matter, exciting another series (*kinetic* changes), by which the necessary groups of muscles are combined in action." ("Brit. and For. Medico-Chirurgical Rev.," Jan. 1845). Under this section fall those cases of cataleptic rigidity which occur in certain susceptible states of mind from the influence of Expectation. In the following illustration the effect of what is usually called Imagination, and is here synonymous with Expectation or Expectant Attention, is admirably exemplified apart from the particular muscular affection which resulted. "I had heard much," says Mr. Braid, "of an interesting case of a highly susceptible lady, so susceptible to ordinary mesmeric

passes that she might be sent off into the sleep by the most simple attempt to produce it, and so sensitive of the influence of magnets that she was quite uncomfortable if a magnet were near her in any room, and in the dark she could point out any part of the room where a magnet of very moderate power was placed, from her seeing the light it produced streaming all around it. I was kindly invited to spend an evening at this lady's house to afford me an opportunity of seeing and having more particulars of these wonders. I had the pleasure of sitting very near the lady, and of enjoying a long and interesting conversation with her and her husband, and no manifestation whatever took place during the whole time, until after I had explained my views regarding the power of an act of *fixed attention*, directed to any part, in modifying the natural condition of the part so regarded. She was requested to direct her fixed attention to her hand, and watch the result, without anything being done either by her husband or any one else. She did so, and very quickly fell asleep, *and the arm to which she had directed her attention became rigidly cataleptic.*" ("Magic, &c.," 1852, p. 82.) Mr. Braid, it must be added, had a fourteen-pound-lifting magnet, with the armature unattached, in his side pocket next to the lady.

(*c.*) *Loss of Muscular Power; Paralysis.*

The simple belief or conviction that a muscle cannot be contracted or relaxed is sufficient in a sensitive person, or in one in whom this sensitiveness is induced, to cause temporary loss of power. It is referred to the Imagination; in other words, the effort to carry out the desire or will is paralysed by the absorbing conviction that it will be ineffectual. The principle is the same (although the result differs) as that which we have already considered when speaking of the effect of a conviction in inducing muscular action. Dr. Carpenter gives two reasons why an action which can be ordinarily performed with ease may become absolutely impossible—"first, if a man's mind be entirely possessed with the idea of its impossibility; or, secondly, if while his judgment entertains doubts of success his attention be distracted by a variety of objects, so that he cannot bring it to bear upon the one effort which may alone be needed" ("Human Physiology," p. 793).

Professor Bennett records, on Professor Christison's authority, two cases which appear to be illustrative of the influence of a mental state unconnected with emotion or with organic

disease upon the power of locomotion. "The first was that of a gentleman who frequently could not carry out what he willed to perform. Often on endeavouring to undress he was two hours before he could get off his coat, all his mental faculties, volition excepted, being perfect. On one occasion, having ordered a glass of water, it was presented to him on a tray, but he could not take it, though anxious to do so, and he kept the servant standing before him for half an hour, when the obstruction was overcome. In the other case the peculiarity was limited. If, when walking in the street, this individual came to a gap in the line of the houses, his will suddenly became inoperative, and he could not proceed. An unbuilt-on space in the street was sure to stop him. Crossing a street also was very difficult, and on going in or out of a door he was always arrested for some minutes. Both these gentlemen graphically described their feelings to be 'as if another person had taken possession of their Will.' "—("The Mesmeric Mania of 1851," p. 16.)

Dr. Gregory gives the case (a very common one) of Mr. W—, an officer, "biologised by Dr. Darling, whose muscular motions were controlled in every possible way. He was rendered unable to raise his hands or let them fall; he was made unable to move one while he could move the other; unable to sit down or to rise up; or to take hold of or let go an object."—("Letters on Animal Magnetism," p. 353.)

Actual paralysis from hard and prolonged intellectual labour should here be noted as a not infrequent result. In many of the cases which come under our notice there are other causes at work, such as anxiety, disappointed ambition as to literary fame, impecuniosity, &c., and no doubt it would be difficult to find a case of purely intellectual paralysis. At the same time excessive exercise of the reasoning powers must be accompanied by danger. It would be interesting to have some estimate of the number of literary men who succumb to paralytic affections, although, for the reason stated above, it might prove very fallacious.

(II.)—*The Intellect acts upon the Heart and non-striated muscles with a power similar to that which it exercises over the voluntary or striated muscles, causing contraction, spasm, and paralysis.*

The direction of thought to the Heart has, very generally, an embarrassing influence upon its regular action. It is true that emotional states exercise a much greater and more

instant influence; but simple attention to its beats is usually attended by slight, and occasionally by painful, cardiac disturbance.

From the same cause medical students, when their thoughts are directed by their studies to this organ, are frequently sufferers from this disturbed action. Anxiety no doubt comes in here to aggravate the disorder, and has been referred to under Emotion. Peter Frank himself, even when in advanced life, is stated by Romberg to have been attacked while devoting especial attention to the subject of heart disease, during the preparation of his lectures, with such severe palpitations, accompanied by an intermittent pulse, that he felt assured he was affected with an aneurism; the symptoms only ceased after the completion of his labours, and after he had enjoyed the relaxation and diversion of a journey ("Diseases of the Nervous System," vol. ii., p. 6).

It is a common remark that medical men frequently die of the disease to which they have devoted special attention. When the coincidence occurs, the two circumstances are likely to be placed in the relation of cause and effect without sufficient reason. There is nothing, however, improbable in the popular impression; for a very slight symptom referable to the organ especially studied by the physician, would concentrate his attention upon it, and would be likely to aggravate any previous mischief, and in the case of the heart, induce irregular action and ultimately hypertrophy, or some other decidedly organic affection. And yet, probable as this seems, do not a large class of facts appear difficult to reconcile with that supposition? How explain the impunity with which thousands of hysterical persons fancy and firmly believe that they have a particular disease, dwell anxiously upon it night and day, and yet escape without any organic disease whatever? What proportion of medical students have heart disease out of those who, after having their studies directed to cardiac maladies, fancy they are themselves affected? A small one, we believe. Dr. Armstrong said in one of his lectures, "You will seldom be alarmed at hypochondriasis when it occurs in young subjects. I have, since I have lectured here, had the honour of curing some of the pupils of extraordinary and dangerous organic diseases by very slight means. I have cured an aneurism of the aorta by a slight purgative, ossification of the heart by a little blue pill, and chronic disease of the brain by a little Epsom salts."

It must therefore be allowed that while attention to the

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action of the heart embarrasses its action, and while, if disease be actually present, it proves mischievous, there is very little evidence to prove that in a healthy organ it would induce more than functional disturbance.

Blood-vessels.—Sir Henry Holland, in the Essay on the "Effects of Mental Attention on Bodily Organs," observes that he has reason to think that "hæmorrhage (as in the simple case of epistaxis) is often increased by Attention, but whether by excitement to the heart's action or by direct influence on the vessels of the part cannot easily be decided. Stimulated attention, moreover, will frequently give a local sense of arterial pulsation when not previously felt, and create or augment those singing and rushing noises in the ears, which probably depend on the circulation through the capillary vessels."

The singular phenomena of stigmata may be fittingly referred to here, for so far as they are genuine and not caused by mechanical irritation they arise from the mind's influence on the capillary circulation through the vaso-motor nerves. No one has treated the subject in a more luminous manner than M. Alfred Maury, who forcibly observes that ecstatic mysticism, including these remarkable appearances, is the most striking proof of the influence of the Imagination upon the body, and is truly a miracle in the sense of being one of those marvellous effects of the laws of thought, whose secret escapes and whose extent confounds us. He admits the facts of stigmatisation (after making the allowance he considers necessary for imposture and exaggeration), and explains its occurrence, so far at least as the reference of the phenomena to a certain group of psycho-physical facts may be regarded as an explanation, by a reference to the influence of dreams upon the skin. In mentioning those cases in which persons have dreamed that they received blows or wounds, and in the morning have found marks of inflammation on the body, and which sometimes, in the course of a day or two, become ulcers, he observes that just so with visionaries, "under the power of the Imagination, by the concentration of the attention, the blood is directed to the place where they fancy they are affected." ("Annales Médico-Psychologiques," 1855.)

Reference may here be made to the influence of expectation or a dominant idea upon the vessels of the brain in causing *sleep*, and in inducing waking from sleep at a certain time. In many persons, as is well known, and as Sir John Forbes demonstrated, it is only necessary to expect sleep and it super-

venes, while a person impressed with the idea that it will not come may be rendered restless for hours. Dr. Elliotson, in describing a mesmeric case, says, " Mere imagination was at length sufficient, for I one day told her and two others that I would retire into the next room and mesmerise them through the door. I retired, shut the door, performed *no* mesmeric passes, but tried to forget her, walked away from the door, and busied myself with something else—even walked through into a third room; and on returning in less than ten minutes from the first, found her soundly asleep, and she answered me just as was usual in her sleep-waking condition" (" The Zoist," 1846, p. 47). The expectation that a hypnotic effect will be produced by a pill often succeeds when it is perfectly inert; but still more remarkable, the effect of a purgative pill has been rendered *nil*, and comfortable sleep induced in the place of insomnia, by the belief that an opiate has been administered. Such a case is related by Dr. Noble, the pills consisting of Ext. Col. co., gr. viii., and Calomel gr. ij! It is not more remarkable that a person's cerebral vessels should from this cause be affected, through the sympathetic, than that he should faint. The expectation of sleep, or supposed inability to remain awake, acts, as in other cases, by paralysing the normal inhibitory influence, which, according to Mr. Moore's ingenious theory, is at work when we are awake, and so allows the unrestrained action of the cervical sympathetic ganglia by which the arteries of the brain are contracted, the amount of blood lessened, and unconsciousness induced. Apart from expectation, mental activity causes sleep only when carried so far as to cause fatigue.

On the other hand, what is called " waking at will" must be referred to the influence of an expectant Idea as much as going to sleep. Most persons can ensure waking in the morning at a certain hour, by strongly fixing the attention upon the time desired, just before falling asleep. This affords an excellent instance of mental activity, without the person being conscious of the process, he being in fact asleep at the time the latent idea comes into operation. This familiar fact involves an automatic calculation of the lapse of time. The Fakir before passing into his hybernating trance determines when he shall awake, and strongly impresses upon his mind the day or even the hour when he shall revive; and revive he accordingly does. The late Sir James Simpson, at a meeting of the Edinburgh Medico-Chirurgical Society, referred to a striking case witnessed by three physicians, in which a person

"biologised" was commanded to sleep thirty-five hours, and did so, "with two short intervals of permitted awakening" ("The Monthly Journal of Medical Science," 1847, p. 486).

In this connection it may be observed that it is often much easier to act automatically, in getting out of bed, when tempted to indulge in further rest, than to bring the Will to act upon the muscles. I wake from sleep, and wish to rest. Reason strongly urges the act. The Will fails; not a muscle moves. Now, if I cease to endeavour to excite movements by volition, and divert my mind to another subject, I find that while thinking of something else, I am on my feet. A parallel case is the ease with which we often remember a circumstance or a name by not thinking of it, but of another matter, after fruitless efforts to recall it by the Will. As I write, a little boy vainly endeavours to remember the tense of a Latin verb. I make him change entirely the current of his thought, and suspend the action of the Will; and the forgotten tense comes back to his memory by automatic cerebral action—the "unconscious cerebration" of Dr. Carpenter. In Macgregor's "Thousand Miles in the Rob Roy Canoe," occurs an incident which will illustrate the same principle. He says, "when on the Meurthe three women were seen on the bank of the river, in great alarm, who searched in vain for two boys supposed to have gone away to fish, but missing for many hours." They eagerly asked Mr. Macgregor to tell them whether he had seen them, and implored him with tears to advise them what to do. "I tried," he says, "all I could to recollect; but no! I had not seen the boys, and so the women went away distracted, and left me sorrowful. But *suddenly*, when toiling in the middle of a very difficult piece of rock-work, lowering the boat [and therefore no longer trying to remember], *I remembered having seen those boys*, so I ran over the fields after the anxious mamma, and soon assured her that the children had been safe an hour ago." Such are the involuntary operations of the cerebrum, when assisted by the suspension of the will, as exhibited in these instances; and still more strikingly when in sleep, this unconscious activity, working to a definite end, produces those changes in the relative force of the sympathetic ganglia and the cerebro-spinal system by which the brain is restored to its waking state. Dr. Cuthbert, in a letter to the "Medical Times and Gazette," November 5th, 1859, on the Ulster Revivals, observes in regard to this subject, that "one of their most remarkable endowments

was the power of producing sleep, and of awaking at a specified time."

Œsophagus, Stomach, and Intestines.—The rejection of the contents of the stomach from a purely mental state is well exemplified in an experiment made upon 100 patients in a hospital, and reported by Dr. Durand (de Gros) in his able work "Essais de Physiologie Philosophique." The house surgeon administered to them such inert draughts as sugared water; then, full of alarm, he pretended to have made a mistake in inadvertently giving them an emetic, instead of syrup of gum. The result may easily be anticipated by those who can estimate the influence of the Imagination. *No fewer than* 80—four-fifths—were unmistakably sick. How many of the rest suffered from nausea is not stated. We need not approve of the deception of the *infirmier;* but, the experiment having been made, it is a pity so many people should have been rendered miserable, without good use being made of their discomfort. In regard to misleading patients generally, even *causâ scientiæ*, one of the practical difficulties which the investigation into the influence of the Imagination presents, certainly is the unseemliness of making experiments of this nature, and the danger of sullying that strict honour which by no profession is more prized or maintained than by the professors of the medical art.

The most trivial matter attaches certain ideas to certain places, persons, and especially articles of dress, to which they cling with a tenacity which is truly surprising, unless the influence of the association of ideas and the automatic action of the brain be considered, and when the image called up is disagreeable, it will haunt the mind grievously, and may at last cause acts over which the will has no longer any control, and which are those of a madman. Locke calls the association of ideas a disease of the understanding, and it may certainly prove as mischievous in inducing bodily and mental diseases, as it is pernicious in the employment of the reasoning powers, and the search after moral truth.

Van Swieten says, "I have seen a man who had taken a sufficiently nauseating draught, not only shudder and be nauseated, but also be frequently purged when he merely saw the cup in which he had taken the medicine;" and adds, "Sic sola idea fastidiosi remedii renovata purgantis pharmaci vices supplevit, et totum corpus turbavit." He compares this to our thinking of sadness or even feeling sad when we merely

see the *word* sadness, although it has only an arbitrary connection with it.

The efficiency of an ideal purgative in exciting the peristaltic action of the intestines has been already incidentally referred to; the following case well illustrates it, and is the more valuable from being the personal experience of a medical man:—

"Dr. S. all his life had the greatest horror of taking medicine, although fully admitting the beneficial and necessary effects of it, and constantly prescribing it judiciously for others; he consequently never took it. After a certain period of life, however, he began to experience a torpidity of the bowels and all the consequent uneasiness, rendering it apparent to himself that relief could only be obtained by the means he prescribed to his patients, namely, the taking of medicine. After due deliberation, accordingly, and conflict with himself, he decided upon taking some, and imagining that an ordinary dose of salts would answer all the purpose, and be less nauseous than most others, he carefully mixed one and laid it by his bedside at night to be taken in the morning when he first awoke. The proximity of it, however, and the impression on his mind of the horrible dose which awaited his first waking, banished sleep from his eyes, and kept it continually before him. At length, however, he did sleep, and even then the vision did not leave him, but like the haunting phantom of the roasting pig to the slumbering glutton, it assumed various guises and positions to his mind, the difference alone being that his was more purely imaginary, as he had not swallowed the cause of the mental disturbance, which the other had; but suffered from the anticipation. At length, however, he awoke, and so far from requiring the prepared medicine, found all occasion for it removed by an effort of nature, and from that time he declares that he has nothing to do when suffering from torpid bowels but to lay a dose by his bedside at night, and that it as effectually acts as if he had swallowed it" ("Medical Essays," by Dr. Sealy, p. 64).

(To be concluded in the next Number.)

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