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Psychical Reflexes:

a Study in Cerebro-mental Physiology and Pathology.

A Thesis for the Degree of M.D.

by

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Within recent years many subjects have been studied and discussed by the medical profession which in former times had not due attention paid to them. Insanity, Nervous Diseases both functional and organic, &c., have received much attention and the study of them has done much to elucidate the true nature of mind. Hypnotism, although known to the ancients, was left entirely to charlatans or at least to persons quite unqualified to make scientific enquiries into such a difficult subject, with the result that science did not benefit by their experiments which resembled the performances of jugglers and acrobats rather than the philosophical researches of scientists. Nothing could be expected from such exhibitions and accordingly the subject fell into disrepute, till Braid, Elliotson and others investigated this highly

interesting condition. Many true and able observers — and I would particularly mention Charcot — have since written on the subject with the result that now it is used as a therapeutic agent. By confining my attention to hypnotism alone I could have proved the existence of the reflexes I wish to treat of as its sole powers rest in the influence the mind has over the body, "the mind gradually passing into a state in which, at the desire of the operator, portions of the nervous system can be exalted in a remarkable degree, and others proportionally depressed; and thus the vascularity, innervation and function of an organ or tissue can be regulated and modified according to the locality and nature of the disorder." (Tuke in Quain's Dict. of Med. p. 132.)

The subject, however, is still to a certain extent shrouded in mystery, and I hope to find matter for this dissertation in manifestations which are more apparent. We must, however, traverse debatable ground as a proper treatment of the matter entails a certain amount of theorizing, and even in the most carefully constructed argument there must of necessity be many a breach owing to our utter want of knowledge; but it is with facts more than theories that I would seek to deal. I consider it important to view all symptoms as much as possible from the patients standpoint, and although they are often vague and indefinite - and they are so in a superlative degree in some of the complaints referred to - I hold that they are worthy of our thoughtful consideration

that we may thereby explain them, or if we cannot account for them, to give relief to the sufferer.
But although the study and investigations of many careful scientific observers have greatly increased our knowledge in the domain of cerebro-mental physiology and pathology — and great advances have been made by the localizing of centres in the brain, by experiments during life and post mortem examination, and by magnificent work in brain surgery — there are still mines of discovery which are unexplored. Speaking figuratively I cannot hope to open up a new seam but shall simply endeavour to consider a subject which has not had so much attention given to it as I think it deserves, and which is of interest to every practitioner. Many difficulties present themselves for we are led to the "confines between"

mind and body, and, there being no line of demarcation, we must at times consider bodily ailments or disordered functions whilst again we must confine our attention to matters purely psychological. Although the "mens sana" as well as the "Corpus sanum" is requisite to make a truly healthy individual we must not materialise the mind and look upon it as an entity distinct from the body. Anatomy, physiology and pathology all point to the brain as being the chief seat or organ of all the mental processes. This tenet was first asserted by Galen and is now generally maintained, but mind itself is an abstract conception like sound or heat. I cannot enter into a metaphysical discussion as to its true nature, for it were useless for me to attempt to define that which

has baffled the greatest philosophers, but I shall content myself with the generally accepted idea of the term as one which is "conveniently used to designate a set of complex psychological energies. It comprehends volition, reason, affection &c., phenomena which are inseparably associated, so far as we know, with a material organisation." Till we get a fuller grasp of what mind really is we shall never be able to understand its workings but our ignorance need not deter us from considering the facts which are evident and drawing our conclusions from them. There are mysteries in every science and the "ultimate truths" are to the most ardent seeker unknown and practically unknowable but the truly scientific spirits of all ages have gone as deeply into their

subjects as they could get and thus have paved the way for future observers. The study of mind is a deep one and of its relation to the body deeper still but "the observational and only genuine study of mind - not the mere reading of metaphysical books and knowing the endless theories of mind but the true study of its phenomena - has always seemed to us (speaking quâ medici) one of the most important, as it certainly is the most studiously neglected, of the accessory disciplines of the student of medicine." (John Brown. M.D "Locke and Sydenham" p. 38.) In this spirit I would seek to consider certain phenomena and write down some ideas on what is to me an interesting subject. For its proper comprehension it is necessary at the outset to look for a short time at what certain

metaphysicians and philosophers have said on the subject of mind. Herbert Spencer says, "Though accumulated observations and experiments have led us by a very indirect series of inferences to the belief that mind and nervous action are the subjective and objective faces of the same thing, we remain utterly incapable of seeing and even of imagining how the two are related. Mind still continues to be a something without any kinship to other things; and from a science which discovers by introspection the laws of this something there is no passage by transitional steps to the sciences which discover the laws of other things." ("Principles of Psychology" Vol I. p. 140.) Nor shall I attempt to bridge over the chasm between mind and matter, for the task would be impossible, but shall endeavour to consider

their reaction one upon another as evidenced more especially in certain disordered functions and diseased states of the bodily organization. To continue our definitions as advanced by philosophers, Sir Wm. Hamilton puts it thus;- "Mind can be defined only from its manifestations. What it is in itself, that is apart from its manifestations, we philosophically know nothing, and, accordingly, what we mean by mind is simply that which perceives, thinks, feels, wills, desires &c." It is with a few of these manifestations as evidenced in the body that I wish to deal. As a last definition I give that of Reid;- "By the mind of man we understand that in him which thinks, remembers, reasons, wills. The essence both of body and mind is unknown to us."

But although the substance of mind is unknowable its manifestations are very evident and it does not require much observation to make us aware of the fact that mind and body mutually react on one another. Having looked very shortly at the nature of mind it is now necessary to consider in few words the wonderful organ which is the material representation, so far as we know, of all mental processes, and to refer very briefly to its connections. The brain is in reality a congeries of organs although it is customary to refer to it as one. For me it is only necessary roughly to divide it up into its component parts, referring to those which have a bearing on our subject. In the central organ of the nervous system sensations of all kinds are felt and

from it (including the medulla) emanate all those forces which are necessary for life. As we rise in the animal scale the frontal lobes gradually enlarge till they reach their maximum in man, and this fact, combined with the effects of injury and disease, has led us to regard them as the seat of our higher intellectual and moral faculties. They are the chief material representation of these faculties but we cannot exclude the other parts of the Cortex and, according to some authors, the Cerebellar hemispheres. (Gowers. "Dis. of the Nerv. Syst." Vol II p. 59.) I would sum up all the information we have on this difficult subject in the words of Foster;—"All our knowledge goes to shew that psychical processes are dependent on, or are in some way associated with the Cortex; but whatever classification of psychical functions we adopt,

we are wholly unable to make out any localization of functions, such as we can make out for movements, visual sensations and the like. Even taking the broad and elementary division into "the emotions" and "the intellect" we cannot satisfactorily allot either division to any particular part of the hemispheres." ("Text Book of Physiology." pt. III. §690 p. 1114.) The motor centres have been carefully mapped out by various observers and there is now no doubt as to their situation in the ascending frontal and ascending parietal convolutions around the fissure of Rolando. The only special sense I refer to is vision, and its centre is in the occipital lobe. Between the various centres there is a network of innumerable nerve fibres: we may mention "association" fibres which in each hemisphere pass

from one part of the cortex to a neighbouring part, "commissural" which unite corresponding points in the two hemispheres, and the fibres which descend from the Cortex to the pons, optic thalami, Corpora striata, medulla oblongata and spinal Cord. It is unnecessary for me to tabulate the many centres located in the medulla and only mention the Cardiac for accelerating and inhibiting the action of the heart, the former through the Sympathetic, the latter through the pneumogastric, and the great Vaso-motor centre which regulates the calibre of the vessels throughout the body. And I here note that "modern observations would seem to show that there is another vaso-motor centre in the cerebral cortex but its exact situation and the nature of its relations with the medullary centre are as yet uncertain." (Bastian in Quain's "Dict. of Med." p. 960.) In the Cord there

are a series of reflex centres which are inhibited by higher centres in the cerebrum, and also centres which govern organs which are controlled by the sympathetic, e.g., the bladder. It is hardly necessary to state that there are nutritional centres in the anterior cornua, and that sensory impressions are conveyed to, and motor impulses from the brain through the cord. To complete this very rough sketch of the nervous system it only remains to say that the vagus along with the sympathetic forms the visceral plexuses and thus connects the latter with the brain, and that the sympathetic is in direct connection with the cerebrospinal system throughout the whole length of the cord. The vaso-motor nerves are sympathetic but they are controlled by centres in the cord which, in turn, are subordinate to the great centre in the bulb already

referred to. It is customary to speak of the sympathetic as a distinct system but studied from the developmental point of view it is seen to be "an outgrowth of the cerebrospinal nervous system." (Quain's "Elements of Anatomy." 10th Ed. Vol I. pt. I. p. 81.)

Having discussed these points as a necessary introduction I must now proceed to define my subject which is an attempt to analyse the effects of mind on the bodily structure as evidenced more especially in certain disturbed states. In endeavouring to discuss this reaction we must theorize to a certain extent but I think we may safely say that mental activity is accompanied by or causes an infinitesimal decomposition of cells in the grey matter of the cerebrum, which destruction is restored by the blood during the ensuing period of repose.

When compared with other physiological processes the likeliest explanation is that some molecular chemical change takes place but the actual waste and repair cannot be demonstrated. But "it is only by supposing an idea to be accompanied by a correlative change in the nerve-cells that we can explain the bodily exhaustion which is produced by mental labour and the breaking down of the brain under prolonged intellectual efforts." (Maudsley. "Body and Mind" p. 284.) The fact that the mental state influences the body requires no proof as it is only too evident by the effect of, e.g., bank failures, business worry, domestic trials &c., which are undoubtedly potent causes of many troublesome and distressing complaints, but the method of its action has not yet been properly elucidated.

The symptoms are most marked in 'nervous' individuals but the fact that they occur at all is sufficient excuse for our considering them. In health and disease there is a constant interaction of mind on body and of body on mind. When the bodily functions are in perfect order they have an exhilarating effect on the mental state making the very fact of existence a delight; on the other hand chronic dyspepsia, for example, in many cases makes the sufferer feel life a burden. In like manner when the mind is diseased or exhausted the body suffers.

On account of this mutual reaction it is often very difficult to decide wherein lies the primary cause of the mischief and we must

therefore beware of the "post hoc ergo propter hoc" argument in our dissertation.

Reflex action has a specific meaning in physiology; I do not however, wish to discuss this technical signification of the term but shall use it in its wider import. In the common acceptation it is the involuntary result of a physical stimulus applied to the skin, the impression is carried along certain afferent nerve fibres to a centre in the cord and is there 'reflected' on the efferent fibres which, in turn, excite, in the case of a motor reflex, the co-ordinated groups of muscles to which they are distributed: in other words the sensory impulse sets up changes in the centre resulting in a liberation of nervous energy and thence impulses

are carried down a motor nerve, E.g., the "plantar reflex." It is needless, however, to consider in detail reflex action as it is usually understood. Although it may not be strictly applicable to every example quoted I think that on the whole it aptly explains and defines the subject under consideration. Outside the bounds of physiology there are reflexes some resulting from a physical others from a psychical stimulus. Of the former we observe in practice the influence of various diseases or disturbed states of, E.g., the abdominal organs on the mental state of the patient, by reason of the close relations which exist between the sympathetic and cerebrospinal systems, the plexuses formed between them and the direct connection of the whole with the great

central organ of the nervous system. The reflex effect of the liver in this way is universally recognised; "uncomfortable thoughts" are presented to his mind; he becomes fretful and peevish, a trouble to himself, and, if he be not trained to exercise a moral restraint over his thoughts and actions, a trouble to everyone about him." (Sir B. Brodie.) There are other two bodily ailments which have a very decided effect on the patients' mental state — phthisis pulmonalis and cardiac disease. The consumptive as a rule takes a bright view of things as far as he himself is concerned and thinks that if he had only a little more strength he would be quite well. This hopefulness about his own condition I have observed to be accompanied by great irritability should anything be said to displease the patient.

In many cases of cardiac disease, on the other hand, the patients take a gloomy view of their condition and become very depressed. But it is the other side of the question I wish to discuss— reflexes resulting from psychical stimuli. We cannot as in the case of an ordinary physiological reflex action trace them along certain conducting fibres to a centre and thence by the centrifugal fibres to the surface where the effect is evidenced but they nevertheless lead reflexly to results which are involuntary and I think on that account may be applied to them the title I have chosen— Psychical Reflexes. I thus take liberties with the term but hope to prove my point as we proceed, shewing that such reflexes really do exist and that by recognising them as factors in the production

more especially of vague and indefinite functional complaints but also as worthy of our consideration in the aetiology and progress of grave organic diseases we may manage to account for symptoms which otherwise we might ignore as being altogether imaginary. To put it briefly, I take as the stimulus something which acts on the patient's mental state, this, as we have tried to point out, causes some minute change in the central nervous system which in turn gives rise to results which are involuntary and, to all appearance at least, reflex. Such a reflex is often evidenced in health for is not the mere thought of a good dinner sufficient to cause a flow of saliva into into the mouth of the hungry man? Blushing is another example of the same thing. The fact that labour pains sometimes

cease when the doctor appears and become much worse when the forceps are produced must also be explained in the same way. The emotions may increase or lessen the secretions and excretions, and, as examples, I may quote the flow of tears from grief, the sweating resulting from fright, the diarrhoea and micturition which may occur from excitement, and the retention of urine and Constipation commonly met with in hysteria. I think that these may all be justly considered as psychical reflexes, but we must now look more carefully at one or two examples of functional derangement and actual disease which may result from such action. Many and varied states might be included under the category but I shall not attempt a classification of all the abnormal

conditions which might result, preferring rather to indicate the mode of action by reference to a few cases which I have observed and for which no other cause could be detected. I would not seek to call the disordered functions or diseased states themselves psychical reflexes but think they may fairly be looked upon as resulting reflexly from the effect of the mental state on the body. There is no doubt that in many cases there is an inherited predisposition, the patients being of a 'nervous' temperament and the controlling centres being in a more 'touchy' state than normal, with the result that a violent emotion or prolonged anxiety acts like a spark applied to combustible material. Although the majority of cases thus belong to the class which nowadays we designate 'neurotic' the fact that they are our

patients forces us to enquire into and, if possible, elucidate the true nature of their Complaints, for we can no longer regard Symptoms as mythical simply because they are ill-understood. Mental Strain or Worry - avoidable or unavoidable - must lead in time to an exhaustion of the higher centres of the Cerebro-spinal System. It is a well-recognised fact that this System inhibits the Sympathetic, when, therefore, the Central System is to a certain degree worn out - for our supply of nervous energy is limited - one would imagine that this inhibitory power must be lessened, the result being that the sympathetic exhibits a morbid activity: by-and-by this System becomes exhausted and the Symptoms have developed into those of a chronic malady. In other words, the excessive brain-work, which Worry &c necessarily involve, has

had a deleterious effect on the higher centres, the nerve Control over the other bodily organs is thereby interfered with, influencing in the first place their innervation and nutrition and resulting in distinct disease. Frequently the connection between the emotions and the symptoms which have subsequently developed is a mere supposition on the part of the patient or his relatives but there is undoubtedly a class of cases of very frequent occurrence which, after the most careful examination and cross-examination, we must admit results from causes purely mental. Doctors are often consulted by individuals who have no actual disease but there must be a slight defect somewhere or they would not come to us. Their symptoms are Entirely of the mind and drugs per se will have no effect on them;

they merely want a few lessons on the fundamentals of health, instead of being told that there is "nothing" the matter with them. In others again this excitable mental state has a debilitating effect on one or other of the bodily functions. Under this division observation leads me to hold that the sexual organs are very commonly the seat of Complaint. We are frequently meeting with cases in which the individuals are quite unable to perform the sexual act. Three cases in particular present themselves to my mind - Young men between 25 and 30 years of age and, to all appearance at least, in rude health. Examination revealed no organic mischief whatever: the generative organs were well developed, the body muscular and vigorous, in fact the only symptom Complained of was their impotency. I have just finished the examination of a

patients urine. He called with it to-day (20th Aug. '96.) and asked me to examine it carefully as he was sure he passed semen with his water and has broken off his engagement as the idea that he is impotent has rooted itself on his mind. (Five coverglasses revealed no spermatozoa but it is interesting to note the presence of oxalate of lime crystals: this salt is commonly present in 'nervous' cases but whether it is the cause or the result of the symptoms is still sub judice.) This patient is to all appearance as healthy and robust an individual as one could imagine, and yet he has this 'skeleton in the closet'. He was led some months ago to try illicit intercourse, the excitement was too much for him and he failed entirely. Surely all such cases must be considered as psychical reflexes. True it is that judicious

and careful questioning brings out the fact that a large proportion of such cases have indulged in the vice of masturbation at one time or other, but unless the mental state is a very important factor in the case why does this form of impotency not occur in those who have indulged to an even greater extent in venery? Erection is really a reflex act the centre for which is situated in the lumbar enlargement, and, like all other reflex centres, is controlled by a higher centre in the cerebrum. Experiments and the effects of disease have placed these facts beyond all doubt. What change actually takes place in the higher centres cannot be demonstrated, but it seems clear that the excitement and mental agitation so affect them that their inhibitory power is increased for the time being, and the impotency we are considering

is the result. The higher centres in the cortex with which we associate mental processes have a powerful influence over the reflex centre in the cord as is evidenced by the effect of sensual thoughts. Now if we look upon the inhibitory centre in the brain as subsidiary to these higher centres we can imagine its excessive action when the others are disturbed by emotional excitement. From our youngest days we as individuals go through a long process of training to control our emotions. The child, E.g., shows its grief in tears whereas the adult controls these outward signs, the higher centres in the Cortex having been taught to inhibit the lower. Fright or excitement oust reflection with the result that the Controlling power is removed, the inhibitory centre acts excessively and for the time being the reflex centre

in the cord is in abeyance. This, I argue, is the cause of the temporary weakness in the class of cases mentioned. This argument is further strengthened by the fact that in such cases powerful erections occur during sleep: the functions of the brain are then in abeyance whereas those of the cord are more active than during waking hours. A moral lecture and a plain talk on the elements of physiology are very important factors in the treatment of such cases. Having gained the patient's confidence we must clearly point out that the symptoms are greatly due to his excited mental state and thus endeavour to re-educate and strengthen the higher centres. In one case in which the result was good I gave large doses of Tinct: Nucis vom: (m XV) and Liq: Sulph: (gr IIIp) three times a day but hold that the disappearance

of his symptoms was greatly due to the educational talks we had together. Perhaps I take credit where no credit is due as nature may have righted herself - as she does in the case of aphonia in the man who for the first time faces an audience - but I have stated the facts as they occurred and think my argument, as to the causation at least, is logically correct. Let us now turn our attention for a short time to another troublesome complaint which one often meets in general practice and which, in my opinion, is in many cases the result of a psychical reflex, to wit, Insomnia. Sleep of itself is a very mysterious and inscrutable state but is nevertheless one of the chief functions of our nature. No individual could possibly go in for continuous muscular exertion as, after a certain point,

fatigue results from the oxidation which has taken place and the accumulation in the muscles of chemical compounds; motion and rest must alternate to ensure a healthy bodily frame. What applies to the body applies also to the mind, and during sleep the mental functions are suspended, an abundant supply of new oxygen is taken into the system, and the changes necessary for the restoration of the brain are going on. We have all felt tired and inclined to "steep our senses in forgetfulness" when some sudden excitement or alarm has restored us to absolute wakefulness and no effort of will could bring sleep back to us till some time had elapsed. On the eve of an important engagement involving, it may be, far-reaching consequences or of some critical situation in

life's history the majority of mankind find it difficult to sleep as is their wont, and among brain-workers a very common complaint is their sleeplessness. It is not for me to treat in detail of the causes of sleep but it is evident that more than one element must be recognised as taking part in its production. The amount of blood in the brain substance is lessened; it has not, however, been proved that sleep is due to the anaemia for we must also consider the presence of waste products the result of the molecular changes that have been going on during waking hours. We cannot sleep if there is active Congestion and therefore look upon anaemia as one of the essentials. The old aphorism, "ubi stimulus, ibi affluxus," may be applied to the brain for every mental effort causes an increased flow of blood to the

cerebral hemispheres and thus sleep is prevented. Within certain limits this is the natural state of affairs but if anyone indulges in brain-work to an unreasonable extent wakefulness may become a pathological condition. Sleep has been inhibited by the continued mental strain and a tendency to, or capacity for being awake would seem to have resulted reflexly, I hold, from the frequent repetition of the inhibition of this natural function. After a prolonged spell of night-work we have experienced this - although lay friends frequently inform us that we become "accustomed to it." In a certain sense this is true but mental work at unreasonable hours may be overdone and thus is established another custom - that of involuntary wakefulness - which in many cases is not easily broken. But the trouble does not stop here for, being deprived of the

restorer nature has provided for our jaded frames, the whole system in time suffers, weakness and nervousness result and in their wake follow it may be grave organic diseases. Insomnia may undoubtedly be but a symptom of some other complaint or may result from the general nervous breakdown which I have described as following it, but there are cases in which it is at first the only symptom present and thus resolves itself into a disease by itself so far as the individual sufferer is concerned. It might be argued that continuous mental work and worry, more especially at unseasonable hours, has had a deleterious effect first of all on the body and ~~that~~ the insomnia resulted therefrom, but there is a type of case in which at least the patient's first complaint is his wakefulness and after suffering from this for some

time the other symptoms appear, and in such I argue that it is due to the reflex action we are considering. Still another example; showing an inhibition of one of the special senses. My attention was called to the case on which I base my notes by one of the Surgeons when working in the London Ophthalmic Hospital. A little boy was led into the receiving room and was said to be blind. The external appearances revealing nothing to account for the amaurosis complained of he was taken into the dark room and submitted to a careful ophthalmoscopic examination but the appearances were perfectly normal. After the examination he thought he could see a little better and he gradually got well. Many would be inclined to call such a boy a young swindler and order a certain form of heroic

corporeal treatment but such is an erroneous view of the case and the explanation which seems to me the correct one has a distinct bearing on our subject. This form of amaurosis usually occurs in young children after a prolonged attack of some disease affecting the eye or its appendages, e.g., Conjunctivitis with Spasm of the eyelids. The act of vision in such cases increases the pain and discomfort and naturally the child shades the eyes and tries not to see. To quote from an author, "the view (Leber. Uhthoff) which represents it as having a central cause is probably the correct one. It is likely, at this tender age when the psycho-physical processes are not yet firmly established, that the desire not to see, and the active withdrawal from the act of vision, leads in a short time to a functional paralysis of the visual

centres in the brain; and that these take some time to recover, or to re-learn their functions, when the ground for the suspension of the latter has ceased." (Swanzy. "Handbook of the Diseases of the Eye." 4th Ed. p. 131.) Such forms of amaurosis are of temporary duration and all tend to get well but in the case mentioned the bright light from the ophthalmoscopic mirror no doubt revealed to the little patient the fact that it was possible for him to see and he thought, perhaps, that something wonderful had been done to restore his vision. The visual centres in the occipital lobes and the higher centres which represent all mental efforts, and which are associated more or less with the whole cortex, usually dwell together in unity and act in concert, and it seems to me within the bounds of reason to suppose that a disturbance in one might lead in time to an

abnormal action in the other. Such cases are of course quite distinct from Psychical or Soul Blindness in which the patient can see perfectly well but cannot recognise a given object. These cases are always the result of definite injury or disease. (e.g. Macewen. British Med. Journal. Aug. 11. 1888.)

Having mentioned these inhibitions of function and special sense as examples of our subject. I now venture on still more debatable ground when I pass to the consideration of another trouble of common occurrence and for which there is often no apparent exciting cause but psychical disturbance. Chorea is most commonly seen in poor, underfed and anaemic children brought up amidst hygienic surroundings not of the best and is therefore one of those troubles not infrequently brought under the notice of the young practitioner. Since first

considering my subject I have endeavoured to enquire carefully into the cause of every case brought under my notice and making due allowance for the fancies of parents and guardians it seems to me beyond question that many cases are called into being by sudden fright or alarm. Reference to the writings of authorities on the subject reveals the fact that most observers are at one on this point although it has also been suggested that the child is easily frightened because of the illness beginning. (Finlayson. 'Clinical manual.' 3rd Ed. p. 254) In his brochure on Chorea Dr. Octavius Sturges affirms that 'fright or some nervous shock or strain is by far the most frequent cause of the disease, and states that 'two-thirds of the cases analysed were due to fright or something allied to fright.' We are therefore dealing with a bodily disease shewing very marked

symptoms, the chief being involuntary spasmodic muscular movements, resulting from a psychical stimulus which has set up certain changes primarily in the central organs of the nervous system, and this must be our excuse for its consideration here as a full discussion of the disease would take us altogether beyond the bounds of our subject Many different factors must be taken into account when considering the etiology of chorea and they all play their part but I wish to emphasise the fact that the mental exciting cause is all important and not to be ignored. Heredity undoubtedly influences its development and we must also note its connection with acute rheumatism and an inflamed endo-cardium but even in the cases in which there is evidence of rheumatism and cardiac disease violent

emotion is the common exciting cause. I here note that it is stated by Gowers regarding the class of cases which I have had no opportunities of observing - Gestational Chorea - that fright, or some other distressing emotion, is the apparent exciting cause of the disease in about the same proportion as in the Chorea of earlier life. (Dis. of Nerv. Syst. 2nd Ed. Vol II. p597.) The pathology is an extremely interesting though difficult problem to solve. Different theories have been advanced and various opinions are held, some looking upon it as a mere functional derangement, others again would ever suspect the presence of multiple emboli, whilst it is held by some to be an infective disease due to micro-organisms. The bulk of evidence seems to shew that the likeliest explanation is that the symptoms are due

to the presence of an irritant in the blood." (Coats Manual of Pathology. 2nd Ed. p. 557.). Gowers sums up our present knowledge thus:- "The hypothesis which seems best to explain the facts is the old theory that the common cause of the endocarditis and the chorea is a blood-state allied to, but not identical with, that which causes acute rheumatism. According to the precise nature of the blood-change, chorea or acute rheumatism or both, with or without endocarditis, may be produced. The facts of these diseases suggest a toxic change of a chemical character, rather than an organised virus. ..... The hypothesis suggested by the facts of the disease is that a special influence is exerted on the motor elements of the Cortex, deranging their function and producing a disturbance of their nutrition, which, once excited, runs a certain course, varying in

severity and duration, but tending to subside" (Loc. cit. p. 617.) The changes which are found post mortem may, in the generality of cases, be accounted for as the result of mental shock. It is generally a disease of childhood and in children, as already mentioned, the emotions are very powerful. The close association of the centres with which we are accustomed to associate the Emotions and the intellect, and the motor Centres would lead us to suppose that a disturbance in one would cause an abnormal action in the other. That some minute change takes place is, I think, evidenced by the fact that a few days usually elapse between the exciting cause and the appearance of the symptoms. It is but mere speculation and perhaps a weak and untenable theory at best, but being impressed with

the fact that mental emotions have a very powerful effect on the body, it seems to me not improbable that, given a case in which the 'original vital endowment' of the child predisposes to the disease and the peculiar blood-state that would seem to render the patient susceptible of it, given we might say a suitable soil for its growth, the fright may be quite enough to set up the chemical change - ill-understood and no doubt hard to comprehend - which leads to the development of the other symptoms. Chemistry teaches us that it takes but little entirely to alter certain compounds; if an electric spark is passed through water it is decomposed into its constituent gases, phosphorus ignites on the slightest friction on account of its great affinity for oxygen, and potassium when

thrown into water immediately unites with the oxygen and the heat of union is so great that the hydrogen takes fire. The experimental physiologist finds that, e.g., the oxidations which are constantly going on in the body take much longer time and require much higher temperatures when carried out in the laboratory. We know that during muscular action chemical changes take place and it is not beyond the bounds of reason to suppose that mental efforts also cause a molecular chemical change. The brain is a living and highly complex chemical compound, which very complexity would render it chemically easy of decomposition. The higher centres in a fit subject for the development of chorea are in an unstable state, their relations must be easily altered and, be the pathology what it may, the fact remains that

a psychical disturbance is sometimes the exciting cause and that being granted I think that therein we must seek to find an explanation. If there is anything at all in maternal impressions - I do not refer to those that smack of the marvellous - any influence from the mother must be carried to the foetus by the blood there being no other medium through which it could be conveyed. It appears to me impossible that the imagination of itself or a mental emotion could have a direct effect on the body but it seems clear that these have a powerful influence on the higher centres and in some unknown way affect the blood itself. We know that there is the most direct connection, structurally and functionally, of every organ and of every tissue with the brain convolutions, each

being separately "represented" there, and that their influence is mutual, powerful and constant. (Clouston "Mental Diseases. 3rd Ed. p. 13). That being so and remembering that the brain is the material representation, so far as we know, of all mental processes, and although the minute Chemical action is in the present state of our knowledge unknown to us, the effects and results being evident we must I think, take for granted that some such change actually does take place, for "where we can have no certainty we must be content with probability, or relinquish all attempts to know." We are too apt to look upon mental influences as something mythical and imaginary, but when we consider the other stimuli which affect the body are they in any way more material? Cold, heat, light,

electricity &c, are all abstract conceptions and yet we fully recognise their effects, and just because it is impossible for us to conceive what mind is we tend to forget its very powerful influence. When speaking of reflex action in general I mentioned as an example the plantar reflex; a manifestation of the effect of a physical stimulus is here made clearly perceptible by the muscular movements which result. The transformation of potential into kinetic energy necessitates a chemical change; psychical impulses may release energy, and therefore, I argue, they cause the necessary change. I would now refer to the class of cases which led me to the consideration of the subject I am trying to follow out and which, judging from my short experience, occur

not uncommonly and evidently result from the high pressure which exists in the business world. Anxiety has been aptly called fright spread out thin; these cases are not caused by sudden emotional disturbance but follow, and apparently owe their existence to, prolonged worry. In them the higher centres have become more instable than normal — their balance is rendered so fine that it takes but little to alter their equilibrium — and this instability renders them more susceptable of the action of a stimulus, and in such patients the reflex effect of the mind is often clearly evidenced although all their symptoms do not result therefrom. Similar cases are described by Althaus in his brochure "On Failure of Brain Power" to which he attaches the name "Encephalasthenia",

and his arguments lead me to class them under that category. In many points, however, they have a distinct bearing on the matter in hand and on that account I consider it not irrelevant to record one of the cases as observed by myself and to endeavour to discuss it; for I am convinced that, call them by what name we may, these 'nervous' cases are the result of the effect of the mental state on the body and that its reflex effect influences their progress, and as we are dealing with causation I venture to advance the following as a type. A.B. aet. 50, married, a well built man but rather thin, was much harassed in business and had experienced a lot of domestic trials. He always enjoyed good health till the symptoms now complained of gradually developed.

He was temperate in everything and regular in his habits but although his hours were not too long he was a slave to duty and seldom or never enjoyed any form of recreation or relaxation. So far as I could make out his family history shewed no neurotic tendency but I could not get a satisfactory account; to all appearance he was of the nervous temperament. Some years ago he was first attacked with fears which have recurred at intervals and which evidently resulted from mental strain and anxiety. I find it difficult to describe those fears, for, in the words of the patient "no one could understand them unless he had experienced them." They came on suddenly and without any warning, but when

seized he gradually grew worse, his countenance assumed an expression of great anxiety, and, if in any company he would leave and go into a room where he might be alone. After lasting some time - usually a few minutes - it gradually passed off, and, when gone, patient did not like to refer to it in any way. I saw these fears well marked in the case of a near relative of my own which ultimately developed into right hemiplegia with aphasia from cerebral haemorrhage. Such cases, in fact, seem to take us to the borders of insanity on the one hand, and of organic disease with grave structural damage on the other. One writer describes similar fears thus:- "It would probably be a correct statement to say that no symptoms of functional nervous disease

is so likely to be overlooked or slighted, or misinterpreted, or improperly named, as this one symptom of morbid fear; it is diagnosticated as hysteria, hypochondria, dyspepsia, imagination, biliousness and actual insanity. Insanity has, it is true, its morbid fears, but they are associated with delusions or hallucinations. There are quite a number of varieties of morbid fear associated with cerebrasthenia or brain exhaustion without any hallucinations or delusions. The patient knows that there is no just objective ground for his fear, but his emotional nature, under the influence of his exhausted nervous condition overcomes his reason and his will." (Beard. "Neurasthenia" p. 52.) These words exactly describe the case we are considering; he said

he had no reason to fear anything and could not understand the indescribable dread which occasionally seized him. He also complained of troublesome headaches, disturbed sleep, and habitual constipation with its accompanying disagreeable sensations: Surely here we have the picture of a 'neurotic' pure and simple; but disregarding terms let us endeavour to analyse the case as being a type of many. If the patient were seized with a fear when suffering from a headache the pain vanished and when first led to study such cases I thought that herein we had an example of the reflex effect of mind but now look upon it as the lesser ill giving place to the greater.

"For where the greater malady is fixed,
The lesser is scarce felt."

When we are deeply affected

about anything we forget our other sufferings which return, however, when the emotional system is calmed, and we read that a soldier may be wounded during an engagement without any immediate suffering. The reality of such patients' distress must be evident even to the least observant. True, the emotions played an important part in the case under consideration, but there must have been some functional cerebral derangement, the mental worry long drawn out having brought the brain into an excitable state. Those who have experienced night-mare must admit the reality of its terrors. It is believed that during dreaming some of the functions of the brain remain active whilst others are in abeyance: now, must not this be the case also in all

forms of "day-mare", if I may so call it? The brain cannot be acting normally, there is a functional derangement. Such derangements of the other bodily organs are well-recognised diseases e.g., when the stomach digests food imperfectly, and we must recognise these symptoms also although they are vague and ill to understand. In certain organic diseases of the central nervous system we observe mal-nutrition of the parts of the body supplied by nerves which are connected with the diseased area, this deficient nutrition sometimes going the length of gangrene. It seems to me very evident that there may be likewise a functional interference with the nervous influence — i.e. without any lesion visible with the naked eye or microscope, but not necessarily excluding a minute atomic change — which is

as real as that having an organic basis. The recognition of such an interference enables us at least to form a more rational opinion about many symptoms which are too often ignored or considered unimportant being due to 'mere nervousness' 'hysteria' or 'imagination'. In the example under discussion we see a temperate — that is in the common acceptation of the term, for he was not 'temperate' in brain-work — and healthy man who had been subjected to too much mental worry and anxiety. This, long-continued, began to have its effect on the higher centres in the Cortex, changing the relations of the nerve molecules or ultimate atoms in some unknown way and rendering the brain excitable. As has been already pointed out the emotional centres are subsidiary to the intellectual, and, in this case, the higher centres,

having become affected by the mental strain, no longer ruled the lower with the result that the emotions ran riot in the form of morbid fears. Having thus looked at the mental or emotional symptoms presented by such patients let us now turn our attention to those that are more easily understood. Habitual constipation is a term which is very commonly used and the qualifying adjective seems to describe its causation as it is in many cases an acquired habit. We have already referred to the inhibition of the reflex and automatic Centres in the cord and bulb by the higher cortical centres. Here we have an example of the same thing, the chronic constipation may be the result of a psychical reflex. Defaecation is really a reflex act, but if the mind is much occupied with other things the calls of nature

are ignored, the desire passes off and if this is persevered in, the frequent inhibition of the function leads in time to the formation of a new and acquired habit - that of habitual constipation. The functionally deranged state of the nervous system in the type of case we are considering favours the development of such symptoms but we cannot describe accurately the actual change which takes place. Others suffer from dyspepsia, sleeplessness, palpitation of the heart, &c; and it seems to me that these may all be caused as described in the examples already quoted. The habitual constipation once established must of necessity lead to an increase of the 'nervous' and other symptoms from the absorption into the system of deleterious substances from the overloaded bowel. Such Cases might certainly be looked at in

a different light altogether the digestive derangements being put down as the cause of the morbid sensations but I am endeavouring to go a step further and get at the primary cause of the constipation and dyspepsia. Far be it from me to account for every specific instance of indigestion and Costiveness in this way, but in such light do I view those described and it seems to account at least for some of the symptoms.

These examples are sufficient to prove the existence of psychical reflexes, and it is needless to multiply instances when we cannot offer any further explanation of their pathology.

If the major premise of a logical syllogism be not altogether beyond question the conclusion must of necessity be doubtful however carefully deducted, and

do in the line of thought I have tried to follow out the Conclusions must be wrong if we do not admit that the mental state produces changes in the body. We cannot demonstrate the infinitesimal Chemical decomposition and molecular alteration of relations which we suppose are produced by every act of cerebration. To attempt to do so would take us into the region of the unknown; the consideration of it raises in us thoughts too deep for words, and the very thoughts do not form clear mental pictures but only blurred and indistinct images. True it is that 'the greatest part of what we know is the least of what we do not; and that even what we think we know is but a piece, a very little one, of our ignorance.' We

observe results, however, and may therefore attempt to discover the causes although they are obscure.

It has been my endeavour to confine my attention to cases which I have seen and do not base my remarks on those recorded by others. I have not been able to trace actual organic disease of an organ to a mental source, but between gross functional derangement and disease involving structural damage there is, as it were, but a step. We have shewn, I think, that the mental state has a very powerful effect on the vascularity and innervation of the whole body, and on that account must be a powerful factor in etiology. I do not wish to imply that all men are malingerers when I say that many symptoms owe their origin to psychical reflexes;

rather would I endeavour to emphasise the reality and importance of such causation. Men in general are creatures of habit and fashion and the type of disease like everything else changes. In these days the "nervous" element, in minor ailments at least, predominates and such being the case we must not ignore it, for after all it is with the patients as individuals that we have to deal. Their complaints are not ours, nor their symptoms, nor their feelings, and it is our duty so far as in us lies to administer relief. We are called in to see a patient who is suffering acute pain, careful examination reveals to us that, e.g., a gall stone is passing along the duct, we at once admit the reality of his sufferings and apply appropriate remedies. We see another suffering

from morbid fear or other vague symptom the result of mental worry or exhaustion and we are too apt to slight them although the patient is suffering what is to him acute agony. And yet the primary cause in each may possibly be the same. One recent writer says 'although it may seem at first sight far-fetched to drag in the nervous system for such a tangible and remote affection as gall-stones, it is quite otherwise, for there is nothing more reasonable than the supposition that the nervous energies being at a low ebb, or frittered away in a restless anxiety, the liver, which admittedly must require a large supply of nervous current to enable it to get through its work, is too torpid, its various changes are carried on slowly and performed badly, the cholesterine that should remain in solution is thrown

down, perhaps formed in too great abundance, and thus the stone is set a-going" (Goodhart: Common Neuroses: p. 127.)

As in causation so I hold that the mental influence is often a potent agent in the treatment of many ailments. I would not argue that the cause being mental the remedies must be mental, any more than I would say that an illness caused by sudden variations of temperature should be treated on thermic principles alone: but as in the one the temperature of the sickroom is regulated, sudden heats and colds being avoided, so in the other an equable frame of mind is all-important and a valuable adjunct to treatment. Before a patient knows the nature of his illness he is anxious and this anxiety in many cases aggravates the

symptoms, but when the physician, in whom he has implicit confidence, assures him that all will be well and that although he is really ill the symptoms will soon lessen in severity under treatment, he becomes more calm and this in some cases leads to an abatement of the trouble. In so doing the physician employs one of the most powerful non-official remedies available for his use. We are too apt to pass over many cases as being due to 'mere nervousness' forgetting to look at the disease as far as possible from the patients standpoint, but in this we err, for although the true pathological nexus between mental and bodily derangements has not been clearly defined, their close relation is very evident. Montaigne in one of his essays says that

"Plato had good reason to assert that, to be a right physician, it would be necessary that he who would take it upon him should first himself have passed through all the diseases he will pretend to cure, and through all the accidents and circumstances whereof he is to judge." Were such an experience possible we would view many symptoms in a different light and certainly would not lack in sympathy, but difficulties enough bestrew our path without facing such a curriculum of suffering. So far as the patient is concerned the feelings enter largely into his illness and in treatment it is essential to recognise this, for here the Quack takes advantage of a fact which the conscientious practitioner is too apt to ignore. Far be it from me

to advocate a pandering to all the whims and fancies of every individual simply because he happens to be our patient but his fears and apprehensions should not be slighted. In many ailments drugs are not required and if we are treating a sensible person a short lesson in physiology may be all the treatment he is in need of. Recognising the reflex effect of the mind as a potent factor in the causation we must endeavour in many cases to re-educate the higher centres as herein lies the prime force which controls and regulates all the other bodily functions. The advice of the ancient grecian sage, γνῶθι σεαυτόν is good philosophy but the knowledge must be of the proper kind and, once

acquired, it proves a powerful antidote. But even in the gravest diseases the mental influence must not be forgotten. In cases of haemoptysis, for example, the assurance that the symptoms are not so serious as they appear frequently acts as a powerful extra-pharmacopoeial remedy. The patient becomes much flurried at the sight of blood, and this excitement increases the heart's action. When the doctor assures him that the bleeding will soon be stopped, the circulation is quieted, the heart beats less rapidly, and one of the most important conditions for the production of the desired result – the formation of a thrombus – is attained. By thus influencing the circulation the mental state must of

necessity have an effect on the nutrition of the body as a whole. In all cases of excessive haemorrhage nature uses this very means to stop the bleeding; the patient faints, the circulation then becomes much slower, the heart no longer pumps the blood with force, and a clot is thus more easily formed. Drugs are undoubtedly useful even in neurotics but in many cases the principle I have tried to indicate should enter into our treatment. Knowing as we do the intimate relations between mind and brain, the close connection of the cerebrospinal and sympathetic nervous systems, and the influence that these have on the body as a whole, we must admit that there is nothing

marvellous or mysterious in the assertion that the reflex effect of the mind has a marked influence in the etiology, and that it is not unworthy of our notice in the treatment of many of the complaints with which we are daily brought in Contact.