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Part I.—Original Articles.

Dr. Hughlings Jackson on Mental Disorders. By Sir
GEORGE SAVAGE, M.D.

I HAVE long felt that the relationship of Dr. Jackson's teaching in reference to nervous disorders has not been sufficiently considered from the psychiatric side. I fear that I shall not be able to do justice to the subject, yet I believe it to be almost a duty for me to attempt it.

To begin with, I knew Dr. Jackson during the greater part of his professional life, for while I was holding resident appointments at Guy's, Dr. Jackson and Dr. H. Gawen Sutton were constantly at the hospital, where they were especially following the clinical teaching of Gull and the pathological work of Wilks. Then followed a few years during which I was away from London, but on my return I renewed my friendship with Dr. Hughlings Jackson, and not infrequently went round the wards of the London Hospital with him. Later still, he would come to Bethlem, and go into some of the wards with me. He used to say that the study of nervous disorders, particularly epilepsy, gave him endless interest, but as for insanity, he disliked it, and, unlike the neurologist of to-day, he would have nothing to do with insane patients if he could help it. His mind was one which needed order and precision, and the disorders of mind only perplexed him. He could understand losses of power and losses of control, but, as they showed them-

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selves in the wards of Bethlem, they puzzled and upset him. At times he seemed to have a real physical dread of the patients, and failed to have anything like the human sympathy which he had for the epileptics. He looked upon many of the insane as rather useless cumberers of the ground.

Dr. Hughlings Jackson absorbed the writings of Herbert Spencer, and all his philosophy depended on the evolutionary theory. His name will always be associated with epilepsy, and the works of Hitzig and others abroad, and Ferrier in England, established his faith in the localisation of functions in the brain. As I shall have occasion to point out, the great principle which he insisted upon was that nervous, and most mental, symptoms were not the direct result of disease of particular parts of the nervous system. In fact, he looked upon disease in any part of the body as consisting of two very distinct factors: the one associated with the putting out of action of the function of the organ, the other—and generally the most evident—the effect produced by removal of the higher function, thus allowing actions which were controlled or directed by the higher function to show themselves. It will be seen here how evolution plays the part, for Jackson looked upon all the fully-developed functions as having passed through elementary states which, in fact, are represented in less developed organisms. We are all aware of the stages which man, for instance, passes, from a simple cellular existence through forms resembling the reptile or amphibian, before passing into the human. This is, of course, the extreme example; but in the education of the body and the mind, and the adjustment of the being to its environment many steps are taken. With complete development these steps are hidden, and it is only by inversion of the process of evolution that they are recognised. It is best seen, as Jackson has made plain, in the dissolutions of senility.

Jackson certainly goes very far in his explanations of symptoms in this way, but if all his views are not established, they are very suggestive.

The creed may thus be given: mental operations are simply the subjective accompaniments of sensori-motor processes. The incentives to volition are sensations received through the organs of sense, or the revived impressions of such sensations. The sensori-motor apparatus of the cortex is re-represented in the higher centres. He says they are represented in the pre-

frontal region, which he considered to be non-excitabile where they have the power of controlling and concentrating consciousness in definite directions, and deciding between courses of action.

Here we have plainly the basis on which his work is built. The organs of sense in their relation with their environment are represented in the brain in various degrees. This representation has to be considered in three grades, ranging from the automatic to the reasoned.

He looked upon the fore-brain as the highest representative part, as the part chiefly concerned in cases of mental disorder, or rather, in its manifestations, that is, its symptoms. Jackson maintained that the right half of the brain is the more automatic, while in the left, is the more organised, automatic acts become voluntary. He referred to the ability of some aphasic patients to ejaculate certain words, often of the interjectionary type, through survival of automatic power of the right brain.

Hughlings Jackson contributed two articles in the *Journal of Mental Science*, in 1875 and 1887. He gave an address which was published in the *Medical Press and Circular* of June 13th, 1894, entitled "The Factors of Insanities," and he contributed to the discussion at the Neurological Society on "Imperative Ideas," which appears in *Brain*, parts 70 and 71. A very complete account of Jackson's views are given in Tuke's *Psychological Dictionary*, by James Anderson, under the heading of "Epileptic Insanities."

He says there are three doctrines as to the relationship of mind to nervous activities. First, that the mind acts through the nervous system (through the highest centres first). Here an immaterial agency is supposed to produce physical effects. Second, the activities of the highest centres and mental states are one and the same thing, or are different sides of one thing. A third doctrine—"one which I have adopted"—is, that states of consciousness, synonymously states of mind, are utterly different from nervous states of the highest centres. The two things occur together. For every mental state there is a correlative nervous state. Although the two things occur in parallelism, there is no interference of one with the other. Hence we do not say that psychical things are functions of the brain, but simply that they occur during the functioning of the brain.

It seems to me that the third doctrine, that of concomitance, is at any rate convenient in the study of mental disease. In a sense the whole body is the organ of mind, and Lewis considered that some degree of consciousness attends activities of even the lowest centres. He had no idea of showing how mind is evolved from the body. States of mind arise in relation with certain activities of the highest centres. Emotions, for example, which arise in connection with activities of the periphery, are re-represented in the highest centres. Fear is the mental counterpart of certain activities of practically every part of the body. These activities—for example, perspiration, urination, etc.—are represented for ordinary mental purposes. Dr. Hughlings Jackson was very fond of the expression “mental purposes” when referring to the organic functions.

Next, I wish to consider the relationship of his philosophy to mental pathology. He wrote a short article entitled “Factors of Insanities.” It is noteworthy that he prefers the term in the plural—insanities, rather than insanity; and he refers to Mercier, who, certainly thirty years ago, began to preach the difference between unsoundness of mind and so-called insanity. Hughlings Jackson seems to agree with Mercier in his general contentions. Included in insanities Jackson places a good many states of mind that are not generally considered under that head. Thus, he considers dreams and dreamy states as nearly allied to mental unsoundness, and groups them with the insanities. And when, later, we consider epilepsy, we shall find that there again he considers the earlier and threatening conditions of epilepsy as insanities, and yet as not to be considered, clinically, as lunacy. I believe it was Hughlings Jackson who said that insanity was “dreaming awake,” while dreaming was “insanity asleep.” As to the factors of insanity beginning with dreaming, he says—“Dreaming has long been likened to insanity. I suggest several degrees of normal dissolution of sleep: (1) Sleepiness, (2) sleep with dreaming, (3) slumber with actions (somnambulism), and (4) deep, so-called dreamless sleep. At least (2), (3), and (4) ought to be considered as different depths of dissolution of the highest cerebral centres, with, in (2) and (3), and possibly in (4), lower ranges of evolution remaining in those centres.”

In considering Dr. Hughlings Jackson's philosophy, we have to recognise that he was an evolutionist and a follower of

Herbert Spencer to the very end ; that he looked upon every disorder as associated with a disintegration or dissolution. To this I shall have to refer later.

He proceeds to say that there are four factors in insanities. There are different depths of dissolution of the highest cerebral centres. There are different persons who have undergone that dissolution, and there are different rates with which that dissolution is effected. There is the influence of different local bodily states and of different external circumstances on the persons who have undergone this dissolution.

The first factor of insanities, then, is the different depths of dissolution. Hughlings Jackson points out that in all forms of mental disorder there are positive and negative states. First, there is the defect produced by disease, and that defect liberates, as it were, the lower functions. So that, taking his so-called "hierarchy," there are the three grades, from what might be called the simplest nervous centre, to the middle nervous centre, and to the highest nervous centres ; and if there is removal of function of the highest, then the lower centres are brought, more or less, into play. And the degree of mental disorder is, to a great extent, related to the amount of dissolution of the highest centre, so that the control may be but slightly removed with comparatively slight disorder, whereas if a greater amount of control is removed by the destruction of the highest centres, there will be, probably, a greater amount of disorder, or over-action, as he has called it, exhibited in the next lower centre. He has pointed out how, gradually, reduction and reduction may go on, till at last there is what he would call both physical and mental paralysis—a true palsy and true dementia—which are very near approaches to death. In this small book he gives interesting diagrams explaining his meanings.

The second factor in insanities is the person who has undergone dissolution. We all recognise the special tendencies of some individuals to break down along certain lines, and it comes to this—that the second factor, the person who has undergone the change, represents the liability to break down, which liability may be congenital, or may be acquired.

The third factor in insanities is the rate at which dissolution has been effected. He points out, very clearly, that when the changes have been slow and steadily progressive, the defective

control is not so marked ; in fact, it is a very gradual process, best marked in senility, so that very gradually the defective control is shown by defective power of one kind and another. If, on the other hand, the dissolution is rapid, as in alcoholic poisoning, then there would be, probably, a very marked, exaggerated action of the lower centres. In the same way, such over-action not infrequently occurs following the profound and sudden dissolution occurring in epilepsy.

The fourth factor in insanities is the influence of bodily states and external circumstances. This, of course, is a very wide subject, and is involved in what he gives as a kind of addition to his factors, namely, the complication of factors. For, as we all recognise, one cause is rarely efficient in producing the malady when it comes before us.

Although it is necessary, for clearness, to speak of the factors *seriatim*, it is evident enough that each must be thought of in association with others. As in different insanities there are different depths of dissolution of the highest cerebral centres, as the persons who undergo dissolution are different, as dissolution is effected at different rates, and as the bodily states and external circumstances of different patients are not the same, we may say that every case of insanity is a function of variables.

Passing now from the general factors of insanity, I think it is most important to consider his views in relationship to epilepsy—the subject which will always be associated with his name. It is at times somewhat difficult to make quite clear what Dr. Hughlings Jackson meant to teach, for his whole frame of mind was so careful and exacting that he scarcely ever dares to make a definite statement without qualifying it in some way ; so that in studying his writings one meets endless footnotes and parentheses, which are somewhat confusing.

The question of epilepsies and insanities has been carefully considered, more particularly in reference to Hughlings Jackson's teaching, by the late Dr. James Anderson in Tuke's *Dictionary of Psychological Medicine*, and I shall not hesitate to quote from that. And I think that probably the best way will be to give a certain number of dogmas or epigrams direct from Jackson's teaching, as they express in his own words and concisely what he means.

In his remarks on evolution and dissolution of the nervous

system, he says that "an epileptic fit really is an universal symptomatology of the discharges, or symptoms due to discharge, of the highest cerebral centres." He speaks of the different epilepsies, the scale of fits, and he says: "I continue, for the most part, to speak of epilepsy as if there was only one clinical entity, but there are really many different epilepsies. I mean what would be called varieties of genuine epilepsy, each dependent on discharging lesions of some part of the highest centres. I also use the term 'fits' advisedly, because I do not, as I should when working clinically, care as an evolutionist, to know whether any paroxysm is or is not a case of epilepsy." He speaks of different insanities associated with epilepsy as local dissolutions of the highest centres. "We should not," he says, "in strictness speak of varieties of insanity, but of insanities, for, obviously, there are different kinds, as well as degrees, of insanity; that is, there are dissolutions beginning in different divisions of the highest centres; melancholia, posterior lobes; general paralysis, anterior lobes, signifying different dissolutions of the highest centres. Evolution and dissolution always co-exist, or occur in alternation." So that with a varying amount of dissolution there is a varying amount of evolution. Perhaps there might appear to be some confusion in his use of the word "evolution." Sometimes I have thought a better term might have been found. The mere relaxing of control and allowing an exhibition of force to occur is hardly evolution, and yet that is the term used by Hughlings Jackson for the result of relaxation of control. He urges that in post-epileptic insanities the dissolution is local in the sense that it preponderates in the highest centres of one-half of the brain. The mania following a fit is the outcome of activities on the levels of evolution remaining, that is, that the mania is due to relaxation of control. In disease there is rarely, even in senile dissolution, an absolutely regular and formal process of decay; there is not a true reversal of the lines of evolution. As he says, in post-epileptic conditions you may get all varieties associated with temporary dissolution, but in various degrees. He remarks: "It is only in such dissolutions as those produced by alcohol that we can expect anything like uniform dissolution, a simply lower level of evolution." Again: "We have implicitly urged that in each case of the insanity, indeed in all nervous diseases, we have a problem of evolution, as well as one of dissolution."

He refers constantly to "the hierarchy of nervous centres." He points out clearly that there is a chain, if you like, or hierarchy, a developing association of the nervous centres, that is parallel to the development of the nervous system as seen in comparative anatomy. He maintains that the whole of the anterior lobe is (chiefly) motor, but he admits that the pre-frontal lobes are motor is a doctrine still held by few.

He puts very clearly—following other physiologists—the lines of evolution of the nervous system. First: Increasing complexity (differentiation), representation of a greater number of different movements. Second: Increasing definiteness (specialisation), representation of movements for more particular duties. Third: Increasing integration, representation of movements of wider ranges of the body in each part of the centres. Fourth: The higher the centres the more numerous the inter-connections of their units (co-operation). Thus—to recapitulate—the highest centres are the most complex, most special, most integrated sensori-motor complexes with most numerous inter-connections. He points out that it must be remembered that the development is not always by insensible gradations, but in the evolution there may have been occasional stoppages, with rebeginnings.

The doctrine of nervous evolution will not be understood unless it can be seen clearly that centres do not represent muscles, but movements of muscles. Jackson is constantly referring to this point; that in considering symptoms, we have to consider the physiological or vital actions much more than we have to consider the mere anatomy or the mere pathology. He says that psychical states are functions of the brain, the highest centres; they simply occur during the functioning of the brain. Thus, in the case of visual perception, arbitrarily simplifying the process there is an unbroken physical circuit, complete reflex action, from sensori-periphery, and ultimately through the highest centres back to the muscular periphery. The doctrine of concomitance I have already referred to. And in many of his writings he insists on the importance of recognising the independence of nervous action and simple consciousness, the inability of bridging the difference between the one and the other. As he says: "To merely solidify the mind into the brain is to make short work of a difficult question." "Our concern, as medical men, is with the body. If there be such a

thing as disease of the mind, we can do nothing for it." Negative and positive symptoms are, for us, only signs of what is not going on, or of what is going on wrong in the highest sensorimotor centres. Brain is to be considered purely as the organ of mind.

In studying the evolution and dissolution of the nervous system in relationship to fits, he gives a very full and complete analysis of the symptomatology of the slight fits of epilepsy. Thus he says: "There is often a warning crude sensation, a stench comes from the nose. Second, there is the emotion of fear (I do not mean fear of the fit, but fear which comes by itself). This is a very complex psychical state. Third, there is sometimes a dreamy state called the intellectual aura. There is often a stage of defect of consciousness before what we call loss of consciousness." In fact, he looks upon the dreamy state as one rather of a defect of consciousness than as absolute loss of it.

Next, there are convulsions—eyes, face, hands, and other parts. Then comes pallor of the face, arrest of heart, flow of saliva. But there are sometimes, in the slight epileptic paroxysms, movements properly so-called, clutching of the throat. A slight paroxysm, in many cases, may simply be confusion for a short time; defectively conscious. After a severe attack, there remains what is called loss of consciousness, with the unconsciousness a concerted series of elaborate movements of all parts of the body. This completes his symptomatological analysis of a fit.

After the fit, he says, there is often insanity. We make three degrees of post-epileptic insanity. And here I may refer to what I spoke of earlier, on his use of the term "insanities," for he speaks of the three degrees of dissolution; the first being associated with the *petit mal* or the aura; the second being associated with the true convulsions; and the third being associated with the profound unconsciousness. It is with the second stage, the ordinary epilepsy, that he is chiefly concerned; and he refers to the automatic conditions that may be met with there. He frequently refers to the coma of epilepsy as if it were to be looked upon as dementia. He says: "My contention is from a scientific—I do not say from a clinical—standpoint is that all these, one, two, three, are insanities. Three is temporary acute dementia. Each departure is a departure from

the patient's normal mental state. This is enough for us mental evolutionists. One and two do not approach the clinical standard types of insanity necessarily, and thus for the clinician, are not insanities. These degrees of insanity are to be compared and contrasted with degrees of physiological insanity of sleep. First, sleep with dreams; next, deeper sleep with actions (somnambulism); third, so-called dreamless sleep, also with degrees of drunkenness. That may be the three degrees of post-epileptic insanity compared.

Now, as to the positive mental symptoms. They make up, or are to us, the present signs of the patient's mentation or consciousness, and are the lower homologues of his normal mentation or consciousness. We have to try to show how sensori-motor activities, activities of the most complex sensori-motor or nervous arrangements, those of the highest centres, are correlative with states of consciousness. To do this, we shall accept the artificial analysis of object consciousness into will, memory, reason, and emotion, and try to show the anatomy and the physical basis of each, that is, what parts of the body the physical basis of each represents specifically. And I may say here that this attempt of Hughlings Jackson is distinctly original.

The following is an imperfect sketch, among other things, ignoring integration. What on the lowest levels are centres for simplest movements of the limbs, become evolved in the highest centres into the physical basis of volition. What on the lowest levels are centres of simple reflex actions of eyes and hands, are evolved in the highest centres into the physical basis of visual and effectual ideas. What in the lowest levels are centres of movement of the tongue, palate, lips, are concerned in eating, swallowing, etc., are, in the highest centres, evolved into the physical basis of words, symbols serving us during abstract reasoning. What on the lowest levels are centres representing the circulatory, respiratory, and digestive movements, are evolved in the highest centres into the physical basis of emotions. So to speak, the lowest level does the menial work, the highest level, evolved out of it, becomes, in great degree, independent of it, and is the anatomical basis of mind.

Shortly, I shall refer next to his article on post-epileptic states. He points out the difficulties of the subject, the need of psychological knowledge to the understanding of it. He

says a medical man's aim should be to deal with what are called diseases of the mind—really diseases of the highest cerebral centres—as materialistically as possible; but to be thoroughly materialistic as to the nervous system we must not be thoroughly materialistic at all as to the mind. I fear that Dr. Hughlings Jackson might not be quite in accord with some of the later Freudian developments. “The elements of the clinical problem are the anatomy, the physiology, and the pathology of disease.” In using these terms, he means that the simple anatomy is important, the physiology is very much more important, and by pathology he refers rather to the disorders of nutrition associated with the nervous system than what we actually understand by pathology. In considering this matter again, he repeats what he so frequently insists upon—the duplex condition of nervous symptomatology. Some of his friends who took a deep interest in his work used to say, in a half-cynical way, “Has Jackson got no further than those two questions of positive and negative symptoms?”

The hypothesis in relationship to the duplex condition of the nervous system is, that the principle of duality of symptomatology applies, with a very obvious exception, to all nervous diseases with negative lesions, insanity included. The negative lesion alone is the result of a pathological change, and produces negative symptoms; the other symptoms completing the symptomatology are owing to activity—often over-activity—of healthy nervous arrangements, and are normal physiological states. Jackson, in writing on mental disorder, frequently speaks of the perfectly normal physiological action of the parts that have been relaxed from control; he says that the same relaxing of control does not necessitate any pathological change in the parts then acting.

It may be worth while to recapitulate here what might be called his creed. The lowest level, in comparison with the highest level, represents impressions and movements of all parts of the body, most nearly directly. It is a series of centres—properly segments—representing parts of the body in (1) few and simplest combinations (little differentiation); (2) in most general ways (little specialisation); (3) in greatest detail (smallest districts of the body, least integration “for local affairs”); (4) the centres on this level have fewest inter-communications (little co-operation). If we take note only of

the organic centres on the lowest level, I think it is plain that this formula applies closely. The cardiac and respiratory centre are most simple: they have few, if any, different movements; there is, indeed, practically a succession of similar movements at equal intervals. Second, these centres have little speciality. Obviously they are for most general ends: they serve the body as a whole, in essentially the same way at all times, from birth to death. Third, that most of the lowest centres represent limited regions of the body is plain (pupillary, respiratory, cardiac, bladder centres). Fourth, the interconnections of organic centres are certainly few; obviously pupillary activities, respiration, circulation, digestion, micturition, go on with the greatest degree of distinctness from one another.

The highest level differs from the lowest only in grade of Evolution. The centres of this level represent impressions and movements of all parts of the body, triply, indirectly, and in comparison with the lowest levels, in most complex combinations, in two most specific ways. Third, each represents very extensive areas of the body, if not the whole body—great integration. Fourthly, these centres have the most numerous intercommunications—that is, that this formula applies to the highest centres is in agreement with current doctrine.

It is certain that the organ of mind is (1) concerned with the most numerous different things; (2) of high degree of speciality; (3) that every single process is an act of a person, and therefore the inference is irresistible that they are, correlatively, activities of the most highly integrated centres—of centres each representing all parts of the body as a whole; and (4) that it is, by its most elaborate relations—very complex special and highly integrated combinations and impressions—that movements in co-existence and sequence are effected.

It is hardly necessary, after saying that, to refer to his remarks on the evolution of the physical basis of consciousness, or on the degrees of detachment and degrees of independence of the various levels of evolution.

So much, then, for the nervous and mental disorders associated with epilepsy and epileptic conditions. Beyond that, Dr. Hughlings Jackson communicated occasional articles on related subjects. Thus, he communicated an article to *Brain* on "Imperative Ideas," and there is something distinctly original in this short article. He refers to Dr. Hack Tuke's

address at Leeds, and he says : " I have suggested that certain absurd and persisting delusions are owing to fixation of grotesque fancies and dreams in cases where a morbid change in the brain happens suddenly and increases suddenly during sleep." This fixation of idea giving rise to an imperative or fixed idea is certainly, I think, original to him. He speaks, later, of it in this way : " We certainly have to account for the existence of these quasi-parasitic states in cases where general mental power is but little lessened." He says : " For my part I consider that illusions, delusions, and other positive mental symptoms and insanities signify healthy nervous arrangements of the highest cerebral centres, called organ of mind. What we call an insane man's illusions are his perceptions ; what we call his delusions are his beliefs, and, more generally, his positive mental symptoms sample the mentation remaining possible to him, a mentation occurring during activities of what is left of his highest centres, of what disease has spared. The physical condition of these positive mental symptoms is not caused—using the word 'cause' in its strict scientific sense—by disease, not caused, that is, by a pathological process. Disease is, I submit, answerable only for the co-existing negative mental element of insanity." Here let me remark that, to take one kind of mental symptom, an illusion, a positive mental state implies a co-existing negative mental state. A man sees a black cat where there is only a black felt hat. Not only is there for him a black cat, but this for him is a felt hat. Similarly, *mutatis mutandis*, for other positive mental symptoms sampling the positive element of a patient's insanity. " As to the physical, disease of the highest range of the highest centres, producing loss of its function or destroying it, answers to the negative mental element in a case of insanity." He says, in reference to the development of fixed or imperative ideas, that when disease of the highest range progresses very slowly, there may be no obtrusive positive mental symptoms (control slowly removed). When it is very rapid, the patient's mentation (the mentation remaining possible to him) diminishes at a great rate (control rapidly removed). In a way, he is somewhat inconsistent in leaving it to be understood that imperative ideas may so slowly grow, whereas he has said they might be parasitic ideas caused by fixation in sleep.

I cannot conclude this imperfect notice of Hughlings

Jackson's work without pointing out the great debt that both neurologists and psychiatrists owe to his work. I always feel, however, one regret, and that is, that his close, logical mind was not associated with fluency of expression, for, as I have already said, a great deterrent to those wanting to study Hughlings Jackson's works lies in the difficulty of following them. However, one has to be thankful that he has left so much, although he may have left no single volume as a record.

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Hallucinations in the Sane. By ROBERT HUNTER STEEN, M.D.Lond., M.R.C.P.Lond., Medical Superintendent, City of London Mental Hospital, near Dartford, Kent, and Professor of Psychological Medicine, King's College Hospital, London.

IN insanity hallucinations are frequently present. This is no recent observation and has been duly noted in the literature since the dawn of medicine. Hippocrates, Asclepiades, and Celsus make mention of them in their writings.

Burton in the *Anatomy of Melancholy* ⁽¹⁾ says: "If it [melancholy] be extreme, they think they hear hideous noises, see and talk with black men and converse familiarly with devils, and such strange chimeras and visions (Gordonius), or that they are possessed by them, that somebody talks to them or within them."

Different authors give varying percentages of those affected. Esquirol says 80 *per cent.* which is a higher average than most observers will allow, still, there is no doubt of the great