THE CROONIAN LECTURES

ON

EVOLUTION AND DISSOLUTION OF THE NERVOUS SYSTEM.

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LECTURE II.

For incidental reference in this lecture, I will state what I believe to be the hierarchy of nervous centres, which accords with the doctrine of evolution. I used to arrange them according to the morphological divisions of the nervous system—spinal cord, medulla oblongata, etc. I now arrange that on an anatomico-physiological basis; that is, especially as to degree of indirectness with which each represents the body, or part of it. The lowest motor centres are the anterior horns of the spinal cord, and also the homologous nuclei for motor cranial nerves higher up; they extend from the lowest spinal anterior horns up to the nuclei for the ocular muscles. They are at once lowest cerebral and lowest cerebellar centres; hence lesion of them cuts off the parts they represent from the whole central nervous system. I am ignoring the cerebellar system. The lowest centres are the most simple and most organised centres; each represents some limited region of the body indirectly, but yet most nearly directly; they are representative. The middle motor centres are the convolutions making up Ferrier's motor region. These are more complex and less organised, and represent wider regions of the body doubly indirectly; they are re-representative. The highest motor centres are convolutions in front of the so-called motor region. I say "so-called," as I believe, and have urged for many years, that the whole anterior part of the brain is motor, or chiefly motor.[1] I speak more in detail of this in another lecture. The highest motor centres are the most complex and least organised centres, and represent widest regions (movements of all parts of the body) triply indirectly; they are re-re-representative. That the middle motor centres represent over again what all the lowest motor centres have represented, will be disputed by few. I go further, and say that the highest motor centres (frontal lobes) represent over again, in more complex combinations, what the middle motor centres represent. In recapitulation, there is increasing complexity, or greater intricacy, of representation, so that ultimately the highest motor centres represent, or, in other words, co-ordinate, movements of all parts of the body in the most special and complex combinations. It is needless to give the scheme of sensory centres. The main conclusions are (1) that the highest (chiefly) sensory centres—parts behind Ferrier's sensory region—and also the highest (chiefly) motor centres—parts in front of the so-called motor region—make up the physical basis of consciousness; and (2) that just as consciousness represents, or is, the whole person psychical, so its anatomical basis (highest centres) represents the whole person physical—represents impressions and movements of all parts of his body; in old-fashioned language, the highest centres are potentially the whole organism. States of consciousness attend survivals of the fittest states of centres representing the whole organism.

I have several times insisted that the symptomatology of all nervous diseases is duplex; that in every case there is a negative, and that there is also a positive element. I shall further illustrate this by certain cases of insanity. I ought to have mentioned before that Dr. Moreau, many years ago, pointed out that, in insanity, there is both a negative and a positive element. Dr. Mortimer Granville, who has for some years applied the doctrine of dissolution, uses the term dissolution, and takes note of the "exposure" of the lower layers (which I call the lower levels of evolution remaining).

I consider post-epileptic states, which are, scientifically regarded, some cases of insanity; for they are, however slight or however transitory, departures from normal mental states. I wish to show three things: (1) that, after epileptic fits of different degrees of severity, there are different "depths" of dissolution, and, consequently, different "shallows" of evolution remaining; (2) to try to account for the existence in some of the cases of increased excitability of the nervous arrangements of the different lower levels of evolution remaining: in this double attempt, I shall make use of a principle essentially stated long ago by Laycock, but much more explicitly by Anstie, and, later, by Thompson Dickson; (3) that negative lesions of the highest centres cause paralysis.

It is well known that some epileptics, after their fits, are maniacal. The condition is called "epileptic mania," but it should be called "epileptic unconsciousness with mania." Plainly the condition is double; there is a negative, and there is a positive element. Since the fit is over, and as the patient remains unconscious, there is of necessity, on the physical side, loss of function of some of the highest arrangements of his highest centres—let us say, of the highest two layers. The coexisting mania is, I contend, the outcome of greatly raised activity of the next lower level of evolution remaining, the third layer, which is normal, except for hyperphysiological activity. But now comes the question, Why is an unconscious man furiously active? Why, on the loss of function of the highest two layers, is the next, the third, layer in the state of hyperphysiological activity spoken of? In order to consider this question methodically, I must begin by speaking of the prior epileptic paroxysm.

An epileptic paroxysm depends upon a sudden and excessive discharge, or liberation of energy, beginning in some *part* of the highest centres.[2] There is, in other words, a "physiological fulminate;" certain cells, by abnormal nutrition (pathological process), gradually attain very high tension—high instability, which is an hyperphysiological condition—and suddenly liberate a large quantity of energy, and then gradually re-attain high instability. The point I wish particularly to urge is, that not only do those highly unstable cells discharge by "downward" lines towards the parts of the body they especially represent, but that they also discharge laterally by "cross-lines," and overcome the resistance of healthy, comparatively stable, collateral nervous arrangements of the same general rank, each of which then discharges "downwards." Thus, partly from the primal discharge, and much more from the secondary discharges of healthy nervous arrangements, there is an enormous energy-liberation towards the periphery. In illustration, let us suppose that the Navy Board—highest navy-centres—consists of twenty-four members, each one of whom governs the whole of the Navy, through the intermediation of middle and lowest officials. We try to illustrate two things. First, destruction of a small part of the highest centres produces very little effect, whilst sudden and excessive discharges of such small part produces, although indirectly, an enormous effect. If one of the twenty-four members gives up his duties, the whole navy administration is very slightly defective throughout, there is compensation by greater activity of some of the remaining twenty-three members; this is analogous to destruction of a small part of the highest centres. It is notorious that a small part of the brain—a small part of the highest centres—may be destroyed without any striking symptoms; compensation is practically perfect. But the case analogous to the epileptic fit, is when one of the twenty-four highest navy officials becomes occasionally insane. Then, by issuing foolish orders to lower officials, "discharging downwards," he produces widespread and yet slight disturbance in the navy. But, by wrongly advising his colleagues, "discharging collaterally," he leads them to issue foolish orders to lower officials; leads them to "discharge downwards." Thus, by a multiplication of foolish orders, the whole navy is severely and universally "convulsed." The officials who, in the case of loss of one of their colleagues, work more to compensate that loss, are compelled, when one becomes insane, to co-operate in his excess. I beg particular attention to the term "Co-operation" in excess. It is, so to speak, Compensation inverted; both have to be carefully considered on any scheme of Localisation.

At length we come to the condition when the epileptic fit is over. It is commonly said, however, of epileptic mania, that it sometimes occurs in, or, rather, that it replaces, an ordinary epileptic paroxysm. Further, what I shall shortly speak of as the first depth of dissolution effected by—remaining after—an epileptic discharge would, I believe, be considered by most medical men to be, or to be part of, a paroxysm. I do not accept these hypotheses; but, if they were verified, dissolution would still be exemplified, although by a different process. I will state a counter-hypothesis, and leave it to my hearers to judge whether or

[1] "Facts seem to show that the fore part of the brain serves in the motor aspect of mind, and we may fairly speculate the posterior serves in the sensory."—British Medical Journal, March 6th, 1869.

[2] It must be clearly understood that I am not speaking of epileptiform seizures; they depend on discharge beginning in some part of the middle centres—so-called motor region—centres of a lower degree of evolution.

not it accords with the facts.[3] The view I take is that the sudden and excessive discharge in an epileptic paroxysm produces exhaustion of nerve-tracts which have been travelled by excessive currents in that paroxysm. I will illustrate by a simple case—an epileptiform seizure. A man has convulsion of the left leg, followed by temporary paralysis of that limb. It will be agreed upon that, in such a case, there is disease in some part of the cortex in the right middle region of the brain (middle motor centres), say a tumour. And, since the event outside is excessive, it is obvious that the corresponding event inside is excessive—discharge of nerve-cells near the tumour. Further, in order that the central discharges or "explosions" inside—primary and secondary—may "get at" the muscles outside, the nerve-currents developed must travel a particular route—passing down the internal capsule into the opposite lateral column of the cord, they will next overcome and discharge certain anterior horns (some lowest centres), and ultimately, by peripheral nerves, get at the muscles; there is excessive activity from cortex discharging to muscles convulsed. The explanation suggested (Todd and Alexander Robertson), of the temporary post-epileptiform[4] paralysis, is that, after the excessive "exercise" of central nerve-fibres during the epileptiform seizure, they remain for a time exhausted. Confirmation of this hypothesis seems to be given by, in some cases, the existence of exaggerated knee-jerk and foot-clonus,[5] in the stage of post-epileptiform paralysis. Beevor has found the same after some epileptic seizures.[6] Further confirmatory evidence is experimental. Franck and Pitres, for whose highly scientific work I have a most respectful admiration, found that after epileptiform convulsions induced in dogs, the part of the cortex which had been artificially discharged, remained for a time unexcitable.[7]

The generalisation arrived at is that a sudden and excessive discharge, or sudden and excessive liberation of energy of part of the middle motor centres, produces great activity, followed by exhaustion of other parts secondarily engaged. Besides the running down of—loss of energy of—the cells of the "discharging lesion" there is a far wider negative state from running down of the parts secondarily discharged, and from the exhaustion of central nerve-fibres effected by these primary and secondary discharges.

Applying Todd and Robertson's hypothesis to the highest centres, we say that after an epileptic fit there is, according to its degree of severity, exhaustion of more or fewer "layers" in those highest centres. I believe there to be also some exhaustion of middle centres, and of fibres in the lateral columns of the cord, and sometimes of some of the lowest centres. (Here is an example of compound order.) The range of exhaustion downwards will vary according to the severity of the discharge; we must bear in mind also another factor governing range, that the lower the centre the more organised it is, and thus that it will resist more and recuperate sooner. I neglect the implication of the lower centres.

Now, manifestly, returning to the case of epileptic mania, exhaustion of the highest two layers of the highest centres being a purely negative state cannot account for the superpositive state, mania. Nothing cannot be the cause of something. I repeat, that the maniacal actions are supposed to be the outcome of the activity, on the lower level of evolution remaining—third layer—of nervous arrangements which, except for over-physiological activity, are healthy; that they are manifestations of the survival of the fittest states on the lower, but then highest, level of evolution. To show more particularly what is meant, we must speak of three degrees of exhaustion, three increasing depths of dissolution, which are effected by epileptic discharges of different degrees of severity, taking count of the corresponding three degrees of decreasing shallows of evolution. First Depth.—There is defect of consciousness significant of dissolution of the topmost layer along with the rise of a certain kind of ideation significant of increased activity of the second layer. The double condition is roughly analogous to ordinary sleep with dreaming. Second depth.—There is so-called loss of consciousness, significant of dissolution of the topmost and second layers, along with actions of more or less elaborateness (one example of which is postepileptic unconsciousness with mania) significant of increased activity of the third layer. The double condition is analogous to sleep with somnambulism. Third.—There is coma, significant of dissolution of the first, second, and third layers, with which, seemingly, there is persistence only of "vital" operations, such as respiration and circulation, significant of retention of activity of the fourth layer. The double condition is analogous to deep slumber, to so-called dreamless sleep.

It will be seen that the opinion expressed is that in each case the lower level of evolution remaining—the then highest level—is of some part of the highest centres. Manifestly it is in the first depth. As to the second, it may be asserted that the lower level of evolution is made up of the middle centres. These centres, and after them the lowest, are in activity, of course, but are, I think, put in activity by what remains of the highest. I believe that in the third depth the lower, then highest, level of evolution is in the highest centres, but do not undertake to defend this opinion. One thing to be insisted upon is that in each of these degrees there is a negative, and that there is a positive, and often a superpositive, element. We must beware of the ordinary nomenclature; (post) epileptic mania is named after the positive element only; (post) epileptic coma is named after the negative element only. Negatively, there are increasing degrees from defect, through so-called loss of consciousness, to coma, signifying three increasing depths of dissolution; positively, there are decreasing degrees from ideation through elaborate actions to mere vital operations, signifying three increasingly shallow levels of evolution remaining. Later on I shall state a serious qualification.

[The first depth was then remarked on. The ideation of "dreamy state" was usually called an intellectual aura, and was by most physicians considered to be part of the paroxysm. Particular attention was drawn to the frequent occurrence of the "dreamy state," with or after movements of chewing, or tasting, and sometimes of spitting—movements believed to imply an excitation of central gustatory elements.]

Second Depth.—There has been a stronger discharge, which has effected deeper exhaustion. Now, there is no ideation, at least none is remembered on recovery; but there are actions. There are really subdegrees or subdepths of the second depth, and no doubt of the first and third depths, of dissolution; and correspondingly there are several subdegrees of diminishing levels of evolution. As to the second depth, there are, symptomatically, actions of different degrees of elaborateness, from such highly special and complex actions as that of a fisherman, unconscious after an epileptic fit, occurring at dinner, pulling out a line from a reel, untying a knot, taking out a hook from his pocket, affixing it and baiting it (doing all this pantomimically), down to such actions, if they deserve that name, as sprawling on the floor.

[Details were then given of very elaborate actions by an epileptic when unconscious after a fit; the case of the fisherman above spoken of will, however, serve for illustration.]

Here was a second depth of dissolution, in which we say, speaking loosely, that there was exhaustion of the highest two layers of the patient's highest centres, answering to his loss of consciousness—answering, in other words, to his being "lost to his surroundings" (his not knowing that he was in the dining-room, etc.). So much for the negative element. We recognise, too, the positive element, lower level of evolution remaining, third layer, from activity of which he acted *en rapport* with other surroundings—acted as if he were on the river's bank. No explanation is adequate which does not account for the two diametrically opposite elements, not only for his ceasing to do this, but also for his beginning to do that. Putting it in another way, that patient's postepileptic state differed from his previous normal state by a minus and also by a plus; after the fit, he was a different person, although in the same skin; or, as the popular phrase is, the postepileptic patient "was not himself." There was too little of him in one way, and too much of him in another way. Not only in cases called epileptic mania, but in all degrees of postepileptic actions—from such elaborate actions as those of the fisherman down to sprawling on the floor—the two diametrically opposite elements have, on any adequate hypothesis, to be accounted for.

I must now make some additional general remarks on evolution and dissolution.

[3] I have been said to accept the doctrine of replacement—to believe that "psychoses" occur instead of ordinary epileptic paroxysms. In reality, I entirely disbelieve that doctrine; I gave it up many years ago. I believe that all elaborate, suddenly-occurring states in epileptics, whether they are to be called mental or physical, follow a paroxysm. The very title of a paper I published, *West Riding Asylum Reports*, vol. v, 1875, "On Temporary Mental Disorders *after* Epileptic Paroxysms," shows this.

[4] A very valuable paper on Paralysis, after such seizures, has been published by Dr. Dutil, *Revue de Médicine*, March, 1883.

[5] I published a case of this kind in the *Medical Times and Gazette*, February 12th, 1881, "On a Case of Temporary Left Hemiplegia, with Foot-Clonus and Exaggerated Knee-Phenomenon, after an Epileptiform Seizure, beginning in the Left Foot."

[6] I have suggested that these increased "reflexes" are owing to loss of control, to over-activity of anterior horns (lowest centres) consequent on withdrawal of cerebral inhibitory influence. I now think it far more likely that there is exhaustion not only of fibres in the lateral columns of the cord, as I suggested in the paper mentioned; but, as Gowers has stated, of inhibitory centres in the cord itself. Westphal and Gowers have pointed out that after some epileptic paroxysms there is temporary loss of the knee-jerk. Gowers suggests that in these cases the lumbar nuclei were exhausted; that the exhaustion was deeper than in cases where the knee-jerk is excessive.

[7] "Ce phénomène de l'épuisement cortical consécutif aux accès d'épilepsie partielle est très facile à constater."—MM. Francois-Franck et A. Pitres, *Archives de Physiologie*, 15 Août, 1883. No. 6.

The doctrine of evolution implies the passage from the most organised to the least organised, or, in other terms, from the most general to the most special. Roughly, we say that there is a gradual "adding on" of the more and more special, a continual adding on of new organisations. But this "adding on" is at the same time a "keeping down." The higher nervous arrangements evolved out of the lower keep down those lower, just as a government evolved out of a nation controls as well as directs that nation. If this be the process of evolution, then the reverse process of dissolution is not only "a taking off" of the higher, but is at the very same time a "letting go" of the lower. If the governing body of this country were destroyed suddenly, we should have two causes for lamentation: 1, The loss of services of eminent men; and 2, the anarchy of the now uncontrolled people. The loss of the governing body answers to the dissolution in our patient (the exhaustion of the two highest layers of his highest centres); the anarchy answers to the no longer controlled activity of the next lower level of evolution (third layer).

Another way of stating the general principle involved (Anstie's principle), is that the over-activity in epileptic mania and in the other cases mentioned, is not caused, but is permitted; on cutting across the pneumogastric, the heart is not caused to go faster, but is permitted to go faster. In other words, the lower level of evolution is not "goaded into activity," but is "let go." So we see that exhaustion of the highest nervous arrangements—two layers—answers to negative affection of consciousness; and this exhaustion being, at the same time, a removal of control from the next lower level of evolution—third layer—it springs into activity—is "let go."

We stay to remark on some differences in the two depths. One great difference between them is that, in the first, the ideation is remembered, or of course we should know nothing about it. From the second, as in somnambulism, nothing is remembered. But it comes to be a question of importance, and of more practical importance than, at first glance, appears, whether or not in the second depth there is some ideation, in spite of the expression "*loss* of consciousness." That there is activity of some nervous arrangements of the highest centres, we are supposing of the third layer, is, I submit, quite certain. The question is this: "Do states of consciousness attend that activity or not? There will be two views on this matter. Let me return to the case of the fisherman, who pantomimically pulled out a line from the reel, etc., when "unconscious" after an attack. Had that man, who, on recovery, remembered nothing of his doings, any states of consciousness attending the nervous activities which were producing his elaborate actions? One view would be that the fact that the patient remembered nothing was proof that there were no mental states. Another view would be that the very elaborateness of the operation implied some co-existing states of consciousness. We must carry each view to its logical conclusion. Those who take the first view—nearly all medical men, I believe—must say that the patient was a mere machine; that, having no consciousness, he was a mere automaton. I beg that it may be borne in mind that, otherwise stated, this view is that elaborate and universal movements may occur without a trace of consciousness. On the second view, it would be admitted that the man was a machine, an imperfect automaton, he having lost the highest parts of his nervous machinery; but it would be asserted that some degree of consciousness attended activities of the nervous arrangements on the lower level of evolution remaining. Each of these two views has consequences, as we shall soon see.

Third Depth.—Supposing a severest discharge; when it is over, the patient is comatose, lies motionless on his back, has seemingly no movements excepting "vital" movements, such as the respiratory and the circulatory.

Having so far very much neglected the distinction between mental and nervous states, I must now have special regard to it, the reason for which will soon appear. The current explanation of the post-epileptic comatose patient's immobility is, that he does not move, because he is unconscious. This, I submit, is a metaphysical explanation. We want, in scientific matters, realistic explanations. My belief is that the postepileptic immobility is paralysis. The objection which has been made to this statement is that, as a mere matter of fact, there is no paralysis. If anyone means that there is no hemiplegia, nor any other local paralysis, I entirely agree with him. What I contend for is, that there is some universally spread paralysis. The facts are not in dispute; it is a question of their interpretation. All are agreed that the postepileptic comatose patient does not move when unconscious; all that I dispute is, that he does not move because he is unconscious. No man was ever unconscious without there being at the same time some physical change in at least the highest arrangements of his highest centres. I contend that it is more realistic to put the patient's immobility down to the negative physical change in his nervous centres—to attribute the physical to the physical—than to the correlative negative mental state. In other words, I give a realistic explanation in place of a metaphysical one. I put this question, "If loss of consciousness were all, why should not the patient move as well as ever?" This question will not seem in the least degree strange to the majority of medical men, for, as I have pointed out, they positively assert that an epileptic maniac who manifests universal and exceedingly elaborate movements has no consciousness.

Let us look at two comparable sets of facts. If a man does not move his leg after a convulsion of that limb, everybody declares that limb to be paralysed. But if a man, after an epileptic fit, which involves the whole of his body, does not move any of his limbs, his condition is not called paralytic; the explanation is given that the patient does not move because he is unconscious. Consistently with this view, one ought to say that the man who does not move his leg after an epileptiform seizure, has lost volition over it. Everybody sees this explanation to be purely verbal; but the explanation, which is identically the same in effect, that the man does not move because he is unconscious, does not jar on anybody's mind; being a familiar expression, it has a deceptive appearance of realism, but I contend that it is not realistic at all. Let us consider a greater range of cases from another point of view; I dwell upon this matter because it seems to me to be of vast importance to establish that negative states of the highest centres produce some universal or widely distributed paralysis of the body. I admit that part of the paralytic condition may be owing to exhaustion of elements of lower centres.

After a slight attack of epilepsy (*le petit mal*), the patient declares himself to be "knocked up," unfit for anything," etc. The explanation of this condition is given in popular language, the patient is said to be weak; but if the very same patient has an exceedingly severe fit, and if after it he does not move any way (except for "vital" movements), then his immobility is explained metaphysically. In the simple case instanced of paralysis of one leg after an epileptiform seizure, the patient is declared to be paralysed. So that of the first a popular explanation is given; but, I would ask, what is "weakness" after an excessive nervous discharge but paralysis? Of the second a metaphysical explanation is given; but I contend that there is no reason why a patient should not move if loss of consciousness were all; it is not all. Of the third only is a thoroughly realistic explanation given. Are we to believe that local immobility after a local convulsion is paralysis, and that universal immobility after a universal convulsion is not paralysis, but that it demands a metaphysical explanation? Besides, supposing that the loss of consciousness does explain the immobility in post-epileptic coma, will it also explain the exaggerated knee-jerks and the foot-clonus described by Beevor? More than this, according to Beevor, there is, after some epileptic attacks, transitory lateral deviation of the two eyes. Does loss of consciousness account for this deviation? Is it not decisive evidence of at least some paralysis, especially as the eyes deviate from the side to which they were strongly turned in the prior paroxysm? Occurring in postepileptiform paralysis, such deviation would certainly be said to imply some paralysis. Occurring after an epileptic fit, it surely also means some paralysis. I shall speak of it again in my next lecture, when referring to some recent experiments by Ferrier and Gerald Yeo, on the frontal lobes, which I call the highest motor centres.

It may be said, "Your supposition that the universal immobility after a severe discharge is paralysis, is discrepant with your explanation of the second degree of postepileptic unconsciousness and mania. If you say that exhaustion of three layers is causative of some universal paralysis in post-epileptic coma, you must admit that in the post-epileptic mania exhaustion of two layers also entails some, if less, paralysis. You are bound to say that the epileptic mania has some universal paralysis, although at the very same time he is in a state of universal activity." Of course, I do not endorse the absurdity that a man is perfectly paralysed all over, and that at the same time he is in movement all over. My contention simply is, that in post-epileptic mania there is some degree of paralysis all over the body, or, more precisely, loss of some movements of all parts, and that at the very same time there is persistence and over development of some other movements of all parts. To show that this is not an extravagance, I would point out that loss of movements of the whole of a part, with persistence of some other movements of the whole of that part, is an exceedingly common thing. Take the case of imperfect paralysis of an arm in ordinary hemiplegia, or after an epileptiform seizure. To say that the arm is "weak" is misleading. The patient has lost some movements of the whole of the limb, and yet retains some other movements of the whole of the limb. Often enough there

is loss of some of the most "delicate" movements, with, at the same time, the retention of many "coarser" movements. Unable to button his shirt, the patient may be able to grasp strongly, or to strike a heavy blow. In some cases there is, if possible, further demonstration. An arm is permanently partially paralysed all over, loss of some movements of the whole of the limb; and yet that other movements of the whole of the limb remain is emphasised by the occurrence of severe convulsion of it, which is nothing other than a sudden excessive development of the movements remaining. Any adequate doctrine of localisation has to account for this. In chorea we find persisting paralysis, with over movements of the same parts; what has been called loss or defect of voluntary co-ordination in this disease is indirect evidence of some paralysis; the involuntary disorder of co-ordination is owing to over activity of movements left.

I contend that there is no difficulty whatever in conceiving, whatever difficulty there may be in believing, that the exhaustion of the highest layer, first depth, which defect of consciousness implies, is causative of a slight degree of paralysis "spread out thin" all over the body (called "weakness"); that exhaustion of two layers, second depth, which loss of consciousness implies, is paralysis spread out more "thickly" all over the body, notwithstanding that, from the raised activity of the third layer, other movements of all parts of the body may be in great excess; and that the immobility in post-epileptic coma is paralysis spread more thickly still all over the body.

Since I say (1) that the highest centres are sensorimotor; (2) that negative affections of consciousness imply negative conditions of parts of the highest centres; and (3) that there is some defect of consciousness in every case of insanity, I ought to hold the opinion that, in every case of insanity, there is some degree, however slight, of universal or widely distributed paralysis—sensory, or motor, or both. So I do. That I could not demonstrate its existence in many cases, I admit. I should expect there to be the least degree of negative affection of consciousness, and correspondingly the least paralysis, in cases of insanity where the accompanying positive element was very elaborate, that is, on the physical side, when the dissolution was very shallow and the level of evolution remaining was very high. In cases of dementia, the patient's "lethargy" might be put down to his negative mental state—a metaphysical explanation. I should call dementia the chronic analogue of what acutely is post-epileptic coma, and attribute the lethargy to the negative condition of more or less of the patient's highest centres, implied by his negative mental state, and call the lethargy paralysis.

Paralysis is indirectly admitted in some cases of insanity (when its existence might be denied directly) in the assertions that there is loss of facial expression, difficulty of articulation, tremor of the limbs (indirect evidence of some paralysis), and shambling gait. Taking but one of these, surely loss of expression implies either loss of the most special or "delicate" facial movements, or continuous development of them (rigidity), or both. There is no abstraction "expression" to be lost. What we know of any healthy person's conduct is from his movements. Such symptoms as I have enumerated are just those I should expect from chronic negative lesions of parts of the highest motor centres. They exist in many cases of general paresis, which Crichton Browne has shown to be owing especially to disease extending from the front backwards in the brain, from highest motor centres towards middle.

Now for the "serious qualification" I spoke of. The following difficulty, taking the case of the fisherman, has to be met. There was so-called loss of consciousness, implying a deep dissolution, and yet his very elaborate doings implied a very high level of evolution remaining. I hold that in post-epileptic states there are local dissolutions, meaning that the post-epileptic exhaustion is in, or preponderates in, one cerebral hemisphere. Thus, whilst there is a low level of evolution in the highest centres of one half of the brain, there is a perfect or very high level in those of the opposite half. If so, the discrepancy disappears.

[The lecturer then variously illustrated the assertion that all elaborate (positive) mental states in cases of insanity of every kind were the outcome of activities of healthy nervous arrangements on the lower level of evolution remaining. He believed that the patient suffering from delirium tremens saw rats, mice, etc., by agency of nervous arrangements which the pathological process had spared; he did not believe that a patient "heard voices" (words spoken), nor that a melancholic man framed the delusion that he was going to hell, during the activity of nervous elements touched by any pathological process. He thought that in Anstie's principle lay the explanation, not only of these positive mental symptoms, but of the necessarily co-existing negative mental symptoms also].

He then spoke of the several factors in cases of insanity. (1) There are different depths of dissolution, both of uniform and local dissolutions of the highest centres. This has just been illustrated by cases of local dissolutions, and might no doubt be illustrated by a parallel series of chronic cases of insanity—by cases from those with very complex delusions, down to cases of dementia, if the duplex symptomatology of each were noted. (2) The person undergoing the dissolution, young or old, educated or uneducated, intelligent or unintelligent. (3) The rate at which dissolution was effected. He believed that the more rapidly control was removed, the greater was the activity on the lower level of evolution remaining—contrasting, in illustration, the furious delirium of the epileptic maniac, who had undergone dissolution in a minute or so, with the quiescence of the senile dement, who had undergone dissolution some thousand times more slowly. (Similarly for different cases of epilepsy.) (4) The influence of external circumstances and local bodily states. Examples of the induction of very elaborate states of the highest centres (in the lower level of evolution remaining) by simple peripheral excitations were given by all writers on dreams. The lower level of evolution, then, in hyperphysiological activity, allowed a wider irradiation to simple stimuli coming to it. "Hearing voices" might not necessarily imply any disease of part of any centres especially concerned with sounds or words. That particular mental abnormality might be determined, in a patient reduced to a lower level of evolution, uniform or local, by some morbid state in the ear or auditory nerve, or in its nucleus acting on the lower level of evolution remaining.]

THREE CASES OF PLEURAL EFFUSION WITH VERY FEW SUBJECTIVE SYMPTOMS.

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THE following cases, which have recently come under my notice, are of interest from the fact that in each the patient was unaware that there was anything serious the matter with the chest. In neither was there any dyspnœa, and inability to lie on the sound side was conspicuous by its absence.

J. D., aged 42, a nervous, hysterical woman, and one who, *primâ facie*, would have been expected to exaggerate every little ache and pain, complained of pains in the abdomen and epigastrium, a feeling of *malaise* and depression of spirits, although not sufficiently severe to confine her to bed. She had been continuously occupied nursing her husband through a long, and finally fatal illness. There was neither pain in the chest nor cough; she ate well, and could sleep when lying on either side.

On examining the chest, as a matter of routine, I found skodaic resonance below the left clavicle as far as the second rib; below that absolute dulness (flatness) extending to the base. There was also dulness in the axillary and infra-axillary regions. Posteriorly, there was high-pitched resonance in the left interscapular area as low as the sixth rib; dulness in the infraspinous and infrascapular regions, taking the italic *f*-shaped curve first pointed out by Dr. Ellis.[1] There was ægophony, and in one spot at the left base posteriorly there was tubular breathing. The heart's impulse was imperceptible, but apparently in the epigastrium. I had great difficulty in persuading her to submit to treatment. On aspirating at the sixth interspace in the infra-axillary region, I drew off thirty-four ounces of clear blood-coloured serum.

W. H., aged 12, an errand-boy, had not been very robust, although he had never been laid up in bed, nor prevented from working. He complained of occasional pains in the left side, which had been felt during the last twelve months. Night-sweats supervened, but there was no cough nor hæmoptysis. He had been under medical treatment for debility.

On examination, the chest was found to be flattened somewhat under the clavicles, and there was very little respiratory motion on the left side. The semicircumference of the chest at the nipple-level measured half an inch more on the left than on the right side. The breath was very fœtid. There was skodaic resonance under the left clavicle downwards to the second rib, and dulness below. The percussion-note over the manubrium was duller than normal in the upper half, and the dulness then deepened in intensity to the ensiform cartilage. Posteriorly, the dulness in the suprascapular and supraspinous areas was

[1] "Clinical Lectures On Cases of Pleuritic Effusion," by Dr. R. Douglas Powell (*Medical Times and Gazette*, 1882). In connection with this, it is curious to notice that such a careful observer as Professor Frerichs states that "the line of dulness in hydatids of the liver is at a lower level close to the vertebral column and the sternum than it is in the axilla, "but," he continues, "this does not hold good with pleuritic effusions." "Clinical Treatise on Diseases of the Liver," by F. T. Frerichs, *Transactions of the Sydenham Society*, Vol. ii, p. 247. See also Dr. Stephen Ward *On Some Affections of the Liver*, 1872, p. 55.