MOTOR SYMPTOMS OF MANIA AND MELANCHOLIA;

WITH A THEORY OF THEIR ORIGIN AND OF THE ORIGIN OF DELUSIONS ARISING IN THESE CONDITIONS.

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"EVERY phenomenon is best studied where it exists in the greatest intensity. It is there that the effects which either depend on it, or depend on the same causes with it, will also exist in the greatest degree. It is there, consequently, and only there, that those effects of it, or joint effects with it, can become fully known to us, so that we may learn to recognise their small degrees, or even their mere rudiments, in cases in which the direct study would have been difficult or even impossible. Not to mention that the phenomenon in its higher degrees may be attended by effects or collateral circumstances which in its smaller degrees do not occur at all, requiring for their production in any sensible amount a greater degree of intensity of the cause than is there met with." Thus wrote John Stuart Mill in Book IV. of his "System of Logic." The principle above quoted is nowhere more applicable than in the study of insanity. We must begin with the investigation of the severest cases of mental dissolution, for it is there that we shall find characteristic symptoms most marked. Knowledge gained by such investigations may then be used for the study of milder cases of the same kind.

Some years ago I drew attention to the fact that melancholiacs suffer from paralysis and rigidity of the muscles of the spinal column and of the large proximal joints, the movements of the wrists, fingers, ankles, and toes being comparatively unimpaired. It appears that a certain amount of scepticism still exists in the minds of some observers with regard to the accuracy of my observations and I venture to suggest that such scepticism has arisen from neglect of the above principle of investigation. Observers have endeavoured to discover paralysis and rigidity in the milder cases of melancholia and have failed to do so because these symptoms are very slight in mild cases. Indeed, in the lesser degrees of melancholia slight paralysis has to be inferred from the patient's slowness of movement and from his inability to occupy himself in any way. It is only in the severest cases that there are obvious well-marked paralysis and rigidity, but these are the cases which should be studied first.

The coexistence of paralysis and rigidity is a common occurrence in disease of the nervous system. Paralysis and rigidity coexist in melancholia but the rigidity is more easily investigated than the paralysis. To recapitulate my previous observations, rigidity is most marked in the muscles of the trunk and neck, less marked but strikingly present in the shoulders and hips, again less marked at the elbows than at the shoulders, less marked at the wrists than at the elbows, and usually absent from the fingers. Similarly, rigidity is less marked at the knees than at the hips, very slight at the ankles, and usually absent from the toes. The rigidity affects flexors more than extensors and adductors more than abductors; hence the attitude of the melancholiac is one of general flexion and adduction, the shoulders being raised owing to the rigid contraction of the upper part of the trapezius. I have called the condition *proximal* rigidity in contradistinction to *peripheral* rigidity such as occurs in hemiplegia where the fingers and wrists are most affected.

In making observations on the above points voluntary resistance to, or assistance in, movement of the limb must be discounted, and it is further to be observed that, as in paralysis agitata, rigidity disappears from a joint after three or four passive movements. For this reason it is difficult to demonstrate the rigidity to a class of students. The paralysis is most easily studied where it is most intense—viz., at the large proximal joints. It is difficult to detect at the elbows but it is easily observed at the shoulders by asking the patient to hold the hands straight above the head. In a severe case the patient cannot raise the elbows above the level of the shoulders. In severe cases of melancholiac stupor the patient stands in an attitude of general flexion with

adduction and there is complete absence of voluntary movement (Fig. 1). But if there is associated with the melancholia some degree of restlessness or agitation, this naturally shows itself in those movements which are least paralysed—viz., in movements of the wrists and fingers,

FIG. 1.

ankles and toes. In other words the patient stands (for the rigidity at the hips renders sitting an uncomfortable posture for melancholiacs) rocking the body from foot to foot by alternate flexion and extension of the ankles, while constantly picking the skin of the fingers or fumbling with the clothes; the fingers are in constant movement (Fig. 2). I

FIG. 2.

the agitation is yet more marked it shows itself in grosser movements of the hands and feet, the patient wrings the hands and some elbow movement comes into play, and slight

movement at the knees may contribute to the rocking movement. In a few cases of melancholia in which the rigidity is sufficiently slight to allow the patient to sit with comparative ease, a to-and-fro rocking movement takes place at the hips as well as at the small joints. In all these cases, however, it is to be observed that the restlessness shows itself most in peripheral activity.

The movements of mania contrast very strikingly with those above described. Observations on movements of the

FIG. 3.

insane in general and of maniacs in particular are best made on female patients in the airing court, because females react more readily than males to ordinary stimuli and because movements are less restrained when the patient is in the open air. The movements of a maniac in a state of motor excitement¹ take place for the most part at the large proximal joints (Fig. 3). The trunk sways freely as the

FIG. 4.

patient walks and when she runs there is exaggerated movement at the hips, whereas in the running of a sane woman there is little movement at the hips. In the waving of the

arms, which is a frequent occurrence in mania, the greatest movement takes place at the shoulders and there is little movement of the wrists and fingers. The maniac shakes hands from the shoulder (Fig. 4), the melancholiac from the wrist (Fig. 5). In the maniac the attitude of prayer is with the hands upraised to heaven, in the melancholiac the attitude of prayer is with the hands clasped in front of the sternum. The typical attitude of the melancholiac is with the elbows close to the side, that of the maniac is with the elbows away from the side.

FIG. 5.

Correlated with these observations, there is an interesting one in the domain of experimental psychology. If the arm of a normal individual in an indifferent mood be allowed to rest upon an automatoscope (an instrument of the nature of a planchette but of more convenient shape), it is found that the instrument records on the paper a slight normal tremor of the arm. If now the individual receive an unpleasant stimulus—e.g., the smell of assafoetida—slight *adduction* of the arm is noticed and recorded by the instrument. If, on the other hand, the experimenter give a pleasant stimulus—e.g., the smell of heliotrope or white rose—slight *abduction* of the arm is noticed and recorded by the instrument.

I have so far attempted to demonstrate that characteristic movements of melancholia occur at the small peripheral joints and that characteristic movements of mania occur at the large proximal joints. I must, however, here call attention to a special variety of mania which does not at first sight appear to fall in line with the cases of mania above referred to. Some cases of acute mania have peripheral movement as well as proximal. These cases are not very frequent but they are usually very severe. The patient is, as a rule, too ill to be allowed out of his room. He crawls about on all fours and persistently polishes the floor with his fingers. If the patient lies on his back the arms are abducted and the legs are extended. Movements when present may be observed in both proximal and peripheral joints. Many of these patients die. They appear to be unable to withstand the most trivial intercurrent physical disease, an acute sore throat or a trifling attack of diarrhoea being in some cases sufficient to carry the patient off. I have, however, seen several such cases recover with very little dementia. Although these patients have both large and small joint movements the large joint movement is in excess, so that there is no difficulty in recognising them as cases of mania.

Having regard to the generally accepted view that insanity is due to some nutritional disturbance of the cortical neurons, I think that the observations above described suggest a possible explanation of the phenomena of mania and melancholia. This explanation depends upon Dr. J. Hughlings Jackson's hypothesis that the slow proximal movements of large joints are represented in the cortical motor areas in large nerve cells and the rapid peripheral movements of small joints in small nerve cells. Now the

¹ A maniac is not always in a state of motor excitement; he has his periods of rest. But here, as elsewhere, symptoms are to be studied when and where they are most intense.

nutrition of a cell may be disturbed in one or more of four different ways: (1) the cell may contain an irritating stimulating body; (2) the cell may contain a depressing paralyzing body; (3) the plasma surrounding the cell may contain an irritating stimulating body; and (4) the plasma surrounding the cell may contain a depressing paralyzing body. Now it is to be observed that, with regard to their cubical content, small bodies have a large relative surface and large bodies have a small relative surface. The large cells of the cortex representing proximal movements have a smaller relative surface than the small nerve cells representing peripheral movements. Let us now consider how these cells would be relatively affected by the four above-mentioned conditions of disturbed nutrition. If an irritating stimulating product were formed within the cortical neurons the result would be general motor activity affecting the proximal movements most, because the large nerve cells in which proximal movements are represented have a relatively small surface by which they may get rid of the deleterious substance, while the small cells would readily excrete it from their relatively large surface. If, on the other hand, a depressing paralyzing product were formed within the cortical neurons the result would be weakness or paralysis affecting the proximal movements most, for similar reasons. The same argument applies if the depressing influence within the nerve cell be deficiency of nutrient matter (trophoplasm); the large cells again suffer most because they have the smaller relative surface by which they may absorb nutrient matter from the surrounding plasma. If the surrounding plasma contained an irritating stimulating body there would result a general motor activity affecting the peripheral movements most, because the small cortical nerve cells, representing peripheral movements, have a larger relative surface exposed to the deleterious influence than the large cells. And lastly, for similar reasons, if the plasma contained a paralyzing body or its equivalent (deficiency of normal nutritive and stimulating bodies) there would result a paralysis affecting the peripheral movements most. The first condition (general motor activity affecting the proximal movements most) is, I have submitted, that which occurs in mania. The second condition (proximal weakness or paralysis) occurs in melancholia, especially in the more stuporous forms. The third condition (peripheral activity) is met with, as above stated, in cases of agitated melancholia and is also occasionally superimposed in mania upon the typical proximal activity. The fourth condition (peripheral weakness) is rarely, if at all, met with in cases of insanity except as a result of coarse brain disease.

The above considerations appear to suggest that we may form the following conclusions: (1) that in mania an irritating product is formed within the cortical neurons—such a view is further supported by the frequency of hallucinations in mania; (2) that in melancholia a paralyzing product is formed within the cortical neurons; (3) that in agitated melancholia there is a combination of deleterious influences—viz., a paralyzing product within the cortical neurons and also an irritating body in the plasma which bathes the nerve cell; and (4) that in a few cases of mania there is in addition to the irritating body within the nerve cell an irritating body in the plasma which bathes the nerve cell. Whether we are to imply from the above considerations a new formation of cytotoxins or an increased formation or deficient elimination of substances which normally occur in the organism there is at present no evidence to show, but as regards melancholia it may be well to bear in mind the old observation that in that disease there is a general tendency on the part of the cells throughout the organism to fail in the excretion of their normal metabolic products.

Origin of the delusions.—When once the fact is grasped that melancholia is a special form of paralysis it is easy to see in what way many of the more common delusions of melancholiacs arise. Although the melancholiac suffers from paralysis he does not realise that he is suffering from paralysis; he only realises that he is unable to do things which formerly were easy to him, and he naturally begins casting about for a reason for this change. If he comes to the conclusion that his condition is of the nature of an illness he does not suffer from delusion and is accordingly a case of "simple melancholia." If the patient is a spiritualist, if he believes (as most people do) that there is an immaterial ghost pervading the organism, a ghost spirit, or soul, which is not mind and which initiates all his actions, then when he finds that he is unable to

perform those actions his natural conclusion is that his soul is lost. Following up this train of thought he gets the idea that he is deserted by God, eternally damned, and cannot recover—that he has committed the unpardonable sin. In this frame of mind the patient may fix upon some past peccadillo as the cause of all the mischief, or by a process of simple paramnesia he may even falsely accuse himself of some dreadful crime. He may, for instance, falsely accuse himself of having swindled his firm, &c. Other patients, starting with the same premiss, regard their inactivity as a loss of vital energy and so come to the conclusion that they are dead. Others, again, with less definite ideas, at first merely believe that they are altered in some way; these patients subsequently develop most grotesque delusions about the nature of the change. For example, one female patient at present in Bethlem Hospital has come to the conclusion that she is a chicken. At first she merely thought that she was changed, but one morning two of the symptoms of melancholia so forced themselves upon her that she there and then concluded that she was a chicken. These symptoms were (1) the harsh dryness of the skin and (2) the position of the arms which were rigidly adducted to the side and flexed—a position roughly suggesting that of a chicken's wing. Occasionally the peripheral movement gives rise to delusion, as in the case of a male patient whose ankle movements were so gross as to give him the feeling of being thrown forwards on to his head; hence he has developed the delusion that he is upside down. If I take hold of his foot and ask, "What is this?" he replies "My head."

With another class of patients (hypochondriacal melancholiacs) the weakness, although general, appears to attract the patients' notice locally. For example, they exaggerate the weakness of the legs and develop the delusion that they are unable to walk or to stand, or that their legs are brittle and hence made of glass. Other patients of the same class suffering from the epigastric sensation in addition to their paralysis get the idea that their breath has all gone or that their bowels are permanently blocked up. The obstinate constipation, which is caused not only by the weakness of the abdominal muscles but also by the lack of intestinal secretions, also assists in the development of this last delusion. Closely allied to the ideas of bowel obstruction are such ideas as that of the throat being blocked up and of the food going up into the head.

In all the above cases the patient merely takes account of his own weakness and blames nobody but himself for his condition. But if he is normally of a suspicious nature, or if he suffers also from hallucinations or illusions, he is apt to ascribe his condition not to his own weakness but to the increase of resistance in his environment. Hence arise all kinds of delusions of persecution. Such patients believe themselves to have been changed by some hostile person or persons by means of some occult influence such as hypnotism. More usually they have delusions of persecution in accordance with the hallucinations from which they suffer. Poisonous gases are introduced into their room (hallucination of smell), poison is put into their food (illusion of taste), they are electrified (cutaneous hallucination), and so forth. Most of these patients are cases of dementia paranoïdes. Cases of true paranoia must be excluded from this category; the delusions of the paranoiac arise in a totally different manner.

So far I have endeavoured to show that most of the delusions of the melancholiac arise from his feeling of inactivity. Now the delusions of exaltation of the maniac arise in a corresponding manner from the feeling of activity which arises from the stimulation of his cortical neurons. The maniac during an attack of motor excitement feels strong and capable of the most wonderful athletic feats. Hence arises the general idea of power and the patient develops the delusion that he is a duke, lord, king, or God, or that he is possessed of untold wealth. The development of delusions of this kind, however, is very often disturbed by the frequent occurrence of hallucinations, so that the feeling of activity is thrown into the background by perversions of the senses.

The above outline of the mode of origin of delusions in mania and melancholia is not intended to be a complete account. It is only intended to draw attention to the fact that a large number of these delusions are to be explained by the feelings of activity and inactivity which I submit to be the most important characteristics of the two conditions.

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