

THE PHYSIOLOGICAL BASIS OF REPRESSION AND DISSOCIATION.

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MOST of those who are interested in psychopathology are prepared to admit that repression and dissociation are processes which underlie many of the symptoms of psychoneuroses and psychoses. We may, however go further than this, for we may see the same processes at work in the normal individual. Since none of us are perfectly adjusted either in respect of the interplay of our own impulses and emotions or in our relation to the environment, we have to make use of some means of reducing or overcoming the friction produced by this maladjustment, and repression and dissociation are two of the commonest means whereby this avoidance of friction is achieved. We are all familiar with the tendency to deny the existence of certain events or impulses and the logic-tight compartments built round incompatible constellations. It is our object to find an explanation of these two functions which accords more with physiological principles than do many of those advanced by the newer schools of psychopathology. Many presentations of Freud's teaching seem to bear too anthropomorphic an appearance, describing as they do the field of consciousness with a censorship dividing it from an unconscious realm containing repressed and dissociated material. Freud's own concept of the censor, however, was formulated simply as a convenient means of description and he deliberately left any physiological explanation on one side ; his description of the censor is of a barrier and nothing more.

If we are to obtain any conception of what we mean by the terms 'repression' and 'dissociation' from the physiological standpoint, we must try to find a common ground of expression between physiology and psychology. I believe that this can be discovered in the concept of a strict correlation between patterns of behaviour and patterns of neuronic activity. I think that everyone will agree that there can be no expression of mind *as we know it* without the activity of brain ; and that no activation of brain takes place without some phenomena which may be objectively recorded by an observer and/or subjectively experienced by the individual concerned, and which may legitimately be called mental.

The acceptance of such a postulate does not commit us in any way to accepting any theory as to causality ; we do not say that mental activity is nothing but a phenomenon of cerebral activity on the one hand, or that the psychological situation determines the activation of a certain group of neurones on the other. We do not even concern ourselves whether mental and cerebral activity is interdependent or independent. These are subjects which may safely be left to the metaphysicians.

At low levels we are content to regard the observed effects as correlated with the activity of neurones which we can actually recognize and map out. This is true of the various reflexes whose paths through the nervous system have recently been described with an increasing degree of accuracy. At such levels we are not accustomed to describe any 'mental effects,' but it does not do to be too dogmatic as to the absence of such effects. This applies more especially to reflexes in the vegetative field, for who shall say how much such reflex actions contribute to general coenæsthesia, which is an important factor in mental situations? As we get higher in the scale it becomes less and less possible to trace out the actual neuronie paths, but we can still envisage the locality of various functions. We know the importance of the structures in the floor of the fourth ventricle in relation to vital function and the regulation of the vegetative organs. We now recognize the importance of the interbrain and more particularly the subthalamic region in relation to primitive affective and more especially painful reactions. To quote Tilney: "Clinical evidence seems to be insistent that the thalamus is a centre for affective tone. Its irritation or destruction leads to changes in affective expressions and attitudes. The thalamus is a part which when diseased may lead to forced laughing and crying. It is a primary centre for involuntary movements and emotional expression. Psychic processes representing a certain degree of consciousness may be carried on by the thalamus independent of the cerebral cortex. These processes are probably limited to painful sensations. The thalamic centres are chiefly concerned with affective experience. Destructive lesions which involve the cortex alone do not necessarily disturb the painful and affective qualities of sensibility." Such functions are of course co-ordinated, discriminated and controlled through their connexions with the cortex. "Personality and behaviour in their most complex form still retain their relations to the primitive emotions. The archaic current of feeling tone arising from the interbrain pervades all the higher psychic faculties and colours them with some degree of pleasure or displeasure."

A good deal of more or less precise knowledge exists as to the localization of function in relation to discriminated and controlled motor activity, while the areas of sensory radiations which are concerned with more purely cognitive mental activity are also delineated with some exactitude. Pavlov's work on conditioned reflexes shows how various sensory and motor functions are analysed in the cortex and how inhibitions may disturb the chain of conditioned responses under certain conditions of cortical activity. The integration of cognitive functions with feeling which may result in what Tilney calls motor incentive to co-ordinate action would on anatomical grounds seem to take place in the frontal lobe, but it may prove on further investigation that the final co-ordinating and discriminating functions of the cortex depend rather on the more recently developed layers of cells than on the more recently developed areas. It thus appears that it does not require any very remarkable effort

of imagination to correlate a neuronie pattern with even the most complicated pattern of psychological significance. In any psychological constellation leading to a pattern of behaviour of whatever kind, we may picture the activation of a complex pattern of neurones extending from the spinal cord through the hindbrain, the interbrain, and the general cortex up to the frontal and pre-frontal regions and the superficial layers of most recently added grey matter. If we do not strain the analogy too far we might liken such a neuronie pattern to a series of railway lines with all the points set right, so that the traveller may pass over just that series without delay or difficulty. It goes without saying that the more habitual such a constellated pattern of behaviour becomes the more set do the points become, the more easily does the traveller accomplish this particular journey and the more difficult it is for him to branch off on to other directions.

It is obvious that it is our purpose here to correlate such more or less closed patterns of neuronie activity with the constellations of ordinary psychology and the complexes of analytic psychology. It has been objected that such a correlation makes no allowance for the undoubted dynamic quality of the complex in psychic behaviour. I do not believe this is a valid objection if due regard is had to the significance of form. How universally important this significance of form is, is a commonplace of modern knowledge. The discoveries of twentieth century physics have deposed substance and enthroned form, while æsthetic has of recent years concerned itself to an increasing extent with this same subject of form and pointed out its universal significance. Dynamic efficiency depends not only on the *vis a tergo* but also on the absence of friction. Energy must of course originate from katabolic processes, and the amount of available energy may vary in different parts of the body or even of the nervous system. Of such matters we are at present ignorant, and we do not know whether one action which appears more forceful than another owes this property to its own energy or to lack of external obstructions. After all, the neuronie pattern is held to be no more than a track for the spread of activation; and if this activation proceeds along a track of a particular form and of no other form this may have the most profound influence on subsequent behaviour. If activation is for example prevented from leaving this pattern form so that it cannot spread to other patterns, we can see how such intensely compulsive reiterations as are found in the obsessional neuroses and similar conditions may arise. We may thus envisage repressed or dissociated complexes which exhibit the tripartite characteristics of cognition, affection and conation as being correlated with an activity spreading through a neuronie pattern involving neurones in the spinal cord, the hindbrain, midbrain and cortex. Such activations may be expressed as activities of the vegetative organs, feelings organized as emotions or disorganized as angoisse and similar manifestations, thoughts practical and phantastic, and actions simple or complex.

If this presentation of the physiological correlate of the psychological concept is accepted, in order to demonstrate our theory of repression it is

necessary to consider another important function of the nervous system. Sherrington has shown how the nervous system as a whole exercises an integrative action, and has formulated the principle of reciprocal innervation. Under ordinary circumstances we find that these reciprocal actions are reasonably harmonious, but become less harmonious as we ascend the scale of nervous levels. The perfect reciprocal action between agonist and antagonist in the sphere of voluntary muscular activity would be a source of continuous wonder were it not such a matter of course. In the vegetative field this is not always so much a matter of course; but in health the ordinary integration of, e.g. contraction and relaxation during the process of peristaltic action of the bowel is so smoothly carried out that we are unconscious of our digestive function. When we come to the emotional field we find less perfect integration in our daily life. Both in animal and human behaviour it is a commonplace to observe the indecisive actions due to a conflict between curiosity and fear, between fear and anger, or between the more complex patterns which we call self-assertion and self-abasement.

When we come to examine pathological conditions in which this integration has broken down we find a state of affairs which I submit throws considerable light on the subject of repression. In the sphere of voluntary muscular action let us consider that form of hysterical paralysis which was so common during the war and which is by no means rare even in these days of peace. The limb is held rigid, the flexors and extensors both being in action at once, the action of one group in fact cancelling out the action of the other more or less completely. Close observation showed that if this mutual cancellation was exact and complete the limb was held rigid and still; but if, as was usually the case, it was not exact, minute movements in either direction were permitted. This phenomenon is generally described as tremor, which in these cases might be regular, fine, or gross according as the action of either group escaped from the lock imposed by the other, regularly or irregularly, for an instant or for longer; but since this movement is physiologically distinct from the tremor of organic disease it would be better to describe it as oscillation. In the vegetative field the principle of reciprocal innervation is the same, though the time relationship is different; for while voluntary muscular integration requires a relaxation of antagonist synchronously with the contraction of the agonist, in involuntary muscular action the relaxation precedes contraction in time so that the peristaltic wave results. In addition to transitory disturbances of this rhythm there is evidence to support the theory that such conditions as achalasia gastrica and Hirschsprung's disease are due to a disturbance of this integrative function and not to any structural obstruction. When we observe vegetative function as a whole and consider the physical accompaniments of anxiety as described by the term 'angoisse' do we not see an oscillation analogous to the tremor or oscillation accompanying hysterical paralysis? Here there is an incomplete balance of vagal and sympathetic function so that various symptoms occur

at one time characteristic of vagotonia and at another of sympathicotonia, much to the discomfort of the patient. Thus we may find a rapid pulse, a certain degree of bronchial spasm, a dry skin, an atonic bowel as present together—to the confusion of those who would try to discover a tonus of one sort or another, but explicable on the theory of oscillation.

In the emotional sphere such cancellations and oscillation effects are met with even in normal life, but still more in pathological conditions. As McDougall has pointed out in discussing the schizophrenic, sulking is an example of the cancellation of opposition. He says, "The sulking child (or adult) is one whose self-feelings are wounded; his self-assertive tendency has been thwarted, he broods over the insult or injury; but he can neither assert himself energetically in new efforts, nor frankly accept the rebuff and yield to superior force; unable to accept a rebuff with deference, or respect, or admiration, he withdraws from all social contact and broods, a prey to a painful conflict in the very citadel of his personality, his sentiment of self-regard; all interest in the outer world arrested, all outer activity paralysed."

"Embarrassment is a fleeting though painful conflict between the self-regarding affects; sulking is a deadlock between them. And sulking is a dangerous condition, already half-way to disorder. In children it normally terminates with the victory of one or other impulse, with an outbreak of naughtiness and violent self-assertion, or in a scene of reconciliation in which the child sobs on his mother's shoulder and promises to be good. In the adult, sulking is apt to terminate more tragically than in the child. The sulking, the self-absorbed brooding over slights or insults, may terminate in an outbreak of vengeful violence or; as in the introverted Malay, who after sulking (like Achilles in his tent) takes his kris and runs amok, cutting down every human being he meets, until he is himself cut down. I am suggesting that the schizophrenic state is essentially a morbidly exaggerated and prolonged state of sulking; and that the sudden outbreaks of violence which such patients are liable to, even those that seem utterly apathetic, are strictly comparable to the amok in which the sulking of the shy, sensitive, introverted Malay is apt to terminate."

Again, in the more purely intellectual sphere, doubt is a state of conflict between beliefs. Doubt is not the opposite of belief, for this is unbelief and we know how, in a certain type of neurotic, all is doubt, even over the most obvious and to most people axiomatic truths.

What I wish to suggest in this paper is that the real nature of repression is as follows. Two complex patterns such as we have described in the beginning, in themselves antagonistic in the nature of the end they serve, fail to be integrated by the higher functions of the cortex or the mind—using the term 'cortex' if we are thinking physiologically, and 'mind' if we are thinking psychologically. Under these circumstances these patterns cancel each other out in the same way as do the patterns of muscular action, vegetative action and emotional action already discussed. Indeed, examples of each or all of

these minor pattern cancellations and oscillations may be found appearing as symptoms which modern psychology teaches us to be due to repression. These comprise pathological doubts and anxiety and the physical symptoms of *angoisse*. We thus get a view of repression as an interlocking of two opposing patterns which may be of equal value psychologically, and the outcome of such repression may be an eventual smooth integration or recovery ; or one side may more or less suddenly give way either partially, so that the opposing pattern becomes partially active in the form of a new symptom, such as an obsession lasting a comparatively long time or as a dream manifestation whose appearance is only momentary ; or wholly, in which case there is a sudden outburst comparable to McDougall's example of the Malay running amok. This occurs more often in the psychoses than in the psychoneuroses, though the 'all or none' reaction is familiar enough in the latter. In the ordinary conceptions of repression there is a tendency to represent it as if something superior was sitting on something inferior—as if, for few of us can avoid mental pictures, a virtuous child were sitting on the lid of a jack-in-the-box. But we do not always find the repressed material so much inferior, at any rate from the physiological point of view, and so I prefer the picture of two wrestlers locked in a clinch.

As an example of repression we may cite the case of a man who presented the following psychological situation. He was an only child and had in early life developed strong emotional attitudes towards his parents. He felt great inferiority towards his father more particularly in adolescence, when the latter had openly expressed intolerance at the son's clumsiness in manual activities demanding dexterity. Later the patient had entered upon a scientific career which had been crowned with considerable success, and had proved that he was definitely his father's superior in the intellectual field. The father was a man of narrow and somewhat bigoted religious views, and amongst other difficulties the son expressed great conflict in his religious life, being obsessed with the fear that if he took any rational attitude towards religious matters an offended and vengeful deity would exact some terrible retribution. Here it would seem that a religious complex in which his father's dominance and the emotional attitude towards this dominance was 'locked' with his scientific complex. Under ordinary circumstances this conflict is of course a common one, but it usually solves itself after a swing in either direction, in which the dogmatism of youth refuses credence either to religion or to science, by the adoption of a compromise such that a realization is possible that the two beliefs are not so incompatible as at first appeared. In spite of his intelligence and openmindedness in other matters, such a compromise was impossible for our patient, and the two patterns held the personality rigid in this respect, with frequent distressing oscillations at all levels of mental activity in the form of symbolic doubts, anxieties, and vegetative disturbances.

To continue our analogy referred to above: the wrestlers must turn towards each other, they must be interested in each other, they must find

contact all the time ; and when we translate this into terms of neuronic patterns I submit this represents repression. But suppose we find two individuals who never come into contact, who are never interested in each other, who continually turn their backs on each other. Translate this into terms of neuronic patterns and I submit we have the state of affairs in dissociation. Instead of antagonizing each other, each goes his own way, as perhaps happens at the levels of muscular action in cerebellar ataxia : there is no junction at their synapses and so there is no interaction whatever.

This difference in reaction between neuronic patterns is probably fundamental, depending on the temperament of the individual. It is surely significant that, on the whole, repression tends to occur in the introvert and dissociation in the extravert. It must be remembered of course that no man is entirely introvert or extravert at all times and in all circumstances, and therefore just as introversion and extraversion are not mutually exclusive in any individual neither are repression and dissociation. However, the introvert, being concerned with his own inner subjective reactions, tends to get his patterns into conflict, antagonising each other as has been described. The extravert, on the other hand, is concerned with the object and his adjustment to it, and so when integration fails, one pattern becomes adjusted to one object in the environment and another pattern to a second object. If then these objects are incompatible and the higher levels of cortical function fail, dissociation is bound to occur. This is best illustrated by the extreme case of the double personality in which major patterns are adjusted to incompatible life situations. In this connexion not only is the function of integration at fault but that of discrimination also fails, for presumably it is by this function that objects are discriminated and their suitability for synchronous adjustment determined. Until we can estimate what is the physiological difference between the introvert and the extravert we cannot go further in the explanation, but this may turn out to be chemical rather than structural.

To sum up, repression and dissociation are unsatisfactory methods of adjustment to conflicting situations. They are made necessary by the imperfection of the cortical functions of integration and discrimination. This imperfection may be due to a failure in complete development of the highest cortical levels in those individuals who are commonly described as always neurotic. On the other hand, the same imperfection may be permanently or temporarily induced by physical or mental trauma in an individual who under ordinary circumstances has these functions sufficiently developed to carry him through life. Here trauma is used in the widest possible sense to include every sort of injury from violence, from toxæmia, from fatigue, from emotional strains and every sort of environmental or endopsychic difficulty ; and physiologists must remember that these higher cortical functions being latest in development are most liable to interference and that they do not need a crow-bar to throw

them out of gear. Repression is an introvert syndrome, and may be represented physiologically by a cancellation of activities between two major patterns accompanied by more or less oscillation in the form of inco-ordinated symptoms characteristic of various levels of neuronic activity. Dissociation is an extravert syndrome, and may be represented physiologically by a complete failure of the passage of any activity from one major pattern which represents adjustment to an object to another major pattern representing adjustment to another incompatible object in the environment.