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BY

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ON CONSCIOUSNESS[1]

By CHARLES S. MYERS.

Little more than a generation ago, at one of the largest London Hospitals, its most distinguished physician is said to have observed to one of his clerks fresh from undergraduate Cambridge: "The sooner, my dear fellow, you forget your physiology, the better it will be for your medicine." Such advice would hardly be ventured to-day. Nor, I think, would a medical student be now told by any of ourselves: "The sooner you forget your psychology, the better it will be for your psychiatry," not perhaps because psychology has proved now more useful in furnishing an applied science than physiology proved then, but because at present, with rare exceptions, the medical student is afforded no opportunity of learning psychology, but has to pick up a smattering of it as best he can when he comes to approach the problems of psychological medicine.

If for this reason alone, it may be not altogether a disadvantage for the Chair of the Section of Psychiatry of the Royal Society of Medicine to be held from time to time by a psychologist whose excursions into psycho-pathology are few and narrow—in my own case limited to the years of the recent war. I need hardly say how honoured such a one feels with this invitation and what a responsibility it places on him when he endeavours to present certain views and aspects, derived largely from a study of *pure* psychology, which he hopes may prove interesting and suggestive to those working in the applied field of *medical* psychology. In this address I propose to review our conceptions of consciousness.

Classification of the Modes of Consciousness.

Let us first consider its main forms or modes. These have for two generations past been classified as cognitive, conative and affective; the cognitive consciousness dealing with the experiences of sensing, perceiving, imaging, recollecting, imagining, and other kinds of knowing and thinking; the conative consciousness with the experiences of acting or striving or willing towards a more or less definite end; and the affective

[1] Being the Presidential Address to the Section of Psychiatry, Royal Society of Medicine, delivered on 11th November, 1924.

consciousness with its experiences of pleasure and displeasure. The inadequacy of this classification has been increasingly, if but tacitly, felt. Thus, the affective consciousness deals with far more than affective tone—mere pleasure and displeasure. (Indeed, as I shall presently indicate, I hesitate to regard these as primitive.) It covers every kind of feeling, not merely emotional, but also intellectual—feelings of familiarity, certainty, doubt, relationship, and so forth. It covers feelings relating to the *acts* of the self, as well as to the *condition* of the self.

Thus, in relation to the self and the self's activity, feelings appear to me divisible into two classes—the 'ipsi-affective' attached to the self, and the 'actu-affective' attached to the self's acts. *E.g.* in the state of *strain* and enhanced vitality produced by a favourable environment, the ipsi-affect is a feeling of 'exhilaration' (evolving into 'gladness'), the actu-affect is one of 'interest.' In the state of strain produced, on the other hand, by an unfavourable environment, the ipsi-affect is a feeling of 'uneasiness' (evolving into 'distress'), the actu-affect is one of 'repugnance.' Again, in the state of *rest* produced by a favourable environment, the ipsi-affect is a feeling of 'ease' (evolving into 'bliss'), the actu-affect is one of 'contentment'; while, in the state of rest and reduced vitality produced by an unfavourable environment, the ipsi-affect is a feeling of 'depression' (evolving into 'sadness'), the actu-affect is one of 'apathy.'

Moreover, when we are engaged in apprehending or recollecting any situation, it is obvious that we must inevitably employ the conative, as well as the cognitive, mode of consciousness as above distinguished. Indeed, knowing becomes a form of doing. Hence attempts have been made to classify the modes of consciousness not on these older lines but on the basis of a distinction between doing and what is done, *i.e.* between process and product, or between act and content, *e.g.* between the act of perceiving and what is perceived, the act of remembering and what is remembered, the act of deliberating or deciding and what is decided on or deliberated about. According to this scheme, consciousness is classifiable along the lines of self-activity and the outcome of self-activity. But even this appears unsatisfactory, because, in the first place, it leaves the affective consciousness out of consideration and, in the second place, it implies that whatever product of consciousness appears to be 'presented' to the self is really a product of self-activity.

In regard to the latter, is it reasonable to suppose that when we suddenly hail a friend or are struck with an idea, the corresponding

percept or thought is *consequent on* an act of the self? Is it not more in accordance with common sense to suppose that such a percept or thought is a 'presentation' to the self, rather than that it is produced by the self? Are there not occurring numerous processes that yield conscious products—acts which are independent of the self? Are not the process of sensing and the spontaneous revival of past experiences examples of these, and are not their mental products—sensations, say of heat or noise, and memories, say of a forgotten duty—*received* by instead of being *created* by the self? To this it may be replied, that such acts and contents are at first mental but not conscious, and that the only consciousness which is possible for us is the self's consciousness—the consciousness arising from the activity of that highest unitary system which we call the 'ego.' Heat is not a sensation until the self attends to it. Before it so attends, something is presented—some mental content produced by the mental act of sensing, which involves not self-activity, but the activity of some lower mental function—mental but not conscious.

The attempt may be made to evade this difficulty by employing the principle of what I shall later describe as 'self-projection,' or by supposing that originally, *e.g.* on the first occasion that the sensation was ever experienced, the self was consciously engaged in the act of producing it, but that in later life the act had become so habitual that, self-activity becoming no longer involved, the act had been relegated to lower nervous levels.

TWO MAIN CONDITIONS OF CONSCIOUSNESS.

To this it may be rejoined that there is no decisive evidence that, as with practice an acquired act becomes a habit, the nervous paths are essentially different (save in so far as concomitant redundant acts are abandoned) from those which were employed during the acquisition of that habit. It may well be that the presence or absence of the consciousness of self-activity is dependent on the degree of resistance which the nervous processes encounter, and that practice wears down this resistance, canalising or facilitating one and the same path as the unpractised conscious act gradually becomes a habitual one. But if consciousness is dependent on the degree of such highest resistance, we have to remember, on the other hand, that when that resistance is excessive—owing to the harmful effect of the experience on the organism—consciousness is again abolished. True, the resistance or inhibition against entry into consciousness may appear to be here of another kind—due to incompatibility instead of to novelty. But elsewhere in mental

life we have at least two other seeming examples of an intermediate range, on either side of which the appearance of one and the same function is favoured.

The Principle of Similarity between Extremes.

Thus, in order to withstand suggestion, the field of consciousness must not be too diffuse, nor must it, on the other hand, be too restricted. The condition of hypnotic suggestion, as is well known, is induced by fixation of attention within narrow limits—gazing at a point of light, thinking concentratedly of going to sleep, etc. But the suggestibility of a person is also increased in the opposite condition of reverie brought about by asking the subject to relax his attention and to 'think of nothing.' Somehow each of these antagonistic states leads apparently to the same result—the abolition of self-control, and the acceptance of ideas which under normal conditions would be rejected.

The second example which I have in mind relates to the development of emotional experience. There is good reason to suppose that one of the principal factors determining our experience of an emotion is the degree of resistance which prevents its expression in bodily activity. If that resistance be not too great—if, say, a dangerous situation is fairly readily soluble by the reaction of flight—the emotion of fear may not be felt. But when great resistance or conflict is offered to such expression, the emotion is at once developed. A similar standpoint has been taken by some, *e.g.* Prideaux, who have carried out observations on the psycho-galvanic reaction. Within certain limits this reaction is more intense when the emotion with which it is associated is less felt. To take the extreme case of the idiot, he gives more free *expression* to an emotional situation and develops the psycho-galvanic response to it more strongly than a person of normal intelligence, but there is good reason to suppose that he *feels* the emotion less intensely. A certain resistance to expression—what Drever calls a condition of 'feeling tension'—seems essential before emotion can occur[1]. But Drever believes that emotional feeling is favoured not only "when there is some check, or at least pause, in the attainment of the end or satisfaction of the impulse," but also "when the end," so far from being checked, "is attained so quickly or abundantly that action cannot keep pace with feeling[2]."

We may well wonder how excess or defect of a given condition may

[1] *Instinct in Man.* 2nd edition, 1921, p. 272.

[2] My argument is hardly affected by any obscurity in the last few words of this quotation.

lead to the same result, but an explanation in evolutionary terms appears worthy of consideration. Along these lines we may conjecture that it is pre-eminently from the *moderate* condition that new effects are developed, the more primitive effects persisting in *extreme* conditions that fall far short, or are far in excess, of the moderate. On this supposition, extreme suggestibility is a primitive mental characteristic, which has gradually become reduced in the course of evolution under conditions of moderately restricted attention. By the same reasoning, readiness to experience emotion is a characteristic of the *primitive* mind. In higher organisms it persists when its end is extravagantly attained or when there is considerable check in the attainment of its end; on the other hand, it becomes reduced or abolished when that end is attained without undue speed and fulness, on the one hand, and without undue check, on the other.

So also in regard to consciousness and resistance. The primitive condition of the living organism is such that its mental activity is largely unconscious. Conscious activity has been differentiated from it. From this it must not be inferred that the beginning of conscious life is to be sought in reflex action; the reflex act is rather the decadent relic of a primordial *mental* activity which preceded the development of *conscious* activity. Mental activity is prior to habitual and reflex (*quasi*-mechanical) action; the mechanical is rather an abstraction from the truly mental.

ACT AND DIRECTION.

The distinction we have drawn between act and content, between process and product, is characteristic of all vital activity. We can separate the act or the process of secreting from the secretion or the product of that process. Whether the level of the nervous system be high or low, whether or not there be attendant consciousness of the mental act or content, we can speak of neural process on the one hand, and of neural product on the other, and we may suppose that every such act involves mechanical work and hence the expenditure of force, and that with every act energy is expended, involving a degradation manifest in the form of electricity, heat, etc. But vital activity is characterised by anabolic as well as by katabolic processes—by creative as well as by destructive changes. Furthermore, these creative changes are characterised by some degree of purposiveness; they do not occur merely by blind chance. Biologists are coming generally to recognise the insufficiency of purely accidental variations as an explanation of the origin of species. Hence, in addition to the explosive force of mere acts,

we have to consider the more continuous setting or direction in which those acts take place. It is the complexity and prominence of this directive setting that pre-eminently distinguishes the nervous from all other tissues of the living organism, and that above all distinguishes the conscious from the unconscious mental life of that organism. And as direction depends on pre-existing dirigibility, it demands plasticity, in contrast to fixity, of reaction.

Functions of Consciousness.

It is fairly obvious that if only one response to a given stimulus were possible, consciousness would be of little value and would hardly have arisen. Its utility arises when alternative reactions are possible, when some sort of choice has to be made between them, for the benefit of the organism as a whole, or when, as in an important emotional situation, it is essential that no other conflicting reaction be made to another simultaneous experience. Consciousness is thus a selector of alternative *responses*.

It is also a selector of alternative *stimuli*. If, owing to uniformity of external conditions or to the immobility of the organism, the organism were unable to alter its relation to the environment, consciousness again would hardly have arisen. One of its most important functions is to seek and maintain an environment that is favourable and to avoid one that is unfavourable, whether that environment be a physical one, say in the form of external nourishment or temperature, or a mental one, say in the form of appropriate or noxious thoughts.

But in order to act effectively as the selector of alternative reactions and of the environment, relatively small variations in the environment must evoke different reactions. If two slightly different stimuli gave identically the same response, no purpose would be served by our being conscious of any difference between them.

These, then, are the main functions and conditions of consciousness; and in realising them we realise still more clearly how all consciousness must form part of 'self-consciousness,' by which I mean not necessarily the knowledge or the awareness of the self, but the involvement of that highest integration of activities which is known as the self within the indivisible, organised, individual organism. Consciousness thus functions as the coordinator of all the past and present experiences of the organism so as to give direction to the selection of its future activities and environment, in compliance with the organism's sanctions and ends.

THE DEVELOPMENT OF PROJECTION.

I spoke just now of the reflex act as a decadent form of mental activity. It has been too common an error to regard the simple in life as prior to the complex. We are apt to forget that the most lowly unicellular organism eats, breathes, secretes, excretes, reproduces, and exhibits irritability, contractility, and even apparent choice and ability to learn by experience, whereas in the higher organism such functions are specialised in its different tissues. The vague complex, in other words, precedes the differentiated simple. So it is largely in the life of consciousness. Simple sensations are not the first experiences. The first post-natal or even pre-natal experiences are vague affections of the self—or of what will come in time to constitute the self, as later it becomes differentiated from external situations, and as later external objects come in turn to be differentiated from external situations. At quite an early period many of the infants' experiences, especially the visual, become projected first as situations, then as objects, instead of being, as at first, little more than affections, so to speak, of the self. It is only gradually that from these objects the separate, simple sensations, say of whiteness, softness and sweetness are differentiated. But these sensations, we must remember, are not wholly projected. Red, for example, clearly resides in the object, but pain lies in ourselves, while such sensations as those of temperature and taste occupy a half-way position.

The observations of Head and Gordon Holmes in conditions of thalamo-cortical interference indicate that such projection may be lost in lesions of such sort. A prick may be no longer projected as such but described by the self as a characteristic change in, as an affection of, itself. Indeed under normal conditions the less projected the sensation, the more it approximates to an affective modification of the self. Titchener goes so far as to believe that sensations (hence cognitive states in general) have become evolved out of feelings.

I believe that this power of projection, the ability of the self to regard its own changes of state as something outside itself, is of far greater importance than is generally supposed. It surely culminates in the self looking down not merely on external independent objects, but also on its own *other* selves who come to be regarded as acting under its jurisdiction. Thus the most consummate actor is said to be he who, though he feels the emotions he portrays, experiences them in such a way that it is as if he were looking down upon another self that actually feels them. Something of the same effect, though doubtless of different causation,

is observable in certain dreams, where we dream that we are dreaming, and in that transient, slightly pathological condition known as 'depersonalisation,' common to large numbers of us, wherein the external environment appears for the moment as strange, and we seem to be looking on another instead of on ourself as really experiencing it and acting on it. It occurs still more strikingly, of course, in the more definitely morbid condition of loss of reality. Similar processes may account for that alternation of personalities behind which there is a continuous personality that knows the acts and experiences of the others. The well-known limits of post-hypnotic suggestibility indicate the same preservation of a higher, dominant, however dormant self. The integrity, the intactness of this supreme self may prove, I even suggest, to be the future criterion between so-called psycho-neurotic and psychotic conditions.

Synthesis and Consciousness.

While the simple is, so to speak, distilled from the vaguer complex, nevertheless synthesis goes on, as well as analysis; and many instances will easily occur to one where new experiences are dependent on an integration of stimuli or of more primitive experiences. On the one hand, where a reflex is inherited or a habit is acquired, consciousness is useless since the stimulus inevitably releases one and only one reaction. On the other hand, where an instinct appears, consciousness (let us call it 'instinct feeling') is essential, because intelligence can be brought to bear so as to improve by growing experience the imperfect instinctive reaction to the situation. Where emotion enters, the number of alternative conflicting instinctive reactions to a stimulus has become manifold, *e.g.* in the case of fear—flight, rigidity, flaccid palsy, crying, clinging to the parent, fighting at bay; and their respective *instinctive* feelings become integrated about a common object on this higher plane to create *emotional* feeling. Where sentiment enters, a number of alternative conflicting emotional feelings have become integrated about a common idea, and a new *sentiment*-feeling, *e.g.* that of love or hate, emerges.

The importance of the integration of such alternative conflicting mental states as the creator of new ones can hardly be over-estimated. Rivers has from the ethnological standpoint attributed new cultures to the clash of immigrant with indigenous ones; and it seems possible that similarly the creations of the inspired genius may be the product of unconscious conflict.

ACT AND POSTURE.

Let us now consider what we know of the activity of living substance. It exists in two forms: (i) intensive and momentary, and (ii) moderate and prolonged. The contractions of striated muscle illustrate intensive and momentary vital activity; the reactions of heat and cold spots offer another example. There appears to occur a firing off of already-prepared, explosive material, followed fairly rapidly by fatigue. The contractions of unstriated muscle illustrate the more moderate and prolonged form of activity, where tone and long-continued adaptation seem to replace the explosive force and consequent fatigue characteristic of the first-mentioned form. Again, the tone and the posture in striated muscle, both of them moderate, long-continued and relatively indefatigable, illustrate the same form of activity. They involve a directive balance, a delicate nervous coordination, between two opposing muscles, flexor and extensor. The sensations of warmth and coolness depend on a similar mechanism. In contrast to the *spot* system subserving heat and cold, this *diffuse* spot-less sensibility involves a close coordination between the mechanisms for warmth and coolness, as is exemplified first in the set state of balance that occurs in the form of 'sensory adaptation,' a kind of stationary posture, as it seems to me, between the opposing mechanisms of warmth and coolness, when the skin is exposed for some time to a warm or a cool environment, and secondly in the action resulting from disturbance of that balance that occurs in the form 'sensory contrast,' when that environment is suddenly replaced, say by a neutral one. Such phenomena as adaptation and contrast do not occur in the spot system; there we have merely sudden, almost ungraded reaction and fatigue.

Thus we come to contrast powerful energetic explosive acts, followed by a loss of material available for the allowance of further acts, on the one hand, and the more moderate, more graded activities, on the other hand, involving reciprocal inhibition and facilitation, and finally yielding a long-continued set or state of adaptation or attitude.

May we not usefully distinguish these two forms throughout mental activity, even up to the highest conscious processes? In other words, have we not, on the one hand, the momentary, relatively fatigable acts of apprehension, recall, decision—of *expression*, in general—and on the other the long-continued, relatively persistent sets or attitudes—mental *postures*, if you like, in which those varying acts take place? On the one side, we have the more mechanical acts, on the other, the more directive

attitudes—though, of course, the acts themselves are far from being devoid of a certain coordination and direction. We recognise thus in mental activity a more mechanical factor and a more directive factor, each involving the expenditure of work; but whereas we have some conceivable idea of the nature of the former, we have none whatever of the nature of the latter.

We might well pause, did time permit, to consider what is the effect of profound morbid changes in attitude on the consciousness of acts. Two obvious and opposite directions of change at once present themselves. At the one extreme, attitude is unusually persistent and unvaried. According to the old *dictum, semper idem sentire ac non sentire idem est.* At the other, attitude is to all intents and purposes non-existent; the mental acts follow one another over a vast field whose meaning is changing with bewildering speed. So far as consciousness is concerned, have we not here yet another of the illustrations already given in this paper that 'extremes meet'?

The Rôle of the Affect.

All that we can say of any higher mental attitude is that it is closely associated with interest—innate (*i.e.* immediate) or acquired (*i.e.* indirect). Hence has arisen the wider notion, extended not only to our higher attitudes but also to our higher acts, that they are dependent on affects, whether the affects partake of those moderate, more continuous forms or attitudes known as interests and moods, or of the more powerful, less lasting forms or acts known as feelings of emotion and of sentiment. Hence, too, has arisen the notion that there is a common fund of mental energy of affective origin, a single *libido*, which can be drained off now into one, now into another channel of mental and motor activity in such a way that what one channel gains involves a corresponding loss among other channels.

The early neglect of the importance of affects has resulted, I think, in an exaggerated swing of the pendulum to the opposite extreme. It is, I think, ridiculous to suppose that the energy in forming our acts is derived solely from our affects. We may, however, reasonably consider the view that, using the term in its widest sense, our attitudes serve as keys that unlock the energies resident in our acts. It is also ridiculous to suppose that our acts depend for their energy on drainage from one set of channels to another. The modern studies of repression alone suffice to prove that censoring, as the Freudians term it, involves actual work in the imposition of resistance. The mind is not comparable, as

according to McDougall, to a vast sewerage system, in which the active channels drain off energy from those which are *ipso facto* rendered inactive; inhibition involves as much work as excitation.

The same exaggerated importance of the affective consciousness has led to the attribution of all forgetting, every slip of the tongue, to emotional conflict and inhibition. Surely prolonged laboratory experience in learning large numbers of senseless syllables or in rapidly naming long series of familiar objects suffices to show the extravagance of this view. Deterioration or disorder in cognitive processes is not always dependent on affective factors. We must recognise that the act may suffer through its excessive exercise, as well as through direct inhibition by other acts; at the same time fully admitting that the attitude which suffers mainly through flagging interest or conflicting feeling may also thus influence the act.

CEREBRAL LOCALISATION.

That some central factor of 'general intelligence' exists, depending on the functioning of the highest system of mental activities known as the self, there can be little reasonable doubt. But its conception is also commonly bound up with that of localising the various conscious processes, which are *not* those of general intelligence, in different regions of the brain. For generations past it has been customary to believe in special centres for the various motor, sensory and perceptual activities involved in speech, and to regard them as 'seats of consciousness,' connected with one another and presumably with that highest central centre of the self or ego. It is interesting to find that the recent researches into aphasia by Head have enabled him to produce cogent evidence against such a view.

For my own part, in my Cambridge lectures I was long wont to protest against it by means of the following illustration: If I wanted to travel by rail from Cambridge to King's Cross, it would be essential for me to pass through Hitchin. A block at Hitchin would prevent my arrival at King's Cross. But I should not be justified in confusing Hitchin with King's Cross and in transferring the block at Hitchin to King's Cross. So, too, if a certain occipital area must necessarily function in order that, say, an apple may be perceived as such, I should not be justified in describing that area as a 'visuo-psychic centre,' because I fail to apprehend an apple when that area is disorganised. All that I can legitimately infer is that that occipital area is essential for visual perception, just as Hitchin is essential for me to reach King's Cross direct from Cambridge. Seats of different consciousness must not be thus

fallaciously localised in relatively small different areas of the cerebral cortex.

A similar error endangers Head's earlier conjecture (in his work with Gordon Holmes) that the thalamus is the "centre of consciousness for certain elements of sensation[1]" which he infers from the results of interference of the normal connections between the thalamus and the cerebral cortex. No doubt he would himself admit that if we isolate a relatively small part of the central nervous system, it is impossible to suppose that that part remains the seat of conscious processes. Consciousness depends on the self. The activities of the thalamus can only affect consciousness by forming part of those activities which contribute to those of the self. All that we can safely infer is that when the thalamus is separated from the cerebral cortex, its activities affect the self in a manner different from that when its normal relations to the cortex are intact. We cannot endow the thalamus with a 'centre of consciousness.'

The Nature of Consciousness.

This brings me, in conclusion, to a brief study of the nature of consciousness itself. There was a time when mind was regarded as the product of the brain just as bile is regarded as the product of the liver. This was succeeded by an age when mind and living matter were considered to be so absolutely different in character that for this, if not for any other reason, it seemed absurd to compare mind with bile as a 'secretion' of living substance. Instead grew up, on one side, the theory of psycho-physical parallelism—that mental and neural processes are two different aspects or reflexions of one and the same unknown activity —and, on the other side, the theory of interactionism—that so far from being parallel they are independent and may each, according to circumstances, influence and control the other.

Times have now changed. Substance proves no longer as 'substantial' as it appears. We are no longer content to regard matter as composed of solid atoms. The structure of the atom is now revealed to us as a constellation of ions, each of which appears to be merely a centre charged with electrical energy, endowed with inertia, mass, weight and structure.

What exactly is the relation of such a view to the hypothesis of a structureless, continuous, almost perfectly elastic ether is so far uncertain. But the phenomena of light prove no longer to be solely explicable in terms of the undulatory theory; some of them now demand a corpuscular

[1] *Brain*, 1911–12, Vol. xxxiv, p. 181.

theory for their solution. At all events matter is coming to be regarded as a manifestation of electric forces, a product of activities.

What now of mind? Is not this likewise a product of activities? Is the difference between mind and matter so fundamental as a hundred years ago it appeared? Are not the hidden *activities* of mind and matter of greater import than their more obvious *products*? Are not the respectively material and mental characters of these products due ultimately to such activity itself?

When we come to consider the difference between mind and *living* matter, the distinction is reduced almost to vanishing point. For it is essentially the same purposive, directive, plastic and constructive characteristics, distinguishing living from dead matter, which, raised to a still higher power, distinguish both nervous and mental activity from the activity of other living tissues. The problems of life that confront the physiologist are almost precisely those of mind that confront the psychologist. Life and mind must ultimately be described in similar terms. From each we can abstract the mechanical, comparable to what we know of the activities of lifeless matter. But is it not conceivable that the apparently blind mechanism of which physics treats is only an abstraction from a purposeful direction that plays its part in the larger universe regarded as an organism, just as we are bound to conceive of such direction even in the lowest living individuals, even in the lowest physiological levels of the higher living organisms?

With progressive evolution of these various levels have 'emerged,' according to the recent terminology of Lloyd Morgan and Alexander, the various levels of mental activity. It may be that the term 'differentiation' will often be found more useful than that of 'emergence,' so frequently is the new really pre-existent, though in a primitive, vague undifferentiated state, in the old. But admitting also the 'creation' of new forms with the progress of evolution, may we not at least sometimes regard the mechanical forms of activity as being a degradation of still higher forms? Because electrical energy is the only energy in which that of the nervous system reveals itself to us, can we deny the possibility that this is a degradation of some higher, what I may term 'psycho-neural,' energy, which assumes a more psychical character in the highest levels of the nervous systems of the most highly organised individuals, whose wider and more plastic areas are more complexly integrated together to function as a single entity?

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