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## The Divorce of Psyche and Soma

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■ As in many marriages the romance of psyche and soma has been stormy. And while numerous marriage counselors have attempted a reconciliation, no solution seems final. Historically, this particular relationship has been known as the mind-body problem and has been inextricably interwoven with the history of medicine. The evidence suggests that primitive medicine and primitive psychiatry were coextensive<sup>1</sup>. Disturbances of both psyche and soma were treated by means which were for the most part "psychological," even though it may have been felt that in some cases the cause of the malady was demoniacal. Over the centuries, when it became more clearly evident that disturbances of the body would respond to physical treatment, medicine proportionally became more divorced from psychological forms of therapy. As the natural sciences, especially chemistry and biology, advanced in the understanding of their subject matter, in a parallel manner — although with some time-lag — the practice of medicine acquired some of their methodology and became locked-in with the materialistic-mechanistic viewpoint of man and of his illnesses.

The gap, then between medicine and psychiatry arose gradually as the treatment

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of somatic disease became increasingly influenced by the dominant natural science approach, while diseases of the psyche were left behind to be treated by whatever means were available. Since the etiology of psychological disturbances was largely obscure and thought to be rooted in non-material factors, there was not much room for a scientific diagnosis or rational treatment. This distinction in treatment seemed to exist whether or not the healer subscribed to a dualistic composition of man, for in either case it was considered — even though for different reasons — that psychic phenomena did not lend themselves to a scientific study.

However, this situation gradually changed when more information became available, relating behavioral disturbances to specific brain or nerve lesions. The discovery, for example, that general paresis was brought about by lesions resulting from invasion of the CNS by the *Treponema pallidum* spirochete was a step forward. Subsequently, a whole host of physical factors has been identified as the possible causes of mental retardation. Many psychic disorders are now known to be caused by, or associated with, the malfunctioning of brain tissue. Severe deficiencies of niacin or of thiamine can lead to psychological disturbances. All these discoveries attest to the rapid development in the last half-century of our understanding of mental disturbances and their physical causality.

Nonetheless there remains a host of diseases which are not currently attributable to specific physical causes. Many investigators



are convinced that eventually some "biochemical lesion" will be found to be the responsible factor for every mental illness. Yet there seem to be a number of conditions in which the causative agent is not a physical one in the ordinary sense, but a psychological one, perhaps related to experience in early life. To be sure, any experience will leave a memory trace which is somehow, somewhere, stored as a modification of a chemical substance, perhaps a RNA-peptide complex as the work of Ungar and others suggest<sup>2</sup>. Such a substance would not be the primary cause of the emotional disturbance but rather the intermediate step by which the "psychological event" influenced brain function so as to set up a perturbation resulting in the overt symptomatology.

In practice there is a gradual rapprochement of psyche and soma although with some hesitation, much as two uncertain lovers attempt a marriage. The field of psychosomatic medicine is a clear witness to the general recognition of their mutual interaction. It has been proposed and explicitly emphasized by others<sup>3</sup> that psychosomatic medicine is the bridge that is closing the gap between medicine and psychiatry. Indeed, one is tempted to suggest that diseases can be conceptualized as existing along a continuum, a psychosomatic continuum, in which one extreme approaches asymptotically a purely physical disease, while the other in a similar manner approximates a purely psychic disorder. Thus from this viewpoint every disease, bodily or mental, would have two components — somatic and psychic — the proportion of which would differ and determine their position along the psychosomatic spectrum. At this point no mention is being made as to whether there exists a cause-effect relationship; all that is being said is that every disease manifests both somatic and psychic aspects, a truism perhaps for members of this audience.

Having suggested the manner in which the gap between psyche and soma probably arose and how this gap is gradually closing, still leaves unsettled the more basic question as to just what these two words really represent.

Man is inclined to name things as they appear to him. And the more familiar he is with some natural object, the more names he tends to give it. Each represents subtle differences in states of the object. Thus Eskimos have some twelve different words to describe the various states in which snow can be found<sup>4</sup>. Are not the words "psyche" and "soma", perhaps, merely representative of the same tendency, so that they stand merely for two aspects of the one and the same reality? I think it unlikely. For over 2500 years, western man (to limit the area of inquiry) has struggled with this problem and is concerned about it to the present day.<sup>4a</sup> On the one hand the Nobel Laureate, Professor E. D. Adrian, summarizes, but does not subscribe to, what is perhaps the majority view as: "Since that time, metaphysicians of all shades have shown a notable unanimity in rejecting the dualist position. They are agreed that the layman's separation of mind and matter will never do and they have given no support to the physiologists who assert that a thought is not the kind of thing which can be expected to depolarize a membrane. They tell us that those who hold such views have no clear conception either of mind or of matter and have been led into error by theological dogma and the ambiguities of language. Unfortunately, their agreement in rejecting dualism has not been coupled with agreement in accepting anything else".<sup>5</sup> More succinctly, Taylor and Wolpe state: "Hence we reject every form of psychophysical dualism, and all derivatives and unacknowledged relics of dualistic theory."<sup>6</sup>

On the other hand, Wilfred Penfield writes the following: "Sherrington, once my teacher in physiology, wrote in the second edition of his book, (*The Integrative Action of the Nervous System*, (1947) 'That our being should consist of two separate elements, offers, I suppose, no greater inherent improbability than that it should rest on the one only'. It is difficult for us to conceive of two separate elements. But it is equally incomprehensible that there should be only one element presenting itself as two — the body and the mind. It is a choice, as Sherrington suggests, a choice of

two inherent improbabilities. But one of them must be close to the truth, and one of them should be chosen by every responsible man as a faith to live by and to die with.”<sup>7</sup> Among those who elect a strong dualistic position besides Sherrington, Adrian, Le Gros Clark, and Bertalanffy is the Nobel Laureate, Sir John Eccles. Perhaps more than any modern biologist, he has attempted to develop in some detail how a dualistic stance can account for the known data.<sup>8,9</sup> We must come to the conclusion, then, that this is not an illusory problem even today. Indeed, its solution is of great practical importance to both psychiatry and medicine.

In its simplest form, the bone of contention between psyche and soma is, how can the obvious biological data and the obvious psychological data be reconciled with one another to form the evident unity which is behaviorally observable and which man experiences in the subjective awareness of the perpendicular pronoun, “I”. We can, however, tease out several layers or levels of phenomena that need explanation.

First, how can one relate the *subjective* experience of color, emotions, truth or love, to some specific neurological and chemical phenomena? While some progress is being made in understanding the *neurochemical* substrates of *neurophysiological* phenomena, much remains to be elucidated. For example, the depolarization associated with the nerve impulse involves a rapid change in the concentration of sodium, potassium and chloride ions on opposite sides of the neuronal membrane. But still unknown is the precise chemical nature of the membrane changes which permit the differential flow of ions. Although we know in some detail the role of mitochondria and oxidative phosphorylation in providing energy for the functioning neuron, we still do not know the step-wise mechanism by which the energy stored in a glucose molecule is transferred during the process of oxidation to form the high energy phosphate bond found in ATP.

Secondly, a greater difficulty is to understand the relation of neuronal activity to our

subjective experience. Although, for example, we can trace nerve impulses from photon excited receptor cells in the retina to the occipital cortex, we still do not understand how this final phenomenon, the patterned cortical stimulation, is related to the experience of vision: color, shape, etc. Hallucinogens such as LSD, psilocybin and mescaline can bring about perceptual distortion and visual pseudo-hallucinations. These phenomena suggest that the presence of a specific foreign molecule in low concentrations at some critical points along the optic pathway can bring about such visual alterations. But just how these chemicals are causally related to the phenomena is as yet almost totally unknown.

Thirdly, still other data which need to be considered relative to the mind-brain problem are those obtained from the split-brain work. Experiments with monkeys in which the corpus callosum and anterior commissure were completely severed (as well as the optic chiasm in some studies) showed that most normal activities were not notably affected<sup>10</sup>. However the animals could be conditioned to respond to different and contradictory stimuli delivered to one visual field or the other, so that the right hemisphere responded to one and the left hemisphere responded to the other. If both stimuli were presented simultaneously, the animal was momentarily undecided but finally selected one or the other.<sup>11</sup> Human subjects with complete surgical section of the forebrain commissures who had been operated on for severe and intractable epilepsy (or were split-brain as result of accident) showed no gross changes in behavior. It was apparent, however, that the language center was represented unilaterally in the dominant hemisphere, usually the left. Although an object projected to the minor hemisphere could not be named, and in fact, the patient would deny having seen anything, he would nonetheless be able correctly to pick up that object when presented with a selection. There appeared to be an awareness that was non-verbal and only available to the conscious self when presented with that object through another sensory modality.

In all these various cases of split-brain, the evidence suggests that there are two separate awarenesses, that each hemisphere has an inner life of its own hidden to the other. Although the two hemispheres can act independently of each other, the organism tends in normal situations to establish a basic unity of action. Even when a conflict situation is deliberately introduced, one hemisphere soon dominates and the organism responds as one. Some light is thrown on this point by instances of agenesis of the corpus callosum. An illustrative case is that of a twenty year old woman in whom the total absence of the corpus callosum was incidentally discovered by cranial roentgenographs, and confirmed by pneumoencephalograms and angiograms<sup>12</sup>. Nothing in her previous behavior had been considered abnormal. Furthermore, most of the tests that revealed marked deficiencies in the surgical split-brain patients showed no significant difference in function from the normal person. There was, however, some deficit in tasks involving the simultaneous use of right and left hands in putting a jigsaw puzzle together. Such a developmental anomaly underscores the compensatory capabilities of the young brain toward achieving unity of function. There appears then to be an overriding drive towards the unification of the individual even when the brain is split, resulting in practically two separate and independent "half-brains." But are there then correspondingly two "half-minds"? I will return to this question a little later.

Without attempting a complete survey of the various contemporary proposals for a solution of the mind-brain problem, I will mention a few to typify the range. As has already been mentioned, Sir John Eccles holds to a strict but somewhat refined Cartesian dualism. He proposes that the brain and mind interact at the level of a critically poised neuron so that the slightest "movement" from the mind will cause the neuron to fire<sup>13</sup>. John Hughlings Jackson supports a theory of parallelism or concomitance in which he clearly distinguishes between mental states and nervous states. "It postulated that for every men-

tal state there is a correlative nervous state. If we modify this to read that every *kind* of mental process is correlated with a specific kind of cerebral process, then we have a rationale for psychophysiology"<sup>14</sup>. Unfortunately, to my mind at least, Jackson explicitly did not trouble (himself) about the mode of connection between mind and matter. More recently, the biologist-philosopher, Ludwig Von Bertalanffy, denies classical Cartesian dualism, rejects reductionism, and advocates an isomorphism by which the constructs of neurophysiology and of psychology are taken up in a more generalized system. In such a system, the psychophysical organism is seen as an "autonomously active system."<sup>15</sup>

To me, none of these explanations is adequate. The strict Cartesian dualism of Eccles, no matter how well refined and redefined in terms of modern neurophysiology, does not escape an impossible mechanistic situation where a non-material event influences *mechanically* a material object, the neuron, and vice versa. The parallelism of Jackson refuses to deal with the question of interaction. Bertalanffy's proposal is criticized by Lach,<sup>16</sup> which in turn is responded to Bertalanffy<sup>17</sup> in a very erudite manner. Nevertheless, the "isomorphism" theory leaves this reader unclear as to how it differs essentially from the interaction theories which Bertalanffy appears to reject.

In view of the above, I would like to submit the following reflections.<sup>18</sup> An outstanding characteristic of an organism, be it bacteria or man, is its manifest behavioral unity. A careful analysis of the whole known range of organisms shows that this unity can exist in several forms or levels. The most basic level is that concerned with maintaining the identity and existence of the organism. It differs from the unity of a molecule in that the latter loses its identity when it interacts chemically with some substance — it becomes a molecule of another kind. This is molecular unity. Not so with a living thing; it generally absorbs ambient material, makes it part of itself or it rejects it. Such a unity we can term "organismic unity". Death of the organism re-

sults in a "dis-unification", a disintegration. Organismic unity is not found in any machine as yet devised by man. Were a system to be made at some future date which would exhibit such a behavioral unity we would have to judge that machine to be alive.

Another level of behavioral unity is found among certain kinds of organisms (in general, those called "animal") that are capable of distinguishing themselves from their environment. These do not merely respond to certain aspects of their surroundings but exercise a kind of discrimination. They are able to take in their environment not only by way of nutrition but also through one or more sensory modalities are able to acquire information and store it as engrams. The memory trace does not lose its identity while at the same time it becomes part of the total behavior pattern of the organism. This kind of behavioral unity might be termed "cognitive-unity".

In man we can discern still another form of behavioral unity which could be called personal, or ego, unity. He has the ability not only to distinguish himself from the environment but he is able also to view himself as an object; which is to say he can "objectify" himself. Without losing identity and existence, he can stand outside of himself and see himself objectively. Thus man is one being — for radically he behaves as one — although we can detect several levels of unity or integration. The highest level is called "mind".

It has already been mentioned that the split-brain individual seems to act as if he had two "minds", two inner lives, one associated with each half-brain. Do these data militate against the basic behavioral unity, i.e., personal unity, of the individual? I would answer "no", because even in the surgically divided adult brain, the individual manages to function in a normal environment as a single individual. While it is true that under special conditions the person can behave as if there were two separate minds, the individual even then seeks to act in an integrative fashion.

The preceding discussion is an attempt to show that the basis for closing the gap be-

tween medicine and psychiatry is the fact that psyche and soma were divorced only in man's attempt to conceptualize the relationship. In actuality, psyche and soma or body and mind are not two *things*, two objects, which somehow must be welded or wedded into some kind of procrustean oneness. On the contrary, whatever may be the nature of psyche and soma, the existential reality is the obvious behavioral unity of the human organism. There is no question of interaction because there are not *two things* to interact; there is no parallelism because there are not two sets of independent states; there is no need for isomorphism because it deals with concepts rather than the objective oneness of the individual. Confronted with the dynamic unity which is man, every action, whether we label it biological or psychological, physical or spiritual, is at one and the same time an expression of psyche *and* soma. In some actions one is more obvious than the other but so long as we have a living human being — and there is no other kind — everything he is, everything he does, is a manifestation of mind and body.

Primitive medicine began with a close identification with primitive psychiatry. Today psychiatry is increasingly accepted as a part of modern medicine. Tomorrow's internist will need to know more about psychiatry and the psychiatrist will need to be more of an internist. Both will be concerned with the whole man and both will be involved with comprehensive medicine. And once again, psyche and soma will be united in a happy marriage.

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Hypochondriasis is a mental preoccupation with a real or suppositious physical or mental disorder, a discrepancy between the degree of preoccupation and the grounds for it—so that the former is far in excess of what is justified, and an affective condition best characterized as interest with conviction and consequent concern, and with indifference to the opinion of the environment. . . including irresponsiveness to persuasion. . .

R.D. Gillespie  
Guys' Hospital Report, 78: 408-460, 1928.