

## **Mind and Brain:**

### **Some Ideas of Vivekananda**

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#### **Human development**

Man has three components in his making – the body, the mind, and a third element, the real Self or *Ātman*. According to the Vedanta, it is the essence of man, beyond the body and the mind. It is the infinite storehouse of all Power and Purity and Love. It is the Witness, in front of which all experiences play on the canvass of the mind. The mind is the interface between the Self and the external world. The Self does not belong to nature, but mind does. Swami Vivekananda said,

‘The living God is within you, and yet you are building churches and temples and believing all sorts of imaginary nonsense. The only God to worship is the human soul, in the human body. Of course, all animals are temples too, but man is the highest, the Taj Mahal of temples.’ [*Complete Works of Swami Vivekananda, Birth Centenary Edition, 1963, Vol. 2, p. 321*]

By birth man is not a *finished Taj Mahal*. For the manifestation of the Self or for growing into full manhood, the body and the mind need to be harmoniously developed through proper nourishment and exercise. That entails training and conscious effort.

The development of muscles of the body can be readily understood by one and all. But understanding and developing the mind is difficult, because it is very subtle.

#### **Mind and brain**

The mind is not a physical entity. It can only be understood as a set of functions it performs. Mind is something in us that performs functions like conceiving, thinking, analysing, doubting, determining, deciding, willing, feeling, fearing, loving, hating, and so on. Nothing whatsoever is known about its substance, location, etc. So, it is not easy to understand and work upon the mind. The instrument with which one can observe and control the activities of the mind is mind itself.

But, it is closely linked to the brain, which is now better understood due to the great strides in neuroscience. Each mental function seems to have a corresponding brain action. The brain has been aptly called *the seat of mind*. The brain also conditions the mind. There is so much mutuality and correspondence between mind and brain that it is extremely difficult to clearly demarcate their areas. So, it may be wiser to refer to the brain-mind complex.

There is a school of thought that outright rejects the existence of the mind as distinct from the brain. Nobel Prize winner of 1981, David Hubel once said to a neurosurgeon, ‘The word *Mind* is obsolete.’ Those who belong to this school say that the objective or external world is all that exists, and that the conscious mind is no more than a product of neural activities. Neurons of the brain are made up of inert matter. So, this is an attempt to deduce consciousness, thought, and feeling from inert matter. That is the position of the materialists.

Others hold that this is absurd. The brain and the mind are different, though closely linked. The mind has to be taken as a different entity, just because it has the qualities and functions like consciousness, thought, imagination, feeling, and so on, which cannot be deduced from inert matter, as we know them, by any stretch of imagination. Pioneers in neuroscience and neurosurgery like Nobel laureate Sir Charles Sherrington and Dr Wilder Penfield, many famous physicists and psychologists, and the Indian seers held the second view. Swami Vivekananda observed,

‘To say, therefore, that the thought forces manifested by the body are the outcome of the arrangement of molecules and have no independent existence has no meaning...’ [C.W. Vol. 2, p. 76]

He held that mind and matter (of the brain) are not two discrete entities, but two forms or phases of the same thing, existing as a continuum and interacting constantly. The mind appears to us only internally – as thoughts and feelings, whereas matter appears only as external objects. The mind must be made up of finer things unknown to the science of external world. Gross, tangible, external matter is also made up of finer, intangible things now studied by Quantum Physics. Modern Physics clearly upholds that gross matter is only apparent. In reality only finer, intangible things exist, which are only mathematically defined forms of energy. These are so small that they are not even physically detectable. They cannot be said to have any substance. They have just a set of properties. Swami Vivekananda said,

‘There is no difference between matter and mind, except in degree. The substance is the same in finer or grosser form; one changes into the other, and this exactly coincides with the conclusions of modern physiological research.’ [C.W. Vol. 2, p. 444]

‘When a man's brain is disturbed, his ideas also get disturbed, because they are but one, the finer and the grosser parts. There are not two such things as matter and mind. As in a high column of air there are dense and rarefied strata of one and the same element air, so it is with the body; it is one thing throughout, layer on layer, from grosser to finer.’ [C.W. Vol. 4, p. 48-49]

Swamiji explained that the mind and the brain function simultaneously. Each mental activity has a corresponding brain function involved. In the words of a specialist in genetics and neuroscience, Dr Charles E. Boklage,

‘Whatever happens in the mind of man is represented in the actions and interactions of brain cells.’ [Cerebral Dominance: The Biological Foundations, 1984 edition]

Swami Vivekananda said in this regard:

‘When we see a thing, the particles of the brain fall into a certain position like the mosaics of a kaleidoscope. Memory consists in getting back this combination and the same setting of the particles of the brain. The stronger the will, the greater will be the success in resetting these particles of the brain.’ [C.W. Vol. 6, p. 133]

Swamiji repeatedly explained how different sense perceptions occur at different areas of the brain, while an integrated picture is presented to us finally by the mind at the conscious state. He spoke about two other states of mind: the sub-conscious (which corresponds to memory, *vide* the above quotation in the context of brain) and the superconscious (which comes from deep meditation and brings the realization of higher truths of life and a metamorphosis of the subconscious).

## Methods of study

Despite their togetherness, mind and brain cannot be treated in the same way. The methodologies to be followed to study them must be quite different. The internal thoughts and feelings cannot be studied with external instruments. He observed,

‘There is this great difficulty: In external sciences the object is comparatively easy to observe. The instruments of analysis are rigid; and both are external. But in the analysis of the mind the object and the instruments of analysis are the same thing. . . . The subject and the object become one. . . .

‘External analysis will go to the brain and find physical and chemical changes. It would never succeed in answering the questions: What is this consciousness? What is your imagination? Where does this vast mass of ideas you have come from, and where do they go? We cannot deny them. They are facts. I never saw my own brain. I have to take for granted I have one. But man can never deny his own conscious imagination.’ [*C.W. Vol. 7, p. 430*]

With the advent of many new instruments for the study of the brain, including EEG (electroencephalography), MEG (magnetoencephalography), PET scan (positron emission tomography scan), MRI (magnetic resonance imaging), and the newest method, fMRI (functional MRI), we get static and dynamic, 2-dimensional and 3-dimensional pictures of the functioning brain. Surgical methods add to the pool of knowledge. Thus scientists have already identified many specific details of brain configuration and function. Many mental functions have been specifically associated with specific areas of brain. Yet, all that would only tell us about the ‘physical and chemical changes’ going on, and not the actual mental processes that we ‘observe’ and feel within. So, Swami Vivekananda said,

‘The mind cannot be analysed by any external machine. Supposing you could look into my brain while I am thinking, you would only see certain molecules interchanged. You could not see thought, consciousness, ideas, images. You would simply see the mass of vibrations – chemical and physical changes. From this example we see that this sort of analysis would not do.

‘Is there any other method by which the mind can be analysed as mind? If there is, then the real science of religion is possible.’ [*C.W. Vol. 7, p. 429*]

Then, with all that knowledge of brain, is it possible to change man’s character qualities? No. Dr Wilder Penfield observed,

‘It is fair to say that science provides no method of controlling the mind. Scientific work on the brain does not explain the mind – not yet.’ [*The Great Issues of Conscience in Modern Medicine, 1960 edition*]

But, as we work upon the mind and control its movements, the brain automatically keeps on changing along with it. With every new thing we learn, every new habit we form, every old habit we shun, there is a corresponding change in the brain.

## The ever-changing brain

Until a few decades back, neurologists believed that all major changes in the brain take place in early childhood. After that the brain gets almost a final shape, unable to change in a big way in later years of life. In 1913 a Nobel laureate Neuroanatomist of Spain, Santiago Ramón y Cajal, expressed this in no uncertain terms, ‘In adult centres the nerve paths are something fixed, ended and immutable.’ But, for the last two decades or so, many path-breaking research works have succeeded to reject that idea. It has been found that throughout one’s lifetime, the brain can change its structure as well as *wiring* in a big way, generating new neurons and new synapses.

The adult human brain is composed of an estimated 100 billion cells called neurons. Each neuron is connected to other neurons through upto a thousand connections called synapses. Signals (electrochemical stimuli) are sent from neurons across these synapses with chemicals called neurotransmitters. There are an estimated 100 trillion synapses in human brain. This neural connectivity serves to make communication networks between neurons. Even a small activity requires innumerable communications between thousands of neurons in a particular sequence. For every new activity, the brain forms a new sequence of communications, and for that purpose makes new connections. As the same activity is repeated, the same path of communications is also repeatedly used, and slowly the pathway widens, as it were, to make this activity easier. Again, if the brain’s database shows that a particular activity is not being performed any more, its path is narrowed, as it were, and weakened. Thus, the brain is always amenable to change. This property is called plasticity of brain or *neuroplasticity*.

Suppose a little girl is learning to fasten her shoelace. On the first day, the brain finds it difficult to handle an entirely new task, as it has to form a whole lot of new connections. But, as she goes on repeating it, day by day the brain *learns* the task by widening the newly formed communication path. After a certain time the task becomes very easy for the girl, requiring little attention. All habits grow in this manner.

So it is for understanding and absorbing new ideas. New communication pathways have to be made by the brain to accommodate a new sequence of logic, for example. And if it goes against our cherished beliefs and convictions, it has to deal with much more difficulty.

### **Swamiji on neuroplasticity**

The character of a man, commonly called a man’s nature, which is known through his behaviour, is the outcome of habits. Swamiji said,

‘Character is repeated habits, and repeated habits alone can reform character.’ [C.W. Vol. 1, p. 208]

Repeated habits give rise to mental tendencies called propensities. That is to say, the mind tends on its own to tread the path it has *learnt* through repeated habits. Unless we consciously take a different route under a given situation, our behaviour will normally follow our propensity. The agglomeration of these propensities is character. By conscious effort we can form new habits and thus new propensities. In other words, we can build our character in a manner we choose. This was explained by Swami Vivekananda.

Now, neuroplasticity has an exact parallel to this process in the realm of brain. And, more than a century back, when *neuroscience* was not yet born as a distinct field of study, Swami

Vivekananda spoke about these changes in our brain with astounding degree of correctness. Let us listen to him:

‘Every new thought that we have must make, as it were, a new channel through the brain, and that explains the tremendous conservatism of human nature. Human nature likes to run through the ruts that are already there, because it is easy. If we think, just for example's sake, that the mind is like a needle, and the brain substance a soft lump before it, then each thought that we have makes a street, as it were, in the brain.... Now perhaps you have marked that when one talks on subjects in which one takes a few ideas that are familiar to everyone, and combines and recombines them, it is easy to follow, because these channels are present in everyone's brain, and it is only necessary to recur them. But whenever a new subject comes, new channels have to be made, so it is not understood readily. And that is why the brain (it is the brain, and not the people themselves) refuses unconsciously to be acted upon by new ideas. It resists. The Prana is trying to make new channels, and the brain will not allow it. This is the secret of conservatism. The fewer channels there have been in the brain, and the less the needle of the Prana has made these passages, the more conservative will be the brain, the more it will struggle against new thoughts. The more thoughtful the man, the more complicated will be the streets in his brain, and the more easily he will take to new ideas, and understand them. So with every fresh idea, we make a new impression in the brain, cut new channels through the brain-stuff...’ [C.W. Vol. 1, p. 224-225]

Here *Prana* means the force of thought. When one tries to build life, make character, and change oneself into what one believes, one has to exert a great amount of thought force for changes to take place in the brain. That is why Swami said, ‘The older I grow, the more everything seems to me to lie in manliness. This is my new gospel.’ Without strength of body and mind, one cannot accomplish the great task of life-building. He said:

‘New channels for thought will be made in the brain, nerves which have not acted in your whole life will begin to work, and a whole new series of changes will come in the body itself.’ [C.W. Vol. 8, p. 197]

‘That is why we find that in the practice of Yoga (it being an entirely new set of thoughts and motives) there is so much physical resistance at first. That is why we find that the part of religion which deals with the world-side of nature is so widely accepted, while the other part, the Philosophy, or the Psychology, which deals with the inner nature of man, is so frequently neglected.’ [C.W. Vol. 1, p. 225]

These observations have been validated by a series of recent research works. Richard Davidson, a doctorate from Harvard University and currently Director of two laboratories at the University of Wisconsin – Madison, has worked with Buddhist meditators to find the changes resulting from meditation. There are many others working in this new territory with exciting results. Swami Vivekananda always predicted that science and religion would soon shake hands. His prophesy already seems to have come true in many important fields of science.