

Brain, Mind and Consciousness - An Evolutionary Approach

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ABSTRACT

In the process of evolution the first invertebrate brain appeared in round worms and annelids. Among invertebrates cephalopod brain is the largest. Later the vertebrate brain evolved and became more complex in human. Brain can be considered as physical state of mind and consciousness. Consciousness can be explained with a 8 circuit model. Biofeedback and artificial intelligence are the current fields of research.

Key words: Invertebrate; Human brain; Consciousness; 8 circuit model; Artificial intelligence

INTRODUCTION

In 1859 Charles Darwin wrote 'In distant future psychology will be based on a new foundation, that of the necessary acquirement of each mental power, and capacity by gradation'.

With a basic knowledge of genes, inheritance, and the principals of Natural selection different aspects of psychology can be studied. It includes sociobiology, anthropology, paleopsychology, ethnobotany and behavioral genetics.

It is incredibly difficult to actually test out many evolutionary psychological ideas in a conventional, scientific, experimental sense. Evidence come from range of sources, including fossils (e.g. brain size), genetics, animal studies, paleo-anthropological research (e.g. study of human artifacts, including tools, art) and related evidence about climate, plant and animal evolution. But then evolutionary psychology is based on jig-saw puzzle with many missing links.

When we think on this evolutionary approach paramecium does not show presence of any nerve cell but has a well developed neuromotor system. Later in coelenterates we can see the presence or differentiation of basic nerve cells and diffused type of nervous system developed.

In nematodes and annelids the so-called brain is formed consisting of accumulation of nerve cells in the form of ganglia and nervous system is also described as ganglionated nervous system.

And thus the simplest type of brain is formed. Later a complex brain got evolved in invertebrates among arthropods and cephalopods of which cephalopods have the largest brain among invertebrates.

The most thoroughly studied invertebrate brain is of *Drosophila* and tiny round worm *Drosophila* neurogenetics is found out to be more relevant to human e.g the biological clock gene found in *Drosophila*, is similar to that of mice and hence human.

Later evolved the vertebrate brain with cluster of many nerve cells, the intricate arrangement of neurons, many specialized areas for specific functions. The brain did not only increase in size but also became a complex structure for controlling various functions.

The brain is the dominant structure of nervous system which work as analyzer, interpreter or as a powerful computer.

THE HUMAN BRAIN

During the evolutionary process in vertebrates the specific part of brain got modified as per the need for survival or adaptation to environment and from this evolved the human brain which is composed of about one trillion nerve cells.

The human brain makes us understand the color, odor, taste, sound, touch, by analyzing; interpreting every finest aspect and also make us think, take decisions and perform accordingly.

When these processes occur they keep the print on our brain or in our nerve cells which we call as memory. We can then recall those events of past and correlate to present event when needed. The memory can be short term or long term. Many of the vertebrates are considered to have short memory while some primates and human are considered to have long term memory too. Exact physiological reaction of storing and recalling memory is not known. But scientist believes them to

be in the form of 'nerve traces'.

The stimulus from sense organs provokes the biochemical processes in brain region, activate the neural network, and bring about conscious experience. Similarly the conscious information or thought like fear, happiness also trigger the biochemical process and show the virtual effect on the body.

The exact processes here are not yet known but create some waves which are known now to be electrical waves. The brain is an electrically powered and electricity generating organ. The wave generated are found to be of various types like alpha, beta, gamma, theta waves, and the particular brain wave frequency which dominates at any given time determines the state of mind.

The brain connection actually reflects the experience which can be considered as mind. So mind can be the thought process, created due to stimulations of various memory cells, triggering the process of generating the biochemical substances, resulting in various waves without showing the actual virtual effect.

The chemical reaction occurring in brain or nerve net change according to our mood or state of mind. Similarly the exogenous dosage of these chemicals like serotonin, histamine, dopamine, noradrenalin, and acetylcholine change our mood. A very good understanding can come when we think of applications of drugs during depression, pain, sad state of mind etc. The anesthetic effect, pain revealing effect, mood elevating effect of many drugs is well known and is used in many psycho therapies.

Thus consciousness can be different from mind and can be a first person world. But mind and consciousness can be considered to be well rooted in physical brain (Greenfield, 2002) According Greenfield (2000) the aberration of dopamine-system where mental status cannot distinguish, between the psychotic and dreaming states can be considered as the most basic consciousness.

Eight-circuit model of consciousness

Psychologist Timothy Leavy (2009) has suggested the eight-circuit model of consciousness where he describes the eight levels of functions of human consciousness. According to him the lower four circuits-larval circuits- deal with normal psychology while upper four- the stellar circuits-deal with psychic, mystical and enlightened states of mind. As per this model the eight levels of consciousness exist in every individual. As one grows from infancy the various circuits are activated and begin to function. It is said that underutilization of lower circuits hinders the complete expression of higher circuits.

The very basic 1st circuit is biosurvival circuit, with which the

human being is born. This circuit is said to have appeared in the earliest evolution of invertebrate brain. The 2nd circuit is the emotional-Territorial circuit, which first appeared in vertebrate territorial animals. The 3rd is symbolic circuit-rational mind appeared first in hominids when they started differentiating from primates. The 4th is Domestic circuit-socio-sexual, which appeared with development of tribes. The 5th is the neurosomatic circuit, which according to Leavy is consciousness of the body. It appeared first in upper classes with the development of leisure-class civilizations around 2000 BC.

The 6th circuit is Neuroelectric Circuit or Metaprogramming. According Leavy this circuit enables telepathic communication and computer games it is traced back to 500 BC.

The 7th Circuit is neurogenetic circuit or morphogenic circuit or Buddha mind. It is concerned with evolutionary consciousness (past and future); it is the one, which talks about memories of past lives, reincarnation, immortality. This circuit first appeared among the Hindus in early first millennium. It gets stimulated with Raj Yoga.

And the 8th Circuit is Psycho atomic Circuit or over mind, which is concerned with information from beyond ordinary space-time, out of body experience. The circuit can get activated with awakening of Kundlani, Shpck, near-death experience.

With 8-circuit model the evolution of brain and consciousness can be correlated, as the simplest circuit of consciousness is the biosurvival, which is seen even in the animals without brain or has originated with origin of life. The higher circuits can be developed by Yoga, Mediations, Reiki practice, and many more ways.

It also helps us to understand the effect of drugs and treatments in disorders. Biofeedback is one of such mechanical means to amplify certain internal cues, make us aware of them and make it possible to control mental and brain states. The use of biofeedback can control the involuntary psycho physiological states like B.P., body temperature etc. The use of machines designed by researchers to human brain provide the brain and mind an opportunity to exercise themselves by means of self observation and self transformation (Livergood)

Further research is in the direction of artificial intelligence where an artificial neural network i.e. network of artificial neurons can be created. This will lead to an artificial brain with the similar processing power as our organic brain. It is believed that at some point of time this artificial brain will become conscious if we consider consciousness is the brain process.

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