



Editorial by Anirban Sukul *PhD*

Consciousness in the light of science

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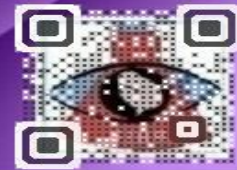


Perception of anything occurs through sense organs like eyes, ears, nose, skin, tongue etc. Whenever a sense organ is stimulated, electrical impulses are relayed through sensory nerves via 3 or 4 neuron chains to a particular loci in the cerebral cortex. Impulses go to the reticular activating system in the brain stem reticular formation. The reticular formation consists of neurons and fibers of different neurotransmitter systems like adrenergic, serotonergic etc. Consciousness may result from the function of the reticular activating system and related parts. Sleep, which is opposite to consciousness, also originates from the same system. The sensory information received in the brain is transformed into central symbols expressed as activated neural populations. These are scattered over extensive cortical areas. There remains the problem of binding and symbol grounding. A single convergence zone for assembling neural representations of perceived objects may not exist in the brain. However, reality is perceived as a whole by a self which like a spectator from outside. The cortex appears to be both the generator and the observer of mental images. Selective attention is achieved through the gating mechanism of the nucleus reticularis thalami.

Consciousness is of two types, transitive and intransitive. In case of transitive consciousness a person is conscious of something or other. There are different forms of transitive consciousness like perceptual, somatic, kinaesthetic etc. Intransitive consciousness is one without an involvement of any object. Awareness appears to be function of the neural networks within the cortex, the thalamus and the cortico-cortical system. Ascending reticular system and its thalamic projections play an important role in modulating awareness, wakefulness and sleep cycles. The neural basis of consciousness is thought to be the elevated activity of the apical dendrite within a thalamocortical circuit. The physical correlate of consciousness is regarded as the relatively intense electromagnetic field that is located along the inside and the outside close to the surface of the active apical dendrite. The anterior insular cortex may be involved in all subjective feelings. The AIC appears to play a fundamental role in awareness. It is thus regarded as a potential neural correlate of consciousness. The neural basis of consciousness focuses on thalamocortical circuitry. The higher-level of consciousness is correlated with higher-level cognitive abilities in humans and other mammals. Recent studies show a number of highly cognitive abilities in birds including manifestations of working memory and category formation, language and numerical comprehension, tool manufacture and cultural transmission of tool design etc. Comparisons of neural circuitry between mammals and birds reveal extensive similarity in thalamic nuclei and ascending systems to the pallidum. Neural features common to both mammals and birds, which may be involved in the generation of both higher-level consciousness, include large multipolar glutamatergic neurons with densely spiny dendrites with extensive interregional connections, GABAergic inputs from local interneurons and connections with thalamic nuclei that are controlled by the thalamic reticular nucleus as well as basal ganglia loops.

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In view of treatment with homeopathy, doctors emphasize on the consciousness which in turn comes as mind. It has been proved, selecting the correct medicine considering the mind of a patient is quite effective. Although sometimes patient tend to fabricate themselves for some various reasons and therefore, sometimes patients' input are not always helpful.

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