

Exploration

On the Nature of Consciousness, Space & Ultimate Reality

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ABSTRACT

In this article, I discuss first the physics involved in our subjective experience of mind and consciousness and then its similarity with the nature of space is pointed out based on the transmission of electromagnetic waves. From this similarity, a possibility of universality of consciousness is inferred.

Key Words: consciousness, space, ultimate reality, subjective experience, mind.

Introduction

(i) How exactly the large conglomeration of atoms, called DNA and RNA molecules, got formed; and self-replicating, conscious living-beings got evolved? (ii) What is 'mind', and what is 'consciousness'; and how they can be understood in terms of physics and chemistry? Such questions are going to be the most interesting topics of research in this 21st century. I present here a preliminary discussion on these subjects.

Firstly, we will divide the total reality into two aspects: (i) the 'subjective' aspect which can be subjectively felt and experienced, but cannot be objectively shown and demonstrated; and (ii) the 'objective' aspect, which can be weighed and measured; and can be subjected to scientific experiments. Then we will try to establish certain correlations between these two aspects. And finally, we will draw some inferences on a possibility of presence of 'subjective aspect' where we are unable to feel them directly. Based on this discussion we will arrive at a hypothesis that 'consciousness' may be present even in the 'space'; and so, 'consciousness' may be a universal entity, not just limited to our brains and 'minds'.

The Hypothesis

All of us are very much sure about the fact that each one of us is a conscious living being; and our 'consciousness' has something to do with our brains. We also know that when a neurosurgeon opens a human brain, he is able to find only a large network of interconnected neurons. These neurons get electrically charged by a mechanism called 'sodium-pump', operated by the energy from our food; and they generate a sequence of electrical-discharge-pulses, whenever they come in contact with the sense-objects like: sound, touch, vision, taste and odor. The neurosurgeons are not able to objectively see any 'mind' or 'consciousness' in the brain. From this observation we find that: where we are perfectly sure about the presence of subjective aspects

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called 'mind' and 'consciousness', what we are able to objectively see is only a large, interconnected network of neurons; similarly, just because we are not able to see 'mind' and 'consciousness' in 'electrons', 'atoms' and 'molecules', it does not mean they may not be able to subjectively perceive the presence of other 'electrons', 'atoms' and 'molecules'. With whom-so-ever we are able to establish communication; and get response, then we come to know that the other one has 'mind' and 'consciousness'; and who-so-ever do not respond to our stimuli, then we think it is 'dead' and 'inert'[1]. A particular subjective experience of 'mind' may be related to a particular neuronal-discharge-sequence, but what exactly is 'mind' and 'consciousness'? To seek answers to these questions, let us consider the following:

Human brain contains around 10^{10} neurons. Each neuron is electrically charged at about 70 millivolts as shown in fig.1. Now, if we could connect all the neurons in a series, then they can develop 700 mega-volts of e.m.f. And if we can connect all the neurons in parallel, and assume that each neuron can deliver just one micro-ampere of current, then also human-brain can deliver 700 000 Amperes of current. Human-brain is equivalent to a 700 watt electric-lamp. But when we try to measure the potential-difference between any two points of brain, the electroencephalogram measures only a few micro-volts. It is so, because the neurons are comparable with electrically-charged-capacitors, as shown in fig.1a-b, which are electrically-connected as shown in the fig.2. The compact packaging of the brain seem to produce a 'mutually-balancing-electric-field', as shown in fig.3.

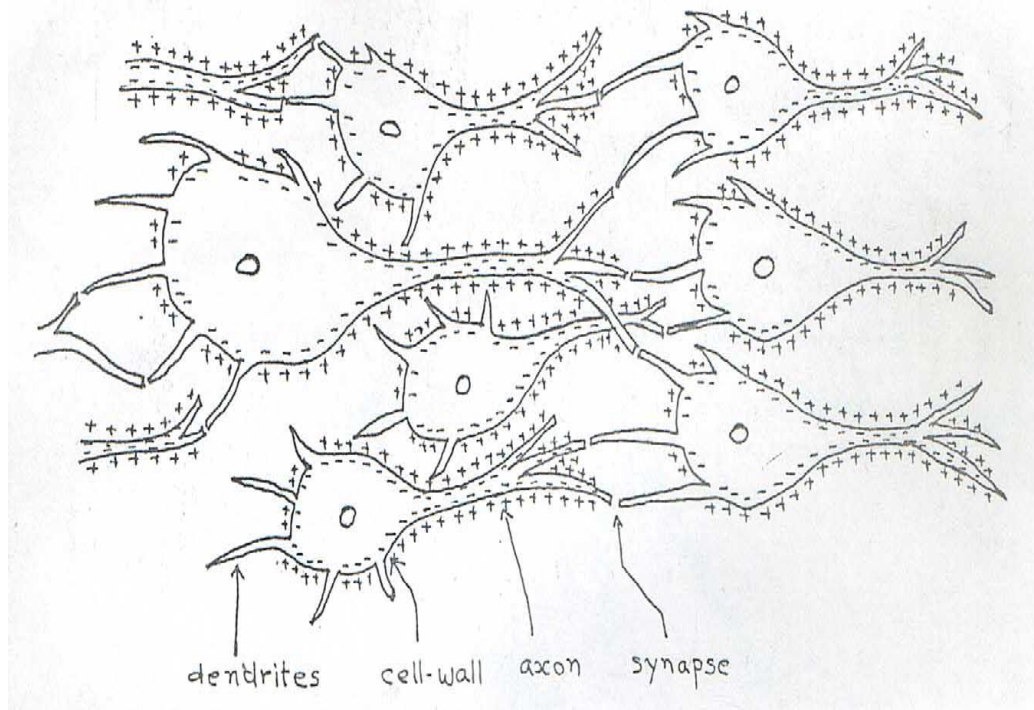


Fig.1(a): A diagram, representing electrically charged neurons. Excitatory and inhibitory neurotransmitters enter the cell through dendrites; and when the in-put of neurotransmitters crosses a threshold-level, the cell electrically discharges, and that discharge-wave travels towards the ends of axon. These ends, in turn, release neurotransmitters in the synaptic-junction, and enter the neighboring neuron.

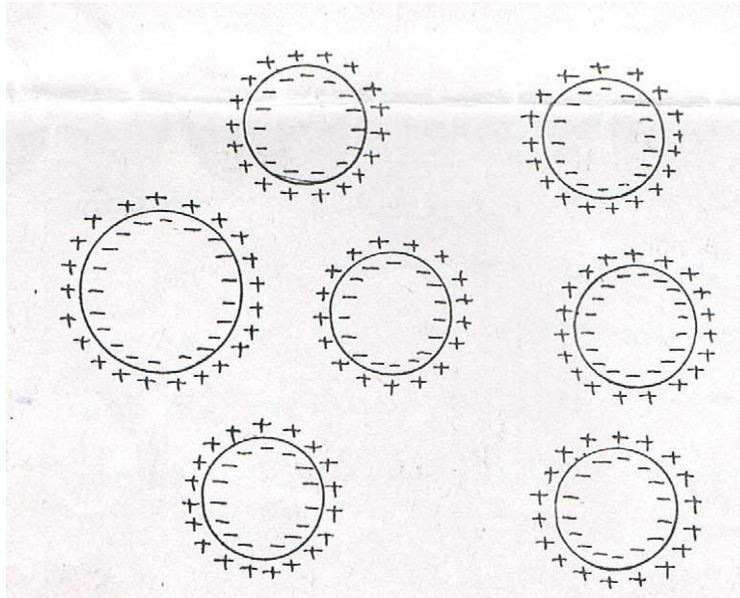


Fig.1(b): From the view-point of electrostatics, the arrangement of neurons, shown in fig.1(a) is equivalent to electrically-charged capacitors, shown here.

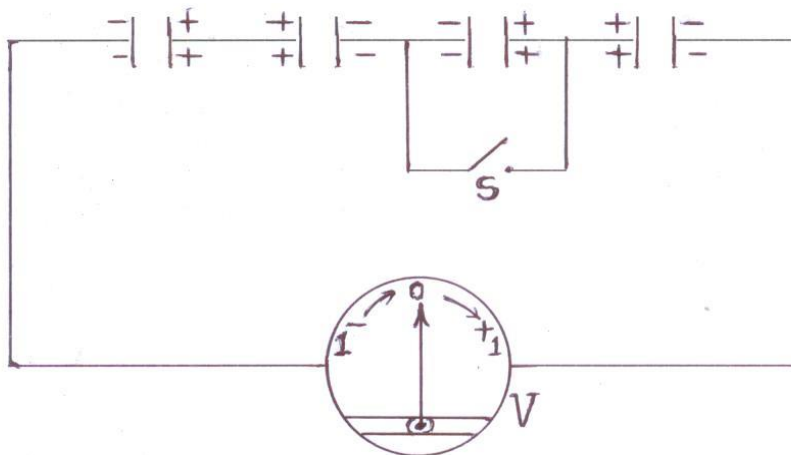


Fig.2: Four electrically-charged capacitors are so connected that the volt-meter reads zero volts. When the switch S is closed, the mutually-balancing-electric-field gets disturbed; and the volt-meter reads voltages equal to the amount of imbalance.

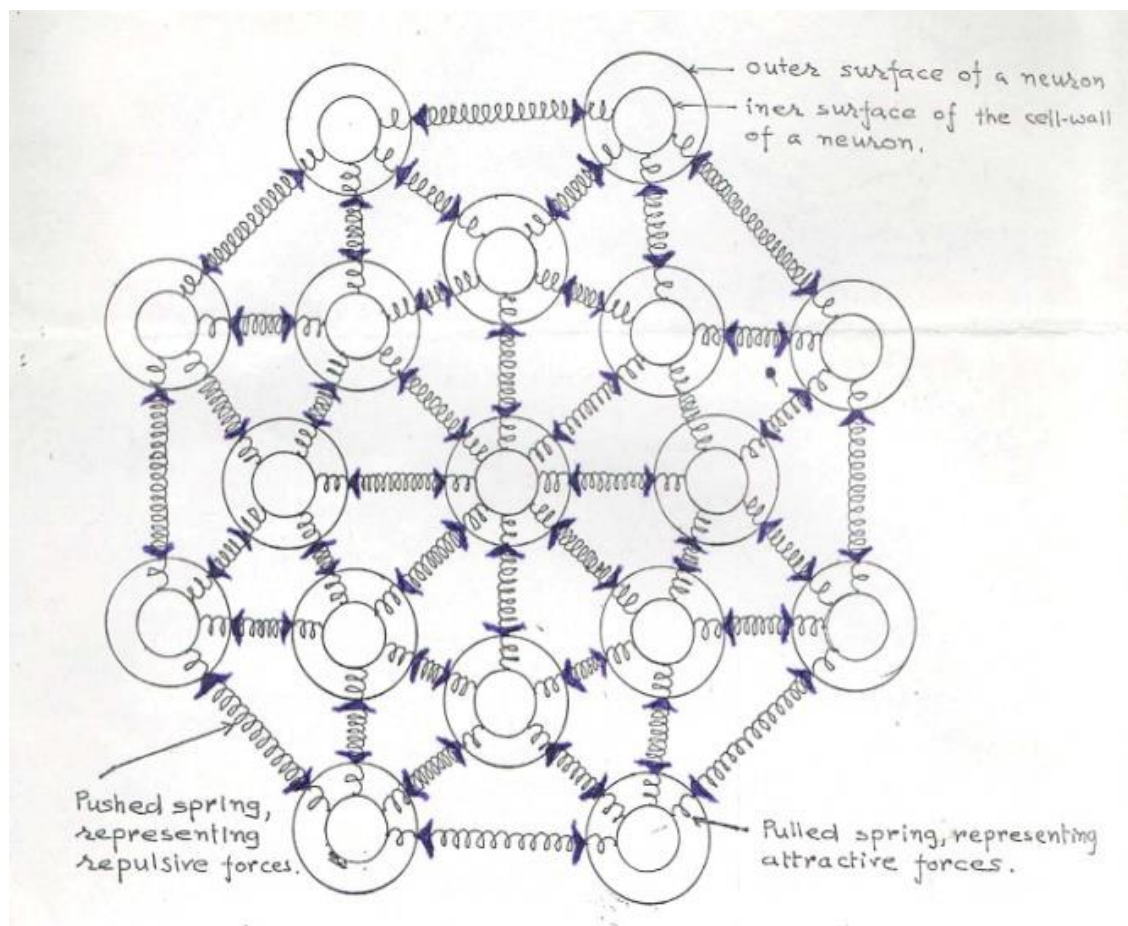


Fig.3: A diagram representing mutually-balancing electrostatic-field of the whole brain. Each and every spherical-capacitor of the figure-1(b) is being pushed apart by the neighboring neurons, as shown here by pushed springs; giving rise to a balanced electrostatic-field. When some of the neurons get discharged, the balance of the 'whole' brain gets disturbed. Separate chains of neuronal-discharge-sequence, contribute to disturb the balance of the whole brain, thus connecting different subjective-experiences.

We are sure that this large collection of neurons has a subjective aspect called 'mind' and 'consciousness'. Now, supposing we emulate an equally large collection of electrically chargeable spherical capacitors, which can be sequentially discharged by photo-cells, pressure-gauges, thermistors, smoke-detectors...etc; and get re-charged by current-sources connected to each one of them; and supposing further that 'mind' and 'consciousness' is an electromagnetic process, related to electromagnetic-field of the whole brain, then we can expect a similar subjective experience of 'mind' and 'consciousness' which may be subjectively felt by the emulator built by us. As far as our objective observation is concerned, there is not much difference between the human-brain and the emulated-brain built by us; because both of them generate a sequence of electrical discharge pulses whenever some audio-visual stimulus is applied; and both of them can get re-charged. Theoretically, such a simulator can be built so perfectly, that the electro-encephalogram patterns (EEG-pattern) generated by human-brain and the emulated-brain in response to a given stimulus are exactly the same. By incorporating long-

term-memory and out-put-transducers the emulated-brain may even be able to speak: “O, it is very cold today!” If we get such a response from the emulator, then we can draw a scientifically acceptable inference that our subjective experiences of ‘mind’ and ‘consciousness’ are collective processes of electrostatic-fields due to charge and discharge activities of neurons.

Now, let us concentrate on the nature of electromagnetic waves, and true nature of ‘space’ emerging from our discussion. We know that in the case of water-waves, particles of water do not travel physically. Only the activity of up and down motion of water-molecules gets spread in the direction of propagation of the wave. Similarly, in the case of ‘electromagnetic waves’, they are the oscillations of electric-field which induce oscillations in the neighboring space. From this discussion it is clear that the so-called ‘empty-space’ is not really empty. Space must be an equilibrium-state of positive and negative electrostatic fields, then-alone a particular point in space can become electrically positive or negative without transport of any physical thing. In this physical world, there is nothing other than such activity of waves. The so-called ‘particles’ of ‘matter’ are nothing more than ‘standing-wave-patterns’ of the above-mentioned waves.

The reader must have already noticed a similarity between the electrostatic equilibrium generated in the human brain due to the large collection of electricity charged neurons; and the electrostatic equilibrium of ‘space’, because of which transmission of electromagnetic waves becomes possible, without any physical transportation. Both, empty-space as well, as human brain, experience electrostatic disturbances; our brain due to the transmission of neuronal discharge sequence; and ‘space’ due to the electromagnetic waves. Since we have a direct subjective experience of our thoughts and feelings, perfectly correlated with the neuronal discharge sequences in our brains, it will not be illogical to infer that the ‘space’ also must be experiencing some kind of subjective feeling whenever electromagnetic-waves pass through it.

Empty space is a three-dimensional, electrically balanced “screen” or an ‘arena’ which gets modified during the propagation of electromagnetic waves. As we discussed earlier, human brain is a crude version of ‘space’; and neuronal discharge sequences generated in it are crude, band-limited representations of the external world; whereas external physical world is a multi-dimensional pattern of full-band of waves. From this discussion it should not be difficult to imagine how crude must be our mental version of the world than the actual physical world; and how crude must be our personal version of ‘consciousness’ from the Cosmic Consciousness.

Summary & Discussion

We first discussed the physics involved in our subjective experiences of ‘mind’ and ‘consciousness’; and then, from the study of propagation of electrostatic disturbances, found a similarity between the ‘brain’ and ‘empty space’. This similarity led us to infer a possibility of presence of ‘subjective aspect’ in the ‘space’. The ‘omni-present GOD’ referred in religious literatures, may be scientifically understandable as follows. Empty-looking ‘space’ is not really empty; the ultimately-real, most-fundamental-reality is present everywhere in space. This ultimate reality can be visualized as ‘mutually-balancing-electrostatic-field’ which is subjectively aware of its own existence; and whenever electromagnetic-waves, or ‘matter-waves’ pass through it, it is able to subjectively ‘feel’ the passage of the waves. Since this ultimate-

reality is subjectively aware of its own existence, and is able to perceive the waves passing through it, we should use the word ‘He’ instead of ‘it’ for the ultimate-reality.

Our conclusion is in agreement with the statements found in ancient spiritual scriptures, e.g. In the Yoga Vashishtha Maha-Ramayana, the Guru Vashishtha explains to the Prince Rama: “This physical-world is a play of waves, arisen in the nectar-ocean of all-pervading pure ‘consciousness’; and it (the physical-world) also subsides in that ocean alone” [2].

An eighteenth-century mathematician William Clifford had uttered these prophetic words: “A piece of ‘matter’ is nothing but ‘curvature of space’, subject (possibly) to fluctuations in the manner of waves” [3].

According to the Nobel Laureate biochemist, Prof. George Wald, [4]: “Mind, rather than emerging as a late product in evolution, may be present always as a complimentary aspect of all matter”.

References

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