

The Neuroscience of Rajyoga Meditation: Brain Waves Through the Ages

by

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Abstract

This paper is written within the philosophical frame work of Brahma Kumaris World Spiritual University, located at Shantivan, Abu Road, Rajasthan, India. When one considers an Eternally Civilized, Time Cyclic Universe, one is lead to periodic changes in all physical system and their parameters – and in particular, the human brain - and its EEG. It is projected that the essentially dominant Beta activity in the present age - would be replaced by Delta activity in alert and conscious brains.

1. Introduction: Dadi Janki ji's Amazing EEG.

Revered Dadi Janki ji was one of the foremost Rajyogi souls of Brahma Kumaris Ishwariya Vishv Vidyalay (BKIVV). She lived up to a ripe old age of 104 years – and was mentally fully active and alert, till her last breath. She succeeded revered Dadi Prakashmani ji, in the year 2007, as the Chief Administrative Head of the Brahma Kumaris.

EEG (Electro-Encephalo-Graph) studies on Dadi Janki's brain were carried out at University of Texas at Austin in 1978. Delta waves were observed over almost the complete brain. This was the case – when she had her eyes open, during talking, walking and during mental calculations, e.g. adding two numbers. So impressive was this, that she was given the title “**Most Stable Mind in the World**”. Limca book of world records referred to her as, “**The Delta Lady**”.

Normally, a new born baby, an infant shows Delta waves all over the brain. Then, as the brain develops, other brain waves emerge. The fact, that Dadi Janki ji, had Delta waves indicates, a very elevated stage – and as pure as that of a child.

2. EEG Primer.

EEG, is one of the best methods to study the activity of various cortical areas of brain – in real time – and gauge the state of consciousness (References 1, and 2). It consists of applying electrodes to various parts of the head of a person – amplifying the signals – and recording them – either on paper or a computer (see Figure 1).

Brain waves observed in EEG are as follows. (Note that the abbreviation “Hz”, or Hertz, below, stands for number of cycles per second.)

Delta wave – (0.1 – 3 Hz) - is observed when person is in a deep, dreamless sleep.

Theta wave – (4 – 7 Hz) - is observed when a person is drowsy.

Alpha wave – (8 – 12 Hz) - is observed when the person is relaxed and the eyes are closed.

SMR wave – (12.5 – 15.5 Hz) - is observed when one is sitting motionless.

Mu wave – (7.5 – 12.5 Hz) – similar to SMR but at a reduced frequency.

Beta wave – (12 – 31 Hz) - are observed when a person is alert and eyes are open.

Gamma wave – (32 – 100 Hz) – are correlated with large scale brain network activity.

Here, mention can also be made of **REM** (Rapid Eye Movement) sleep - when a person is dreaming.

3. The first step of Rajyoga meditation.

One of the first thoughts in Rajyoga meditation is – “I am a point soul – a conscient, non-physical star like entity, located in the center of the forehead – in between the eyebrows. This region is referred to as the “Bhrukti” in Hindi. This thought is a step towards, what is called as the “Soul conscious state”. This takes the attention of the person towards this area – and a slight muscular tension there – with a corresponding activity in the motor cortex. The muscular tension in Bhrukti, also leads to activity in the corresponding region of the sensory cortex.

Jagdish Chander Hasija (see reference 2 and Figure 4), argued soul should be located in Hypothalamus. Its skin projection would be at Brukti.

During meditation, one sits in a comfortable position – motionless. This sets the Sensory Motor Rhythm (SMR) going. The attention gets detached from motor and sensory cortex. This motionless

position coupled with focus on self as a point soul, in a few minutes, leads to a feeling of lightness – detachment from the body. This state is also referred to as the “Body-less state”.

Scientific studies on Rajyogis has shown, that there is – (1) Increase in peripheral blood circulation – imparting a red glow to the face of the Rajyogi, and (2) Decrease in Galvanic Skin Resistance – indicating reduced stress levels. These two effects give a different feel to the physical touch (e.g., hand shake) of a Rajyogi.

4. Rajyoga while performing action.

The beauty of the Rajyoga meditation comes, when one is able to perform various tasks in the detached soul-conscious state – while also in the remembrance of God – and a further detachment based upon the Time Cycle. This state is referred to as “the yogic stage of remembrance of 3 dots (points)”. Here is where, one surmises, the delta waves seen in Dadi Janki’s, EEG materialize. While the cortex is showing the slower brain waves, it is expected that the Reticular Activating System (RAS), is showing an active state – leading to alertness. This stage may also be termed as Karma-yoga – i.e., **Rajyoga in action.**

Neurons of the reticular formation, particularly those of the ascending **reticular activating system (RAS)**, play a crucial role in maintaining behavioral arousal and consciousness. The overall functions of the reticular formation are modulatory and premotor, involving somatic motor control, cardiovascular control, pain modulation, sleep and consciousness, and habituation.

5. Meditation and Music: The left brain and the right brain.

Various parts of the brain and their functions are indicated in Figure 2. Just as nature has given us 2 eyes, 2 hands, 2 ears, 2 lungs, 2 kidneys, 2 feet..., our brain also consists of 2 hemispheres – the Left hemisphere and the right hemisphere (see Figure 3). The two hemispheres are connected by the Corpus Callosum, which is a large bundle of more than 200 million nerve fibers, permitting communication between them (see Figure 3). Interestingly, the left side of brain controls the right side of the body, while the right side of the body controls the left side of the body. Left brain is called the dominant hemisphere and is associated with, logic, spoken and written language – its expression, reading, writing and comprehension (see Figure 3 for more detailed specialization of the two hemispheres). Right brain is intuitive, artistic.

When listening to a song such as ...

Aa lout ke aaja mere mit... (in Hindi)

The left brain interprets the meaning of the words. The meaning is transmitted via Corpus Callosum to the right brain. The emotion behind these words is made by right hemisphere. The melody is also enjoyed by the right hemisphere. Once the soul is stabilized by such a song – a period of silence, or only instrumental music (without lyrics), can be used to continue the meditation.

6. Surrender to God, Endorphins and rapture.

Rajyoga meditation is a two way communication between the meditator and God. When one is stabilized in the soul conscious stage – one experiences God's rays falling on oneself. One feels bliss and rapture with God. At the physical level of the body and brain, Endorphins (body's feel good chemicals) are released.

7. Conclusion: Brain waves and the Time Cycle.

In the Rosary of the Human Souls, the souls show likeness in qualities – to their neighbors. Dadi Janki's amazing brain activity suggests that in the final stage, all the souls going into Golden age, would have Delta waves. Now, the fact that in the end of Iron age, all the souls have Beta waves, suggests that Brain Waves change, within the Yugas (ages) of the Kalpa (Time Cycle). Thus, we have the following possibility for the baseline EEG brain activity of the human souls, across the ages –

Golden Age – Delta Waves – The brain corresponds to the highest spiritual state.

Silver Age – Theta Waves – Slight deviation from highest stage.

Copper Age – Alpha Waves – The souls are still relaxed.

Iron Age – Beta Waves – Body conscious souls give Beta activity.

Note that, with all of these brain waves, the person would be alert with an active Reticular Activating System RAS (see Figure 5).

Such a conclusion is in harmony with the concept of Time Cycle. Since everything is changing in a cycle, therefore the brain activity per se is also changing in a commensurate cycle. Further, science and technology – which ultimately is a result of the brain activity – would also change in a cycle (Reference 4).

References.

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3. Jagdish Chander Hasija : *Eternal Drama of souls, matter and God, Vol. I and II*. Published by – Literature Department of Prajapita Brahma Kumaris Ishwariya Vishwa Vidyalaya, 1985.
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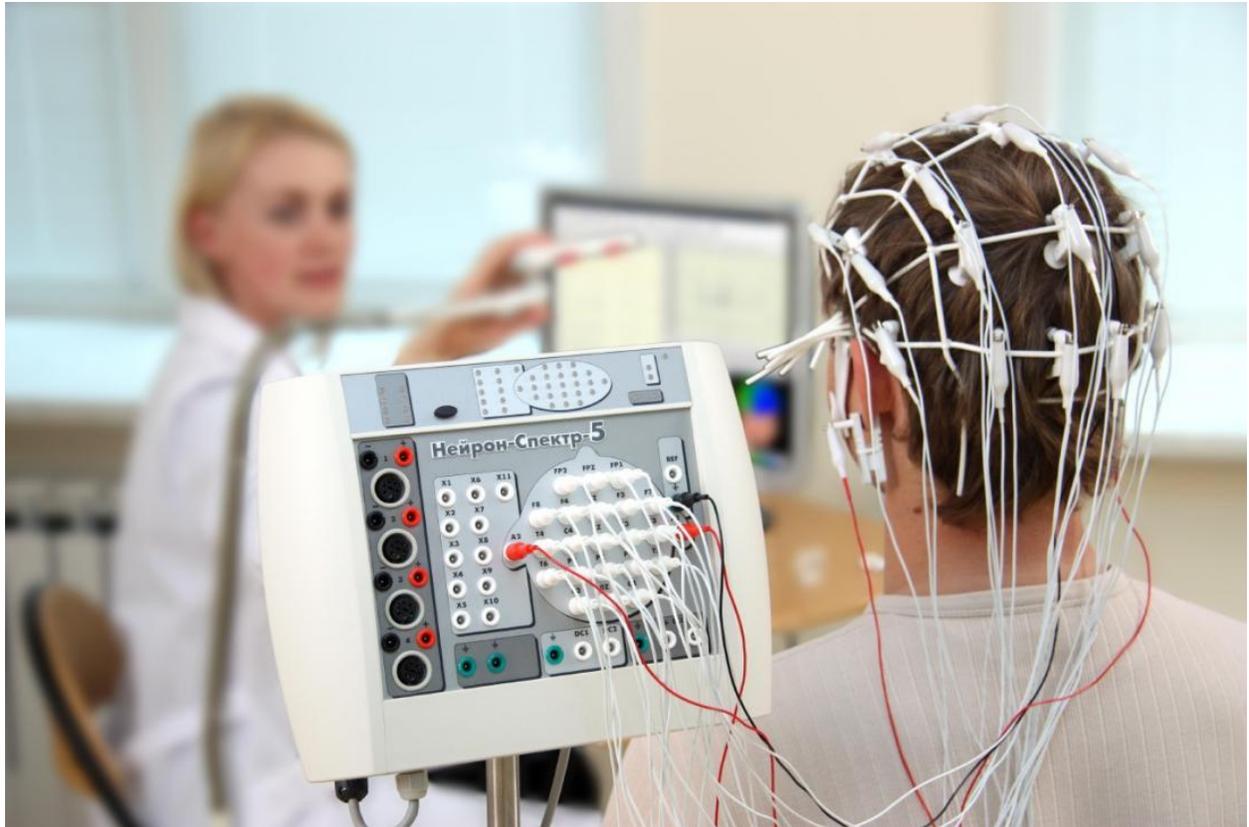


Figure 1

Process of an EEG recording.

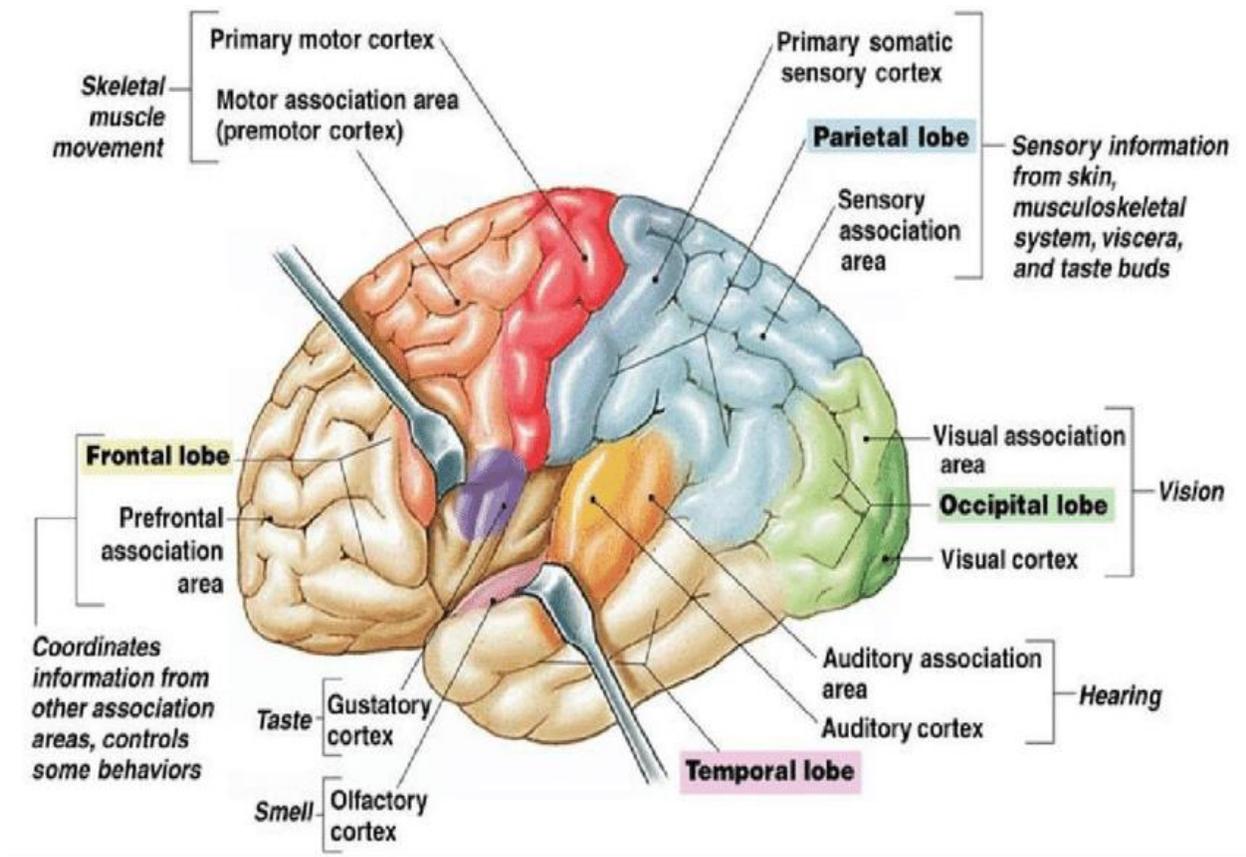


Figure 2.

View of different areas of brain and their function.

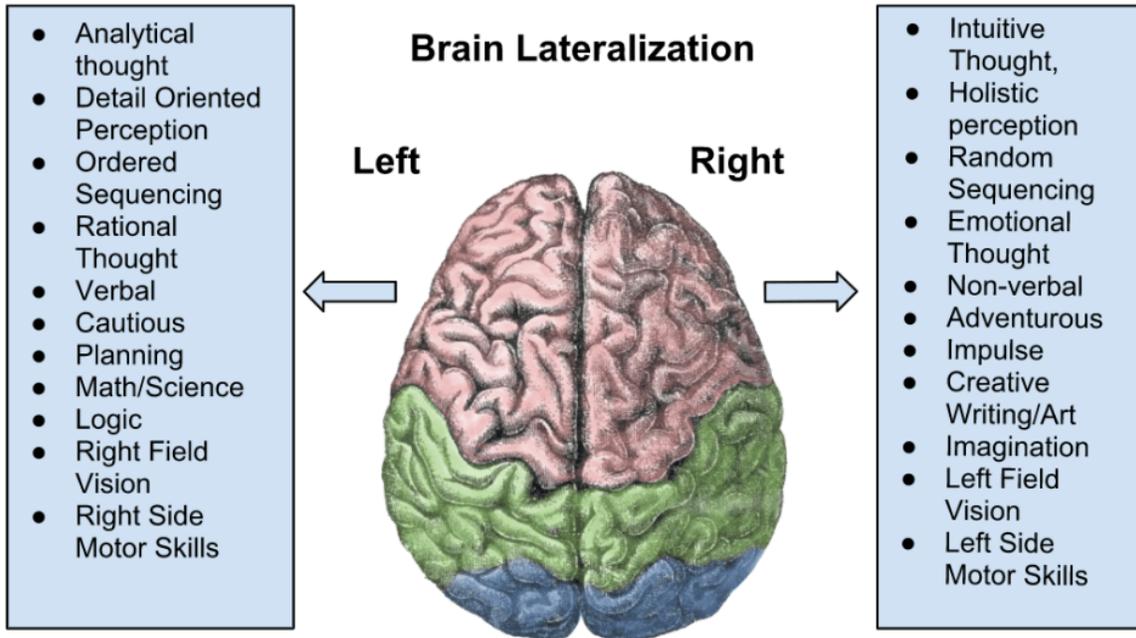


Figure 3.

The Left and Right Hemispheres, and their specializations.

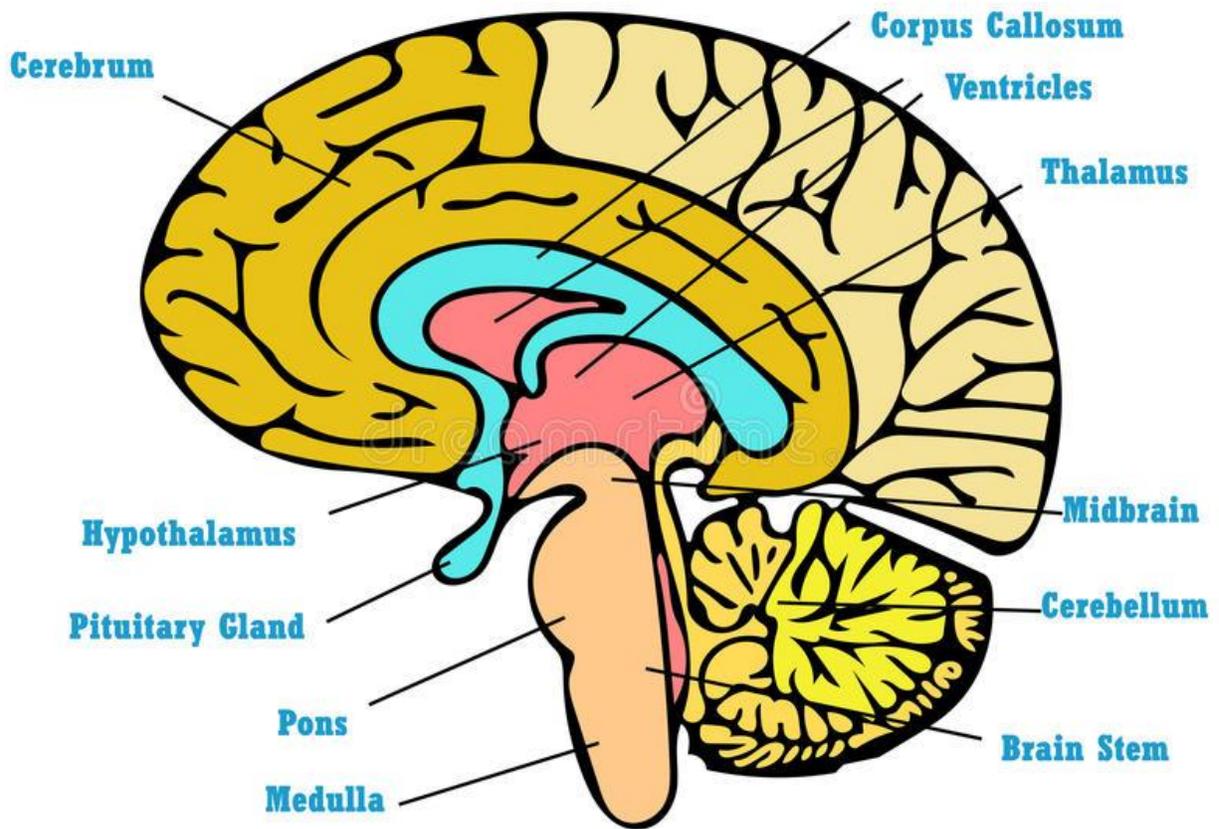


Figure 4.

Hypothalamus (see above), has been suggested as the seat of soul by Jagdish Chander Hasija. Also note Corpus Callosum, which connects the two hemispheres.

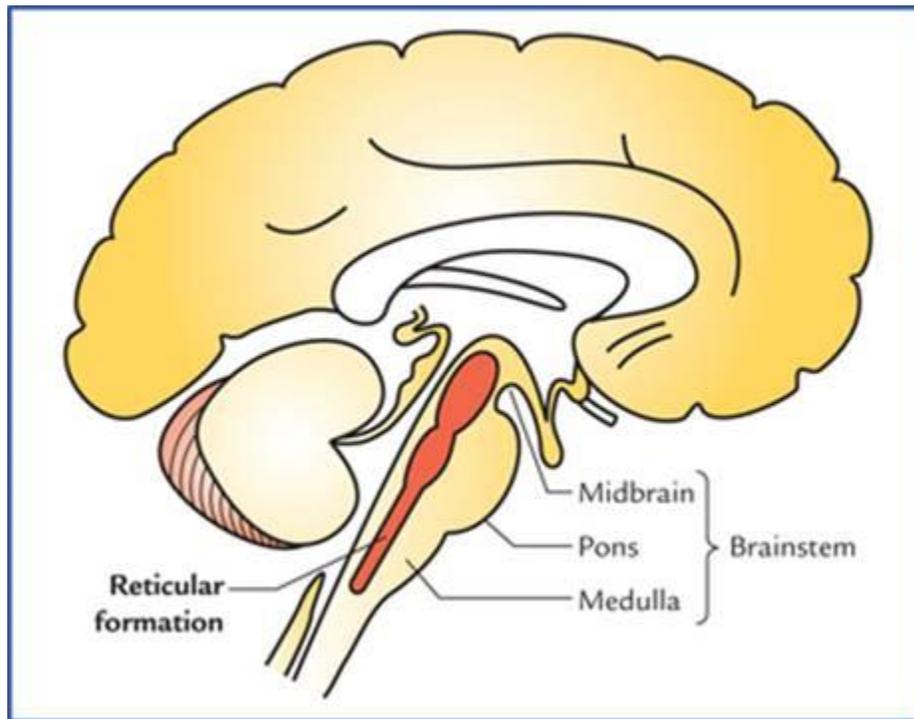


Figure 5.

Note the reticular formation above. It receives signals from the body and relays them up to the brain. Reduced activity of RAS indicates drowsiness or sleep.