

**INNER SELF LOCATED**

Sufficient is now known from neurophysiology and electroencephalography to pinpoint the part of the brain that operates in our sleep. It is the purpose of this article to review Hindu philosophy (as expounded in the *Upaniṣads*) on the subject of sleep and to enquire whether the part of the brain that operates during sleep is the part of the brain where the Self resides. It will be shown that scriptures abound with clues as to the precise location of the Self and just a basic knowledge of neurophysiology and electroencephalography is sufficient to interpret these clues, at which stage they become veritable signposts pointing in the right direction.

It can be no exaggeration to say that the state of sleep is the very cornerstone of Hinduism. According to the *Kaṭha Upaniṣad*, *Puruṣa*, who keeps awake and goes on creating desirable things even when the senses fall asleep, is pure; and He is *Brahman* and he is called the Immortal. All the worlds are fixed on Him; none can transcend Him (II. ii. 8).<sup>1</sup> This *Puruṣa* is called thus, because he sleeps in all bodies (*Puriṣaya*) (*Bṛhaāraṇyaka Upaniṣad* 2.5. 18).<sup>2</sup> On an individual plane this *Puruṣa* or *Brahman* is known as *Ātman* or the Self.

Two states of sleep are distinguished. There is firstly the dream consciousness which is evoked and sustained by the Self. 'The blissful Self, revived by the impression of joy etc. is perceived in dream...' (Śaṅkarācārya's Commentary on the *Taittirīya*

*Upaniṣad* p. 323) 1 'That radiant infinite Being... puts the body aside in the dream state.' (*Bṛhadāraṇyaka Upaniṣad* IV. 3. 11)<sup>2</sup> This one who, being adored, moves about in dream, is the Self... (*Chāndogya Upaniṣad* VIII. 10. 1)<sup>3</sup> *Puruṣa* is the supreme person, who Himself becomes manifest as the persons in the eye and in dream...' (Śaṅkarācārya's Commentary on the *Chāndogya Upaniṣad* p. 658) <sup>4</sup>.

'When the Self thus stays in the dream state, these are the results of its past work.' (*Bṛhadāraṇyaka Upaniṣad* 2 1. 18) <sup>4</sup>. 'Dreams generally correspond to experiences of the waking state. But sometimes one dreams things neither experienced nor to be experienced in this life. And since dreams are not original experiences, the above must be attributed to experiences of another life...' (Commentary on the *Bṛhadāraṇyaka Upaniṣad*, p. 319) <sup>4</sup>. 'When it dreams, it takes away a little of this all-sustaining body, itself makes (the body) insensible and itself creates (a dream body) and dreams through its own radiance (illumined) by its own light. In this state this entity (the Self) itself becomes the light. (*Bṛhadāraṇyaka Upaniṣad* 4. 3. 9)<sup>4</sup> The *Praśna Upaniṣad* states, 'there, in dreaming state, that God experiences His own greatness. He sees all, Himself being all.' (IV. 5)

There is secondly the state of deep sleep. "...then the sleeper becomes merged in Existence. He attains his own Self. Therefore, they speak of him as, "he sleeps" for he attains his own Self." (*Chāndogya Upaniṣad* VI. 8. 1) <sup>3</sup>. "...they reach daily (during sleep) this *Brahman* which is the goal.' (*Chāndogya Upaniṣad* VIII. 3. 2)<sup>3</sup>. 'In deep sleep *Puruṣa* remains unmanifest and His organs fully withdrawn.' (Śaṅkarācārya p. 660). Krishnananda says, 'It is only in the state of deep sleep that the self goes back to its own pristine purity. The energy is withdrawn; consciousness is withdrawn; the ability to perceive is withdrawn. It appears as if life itself has gone. There is a practical non-exist-

ence of the individual for all conceivable purposes. What happens is that the central consciousness, which is the Self, draws forth into itself all the energies of the external vestures, viz the body, the *Prāṇa*, the senses, the mind, etc. and rests in itself without having the need to communicate with anything else outside.' (p. 855) <sup>3</sup>

The Self is consistently stated to be the agent that brings about the transition from the sleeping state to the waking state. '...it hastens back in a reverse way just to its previous state, that of waking ...' (*Bṛhadāraṇyaka Upaniṣad* 4. 3. 15) <sup>4</sup> 'As a large fish swims alternately to both the banks (of a river) eastern and western even so does this infinite entity move alternately to both these states—those of dream and waking.' (*Bṛhadāraṇyaka Upaniṣad* 4. 3. 18) <sup>4</sup>. 'while the Self withdraws itself from all manifestations when it is in sleep, it projects itself in waking through the very channels through which it withdrew itself in sleep. (p. 865) <sup>5</sup>

The *Kaivalyopaniṣad* states that 'The being who sports in the three cities (viz the states of wakefulness, dream and profound sleep) from Him has sprung up all diversity. He is the substratum, the bliss, the indivisible consciousness, in whom the three cities dissolve themselves.' (14) <sup>6</sup> 'Verily the *Ātman* (Self) should be known as being the same in its states of wakefulness, dreaming and dreamless sleep.' (*Amṛtabindūpaniṣad* 11) <sup>6</sup>. It should be noted, however, that when the Self has totally withdrawn, It is no longer considered to be contained within the state of deep sleep and the *Upaniṣads* speak of a fourth state. Then It is 'devoid of states, positive or negative, and remains in a state of non-separation and oneness, that It is spoken of as *Turīya*, the fourth.' (*Sarvopaniṣad* 2) <sup>6</sup>. The Self or *Ātman* is the *Liṅga-Śarīra* (subtle body) and the "heart's knot". In the fourth

state the Self transcends the individual altogether and merges with the macrocosmic *Brahman*. "That very mind becomes the fearless *Brahman* possessed of the light of Consciousness all around." (*Māṇḍūkya Kārikā* III. 34).<sup>7</sup>

Right from the time of the *R̥g Veda* the divine texts have consistently maintained that the Self is located in the heart (*hṛdaya*). 'Because this Resplendent God who is the nourisher of all by His might knows fully the hidden soul or *Ātman* dwelling in the cave of the heart or intellect doing many noble deeds, He is Omnipotent.' (1. 23 14) Śaṅkarācārya explains the meaning of the word *aṅguṣṭhamātraḥ*—of the size of a thumb, the lotus of the heart is of the size of thumb; (and) as conditioned by the internal organ existing in the space within the lotus of the heart (the Self) has the size of a thumb.' (p.181)<sup>1</sup>. The *Chāndogya Upaniṣad* states : 'This Self of mine within the heart, is smaller than paddy or barley or mustard or a Shyamaka seed, or the kernel of Shyamaka seed. This Self of mine within the heart is greater than the earth, greater than the intermediate space, greater than the heaven, greater than the worlds' (III 14 3)<sup>3</sup>. In particular the location of the Self in deep sleep is given as the heart. The *Bṛhadāraṇyaka Upaniṣad*. for example, states : 'When this Self that is associated with the intellect is thus asleep, it withdraws by its specialised knowledge the functions of the organs, and lies in the Supreme Self that is within the heart. (2. 1. 17) <sup>4</sup>. 'In the ether of the heart situated in the interior of the sheath, the divine soul attains the state of sleep. Then by resorting to the same course he leaps into the waking state.' (*Subāla Upaniṣad* IV 1) <sup>5</sup>

The Sanskrit word '*hṛdaya*' (heart) is composed of three letters '*Hṛ*' '*Da*' and '*Ya*'. Krishananda explains, *Hṛ* means to draw. That is the grammatical root meaning of the word *Hṛ*. Drawing, to attract, to pull towards oneself, to compel everything

to gravitate towards oneself, to bring everything under one's control, to subjugate everything, to superintend over all things and to be overlord of everything—all these meanings are comprehended in the root meaning of the letter *Hṛ*...that which draws everything towards itself.' (p. 682)<sup>5</sup> 'The other letter is *Da*. In the word *Hṛ-da-ya*, *Da* is the second letter. *Da* connotes the meaning, 'to give' in Sanskrit (p. 683)<sup>5</sup>. 'The third letter is *Ya* of *Hṛ-da-ya*. In Sanskrit *Ya* means, "to go" (p. 684)<sup>5</sup>. The obvious etymological significance, then, of the word "*Hṛdaya*" is that it goes by drawing and giving. Monier-Williams in his *Sanskrit English Dictionary* confirms Krishnananda's explanation of the three roots '*Hṛ*', '*Da*' and '*Ya*'. Monier-Williams lists 'to withdraw' as a specific meaning of the root '*Hṛ*' (p. 1302)<sup>9</sup>. He lists 'giving, granting, offering, effecting, producing as meanings of the letter '*Da*' (p. 464)<sup>9</sup>. '*Ya*' in the masculine, Monier-Williams says, is a 'goer or mover' and in the feminine '*Yā*' means the act of going. (p. 838)<sup>9</sup>.

Given the fundamental precept of Hindu philosophy that the Self is responsible for the three states of waking, dreaming and deep sleep, and the equally fundamental precept that the Self is located in the heart (*hṛdaya*), the conclusion is inescapable that the heart (*hṛdaya*) is the part of the brain that is responsible for drawing the individual into sleep and for waking him or her up again. The heart (*hṛdaya*) goes by drawing and giving, that is to say withdraws waking consciousness from the individual (draws him or her into sleep) and then it gives consciousness back to the individual at the time that it wakes the individual up (it produces a new waking consciousness). In order to locate the Self it is simply a matter of pinpointing the part of the brain that operates during our sleep.

There are many indications that the embryo in the womb is in state of sleep. The state of 'wakefulness' comes about after

the state of sleep and depends upon the fetus being developed to the point where, at the end of the sixth month, its eyelids actually open. The part of the brain that operates during sleep is the embryo brain region. The adult sleeper must therefore be regarded as having reverted to the primary fetal state (the embryonic state). Mentally, the adult sleeper has returned to his mother's womb. This is reinforced by the many physical similarities between an embryo and an adult in the state of sleep that are too obvious to list here.

The specific neurophysiological and electroencephalographical indications that the embryo brain is in a state of sleep are as follows :

a) We know that growth hormone is released from the pituitary gland specifically during the state of 'slow-wave' sleep. The pituitary gland in the embryo brain develops some thirty days after conception and commences to release growth hormone. In other words, 'slow-wave' sleep must be occurring for the growth hormone to be released.<sup>10</sup>

b) The electroencephalogram picks up dysrhythmic low voltage brain wave activity as early as the second month of gestation.<sup>10</sup> This is consistent with 'slow-wave' sleep having commenced.

c) Five weeks after conception the embryo will make an 'avoidance' type movement if the trigeminal nerve in its face is touched or stroked. It will even 'sneer' eight weeks after conception or 'scowl' eleven weeks after conception.<sup>11</sup> Such responses are consistent with the embryo being disturbed in its sleep.

d) The part of the brain that is responsible for the transition from 'slow-wave' (NREM) sleep to dreaming (REM) sleep is located in the embryo brain region.<sup>12</sup>

e) The neurotransmitter 'noradrenaline' which draws the individual into sleep comes from the embryo brain region.<sup>13</sup>

f) The neurotransmitter 'dopamine' which wakes the brain from sleep comes from the embryo brain region.<sup>13</sup>

g) There may also be a peptide neurotransmitter which is responsible for sleep, and although research data is not clear, larger concentrations of this substance have been located in the embryo brain region.<sup>14</sup>

h) Another neuropeptide 'somatostatin' which releases or inhibits growth hormone, and is therefore very relevant to the sleeping process, has been traced to the embryo brain region.<sup>18</sup>

i) Electroencephalography indicates that the 'synchronizing' and 'desynchronizing' brain waves of the sleep-wakefulness cycle emanate from the embryo brain region.<sup>12</sup>

j) In 1962 Jouvett suggested that the path responsible for sleep desynchronization (dreams) commences in the embryo brain region. Conversely the pathway responsible for the desynchronization observed during waking hours commences in the embryo brain region.<sup>12</sup>

The embryo brain consists of the thalamus, hypothalamus, midbrain and brain-stem. These are the specific areas of the brain that are discernible about five weeks after conception. As the brain grows and expands these areas remain the central core and guiding influence. It is mentioned in passing that the thalamus and hypothalamus comprise a part of the brain known as the diencephalon which also contains the pineal body. A special significance for this pineal body is not ruled out although there is little neurophysiological evidence as to its functions.

The hypothalamus is responsible for the states of being awake or asleep which are pivotal in our lives. It is said to organize,

when electrically stimulated, total acts of aggression, timidity, mating and sexual behavior in animals. As to these last mentioned aspects, compare the content both of our dreams and our thoughts, where themes such as these regularly occur. In terms of human emotion we would talk of hatred, fear, love and desire. The hypothalamus apparently directs our mental processes from the very beginning, and is responsible for all our emotions. The hypothalamus is also considered responsible for the autonomic nervous system which directs all the myriad functions that take place in our body over which we have no conscious control—functions relating to circulation, respiration, digestion, excretion, regulation of body temperature and metabolism, regulation of water content, reproduction. The fact that the hypothalamus remains a relatively small area in the developed adult brain merely attests to its potency and to the fact that it was performing functions just as complex in the embryo period when it was very small indeed. Hence references in the *Upaniṣads* to the Self being of the size of a thumb or less. The entire embryo brain region in the adult brain is indeed about the size of a thumb. The hypothalamus itself has a rostrocaudal extent of about 10 mm.<sup>16</sup>

Compare the fact that the hypothalamus controls respiration with the passage in the *Bṛhadāraṇyaka Upaniṣad*, 'That which breathes by the breath is thy soul which is within every being. (3.4.1) : It is also known that the fetus in the womb practises breathing movements specifically during REM sleep.<sup>17</sup> Another factor indicating the workings of the Self in the embryo brain region, the source of respiration and dreams : 'Now he who, without stopping the respiration, goes upwards, moving about yet unmoving, dispels darkness, he is the Self. (*Maitreyi Upaniṣad* II, 2).<sup>3</sup>



The thalamus has extensive connections with the higher regions of the brain and determines what will become conscious to us. Fibres from the thalamus are connected as well to neurones of the central nervous system, gustatory, auditory, visual, and from the skin, the organs of balance, the bladder, the alimentary canal, the muscles and joints. The *Upaniṣads* speak about precisely these nerves emanating from the heart. 'Again when (this person) is fast asleep, when (he) knows nothing whatsoever returning in the body with the seventy-two thousand nerves by name *hita* which proceed from the heart to all parts of the body, he sleeps (*Bṛhadāraṇyaka Upaniṣad* II i 19) <sup>15</sup>

By 5 months of gestation, increased brain wave activity is noted with onset of activity in the area around the thalamus. <sup>10</sup> This is consistent with the thalamus acting as a mediator or 'go-between' between the embryo brain and the higher regions of the fetus's brain that is by now substantially developed. And it is likewise consistent with brain wave activity in the adult where there are 10/sec rhythmical brain waves that are considered to comprise a loop between the cortical regions and the thalamus. <sup>12</sup> There are a number of theories about the precise pathway that the loop takes but the concept of the thalamus as a 'go-between' is reinforced by Baron Adrian's observation that rhythmic thalamic activity persists even if substantial areas of the cortex are removed—indeed even if the whole cortex is removed! Further reinforcement comes from the theory that the thalamus acts as a central 'pacemaker' for cortical rhythmical activity, which implies that command signals from a small thalamic region are distributed to wide areas of the cortical mantle. <sup>12</sup>

The importance of the brain-stem is certainly on a par with the other areas of the embryo brain because a system of pro-

jections are in place here by the end of the embryo period ( 8 weeks) which influence the growth and development of the cortical (higher) regions. It is generally concerned with the states of arousal—sleeping, waking, relaxation, alertness, vigilance etc. Sensory input from the receptors does not reach the anatomical substrate of consciousness while we are asleep because of the operation of the brain—stem; if the input is urgent it awakens us.<sup>15</sup> 'The nerve that rises upward from the heart is their passage for moving (from the dream state to the waking state); it is like a hair split into a thousand parts. (Numerous) nerves of this body, called *Hita* are rooted in the heart. (*Bṛhadāraṇyaka Upaniṣad* 4. 2. 3).<sup>4</sup> This Self (i.e. the subtle body) is surely in the heart. There are a hundred and one of the (chief) nerves. Each of them has a hundred (division). Each branch is divided into seventy—two thousand sub—branches. Among them moves *Vyāna*.' (*Praśna Upaniṣad* III. 6)<sup>7</sup>

Neurones or nerve cells in the brain are a spherical medium enclosed within a surface membrane and containing a salt solution quite different from the surrounding medium. The composition of the external salt medium is similar to that of an ultrafiltrate of blood. Nerve fibres likewise contain an internal aqueous medium and lie in an external aqueous medium which corresponds again to an ultrafiltrate of the blood. (p. 20).<sup>18</sup> As the *Chāndogya Upaniṣad* says, 'Those that are these nerves of the heart are filled with subtle juices...' (VIII 6.1)<sup>3</sup>

There are many clues in the *Upaniṣads* that the Self is located in the embryo brain region in the centre of the brain. For instance very often the Self is simply described as being located in the middle. 'After meditating on the Self seated in the middle of the heart like a lamp placed inside a vessel of the size of a thumb and of the form of smokeless flame (the Self manifests himself).' (*Pañcāgala Upaniṣad* III. 3).<sup>8</sup> 'All deities worship that

adorable one, the seated in the middle, who pushes the *prāṇa* upward and impels the *apāna* inward' (*Kaṭha Upaniṣad* II. ii. 3)<sup>1</sup> '...in the middle (between the two parts) there comes into being the divine person, the person, with a thousand eyes, a thousand feet and a thousands arms...' (*Subāla Upaniṣad* I. 1)<sup>2</sup> ('between the two parts' – the two hemispheres of the brain). These would all appear to be clear references to the embryo brain region. 'Therein the individual soul who has established himself in the middle of the eyebrows...' (*Paiṅgala Upaniṣad* II. 8)<sup>3</sup> It so happens that the spot in the middle of the eyebrows, the mystical third eye of Shiva, is directly in line with the embryo brain region in the middle of the brain.

We learn from neurophysiologists that when pieces of midbrain are isolated from the brain the cells continue to fire spontaneously and in a sustained manner.<sup>12</sup> By 'firing' is meant 'synapses' – the nerve cells acquire electrical properties. When one considers that by the fifth week after fertilization the embryo cranium is bulging with midbrain, and given the spontaneous nature of midbrain activity independently of the higher regions, it is apparent that we have a mental life from a very early age. This spontaneous firing of the midbrain is what the *Bṛhadāraṇyaka Upaniṣad* is referring to when it says, 'it thinks as it were and quivers, as it were' 'as in dream the mind vibrates'. (*Māṇḍūkya Kārikā* III. 30)<sup>7</sup> Krishnanada says, 'Even if there is a blazing sun in dream it is the mind shining.' (p. 519)<sup>8</sup> The midbrain 'shines' in the sense of spontaneous firing of nerve cells. 'As from a blazing fire sparks of like form issue forth by the thousands even so many kinds of beings issue forth from the Immutable...' (*Māṇḍūkya Upaniṣad* III. i. 1)<sup>8</sup>

The fact that the midbrain is directly connected with the eyes is the clue that it is the source of dreams. The *Maitreyī Upaniṣad* tells us that 'The person who is in the eye, who abides in the

right eye, he is Indra and his wife abides in the left eye... There is a channel extending from the heart up to the eye and fairly fixed there. That is the channel which serves both of them, by being divided in two though but one.' (VII. 11) 'That is the eye in a man through which one sees in a dream.' (*Vedic text* p. 52)<sup>7</sup> The visual pathway runs forward from the midbrain to the eyes and backwards from the midbrain to the visual cortex at the back of the brain. The visual pathway is indeed 'divided in two though but one' as the *Maitreyi Upaniṣad* says in order to serve both eyes. Dreams involve visual image and are therefore inextricably tied in with the visual pathway. Śaṅkarācārya says, 'and then a man whose eyes are plucked out should not perceive blue yellow etc. in dream.' (Commentary on *Altareya Upaniṣad* p. 52)<sup>7</sup>. This is an allusion to the fact that only the colour cone receptors in the retinae of the eyes can produce a colour image in our dreams. It is apparent then that a dream image originates in the midbrain as an electrical impulse which then travels forwards the eyes where the impulse is converted into a colour image—this is why dreams always involve eye movement either rapid or non-rapid and from the eye back along the visual pathway to the visual cortex where the image is actually registered. It is therefore understandable that brain wave patterns during REM sleep (desynchronized) are practically identical with those recorded during arousal.<sup>12</sup> The visual pathway comes into operation in both cases. Krishnananda says, "As in dream, so in waking, as in waking so in dream." (p. 521)<sup>5</sup> The midbrain 'thinks as it were, and quivers, as it were. For being one with dreams, it goes beyond this (waking) world.' (*Bṛhadāraṇyaka Upaniṣad* 4.3.7)<sup>4</sup>.

'This is but the middle-part of the Self.' (*Chāndogya Upaniṣad* V. 15 2)<sup>3</sup>; 'Madhye āsīnam—sitting in the middle—sitting in the space inside the lotus of the heart, shining in the intellect as

revealed knowledge.' (Śaṅkarācārya's Commentary on the *Kaṭha Upaniṣad* p. 187)<sup>1</sup> 'Abiding in the middle place, man sees both places, this and the place of the other world.' (*Bṛhadāraṇyaka Upaniṣad* 4.3.9)<sup>2</sup> It is submitted that in the midbrain is located the cosmic intelligence, *Brahman*, and *Ātman* or the individual Self operates through the hypothalamus and thalamus as well as the brain stem. 'The Supreme dwells in close fellowship with the individual Self in the cave of the human intelligence.' (Rangaramanuja—quoted by Radhakrishnan p. 621)<sup>3</sup>. There are dozens of similar references in the *Upaniṣads* to this 'guhā', this secret place, this cavity, this cave in the intellect which is the *ākāśa* : space. 'It is used as a name of the Supreme, because like space, *Brahman* has no body and is subtle.' (Radhakrishnan, p. 511)<sup>4</sup> There is literally a cavity or space associated with the midbrain. The fourth ventricle. A broad shallow rhomboid-shaped cavity that extends from the upper cervical spinal cord to the cerebral aqueduct of the midbrain. (p. 35)<sup>16</sup> 'The fourth state, *Turīya* ? 'the ether of the heart?' And it does arguably resemble the broad leaf of a lotus plant. 'In addition there is the central grey matter (grey perforating substance) of the midbrain which is also known as perforated space.' (p. 198)<sup>18</sup>

That the embryo brain region is the location of the Self is consistent with the many references in the *Upaniṣads* to the Self being the 'seed', 'the source', 'the creator'. 'In a person, indeed this one first becomes an embryo.' (*Aitareya Upaniṣad* II. i. 1)<sup>5</sup> 'It is the seed of all activity, that is to say, it is the state of deep sleep. That (mental state) is called *jñānam*, knowledge...' (Śaṅkarācārya p. 392)<sup>7</sup> It is repeated that by the fifth week after fertilization the embryo cranium is bulging with midbrain that is firing spontaneously. This is the vital force. 'It is like that which is known as the flash of lightning, and It is also as though the eye winked.' (*Kena Upaniṣad* IV. 4)<sup>1</sup> 'The vital force enters into

the womb along with the seed and it develops itself into the embryo and all the other limbs such as the eye, the ears and the rest manifest themselves subsequently.' (Sivananda, p 534)<sup>15</sup>

'The desire is for knowing some special director of the mind. (Ananda Giri) 'Who is that effulgent being who is the director of the mind and other organs towards their own objects and how does he direct?' ('Śaṅkarācārya's Commentary on *Iśa Upaniṣad*, p. 39)<sup>1</sup> 'He is all-pervasive, pure, bodiless, without wound, without sinews, taintless, untouched by sin, omniscient, ruler of the mind, transcendent and self-existent.' (*Iśa Upaniṣad*. 8)<sup>1</sup> This 'special director', this 'ruler' of the mind has to be the part of the brain that determines the growth and development of the whole brain, ie the embryo brain region.

: As the spider weaves out the web and again withdraws it, so the *Jīva* comes out to and goes back again to the wakeful and dreaming states respectively.' (*Brahmopaniṣad* p. 62)<sup>6</sup> This reference to the Self being like a spider that casts out and withdraws its web occurs a number of times in the *Upaniṣads*. It is consistent with the Self being located in the *hṛdaya* (heart) that goes by drawing and giving. It would appear to be an illustration of the way the Self lodged in embryo brain region by means of the neurotransmitter, noradrenaline, draws the individual into sleep, and by means of the neurotransmitter, dopamine, wakes the individual up again. These neurotransmitters emanate from the embryo brain region in spider web pattern through the network of nerve channels in the brain. 'And when a man is about to wake up, they emanate—they proceed to their respective functions—from the mind itself just like the rays radiating from the sun.' (Śaṅkarācārya's Commentary on *Praśna Upaniṣad* p. 452)<sup>7</sup>

We perceive an external world and function within it by virtue of the outer regions of the brain, and in particular the cerebral cortex. For instance, the visual cortex acting on messages received from the retina of the eye forms an internal map of what is seen. The parietal lobes are responsible for providing us with 'body schema' information about the spatial properties of our own body. It therefore becomes easy to understand references in the *Upaniṣads* to the upside down tree. 'With the root above and branches below (stands) this ancient fig tree. That (indeed) is the pure; that is *Brahman*. That indeed is called immortal. In it all the worlds rest and no one ever goes beyond it.' (*Kaṭha Upaniṣad* II. iii. 1)<sup>8</sup>. The brain truly resembles a tree with the embryo brain region as its root and trunk and the cerebral hemispheres and cortex where the manifested world is registered as the branches. The root is 'above' in the sense that *Brahman* is located in the root. 'It is the Self that is below.' (*Chāndogya Upaniṣad* VII 25 2)<sup>3</sup> '...that One, the omniscient and transcendent—who is both *para*, high, as the cause and *apara*, low, as the effect...' (Śaṅkarācāray's Commentary on *Mūṇḍaka Upaniṣad*, p. 139)<sup>7</sup>. The tree branches 'downwards' in the sense that the cerebral cortex where the manifested world is located is the effect and is low, for this world is indeed lower (*Bṛhadāraṇyaka Upaniṣad* 3.18)<sup>4</sup>.

'Just as all spokes are fixed in the nave and the felloe of a chariot wheel even so are all beings, all gods, all worlds, all organs and all these (individual) selves fixed in the Self.' (*Bṛhadāraṇyaka Upaniṣad* 2. 5. 15)<sup>4</sup> It doesn't take much imagination to envisage the brain as a section of a wheel. The embryo brain region in the middle is the hub or nave and the cerebral cortex is the circumference or felloe. 'Within that (heart) in which are fixed the nerves like the spokes on the hub of a chariot wheel moves this aforesaid Self by becoming multiformed,

(*Muṇḍaka Upaniṣad* II. ii. 5)<sup>7</sup> Note the allusion is simply to the way the spokes are fixed in the hub; not to the Self being the hub of a complete wheel.

There are many references in the *Upaniṣads* to the Self being 'unborn.' 'This great, unborn soul is the same which abides as the intelligent (soul) in all living creatures, the same which abides as ether in the heart; in him it sleeps; it is the subduer of all, the Ruler of all, the sovereign lord of all beings.' (*Bṛhadāraṇyaka Upaniṣad* 4.4.22)<sup>8</sup> It is only when one grasps the significance of the sleeping state that the reference to the Self being unborn can be understood. From conception onwards the embryo is asleep and the adult sleeper reverts precisely to that embryonic state of mind. The Self is located in the embryo brain region and preserves its embryonic identity. It is in this sense that the Self is 'unborn'. When an adult goes to sleep he mentally reverts to his mother's womb. 'The talkers vouch indeed for the birth of that very unborn, positive entity. But how can a positive entity that is unborn and immortal undergo mortality?' (*Māṇḍūkya Kārikā* III. 20)<sup>7</sup> ' (The Self) without being born (appears to be born in various ways), it follows that He is born on account of *Māyā* alone.' (*Māṇḍūkya Kārikā* III. 24)<sup>7</sup> As *Ṛg Veda* says, 'It is the controller of the body, the unborn part, which survives death.' (X. 16. 4)

Finally, once one understands the significance of *hṛdaya* as the embryonic region of the brain that draws the individual into sleep and wakes the individual up again, it becomes possible to understand the full meaning of the word '*satya*' truth. 'The gods adore even truth. The name of *satya* (truth) consists of three syllables. The first syllable is '*Sa*', the second syllable '*Ti*' and the third syllable '*Ya*'. The first and the last syllables (*Sa* and *Ya*) are truth, the middle falsehood (*anṛta*), falsehood is on



either side encompassed by truth.' (*Bṛhadāraṇyaka Upaniṣad* 5.5.1)<sup>9</sup> This is an allusion to the sleeping-waking cycle. Truth, the Self, which withdraws into the *hṛdaya* when we are asleep is the reality. When the Self gives us a waking consciousness, that is the falsehood, the untruth. In other words, *māyā*, the illusion of the manifested world. On again being drawn into the state of sleep we return to the reality. The truth is that *Brahman* is in the heart (*hṛdaya*) and *Braoman* is the reality.

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#### NOTES

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