

NEUROLOGY IN ANCIENT INDIA :  
ĀJÑĀ CAKRA—A PHYSIOLOGICAL REALITY

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*Hatha Yoga* is based on normal human neuroanatomy-physiology which has been misunderstood by Western scholars.

A careful literal translation of verses 32, 33 and 35 of *Ṣaṭcakra Nirūpaṇa* shows that this description of *ājñā cakra* matches with the right and left thalami of modern anatomy, because *ājñā cakra* consisting of two petals is sited at the highest level in the central neural axis at ten fingers' breadth from the tip of nose.

*Ājñā cakra* receives afferent impulses from all five senses and the whole body. It is also the seat of desires (conation), emotional feeling (affect) and sleep, all of which holds true for thalamus. Hence, physiologically *ājñā cakra* is once again identified as the two thalami.

*Ājñā cakra* has a functionally subsidiary nerve station called *tālu cakra* situated at palate level which is depicted as the site of *jīvātmā* (soul). This tallies with the vital functions of the reticular formation and the medullary nuclei in the floor of the fourth ventricle, which structures are in intimate communication with thalamus-hypothalamus and are truly responsible for maintenance of life.

The letter *Om* is revered in Hindu philosophy as depicting the soul and *parabrahma*. That this letter is actually present in physical form in medulla oblongata at the site described for *jīvātmā* is a striking revelation which proves that the Hindu belief about *Om* is scientifically correct.

By analysing the thalamic functions of wakefulness, dream, and sleep *Vedānta* produces its scientific approach to *brahmaṇ* which is the aim of *Yoga*.

The mechanism of death is an area where the Western science keeps groping in the dark. But *Yoga* has the correct scientific knowledge, not only of the vital medullary functions which maintain clinical life, but also of the astral life after physical body-death. Thus, *Yoga* is the right authority to deal with the area of life and death.

Instead of being labelled as 'mysticism' this scientific master achievement of ancient Indians should be accorded its proper place in the History of Science.

## INTRODUCTION

In a previous paper (Joshi, 1986) the physiological identity of the base *cakra*, *mūlādhāra*, which controls all pelvic organ functions, has been proved.

*Ājñā cakra* is the sixth and the last nerve station in the neural axis *suṣumṇā*, as it disperses into the cerebrum.

*Ājñā saṃkramaṇam tatra gurorājñeti kīrtitam*

(*Rudra Yāmala Tantra*—27/69)

"*Ājñā cakra* is so named because the *ājñā* (command) of Guru is received here."

This is the seat of *manas*. For a Yogī *manas* is more important than *buddhi* (intellect), because there can be no success in Yoga without the control of *manas*.

From the scientific view point of *Sāṃkhya*, *manas* forms the third part of *antaḥkaraṇa*, and is responsible for the emotional components—*affect* and *conation* as is brought out in this article.

*Manas* means the internal sense. It has ten projections called *indriya* (external senses), through which it keeps in contact with the external world. Receiving information through these *indriya* projections, *manas* conveys the same to the intellect, which in turn controls the function of *manas*.

*The Vedānta point of view :*

The principle of *mukti* (release) from recurring cycles of birth and death forms the sheet-anchor of all Hindu religious thought. It is this *Sāṃkhya* theory of *manas* which provides the foundation for this principle. *Sāṃkhya* recognises the human person as a psycho-biological whole, in which respect it is at par with the modern medical science.

The present article aims to explain only the anatomic-physiologic aspects of *ājñā cakra*, bereft of its *tāntrika* application. It may be seen that these closely tally with the known facts of modern neurology.

## REVIEW OF LITERATURE

The present article is a part of the present author's continuing study of Yogic neurology.

The earliest account of *cakras* is available in *Saubhāgya Lakṣmī Upaniṣad* of *R̥gveda* which makes this knowledge as old as the *Vedas*.

Chronologically, the last classical text on the subject is *Saṭcakra Nirūpaṇa*, written by Pūrṇānanda Svāmī in 1577. I have chosen this text for my study because it gives the most comprehensive coverage. In 1918, this text was translated by Sir John Woodroffe as his *Serpent Power*. Having little acquaintance with neurology, he was able to freely distort it so that even the clear anatomical

descriptions wear an aura of mysticism. For this reason I consider it necessary to read the original text only and discard Woodroffe's translation.

The verses of *Ṣaṭcakra Nirūpaṇa* are aphoristic. Every small word speaks volumes. Hence, to bring out their full meaning it is necessary to obtain references from other classical texts. I have obtained such references from :

- (1) *Saṁbhāgya Lakṣmī Upaniṣad*—This forms a part of *R̥gveda Saṁhitā*. It describes nine *cakras* instead of six. Two of these together make the *ājñā cakra* of *Ṣaṭcakra Nirūpaṇa*.
- (2) *Rudra Yāmala Tantra*—A post-Buddha tāntrik classic ; it deals very extensively with the tāntrik *sādhanā* of the six centres and the *kuṇḍalinī*.
- (3) The *Upaniṣads*—*Māṇḍūkya*, *Bṛhadāraṇyaka* and *Brahmabindu* with their numerous commentaries ; these chiefly give us the Vedāntic analysis of the four states of human existence, Awake, Dreaming, Sleep, and *Turīya*, produced by corresponding states of *manas*. The foundations of human psychology are exposed here.
- (4) *Sāṁkhya Kārikā* of Iśvar Kṛṣṇa and its commentary by Vācaspati Miśra—an accepted classic of *Sāṁkhya* philosophy, dealing with the physiological function of *manas* and the ten *indriyas* and their relation with *buddhi*.

An intelligent perusal of these ancient Yogic texts in original will bring a striking revelation to any student of neurology that the ancient Indians knew as much of neurology as we know of it today, and in the area of psychology they were far ahead of modern science.

#### *My study of Yogic Neurology :*

My first article (Joshi, 1984-85) explains the identity and function of *kuṇḍalinī*. The second article (Joshi, 1984) gives a general acquaintance with neuroanatomy-physiology of Yoga. The third article (Joshi, 1986) specifies the physiological identity of *mūlādhāra cakra*. The present article aims to explain the neuroanatomy-physiology of *ājñā cakra*.

#### SOURCE MATERIAL AND METHOD

Verses 32 to 38 of *Ṣaṭcakra Nirūpaṇa* pertain to *ājñā cakra*. Of these only the verses 32, 33 and 35 deal with anatomy and physiology. Hence, these three verses form the material for the present study. The remaining verses (34, 36, 37 and 38) deal with *siddhis* and hence are outside the scope of the present article. While trying to explain and interpret these verses correctly necessary references have been obtained from other classical texts mentioned earlier.

To bring out the correct meaning of these aphoristic verses it has been necessary to observe sharp precision in translation and to avoid allegory,

metaphor and mysticism. Multiple recensions of some verses are available and I have chosen that recension which conforms to the known facts of scientific neurology.

To demonstrate the concurrence of these verses with our knowledge today, appropriate diagrams for comparison have been borrowed from a modern Western classic—the *Text Book of Anatomy* by Gray, 36th Ed., 1980, for which permission I am thankful to the Publishers, M/s Churchill Livingstone Edinburgh.

## OBSERVATION

*Ājñā nāmāmbujaṃ taddhimakara sadṛśaṃ dhyānadhāmaprakāśaṃ  
Hakṣābhyāṃ vai kalābhyāṃ parilasitvapuḥ netrapatram suśubhram  
Tanmadhye Hākinī sā śāśisamadhavalā vakraṣaṭakam dadhānā  
Vidyāmudrāṃ kapālaṃ ḍamarujapavāṭiṃ vibhratī śuddhacittā . 32*

*Etatpadmāntarāle nivasati ca manaḥ sūkṣmarūpaṃ prasiddham  
Yonau tatkarṇikāyāmītarśivapadaṃ lihgacinhaparakāśam  
Vidyunmālāvilāsaṃ parama kulapadaṃ brahmasūtraprabodham  
Vedānāmādibhūjam sthirahṛdayagaṇaścintayettatkramaṇa . 33*

“The lotus named *ājñā* is like the moon. It has two petals adorned with letters *Ha* and *Kṣa*. It becomes known by *dhyāna yoga*.”

“Within it is *Hākinī* of pure *citta*, white as moon and having six faces and four hands.” (32)

“Within this *padma* dwells the well-known *manas*, in the pericarp of which is *Itara Śiva* in the form of *liṅga*. This highest seat in *Suṣumṇā* which receives information from the *Citrīṇī* and is adorned by garlands of electric impulses is the original seed of the Vedas (*i.e.* the World).” (33)

These two verses are complementary. So, I will deal with them together.

*Comments :*

Verse 32—The site of *ājñā cakra* at mid-eyebrow level is accepted by all. Yet these verses here make no direct mention of the site.

Verse 33 indicates that this *cakra* is *paramakulapadam*. *Kula* means the *suṣumṇā* and *paramapadam* means the highest seat.

*The highest seat in suṣumṇā :*

The upper end of *suṣumṇā* is described in *Bhūta Śuddhi* thus :

*Suṣumṇā cavyavallīva meruśliṣṭā purogatā*

*Grīvāntaṃ prāpya galitā triyagbhūtāvarānane  
Saṃkhiṇī nālamālambya sā gatā brahmasādanam .*

“Reaching the end of neck, *suṣumṇā* inclines horizontally, embracing the *Saṃkhiṇī* (auditory) pathway, it gets dispersed into the cerebrum.”

Bhāvopniṣad gives a more precise measurement :

*Suṣumṇā pṛṣṭha vaṃsākhya vīṇādanḍasya madhyagā  
Murdhni vā brahmarandhrāntī nāsāgrād vā dasāṅgulam .*

“*Suṣumṇā* runs inside the backbone. Within the skull it ends into the cerebrum at the distance of ten fingers breadth from the tip of the nose.”

Anatomically, this highest seat in the neural axis at mid-eye brow level ten fingers from the tip of nose and related to the auditory pathway can be nothing else but the two thalami (The author has measured this on cadaver). (See Pl. 1.)

*Netrapatram :*

*Ājñā cakra* has two petals and we have a right and a left thalamus on either wall of the third ventricle. (See Pl. 2)

*Hākinī :*

This verse describes a six faced and four handed *Hākinī* of pure *citta* in *ājñā cakra*.

In each of the six *cakras* of *suṣumṇā* we have the deities *Ḍākinī*, *Rākinī*, *Lākinī*, *Kākinī*, *Śākinī* and *Hākinī*.

I have proved in my previous article that *Ḍākinī* is the name for sensory afferents received in the *mūlādhāra* (i.e. Inferior Hypogastric Plexus). Similarly, the others named above too are sensory afferents received in the neural axis at different higher levels. Ultimately all these afferents reach the thalamus, where they are collectively named *Hākinī*. This is proved by the following verse of *Rudra Yāmala* :

*Vṛṣāsanasthaṃ Yogīndraṃ Hākinī Parameśvaram  
Bhrūpadma karṇikāmadhye Kākinī Śākinīpriyām  
Lākinī Rākinī dhyeyā Ḍākinī paripūjītā*

(*Rudra Yāmala Tantra* 82/194-195)

*Rudra Yāmala* 79/12 describes *Hākinī* as *devamātā*. The word *deva*, etymologically means our senses *Dyotante iti Devatā*.

Hence all the five senses and the sixth *manas* are mothered by *Hākinī* and these same are the six faces of *Hākinī* (See Pl. 3)

Because of this *Hākinī* is *śuddha citta*. *Śuddha citta* is explained in *Brahmabindu Upaniṣad* 2, 3 and 4. It means *nirviṣaya citta* or *citta* power in its pure form and detached from the external world.

The most excellent description of *Hākinī* is available in *Rudra Yāmala* :

*Etat cakrasyamadhye sakala suragaṇa vidyutākāradīptā  
Prāṇākhyā vahnijihvā sukhmaya vimalā yoginī yogamukhyā  
Dhyāyetdevim parādhyāṃ tribhuvanajanānīm ṣaṇmukhīm Vedahastām  
Vidyāmudrāṃ kapālaṃ ḍamarujapavaṭīm dhārayantīm jvalantīm .*  
(79/19,20)

*Sakala suragaṇa vidyutākāradīptā, Prāṇākhyā* means *Hākinī* is *Prāṇa*, which is aglow with electrical impulses from all the senses.

*Ṣaṇmukhīm* is six faced : this again refers to the five senses and *manas*, the sixth.

*Vedahastām* is four hands ; they are named as *vidyāmudrā, kapālaṃ, ḍamaru, japavaṭī* which represent *jñāna, vairāgya, nāda* and *bhakti*, the four methods which are natural offsprings of *śuddha citta* i.e. *Hākinī*.

It is because of these four that *Hākinī* becomes *Yogamukhyā*—chief instrument for practice of Yoga ; and again, because of these four *Hākinī* is *Vahnijihvā*—fire tongued, because it burns the *jagat* of the Yogī, of which *kāma dahana* by Lord Śiva is an example. The third eye of Śiva is the eye of *jñāna*.

Physiologically, thalamus is the organ which receives all sensory afferents from the whole body. Hence, once again there is no doubt that thalamus is synonym for *ājñā cakra*.

*Comments :*

Verse 33—“Within this *padma* dwells the well known *manas*.”

*What is manas ?*

*Manas* is a technical term of *Sāṃkhya Yoga*. The faculties of mind are collectively termed *antaḥkaraṇa*.

*Antaḥkaraṇaṃ trividhaṃ daśadhā vāhyaṃ Trayasya Viṣayākhyāṃ  
sāmpratakālaṃ Vāhyaṃ trikālamābhyaṅtaraṃ karaṇaṃ.*  
(*Sāṃkhya Kārikā*—33)

*Sāṃkhya Tattva Kaumudī* by Vācaspati Mīśra is a commentary of the above work from which I translate the above verse as follows :

“*Antaḥkaraṇa* has three facets, *Buddhi, ahaṅkāra*, and *manas*. These are

called *antaḥkaraṇa* because from within the body they deal with the external world. For this dealing, the ten *indriyas* act as their doors. While the *indriyas* can receive only the present events, the *antaḥkaraṇa* can work in the past, present and future uninhibited by the time factor.”

*Ubhayātmakamatra manaḥ saṃkalpakamindriyaṃ ca sādharmaṃyāt.*  
(*Sāṃkhya Kārikā*—27)

*Manas* is that part of *antaḥkaraṇa* which acts by *saṃkalpa* (i.e. desiring, scheming and conation). Simultaneously *manas* is a congener of the ten *indriyas* with all of which it acts in common. (No *indriya* can act without *manas*). (This position is explained diagrammatically in Pl. 3).

*The ten indriyas :*

On the one hand *manas* is a part of *antaḥkaraṇa*, on the other hand it makes a single unit with the ten *indriyas*, through which it deals with the external world. The *indriyas* (external sense and work organs) do not communicate with the intellect directly but through *manas* as their mediator and moderator.

*Indriyas* also called *bāhiṣkaraṇa* are enumerated in *Sāṃkhya kārikā* as follows :

*Buddhīndriyāṇi cakṣu śrotra ghrāṇa rasana tvagākhyāni*  
*Vākṣpāṇipāda pāyūpasthāni karmendriyāṇyāḥuḥ.*  
(*Sāṃkhya Kārikā*—26)

I translate below the commentary of this verse from *Sāṃkhya Tattva Kaumudī*.

*Indriyas of perception :*

*Cakṣu* is the agency which receives vision. *Śrotra* is the agency which receives sound. *Rasanā* is the agency which receives taste. *Ghrāṇa* is the agency which receives smell. *Tvaka* is the agency which receives touch, pain, temperature and pressure (i.e. *sparśa*).

*Indriyas of action :*

- Vāk* — Produces the external disturbance for expression and communication.  
*Pāṇi* — Produces external disturbance for positioning of objects.  
*Pāda* — Produces external disturbance to displace own body.

*Upastha* — Produces external disturbance to generate pleasure.

*Pāyu* — Produces disturbance for excretion of unwanted material from the body.

All sensory information is received through *jñāna indriyas*, but before it can be appreciated by the intellect it is mediated through *manas*, which can vary the alertness of the intellect to such information. As an example, a person deeply absorbed in a novel is unable to see or hear whatever is going on around him because his *manas* is in the novel. Mood and emotional feelings occur in *manas*.

The first chapter of *Bhagavat Gītā* is named *Viśāda Yoga* or grief Yoga. Verses 26-31 and 47 of this chapter provide us with a very accurate and lucid word picture of emotional exteriorization, which I translate below. Note that the cause of these physical symptoms of Arjuna is given as the flooding of his *manas* with extreme pity, sorrow and grief.

“Arjuna saw all his kinsmen in the battlefield.” (27) “He was overcome with extreme pity. With sorrow he spoke thus—O Kṛṣṇa ! I see all my people here ready for battle.” (28)

“My body feels limp, mouth feels dry, I am trembling and my hairs stand on end.” (29)

“The bow slips from my hand and skin burns. I can neither sit nor stand. My *manas* is in a spin.” (30)

“All omens look harmful to me. I see no good in killing my people in the battle.” (31)

“Saying this Arjuna threw away his bow and arrow and sat in the chariot flooded with grief.” (47)

*The four states of human existence :*

The four states of human existence are wakefulness, dreaming, deep sleep, and *turiya*. These are caused by corresponding dispositions of *manas* and are analysed in *Vedānta* (see discussion).

For these reasons *manas* is of the greatest importance to the Yogī. According to Patañjali, Yoga itself is nothing but control of *manas* :

*Yogaḥ cittavṛtti nirodhaḥ.*

Now, this verse states, that the *ājñā cakra* placed at the top of neural axis at the eyebrow level is the seat of *manas*.

Anatomically, the structures at the above site are the third ventricle, the thalamus and hypothalamus.

Physiologically, the functions attributed to *manas* above are known to us



today as the functions of the thalamus. Thalamus is known to neurology as the great relay station on the sensory pathway to the cortex. It receives afferent fibres from the trigeminal luminiscus, the gracile and cuneate nuclei and the ventral and lateral spinothalamic tracts. It also receives proprioceptive information from the cerebellum, auditory fibres from the inferior colliculi and cochlear nucleus, the olfactory afferents through the amygdala and visual neuroues from the retina. Thus, touch, pain, temperature, sound and joint sense, taste, vision, and sound and smell are all received here to be relayed to the cortex.

Thalamus also receives ascending fibres from the reticular formation due to which it can tonically activate any afferent sensory influx to vary the alertness of the cortex to this input. Thalamus, thus plays a role in maintaining the state of wakefulness and alertness. Conversely, by causing a cumulative functional depression of the state of cerebral excitation, thalamus is responsible for producing sleep. Because of this, even the people living by the railway tracks learn to sleep peacefully amidst the earsplitting noise.

#### *Emotion :*

Emotion has a mental and a physical side. The mental aspect consists of cognition, affect and conation. The physical aspect consists of widespread changes in the viscera and the skeletal muscle as follows :

Viscera — Tears, nasal secretion, cold-sweat, pallor, pilo-erection, dry mouth, and dilated pupils.

Skeletal muscle — Reduced tone, feeble contraction, and tremor.

(compare this with the condition of Arjuna in *Bhagavata Gītā* cited above).

It is well known to physiology that the complex patterns of emotional exteriorization are achieved through the autonomic system by the prefrontal-thalamic-hypothalamic complex.

This physiological exposition of the thalamic function tallies minutely and completely with the functions of *manas* described in Yoga and *Sāṃkhya*. Hence, it is a logical conclusion that the *ājñā cakra* of Yoga is synonymous with the thalamus.

#### *Vedānām Ādibījam :*

*Manas* is the original seed of *Vedas*. The word *Vedas* here does not mean the four books of divine knowledge, but refers to the purpose of the same knowledge, i.e. correct behaviour and action which lead to worldly fulfilment (as is explained in *Bhagavat Gītā*, 15/1).

*Vedāntā* tells you how your world sprouts from your own *manas*.

When you attach yourself to this body, this home, this family, this country,

etc. you have created a person with a body, a family, a home, and a country, for which things you then live, work, earn, govern, and fight wars. The moment you can completely detach yourselves from all your attachments, your world disappears. That happens every night while you fall into deep sleep at which time you are there but your world is not, because, the *manas* has withdrawn into the self.

When a Yogī practices the same thing during wakefulness it is called *Samādhi*.

*Himakara Sadrśam :*

Verse 32 says that *ājñā padma* is like the moon. No special attributes like whiteness or coolness are given. Hence, this reference is to the whole character and function of moon. Moon is the presiding deity of *manas* which is sited in the *ājñā cakra*, hence this comparison is appropriate. This finds confirmation in *Viṣṇu purāna*. (12/1)

*Rathastricakraḥ somasya kundabhāstasya vājinaḥ  
Vāma dakṣiṇato yuktā daśa tena caratyasau.*

“The chariot of Moon has three wheels (*i.e. trividha antaḥkaraṇa*) and is pulled by ten horses (ten *indriyas*). This finds confirmation in *Rāma Carita Mānasa* (6/15) where *manas* is depicted as *śaśī*.

Woodroffe has mistranslated this portion as we will discuss.

*Dhyāna dhāma prakāśam :*

The *dhāma* (*i.e. the station—ājñā cakra*) gets illuminated and known to Yogī by *dhyāna* (meditation).

Again, Woodroffe mistranslates this portion as we will discuss.

Verse 34, which deals with *siddhi*, is outside the scope of the present article and hence is not dealt with here.

*Verse 35 :*

*Tadantaścakreasminnivasati satataṃ śuddha buddhyantarātmā  
Pradīpābhajyotiḥ praṇavaviracanā rūpavarna prakāśaḥ.  
Tadūrdhve candrārḍhaḥ tadupari vilasat bindurūpī makāraḥ  
Tadādye nādeasau jaladhavala suhādharma santānahāsī.*

“In this inner *cakra* of that (*ājñā cakra*) is sited always the innerself (*jīva-ātma*), which is pure intellect and manifests here in the formation of *praṇava* as the letter-symbol *Om* ( ॐ ) which is alight with a glow like the flame of a well-lit-lamp.

“Above that (*Om*) is half moon and above that (half moon) is *makāra* in the form of *bindu*.

“This (half moon) above the *ādi-nāda* (*Om*) produces a stream of nectar which sparkles like clear water.”

*Comments :*

The second half of this verse needs to be discussed first, because it provides us with a clue to the fact that the site of these structures is the medulla oblongata.

The half moon shaped structure which produces a sparkling and clear water like fluid is an accurate and lucid description of the choroid plexus of the fourth ventricle secreting the cerebro spinal fluid (C.S.F.) (*See* Pl. 4)

This receives confirmation from *Saubhāgya Lakṣmī Upaniṣad*.

*Tālucakraṃ tatrāmṛtadhārāpravāhah  
Ghaṇṭikālīṅgamūla cakraraṇdhraiḥ rājadantāvalambinīvivaraṃ daśamadvāraṃ  
Tatra śūnyaṃ dhyāyet cittajayobhavati.*


“A stream of nectar flows at the *tālu* (palate) *cakra* which is at the root of uvula within the round opening at the level of the front tooth. Meditate on the vacant space there at the tenth door.”

The human body has only nine exits. The tenth door described here at the level of front tooth is the foramen magnum. (*See* Pl. 1). The vacant space there is the fourth ventricle, where a stream of C.S.F. flows.

Confirmation for this is available in *Yoga Rāja Upaniṣad*.


The site of *ājñā cakra* is at eyebrow level. Then why is *tālu cakra* described as its subsidiary ? We will discuss this.

The correct site of the subsidiary *cakra* having thus been established, we now come to the main structure described in the first half of this verse—*praṇava viracanā rūpa varṇa prakāśaḥ*.

“The *Om* formation which is manifested in the form of actual letter  ”

A transverse section of the medulla oblongata in its caudal part shows a most remarkable figure of *Om* (Pl. 4).

*What makes this Om :*

The right and the left nuclei gracilis, nuclei cuneatus, spinal nuclei of the trigeminal nerves and the anterior grey columns, all embedded in the reticular formation combine together to produce this striking similarity to  figure.

Although not much is known today about the extent, connexions, subdivisions and functions of the reticular formation, yet it is established that non-

functioning of this part of human brain causes irreversible brain death and the vital centres including those of respiration and circulation are present here in the floor of the fourth ventricle and this area receives hypothalamic impulses controlling the autonomic nervous functions.

*Tatantaḥ cakra asmin nivasati satatam antarātmā :*

“Within that (*ājñā cakra*) in this (subsidiary) *cakra* resides always the inner self.”

*Antarātmā* or inner self means the consciousness which is embodied in mind and matter—a synonym for *jīvātmā*, which Woodroffe has correctly explained in the third chapter of his *Serpent Power*.

The phrase *tatantaḥ cakre* deserves attention. *Tasya antaḥ cakra* becomes *tadantaḥ cakre*. *Tat* refers to the *cakra* under discussion i.e. *ājñā* included within *tat* (*ājñā*) is another subsidiary *cakra* in which the inner self resides.

The site of this subsidiary *cakra* is revealed by reference to the choroid plexus of the fourth ventricle as discussed above. In some Yogic texts this subsidiary *cakra* has been named as *tālu cakra*, and counted separately from *ājñā cakra*.

Thus, this verse states that the inner self (*jīvātmā*) always resides in the *Om* formation in the *tālu cakra* of the brainstem. According to *Bhagavat Gītā* (8/13) the single indestructible syllable *Om* is the true expression of Brahma—*Om Ityekākṣaram Brahma*.

Again according to *Gītā* (15/7-8) it is the departure of *jīvātmā* from the body that is the cause of death. That is exactly the function of reticular formation as shown above.

In his translation of this verse Woodroffe has completely overlooked that the letter structure *Om* is physically present at this site, in the brainstem, with its vital life supporting physiological function.

*Śuddha buddhi antarātmā :*

*Ātman* is pure knowledge beyond all limitations of form, space, and time.

This is confirmed by *Bhagavat Gītā* (13/17) *Jñeyam jñānam jñānagamyaṁ*.

“Ātman is knowledge, yet, the object of knowledge and also the goal of knowledge.”

*Pradīpābha jyotiḥ :*

“Radiant like a well-lit lamp.”

This refers to the constant glowing of the medullary nuclei due to the

presence of electrical impulses. *Antarātmā* is aglow by itself (Gītā 13/16) and it is sited in *praṇava*. Hence *praṇava* glows.

#### DISCUSSION

*Psychology of Yoga and Vedānta :*

*Mana eva manuṣyāṅām kāraṇam bandha mokṣayoḥ  
(Brahmabindu Upaniṣad—2)*

*Manas* alone is the cause of our fetters and also the release from the same.”

The topic of *antaḥkaraṇa* has been very deeply and scientifically investigated by ancient Indians, because complete control of *antaḥkaraṇa* is essential to achieve *mokṣa* which is the central theme and object of Yoga.

Modern psychology based on its analytical and objective concepts is a relatively recent development in Science. The Indian system of Yogic philosophy, based on similar methods has thrived in an unbroken tradition since its Vedic origins. Despite this antiquity, quite a few tenets of Yogic philosophy bear a close similarity to scientific concepts of modern psychology. Its understanding in the West is hampered by semantic difficulties. In spite of this a progressive rapprochement between the two is visible today.

The Yogic psychology has as its base a correct understanding of human neuroanatomy-physiology. Unfortunately, Western scholars like Woodroffe were unable to grasp this neurology and they have branded this as ‘mystic’.

*The site of ājñā cakra :*

Anatomically, *ājñā cakra* is sited at eyebrow level in every Yogic text. But, *Ṣaṭcakra Nirūpaṇa* makes no direct mention of this ; further, it describes the structures at the floor of the fourth ventricle as subsidiary to *ājñā cakra*.

Structures at the fourth ventricle constitute what has been called *tālu cakra* in *Saubhāgya Lakṣmī Upaniṣad*. Why *tālu cakra* becomes a subsidiary of *ājñā cakra* becomes clear from *Śiva Saṃhitā* where it describes *khecari mudrā* as follows :

*Bhavorantargatā dr̥ṣṭiḥ vidhāya sudṛḍhā sudhoḥ  
Lambikordhva gate garte rasanā vipar̥itagām  
Saṃyojayetprayatnena sudhākūpe vicakṣaṇaḥ*

(4/51-53)

“While meditating within eyebrows, the expert (Yogī) must carefully apply his inverted tongue at the well of nectar in the pit above the uvula.”

Thus, for success in meditation of *ājñā cakra*, a Yogī must maintain *khecari mudrā* by pressing at the *tālu cakra*.

Therefore *tālu cakra*, though anatomically separate and distant from *ājñā cakra*, is yet considered a subsidiary for the purpose of practical Yoga.

*Human person in Yogic view :*

Yoga considers the human person as a psychobiological unit, where the physical body acts as an instrument constantly receiving direction from the *antahkaraṇa*, which controls and conditions the former.

*Katha Upaniṣad* (1/3/3-4) compared the body to a chariot, where *jīva ātmā* is the owner, intellect is the driver, *indriyas* are the horses and *manas* is the bridle.

The Western science ignored this for a long time. Even today medical men are apt to consider a human person as just so much bone, muscles, and vicera all working to the laws of nature, as they try to maintain vegetable life in a corpse with the help of mechanical respiration and circulation.

Modern science does not recognise *jīva ātmā*, hence, the area of life and death is beyond its jurisdiction, as I show below. Yogic science is the proper authority to deal with this area.

*Jāgrata, svapna and suṣupti—The scientific basis of Hindu philosophy :*

A person can be either awake, or dreaming, or deeply asleep. Through practice of meditation a Yogī can attain a fourth state called *turiya*.

These four states are caused by corresponding dispositions of *manas*. Vedānta philosophy analyses these states in detail to provide an approach for realization of self. But, a scientist may obtain from it a root level insight into the deep study of psychology made by ancient Indians.

To be able to grasp this Vedāntic analysis it is first essential to know and accept the three levels of creation which are revered in Hindu philosophy (see *Māṇḍūkya Upaniṣad*). They are :

1. The level of the gross physical world called *virāt*, corresponding to the awake state.
2. The level of the subtle, physical called *sūkṣma jagat* or *Hiraṇyagarbha* corresponding to the dream state.
3. The supra physical level of seed state called *kāraṇa jagat*, corresponding to dreamless deep sleep.

No object and no event in this creation can exist without these three states.

*Hindu ritual of śāntipāṭha :*

Every Hindu religious discourse starts with a *śāntipāṭha*—  
“Om ! Śāntiḥ ! Śāntiḥ ! Śāntiḥ !”

Peace is requested from God, three times for three levels of existence. Existence at body level alone is meaningless without the other two levels. Thus, this short prayer contains in it the wisdom of all Hindu philosophy in the manner of an aphorism. The edifice of Vedānta has its foundations in the supra physical.

Unfortunately, Western science accepts nothing without physical proof. Hence, it cannot approach the supra-physical level. Thus, East and West go separate and the twin do not meet.

*Vedāntika analysis and inferences :*

The awake, dream and asleep states are analysed in very great detail in Vedānta, chiefly in *Māṇḍūkya* and *Bṛhadāraṇyaka Upaniṣads* and their numerous commentaries by great sages like Gaud Pādācārya and Śaṅkarācārya. It is not possible to cover that marathon debate here except for the short glimpse given below. This analysis produces great results in Vedānta, because it is the chief argument for *advaita* as well as *dvaita* philosophy.

TABLE—1

Vedāntic Analysis of Three Human States

<i>Antahkaraṇa</i> (3 parts)			
State	Part which is active	Part which is withdrawn	Part which is dominant
1. Awake ( <i>Jāgrata</i> )	Intellect with <i>indriyas</i> , <i>manas</i> , and <i>ahaṃkāra</i>	None	Intellect
2. Dreaming ( <i>Svapna</i> )	<i>Manas</i> and <i>ahaṃkāra</i>	Intellect and <i>indriyas</i>	<i>Manas</i>
3. Deep sleep ( <i>Suṣupti</i> )	<i>Ahaṃkāra</i>	Intellect, <i>manas</i> and <i>indriyas</i>	<i>Ahaṃkāra</i>

*The three states :* (see table 1)

Whether I am awake or dreaming or in deep sleep, the physical universe is actually present around me in the same form all the time. But while I sleep I desire nothing, am not aware of any possessions or relatives, because my *manas* is withdrawn into the self together with *indriyas* and intellect.

While I am awake, I possess things, have many desires and many relatives. I

call myself Doctor Joshi, belonging to Nainital, India. I possess a house, a wife and children, parents, property, a bank balance, and endless desires. All this because of the play of *manas*, which is out and active with consciousness.

Now, it is during the dream state that the action of *manas* gets fully exposed. Here, the external sense-projections (*indriyas*) are withdrawn and inactive but *manas*, the internal sense has its full play. So, cut off from the external physical world, it creates a world of its own out of nothing. From impressions which it has gathered during the awake state, *manas* creates this magic display of dream which has no physical existence for its base. For the duration of dream, the dream world is as real as the world of awake state during wakefulness.

Now, Vedānta argues that our perception of the world of awake state is as false as the perception of the dream world during dream state. (*Śrīmat Bhāgavat—10/47/32*)

This simple scientific fact is generally misunderstood by people who are unacquainted with the method of Hindu philosophy. I attempt to explain it below.

The word *jagat* of Vedānta does not mean the universe with its galaxies, planets and the earth, and its biosphere in the physical sense. *Jagat* means our personal and social world, which we create for ourselves. Vedānta does not deny the existence of the physical universe and its objects. It only denies the false values we attach to these objects. In Vedānta, the objects of the physical universe are called *sat viśeṣa*, which literally means a 'qualified truth'.

*What is sat viśeṣa ?*

Vedānta digs very deep into physics to analyse physical objects. *Śrīmat Bhāgavata* (3/11) gives a clear definition of atom and measures its size. It then argues that all physical objects in the universe are made up of atoms only. If a beautiful young woman is lying on her operation table, the surgeon does not look upon her as a sex object. To him she is only a human organism. Well, in the view of Vedānta there is no human organism and no sex object lying on that table. Vedānta says that the operation table is one lump of atoms, upon which lies another lump of atoms that you call the woman. All other values for these two objects are your own assumptions which are false (*bhrama*).

Thus, the physical objects of our awake world are real but acquire imaginary values which we give them. Again, Vedānta delves into physics. It tells us that all physical values are relative. The gram and the metre, day and night, east and west, rupee and sterling, Indian and Pakistani, ugly and beautiful—all are relative. They do not exist in the absolute. This is a facet of *ahamkāra* with which we create the world of our awake state. Because of *ahamkāra*, we attach ourselves to our body and objects.

All emotional stresses arise from attachment (*Gītā*, 2/61). All things which I



call mine are only my own stipulations. For example, my body—it is mine because I so stipulate. When a surgeon amputates my leg or resects my intestine do I carry that home? No! That is trash. Well! how is one leg different from the other leg? For example, my father—he is my father because I so stipulate. No son can ever know who sired him. My wife—one of the six billion humans on the earth she became my wife on the day I so stipulated. It is so with every single object.

With this scientific background we now consider the personal and social values which our *manas* creates for objects.

When I dream, the dream has two components—a view and a viewer. My awake world too has the same two components—the view and the viewer. While the view during wakefulness is real and physically present, that in a dream is imaginary and non-existent. In both states, the viewer is my *manas* (the internal sense).

In the dream, the *manas* creates imaginary objects and gives them imaginary values, while in the awake state the objects are physically present and *manas* gives them imaginary values. Since in both cases the values affixed to objects are imaginary, Vedānta argues that the two states are the same because it is the values that matter not the objects. (See table No. 2).

TABLE—2

State	The viewer	The view	The value
Dream	<i>Manas</i>	Imaginary and false	Imaginary and false
Awake	<i>Manas</i>	Real physical	Imaginary and false

To sum up, our perception in the awake state is distorted by several factors.

1. We do not perceive the physical objects for what they truly are, because, guided by external senses we rely on colours, shapes, sounds, touch, etc. So we miss the reality.
2. Due to relativity we see things which are not there at all, like blue in the sky.
3. Due to our attachment to objects, we give them imaginary values which starts our emotional stresses.

Therefore, based on this false perception our entire social structure (*jagat*) is false like a dream. It is like a piece of rope lying in darkness which creates an illusion of a snake. There is no snake there, yet we are afraid of it.

Since all our emotional stresses are results of this false attachment to objects, Vedānta declares—*Prajñāparādhamevā eṣa duḥkhamiti yat.*

“What is called grief is only a fault of our intellect (*i.e.* a miscalculation).”

Not only grief, but all our worldly pleasures (perceived with external senses and *manas*) too are false and temporary.

This scientific analysis of the three states is the foundation on which the edifice of Yoga and Vedānta has been built. *Manas* is the factory of desires (*kāmanā*) which is the cause of fetters (*bandhana*). Hence by control of *manas* a Yogī achieves *niṣkāma karma*, which is the path of freedom. For this Yoga *sādhana*, a basic knowledge of *ājñā cakra* (*i.e.* neuroanatomy-physiology of the thalamus) is helpful, and that is the aim and purpose of Yogic neurology. Yoga does not aim for academic advancement of science, nor of therapeutics. The present article aims only to place Yogic neurology in the right historical perspective.

#### *The Mechanism of Death :*

The event of “death” is now better understood than before. At present, physicians regard human survival impossible after “brain death” which means stopped activity of the brain-stem diagnosed by its non-functioning.

That is not correct by the science of Yoga, which has its own theory for the mechanism of death in which the body and the soul are counted as two different entities. According to Yoga the human body is a non-conscious (*jaḍa*) entity, no different from a vegetable. In it the tissue cells keep alive with the agency of *dhanañjaya prāṇa*. Clinical life or death makes no difference for this position (Joshi, 1985). As an example, mutton and pork keep fresh weeks after slaughter because the tissue cells are alive. That is also the secret for the success of transplant surgery. For this reason, the cells of brain stem too are alive after “clinical brain death”, when no conduction of nerve impulses can be demonstrated.

This teaching of Yoga is proved, in practice, by the ancient Hindu ritual of *Kapālakriyā*.

#### *The kapālakriyā ritual :*

Hindus dispose of a corpse by cremation. During cremation, as the corpse takes fire, it is customary to break the skull with a bamboo pole. This is known as *kapālakriyā*. It is accompanied by chanting of a hymn to exort the *dhanañjaya prāṇa* to leave the brain tissues of the corpse.

*Clinical life—the Yogic truth :*

After death the corpse is a lifeless lump of tissues. In the same manner, the embryo in mother's womb during the first few weeks of pregnancy is a non-conscious lump of tissues without clinical life. It becomes alive when *jīvātmā* (i.e. the soul embodied in *antaḥkaraṇa*) enters it. Henceforth, *jīvātmā* becomes the owner of this property (the foetal body) (*Bhagavat Gītā*, 15/7-8).

For this action *jīvātmā* is propelled by the force of its *karma*. When this person dies, the same *karma* force propels the *jīvātmā* out from the body property (*Srīmat Bhāgavat*, 3/31/1), which then becomes vacant and ownerless. It will soon disintegrate but till then it is available for occupation to any other owner who has the particular *karma* qualification (a near impossibility).

*Transmigration of soul :*

A *siddha Yogī*, by assiduous practice of *niṣkāma karma*, transcends the *kārmik* law. He is free of fetters. Hence, such a *Yogī* has the power to occupy any vacant and ownerless property (i.e. the corpse) by the process of transmigration. This is the secret of transmigration of soul taught by Patañjali.

*Bandhakāraṇa śaithilyāt pracārasaṃvedanācca  
cittasya paraśarīravesaḥ. (Patañjali Sūtra, 3/38)*

“Due to loosening of *karma*-fetters and the knowledge of flow (of *prāṇa*) the *citta* can enter and occupy another person's body.”

Ancient Indian literature has a large record of instances of planned transmigrations by *siddha Yogīs*, like Ādi Śaṅkarācārya and the Nātha *Yogīs*.

In recent times numerous instances were reported in newspapers during 1937-56, which need to be scientifically investigated. A British officer of the then British Indian Army Mr. L.P. Ferrel is said to have eye witnessed and personally helped two *Yogīs* in transmigrations in 1937 and 1942.

Once, transmigration is accepted for a fact, the *Yogic* theory about life and death becomes a scientific truth and the modern science loses any jurisdiction in this area, because the existence of the soul cannot be physically proved.

It is after such a perfect understanding of life and death that *Vedānta* advises that one may keep alive only with full possession of one's sense faculties and performing one's duties, without which life is meaningless. (*Īśa Upaniṣad*, 2)

Therefore, the present trend where the physicians try to maintain a dead person alive with mechanical measures in anti-*Yogic* and unsagacious from the point of view of *Vedānta*.

*Fallacies of John Woodroffe :*

Woodroffe committed serious faults in translation of these three verses which are counted below :

1. *Himakara sadṛśam*—He translates this as “beautifully white like the moon.” That is unwarranted. There is no mention of beauty or whiteness in the verse. *Ājñā cakra* is compared to moon, because moon is the presiding deity of *manas*. Natal astrology depends on that.
2. *Dhyāna dhāma prakāśam*—He translates this as “It shines with glory of dhyāna” whereas the verse simply states that this *dhāma (ājñā cakra)* is known by *dhyāna*. This is only a reference to the method of Yoga.
3. Woodroffe creates unnecessary confusion regarding the number of hands of Hākinī. *Rudrayāmalaṃ* clearly states *veda hastām*—four hands.
4. The lively description of choroid plexus has been spoiled by Woodroffe by accepting the wrong recension *baladhavala* in place of *jaladhavala*.

It is because of such faults that the true-to-life narratives of Yoga get branded “mystic.”

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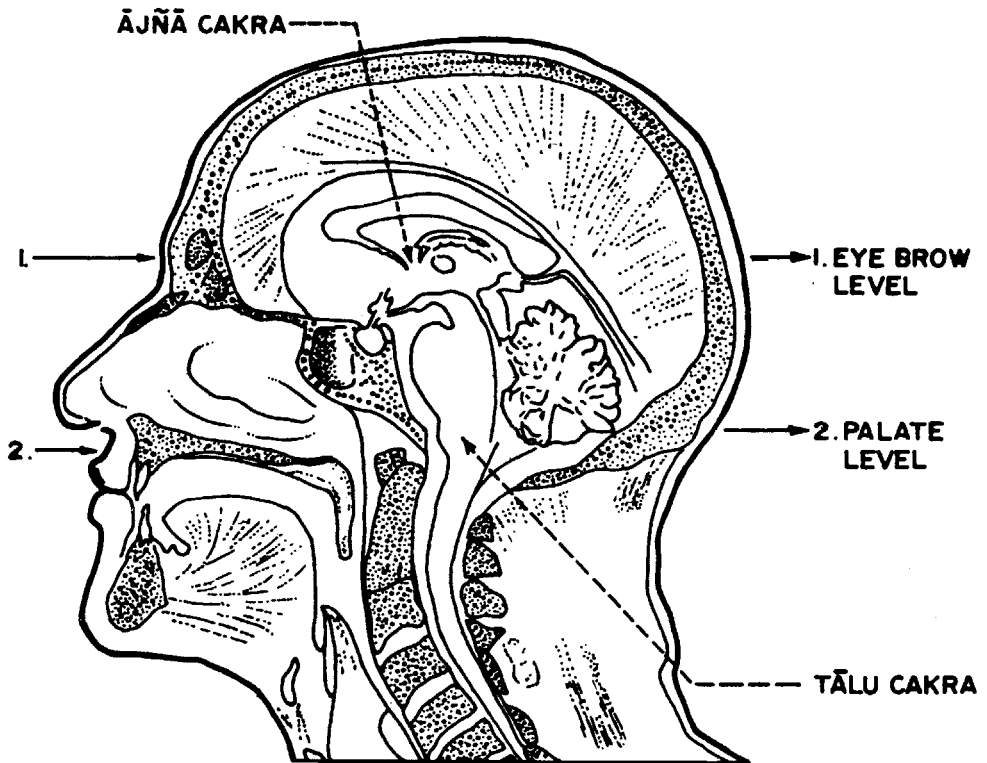
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PI. I. THE THALAMI ARE ĀJÑĀ CAKRA



Median sagittal section through the head

1. At eyebrow level is Ājñā cakra (the thalami)
2. At palate level is Tālu cakra and the IV ventricle

PI.2. THE TWO THALAMI MAKE ĀJÑĀ CAKRA

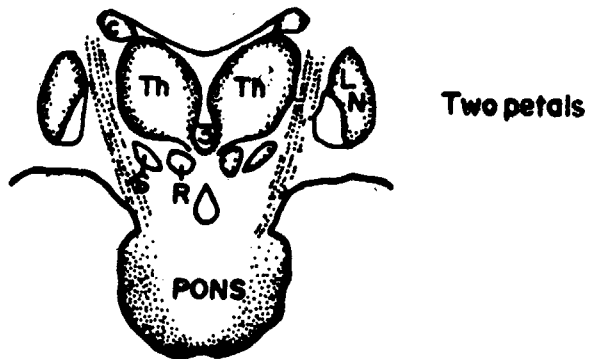
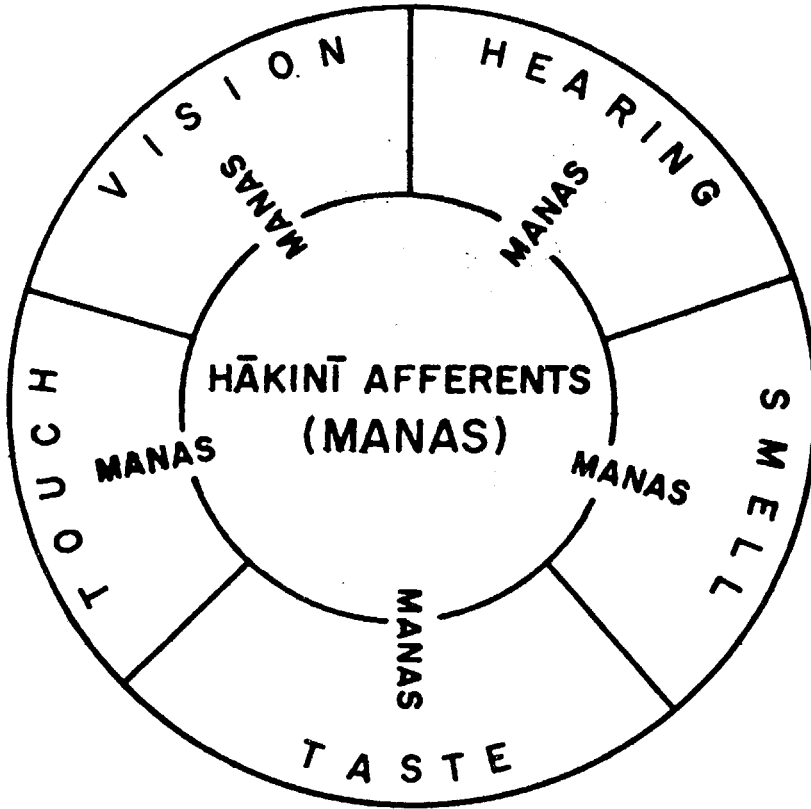


Fig.

The right and the left Thalami (Coronal section), 3 - III Ventricle, L.N. - Lentiform Nucleus, R - Red Nucleus, S - Subthalamic Nucleus, C - Caudate Nucleus.

### PI. 3. SIX FACES OF HĀKINĪ

Hākinī means Thalamic afferents.



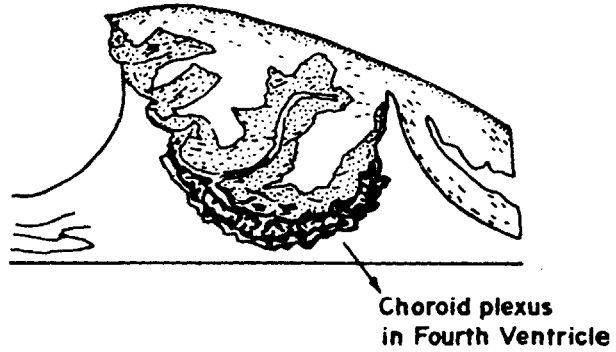
**Sakala Surgaṇa vidyutākāra dīptā = Aglow  
with electrical impulses from all senses**

**Deva-Mātā = Mother of all senses. (Rudravāmala)**

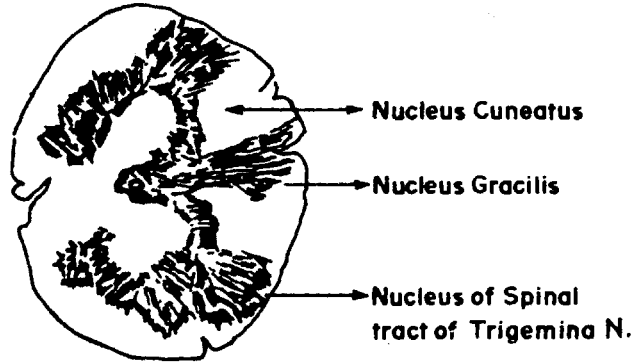
### PI. 4. TĀLU CAKRA "OM" FORMATION

( Two diagrams combined for a complete T.S. at Palate level of PI. I )

**A**  
Fourth Ventricle with  
Choroid Plexus  
Gray's Anatomy, 36th. Ed.



**B**  
Transverse Section of  
Medulla oblongata at level  
of Pyramidal decussation.  
Gray's Anatomy, 36th. Ed.



Pradīpābha jyotiḥ Praṇava viracaṇā rūpavarṇa prakāśaḥ .  
Tadūrdhve Candrārdhaḥ tadupari vilasat bindurūpī Makārah  
Tadōdye nādeasau jaladhavala sudhādḥāra santānhāst

( S. Ni. - 35 )