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EDITOR'S NOTE

The evidence for actual visions of Vedic poets and priests has been downplayed in recent writings. This in spite of hymns such as the famous *laba suukta* (RV 10.119) and that of the long-haired *muni* of RV 10.136, who has drunk 'poison' and clearly represents a shaman-like figure on a quest, flying through the sky with the wind and the gods. One must also take into account the singular hymn that speaks not of vision but of aural experiences, RV 6.9.6 "apart fly my ears, apart my eyes, apart the light that has been put into the heart; my mind moves away into the distance..."

North Asian and, indeed Laurasian, shamanism (see M. Witzel in: Mother Tongue VI, see: <http://www.people.fas.harvard.edu/~witzel/MT-VI.jpg>) is also visible in rituals such as the Vūjapeya, where one has to climb up a pole to reach 'heaven,' and to stay there for a while. This is what Kham shamans in the Nepalese Himalayas still do today.

These and other Central and North Asian connections (see now J.F. Staal, How a psychoactive substance becomes a ritual: the case of Soma. *Social Research* 68, 2001, 745-778) urge us to take a closer look at shamanistic behavior and the kind of vision quests that

shamans undertake, and to compare this with Vedic practices. The matter will also be taken up later in this volume in a paper of G. Thompson.

I therefore invite readers to take a close look at the descriptions and interpretations of meditations and visions discussed here by Ph. Nicholson. They overlap with some of the images described in the Rgveda that result from sleep deprivation and the concurrent consumption of Soma.

We certainly can argue about the details of Vedic myth, religion or the preparation of the Soma drink as used and discussed in the following three papers. However, I feel that a new look at the Soma hymns and their background should be undertaken in connection with overnight ritual, the effects of sleeplessness and of sleep deprivation-induced visions.

Finally, as the following three papers can be read without actual use of diacritics they have been dispensed with here.

MW.

The Soma Code, Part I: Luminous Visions in the Rig Veda

Philip T. Nicholson

ABSTRACT

The meanings of many metaphors used to describe luminous visions in the Rig Veda (RV) remain elusive or ambiguous despite years of expert hermeneutical exegesis. In this series of papers, we classify the metaphors used to describe luminous visions into sets based on certain abstract characteristics (shapes, colors, movements, order of appearance), then show how these metaphor-sets can be matched with remarkable precision, image by image, to a sequence of internally-generated light sensations ('phosphenes') induced by meditation. These meditation-induced phosphenes can also evolve in longer and more elaborate sequences if the subjects practice meditation while in a sleep-deprived condition. A sleep deficit increases the risk of subclinical seizures emerging at sleep onset - and the paroxysmal activity generates further evolution of the phosphene imagery. In the first paper of this three-part series, we document the parallels between the meditation-induced phosphenes and two types of luminous visions described in the RV - the Asvins' radiant, three-wheeled chariot and the flame-arrows of Agni. In the second paper, we analyze metaphors used to describe the visions of Soma and Indra and show that there is a close match between these luminous visions and paroxysmal phosphenes. Based on the extensive parallels revealed by our comparison, we conclude that the metaphors for luminous visions in the RV were meant to refer to the same visual content as appears in the meditation-induced visions described by the author, and that, despite years of poetic embellishment, the eulogists' choice of metaphors suggests a much more empirically-oriented attempt to describe visionary experience than has hitherto been suspected. This hypothesis about the meaning of luminous visions in the RV has important implications for several issues debated by Vedic scholars, including: (1) the identity of the original soma plant; (2) the influence of shamanic practices in the creation of the Vedic myths, and (3) the extent of the continuities between the visionary experiences described in the RV and those described in the Upanishads and in the many yoga meditation texts in the Hindu, Tantric, and Tibetan-Buddhist traditions.

Luminous Visions in the RV: Gonda's Legacy

The importance of luminous visions in the Rig Veda (RV) has been well-documented by Gonda [1963] in his monograph, *Vision and the Vedic Poets*. He points out that Agni, the Vedic god of fire, can manifest in inner visions that inspire the poet-seers to compose hymns to the gods [pp. 17-18], that these luminous visions of Agni (*dhitayah*) are like "lightnings and flame-arrows" that "begin to glow spontaneously in a secret place," and that the visions arrive "in front of (or ahead of; on the surface of) the

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vipah, i.e. the inspired words of the seer-eulogists [Ibid., pp. 172-3]." The eulogists compare the visions of Agni "to a hole in the ground abounding in water from which one may draw the desirable liquid," and also to "a stream or 'fountain' of transcendental truth (*dhara rtasya*) [Ibid., p. 172]." The source from which these luminous visions flow is "beyond human reach, knowledge and understanding, and those who receive them may be said to glow or shine themselves," as in verse 8.6.8, which states that "When the visions which are concealed glow spontaneously, the Kanvas (begin to glow) by the stream of *rta* [Ibid., p. 172]." The basic idea is that there can be a "breaking through of a stream of the great and fundamental power called *rta*-, of a sudden influx of sacredness, of an extraordinary insight into the reality beyond the phenomena of this world [Ibid., p.172]." But, even though the streams of *rta* can break into consciousness, "the man to whom *dhitayah* come is not idle" since it is "expressly stated that he must fashion them, give them a definite form. This activity is compared to the carpenter or cartwright [Ibid., p. 184]."

Gonda also notes that the eulogists of the RV sometimes describe Soma as a type of *dhiyah*, or "vision-producing-insight," in addition to its manifestations as a plant, a drink, and a god. As a vision, Soma displays a "bright or pure shape or form (*sukram varnum*)" which can be described as "light (*jyotih*)" or "radiance (*socih*)" or simply as "eye" (*caksuh*), a single word that refers to an inner faculty of vision, a faculty distinct from the observable, physical eye, which can directly perceive the inspirational visions of *rta* [Gonda, op. cit., p. 167]. Another sign that the eulogists regarded Soma as a type of luminous vision is that they often use the word, *manisa*, which Gonda translates as an intuition of truth received in a flash of light. See, for example, verses 9.72.6 ("the inspired sages, who are skillful in their art and possessed of *manisa*"), 9.79.4 ("the *manisa*-ones ignite thee"), and 10.114.6 ("the sages, having produced, by means of higher wisdom [*manisa*]") [Ibid., p. 53]. Also, the eulogists often claim that their songs "make[s] the *dhih* swell like a milk-giving mare (1.34.6)," and, similarly, in 8.6.43, that ". . . it is not the gods but rather men - the *rishis*, the Kanvas - who appear to be able to make the *dhih* swell and increase; they achieve that by their liturgical words [Ibid., p. 124]." The 'swelling' metaphor will be particularly important in our discussion of the Soma visions in Part II.

The Need For a New Approach

While Gonda's exegesis documents the types of metaphors the eulogists use to describe luminous visions, these metaphors are so ambiguous and so opaque to modern sensibilities that it is difficult to interpret what the composers meant to communicate when they chose those words and phrases. The obstacles faced by scholars are particularly formidable in the ninth book of the RV which contains most of the hymns written to Soma. Keith [1925] complains about the "chaos of the ideas [Ibid., p. 171]" and the "obscurity in detail [Ibid., p. 167];" MacDonell [1971] writes that the descriptions of Soma are "overlaid with the most varied and chaotic imagery and with mystical fantasies often incapable of certain interpretation [Ibid., p. 104]." In her introduction to a translation of selected hymns from the RV, O'Flaherty [1981] points out that problems of interpretation are complicated by language that is "intrinsically difficult (dense,

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complex, and esoteric even for the people of its own time), or difficult to people of another time (because of archaisms, *hapax legomena*, discontinued usages), or difficult because we have lost the thread of the underlying idiom [Ibid., p.14]." Even if experts agree on the literal meaning of the Sanskrit words, they still might not be able to interpret what those words were intended to mean, not least because the RV "is written out of a mythology that we can only try to reconstruct from the Rig Vedic jumble of paradoxes heaped on paradoxes, tropes heaped on tropes [Ibid., p. 18]."

In this paper we show that the range of meanings that can be reasonably attributed to the metaphors used to describe luminous visions can be bracketed within relatively narrow parameters if the metaphors are classified into sets based on certain abstract characteristics, specifically, shape, color, movement, and order of appearance as described in the RV. To define which abstract characteristics are important for this classification, we have imported a new, independently-derived, and non-textual source of information of the sort not usually consulted in the interpretation of Vedic texts.

New research in the neuroscience of vision, sleep, and epilepsy - and the application of those research findings to the subject of mystical visions - now makes it possible to propose theories that explain in great detail how the brain mechanisms that are normally associated with slow wave sleep can also be activated by behaviors that simulate sleep, such as meditation in which the subject combines deep physical relaxation with an inwardly-orientation and fixation of visual attention on the center of an empty visual field. A meditation-induced activation of the brain's sleep rhythm oscillators can generate epiphenomenal sensations of light devoid of any figurative content ('phosphenes') that display distinctive, predictable shapes, colors, movements, and temporal sequences [Nicholson, 1996a,b; 2002a,b].

Research also shows that a transition from waking to slow wave sleep can be destabilized with surprising ease in a series of smooth, fast, incremental steps, a destabilization that is most likely to occur if, at the time the transition to slow wave sleep begins, the subject's cortical neurons are already abnormally excitable - a condition that can be induced by many different kinds of events, including sleep loss. If the brain mechanisms that govern the transition to slow wave sleep become destabilized because cortical neurons are hyperexcitable, some regions of the brain break out in paroxysmal firing. In effect, this constitutes an epileptiform seizure, but these kinds of seizures often do not trigger dramatic symptoms that would signal a problem to an untrained observer. These new research findings about rapid shifts to paroxysmal activity upon activation of sleep rhythm oscillators can be used to explain why a meditator who is attempting to induce phosphene visions might experience the outbreak of a seizure and to explain how this outbreak of paroxysmal activity shapes the further evolution of the original, sleep-onset phosphene images [Nicholson, 1999; 2002a,b]. In this paper we reproduce a series of drawings from the sources just cited to illustrate the shapes, colors, movements, and ordinal progressions of the meditation-induced, sleep-onset phosphenes and their further elaboration after the outbreak of paroxysmal brain waves. (A more detailed exposition of the underlying neurophysiology is available in the sources cited [See Note 1].)

Before attempting to compare the meditation-induced phosphene sequences with luminous visions in the RV, we collect examples of the different types of metaphors

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used to describe these visions and classify them into metaphor-sets based on abstract characteristics like shape, color, movement, or location. For example, one of the more important sets contains a wide range of metaphors used to describe the vision of newborn Soma and enrolled in the set based on their having a 'bulbous' shape. The metaphors in this set are words like "udder," "stalk (*amsu*)," "navel," "bull's horn," "penis," "pot," "stormcloud," "waterskin," "heaven's head," and "filter of sheep's wool." Using this classification system, it becomes less important which particular word a translator chooses for the Sanskrit or which language is being used for translation: fine-tuning the choice of the individual word - the essence of good translation - is largely irrelevant for our purposes, which is to define a metaphor-set, find out where the members of that set appear in the RV, and how the set functions in relation to the other metaphors for luminous vision. We can then compare the characteristics of each metaphor-set (and the sequencing of the metaphor-sets) against a standard template, namely, the drawings of the meditation-induced phosphenes described by the author. If we can show that the parallels between these two sets of visual images are sufficiently detailed and comprehensive, this demonstration supports the inference that the metaphors used to describe luminous vision in the RV refer to the same kind of visual contents as a meditation-induced phosphene sequence.

Human neurophysiology has not changed significantly since the Vedic era, so if we believe (1) that luminous visions in the RV contain essentially the same content as the meditation-induced phosphene sequence, (2) that the brain mechanisms responsible for generating these phosphene images operate within predictable parameters, and, (3) that this underlying neurophysiology imposes significant constraints on the what kinds of images can appear in a sequence of meditation-induced phosphenes, then we should be able to apply those same constraints to bracket the range of meanings assigned to luminous vision metaphors in the RV so that they fall within very narrow parameters.

Before we begin our analysis, it is important to address a methodological problem. The author is not an expert in Sanskrit or Vedic Studies, nor does he have sufficient command of German, French, or Russian to read the most recent translations of the RV which appear in those languages, so this study is based on English translations. There are a number of recent English translations of selected verses [e.g., see Gonda, 1963; Bhawe as cited in Wasson, 1971; O'Flaherty, 1981; Dange, 1992], and, whenever possible, we use them, but we have also found it necessary to make use of older translations [e.g., Wilson, 1888; Griffith, 1889], even though some contemporary scholars find them unreliable [e.g., O'Flaherty, 1981]. Given the author's deficiencies, readers might be concerned that this investigation is seriously compromised at the outset, and certainly this concern would seem to be warranted if our goal were to make yet another hermeneutical exegesis of the RV. The formidable difficulties that face anyone who wants to get "inside the Vedic mind" in order to better translate Vedic texts have been aptly summarized by Witzel [1996], and the prerequisites he mentions are not met in this case. Why, then, do we feel justified in pursuing this investigation, despite these major drawbacks?

Our goal is a systematic classification of metaphors based on certain abstract characteristics that have not been explored by others scholars, and, to make those

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classifications, we rely on a standard that is external to the hymns themselves and derived from our familiarity with current scientific research in the neuroscience of sleep, vision, and epilepsy. In effect, we propose to use the drawings of meditation-induced phosphene visions experienced by the author and reproduced here as *predictions* of the kinds of abstract characteristics that visions in the RV are likely to have if they were also induced by meditation (and destabilization of meditation). Because the metaphor-sets as we have defined them are so general, it seems unlikely that completely new kinds of words will come to light that cannot be placed within one set or another, whatever the language of origin.

The parallels between the luminous vision metaphors of the RV and the meditation-induced visions turn out to be so extensive, so detailed, and so comprehensive that we believe it is reasonable to conclude that both sequences refer to the same kind of visual content, and, therefore, to the same kinds of generating mechanisms. In this view, the meditation-induced phosphene sequence is a template that decodes the meanings of luminous visions in the RV in much the same way that the Rosetta Stone enabled scholars of an earlier age to decipher Egyptian hieroglyphics by comparing the hieroglyphics text with the same message carved in Greek and Aramaic.

A Sequence of Meditation-Induced Phosphene Visions

The author, a medical writer with no history of drug or alcohol abuse, no family or personal history of epileptic symptoms, and no sectarian affiliation, practices self-hypnosis or meditation to relax, to generate new ideas for his writing by free association, to dissipate muscle tension headaches, and to divert attention during minor surgical or dental procedures. He learned to meditate by imaging mental images while in graduate school, then later, after attending a course on Buddhist meditation, learned how to meditate without mental imagery. During this class, the author began to see sensations of light generated by internal processes, called 'phosphenes'.

The author's phosphene-inducing meditation phosphene technique is as follows: he lies on his back, closes his eyes, takes slow, deep, rhythmic breaths, keeps his eyes converged and slightly depressed, and keeps his attention fixated on the center of the visual field. The eye convergence is sustained with enough forcefulness to elicit a sensation of "fullness" or "pressure" in the eyeball, and the fixation of attention is forceful enough to evoke a sensation of 'locking in'. The concentration of attention also produces auditory feedback - a characteristic buzzing that is part sound, part vibration, that originates inside the lower rim of the skull, and that feels as if it radiates upward on both sides. To keep his level of arousal low and his mental field free of distraction, the author maintains a passive, indifferent attitude, allowing stimuli that might be potentially distracting to drift in and out of consciousness without any attempt at suppression. During this behavioral state of calm, inward orientation and fixation on the as-yet undifferentiated visual field, the author begins to see waves of brightly-colored phosphene annuli that follow a predictable sequence.

The phosphene sequence induced by meditation also appears spontaneously when the author is lying in bed and waiting to fall asleep, in which case no induction behaviors are needed; the only prerequisite is keeping the eyes fixed straight forward and keeping the attention focused on the center of the visual field.

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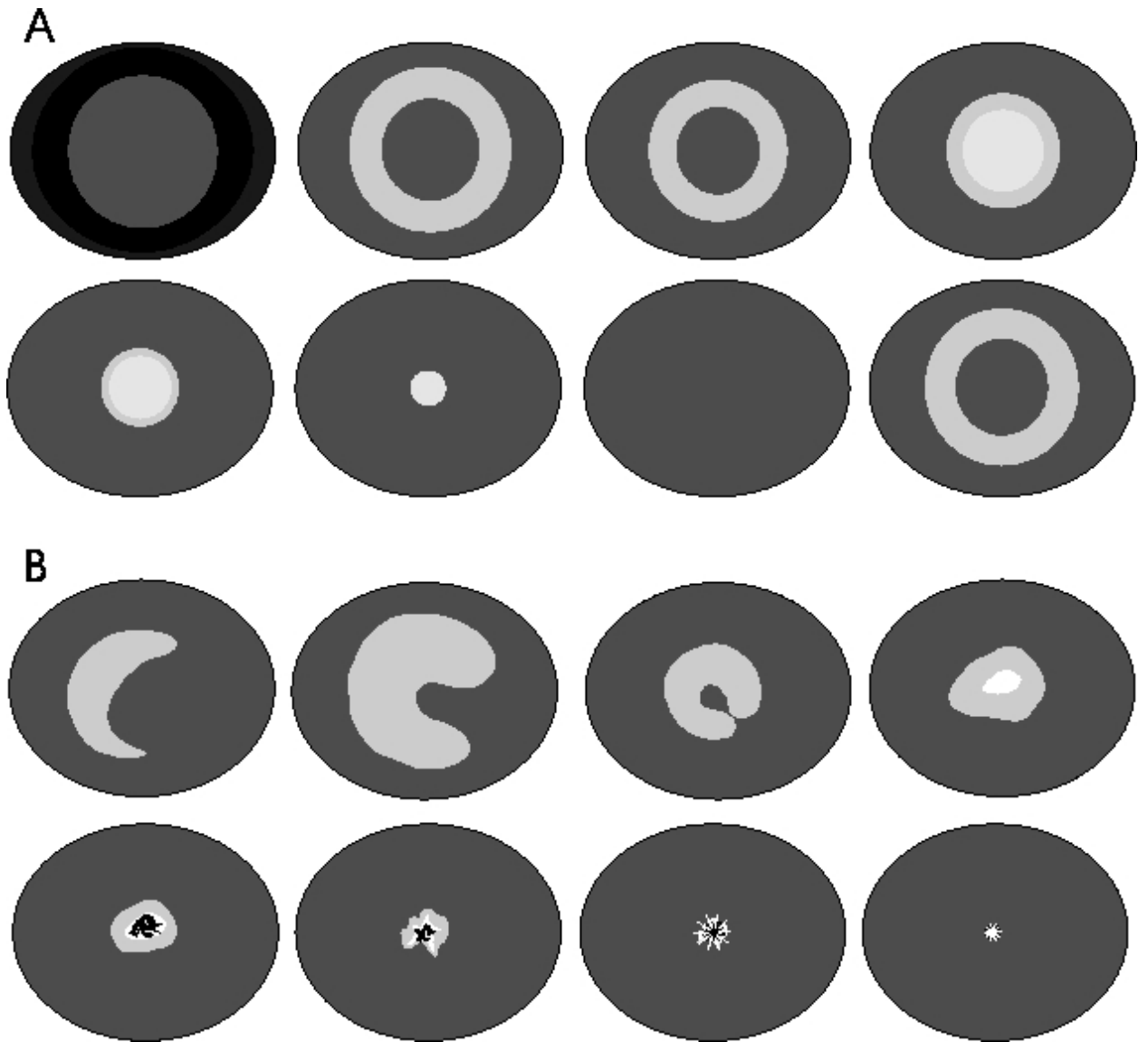


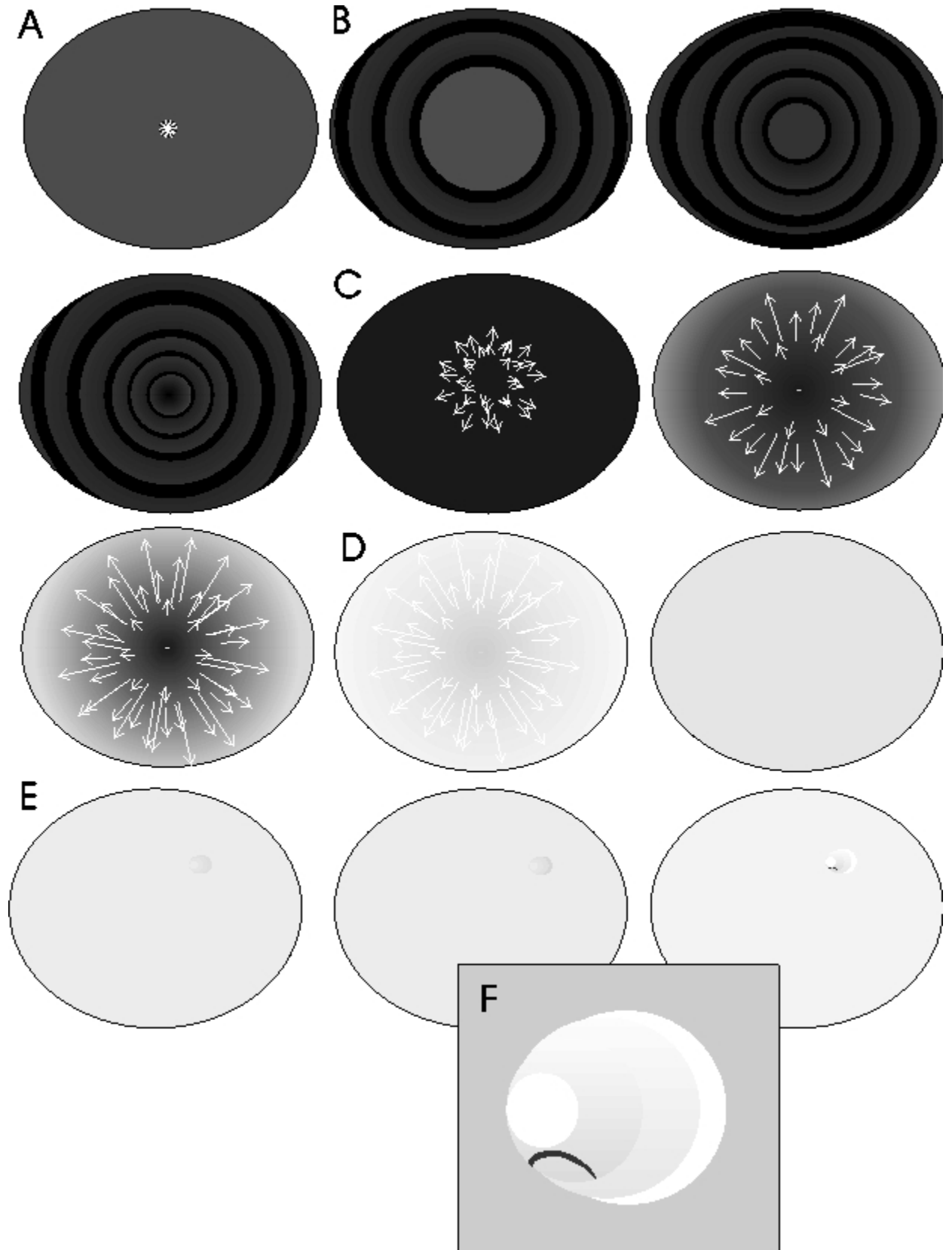
Figure 1.1. The sequence of phosphene images that can be induced by meditation or activated spontaneously at sleep onset. **A.** One 5-second cycle of a 'receding annuli' sequence. Initially the author sees a dark, barely-perceptible wave - a sensation of movement - that flows inward from the 360° perimeter of vision, then sees a bright yellowish-green phosphene annulus illuminate in the visual field at about 80° of isoecentricity. The annulus continues to shrink in diameter at a constant rate, preserving its symmetry throughout, and disappears into the center of vision after 4 seconds (as estimated by the author's count of "1001 . . . 1002."). The shrinking

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generates an illusion that the annulus is 'receding' in 3D space. A new annulus appears every 5 seconds (0.2 Hz) until the sequence terminates automatically after a total of 4 to 5 cycles. About halfway through the trajectory, the annulus fills in with a phosphene disk. During the early years of phosphene induction, the color of the fill-disk was a brighter, more opaque green than the annulus itself, but after several years of phosphene induction, the color of the fill-disk changed to dark blue. **B.** Typical amorphous waves of expanding and contracting phosphene with a 'mist-like' texture. The first row shows an amorphous wave of yellowish-green phosphene - dark blue after the change noted above - which sometimes has a vaguely-defined crescent shape, as shown here. The amorphous wave illuminates upon reaching 80° of isoeccentricity, like the annuli. The waves enter from either the right or the left perimeter and sweep across the visual field with an expanding and enveloping motion. Meanwhile, behind the leading edge, the phosphene begins to dissipate, so that the rear of the wave is shrinking inward at the same time that the forward edge continues to expand into as yet untouched regions. Within a few seconds, all of the remaining phosphene shrinks into the center of vision, like the receding annuli. After a prolonged session of phosphene induction, the amorphous expanding clouds often last longer and develop a brighter, more finely-grained, opaque, and iridescent phosphene at the core. This bright central core keeps ebbing back from the fixation point and then filling back in, producing an image resembles a disembodied 'eye' with a bright 'iris' and a dark inner 'pupil'. On the morning of the seizure, the central, 'eye-like' phosphene gradually condensed into a tiny, 'star-like' cluster of thin, flashing filaments of white and blue phosphene, in effect, a dot or 'bindu'. [From Nicholson, 2002a]

The meditation-induced, sleep-onset phosphenes are illustrated by the author's computer-generated drawings in Figure 1.1, with a detailed description in the adjacent legend for easy reference. There are four different kinds of phosphene images in this sequence: (1) RINGS that flow in from the periphery of the visual field and shrink steadily in diameter, creating an illusion that they are 'receding' in 3-D space; (2) SWIRLING MISTS, amorphous in shape, that sweep across the visual field and then contract, disappearing into the centerpoint; (3) the amorphous phosphene mist eventually acquires a brighter node of phosphene that hovers at the center of the visual field and that has a dark space within it, creating the illusion of an EYE-LIKE IMAGE with a bright phosphene 'iris' that pulls back to reveal a dark, empty, 'pupil' space, then fills in, then pulls back again, and so on; (4) a STAR-LIKE IMAGE of tiny, twinkling, phosphene filaments seems to 'condense' at the center of the visual field.

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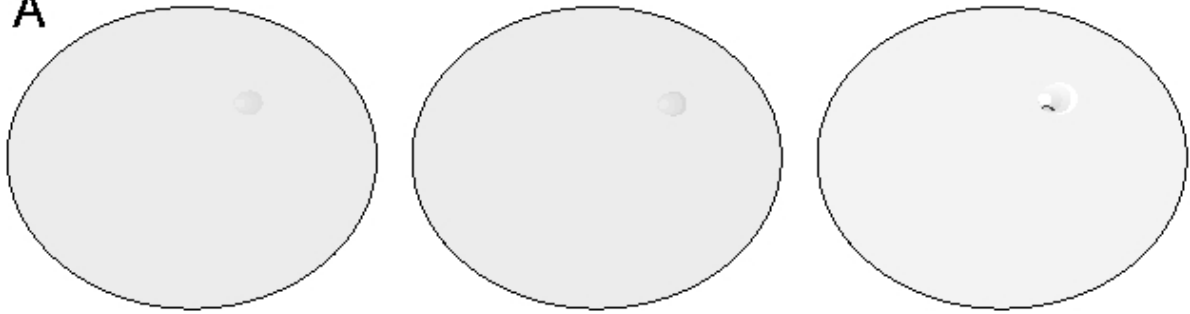


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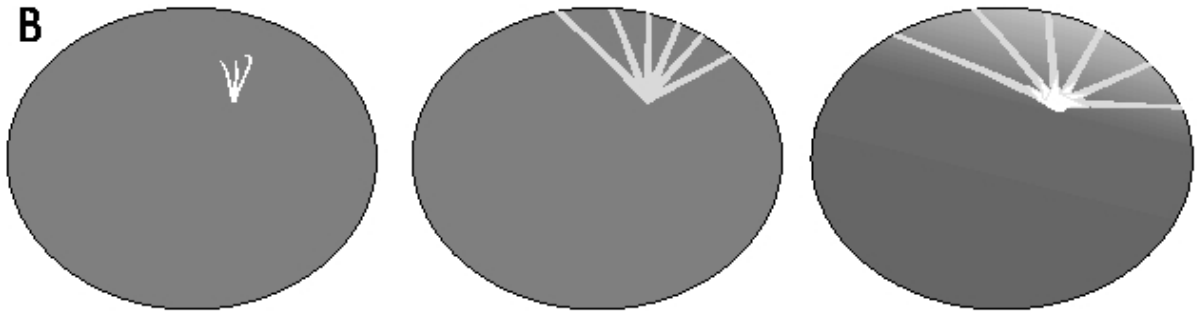
Figure 1.2. Transition to paroxysmal phosphene images. **A.** The familiar, 'star' or 'bindu' image of thin, flashing filaments of white and blue phosphene, the culmination of amorphous wave activity seen in Figure 1. **B.** A stream of dark, barely-perceptible 'receding annuli' that entered the visual field at a rate of more than one per second (≥ 2 Hz), never illuminating as colored phosphene. The influx of dark waves generated an illusion of movement through a dark, 'tunnel-like,' 3D space. After a few seconds, the flood of dark annuli stopped abruptly, eclipsed by onset of the next visual image. **C.** A radiating spray of phosphene 'mist' interspersed with many beige-colored 'flecks' replaced the 'tunnel' of dark annuli. The spray seemed to radiate toward the viewer along a conical trajectory through 3D space and to 'strike' the forehead, so that the subject felt compelled to pull his head back against the pillow and arch his back. There were also muscle tremors in the face and extremities. **D.** A gradual brightening and bluing of the visual field. This effect slowly but steadily obscured more and more of the radiating spray until it was the only visual sensation present. The approximate hue of blue, based on the author's comparison of color swatches from a CMYK Process Color Chart, is 40% Cyan without any Magenta, Yellow, or Black - a color similar to the blue of the sky on a clear, dry day in the summer or autumn. **E.** The appearance of a bulbous, hollow, translucent white phosphene that seemed to 'protrude' through the bright blue visual field, as if there were 3D 'depth' in the visual field. At first the bulbous image appeared as a faint glow, but when the author focused his attention on it, the glow became brighter, revealing a bulbous nose. As the phosphene glowed even more brightly, it revealed more caudal extension. This change created an illusion that the figure had just 'moved' forward in 3D space, and, conversely, as attention waned, the phosphene dimmed so that its caudal extension shortened, making it seem to 'recede'. Beneath the anterior pole of the bulbous image was a thin line or shadow, shaped like an inverted crescent. After many successive 'protrusions' and 'recessions,' the bulbous image suddenly glowed brightly - so much so that it looked as if the bulb had 'lurched' toward the vertical meridian - and, in the same moment, it disappeared and its former site was occupied by a cluster of three thin, white, phosphene rays (Figure 3B). These rapid movements created an illusion that the bulb had somehow 'ruptured' and that this 'released' the phosphene rays. [From Nicholson, 2002a

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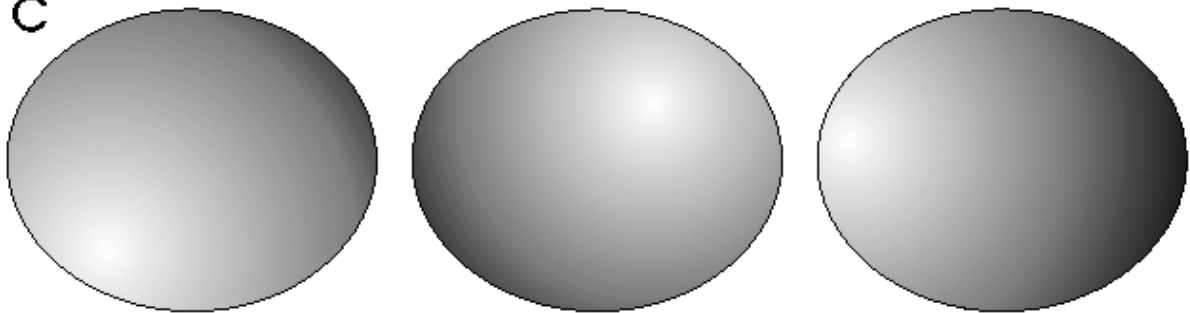
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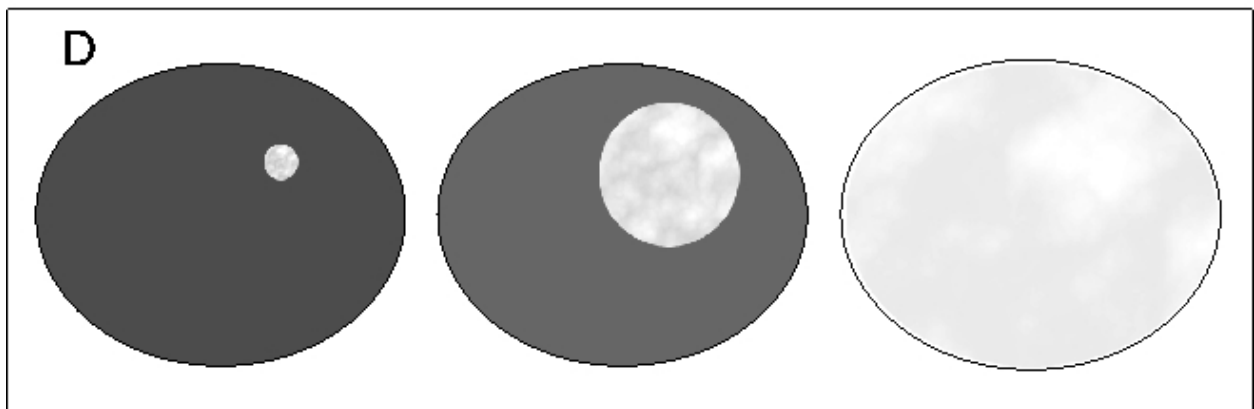
B



C



D



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Figure 1.3. The final transition to photoparoxysmal phosphenes. **A.** The white phosphene bulbous image. **B.** When the bulbous image disappeared, it was replaced instantly by three thin white phosphene rays, and, at the same time, the bright blue background disappeared, leaving the rays silhouetted against the normal, charcoal-colored visual field (eigengrau). In the first presentation, the three white rays extended less than halfway to the perimeter of vision, and the tallest ray had a distinctive 90° bend to the left at the tip. One second later, the rays reappeared, now in a new, realigned version in which the rays had doubled in number (from 3 to 6), had lengthened so as to extend all the way to the peripheral rim of vision, and had fanned farther apart at the tops. In the next second, the author observed a third transformation: he saw the rays fan much farther apart, a movement that resembled the petals on a flower wilting in the heat. In this third display, the bases of the rays had tiny, shard-like triangles of bright, opaque white phosphene superimposed. The third display of the rays was the final one, and it persisted in the visual field for about 10 to 12 seconds. There were no auditory or sensorimotor symptoms accompanying any of the transformations of the rays. **C.** Serial flashes ('explosions') of dull white phosphene, appearing in either the right or left hemifield. Single flashes never occupied more than about a third of the visual field and seemed to alternate between the right and left side in a non-rhythmical pattern. The experience felt like being inside a dark stormcloud when it was illuminated from within by flashes of sheet lightning. The photoparoxysm was accompanied by loud, crackling sounds, sensorimotor sensations of bilateral polymyoclonus that seemed to involve an 'ascending current of energy,' an orgasmic sensation diffused throughout the body, and psychic symptoms of euphoria and awe mixed with fear. **D.** Postictal visual symptoms. For several weeks after the initial photoparoxysm, whenever the subject went to bed and closed his eyes, a white glow appeared in the same place where the bulb and rays appeared earlier. When he focused attention on this glow, it began to expand as if billowing out toward the viewer in 3D space. The surface of the expanding phosphene presented a fractal-like pattern resembling the surface of a cauliflower, a billowing cumulus cloud, or a froth of soap bubbles. After a few days, the glow still appeared, but now it expanded with a surface that presented an undifferentiated, fog-like whiteness. Once the wave expanded, the entire visual field appeared white, as if the viewer were enveloped by fog or a snow 'whiteout'. If the author kept his attention focused, the field remained white for a relatively long amount of time, sometimes for more than several seconds. While this whiteness was present, the author experienced a weaker version of the seizure-related sensorimotor and psychic symptoms. [From Nicholson, 2002a]

These meditation-induced, sleep-onset phosphene images can evolve into a more elaborate sequence if the sleep rhythm oscillators are destabilized, triggering paroxysmal activity in the brain. This happened to the author on one occasion in which he tried to relax himself to sleep using his familiar technique of meditation in

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circumstances that were highly unusual: having slept only four of the preceding thirty-six hours because of 'jet-lag' insomnia, he went to bed at 4 o'clock in the morning and began to meditate. The familiar meditation-induced phosphenes began to appear almost immediately and manifested with unusual intensity and speed, then, instead of concluding with the familiar image of a star-like phosphene dot, the phosphene sequence evolved the new images illustrated in Figures 1.2 and 1.3: (5) THIN BLACK RINGS suddenly began to flow inward, shrinking in diameter like the sleep-onset phosphene rings but at an abnormally fast rate of two or more per second, creating the illusion of a dark, moving tunnel; (6) a SPRAY of beige-colored phosphene 'flecks' that seem to radiate out toward the viewer, suddenly replaced the inward-moving black rings; (7) a UNIFORM BLUE BACKGROUND began to gradually become brighter, causing the image of radiating spray to fade out; (8) a BULBOUS GLOW appeared in the upper right quadrant of the visual field and waxed and waned in brightness, creating the illusion of its moving forward or receding, depending on the intensity of the attention focused on it; (9) A FAN OF THREE WHITE RAYS suddenly replaced the bulb image, with the rays in this first display extending less than halfway to the perimeter of vision; (10) A FAN OF SIX WHITE RAYS suddenly replaced the three rays after a delay of one second, with the rays now extended to the perimeter of vision; (11) A FANNING APART OF THE SIX RAYS occurred after another delay of one second, creating the impression the rays were 'drooping' or 'wilting'; (11) SERIAL FLASHES of dull white phosphene that filled large expanses of the visual field began after a twelve seconds delay, an image that looked exactly like sheet lightning illumining a dark stormcloud from within. This final image in the paroxysmal sequence was accompanied by loud, sizzling, 'electric' crackling sounds, spasms of many different muscle groups, an illusion of a 'current' flowing upward through the body, quasi-orgasmic sensations, and an emotional mix of fear, awe, and euphoria. At this point the author stopped the flashes by diverting his attention and getting up to walk around.

After the episode of paroxysmal activity, the author found that, whenever he laid down to go to sleep and closed his eyes, he saw (12) a POST-PAROXYSMAL WHITE GLOW at the same location in the visual field where the bulbous image and the rays had once appeared (see Figure 1.3D). If he looked at the glow and did not try to distract himself, this staring would cause the small white glow to expand as a cloud of white phosphene that seemed to be radiating out toward the viewer as it expanded. For several days after the paroxysmal episode, the surface of this expanding whiteness presented a distinctive cauliflower-like pattern, like the billowing surface of a cumulus cloud buffeted by explosive pressures within, or like a foam of soap bubbles rising in the sink in response to water streaming down from the faucet. After that, the phenomenon of the expanding glow continued, but there was no longer a multi-faceted surface but rather an undifferentiated whiteness - like being surrounded by dense fog.

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Sequences of Meditation-Induced Phosphenes Reported By Other Observors

Are the experiences described by the author ideosyncratic or are similar phenomena reported by other observors as well? This is not as easy a question to answer as it may appear at first glance. Many mystics who write autobiographical narratives describe visions using language that is abstract, 'experience-distant,' and metaphysical; often these writers simply repeat phrases they learned from reading the authoritative texts of their tradition, suggesting that the primary intent in these cases is to portray the experience as authentic by showing that it fits squarely within the conventions of the tradition and thus that it is worthy of validation by one's peers. There are, however, a few exceptions.

Table 1.1. Autobiographical Descriptions of Light Vision Sequences by Hindu Mystics

	Gopi Krishna	Muktananda	Lahiri Mahasay
CIRCLES OR RINGS	I sat breathing slowly and rhythmically, my attention drawn towards the crown of my head, contemplating an imaginary lotus in full bloom, radiating light. [p. 11]	Next, the pupils of both my eyes became centered together. I began to see one thing with two eyes. . . . After this happened, a blue light arose in my eyes [p. 125].	To practice pranayam at 4 o'clock in the morning is good [p. 93]
MISTS OR CLOUDS	I never practiced yoga by Tantric methods. . . . If I had done so with a firm belief in the existence of the lotuses, I might well have mistaken the luminous formations and the glowing discs of light at the various nerve junctions along the spinal cord for lotuses, and . . . might even have been led to perceive the letters and the presiding deities . . . suggested by the pictures already present in my mind. [p. 174]	[A] light came in meditation, like a candle flame without a wick . . . the two-petaled lotus between the eyebrows [p. 128].	[Hand-drawn outline of a thick ring with wavy lines filling the central disk (p. 103) & of rings-within-rings, p. 104]
CLOUDS WITH BRIGHT CENTRAL NODES		The blue akasha, an expansion of blue color, began to appear, and with it, the neela bindu, the Pearl of infinite power. As I watched it, I felt as if my eyes were going to burst. . . . I was completely entranced . . . [p. 135]	When the air of breath is held tranquil, the six centers are seen in bright Light but it does not stop at the centers. [p. 108]
STAR-LIKE POINT		It was not the Blue Light or the Blue Pearl, but a blue star. Though it looked small, it was large enough to contain me . . . [p. 149]	OM is radiant Light. When this Light is spread throughout the body, all is seen . . . [p. 208]
SPRAY OF SPARKS RADIATES	[I]t seemed as if a jet of molten copper . . . dashed against my crown and fell in a scintillating shower of vast dimensions all around me. . . . a fireworks display of great magnitude . . . a brilliant shower or a glowing pool of light [p. 50]."	[T]he blue star passed within me into my sahasrara and exploded. Its fragments spread throughout the vast spaces of the sahasrara. There was no star in front of me now, but just an ambrosial white light. [p. 150]	I saw a blue color in the light; in the blue, I saw a white spot; and in the white spot, I saw a man . . . [p.211]
			Beyond the five senses there is mind . . . ; beyond the mind there is buddhi, that is bindu, or spot; beyond the bindu, Brahma . . . the Pure Void [p.212]

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BRIGHT & BLUE LIKE THE SKY	[A] glowing pool of light [p. 50]	There was no star in front of me now, but just an ambrosial white light. [p. 150]	
BULBOUS IMAGE APPEARS		Sometimes I would have a new movement in the heart, in which an egg-shaped ball of radiance would come into view. This is the vision of the radiant thumb-sized Being, who is described . . . in the Shvetashvatara Upanishad: . . . "The inner soul always dwells in the heart of all men as a thumb-sized being." [p. 136]."	It seems there is another uvula above the uvula. [p. 99] First the dazzling sign or penis (Jyotir Lingam) is seen, then it disappears into Voidness or Silence. . . . [Includes a hand-drawn outline of a thumb-like shape (p. 108)].
RAYS RISE & FAN			
BRIGHT WHITE LIGHT	I kept my attention centered around the lotus. Suddenly, with a roar like a waterfall, I felt a stream of liquid light entering my brain. . . / . . . I felt the point of consciousness that was myself growing wider, surrounded by waves of light . . . immersed in a sea of light. [p. 12-13]	"One day it opened up and its light was released, and the brilliance of not one or two thousand but millions of suns blazed all around. The light was so fierce that I could not stand it . . . That brilliance had drawn me toward itself, and as I gazed at it, I lost consciousness. . . [p. 175-6]	The sun is the form of OM. [p.111] The sun is Kali, I myself am Kali. Thinking about Kali I become Kali.[p. 210] I am Mahapursusa. In the sun I saw that I myself am Brahma, the ultimate Self. [p. 210]

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Table 1.2. Autobiographical Descriptions of Lights Seen By Non-Hindu Mystics

	Ignatius Loyola	John of the Cross	Najmuddin Kobra
CIRCLES OR RINGS	While living in this hospital it many times happened that in full daylight he saw a form in the air near him and this form gave him much consolation because it was exceedingly beautiful. He did not understand what it really was, but it somehow seemed to have the shape of a serpent and had many things that shone like eyes, but were not eyes. 3.19 [p. 29]	The soul puts on the white robe of faith on its going forth on this dark night Over the white robe of faith the soul puts on forthwith that [disguise] of the second color, a green almilda [a shoulder mantle with a neck hole], emblem of the virtue of hope . . . [DNS, p. 180]	Ours is a method of alchemy. It involves extracting the subtle organism of light from beneath the mountains under which it lies imprisoned. VS #12 [p. 77]
MISTS OR CLOUDS			
CLOUDS WITH BRIGHT CENTRAL NODES	But often when he went to bed, great spiritual lights came to him, as did wonderful consolations, so that they took up most of the time that he had set aside for sleep, which was not much. 3.26 [p. 34]	S. Paul calls hope the helmet of salvation. Now a helmet is armor which protects and covers the whole head, and has no opening except in one place, where the eyes may look through. Hope is such a helmet . . . It has one loophole through which the eyes may look upwards only . . . [DNS, p. 180]	It may happen that you visualize yourself as lying at the bottom of a well and the well seemingly in lively downward movement. In reality, it is you who are moving upward. VS #12 [p. 76]
STAR OR DOT		Over the white and green robes . . . the soul puts on a third [disguise], the splendid robe of purple. [DNS, p.181]	[W]hen you see above you a great wide space . . . and you perceive on the far horizon the colors green, red, yellow, and blue, know that you are about to pass, borne aloft through the air, to the field of these colors. The colors are those of the spiritual states experienced inwardly. VS #13 [p. 77]
SPRAY OF SPARKS RADIATES			[I]t effuses lights as a spring pours forth its water, so that the mystic has a sensory perception . . . that these lights are gushing forth to irradiate his face. This outpouring takes place between the two eyes and . . . it spreads to cover the whole face. VS #66 [p. 85]
BRIGHT & BLUE LIKE THE SKY			[I]t spreads to cover the whole face. At that moment, before you, before your face, there is another Face, also of light, irradiating lights, . . . [resembling a] diaphanous veil . . . VS #66 [p. 85]
BULBOUS IMAGE APPEARS	During prayer he often, and for an extended time, saw with inward eyes . . . a white body, neither very large nor very small; nor did he see any differentiation of members. 3.29 [p.38]		[B]ehind its diaphanous veil, a sun becomes visible, seemingly animated by a movement to and fro. In reality . . . this sun is the sun of the spirit that goes to and fro in your body. VS #66 [p. 85]
RAYS RISE AND FAN			

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<p>BRIGHT WHITE LIGHT</p>	<p>And it is at times as though a door were opened before it into a great brightness, through which the soul sees a light, after the manner of a lightning flash, which, on a dark night, reveals things suddenly, and causes them to be clearly and distinctly seen, and then leaves them in darkness . . . [AMC, p. 220]</p>	<p>Its fire does not cease to blaze, its lights no longer disappear. Without interruption you see lights rising and lights descending. The flames of the fire are all around you - very pure, very ardent, and very strong. VS #51 [p. 76]</p>
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In Table 1.1, we list excerpts from the autobiographical writings of three Hindu mystics: (1) Shyama Charan Lahiri Mahasay (c. 1828 - 1895), a clerk in the Bengali Military Engineering Service who practiced meditating before dawn for many years and experienced Self-Realization in 1861 under the tutelage of a Swami Babaji [Satyeswarananda Giri, 1991]; (2) Gopi Krishna (1903 - 1984), a Kashmiri clerk working for the Directory of Education who, like Lahiri Mahasay, also practiced meditating before dawn, and who experienced a sudden, unexpected 'rising of kundalini' during a meditation session in 1937, an experience which led him to write extensively on the subject [Krishna, 1971, 1988]; and (3) Muktananda (1908 - 1982), son of a wealthy family in Mangalore who began the life of a wandering seeker at age 15, was initiated into the Siddha tradition by a Swami Nityananda at age 39, and who achieved Self-Realization after nine years of rigorous meditation [Muktananda, 1978].

In Table 1.2, we list excerpts from the autobiographical writings of three non-Hindu mystics: (1) Ignatius of Loyola (1492 - 1556), a Basque knight who, after recovering from severe leg wounds, committed himself to a program of rigorous self-mortification and sustained prayer vigils, thereby inducing a series of visions that inspired him to begin the work that eventually led to his founding the Jesuit Order [Tylenda, 1985; Messner, 1992]; (2) John of the Cross (1542 - 1591), a Spanish Carmelite monk who, while imprisoned in solitary confinement and tortured for six months by monks in a hostile monastery, experienced the mystical raptures described in his religious poems and in his commentaries on the poems (written with great caution to avoid the Inquisition) [Zimmerman, 1973; Kavanaugh, 1987]; and, finally, (3) Najmoddin Kobra (1145 - 1220), a Muslim Sufi mystic from northern Iran, the first Sufi to describe his experiences of the inner lights, or "colored photisms," in great detail and to interpret the significance of these lights as signs of spiritual progress [Corbin, 1971].

Although none of these accounts replicates all of the phosphenes described by the author, but there are many striking resemblances. Particularly interesting are the explicit references to a small white glow with a bulbous shape, the hallmark of newborn Soma as described in the RV and discussed in the next paper (Part II). There are other sources to which we might refer to corroborate the author's descriptions of light images - especially interesting in this regard are the Upanishads and yoga meditation texts composed long after the RV - but it would be anachronistic to import material from these sources for the purpose of interpreting passages from the RV. Therefore, we will

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postpone presenting this material until the final paper (Part III) where we will use it to demonstrate the essential continuity between Vedic and Post-Vedic visionary experiences.

* * *

Harbingers of Soma: 'Receding Rings' and the Asvins' Three-Wheeled Chariot

In the meditation-induced sequence of phosphenes, the first image is a stereotyped progression in which, one after another at 5 second intervals, yellowish-green rings (annuli) sweep in from the perimeter of the vision field and shrink steadily in diameter, creating the illusion that the ring is 'receding' in a 3-D space until it disappears into the centerpoint (See Figure 1.1). Are there metaphors in the RV that refer to visions of ring-like light that seems to move away from the viewer? If so, this would be an important clue that the eulogists of the RV were referring to visions that were seen by someone during meditation.

The hymns refer to a group of deities called the Rbhus who are described as using "mental mediation" to build a special chariot for the use of other deities, the Asvins [Gonda, op. cit., p. 168]. The Asvins' chariot is said to have three wheels, which signals that this is not a reference to the two-wheeled war chariots that were used in Vedic times. In these verses, Gonda interprets the Asvins' chariot as a "bright" vision (*dhih*) that moves away from the seer [*italics added for emphasis*]:

[T]ogether with this eulogy, O Asvins, *with the bright dhih, you drive, O you travellers in a radiant chariot* 8.26.19 [GON, p. 168]

[T]he *pure or bright* [sukra], divine materialized inspiration [manisa] *must depart (appear, start) from me, like a well-fashioned chariot* which is to win vajah. 7.34.1 [GON, p. 165]

Gonda also points out that, in 8.97.12, the wise men are said to use their minds to "bend" the vision of a "felly," i.e., the rim of a wheel: "[T]he poets are said to make the god favourably disposed merely by means of their faculty of sight: the image used is that of the felly which is bent; they 'see' this felly with their inner 'eye' and thereby they bend it, i.e. they exert their influence upon the god (*nemim namanti caksasa*) [Gonda, Ibid., p. 33]."

Other verses emphasize that the chariot has no horses and no reins, that it is "radiant with (glowing) wheels," and that it "follows the track of the waters:"

[T]hat *chariot which is clothed in radiance*, and which, when harnessed, *traverses its appointed road.* 7.69.5 [WIL]

The glorious *three-wheeled car* (of the Asvins, made, Rbhus, by you), *traverses the firmament without horses, without reins: . . .* We invoke you respectfully, Vajas and Rbhus . . . for you are the wise sages who, *by mental mediation, made the well-constructed undeviating car* (of the Asvins). 4.36.1-2 [WIL]

May your *golden chariot* . . . come to us, *following the track of the waters, radiant with (glowing) wheels, . . .* 7.69.1 [WIL]

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The *brilliant* chariot, *diffusing splendor*, rolling *lightly* on its *three wheels* . . . Vala 10.3 [WIL]

Some verses identify the third wheel of the chariot as being the most efficacious, noting that it is "concealed" to all but the "sages who know it:"

One of your chariot wheels is moving swiftly round, *one speeds for you its onward course* 8.22.4 [GRF]

For wonder you have fixed the (additional) one wheel for the chariot, as it was moving (with the other wheels) - a miracle! You *fly* 5.73.3 [DNG, p. 135]

The *single wheel that is concealed*, the sages know it also 10.85.16 [GRF]

The Asvins' radiant chariot is identified as a harbinger of Soma and also of the dawn that precedes the arrival of Soma:

Come hither, Asvins, on your car of triple form and triple seat, to drink the savory Soma juice . . . 8.75.8 [GRF]

May this desirable and gratifying Soma expressed by the stones be, Indra, for thee: ascend the *verdant chariot*, and with thy tawny (steeds) come to us; *Desiring (the Soma), thou honorest the dawn* . . . 3.44.1-2 [WIL]

Another important detail about the vision of the radiant chariot is that the Asvins are described as hearing a tell-tale buzzing sound - like the sound of a fly or bee (*maksika*) - and that this buzzing serves to reassure them that their chariot is following the path that leads to Soma: "To you, O Asvins, that *maksika* betrayed the Soma 1.119.9 [WIL]." This recalls the author's report of hearing a characteristic sound whenever he begins to meditate for the purpose of inducing phosphenes.

The Amorphous Phosphene Waves and 'Flame-Arrows' of Agni and Apam Napat

The amorphous expanding phosphene mists described by the author can be compared to the "flame-arrows" of Agni (*dhitayah*) which are described in the RV, based on Gonda's translations, as "many-colored" (10.91.5) and "smoke-like" (1.27.11; 5.11.3; 7.2.1; 1.3.3), as flowing like a stream or a fountain (1.67.7; 3.10.5), and as "assembl[ing] like the streams of water into holes (10.25.4) [Gonda, op.cit., p. 173]." This last metaphor of water-draining-into-holes is a particularly apt description of the amorphous phosphene waves with their swirling expansion across the visual field and then their subsequent contraction into the center (Figure 1.1).

Agni's flame-arrows are described in the hymns as originating in "The Waters," a metaphor that is usually interpreted as referring to natural events in which fire is combined with water, as, for example, when lightning illumines a raincloud, or Agni's flame-arrows that shine forth in the dark depths of consciousness that wise men enter when they meditate. In this incarnation as a light shining amid dark waters, Agni is called "Child of the Waters" (Apam Napat), and the task assigned him while he plumbs these depths is to animate the streams of cosmic order (rta) so that they flow more quickly toward the ultimate confluence that will bring into being the visions of Soma and Indra [Dange, 1992, pp. 43-59]. Pursuing this task, Agni is not only Apam Napat

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but also undergoes many transformations, which accounts for why he is evoked in eulogies dedicated to other Vedic deities who manifest themselves at later stages in the evolution of the rta:

Kindled in many a spot, *One is Agni; Surya is One*, though high o'er all he shineth.
Illumining this All, still *One is Ushas. That which is One hath into All developed*
Vala 10.2 [GRF]

He is first engendered in the habitations (of the sacrificers); then upon his station,
(the altar), the base of the vast firmament; *without feet, without head, concealing his*
extremities, combining with smoke in the nest of the raincloud. / Radiance has first
proceeded to thee, (Agni), . . . in the womb of the water, in the nest of the raincloud . . .
4.1.11-12 [WIL]

Agni is head and height of heaven . . . he quickeneth the waters seed. / Upward, O Agni,
rise thy flames, pure and resplendent, blazing high, thy lustres, fair effulgences
8.40.11-12 [GRF]

I have sought the waters today; we have joined with their sap. O Agni full of moisture, come
and flood me with splendor. 10.9.9 [OFL].

This analysis of Agni as the god who helps the wise men see visions of light that evolve through many stages until they eventually manifest as Soma and Indra helps clarify the meaning of a verse like the one cited below. Here Agni is the "cowherd who never tires," the one who disguises himself in visions of light like the receding rings and the amorphous waves "that move towards the same center but spread apart," and with Agni's help the "wise see in their heart . . . the bird annointed with the magic of the Asura," and the flight of this bird brings with the vision of Indra, "the revelation that shines like the sun:"

The wise see in their heart, in their spirit, the bird annointed with the magic of the Asura.
The poets see him inside the ocean; the sages seek the footprints of his rays. / The bird
carries in his heart Speech that the divine youth spoke of inside the womb. The
poets guard this revelation that shines like the sun in the footprint of Order [rta]. / I have
seen the cowherd who never tires, moving to and fro along the paths. Clothing himself in
those that move towards the same center but spread apart, he rolls on and on inside the
worlds. 10.177.1-3 [OFL]

Conclusion, Part I

In this paper we have shown that the visions of a radiant, three-wheeled chariot and the flame-arrows of Agni closely match the phosphene images that appear during the early stages of meditation, that is, the threshold image of a succession of three to five 'receding rings,' followed by the waves of amorphous, swirling phosphene mist. The eulogists of the RV describe these visions as propitious signs that one has entered on the path that leads to Soma and Indra. This is the subject we address in our next paper (Part II).

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NOTES

Copies of the author's articles on the neuroscience of meditation-induced visions can be ordered from the publisher: The International Society for the Study of Subtle Energies and Energy Medicine, 11005 Ralston Road, Suite 100D, Arvada, CO 80004 USA; telephone (303-425-4625); email <issseem@compuserve.com>; website: www.issseem.org. Also, the author is preparing an anthology of articles on these topics for publication in book format, which should be available by October, 2002. Interested readers can contact (1) the author directly (tele: 617-566-7429; fax: 627-738-7634; email: nicholson@us.inter.net) (2) the publisher (tele: 1-888-795-4274; fax: 215-923-4685; email: <info@xlibris.com>; or via the web at www.xlibris.com); or, (3) local or web book retailers, searching under the author's name or under the subject headings of "kundalini," "visions," "neurophysiology of kundalini," or "meditation."

ABBREVIATIONS FOR ENGLISH TRANSLATIONS

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- DNG Dange, S. A.. 1992. *Divine Hymns and Ancient Thought, Vol. I: RgVeda Hymns and Ancient Thought* (N. Singal, NAVRANG: New Delhi,).
- GRF Griffith, R. T. H.. 1971 [1889]. *The Hymns of the RgVeda, Vol. I - II* (Chowkhamba Sanskrit Series: Varanasi,).
- OFL O'Flaherty, W. D.. 1971. *The Rig Veda: An Anthology* (Penguin Books: London).
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The Soma Code, Part II:

Soma's Birth, Purification, and Transmutation into Indra

Philip T. Nicholson

ABSTRACT

In this paper, the second in a three-part series on interpretation of metaphors for luminous visions in the Rig Veda (RV), we sort the metaphors used to describe the visions of Soma and Indra into sets based on certain abstract features (shape, movement, color, and temporal order), then show that these metaphor-sets closely match the characteristics of the meditation-induced phosphenes described in Part I. Our analysis suggests (1) that a vision which looks like a terrestrial dawn appears before the vision of Soma, analogous to the gradual brightening and bluing of the visual field that occurs in the paroxysmal phosphene sequence; (2) that the vision of newborn Soma - the 'woolen filter' in which the Soma juice is purified - has a distinctive bulbous shape and moves by itself, characteristics analogous to those of the translucent white bulbous image in the paroxysmal phosphene sequence; (3) that the vision of three 'purified' Soma streams rising and spreading is analogous to the phosphene rays which evolve in three discrete stages; and, finally, (4) that the visions of Indra, which are variously described in the RV as lightning-like flashes, as a continuous flood of light waves, as 'milk with curds' or as 'light with a thousand studs,' can all be matched with the phosphene effects that appear when paroxysmal activity reaches its maximal stages or with residual sequelae that appear after the paroxysm. In this analysis, the precision of the match between the transformations of Soma and the analogous phosphenes is particularly noteworthy. A table at the end of this paper summarizes the full extent of the parallels linking metaphors for luminous visions in the RV and paroxysmal, meditation-induced phosphenes.

The Birth of Soma

The metaphors used to describe the initial vision of Soma all refer to a bulbous shape, for example, to an "udder," "stalk (*amsu*)," "navel," "bull's horn," "phallus," "pot," "stormcloud," "waterskin," "heaven's head," or "woolen filter." More than one of these bulbous metaphors may appear in the same verse [*italics added for emphasis*]:

Udder:

[F]ill the dhih up, make it *swollen like an udder filled with milk* . . . 10.64.12 [GON, 1963, p. 124]

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When the *swollen amsu* ['stalks'] were milked like cows with *udders* . . . 8.9.19
[BH/W, pp. 43-44]

The *Soma amsu, filled full, moves itself every way* . . . 9.74.1-2 [GRF]

The *udder* of the cow is *swollen*; the wise juice is imbued with its streams . . . the cows
milk their milk with *Soma, heaven's head*. 9.93.3 [BH/W, p. 46]

Navel:

[T]he *navel* of the earth, which is also the mainstay of the sky 9.72.7 [BH/W, p. 47]

Your *highest navel is attached in heaven* . . . 9.79.4 [BH/W, p. 50]

Thy descendants, O Immortal One . . . receive them on thy *navel, O Soma*, thou who
are the *head [of heaven]*. 1.43.9 [BH/W, p. 51]

Soma, *Navel of the Way (Rta)* 9.74.4 [BH/W, pp. 29-30, 50]

Bull's Horn:

He bellows, terrifying *bull*, with might, *sharpening his shining horns*, gazing afar. The
Soma rests in his well-appointed birthplace. *The hide is of bull, the dress of sheep*.
9.70.7 [BH/W, pp. 41-42]

Whilst alighting, this quick-flowing Soma hastens to the filter . . . (he moves) *like a
buffalo sharpening his pointed horns, like a warrior on a foray for cattle*. 9.87.7 WIL

Soma with *sharpened horns* attains his [full] reach. 9.97.9 [BH/W, pp. 41-42]

Penis (of a Bull, a Stallion, or a Man):

O Soma . . . thou, *Bull, seated in the filter above the calf's wool, clarifying thyself, thou
Soma, that Indra may have his pleasure!* 9.86.3 [WIL]

The *penis, men, take the penis and move it and stick it in to win the prize*. Inspire Indra . . .
10.101.12 [OFL]

They milk the *amsu* ['stalk'], this *bull* at home on the mountain. 9.95.4 [BH/W, pp.
23, 45]

Clarify thyself, O Soma . . . Thou who art a *bull* . . . 9.70.9 [BH/W, p. 55]

Soma, *stormcloud* imbued with life, is *milked* of ghee, milk. . . *The swollen men piss the
flowing [Soma]*. 9.74.4 [BH/W, pp. 29-30, 50]

Heaven's Head:

On Soma's *head* the cows with a *full udder* mix their best milk in streams. 9.71.4
[BH/W, pp. 22, 46]

This *bull, heaven's head, Soma*, . . . 9.27.3 [BH/W, p. 45]

Pot, Waterskin, Stormcloud:

(Soma), send (us) him who is like a *pot*; . . . 9.52.3 [WIL]

The fingers press the Soma, they squeeze it *glittering like a water-skin*; its juice
becomes three-fold, enemy-averting. 9.1.8 [WIL]

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Soma, *stormcloud* [*atmanvan nabho*] imbued with life, is *milked* of ghee, milk. *Navel of the Way*, Immortal Principle, he *sprang into life in the far distance*. 9.74.4 [BH/W, pp. 29-30, 50]

Woolen Filter:

The *sharp* seer, in *heaven's navel*, is magnified in the *woolen filtre*, Soma the wise, possessed of good intelligence. 9.12.4 [BH/W, p. 51]

O Soma, . . . thou, *Bull, seated in the filter above the calf's wool*, clarifying thyself, thou Soma, that Indra may have his pleasure! 9.86.3 [BH/W, p. 57]

The vision of newborn Soma is described as a "celestial structure" located "in the far distance," as if "seated on the mountain top," and it is clear from the context that, unlike those verses that describe Soma as a plant that priests gather from the mountains, these specific references to 'mountains' are metaphorical and designed to put Soma in his "accustomed place," which is "in the firmament of heaven:"

In the firmament of heaven the Seers milk . . . the bull-Soma *seated on the mountain top*. 9.85.10 [BH/W, p. 22]

Clarify thyself, O Soma, in the *celestial structures* of thine essence . . . " 9.86.22 [BH/W, p. 39, 57]

[*N*]avel of the Earth, which is also the *mainstay of the sky* 9.72.7 [BH/W, p. 47]

Your highest navel is attached in heaven . . . 9.79.4 [BH/W, p. 50]

This Soma, which today *circulates in the distance*, which is a cleanser, may it cleanse us in the filtre! 9.67.22-24 [BH/W, p. 34]

Soma, *stormcloud* . . . *Navel of the Way* . . . *he sprang into life in the far distance*. 9.74.4 [BH/W, pp. 29-30, 50]

Milking the dear sweetness from *the divine udder, he has sat in his accustomed place*. 9.107.5 [BH/W, p. 43]

This is consistent with Gonda's explanation that the Vedic deity, Vivasvant, who was first to celebrate a Soma ritual, performed a ritual milking in his heavenly "seat" (1.53.1) at the "navel of the world" (1.164.35; 2.3.7) (*nabha yajñasya*) [Gonda, 1963, pp. 187].

We can also infer from the many references to a filter of sheep's wool that the surface of the Soma bulb is a dull white color. Alternatively, one might conclude that the Soma "envelop" is simply some kind of brightness - "a radiance associated with Asuras (9.71.2)," rather than white or any other color [Wasson, 1971, p. 40].

Besides giving information about the location and color of the newborn Soma, the hymns often refer to the distinctive movements of the Soma-bulb: for example, 9.74.1 describes the Soma as moving on its own - "The soma stalk [*amsu*], filled full, *moves itself everyway* [GRF]" - and 9.68.4 describes Soma as "protecting his head" from the priests' fingers, suggesting a pulling-back movement. When a bull is "sharpening his horns (9.70.7; 9.87.7)," the animal moves its head back and forth, rubbing one horn against a hard surface; this is a metaphor that succinctly describes the kind of back-and-forth movement of the bulbous phosphene image in response to different intensities of attention (Part I, Figure 3). Another metaphor used in the same verse as the horn-sharpening metaphor is that the movement is "like a warrior on a foray for cattle

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(9.97.9)," suggesting that the moves are furtive, tentative, exploratory - and, again, this would also be an apt metaphor for describing the attention-driven movements of the bulb in the phosphene sequence. There are also allusions that suggest these movements resemble those that occur during sexual congress, an important subject that we address below in a separate section.

The Purification of Soma

When Soma emerges from the 'filter' as purified juice, it suddenly presents a very different image:

Aggressive as a killer of peoples he advances, billowing with power. *He sloughs off the Asurian color that is his. He abandons his envelop, goes to rendezvous with the Father [Sky].* 9.71.2 [BH/W, pp. 40-41]

Like a serpent he *creeps out of his old skin* . . . 9.86.44 [BH/W, p. 41]

The first vision of purified Soma displays three thin white "streams" (or "jets" or "rays") of light spreading apart from a common base in a trident-like image. The white color is translucent like fresh milk squirted out of a cow's udder. The three Soma jets move "as rapid as thought," rising up like birds flying and at the same time "spreading" at "oblique angles," so that the "rays spread a filter on the back of heaven," creating a "dazzling mesh . . . spread afar." The speed of the jets makes it seem that the Soma had been "pressed" through a sieve by application of some invisible force:

The filtre of the burning [Soma] has been *spread* in heaven's home. Its *dazzling mesh was spread afar* . . . They *climb the back of the heaven in thought*. 9.83.2 [BH/W, p. 54]

Thy *shining rays spread a filtre on the back of heaven*, O Soma, with Forms. 9.66.5 [BH/W, p. 26, 52]

The heavenly Somas *spread the strainer* of the sun's rays. 9.10.5 [BH/W, p. 52]

Thy clear *rays spread over the back of heaven*, the filtre, O Soma 9.66.5 [BH/W, p. 26, 52]

Thy filtre has been *spread*, O Brahmanaspati [Soma]. . . 9.83.1 [BH/W, p. 53]

Thou runnest through the three filters stretched out; thou flowest the length, clarified. 9.97.55 [WIL]

[I]n jets, the pressed Soma is clarified according to its nature, suitable for thee, O Indra! 9.72.5 [BH/W, p. 56]

Passing obliquely through the sheep's hairs . . . 9.42.8 [WIL]

Thy inebriating drinks, *swift*, are released ahead, like teams *running in divers directions*, like the milch cow with her milk towards her calf, so the Soma juices, waves rich in honey, go to Indra . . . 9.86.2 [BH/W, p. 57]

High in the seat of heaven is spread the Scorcher's sieve: its threads are standing separate, glittering with light. . . with consciousness *they stand upon the height of heaven*. 9.83.2 [GRF]

From tawny Pavamana, the Destroyer, *radiant streams have sprung, quick streams* from him whose gleams are swift . . . 9.66.25 [GRF]

The royal (Soma) *plunges into the firmament*, . . . the *streams*, he associates with the wave of the waters; *being filtered, he stands upon the uplifted woolen filter* on the navel of the earth, the upholder of the vast heaven. 9.86.8 [WIL]

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This (Soma) . . . filtered, and sent forth, . . . *as a bird goes with a stream (of juice) through the fleece; . . . / Wearing a coat of mail (i.e. clothed in light) reaching to heaven, the adorable Soma, who fills the firmament . . .* 9.86.13-14 [WIL]

Soma . . . *widely spreading . . . / . . . When Soma seeks to gain (heaven) he assumes a white color; . . . he bursts asunder the raincloud from heaven.* 9.74.7-9 [WIL]

Let loose thy stream which is *as rapid as thought.* . . 9.100.3 [WIL]

These descriptions of rays rising from the same place where the filter had just disappeared and spreading apart at oblique angles match the author's report of seeing the bulbous phosphene replaced by a cluster of three thin white filaments stretched halfway to the perimeter of vision and spreading apart from a common base to form a trident-like image (Part I, Figure 3).

The Number 'Three'

Many verses specify that the purified Soma is pressed out in three streams:

The fingers press the Soma, they squeeze it glittering like a water-skin; *its juice becomes three-fold . . .* 9.1.8 [WIL]

The ancient sage (Soma) is purified by the wise . . . he roars into the receptacles; generating *the water of the three-fold* (Indra), . . . 9.86.20-21 [WIL]

He invests himself with the rays of the sun *stretching out the triple thread* in the way he knows. . . . 9.86.32 [WIL]

The supporter of heaven the prepared exhilarating (Soma) is let loose, *the triple (liquor) rushes to the waters; . . .* 9.86.46 [WIL]

Raise the *three voices* that are preceded by light and that milk the udder, which is milked of sweetness . . . 7.101.1 [BH/W, p. 15]

The Guardian of the Rta [Soma] cannot be deceived, he of the good inspiring force; he carries *three filters* inside his heart. 9.73.8 [BH/W, p. 54]

Thou comest unto *three extended filters*, and *hastenest through each one* as they cleanse thee. 9.97.55 [GRF]

He took the Soma for himself and *drank the extract from the three bowls . . .* 1.32.2 [OFL]

The ancient sage (Soma) is purified by the wise . . . he roars into the receptacles; generating *the water of the three-fold* (Indra) . . . 9.86.20 [WIL]

At the *Trikadrukas* the Gods span sacrifice that stirred the mind . . . 8.13.18 [WIL]

The meanings of these references to the number, 'three,' which have hitherto been considered obscure [Dange, 1992, p. 229], would be clarified, if, as we propose, the reference to 'three' represents an empirically-oriented description of an image in the visual field, i.e., the phosphene image of three rising rays. Since this trident-like vision of Soma being pressed through the filter appears shortly before the advent of the Indra vision, seeing these three rays would likely be considered as a propitious omen by someone who fervently hoped to see Indra. This suggests the possibility that the vision of three phosphene jets arrayed in a trident-like pattern might be the original source of the Trident symbol so important in modern Hinduism.

Another interesting aspect of the number, 'three,' as it appears in the RV is that the descriptions of the purified Soma streams of refer to 'three' in conjunction with the

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number, 'seven,' a conjunction which is usually translated into English by phrases like "thrice seven," "three times seven," or "seven . . . three-parted:"

He unto whom they sang the *seven-headed* hymn, *three-parted*, in the loftiest place, he sent his thunder down . . . 8.22.4 [GRF]

He to whom they sang the seven-headed hymn with its *three parts* in the *highest region* - he has made all these worlds *tremble* . . . Vala 3.4 [WIL]

O Lords of splendor, aid us through the *Three-Times-Seven*. . . Vala 11. 5 [GRF]

(Soma) is purified by the wise . . . he roars into the receptacles; generating *the water of the three-fold* . . . / . . . this Soma, having milked the *thrice seven* (cows) of their curds and milk, exhilarating, flows pleasantly . . . 9.86.20-21 [WIL]

The linking together of 'three' and 'seven' suggests an interesting parallel with the meditation-induced phosphenes described by the author (Part I, Figure 3). The phosphene image of the rising rays evolves in three stages: at first there are only three rays rising halfway to the perimeter of vision, but one second later the three rays are replaced by six, all of which extend to the perimeter of vision. In the third and final stage of this evolution, the six rays fan farther apart, a movement that looks like the petals of a flower opening (or wilting) in the heat of the sun. While 'three-to-six' is not identical to the three-seven conjunction used in the RV, it seems reasonable to infer that witnesses might differ slightly in their recollections of the number of rays, especially since this would be a strange and fleeting event that only occurred once in a lifetime. It is also possible that, if the number 'seven' were considered auspicious by the Indo-Aryan religious tradition, this might influence reports about the number of rays observed. But, whatever the source of the disparity, our analysis suggests that the usual English translations of the conjoined use of the numbers three and seven as "thrice-seven" or "three-times-seven" are incorrect, and that it would be more accurate to translate the conjunction as "three-then-seven," i.e., as a reference to the evolution of the rising rays of Soma.

The Final 'Nesting' of the Soma-Rays

Several verses in the RV describe the final stage in the unfolding of the Soma rays using bird metaphors, i.e., the rays rise like a bird flying up to the rim of its nest and then "alighting" as it comes to rest:

[F]alling like a bird alighting on the trees the Soma when purified alights upon the pitchers 9.96.23 [WIL]

[I]n the (Vasativari) waters: he alights like a falcon on his own place 9.42.4 [WIL]

The shining (Soma) approaches the golden seat . . . as a falcon (approaches) his nest 9.71.6 [WIL]

The Soma . . . purified, he passes through the sheep's fleece, to alight on the water-moistened seat like a hawk (on its nest)." 9.82.1 [WIL]

This 'alighting' motion recalls the distinctive "drooping" or "wilting" movement that occurred in the third and final stage of the evolution of the meditation-induced phosphene rays. The metaphor of a bird alighting recalls other verses that refer to the purified Soma as a "sun-bird," e.g. 10.177.1-3 (discussed in Part I) in which the wise men

are described as having seen in their hearts "the bird annointed with the magic of the Asura [sky gods]" or "the footprints of his rays" as a "revelation that shines like the sun in the footprint of Order [OFL]."

The Vision of Soma Penetrating Indra

The streams of purified Soma are described as "penetrating" into Indra's belly but also as Indra "drinking up" the Soma streams like a calf drinking milk from an udder, with both metaphors sometimes present in the same stanza:

Soma, being purified, alights on the vessels; *putting his seed (in the vessels) as in a heifer*
... 9.99.6 [WIL]

[G]oing to his station like a bridegroom to his bride, he combines in the pitcher with the curds and milk 9.93.3 [WIL]

[T]he omniscient (Soma) hastens invoking (the gods) towards (the cups) like (a libertine) to the wife of a friend. / O Pavamana . . . thou goest like a gallant to his mistress 9.96.23 [WIL]

Clarify thyself, O Soma, for the invitation to the gods. *Thou who art a bull enter into the heart of Indra, receptacle for Soma! . . .* 9.70.9 [BH/W, p. 50]

Enter into the heart of Intra, Soma's receptacle, like the rivers into the ocean, thou [O Soma] . . . supreme mainstay of the sky! 9.108.15 [BH/W, p. 58]

Pressed by the pressing stones, thou clarifiest thyself in the filter, O Soma-juice, when *penetrating into the entrails of Indra!* 9.86.23 [BH/W, p. 58]

Cleansed like a winning race horse, *thou hast spilled thyself in the belly of Indra, O Soma!* 9.85.5 [BH/W, p. 57]

Cleanse the Soma . . . *put the Soma juice into Indra.* 9.11.5-6 [BH/W, p. 28]

[I]n jets, the pressed Soma is clarified according to its nature, suitable for thee, O Indra!
9.72.5 [BH/W, p. 56]

Like a race horse launched in movement for the victory prize, flow, O Soma, . . . thou, *Bull, seated in the filter above the calf's wool, clarifying thyself, thou Soma, that Indra may have his pleasure!* 9.86.3 [BH/W, p. 18]

Clarify thyself, O Soma, in the celestial structures of thine essence, *thou who hast been released roaring into the vessel, in the filter. / Lodged in the belly of Indra, roaring with vigour, held in hand by the Officiants, thou hast made the sun to mount the sky.*
9.86.22 [BH/W, p. 57]

The *penis, men, take the penis and move it and stick it in . . .* Inspire Indra 10.101.12 [OFL]

While both Soma and Indra participate in this single vision, they are described as still retaining their separate existences since each continues to inhabit his own celestial 'seat': "Indra is farther than this seat [i.e. Soma's seat] when the milked amsu, the Soma, fills him . . . 3.36.6 [BH/W, p. 44]."

Describing the purified Soma as streams that "penetrate" into Indra's belly implies sexual congress, an implication made explicit in the verses listed below that refer to Soma as going to Indra like a bull "putting his seed . . . in a heifer," "like a gallant to a mistress," "like a bridegroom to his bride," or like "a libertine to the wife of his friend." Alternatively, verses may use the metaphor of a bull or stallion being milked. Gonda, in a critique of translations of verse 10.31.2, suggests that the sexual metaphors in the

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RV may express the thought that the poet-seers 'conceive' their visions and inspired hymns in the same way a baby is conceived:

Geldner's translation of *adhayi dhitiḥ* "die Erkenntnis ist erfolgt" is perhaps not completely incorrect; it is however a tempting surmise to connect this phrase with the combinations of *dha-* and *retah*, *garbham* and to compare the double sense of the English *conceive*. Cf. also 8.12.11 where the *dhitiḥ* is called *garbho yajnasya*. [Gonda, 1963, p. 184]

Before leaving this subject, we also point out that the penis metaphor is used in a different way in a verse that describes the jets of purified Soma using a 'pissing' metaphor:

Soma, stormcloud imbued with life, is milked of ghee, milk. . . Acting in concert, those charged with the Office, richly gifted, do full honor to Soma. *The swollen men piss the flowing [Soma]*. 9.74.4 [BH/W, pp. 29-30, 50]

Most translators interpret the pissing metaphor as an embellishment of the image of a stormcloud spitting rain with which the verse begins, but, in view of the fact that many other verses incorporate allusions to the ejaculation of male semen, we suggest that the more literal interpretation is the most accurate, that is, that the eulogists meant to say that jets of Soma shoot out like urine from men who are finally able to release their swollen bladders.

What Force Expels the Soma Jets from the Soma Bulb?

Many verses describe the Soma juice as having been forced out of the woolen filter by "priests" ("officiants," "masterly men," "wise men," "preparers of the Soma") who use their "fingers" to wield "pressing stones" to accomplish this task:

The *ten fingers, the two arms, harness the pressing stone*; they are the preparers of the Soma, with active hands. The one with good hands has milked the mountain-grown sap . . . the *amsu* has yielded the dazzling. 5.43.4 [BH/W, pp. 22, 44]

The *priests, the ten fingers, milk thee forth* for the gods . . . *ten fingers of the skillful (ones) milk thee forth with the stones* . . . 9.80.4-5 [WIL]

This bull, heaven's head, Soma, when pressed, is *escorted by masterly men [nr̥bhir]* into the vessels, he the all-knowing. 9.27.3 (BH/W, p. 45)

Many wise men utter praise together, when they have milked the Soma into Indra's belly, when *fair-armed men cleanse the delightful exhilarating juice with their ten united fingers* [lit., "ten having one nest"] 9.72.2 [WIL]

The best juice (dwells) in the navel of heaven, . . . *the stones devour thee upon the cowhide; the wise (priests) milk thee into the water with their hands* 9.79.4 [WIL]

There are many reasons why the metaphor of priests wielding stones should not be interpreted literally. One objection is that a literal interpretation would reverse the timing of events: in these verses, the vision of Soma is already present in the visual field, so it cannot be the case that the priests are still engaged in crushing the stalks to prepare the Soma drink to be used in the ritual. A second objection is that the pressing of Soma is described here as a "celestial" event and thus one that takes place at "heaven's

seat" or at the "seat" of a god. For example, 9.102.2 describes Soma as appearing "at a place near the two pressing stones of Trita [WIL]." This reference to Trita, a sky god, is particularly interesting since the name, Trita, which connotes the number 'three,' anticipates the number of Soma streams that will later shoot out of the filter. Also, 8.12.32 describes the first Soma sacrifice by the god, Vivasvant, as a "navel-milking" (*nabha yajnyasya*) performed in the god's celestial seat [Gonda, 1963, p. 187]. Hints of divine agency in the pressing of Soma are also apparent in 9.47.1, which states that "The shining soma [is] being purified by *the golden hand* that urges it forth . . . [WIL]."

Consistent with the interpretation that divine hands wield the pressing stones are the verses that describe Soma as moving itself, as, for example, in 9.74.1, which reads, "The soma stalk [*amsu*], filled full, *moves itself everyway* [GRF]," or 9.68.4, which describes Soma as "protecting his head" from the priests' fingers, perhaps a reference to a pulling-back movement. The description of Soma moving itself is consistent with a mythological explanation that the golden hands of the gods are applying pressure on the Soma bulb from a celestial region invisible to humans.

These metaphors suggesting that the fingers that press the Soma bulb are divine, not human, can be reconciled with an alternative interpretation in which the priests' 'fingers' do play an important role - but these are not the 'fingers' one might suppose. A number of verses suggest that the references to "priests' fingers" are actually euphemisms for the priests' singing hymns. Their chants attract the attention of the gods and motivate the gods to act on behalf of humans; therefore, it might be said that the priests' hymn-fingers play an important causal role since they recruit the gods and get them to apply the pressure that 'massages' the celestial Soma-bulb. Thus it is a divine-human partnership that produces the perturbations wise men see when the Soma-bulb appears to "move itself." Consistent with this interpretation are the following verses:

- [T]he worshippers send forth praises; the filtered (juices) hasten to the fair praise . . . , the exhilarating Soma juices enter Indra 9.85.7 [WIL]
They send forth with their fingers [alt. translation, 'with their praises'] the powerful Soma . . . passing through the fleece 9.106.11 [WIL]
[O]ur holy hymns are pressing nigh to Soma. To him they come . . . and, longing, enter him who longs to meet them. / They drain the stalk [*amsu*], the Steer who dwells on mountains . . . 9.95.3-4 [GRF]
(The priests) milk forth the Soma cleansed (dwelling) on a high place like a buffalo, the sprinkler, placed between the grinding-stones; praises attend upon the longing Soma . . . 9.95.4 [WIL]

Having enumerated the reasons why references to priests wielding pressing-stones should not be taken literally in those passages that refer to visionary experiences, we acknowledge that there might also be a sense in which it would be reasonable to say that priests actually do grab stones, crush stalks, and prepare a drink that produces visions. If the original Soma plant were some kind of Ephedra, as many scholars suggest (see our discussion in Part III), then we might envision the following scenario: the priests gather Ephedra plants and crush the stalks to prepare a drink containing ephedrine, a stimulant. They use this ephedrine drink to keep awake throughout the night as part of a Soma ritual. As a result, they would lose enough sleep to predispose them to an outbreak of paroxysmal brain discharges when they tried to meditate - and

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the photoparoxysmal phosphene images that were generated by the seizure would bestow the visions of Soma and Indra. In this were the actual scenario of events, it is easy to imagine that the preparation of the Soma drink and the visions of Soma would be associated in the minds of the observers as a causal link, even if the link were indirect or perhaps non-existent. In this view, references to the priests' fingers may celebrate two different acts - the physical preparation of the Soma drink, but also the singing of hymns that recruit divine help to press the purified Soma jets out of the celestial vision of the Soma filter.

The Vision of Indra

Indra appears in an overwhelming blast of brilliant white light described as "lightning," as "an ocean" of "dazzling" white that flows "continuously," as "a vesture of grand occasion," as "a spread-cloth like to a cloud," as the "dappled one, enveloped in a membrane of light," or as an opening of the divine "eye (*caksus*)," which leaves the seer "sun-eyed (*svarcaksa*)."
Indra's brilliance is blissful and god-like but also like a "burning:"

Soma, exhilarating Indra (and) the celestial people, thou rushest forth, when filtered,
like the wave of a river 9.80.5 [WIL]

[T]he *lucid* water-shedding rivers do not fill the ocean with water 5.85.6 [WIL]

The inspired seers guard this inspired thought which is bright-like-lightning, a *dhih* of the nature of the *light of heaven at the abode or seat of rta*. 10.177.2 [GON, 1963, pp. 178-9]

Soma, who art purified, . . . enter Indra's belly in a mighty stream; milk heaven and earth for us as *lightning (milks) the clouds*; . . . 9.76.3 [WIL]

With *unfading vesture, brilliant, newly clothed*, the immortal *hari* wraps himself all around. By authority *he has taken the back of heaven to cloth himself in a spread-cloth like to a cloud*. 9.69.5 [BH/W, p. 40]

He sloughs off the Asurian color that is his. He abandons his envelop . . . *With what floats he makes continually his vesture-of-grand-occasion* 9.71.2 [BH/W, p. 40]

We have drunk the Soma; *we have become immortal; we have gone to the light; we have found the gods*. 8.48.3 [OFL]

Inflame me like fire started by friction. 8.48.6 [WIL]

The filtre of the *burning* [Soma] has been spread in heaven's home. 9.83.2 [BH/W, p. 54]

[Soma] who has for eye *the sun* [*svarcaksa*] 9.97.46 [BH/W, p. 47]

[H]e has clothed himself with the *fire-bursts of the sun* 9.71.9b

I have drunk the navel into the navel for our sake. Indeed, *the eye is altogether with the sun* [*caksus cit surye*]. 9.10.8ab [BH/W, p. 46, 50]

Quickened by the seven minds, he [Soma] has encouraged the rivers free of grief, which have *strengthened his single eye* 9.9.4 [WIL]

The wise behold with their mind (*seated*) in their heart the Sun made manifest by the illusion of the Asura; the sages look into the solar orb . . . sages cherish it in the place of sacrifice, brilliant, heavenly, ruling the mind. / *I beheld the protector (the Sun), never descending, going by his paths to the east and to the west; clothing (with light) the (four) quarters of heaven . . .* 10.177.1-3 [WIL]

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The sovereign (Soma) has put on *the vestment of the waters* 9.84.2 [WIL]
[T]he asura-colored showerer (of benefits) illumines as soon as born, the whole luminous region . . . / . . . Indra has uncovered *the desirable white-colored, fast-flowing Soma, effused by the expressing stones, and overlaid with the shining (milk and other liquids)*, in like manner as when, borne by his tawny steeds, he rescued the cattle. 3.44-45 [WIL]

The colors and textures of the Indra vision are described by three different but related metaphors: as an opaque whiteness like milk in a bucket, a mottled whiteness like milk "mixed with curds," or an even more variegated surface faceted by "a thousand studs [*bhrstir*]:"

Now he has gone to the *white pot coated by cows*; the racehorse has reached the winning line . . . 9.74.8 [OFL]

Pressed for Indra . . . the Soma plants requiring a *mixture of curds*. 5.51.4-7 [BH/W, p. 27]

[M]ix the libation with curds, offer the Soma to Indra. 9.11.5-6 [WIL]

King [Soma], having the filtre for chariot, he has attained the victory prize; a *thousand studs*, he conquers puissant renown. 9.86.40 [BH/W, pp. 52, 59]

If we refer to the paroxysmal phosphene sequence described by the author, we can identify counterparts for each of these descriptions at different stages in the evolution of the Indra vision. In the paroxysmal phosphene sequence, the rising rays are followed by a continuing series of dull white flashes that look exactly like sheet lightning illuminating dark stormclouds from within (see Figure 3, Part I). This is probably the empirical referent of the lightning metaphor. These lightning-like flashes were replaced by a different kind of phosphene vision once the author stopped the initial flashing by diverting attention to other things and then getting up and walking around the house. Then, when he returned to bed, he saw a faint glow hovering in the same place where the bulb and the rays had once been, and, when he looked at this glow, it suddenly began to expand very rapidly, as if it were radiating out in all directions toward the viewer (see Figure 4, Part I). The surface of this expanding white phosphene cloud had a distinctive, variegated, cauliflower-like appearance: in effect, it looked very much like a foam of soap bubbles surging upward in response to a downward jet of water or like the surface of a cumulus cloud billowing outward in response to explosive pressures contained within. This variegated whiteness is aptly described as "milk mixed with curds" or as white light with "a thousand studs." A few nights after the initial photoparoxysm, the glow still remained but, when it expanded, the surface had lost its former variegation and presented an undifferentiated, fog-like cloud of white mist.

While we are addressing the subject of Indra, it is important to make a brief excursion to examine one particular verse that assumes a critical role in the current debate about the identity of the original Soma plant that we will review in Part III. In an influential article arguing that Ephedra is the most likely candidate for the original Soma, Falk [1989] claims that it is a mistake to interpret the hymns of the RV as referring to visual "hallucinations." While it is true that Falk has in mind the kind of dream-like figurative hallucinations induced by harmaline alkaloids (the competing candidate for the original Soma), he states his case in such a way as to exclude all kinds of luminous visions, including those we have documented in this series of papers. The

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most recent review of the debate about the Soma plant concurs with Falk's position [Nyberg, 1995]. Since our analysis of the evidence supports a conclusion diametrically opposed to Falk, it is worthwhile to spend a moment studying the verse that Falk cites as an example of misinterpretation:

The only half-serious reason to expect hallucination as an effect of Soma-drinking in an Indian context is the well-known *Labasukta*, RV 10.119. There it is said that some winged creature, after consumption of Soma, touches sky and earth with its wings and extends bodily even beyond these borders Usually it is Indra who grows until he extends beyond heaven and earth (e.g. RV 1.81.5; 8.88.5). . . . But Indra has no wings! And nowhere is it said that human Soma-drinkers feel that they are growing. . . . The act of growing in the *Labasukta* simply classifies the bird amongst the gods and gives no indication that it was due to the effects of any drug. . . . Because all the proponents of Soma as a hallucinogenic drug make their claim on the basis of a wrong interpretation of the *Labasukta*, their candidates must be regarded as unsuitable [Falk, *Ibid.*, p. 78].

We believe Falk's reading of this verse is seriously mistaken - that, contrary to his claim, this verse is a perfect example of the celebration of luminous visions in the RV, particularly the culminating visions of Soma and Indra. We have already noted the many times that metaphors of birds flying are used to describe the rising streams of purified Soma, and, in addition, that the streams penetrate as far as the seat of Indra, so that, at the moment when Soma is rising and Indra is drinking, it might well be said that Indra is lifted on wings. Moreover, bird metaphors are also used to describe the sun-like flood of bright light that appears when Indra explodes into view, as, for example, in 10.177.1-3, discussed in the first paper (Part I), where wise men are described as having seen in their hearts "the bird anointed with the magic of the Asura [sky gods]" or "the footprints of his rays" as a "revelation that shines like the sun in the footprint of Order [OFL]." Based on these considerations, we conclude that Falk and Nyberg cannot possibly be right in their conclusion that the RV does not refer to luminous visions, even though we concur in many other aspects of their argument in favor of Ephedra as the original Soma plant (see Part III).

Indra and the Vision of Dawn

So far we have examined the birth of Soma and its transmutation into Indra and have identified images with similar characteristics in the paroxysmal phosphene sequence described by the author. We know, based on the meditation-induced phosphene sequence, that a gradual brightening and bluing of the visual field occurred soon after the onset of paroxysmal brain discharges, that this took place before the bulbous image appeared, and that this uniform brightening and bluing disappeared abruptly at the same instant that the Soma-like bulbous image disappeared. Therefore, it is reasonable to expect that some hymns in the RV have metaphors that describe a similar phenomenon occurring at a similar place in the progression of luminous visions. Is there any evidence to support this inference?

Several verses in the RV mention that Indra's lightning bolt kills Usas, the goddess of dawn, but, paradoxically, Usas is said to be "enriched" by Indra's triumph:

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Indra . . . *thou hast slain the woman, the daughter of the sky [i.e. the dawn], when meditating mischief. / Thou, Indra, who art mighty, has enriched the glorious dawn, the daughter of heaven.* 4.30.7-11 [WIL]

If Indra's brilliance, which is a vision, kills Usas and thereby "extinguishes the dawn (9.82.3)[WIL]," this suggests that, in this context, Usas also refers to a vision, one that was present in the visual field at the time Indra appeared. Usas is enriched, even though she dies, because Usas, like all the other deities, is part of 'The One,' and thus, like the others, she has an assigned role in the evolution of luminous visions that culminates in the appearance of Indra. The vision of Indra is a "Union of The Waters and the Sun," a realization of, or restoration of, the primordial cosmic order of Brahman, Purusha, and Rta. Usas, and all creation, benefits when cosmic Unity is restored.

In the verses listed below, there are more hints that the eulogists are sometimes referring, not to a terrestrial dawn, but rather to an inner vision of dawn where "paths to the gods are beheld" by the seer, and the path is illuminated by "days that have dawned before the rising of the sun," where the dawn-like light is not as transient as a terrestrial dawn but rather "beheld like a wife repairing to an inconstant husband:"

The paths that lead to the gods are beheld by me, innocuous and glorious with light: the banner of Ushas is displayed in the east, she comes to the west, rising above the high places. / Many are the days that have dawned before the rising of the sun, on which thou, Ushas, has been beheld like a wife repairing to an inconstant husband, and not like one deserting him. / Those ancient sages, our ancestors . . . discovered the hidden light, and, reciters of sincere prayers, they generated the Dawn. 7.76.2-3 [WIL]

The next stanza of the same verse adds an important detail:

Auspicious *Ushas . . . who art the conductress of the cattle* (to pasture), the bestower of food, *dawn upon us . . .* 7.76.4 [WIL]

Come, (Ushas), with the desirable (radiance); *let the cows who are of full udders accompany thy chariot* 172.1-4 [WIL]

These references to Usas as a "conductress of cattle" are important because they reverberate with another metaphor that is frequently used in verses dedicated to Soma and Indra, i.e., references to a herd of hidden cows that the eulogists use to explain the source of the 'milk' that gets mixed in with the Soma juice. Because of the hidden cows' milk, the Soma juice is white when it shoots out of the filter:

[T]he asura-colored showerer (of benefits) illumines as soon as born, the whole luminous region . . . / . . . Indra has uncovered the desirable white-colored, fast-flowing Soma, effused by the expressing stones, and overlaid with the shining (milk and other liquids), in like manner as when, borne by his tawny steeds, he rescued the cattle. 3.44-45 [WIL]

The rishi, the sage, the foremost of men, the far shining intelligent Usanas - *he verily by his poetic gift discovered the secret milk of those cows which was hidden and concealed* 9.87.3 [WIL]

For Usas to be the "conductress" of the herd of hidden cows that supplies the milk for the Soma vision, Usas must also be a vision, one recognized by the eulogists as appearing at a set place in the unfolding of the sequence of luminous visions. This

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linking of the eulogists' hymns, propitious visions of a divine dawn, and the celestial cows is emphasized several times in the following verses:

[O]ur mortal forefathers departed after instituting the sacred rite, when, *calling upon the dawn, they extricated the milk-yielding kine, concealed among the rocks of the darkness (of the cave) . . . / . . . unprovided with the means of (extricating) the cattle, they glorified the author of success, when they found the light, and were thus enabled (to worship him) with holy ceremonies / Devoted (to Agni), those leaders . . . with minds intent upon (recovering) the cattle, forced open, by (the power) of divine prayer, the obstructing, compact, solid mountain confining the cows, a cowpen full of kine. / They first have comprehended the name of the kine, knowing the thrice seven excellent (forms) of the maternal (rhythm); . . . / . . . then they glorified the conscious dawns, and the purple dawn appeared with the radiance of the sun. / The scattered darkness was destroyed; the firmament glowed with radiance; the lustre of the divine dawn arose . .*
4.1.11-17 WIL

Note the reference here to the conjunction, "thrice-seven," which we discussed earlier in relation to the three streams of purified Soma that increase in number to seven, which led us to suggest the translation, "three-then-seven." In the context of this verse, the reciting of this conjunction suggests that the eulogists meant to say that, once the ancestors understood what kinds of visions were possible - "hav[ing] comprehended the name of the kine, [and] knowing the thrice seven excellent (forms)," they then realized the importance of inducing a vision of the "conscious dawn" in which the purple shines with the "the radiance of the sun."

Just as a vision of "divine dawn" can be said to herald the vision of Soma, the Dawn vision has its own harbingers - the Asvins' chariot and Agni's flame-arrows:

May this desirable and gratifying Soma expressed by the stones be, Indra, for thee: *ascend the verdant chariot, and with thy tawny (steeds) come to us; Desiring (the Soma), thou honorest the dawn . . .* 3.44.1-2 [WIL]

The *brilliant chariot, diffusing splendor, rolling lightly on its three wheels, offering an easy seat . . . at whose yoking the Dawn was born, rich in marvelous treasures - I invoke that your chariot (O Asvins) Vala 10.3* [WIL]

Where is that ancient one of those (Dawns), through whom the works of the Ribhus were accomplished? For as the bright Dawns happily proceed, they are alike and undecaying. / Verily those auspicious Dawns have been of old, rich with desired blessings . . . / . . . the divine Dawns, arousing the assembly of the sacrifice, are glorified like the (rays) creative of the waters. / Those Dawns proceed verily alike, of similar form, of infinite hues, pure, bright, illumining, concealing by their radiant persons the very great gloom. 4.51.6-10 [WIL]

It is worth noting here that the "divine Dawns" are described in 4.51.8 as "arousing the assembly of the sacrifice," i.e., an invigorating the assembled priests. This point will be relevant in our discussion of the ancient Soma ritual in Part III. One of the leading candidates for the original Soma is Ephedra which contains an adrenaline-like stimulant that has an invigorating effect on users, as this verse suggests.

The hypothesis that Dawn sometimes refers to a type of luminous vision is consistent with Gonda's analysis of the term, *rtasya* (meaning the "seat" or "place" of *rta*)

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in 4.51.8. Discussing the phrase, *rtasya devih sadaso budhana*, Gonda points out that "rta is ubiquitous and not confined to a special locality," and that, therefore, this phrase could be interpreted as referring a light generated inside the seer and not just to a terrestrial dawn:

There is, as far as I am able to see, nothing to have us believe either that this sadah is identical with that in 10, 111, 2 or that all *rtasya sadamasi* are situated in the East. What the text means, is, in my opinion, this: the Dawns have their origin in, or rather are based on or conditioned by, rta; what it says is that at the 'place' where the Dawns awake rta makes its presence known. [Gonda, 1963., p. 182]

Gonda makes a similar point in a monograph analyzing the use of the Sanskrit medium tense in the RV: referring to 7.92.2, Gonda suggests that this phrase which is often translated as "(the dawns) color themselves" could also be interpreted, given the use of the medium tense, as applying to an event that the poet-seer causes to happen within himself, so that "the person who is subject is characterized as performing the process in his own sphere and in his own interest . . . [Gonda, 1979, p. 23]." Two other verses translated by Gonda describe the seer as beholding an inner vision of dawn that is regarded as an auspicious omen of what comes next:

[T]he man who in the early morning kindles his sacrificial fire mentally should acquire, by way of a 'vision,' a flash of intuition, the knowledge of the deeper sense of what he is doing: 'I have kindled the fire with the rays of the matutinal light.' 7.104.14 [GON, 1963, p. 77]

[B]orn still before daylight, attentive, recited, in parts, when the sacral functions are performed, dressed in beautiful-and-auspicious white clothes is this our ancestral *dhih* which was born long ago. 3.39.2 [GON, 1963, p. 77]

Table 2.1. Synopsis of parallels between phosphene sequence and luminous visions.

Meditation-Induced Phosphenes	Luminous Vision Metaphors
Rings (3 - 5) that shrink in diameter.	Visions of wheel rims moving away.
Waves of amorphous phosphene mist	Visions of flame-arrows assembling like water pouring into holes.
Bright central node & pupil-like space	

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	Many-colored, smoke-like visions.
A star-like cluster of thin filaments. An influx of thin, dark, fast-paced rings. A radiating spray of beige-colored flecks.	
A gradual brightening and bluing of the entire visual field that obscures & then eclipses the spray.	Visions of a day before the day that lasts longer than a terrestrial dawn. A hidden light of Divine dawn.
Small white bulbous glow, upper right quadrant. Attention makes it move. Bulbous image & the blue disappear	A vision with a bulbous shape, like an udder, navel, head, bull's horn, pot, penis, waterskin, woolen ball. Indra kills Dawn but also enriches her.
3 thin white rays fan out from a base. 6 rays replace the 3 & extend further. Same 6 rays move apart ('wilt')	3 jets of pure Soma rise from the filter. The 3 become 7. The rays fly like a bird as it 'alights' on its nest.
A sudden outbreak of lightning-like flashes That continues until attention is diverted.	Indra manifests as a bolt of lightning, as a continuous flood of bright, sun-like light, or an 'eye' (caksus) that is altogether one with the sun.
The aftermath = a white glow that expands with a surface texture like the cauliflower.	Indra as 'milk with curds' or a whiteness that is variegated by a 1,000 studs or petals.

Conclusion, Part II: The Soma Code

Our analysis of the metaphor-sets used to describe luminous visions in the RV has uncovered many parallels with the meditation-induced phosphene sequence described by the author. These parallels, which are present image-by-image and also in the temporal sequencing of images, are summarized in Table 2.1. Our theory about the origins of luminous visions described in the RV provides a detailed, comprehensive, and economic explanation accounting for the choices of particular metaphors and what the composers meant to communicate by choosing these and not others. Our theory also explains some other puzzles that have so far eluded explanation. In the final paper of this three-part series, we use this new theory to investigate the relationship between

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visionary experiences in the RV and those described in later works, such as the Upanishads and the many yoga meditation texts in the Hindu, Tantric, and Tibetan-Buddhist traditions. We also propose that the homologies between natural events, the actions of Vedic deities, and the visions of human seers which are postulated by Vedic myths can be best explained as projections onto nature and mythic elaborations that originated in the visionary experiences of tribal shamans. Finally, we show that this theory about the nature of the luminous visions in the RV now makes it possible to choose between the two leading candidates that have been proposed most recently as the original Soma plant.

ABBREVIATIONS USED

BH/W	Bhawe, S. S.. 1957, 1960, 1962. <i>The Soma Hymns of the Rig Veda, Parts I - III</i> , as quoted in Wasson, R. G., <i>Soma: Divine Mushroom of Immortality</i> (Harcourt Brace Jovanovich: New York, 1971).
DNG	Dange, S. A.. 1992. <i>Divine Hymns and Ancient Thought, Vol. I: RgVeda Hymns and Ancient Thought</i> (N. Singal, NAVRANG: New Delhi,).
GRF	Griffith, R. T. H.. 1971 [1889]. <i>The Hymns of the RgVeda, Vol. I - II</i> (Chowkhamba Sanskrit Series: Varanasi,).
OFL	O'Flaherty, W. D.. 1971. <i>The Rig Veda: An Anthology</i> (Penguin Books: London).
WIL	Wilson, H. H.. 1888. <i>Rig-Veda Sanhita: A Collection of Ancient Hindu Hymns, Vol. I - VI</i> (Trubner & Company: London,).
GON	Gonda, J. 1963. <i>The Vision of the Vedic Poets</i> (Mouton & Co.: The Hague, Netherlands).

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The Soma Code, Part III: Visions, Myths, and Drugs

Philip T. Nicholson

ABSTRACT

In this final paper of a three-part series on the interpretation of luminous vision metaphors in the Rig Veda (RV), we consider several implications raised by the hypothesis that vision metaphors in the RV refer to the meditation-induced (and meditation-destabilized) phosphene sequence described by the author in Part I. First, we show that there is a remarkable continuity in the description of luminous visions in the RV, the Upanishads, and yoga meditation texts in the Hindu, Tantric, and Tibetan-Buddhist traditions. Second, we show that similar types of meditation-induced phosphene visions are also reported in studies of contemporary shamans and prehistoric rock art attributed to shamans. Since it is likely that shamanistic practices were widespread at the time the RV was composed, we examine evidence that the Vedic priests practiced shaman-like trance induction rituals and that the visions they induced were used as the basic organizing structure for Indo-Aryan myths that describe the attributes of gods and define the gods' roles in the trajectory of cosmic events. Third, we show that the hypothesis that luminous visions in the RV represent phosphene images is relevant to the current debate about the identity of the original Soma plant. If luminous visions refer to phosphene images and not to memory-based hallucinations with dream-like content, this would exclude Syrian rue, which contains hallucinogenic harmaline alkaloids, as a likely candidate. The leading alternative, Ephedra, contains an extract (ephedrine) that is an adrenaline-like stimulant that does not induce visions. But if the original Soma ritual required an all-night vigil, as some scholars suggest, then the attendant sleep loss would likely create a strong sleep-rebound effect and increase the incidence of sleep-onset seizures when the priests reactivated sleep rhythms by trying to meditate just before dawn when the sleep rebound effect would reach maximal levels. If the priests also drank ephedrine to keep themselves awake, this would potentiate the sleep deficit and also add the risk of overstimulating the sympathetic nervous system, which, in extreme cases, can trigger a temporary collapse and install a state of parasympathetic dominance, the final common outcome of many different trance induction rituals.

The Continuity of Visions in Vedic and Post-Vedic Meditation Traditions

Table 3.1. A comparison of descriptions of luminous visions in Vedic and Hindu texts.

	THE RG VEDA	SELECTED UPANISHADS	THE YOGASUTRAS
RECEDING RINGS	[T]he single wheel that is concealed 10.85.16	Fog, smoke, sun,... these are the preliminary forms which produce the manifestation of Brahman in yoga (SvetasUp, II: 11)	In the light, everything is encompassed, the seer as well as the seen (4.23)
MISTS OR CLOUDS	With the bright dhīh, you drive, O you travelers in a radiant chariot 8.26.19 When the visions that are concealed begin to glow spontaneously, the Seers begin to glow . . . 8.6.8 The flame-arrows of Agni...assemble like streams of water into holes 10.25.4	In the city of Brahman is an abode, a small lotus flower; within it, a small space. What is within, that should be sought (ChandogUp, VIII: 1: 1)	
STAR			
RADIAL SPRAYS OF SPARKS		Fireflies...these are [also] preliminary forms . . . (SvetasUp, II: 11)	Also one sees countless bright speckles striking consciousness. Keep on watching: when the whirling [<i>vinivṛtīh</i>] ends, the abode of the <i>atman</i> will appear (4.24 - 4.25)
BRIGHT BLUENESS	[T]he days that have dawned before the rising of the sun . . . 7.76.2		
BULBOUS IMAGE	[F]ill the dhīh up, make it swollen like an udder filled with milk 10.64.12 [R]eceive them on thy navel, O Soma, thou who are the head . . . 1.43.9 Soma, stormcloud imbued with life... Navel of the Way . . . 9.74.4 The sharp seer, in heaven's navel, is magnified in the woolen filter 9.12.4 They milk the amsu, this bull at home on the mountain . . . 9.95.4 [G]littering like a waterskin 9.1.8	That which hangs down between the palates like a nipple, that is the birthplace of Intra (TaittrUp, I: 6: 1) The person [<i>purusa</i>] the size of a thumb... like a flame without smoke. (KathaUp, II: 1: 12, 13) He is of the measure of a thumb, of appearance like the sun,...the self he seems to be of the size of the point of a goad (SvetasUp, V: 13)	That bending-down image [<i>viveka-nimnam</i>] - it bears Aloneness [<i>Kaivalpa</i>] behind it (4: 26)

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<p>RAYS</p>	<p>He sloughs off the divine radiance, abandons his envelope, and goes to rendezvous with the Sky 9.71.2</p> <p>The filter of the burning has been spread ...Its dazzling mesh spread afar 9.83.2</p> <p>In jets, the pressed Soma is clarified 9.72.5</p>	<p>The bird of golden hue resides in the heart and in the sun, a diver-bird, a swan [<i>hamsa</i>], of surpassing radiance (MaitrUp, VI: 34)</p>	<p>That tearing apart [<i>chidrescu</i>] - it releases more changes (4: 27)</p>
<p>-----</p> <p>BRIGHT WHITE FLASHES</p>	<p>I have drunk the navel . . . the eye is altogether with the sun 9.10.8</p> <p>[T]his inspired thought which is bright-like-lightning . . . the light of heaven at the abode or seat of rta 10.177.2</p> <p>[H]e has clothed himself with the fire-bursts of the sun 9.71.9</p>	<p>Brahman sparkles like a wheel of fire, of the color of the sun (MaitrUp, VI: 24)</p> <p>Brahman. the ocean of light. In it, worshippers become dissolved like salt (MaitrUp, VI: 36)</p> <p>They rise forth...like lightnings from the light within the clouds (MaitrUp, VI: 36)</p>	<p>To one elevated in awareness, who continues to relinquish desire, the vision of ultimate discernment bursts forth like a stormcloud of cosmic dimension [<i>dharmamegha-samadhi</i>] (4: 29)</p>

Table 3.2. A comparison of luminous visions in Tantric and Tibetan-Buddhist texts.

	TANTRIC TEXTS	TIBETAN-BUDDHIST TEXTS
<p>ANNULI</p> <p>MISTS OR CLOUDS</p>	<p>In the middle of the vault of the palate, like the tapering flame of a candle, the...fiery effulgences shine continuously (GA, p. 10 - 11)</p>	<p>'Meditate on the four wheels, each like an umbrella or like the wheel of a chariot' (YSD, I: ii: 98)</p> <p>From this practice come smoke-like or ethereal shapes</p> <p>The forming of thoughts ceases, and phenomena, appearing like smoke, mirage... (YSD, I: ii: 98)</p>
<p>-----</p> <p>DOTS OR STARS</p>	<p>Above this energy [the ajna cakra midway between the eyes] dwells the dot, <i>bindu</i> (GA, p. 10 - 11)</p>	<p>Phenomena, appearing...like fireflies (YSD, I: ii: 98)</p>
<p>-----</p> <p>RADIAL SPRAYS</p>	<p>When the <i>bindu</i> explodes and shatters, it expands immediately... (GA, p. 10 - 11)</p>	<p>The Flaring will appear as a yellow radiance (YSD, I: ii: 125)</p>
<p>SPARKS</p>	<p>...a continuous whirling movement [ghurni] until there appear dazzling sparks just as the kundalini rises (AT, 5: 101, 107, 111; KS, II: 3)</p>	<p>Phenomenon, appearing...[like] something resembling the light of dawn, and something resembling a cloudless sky (YSD, I: ii: 98)</p>
<p>-----</p> <p>BRIGHT BLUENESS</p>	<p>-----</p>	<p>-----</p>

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BULBOUS IMAGE	<p>When the bindu explodes and shatters, it expands immediately and forms the mastaka [the 'Egg of Brahman'], similar to the angular fruit of the water chestnut (GA, p. 10 - 11)</p> <p>Concentrate on the image that resembles the stomach of a fish . . . [showing] unfoldment and contraction (TA, 5: 57-61)</p> <p>...the supreme <i>linga</i> [phallus] of the skull. From above the uvula, this <i>linga</i> showers nectar. In the inner space, the womb in the middle of the forehead, is found that nectar. Having raised it to the surface of the brahmadanda, similar to an ivory tusk, the kundalini releases its flow. Inside the tusk there is but one orifice, the mouth of the kundalini (GA, p. 10)</p>	<p>One should have a vision of the form of the Buddha outlined against a cloudless sky, like the moon's reflected form seen in water. Or one sees, as a form reflected in a mirror, the unobscured, radiant <i>Nirmanakaya</i> [Pure Illusory Body] (YSD, II: ii: 19-20)</p> <p>The Pure Illusory Body... springs forth from the State of the Clear Light like a fish leaping forth from water , or like the form of [the Celestial Buddha], which rises as one does upon waking from sleep (YGS, IV: iii: 34)</p> <p>And thus is produced the invisible psychic protuberance on the crown of the head. When the protuberance becomes filled with the vital force of the transmuted seminal fluid, one..realizes the State of the Great Vajra-Dhara [Wielder of the Thunderbolt] (YSD, I: ii: 144-145)</p>
RAYS	<p>The supreme energy blossoming into bliss is adorned like a five hooded cobra as she rises (AT: 248-251)</p> <p>The rising energy forms a five-fold wheel... like a swan of dazzling white drinking in the cosmos</p>	<p>Simultaneously with this realization, the white fluid...flows upward to the crown of the head (YSD, I:iii:144-145)</p>
BRIGHT WHITE FLASHES	<p>When the energy with five modal ities draws herself up . . . and enters Brahman's seat, she flashes forth like lightning.... such is the so-called serpent piercing. (AT: 248-251)</p>	<p>One gains...mastery of the Very Bright (YGS, IV:iii:35)</p>

A cross-text comparison of descriptions of luminous visions in the RV and in religious texts written much later in time reveal that there is a remarkable continuity that extends throughout history and into the present day. Table 3.1 compares excerpts from the RV hymns with excerpts from several Upanishads (translated by Ramakrishnan [1992]) and from Patañjali's *Yogasutras* (translated by the present author [see Note 1]). Table 3.2 compares excerpts from yoga meditation texts in the Tantric tradition - Abhinavagupta's *Tantraloka*, Goraksanatha's *Amaraughasana*, and Ksemaraja's *Shivasutravimarshini* (all translated by Silburn [1988]) - and excerpts from a Tibetan-Buddhist text, *The Epitome of the Six Abridged Doctrines* (translated by Evans-Wentz [1958] or Mullin [1996]). [Tables adapted from Nicholson, 2002a]

While cultural diffusion is clearly a factor that contributes to the recurring presence of similar phosphene images, the fact that these replications are so detailed supports the hypothesis that the primary reason for these similarities is not cultural diffusion but rather the nature of the causal mechanisms involved: as we explained in Part I, meditation-induced phosphene images are epiphenomena of the brain rhythms that govern the transition from waking to slow wave sleep, and this neurophysiology imposes narrow constraints on what kinds of phosphenes can appear in the visual field of meditators. Extrapolating from this hypothesis that meditation induces a predictable progression of light visions, we can anticipate that the same kinds of visions will appear in other religious traditions.

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Did the Rig Veda Originate in Shaman-Like Visionary Experiences?

Visions of internally-generated lights devoid of content drawn from life experience (i.e., 'phosphenes') have played major roles in the founding and continuing revitalization of the world's major religious traditions [Bucke, 1969 (1901); Laski, 1961; Underhill, 1990 (1930); Arbman, 1963, 1968, 1970]. Based on analysis of the autobiographies of mystical visionaries in various traditions, we can infer that two types of phosphene images predominate during the early states of meditation or contemplative prayer - images of phosphene rings (annuli) and images of amorphous phosphene clouds or mists. Examples of mystics' descriptions of these two kinds of visions appear in Table 3.3 [Nicholson, 1996a].

Table 3.3. Autobiographical descriptions of visions of phosphene rings and clouds

HEBREW MYSTICS

[T]he appearance of the *wheels*...was like the gleaming of *beryl*; and the *four* had the same form, their construction being something like a *wheel within a wheel*" Ezekiel
[T]ike a *dome*, shining like *crystal*, spread out about their heads....And above the dome, something like a throne, in appearance like *sapphire*..." Ezekiel
[A] *round ladder*....like a full *sphere*, rolling back and forth before him...bright *blue*." R. Abulafia
A glowing light...*clear* brilliance...A *purple* light that absorbs all lights...." Moses de Leon

HINDU AND BUDDHIST MYSTICS

[A] perfectly *round*, beautiful *deep-blue* shape, of a size appropriate to the center of a *mandala*, as if exquisitely painted, of extreme clarity..." Tsong Khapa
[A] *luminous revolving disc*, studded with lights...a *lotus* flower in full bloom..." Gopi Krishna
[B]oth my eyes became centered...When this happened, a *blue* light arose in my eyes....like a *candle flame without a wick*, and stood motionless in the *ajna chakra*." Muktananda

MUSLIM MYSTICS

[Like] *chandeliers*....sublime lights, [like] stars, *moon*, or the *sun*..." Sharafuddin al-Maneri
[I]ts color is deep *blue*; it seems to be an *upsurge, like...water from a spring*." Najmoddin Kobra
[V]isualize yourself as lying at the bottom of a *well* [looking up] and the well...in lively downward movement." Najmoddin Kobra
[T]he color *green* is the...suprasensory uniting all the suprasensories." Alaoddawleh Semnani
[T]he light rises in the Sky of the heart taking the form of...light-giving *moons*..." Najm Razi

CHRISTIAN MYSTICS

[H]is own state at...prayer resembles...a *sapphire*; it is as *clear* and bright as the sky." Evagrius
[D]escending like a bright *cloud of mist*...like a sun, *round as a circle*." Simeon Neotheologos
[S]aw something in the air near him. He did not understand the type of thing, but in some ways it appeared to have the form of a serpent, with *many things that shone like eyes, although they were not eyes*." Ignatius of Loyola
[T]he soul puts on...a *green almilla* [cape worn over shoulders, beneath armor]..." John of the Cross
[The almilla is like a helmet which] covers all the senses of the head of the soul...It has *one hole* through which the eyes may look upwards..." John of the Cross

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[A] *round* thing, about the size of a *rixdaler*, all bright and *clear with light like a crystal*." H. Hayen

[I] saw a bright light, and in this light the figure of a man the color of *sapphire*...blazing with a gentle glowing fire...the three were in *one light*..." Hildegard von Bingen

[S]aw a *blazing fire*, incomprehensible, inextinguishable...with a flame in it the *color of the sky*..." Hildegard von Bingen

[S]aw placed beneath her feet the whole machine of the world as if it were a *wheel*. She saw herself placed above it, her eyes of contemplation magnetized towards the incomprehensible..." Beatrice of Nazareth

[I] saw the eyes...I do not know if I was asleep or awake..." Angela of Foligno

[A] kind of sunlit, winged being...like a *child's head* beneath two little wings." Abbess Thaisia

[R]ound patterns: *small circles would expand and eventually dissipate, only to be followed by other small circles of light*." Philip St. Romain

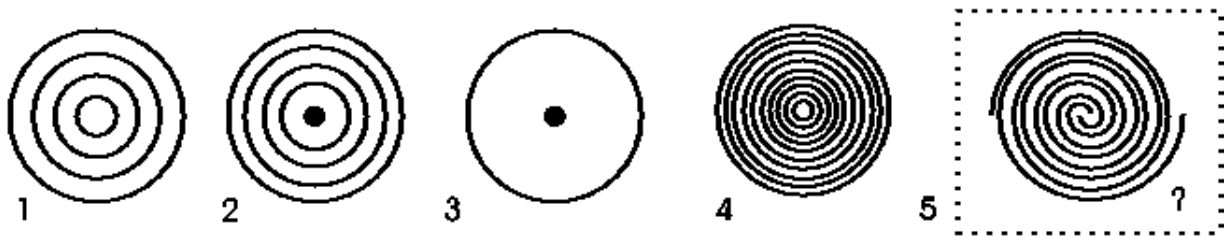
[A]n extraordinary *circle* of gold light...pulsating against a deep violet background....There were *always four or five*....*As soon as one would fade, another would appear*..." Philip St. Romain

These same two kinds of visions are also prominent in ethnographic studies of contemporary tribes that rely on shamanistic practices. Since we know that the oral traditions of the Indo-Aryans developed during a time when shamanistic practices were widespread, it is possible that shaman-like visionary experiences were influential in the composition of the RV hymns. Our analysis in an earlier article (Part I) of the luminous visions in the RV shows that ring-like image and amorphous mist-like images are important early harbingers of being on the path that leads to Soma and Indra: the Asvins' radiant, three-wheeled chariot manifests as bright wheel-like rings moving away from the viewer (similar to the phosphene image of receding rings) and the visions of Agni's flame-arrows that "assemble like water pouring into holes" (similar to amorphous phosphene mists). To put ourselves in a position to address the question of shamanic influences on the RV, we need first to examine how the phosphene images of rings and amorphous mists are embedded in the ritual practices, artistic creations, and mythological theories of shamanistic cultures.

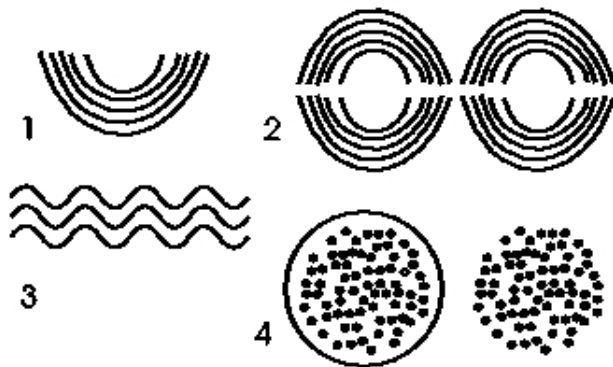
Shaman are individuals who specialize in making contact with an otherwise invisible world of spirits and in communicating with the spirits on behalf of other members of the tribe [Jakobsen, 1999]. Where shamanistic practices still exist, learning how to induce a trance and to see visions, then to go further and extend and elaborate those visions, is often a prerequisite for being accepted as an authentic shaman by others in the tribe [Noll, 1985]. For example, informants in the Alaskan Iglulik Eskimo tribe told Rasmussen [1930] that a shaman must be able to summon up an interior "illumination," called the *angákoq* or *quamaneq*, "a mysterious light which the shaman suddenly feels in his body, inside his head, within the brain, an inexplicable searchlight, a luminous fire, which enables him to see in the dark, both literally and metaphorically speaking, for he can now, even with closed eyes, see through darkness and perceive things and coming events that are hidden from others [p. 111]." To this Holtved [1967] adds that a shaman often "gets his visions sitting or lying in deep concentration at the back of the sleeping platform, behind a curtain or covered with a skin. The drum is not used in this connection [p. 47]."

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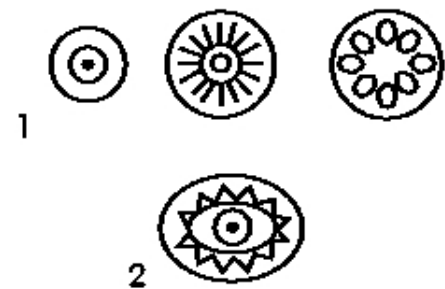
A Concentric Annular Images



B Waves & Mist-Like Images



C Eye-Like Images



D Compound Images

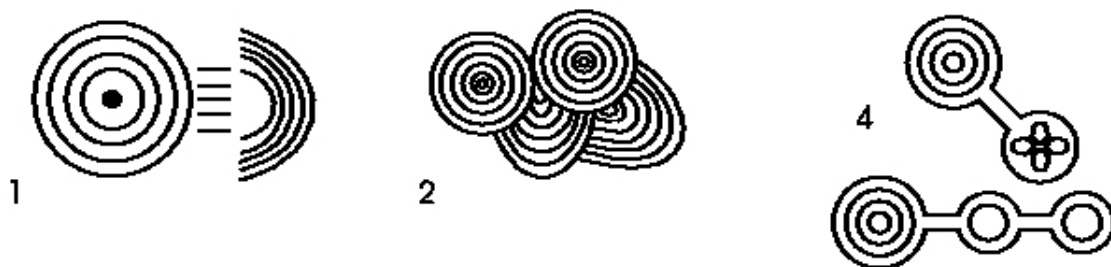


Figure 3.1. Images of internally-generated sensations of light with abstract geometric shapes ('phosphene images') in ethnographic reports and prehistoric rock art studies. A. *Concentric Annular Images*: 1. Four concentric annuli: South

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Africa (Lewis-Williams and Dowson, 1988, Fig. 1); California (Patterson, 1998, p. 43; Benson and Sehgal, Fig. 9 - 10). 2. Four concentric annuli with central dot: Australia (Halifax, 1982, pp. 39, 70; Taylor, 1988, pp. 286-7; Lawlor, 1991, pp. 46, 48-49, 108); Ireland (Herity, 1974, Fig. 37). 3. Single annulus with central dot: Columbia (Reichel-Dolmatoff, 1978, Plate 38); Alaska (Nelson, 1899, as cited in Benson and Sehgal, Fig. 5); Siberia (Vastokas, 1977, as cited in Benson and Sehgal, Fig. 2, p. 6). 4. More than 4 densely-packed concentric annuli, a 'tunnel-like' image which may represent a stream of dark, fast-paced receding annuli observed during the emergence of hypersynchronous CTC seizure (see text): Mexico (Siegel and Jarvik, 1975, pp. 125, 139); Ireland (Herity, 1974, Fig. 81); California (Benson and Sehgal, Fig. 6, p. 8). 5. Double spiral (included here because it, along with the single spiral, may represent an illusory sensation of movement associated with the 'tunnel' sequence of dark, fast-paced annuli rather than an independently-generate image): Ireland (Herity, 1974, Fig. 70; Dronfield, 1996, Fig. 9); Mexico (Halifax, 1987, p. 71; Schaefer, 1996, Fig. 31, p. 156). *B. Amorphous Waves and Small-Particle Mists:* 1. 'Navicular' image of horizontal 'nested' arcs: Ireland (Herity, 1974, Fig. 78); South Africa (Lewis-Williams and Dowson, 1988, Figures 1 - 4; Lewis-Williams, 1995, p. 7). 2. Juxtaposition of 2 sets of nested arcs: Columbia (Reichel-Dolmatoff, 1975, Plates 36, 39, 1978, Plate 23); South Africa (Lewis-Williams and Dowson, 1988, Fig. 2). 3. Parallel wavy lines: South Africa (Lewis-Williams and Dowson, 1988, Figures 1-2); California (Whitley, 1994, Fig. 1). 4. Clusters of tiny dots or circles: Columbia (Reichel-Dolmatoff, 1975, Plate 36); South Africa (Lewis-Williams and Dowson, 1988, Figures 1-2; Ouzman, 1998, Figure 3.6., p. 38). *C. Eye-Like (Iris and Pupil) Images:* Set 1. Ireland (Herity, 1974, Fig. 28, 36); California (Patterson, 1998, Fig. 3). Set 2. Columbia (Reichel-Dolmatoff, 1987, Plates 10 - 11). *E. Compound Images:* 1. Annuli-to-waves: South Africa (Lewis-Williams and Dowson, 1988, Fig. 1). 2. Annuli-plus-waves: Ireland (Herity, 1974, Fig. 37; Dronfield, 1996, Fig. 9). 3. Waves-to-eye: Ireland (Herity, 1974, Fig. 37). 3. Annuli-to-eyes: California (Whitley, 1998, Fig. 1). [From Nicholson, 2001]

In shamanistic cultures, the ritual art (and secular decoration) often incorporates patterns that are said to be representations of visions of light that the native informants see during meditation or other states of advanced relaxation. Some of these patterns are illustrated in Figure 3.1. The image of concentric circles, for example, covers the full face of a mask carved by an Eskimo shaman in Siberia to commemorate his journey to the spirit world and to depict the spirits (*tanghak*) he saw during his trance (e.g., see Nelson [1899, Plate 99], or Ray [1967, pp. 6 - 9, 17], both cited in Benson and Sehgal [1987]).

The motif of concentric rings also appears in the decorative and ritual art of aboriginal tribes in Australia [see Halifax, 1982, pp. 39, 70; Taylor, 1988, p. 287; Lawlor R, 1999, pp. 46, 48-9, 107-108]. Of particular interest is a report by Elkin [1974 (1945)] that "men of high degree" assemble in groups to create ceremonial ground-paintings (*ilbantera*) with 4 to 5 concentric rings that symbolize a sacred waterhole. This waterhole is seen as the portal all living beings have to use to move between the visible world and the world of spirits. The spirit world is envisioned as a paradise of perpetual light inside caves located deep within the earth [Eliade, 1964, p. 46]. To enter

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Dreamtime and find the light of spirits, an elder withdraws from social interaction and begins to meditate: "He is sitting down by himself with his thoughts in order 'to see'. He is gathering his thoughts so that he can feel and hear. Perhaps he then lies down, getting into a special posture, so that he may 'see' when sleeping. . . . [Elkin, p. 56]."

Ring-like phosphenes are also observed during the early stages of hallucinogen intoxication, that is, before the blood levels of the drug are elevated enough to trigger dream-like fantasies. For example, in a study of the peyote-induced visions of the Huichol Indians of the high Sierra Madre range in Mexico, Schaefer [1996] reports that "phosphenes induced by psychotic chemicals appear in two stages," and first to appear are the colored, abstract images, called *nierika*, that "serve as portals to other worlds. Many take the form of pulsating mandalas [Schaefer, 1996, p.156 and Fig. 31; Benson and Sehgal, 1987, Fig. 3]." In a study analyzing the frequency of particular kinds of geometric figures in Huichol peyote visions, Siegel and Jarvik [1975] found that 71% of items referred to "simple forms, colors, and movement patterns [Ibid., p. 125]."

While studying the Tukano Indians of the Amazonian rain forest, Reichel-Dolmatoff [1972, 1975, 1978, 1987, 1996] was told by Tukano informants that, after drinking one or two cups of *yajé* (ayahuasca), they see several different kinds of "luminous patterns" before the figurative hallucinations begin. These preliminary phosphenes include (1) circular shapes, which they draw as a single annulus with a dot in the center or as a set of 3 to 4 concentric annuli; (2) "wavy threads called *dárirí* with colors ranging from green to blue to violet," which they draw as wavy lines in parallel or as clusters of curvilinear arcs nested one inside the other; and (3) eye-like images [Ibid., 1996, p. 33]. All of these phosphene motifs are often used to decorate the walls of their houses [Ibid., 1978, e.g., pp. 12-13, 23, & 36; *ibid.*, 1996, pp. 157 - 203, Plates 36 - 39; *ibid.*, 1987, Plates 10 - 11]. When the ethnologist experimented with *yajé*, he observed the circular images himself: "A circle appears, it doubles, it triples, it multiplies itself (1972, pp. 91-92)." While these abstract phosphenes are often associated with ayahuasca, the Tukanos also report that the same kinds of visions also appear "during fleeting states of dissociation, daydreaming, hypnagogic states, isolation, sensory deprivation, or other situations of stress [Ibid., 1996, p.33]." The myths of the Tukanos attribute these light visions to energies (*bogári*) emitted by an invisible twin of the visible sun. These *bogári* energies are usually also invisible until they manifest as some natural light display - as flashes of lightning, for instance, or as airborne dust particles illuminated by a beam of sunlight - or manifest as an inner vision of light.

Many of the same images depicted in the artwork of shamanistic cultures - the concentric annuli, wavy lines, and eye-like forms illustrated in Figure 3.1 - are also found at prehistoric rock art sites. To explain why similar patterns appear at so many different rock art sites from the megalithic and paleolithic eras, sites which are widely dispersed geographically (ranging from Australia to South Africa to continental Europe, Ireland, and the far western regions of the United States), Lewis-Williams and Dowson [1988, 1993] have proposed a "neuropsychological model" of prehistoric rock art production and consumption. This theory, which has been elaborated in many subsequent studies [Whitley, 1994, 1998; Lewis-Williams, 1991, 1995a, b; Dronfeld, 1996a,b; Clottes and Lewis-Williams, 1998; Patterson,1998], states that the "best-fit explanation" for why certain kinds of abstract, geometric images were carved at

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prehistoric rock art sites is that these images depict phosphene phenomena observed by shamans (or others) during altered states of consciousness.

If the same kinds of phosphene visions were induced by shamans in many megalithic and paleolithic cultures, by shamans in many contemporary tribes, and by visionaries in all of the mystical traditions of the world's major religions, the kinds of behaviors that induce these visions must arise independently, or, put another way, the behaviors necessary to induce phosphene displays must be relatively easy to discover on one's own. A person prone to fantasize or to dissociate from his or her surroundings will not find it difficult to drift into a self-hypnotic trance, and then, once in that state, to notice that glimmers of phosphene light appear. The use of hallucinogenic drugs also acquaints people with phosphene images that appear before dream-like hallucinations supercede. Our hypothesis identifying sleep rhythms as the underlying cause suggests that the only skill required to induce a predictable sequence of phosphene images is the ability to simulate the kind of mental and physical relaxation a person achieves just before falling asleep, since this state of low arousal 'fools' the body into premature activation of the brain mechanisms that govern a normal transition to sleep.

In his cross-cultural comparisons of shamanic practices, Winkleman [1986, 1990, 1992] found that the final common outcome of most trance induction rituals is installation of a physiological state of "parasympathetic dominance." A state of parasympathetic dominance is characterized by (1) onset of synchronous brain rhythms; (2) relaxation of the large skeletal muscles; and (3) onset of high-amplitude activity in the neurons of the hippocampal-septal circuits [Mandell, 1980; Winkleman, 1986]. The classic example of this state is slow wave sleep. If meditation activates slow wave sleep mechanisms, as we propose, then it institutes a state of parasympathetic dominance. But simulation of the transition to sleep is not the only way to reach this state; it is also possible to induce it by over-stimulating the complementary nervous system, i.e., the sympathetic nervous system, to the point of saturation and temporary collapse. Techniques to induce this kind of collapse are described by Sargant [1974] and by Winkleman [1986; 1990, 1992]. Some techniques of over-stimulation of the sympathetic nervous system used by shamans are sustained sleep deprivation, self-mortification to inflict pain, dancing to the point of physical collapse, or surrendering oneself to chants or drumbeats that drive the brain toward synchronous rhythms.

Where does this survey of shamanistic trance induction rituals, past and present, take us in our present inquiry about the effect of shamanistic influences on the composition of the RV? The key point is this: if the priests or wise men of the Indo-Aryan tribes induced the same kinds of visions as contemporary shamans, and they induced them using the same techniques - by retreating from social interaction and meditating - then, while engaged in this task, the priests were functioning like shamans, 'specialists' with special skills that enabled them to communicate with the spirit world on behalf of the tribe.

There is some evidence that these shaman-like visionary experiences may have provided the Indo-Aryans with the basic conceptual structure that informs the Vedic myths. The attributes of the gods, their actions, and the sequence of cosmic events they set in motion are arranged in sequences that closely parallel the sequence of meditation-induced phosphene images. Given that there is this close alignment, can we infer that the myths originated from the visions and not vice versa? The approach we employed to decode the metaphors for luminous visions in the RV was to use the sequence of

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meditation-induced phosphenes as a template for making 'predictions' about the kinds of visual characteristics that were likely to be important and about the order in which different kinds of visions would be likely to appear; as we now refocus attention from decoding vision metaphors to understanding the origins of the Vedic myths, it makes sense to experiment with a similar approach. We might ask, then, is it possible to predict the sequence of cosmic events described in the Vedic myths based on our knowledge of the mediation-induced phosphene sequence, and, conversely, is it also possible to predict the content of visions using the sequence of cosmic events as a standard?

Figure 3.2 describes the general trajectory of cosmic events posited by Vedic mythmakers, juxtaposing events that take place in three dimensions - the world of natural phenomena, the divine realm where gods act unseen, and the dark void of meditative consciousness which only the wise men can enter and where they see visions of other-worldly light. In Vedic myths, the creation of worlds splits the primordial Unity of Brahman and also splits the rta, the energy that instills Truth and Order, so that separate streams flow in all different regions of the created world. Although the streams of rta are split by creation, each stream retains an inertial momentum that tends to bend it back towards an eventual confluence with the other streams, a convergence that would restore the primal Unity - the "Union of the Waters and the Sun." Because the streams of rta are a part of everything that exists, there are sometimes harmonious convergences of events that take place in all three dimensions - 'homologies' that link natural phenomena, the acts of the gods, and the inspired visions of light that come to wise men. Homologous events are important because these convergences afford glimpses into the flow of the rta and the ultimate nature of the cosmos. Some important homologies linking natural events, divine actions, and human visions are listed in Figure 3.2. Referring to this chart, we can ask if it is possible to predict the sequence of events that appears in one of the columns once we know the sequence of events in another column. Several permutations are possible:

Figure 3.2. Flow chart illustrating some homologies of nature, divine acts, and human vision postulated by the Vedic myths.

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If we know the diurnal rhythm of sunset alternating with sunrise (in the left column), we can predict the overall trajectory of cosmic events in the Vedic myths (in the right column), namely, that the myths will center on the loss of the sun and attempts to bring the sun back into the sky. But knowing this does not enable us to predict the details of the Vedic myths that explain how this goal is accomplished.

If we know the sequence of the meditation-induced phosphenes (in the center column), we see, first, that it mirrors the diurnal rhythm of the sun - meditation, like sunset, casts human consciousness into a dark space, but eventually that darkness yields a vision of the rising sun - but, second, we see that the meditation-induced phosphene sequence also describes many different transformations that occur in the visions before the culminating vision of the sunrise. It is this detail in the phosphene sequence that provides a basis for making predictions about the events that take place at the cosmic level, or, put another way, to predict what kinds of gods will have to appear in the Vedic myths and what kinds of acts the gods will initiate to recover the hidden sun if, as we propose, the myths are based on the sequence of meditation-induced phosphene images.

The Vedic mythmakers are most likely to be posit divine responsibility for events when they detect similarities ('homologies') between natural phenomena, which are beyond all human control, and the visionary experiences that wise men can induce by meditating. Wherever such an homology occurs, we find a god assigned responsibility for coordinating these events that take place in different dimensions of reality. We can predict, for instance, that the Vedic myths will feature a god whose nature it is to release light in the midst of dark, since this homology is omnipresent, and, indeed, this is the nature of Agni: he sends fire to the forest, fire to the altar, and, in his incarnation as "Child of the Waters" (Apam Napat), Agni lights the fire of lightning inside the raincloud and send flame-arrows into the dark consciousness of "The Waters" of meditation. Following this same line of thought, we can also predict, based on homologies between a terrestrial dawn and a phosphene effect in which there is a gradual brightening of a pale blue color, that there will be a god assigned responsibility for sending both of these lights - hence the god, Usas. This brings us to the god, Soma.

We have described two phosphene visions in the meditation-induced sequence that the eulogists call Soma - the vision of newborn Soma as a bulb of wool and the vision of purified Soma shooting out of the woolen filter in three rays - but if all of the Vedic gods were created to explain homologies between visionary experiences and natural events, where is the natural phenomenon that is the homology for the vision of Soma? The answer is evident once we look beyond the Soma vision to see what comes next in the phosphene sequence: the streams of purified Soma "penetrate" to the abode of another god, Indra, who drinks them. Invigorated by this drink, Indra attacks and kills the demons of the night, releasing the sun. A brilliant, sun-like flash then appears. Given this culmination, we can now see, looking back at the Soma visions, that the homology for the Soma vision in the natural world must be the Soma drink that was prepared from the Soma plant. This analysis implies that the Soma drink must be invigorating and even exhilarating, and, indeed, as we shall see in the next section of

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this paper, the leading candidate for the original Soma is a strong stimulant. The homology that led the Vedic mythmakers to postulate the existence of a god named Soma must have been the common features shared by the preparation of an invigorating drink and a set of visions that began as a phosphene bulb that moved itself about, as if it were being pressured from some invisible force, and which then transformed into a vision of thin streams of white light shooting out like jets of fresh milk expressed from a cow's udder.

We are considering whether or not it is possible to predict the trajectory of cosmic events using the sequence of meditation-induced phosphenes as a standard. From our analysis of the Soma/Indra transformations, we can now see that the phosphene visions of Soma would have been the only source of information the Vedic priests had available, prior to Indra's manifestation as a sun-like vision, to track events taking place in the otherwise invisible realm of the gods. The myths portray Indra as struggling with the demons of the night to free the sun, but the particulars of the struggle - for example, the manner in which Indra obtained the power he needed to defeat the demons of the night - could only have come from the meditation-induced phosphene sequence. The importance of the Soma visions also highlights the importance of the Soma drink prepared for the human rituals; the existence of an homology linking a human drink that invigorates with visions of a celestial drink being prepared and then squirted out into the heavens is a sign that the streams of rta have informed both events - and a sign that a god is at work. The priests, knowing that it was possible to reproduce within themselves the awesome spectacle of a lightning storm, and confident that the vision of lightning and sun-like brilliance was the culminating vision beyond which there was nothing more to be seen, chose Indra, god of the thunderstorm, to be first among the gods, and saw the advent of Indra as a restoration of "The Union of the Waters and the Sun."

So far we have shown that a great many details about cosmic events in Vedic mythology can be predicted based on a knowledge of the diurnal rhythm of the sun and the sequence of meditation-induced phosphene images. Is it possible to make predictions in the reverse direction - to use the actions of the gods (the right column in Figure 3.2) as the standard to predict the content of visions (shapes, movements, colors, and temporal sequence)? Clearly not. And that's why the interpretation of the metaphors describing luminous visions in the RV has resisted interpretation for so long; experts in Sanskrit and Vedic studies have known for years about the Asvins' radiant chariot, Agni's flame-arrows, Soma's woolen filter, and Indra's lightning bolt, but have been unable to understand how these mythic events relate to the visionary experiences extolled by the eulogists.

If we can only make predictions in only one direction - from the visions to the myths - this suggests that Vedic myths were constructed around the armature provided by the sequence of light images that they could induce within themselves by meditating. These visions would have been the best evidence available about the nature of the hidden world of the gods.

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The Search for the Original Soma

Scholars agree that a Soma ritual was practiced by the ancient Indo-Aryan tribes (and also that the Indo-Iranians who emigrated from the same original homeland had a 'Sauma' ritual), but exegesis of the RV and the Iranian *Avesta* has revealed very little information about the nature of the original Soma [Flattery and Schwartz, 1989, p. 6]. When Wasson [1971], an ethnobiologist, became interested in learning more about the original Soma plant, he was surprised to find out how little anyone knew about the subject:

But what manner of plant was this Soma? No one knows. For twenty-five centuries and more its identity has been lost. The Hindus . . . allowed this authentic Soma to fall into disuse and early on began to resort to sundry substitutes, substitutes that were frankly recognized as such and that to this day are met with in India in their peculiar religious roles [Ibid., p. 5].

Some Hindu sects still perform Soma rituals in which the priests prepare a drink by crushing the stalks of a plant called 'Soma' and filtering water through the mash [see Keith, 1925, Vol. 32, pp. 326 - 332; Gonda, 1982; Falk, 1989], but there are significant disparities between the effects produced by these drinks and the effects attributed to the original Soma in the hymns of the RV [Wasson, op. cit., p. 7].

In his review of existing theories about the identity of the Soma plant, Nyberg [1995], a botanist, concludes that scholarly debate has now narrowed the field of likely candidates to two plant species - Syrian rue and Ephedra. Syrian rue contains harmaline alkaloids, hallucinogenic substances which are also present in mescaline and ayahuasca and which clearly have the capacity to induce visions. In support of the theory that the original Soma/Haoma produced an hallucinogenic extract, Flattery [Flattery and Schwartz, 1989] analyzes ancient Zoroastrian texts and religious rituals and concludes that the priests who drank "sauma" during Zoroastrian rituals did so with the intent and expectation of inducing visions:

[T]he three Pahlavi accounts are consistent in showing that sauma brought about a condition outwardly resembling sleep (i.e., *stard*) ['stunned,' 'dazed,' 'sprawled'] in which targeted visions of what is believed to be a spirit existence were seen. [Ibid., p. 23]

From the apparent role of sauma in initiation rites . . . , experience of the effects of sauma, which is to say, vision of *menog* existence, must have at one time been required of all priests (or the shaman antecedents of them) [Ibid., p. 20].

The other leading candidate for the original Soma plant, Ephedra, contains the extract, ephedrine, a sympathetic nervous system stimulant analogous to adrenaline. Ephedrine excites the physiological systems of the fight/flight response but does not induce visions [Falk, 1989; Nyberg, op. cit.]. This is obviously an inconvenient fact for the advocates of Ephedra, a point Flattery underscores:

Despite being commonly designated haoma (and the like), Ephedra is without suitable psychoactive potential in fact (and is not regarded in traditional ethnobotany as having any psychoactive properties at all) and, therefore, it cannot have been

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believed to be the means to an experience from which priests could claim religious authority or wisely believed to be the essential ingredient in an intoxicating extract [Flattery and Schartz, op. cit., p. 73].

The choice between these two candidate plants turns on a single issue - the nature of the luminous vision metaphors that describe the effects of drinking Soma in the hymns of the RV:

A primary consideration in the identification process is whether or not soma/haoma can be regarded as a hallucinogen. . . . In my opinion, as well [as Falk's], it is possible to choose a hallucinogenic candidate only if you have already decided to interpret the texts in this way [Nyberg, op. cit., p. 385].

Falk rejects any interpretation of the RV hymns that would link Soma with "hallucinations." He clearly means to target the kind of visions that would be induced by the harmaline alkaloids in Syrian rue, that is, dream-like hallucinations that contain figures and objects drawn from life-experience, but Falk states his case in such a preemptory manner as to imply that he would also reject interpretations that linked Soma with phosphene images. His interpretation of a sample hymn illustrates his viewpoint:

The only half-serious reason to expect hallucination as an effect of Soma-drinking in an Indian context is the well-known Labasukta, RV 10.119. There it is said that some winged creature, after consumption of Soma, touches sky and earth with its wings and extends bodily even beyond these borders Usually it is Indra who grows until he extends beyond heaven and earth (e.g. RV 1.81.5; 8.88.5). . . . But Indra has no wings! And nowhere is it said that human Soma-drinkers feel that they are growing. . . . The act of growing in the Labasukta simply classifies the bird amongst the gods and gives no indication that it was due to the effects of any drug. . . . Because all the proponents of Soma as a hallucinogenic drug make their claim on the basis of a wrong interpretation of the Labasukta, their candidates must be regarded as unsuitable [Falk, *Ibid.*, p. 78].

Falk's reading of this specific verse is, in our opinion, seriously mistaken. Bird metaphors are often used in the RV to describe luminous visions, especially the streams of purified Soma, a subject we addressed at some length in Part II. Since the streams of Soma are said to penetrate as far as the seat of Indra, and since Indra drinks those streams just before appearing as a flash of lightning, it is not difficult to understand why a poet might say that Indra is lifted on wings. Also, bird metaphors are also used to describe Indra as a sun-like flood of continuous light, as, for example, in 10.177.1-3, discussed in Part I, where wise men are described as having seen in their hearts "the bird annointed with the magic of the Asura" appearing as a "revelation that shines like the sun in the footprint of Order [OFL]." Falk's interpretation of this particular verse - and his general rejection of any links between Soma and visions - is diametrically opposed to everything we have written in this series of articles on the interpretation of luminous vision metaphors.

It is understandable why the proponents of Ephedra as the original Soma plant would be moved to adopt this approach, since they have to account for the fact that ephedrine does not cause visions. There is, however, an alternative approach, one

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which has not yet been considered by any of the contenders, that supports the Ephedra hypothesis without requiring a denial of the links between the Soma metaphors in the RV and luminous visions. The key word, as noted earlier, is 'hallucination,' but now we need to be more precise in our definition of the term. In technical psychiatric jargon, internally-generated phosphene images are called 'formed' or 'unformed hallucinations' to distinguish them from dream-like 'experiential hallucinations' which contain memory-based content. If the Falk-Nyberg thesis were limited to the claim that the RV does not contain references to *experiential hallucinations*, the type induced by the hallucinogenic harmaline alkaloids in Syrian rue, and that, if there are no references to experiential hallucinations, then Syrian rue cannot be the original Soma, there would be no contradiction between the Falk-Nyberg position and our own. The problem left unsolved, then, is to find a way to explain how a stimulant like ephedrine could be associated in the minds of the Indo-Aryans with induction of inspirational visions.

Vigils and Visions: Falk on Soma and Sleeplessness

Falk was the first to point out that the hymns of the RV often state that Soma "prevents sleep," an observation he illustrates by citing many verses: 10.34.1, which refers to the "alerting drink of Soma;" 8.92.12, where "Indra is awake because he drank Soma" (a point repeated in 9.36.2, 9.44.3, 9.103, and 9.106.4); and 8.44.29, where "Agni is awake [*jagrvi*] like an inspired poet [Falk, op. cit., p. 80]." Also, verse 9.96.18 calls "Soma a maker of seers, *rsikrt*;" 5.44.14 promises that "to someone staying awake the *rces* will come and the samans, and Soma will declare him his friend;" 1.53.1 disparages poets who are not blessed with "the gift of quasi-sleeping;" in 8.44.29 Agni is described as "awake like a poet" (a theme repeated in 1.31.9, 3.24.3, and 6.15.8); in 3.26.3, Agni, "a finder of the sun," is described as "staying awake waiting for the gods;" and, in 9.107.7, "Soma is called *vipra* and *jagrvi* and one who makes the sun rise [Falk, op. cit., p. 80]." Also relevant to Soma's identity as a stimulant is 8.79.7-8 where the eulogist "begs Soma to be peaceful to the heart" and "to ward off excessive agitation," an acknowledgment that over-stimulation of the nervous system can result from drinking Soma [Falk, op. cit., p. 87].

After drinking Soma, the priests may have mounted all-night vigils in which they avoided social interaction and chanted in solitude:

It is in this light that RV 8.48.14 is to be read, where the poet expresses the wish that neither sleep nor idle talk should govern him after he has drunk Soma So it seems that at least some of the poetry of the RV was created at night. That *jagrvi* does not just mean 'alert', but refers to the night, when ordinary people are asleep, is obvious from all these stanzas, which connect someone awake with the hope of seeing the sun rise [Falk, *Ibid.*, p. 80].

Falk reinforces this point by examining a Soma rite described in the Brahmanas - the *Atiratra* rite of the *srauta* Soma ritual - in which the priests are described as staying awake all night:

The priests have to stay awake, because 'wakefulness means light' The priests have to keep the fire ablaze and must never be silent. Fire, Soma, and the wakefulness and speech of the priests guarantee the destruction of the demons of the

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night, i.e. they help Indra in his mythic struggle, and on the mundane level, the priests overcome misery [Falk, 1989, p. 81].

The source text states that the priests did not drink the Soma themselves until after they had spent the night offering it to Indra, which means they would not have drunk any of it until sometime the next morning; however, it is also possible that the priests consumed some of the drink during the night to help them stay awake [Falk, op.cit., p. 82]. In either event, Falk suggests that this *srauta* ritual is probably closer to ancient Indo-Aryan custom than the *Agnistoma* ritual which lasts only a day. If he is correct, there is a way to explain how a stimulant like ephedrine came to be associated with inspirational visions based on the neurophysiology of slow wave sleep that generates the meditation-induced, meditation-destabilized sequence of phosphene images. This explanation can account for the outbreak of paroxysmal visions whether or not the priests drank ephedrine on the night of the vigil.

Losing a night's sleep increases the excitability of cortical neurons, creating a potential for synchronized sleep rhythms to rebound in force at the first opportunity. If the priests tried to meditate in the early hours just before dawn - a time when the sleep rebound effect would be particularly strong - there would be an increased risk that sleep rhythm oscillators, once activated by meditation, would destabilize. Indeed, this is precisely what happened to the author at the time he inadvertently triggered the outbreak of a subclinical seizure, although his sleep deficit was slightly more pronounced (only four hours of sleep in the preceding thirty-six hours). During this paroxysm, the author saw the phosphene sequence (see Part I) which includes images resembling the Vedic visions of the Dawn-before-dawn, the Soma filter, the streams of purified Soma, and Indra's lightning bolt.

If, in addition to the sleep deficit, the priests also drank the ephedrine the night before to help them keep awake, this stimulation of the sympathetic nervous system would not only aggravate the sleep rhythm rebound effect but also enhance the hyperexcitability of cortical neurons by over-stimulating the sympathetic nervous system. We have noted earlier in this article that the final common pathway of many different kinds of shamanic trance induction rituals is over-stimulation of the sympathetic nervous system to the point of triggering a temporary collapse, and that this collapse evokes a physiological state of parasympathetic dominance similar to slow wave sleep. Therefore, if the priests began to practice meditation after a sleepless night fueled by drug-induced exhilaration, and in this process activated the sleep rhythm oscillators, the risks of triggering a destabilization of sleep rhythm oscillators would be even greater than if they had not consumed the ephedrine.

In both of the scenarios, the proximate cause of the paroxysmal phosphene visions is meditating while in a sleep-deprived condition, not the use of ephedrine per se, but even if ephedrine is only a predisposing factor, it would not be surprising, given the proximity of events - the vigil, the prolonged sleeplessness, the drinking of a strong, exhilarating stimulant, and the advent of paroxysmal visions of light - if the participants were to conclude that there was a causal connection between these events.

Or perhaps the priests knew all along that there was no direct connection between the Soma drink and the Soma visions; perhaps what was most important to them was the homology between the exhilaration they felt when they drank the terrestrial Soma and the vision of a sun-like Indra bursting into view just after the vision of Soma jets

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shooting out like milk from a cow's udder. Consistent with this interpretation is the famous verse which reads: "One thinks he has drunk Soma when they press the plant. But the Soma that the Brahmans know - no one ever eats that. / Hidden by those charged with veiling you, protected by those who live on high, O Soma, you stand listening to the pressing-stones. No earthling eats you. / When they drink you who are a god, then you are filled up again. . . . 10.85.3-5 [OFL, p. 267]."

NOTES

1. The translations for Patañjali's *Yogasutras*, verses 4.23 through 4.29, are my own. I was able to make translation, despite my rudimentary skills in Sanskrit, because this text can be read in conjunction with a source that provides word-by-word translations of the root Sanskrit terms [Feuerstein, 1989], because I had the template of meditation-induced phosphenes available for comparison, and because I could consult with Dr. Michael Witzel, Harvard, on words that seemed problematical (e.g., *nimnam*). Every published translation that I have read - and I've read many of them - uses 'experience-distant' metaphysical interpretations in the fourth chapter about Kaivalya, completely missing the possibility that these verses might actually be describing lights that would appear in the visual field. The template of meditation-induced phosphenes helped unlock the meaning of this text in much the same way it worked in the present study of vision metaphors in the RV.

ABBREVIATIONS USED

BH/W	Bhawe, S. S., <i>The Soma Hymns of the Rig Veda, Parts I - III</i> , 1957, 1960, and 1962, as quoted in Wasson, R. G., <i>Soma: Divine Mushroom of Immortality</i> (Harcourt Brace Jovanovich: New York, 1971).
DNG	Dange, S. A. <i>Divine Hymns and Ancient Thought, Vol. I: RgVeda Hymns and Ancient Thought</i> (NAVRANG: New Delhi, 1992.).
GRF	Griffith, R. T. H., <i>The Hymns of the RgVeda, Vol. I - II</i> (Chowkhamba Sanskrit Series: Varanasi, 1971 [1889]).
OFL	O'Flaherty, W. D., <i>The Rig Veda: An Anthology</i> (Penguin Books: London, 1971.).
WIL	Wilson, H. H., <i>Rig-Veda Sanhita: A Collection of Ancient Hindu Hymns, Vol. I - VI</i> (Trubner & Company: London, 1888.).

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GON Gonda, J. 1963. *The Vision of the Vedic Poets* (Mouton & Co.: The Hague, Netherlands).

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