

Does the Nervous System Have an Intrinsic Archaic Language? Entoptic Images and Phosphenes

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ABSTRACT

Psychoactive plants have been consumed by many cultures, cults and groups during religious rituals and ceremonies for centuries and they have been influential on the eruption of many images, secret and religious symbols, esoteric geometrical shapes, archetypes, religious figures, and philosophy of religions since the dawn of *Homo sapiens*. Some of the psychoactive plants used for religious purposes were: narcotic analgesics (*opium*), THC (*cannabis*), psilocybin (*magic mushrooms*), mescaline (*peyote*), *ibogaine* (*Tabernanthe iboga*), DMT (*Ayahuasca* and *Phalaris species*), *Peganum harmala*, *bufotenin*, muscimol (*Amanita muscaria*), *Thujone* (*absinthe*, *Artemisia absinthium*), ephedra, mandragora, star lotus, *Salvia divinorum* etc. An important property of these natural chemicals is to induce the human psyche to perceive optical forms and shapes that are existent in the subconscious and presumed collective unconsciousness, and which emerge during certain trance states and ASCs (altered states of consciousness). Some of these simple geometric forms are called *entoptic* images and *phosphenes*. Entopic images and phosphenes have been found in various cultural works of art and in the drawings on cave walls, which were formed during shamanic religious rituals since Neolithic times. Also *entoptic* images exist in many folkloric, traditional and cultural geometrical shapes. Long before the creation of languages, visual perception and information were the only source for mankind, alone of the primates, to perceive the outer world. This article reviews the possibility of an ancient forgotten language of visual signs and symbols, which is genetically existent in the human brain and emerges during ASCs, trance states, and consciousness altered by psychoactive plants.

Key Words: entoptic, phosphene, hallucinogen, archaic neurological language, paganism, shamanism, psychoactive plants, opium, cannabis, psilocybin, mescaline, DMT, ayahuasca, thujone, peganum harmala, phalaris, ibogaine, peyote, magic mushroom

DOI Number: 10.14704/nq.2014.12.3.756

NeuroQuantology 2014; 3: 427-445

Introduction

Some specific plants have certain chemical components that are psychoactive and induce hyper-excitation of the central nervous system (CNS) and hallucinations in the human brain. These plants may contain either central nervous

stimulants, such as *benzoyle-methyl-ecgonine* (cocaine's active ingredient, in coca leaves), a serotonin–norepinephrine–dopamine reuptake inhibitor, and mono amine alkaloid *cathinone* (in Khat); or a wide range of hallucinogens, such as: *mescaline* (in peyote cactus), *psilocybin* and

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Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Received: 7 January 2014; **Revised:** 14 July 2014;

Accepted: 2 August 2014



psilocin (in magic mushrooms, *Psilocybe cubensis*); *ibogaine* (naturally occurring psychoactive substance found in plants in the *Apocynaceae* family such as *Tabernanthe iboga*, *Voacanga africana* and *Tabernaemontana undulate*); *N,N-Di-methyl-tryptamine* (DMT, such as in *Ayahuasca brew*, *Mimosa tenuiflora*, *Diplopterys cabrerana*, *Psychotria viridis*, reed canary grass (*Phalaris arundinacea*) and harding grass (*Phalaris aquatica*), etc.); and *tetra-hydro-cannabinol* (THC, in *Cannabis sativa*) (Stafford, 1978; Shulgin, 1991-1997; Popik, 1995; Metzner, 1998; Krippner, 2011; Sayin, 2012a; Ruck, 2001; 2009; 2013a, b) (See figures of the former article, Figures-1, 2, 3; Sayin, 2014). The plants that contain psychoactive substances are found extensively around the globe, from our closest gardens or prairies and local farms to regional or national forests and far away to the distant Amazon rain forests. It is ironic that, although most of these active ingredients are illegal today and banned by governments, it is very simple to extract these hallucinogenic psychoactive substances from their specific plants in our home kitchens, without the need of a sophisticated organic chemistry laboratory and expensive extraction equipment, in as much as the ancient cultures operated in very primitive conditions.

The extensiveness and availability of psychoactive substance containing plants (PSC-plants) is one of the reasons that these plants have been utilized in most of the religious shamanic rituals of many ancient cultures. Some of the main reasons why the ancient cultures used those PSC-plants were: to unravel the “*unseen spiritual world*”, to solve certain daily philosophical questions and puzzles, to reach certain extraordinary “*peak experiences*” and to contact “*the spirits of the ancestors*”, etc. We come across the use of such plants in many ancient drawings or pictures, reliefs and sculptures. Also, there is ample evidence that most of the religious figures, such as mythological entities and creatures, gods, goddesses, demons, angels, etc. have close connections to what those ancient people were perceiving during the psychedelic rituals of shamanic origin (Stafford, 1978; Senn, 1989; Popik, 1995; Saver, 1997; Metzner, 1998-2002; Griffiths, 2006; De Corne, 2011; Krippner, 2011; Sayin, 2012; 2014; Ruck, 2006; 2008; 2009; 2013a and 2013b).

In most of the ancient cave drawings or the drawings on various objects, such as “*magical*”

shaman drums, we find the figures of the cross, sun, moon phases, planets of the solar system, demons, devils, spirits, monsters, personified or supra-natural animals, hunted animals, great spirit, out-of-body-experiences, flights to other worlds, talking to spirits and many other archaic images, which cannot be perceived during mundane daily consciousness. It is very difficult to accept the notion that it was possible, for the ordinary primitive man, to imagine and visualize such entities, which did not belong to his world and which he had never perceived during daily life. Considering that even old shamans were unlikely to imagine and envision such ingenious and inspired images without the aid of certain PSC-plants (Figure 1), we can hypothesize that these archaic and ancient images were drawn under the effect of PSC-plants and/or during many other trance states in shamanic rituals. During the last decades, a vast amount of archeological and anthropological items of evidence has accumulated, supporting our hypothesis, while many new discoveries were made about the correlation of shamanic trance states and PSC-plants (Stafford, 1978; Kent, 2010; De Corne, 2011; Sayin, 2012; 2014; Ruck, 2000; 2001; 2006; 2008; 2009; 2013a; 2013b). It is also interesting that some similar images were used in different cultures from the Amazon and North America, to the Middle East and Nordic countries, India and the Far East, while the ancient cultures living in those regions had no substantial connection and no means of communication with each other to transfer the knowledge or similar imaginative and visionary thinking; thus, supporting the hypothesis that these images are innate and they originate from the subconscious or collective sub-unconsciousness (Jung, 1968; 1981). It should not be forgotten that, primitive men and ancient shamans drew pictures of what influenced them profoundly during their trance states or their daily lives. Thus, we can continue our conceptualization that most of the supra-natural images, creatures, gods or goddesses which are widely distinguished in myths or religious stories could have been perceived during these psychedelic experiences, either by ordinary men or most probably by the religious monks and the shamans.

One of the most striking concerns is that these ancient drawings in different cultures that had no connections with each other have some common geometrical shapes, which we now call *entoptic images* or *phosphenes* (Figures-1, 2, 3). It was also an interesting finding that perception

of many different entoptic images occurs during the effects of many mind altering drugs and the administration of various PSC-plant extracts (Kent, 2010; Nichols, 2004; Ruck, 2006; 2009; 2013-a-b; Sayin, 2012a; 2014). Thus in this article we will discuss about the following hypothesis and conceptualizations:

- Most of the religious ideas, symbols, and images are innate; they already exist in our central nervous system.
- In many cultures, these religious archaic symbols and images were *mainly* seen and experienced during hallucinogen-induced altered states of consciousness (H-ASC), autohypnosis and other forms of trance that induced ASC.
- These religious archaic symbols were composed of many *common* geometrical figures and shapes shared in different cultures, which had no means of communication and connection; which is another proof that religious symbols, ideas, and images are innate.
- From the polytheistic religions of early times and paganism, to the institutionalized modern monotheist religions, it is unlikely that much information comes from outside of the organism, but rather it is mostly the unraveling of the subconscious and collective sub-unconsciousness.
- Phophenes and entoptic images may be an archaic form of symbolic language generated by CNS, by which, shamans were able to access an archaic ancestral information pool, which was important in the evolutionary process and the survival of the species.

Phosphenes and Entoptic Images

Phosphenes (literally "*light that shines forth*") are luminous, ephemeral signposts marking the landscape of the inner space of the nervous system, also known as "*Entoptic Phenomena or Entoptic Hallucinations*" (Kent, 2010). A phosphene is a multicolored shape or pattern seen in the darkness, without external visual stimulation, while no light shines on the retina. Phosphenes can be seen with closed eyes or in a completely dark room with open eyes. Phosphenes may appear as: spirals; exploding stars; glimmering and shining dots or spots; wispy clouds; wheels; tunnels; funnels; parallel lines; wavy lines; wave patterns, pulsating waves; dotted lines; zigzags, checkerboards; honeycombs; spider webs; dot patterns; circles

within circles; crosses; thin meandering lines, like lightning; geometric shapes, like triangles, squares, pentagons, etc. They may swirl, pulse, superimpose, fragment, shine, move in different dimensions, or morph into other images.

Phosphenes can be activated by the mechanical, electrical, or magnetic stimulation of some parts of the visual cortex and/or by the similar stimulations of the eyeballs and the retina. Phosphenes can also be experienced by hypnosis; reverie; fever delirium; fatigue; sensory deprivation; sweat lodges; profound concentration; hyperventilation; medicinal herbs; psychoactive drugs (such as psilocybin, DMT, mescaline, LSD, etc.); food and water deprivation; electrical and magnetic stimulation of the visual cortex; strobe lights; rhythmic movement; migraine headaches; meditation; meditation by means of shamanic drumming; trance states; intense emotion; stress; crystal gazing and other kinds of ASCs, etc. (Kent, 2010; Lewis-Williams, 1988; 2005).

Entoptic hallucinations are differentiated from eidetic (photographic) hallucinations in that they originate within the neural connections between the eye and cortex, as opposed to emerging within the cortex or midbrain. There is evidence that entoptic phosphene patterns have influenced human cultural and religious archetypes since 10,000 B.C. (Lewis-Williams, 1988; Pettifor, 1996). Several scientists have found that phosphenes have common features across cultural boundaries. Such findings point to a universal library of neurological optic symbols (Lewis-Williams, 2005). Does this mean that some kind of universal language of symbols is embedded into the nervous system, which become manifest when psychoactive plants are ingested? Is this one of the reasons that people are affected psychologically when they are exposed to flashing archetypal images? Flashing and revolving spirals, for instance, are often used to induce hypnosis, another unraveled ASC form of the human nervous system. *Swastika*, as an ancient archetypal symbol, was used by many different cultures; lately by Nazis as a part of propaganda and brain washing of the German society.

Can You Induce Phosphenes Easily?

If you have ever bumped your head and seen stars, those were phosphenes. You can, however, stimulate the appearance of phosphenes without hurting your head in the process. Hold your fingers over your closed eyelids and make very



slow and gentle circular motions or apply very gentle pressure. When images begin appearing, remove your fingers, keep your eyes closed, and watch the visions. Why does pressure on the eyeballs create phosphenes? Mathematician G. Bard Ermentrout explains that the pressure inhibits signals from the retina, thereby encouraging the brain's cortex to fill the void. The brain begins firing spontaneously and creates hallucinatory patterns. Distinct shapes are commonly seen in phosphenes. Phosphenes are said to be generated by the nervous system's intrinsic geometry. It is also hypothesized that phosphenes may be the behavior of atomic particles as observed by the naked eye: the interface of two worlds, the normal and the nuclear.



Figure 1A. Entoptic images drawn by the shamans of different cultures. A) A prehistoric drawing (30,000 years old) on a cave wall. B) A shaman figure on a cave wall found in Texas. It seems that the shaman was having a H-ASC, as the picture shows the symbolic flight of the shaman between the spritual world and this world. C) An old Celtic relief and drawing depicting a shaman. D) An old shaman drum found in Lapland, full of many magical drawings, probably trying to explain a lot of information in a small area, such as the experiences of H-ASCs and maybe some archaic ancestral information transferred during the religious ritual of the shaman with psychoactive plants.

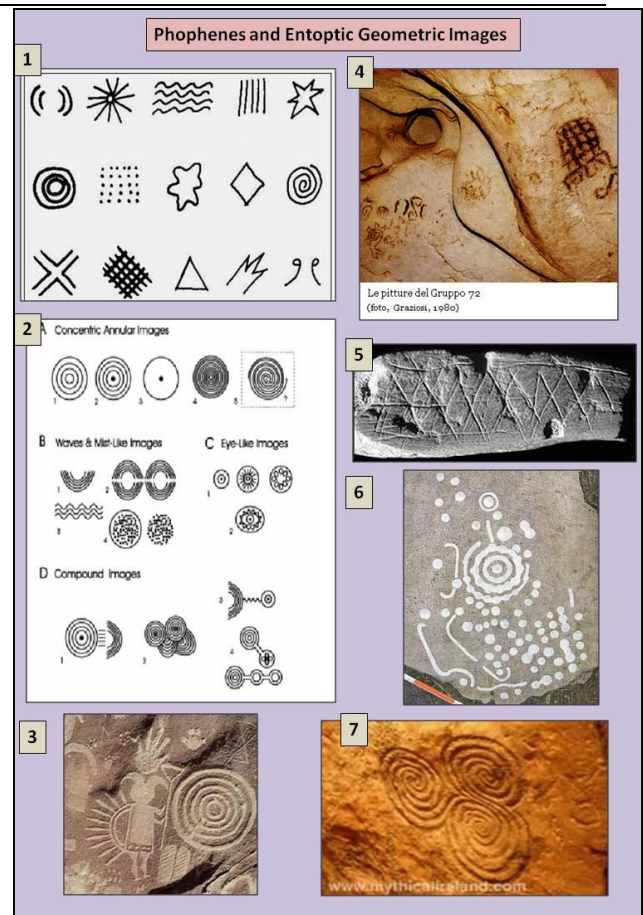


Figure 1B. Phosphenes and entoptic geometrical images; A Geometrical Archetypal Design of the Nervous System. 1) Entoptic phenomena and phosphenes which occur by means of the mechanical, electrical and magnetic stimulation of visual cortex, which are similar to the Paleolithic art patterns detected in the South African Caves. (Lewis-Williams, 1988) 2) More complex phosphenes; concentric circles, spirals, patterns of pulsating waves, compound circular images that occur during the consumption of psychedelic plants and drugs. The patterns are the basic geometrical forms that are engraved in the nervous system's network (Kent, 2010). 3) Shaman standing before the vortex? North American engraving. 4) Paleolithic phosphenes in Pileta Cave, Spain. 5) A very old (70,000 years) example of abstract art, one of the first examples accepted as abstract art, South Africa. This is an entoptic lattice. 6) Paleolithic cave wall carvings resembling phosphenes, Anebjerg, Denmark. 7) The famous Newgrange triple spirals resembling phosphenes.

Possible Neurological Mechanisms of Entoptic Images

The possible neurophysiological, electrophysiological and optical mechanisms of H-ASC and entoptic images will be a subject of another original scientific article, which will be published soon, since this article *merely* defines and describes the correlation of entoptic images and the archetypal model of neurological perception during daily life and the ASCs, induced by the PSC-plants; besides, there are



very few scientific studies and articles or reviews about the actual neurophysiological mechanisms of phosphenes, optical perceptions and entoptic images correlating them with the ASCs and the central nervous system's undiscovered mysteries. The topic of electrophysiology of ASC induced entoptic images is an untrodden zone of neuroscience.

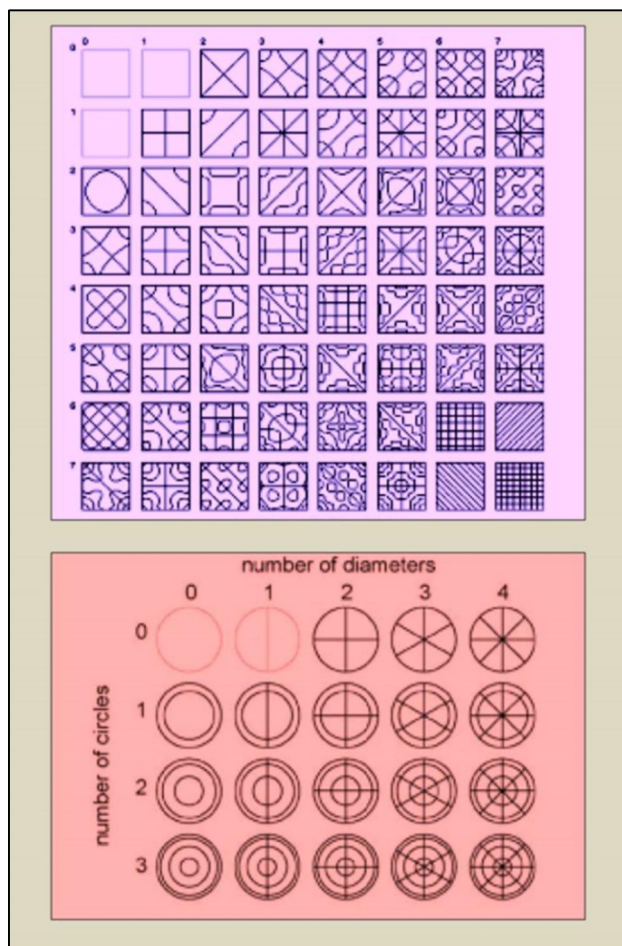


Figure 2. Chladni figures for a square steel plate (top) and a circular plate (bottom) demonstrate the variety of standing wave patterns generated in simple resonating systems. Archetypal forms generated in both rectangular and circular plates are isomorphic of flicker phosphenes seen at various frequencies of light pulse stimulation, and have been reproduced in textile patterns, ceramics, and sacred mandalas since roughly 10,000 B.C. Kent JL. *Psychedelic Information Theory: Shamanism in the Age of Reason*. Seattle: PIT Press, 2010.

Given the basic neurophysiology and electrophysiology of the central nervous system, the most important point we should stress is that entoptic images and phosphenes do not originate from the retina *only*, although some simple phosphenes can be activated by pressure or electrical stimulation of the eyeball. Entoptic images, most probably, originate from the occipital lobe, somato-sensory cortex, temporal

lobe, and parahippocampal gyrus, some different structures of the limbic system, hippocampus and paleo-cortex. The profound activation of some neurotransmitter systems, such as serotonergic system, GABAergic system and interneurons, cholinergic system, and dopaminergic systems, and deactivation of glutamatergic and noradrenergic pathways may also underlie the neurochemical mechanisms of the formation of entoptic images and phosphenes. *The hippocampus*, which is the phylogenetic locus for the three dimensional perception and the place of space recognition of the mammals and higher primates, is the main memory source of geometrical shapes and images, as well as the temporal lobe and some other limbic structures. The details of the possible electrophysiological, neurochemical and neurophysiological mechanisms of the formation of entoptic images will be explained in our future scientific articles.

Evidence suggests that the form constants of phosphenes are directly related to spatial relationships between the ring-like structure of the retinal cells and the grid-like or columnar neural structures of the visual cortex. The spontaneous production of geometric hallucinations is due to excitation and loss of stability in these retinal-cortical feedback coupling pathways. The transition from seamless visual aliasing to spontaneous geometric patterns can be described as a trans-critical sensory bifurcation reflecting the spatial organization of the recurrent network (Bresloff, 2002; Gutkin, 2003; Ermentrout, 1979). Pulses in the same frequency range as brain waves (theta to gamma) are most effective in producing flicker phosphenes. Flicker phosphenes created by stroboscopic lights or mind-machines tend to be more amorphous at low frequencies (1-4 Hz), tend to fall into web, spiral, or cloverleaf patterns at medium frequencies (4-9 Hz), and tend to lock into grid, honeycomb, or checkerboard patterns at higher frequencies (9-16 Hz+). Flicker phosphenes will have slow lateral drift at lower frequencies; a rotational drift at medium frequencies; and will maintain stability or produce fast lateral drift at higher frequencies. These phase-related transitions in standing wave shape are also seen in Chladni patterns created in vibrating plates (Figure 2). Presumably any technology which uses pulsating frequencies to produce phosphenes, such as trans-cranial magnetic stimulation (TMS), may also use pulses corresponding to the frequency range of human temporal aliasing to produce

substantially stabilized phosphene forms (Bokkon, 2008; Kent, 2010).

Expanded Sexual Response (ESR) and Entoptic Images

Recently a new phenomenon called “*Expanded Sexual Response*” (ESR) on female orgasm has been defined (Sayin, 2010, 2011-a-b; Sayin, 2012-b; Taylor, 2000, 2002). During ESR and prolonged orgasms some women reported that they experienced a form of short ASC; a further analysis also showed that they were able to see many entoptic images and phophenes during ESR and prolonged orgasms and *status orgasmus*, such as seeing flashes of light, spirals, whirling figures, circles and small bright stars etc. as seen during H-ASCs. A personal communication with Taylor, who first defined the term “*expanded orgasm*”, also revealed that she experienced phosphenes during prolonged orgasms (Taylor, 2000, 2002).

Taylor, who coined the term “Expanded Orgasm” (EO) in 2000 and the author of the book “*Expanded Orgasm*”, has described the entoptic images experienced during transcendental expanded orgasms for this article as a compliment!

“I cover my eyes...relax... surrender to the experience in all ways physical, emotional, spiritual, and mental... and continue to allow the dazzling starbursts to emanate from some central source from within, without flinching or turning away, or seeking a way During Expanded Orgasms, I frequently “see” internally-generated sources of light. For me, these lights are images that almost universally appear as stars bursting from a central source, and exploding into to periphery of my vision. Their color may be white, blue, bluish white, purple, or a rainbow of colors. These inner lights may be so intense that I instinctually cover my outer eyes with my hands; the light appears blinding. It’s not, of course. It’s just very, very bright, turn down the intensity of erotic stimulation. I find myself gazing into infinity. I can feel this starburst all through my body, going both into my deepest core, and out into the universe.”

Discussion

The data, examples and figures presented in this and the accompanying article preceding this one (Sayin, 2014) clearly show that;

- In many different areas of the globe and during very different periods of time, psychoactive plants were used for religious ritual and medical treatment purposes all over the world by many ancient cultures, since 40,000 years ago and until the latest centuries.
- Pagan cultures and shamans used these psychoactive plants for philosophical, religious, magical, healing and medical purposes.
- Most of the modern monotheistic religions have close connections and an implausible *nexus* to these pagan cultures, as it is in the case of *Jesus Christ*, who was presumably a continuation of ancient pagan gods, Horus, Attis, Mithra, Dionysus and Krishna (Acharya, 1999; 2004; Freke, 2001; 2002; 2006; Sayin, 2014; Ruck, 2000, 2013-a-b see the former article, Sayin, 2014).
- In most of the archaeological remains, cave drawings, reliefs, sculptures, motifs, miniatures, vase pictures, paintings of ancient cultures and religions, we can detect the traces of psychoactive plants and evidence that they were used for religious purposes, such as magic mushrooms, peyote, DMT-containing plants (*Ayahuasca*, *Phalaris* species), opium, cannabis, wormwood, *Tabernanthe iboga* (ibogain), etc.
- In most of the remains, cave drawings, reliefs, sculptures, motifs, miniatures, vase pictures, paintings of ancient cultures and religions, we can detect entoptic images and phosphenes, going back to Paleolithic ages.
- Entoptic images and phosphenes can be perceived during H-ASCs more frequently and profoundly than during the consciousness of daily life.
- The entoptic images, phosphenes, mythological figures, such as demons, spirits, gods, goddesses, angels, supra-natural creatures, mythical creatures (such as Pan, satyrs, nymphs, dragons, trolls, etc.) in folktales were, most probably, envisioned under influence of these PSC-plants during those religious ceremonies and rituals (Sayin, 2014; Ruck, 2000; 2001; 2006; 2008; 2009; 2012; 2013-a-b).
- Therefore, many ancient polytheistic pagan religious figures and/or some of the modern monotheistic religion characters,

figures or images have close relationships to the ASCs experienced during the PSC-plant ingestions throughout thousands of years since the dawn of *Homo sapiens*.

- H-ASC experiences in ancient cultures helped many archetypal symbols and figures emerge from the depths of the psyche, e.g. collective un/subconscious, reflecting itself in the cultural art and cultural motifs.
- Most probably, in *Homo sapiens*, the recollection of archaic information from the collective un-sub-consciousness enables the species to recall and learn the ancestral information pool, consciously, which may help the *Homo* species to adapt the environment and also to evolve in a better way. Thus, the ancient archaic information recalled during the religious rituals induced by PSC-plants may help the evolution of the *Homo* species and, also, the neo-cortex and the brain of *Homo sapiens*. (A similar argument has been put forth concerning rapid-eye-movement [REM] sleep, which is generated in one of the most primitive parts of the brain [pons and medulla in the brainstem—the rhombencephalon]. Motor-behavioral central pattern generators release primitive-archaic behaviors with associated dreaming that enable rehearsal of flight-or-fight and other protective responses to a variety of threatening situations, which can greatly enhance adaptation to the environment during waking life. These behavioral responses during REM sleep dreaming ordinarily occur with preserved REM sleep atonia [generalized skeletal muscle paralysis], thus protecting the dreamer from simultaneously acting-out his dreams and becoming injured with his eyes closed while attending to the dream environment and not to the actual sleeping environment. The loss of the normal REM- atonia in neuropathological and other conditions is the hallmark of REM sleep behavior disorder, a parasomnia in which the dreamer and the bed partner become injured during aggressive dream-enactment. [Carlos H. Schenck, M.D. Personal Communication].

As a conclusion it may be derived that H-ASCs induced by PSC-plants promotes “*mystical thinking, imagery, and symbolism*” and most of

this symbolism comprises very ancient, innate entoptic images, which exist in the depths of the psyche.

According to Kent, as quoted from his book *Psychedelic Information Theory*:

“Psychedelic information is generated within the domain of the personal; yet many people who take psychedelics perceive the information as having species-level importance. There are a few reasons for these phenomena. The first, and easiest, is that psychedelics create states of mania and delusions of grandeur in which the subject feels that he or she is the most brilliant person on the planet, or that they are receiving supernatural prophecy. Secondly, the subject may experience archetypal visions or sensations of transcendence that are perceived to be of high religious or mystical importance. Thirdly, the subject may experience a deconstruction of consciousness associated with animal consciousness, reptilian consciousness, plant consciousness, the Gaian mind, genetic-level intelligence, or deep species memory; information perceived to be of value to all humans or all living creatures. Because psychedelics produce all of these experiences they are routinely perceived as having species-level importance. Psychedelics are obviously useful in the domain of the personal; shamanism and psychedelic therapy rely on the information function of psychedelics to diagnose and heal. In the cultural domain psychedelics can be employed in ritual to build strong religious or tribal groups; they can be used in healing or sorcery; or they can be a catalyst for innovation and creative expression. Beyond this their value is ambiguous. There are some debates to be made in this area, such as pointing out that Francis Crick envisioned the spiral structure of DNA after he ingested LSD, or that LSD helped Kary Mullis think up the PCR process that earned him a Nobel Prize in genetics” (Kent, 2010).

Although Kent is correct that there are delusional, paranoid and psychotomimetic part of the psychedelic consciousness, his hypothesis cannot be accurate that psychoactive plants can be fruitful and productive in all human beings and users, most people use them for recreational purposes, which can be very detrimental for some and for many users. Actually, in ancient times psychoactive plants were used in religious rituals *only* by the people who were ready for it; not everyone had consumed them, other than the master shamans. *Psychoactive substances are not for everyone*. Only prepared, conversant, cultured, philosophical, educated

and ready people, who have a healthy psychological and neurological unity, should try them. In the case of Nobel laureates Francis Crick and Kary Mullis, LSD may have helped them to unravel what was in their unconscious and also increased the input of associations, whereas LSD is a very powerful central nervous system stimulant and association generator, as well as it can create the images, such as fractal geometry, three-four dimensional visualization and other computerized possibilities, depending on the background of the person, which normal brain and daily consciousness cannot perform.

Psychoactive plants, H-ASCs and Mystical Experience

Some recent research has found that administering psychedelic drugs in a supportive and good setting can induce profound mystical experiences; for instance, a recent study found that about 60% of volunteers in an experiment on the effects of psilocybin, who had never used psychedelic drugs before, had a “*complete mystical experience*” characterized by episodes such as unity with all things, transcendence of time and space, a sense of insight into the ultimate nature of reality, and feelings of ineffability, awe, and profound positive emotions such as joy, peace, and love (Griffiths, 2006).

Another study by Lerner and Lyvers (2006) compared people who used high doses of classic psychedelic drugs (e.g. LSD, mescaline and psilocybin) with people who used other illegal drugs, but never had tried psychedelic drugs, and people who had never used any of them. Psychedelic drug users endorsed more mystical beliefs (such as in a universal soul, no fear of death, unity of all things, existence of a transcendent reality, and oneness with God, nature and the universe). Psychedelic drug users also said they placed greater value on spirituality and concern for others, and less value on financial prosperity, than the other two groups. These findings are in accordance with other new findings from another study (Móró, 2011) that found that psychedelic drug users regarded spirituality as more personally important, compared to users of other drugs and non-drug users. These findings suggest that people who use psychedelic drugs consider themselves more spiritual than people who prefer other drugs or who do not consume any of these drugs.

It seems that psychedelic drug use and having spiritual and mystical beliefs and/or experiences have a correlation. Another study on psilocybin found that people who had never used psychedelic drugs before reported long-term increases in “*death transcendence*”, which meant that subjects expressed an enhanced belief system in continuity after death (MacLean, 2011). In this regard, Griffiths *et al.* found that of the volunteers, those fourteen months after ingestion of psilocybin for the first time, two-thirds graded the experience as in the top five for both “*most personally meaningful*” and “*most spiritually significant experience*” in their entire lives. About 64 % reported the experience had increased their personal well-being and life satisfaction over the fourteen month period. Additionally, volunteers said that they experienced positive changes in their attitudes towards life and to the self, as well as increased positive mood, peace with other people, increased feeling of well-being and empathy and a sense of greater altruism (Griffiths, 2006). These results show a correlation of psychedelic experience and an increased tendency to mysticism and a spiritual approach to other people and the universe. But, another skeptical explanation could be that mystical experiences could actually inflate the volunteers’ egos leading to some kind of grandiose false beliefs and *delusional thinking* about their superiority to others and also perceiving themselves as, “*they are more ‘enlightened’ than other people*”, like prophets. (Mirante, 2007).

As shown in Table-1, a study made by Masters and Houston among 206 LSD users revealed the fact that at least during more than 90% of the “*LSD psychedelic experiences*”, religious imagery was perceived (Stafford, 1978); while, at least during 58% of the “*LSD trips*” volunteers envisioned religious and mythological symbolism, such as cross, star of David, Yin-Yang symbol, etc. These findings strongly support the hypothesis that H-ASCs induce a powerful and influential mystical experience in the central nervous system of humans, just as throughout the hundreds of centuries since the foundation of old polytheistic pagan religions or some of the modern monotheistic religions; whereas we, *now*, know that most of the imagery and envisioning were induced through H-ASCs, ingesting PSC-plants during religious rituals. Therefore, mythological figures, such as demons, spirits, gods, goddesses, angels, supra-natural creatures, mythical creatures, Satan were, most probably, created by

humans who were having mystical experiences on PSC-plants.

Hallucinations may arise out of *entoptics* (Lewis-Williams, 1988; 1991; 1996; 2005).

Table 1. Religious imagery during an LSD trip among 206 subjects (Source: Peter Stafford, *Psychedelics Encyclopedia*, CA: Ronin Press, 1978; pp: 89. Experiment conducted by Masters and Houston)

Religious imagery of some kind	96 %	Miraculous and numinous visions	60 %
Religious architecture, temples, churches	91 %	Galaxies, heavenly bodies, creation of universe, of earth and solar system	11.4 %
Religious sculpture, painting, stained windows	43 %	Scenes from contemporary Christian, Jewish, or Muslim Rites	10 %
Religious symbols (cross, yin yang, Star of David)	58 %	Ancient Greek, Roman, Egyptian, Mesopotamian, and similar rites	67 %
Devils, demons	49 %	Primitive rites	31 %
Angels	7.0 %		

Entopic Images and Phosphenes

Supporting the hypotheses of Carl Gustav Jung (1968; 1981), Lewis-Williams *et al.* proclaim that human species have had the same nervous system in common, thence the same perception system, throughout the entire history, and that the persistence of certain *shared symbols* can be attributed to the humanity, not necessarily to a continuing symbolic tradition, but to *'the antiquity of the human nervous system and its consequences.'* Lewis-Williams and Dowson argue that *'entoptic'* be considered as a generic term from the Greek *'within vision'* and that entophthalmic is a more accurate label for phenomena originating in the eye; however, our assessment is that entoptic images do *not* occur *only* in the *eye*, but originate from many other areas of the central nervous system. These mental images are luminous, pulsating, expanding or contracting, blending and changing geometric forms. They include zigzags, dots, grids, meandering lines and U-shapes (Lewis-Williams, 1988; 1991; 2005).

Lewis-Williams and Dowson further break these down into *'phosphenes'* which can be produced by physical stimulation, and *'form constants'* which are produced beyond the eye in the cortex itself. It is these *"geometrical forms"*, which Lewis-Williams and Dowson primarily focus on, though they do not exclude phosphenes, and refer to both under the general term *'entoptics'*. They do, however, distinguish between *entoptics* and *hallucinations*. *Entoptics* are geometric patterns whose origins are in the nervous system itself, whereas *hallucinations* are iconic and culturally determined and may be experienced by all senses (aural, visual, tactile, olfactory and synesthetic), not just the visual.

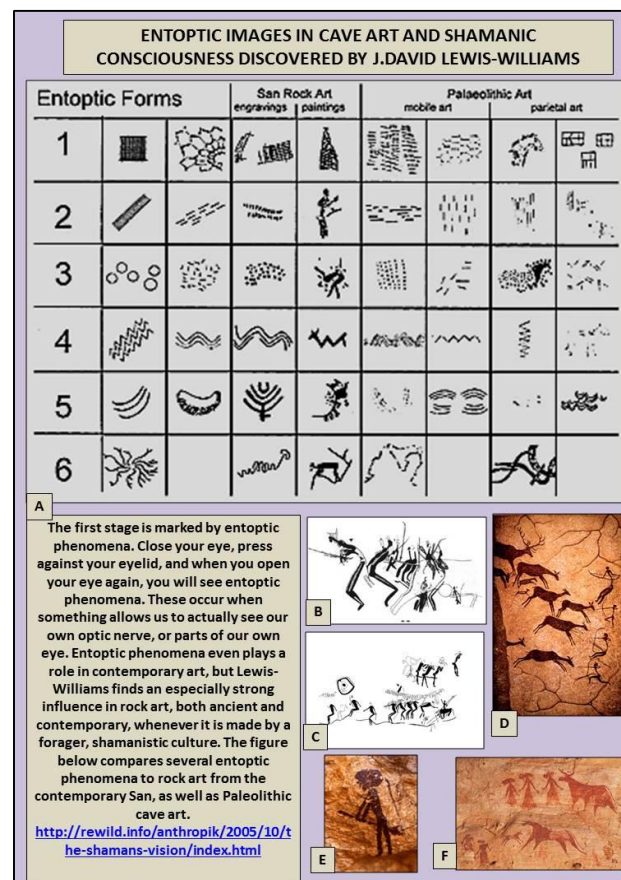


Figure 3A. The classification of entoptic images by Lewis-Williams and some samples of shamanic drawings from the walls of ancient caves.

Dronfield suggests the use of *'subjective visual phenomena'* to cover all probabilities, including entoptic, entophthalmic, phosphenes and hallucinatory visual experience (Dronfield, 1993). Subjective visual phenomena are visual perceptions which are *'generated'* or spontaneously released within the neural network of the visual pathway, having their source at various points between the retinas and processing areas of the brain, such as occipital lobe, temporal lobe or limbic structures. Almost all people are likely to have some kind of experience of such a phenomenon. Phenomena such as *'spots before the eyes'*, *'seeing stars'* or the flashes of color when rubbing or tightly closing the eyes are examples of phosphenes. The fuller range of phenomena can only be seen, however, by either induction of altered states of consciousness such as in hallucinogen intoxication, trance, stress, by stimuli such as flickering light or sensory deprivation, the



spectrum of dissociated sleep-wake states, or in certain psychopathological conditions such as migraine, epilepsy or schizophrenia (Dronfield, 1993).

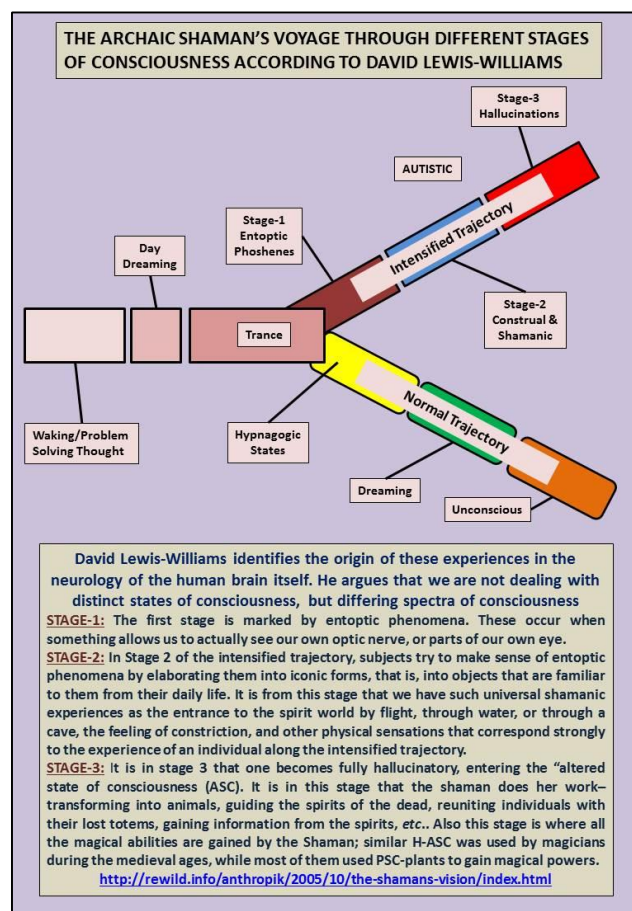


Figure 3B. The explanation of different consciousness states by Lewis-Williams.

The tendency towards “*geometrical formation and replication*”, as expressed in these form constants, is also apparent in the following two ways: (a) the forms are frequently repeated, combined, or elaborated into ornamental designs and mosaics of various kinds; (b) the elements constituting these forms, such as the squares in a chessboard design, often have boundaries consisting of geometric forms. At times, the boundaries are represented by lines so thin that it may be impossible to say whether they are black or white (Mirante, 2007).

In the 1950s, German psychologist, Max Knoll noted similarities between abstract patterns induced by electrical stimulation or hallucinogenic substances like LSD with patterns in Southern African art. Some researchers, like Heinrich Klüver, have suggested that the ‘geometry’ of hallucinations (mostly mescaline) actually reflects the

neurological structure and processing functions of the brain. Klüver was among the first to try and identify and categorize what could be considered as constants in hallucinatory experiences (mainly mescaline): (a) grating, lattice, fretwork, filigree, honeycomb, or chessboard; (b) cobweb; (c) tunnel, funnel, alley, cone, or vessel; (d) spiral. Many phenomena are, on close examination, nothing but modifications and transformations of these basic forms, as a result of the hyper-activation of neuronal networks (Klüver, 1966; Mirante, 2007).

The visual records of these experiences may be clues to a peculiarly efficient process for weakening the influence of socially mediated meaning, making unusual associations, and generating new metaphors. These neural artifacts and/or after images can be the clues of the psychological profile of the shamans, who were in a deep trance state.

According to the Lewis-Williams “taxonomy”, there are six types of form constants (Lewis-Williams, 1988; 1996; 2005): (1) grids, lattices, expanding hexagonal patterns, (2) sets of parallel lines, (3) dots and short flecks, (4) zigzag lines crossing the field of vision, (5) nested catenary curves, (6) filigrees or thin meandering lines (Fig 3-A). Apart from the six types of form constants there are also seven principles of perception: (1) Replication, (2) Fragmentation, (3) Integration, (4) Superpositioning, (5) Juxtapositioning, (6) Reduplication, (7) Rotation. More complex hallucinatory images are a variation and combination of entoptic form constants or the perception.

Bahn (1996), indicates the presence of phosphene motifs in the art of 3-4 year olds and questions their status as a similarity of trance and shamanic states. It must be pointed out, however, that 3-4 year olds have enormous associative capacity necessary for early learning. Their subsequent capacity for arbitrary associations (Bruner, 1978) and for generating metaphors is not disparate to trancing adults. Another interesting phenomenon is that 3-7 year olds have the capability of experiencing “*synesthesia*” spontaneously, which is lost when they grow up, without using any psychoactive chemicals or hallucinogens. Some children may explain music or taste in colors, or vice versa. This ability during the development of the central nervous system may also show that during the early growth period, the brain may be more open or more susceptible to emerging of



some other ancestral or archaic information which originates from the genetic background of the brain structures (Mirante, 2007; Simpsona, 1956; Green, 2008; Ward, 2013; Simner, 2014; Cytowic, 1989, 2003).

Researching the human ability to produce metaphors and symbols, Gardner *et al.* found that: "... the highest number of appropriate metaphors was acquired from the preschool children, who even exceeded college students; moreover, these 3-4 year olds fashioned significantly more appropriate metaphors than did children aged seven or eleven... This shows the capacity of at least some young children to perform the "finding metaphors game" at an astonishingly high level" (Gardner, 1979).

In *synesthesia*, we translate experience from one sense modality, say sound, to another, say tactile input or color. We speak of "hot music". The 'law of parallel alignment' is said to prevail. On the sound continuum of fast to slow, a certain kind of music, jazz, occupies a position parallel to that occupied by hot objects on the continuum of hot to cold. Metaphoric prediction is the same sort of translation, in our case of an incipient subject from one domain to another, and it can be conceptualized in relation to continua. Some synesthetic musicians see the notes and music as a painting; when they play piano, for them, it is like painting music in the air. Synesthesia is a natural capability of the nervous system, which also emerges during mystical and religious experiences during the rituals performed with the ingestion of psychoactive substances, and it can also be triggered by various brain pathologies (Cytowic, 1989, 2003, 2006).

Cytowic (1989) suggests that *synesthesia* is a cross-association phenomenon which takes place in the limbic system of the left hemisphere. About 5 in a million people experience one or more aspects of this phenomenon continually (generally the translation of sound into color), while most of the children experience it at a certain form during the different phases of neurological development. Other people most of the time induce an altered state of consciousness (ASC) to experience the synesthesia, such as through meditation, sensory deprivation, hypnosis or H-ASC. Synesthesia is a conscious peek of a neural process that happens all the time in everyone. What converges in the limbic system, especially the hippocampus, is the highly processed information from sensory receptors about the world, a multisensory evaluation of it. A multisensory awareness is something that has

been lost from conscious awareness in the majority of people, but exists in the metaphoric-archaic dictionary of the ancestral information, as a hidden language in the depths of consciousness and the limbic system. Like form constants, these cross-modality sensual associations are essentially meaningless but, for people who do experience them in altered states, they are often accompanied by emotional extremes. *Synesthesia* is like adding a new dimension to the 3-D world for evaluating the outer world in an easier and more explicable way by means of creating metaphors (Cytowic, 1989, 2003, 2006).

In most of the inner journeys attained by consuming psychoactive plants, the shaman experiences synesthesia and the recollection of entoptic images may be accompanied by synesthesia, as well. This may allow the psychedelic experience of the central nervous system to induce more profound metaphors and more variant allegories, related to the mystical experience, which is a form of recalling the ancestral information from the limbic system. Thus, the shamanic experience is like a "metaphor generation" with more variant, numerous and precise wall stones or Lego pieces to build a mystical unity.

Domination of Right Hemisphere, Parasympathetic Nervous System and the Limbic System during the Effects of Psychoactive Plants

During trance states and ASCs induced by PSC-plants, there can be a tendency to have brain functions facilitate a dominance of limbic system activity, right hemisphere functioning and enhancement of the parasympathetic system. The occurrence of limbic (septo-hippocampal) slow wave dominance is an example for these hyper-associative states of the trance. It is well known that parasympathetic dominance, also, usually occurs during sleep, meditation, and trance states, which takes the neuropharmacological focus of the sympathetic nervous system and "flee or fight responses" away, helping the person to loosen conscious associations in order to be able to integrate the new experiences that happened during the day into the long-term memory via DNA and protein synthesis— i.e., to learn and to upgrade the symbolic landscape, symbolic database and integrate the new information (input data) with the old, cultural archetypal information. Such a dominance of the parasympathetic



neurotransmitter, acetylcholine (ACh) in the pathways of septo-hippocampal system, which has been phylogenetically organized by many circuit connections into the amygdala and other structures of the limbic system, may prevail and allow the ancient information to come out, in connection with the new ones (Mirante, 2007; Cytowic, 2006). Entoptic images comprise the basics of such a revival. In children, such circuitries are more uninhibited and open, such that children may experience similar shamanic consciousness states easier. Similarly, endogenous psychoactive substances, such as DMT, secreted from the pineal gland, may be more active in the developing brain.

Neurotransmitters and Psychedelic-Shamanic Experience

Most of the psychedelic chemicals have been proposed to exert their actions through serotonin (5-HT) receptors; particularly, 5-HT_{2A} and 5-HT_{2C}. In the case of LSD, psilocybin, psilocin, DMT and mescaline mostly, serotonin receptors have been reported to be the targets for most of the effects of H-ASCs (Hintzen, 2010; Passie, 2008). How they can exert their numerous effects (Sayin, 2012a) by means of agonism in some 5-HT receptors and antagonism in others in the serotonergic pathways is still a mystery. A recent study about the bindings of various drugs on different receptors has revealed the affinities of psychedelic drugs to various receptors (Ray, 2010).

The mammalian 5-HT_{2A} receptor is a subtype of the 5-HT₂ receptor that belongs to the serotonin receptor family and is a G protein-coupled receptor (GPCR). This is the main *excitatory* receptor subtype among the GPCRs for serotonin (5-HT), although 5-HT_{2A} may also have an *inhibitory effect* on some areas such as the visual cortex and the orbitofrontal cortex. This receptor was first given importance as the target of serotonergic psychedelic drugs such as LSD. Suicidal and depressed patients have had more 5-HT_{2A} receptors than normal patients, which suggest that post-synaptic 5-HT_{2A} over-density is involved in the pathogenesis of depression. 5-HT_{2A} is expressed widely throughout the central nervous system (CNS), participating in post synaptic transmissions at most of the serotonergic terminal rich areas, including the neocortex (mainly prefrontal, parietal, and somatosensory cortex) and the olfactory tubercle; high concentrations of 5-HT_{2A}

on the apical dendrites of pyramidal cells in layer V of the cortex have been proposed to modulate cognitive processes. Activation by the agonists of 5-HT_{2A} induces hyper activation in CNS (Aghajanian 1999; Nichols, 2001; Hintzen, 2010; Passie, 2008; Barnes, 2011).

The 5-HT_{2C} receptor is a subtype of 5-HT receptor that binds the endogenous neurotransmitter serotonin. It is also a G protein-coupled receptor (GPCR) that is coupled to Gq/G11 and mediates *excitatory neurotransmission*, while it may have some inhibitory effects on the release of dopamine and norepinephrine at certain parts of the brain. 5-HT_{2C} receptors are claimed to significantly regulate mood, anxiety, feeding, and reproductive behavior. 5-HT_{2C} receptors regulate dopamine release in the striatum, prefrontal cortex, nucleus accumbens, hippocampus, hypothalamus, and amygdala, among others (Aghajanian 1999; Nichols, 2001; Hintzen, 2010; Passie, 2008; Barnes, 2011).

The 5-HT₁ receptors are a subfamily of 5-HT receptors that bind the endogenous neurotransmitter serotonin. The 5-HT₁ subfamily consists of five G protein-coupled receptors (GPCRs) that are coupled to Gi/Go and mediate *inhibitory neurotransmission*; accordingly, 5-HT_{1A}, 5-HT_{1B}, 5-HT_{1D}, 5-HT_{1E}, and 5-HT_{1F}. HT-1 receptor activation *decreases* cAMP. 5HT-2 receptor activation *increases* PLC (phospholipase-C). 5HT-4, 5-HT-6, 5HT-7 receptor activation also *increase* cAMP, thus mediating an *excitation* (Pletscher 1993; Aghajanian 1999; Austin, 1999; Nichols, 2001; Hintzen, 2010; Passie, 2008; Barnes, 2011; Sayin, 2012a). In most of the effects through activation or deactivation of cAMP and PLC, calcium-calmodulin system and minute changes in the intracellular calcium concentrations play a key role.

Although ibogaine, ketamine and PCP (phencyclidine) have some similar psychoactive effects or induce similar hallucinations, they act on NMDA receptors, and have no substantial binding on 5-HT receptors, while some hallucinogens work on sigma receptors and/or kappa opioid receptors, whereas opium does not have noticeable hallucinogenic effects. THC has no effects on 5-HT receptors, but binds on CB₁ and CB₂ cannabinoid receptors. Thus, the “*serotonin receptor theory*” and its correlation with the psychedelic drugs and H-ASCs is not *yet* a fully established one.



More importantly, SSRIs (serotonin reuptake inhibitors, used to treat clinical depression) that increase the serotonin in many parts of the brain, do not have any hallucinogenic effects, even in very high doses; otherwise all the people treated with SSRIs would be hallucinating if they overdosed themselves. If all the particular psychological effects of hallucinogens listed in our former work (Sayin, 2012a, Tables 1-A, B, C) were induced by the activation of *only* serotonin and 5-HT-1 and 5-HT-2 receptors, then a minute increase of 5-HT in the synaptic cleft would induce powerful hallucinations, because the affinity to 5-HT receptors, of the natural agonist 5-HT, of which concentrations in the synaptic cleft would be increased by SSRIs repeatedly, would be more potent than any of the hallucinogens.

LSD has an effect on nearly most of the 5-HT receptors, and dopamine receptors, most of the adrenergic receptors. Quoting from *Psychedelic's Encyclopedia* (Stafford, 1978):

“LSD is a very curious chemical. When given by injection, it disappears rapidly from the blood. It can be observed when tagged with Carbon 14 in all the tissues, particularly the liver, spleen, kidneys, and adrenal glands. The concentration found in the brain is lower than in any other organ - being only about 0.01 percent of the administered dose. [...] LSD is highly active when administered orally, absorbed through mucous membranes or through the skin, and is almost completely absorbed by the gastrointestinal tract. Concentrations in the organs reach peak values after only ten to fifteen minutes; then they decrease very rapidly. [...] Some 80 percent of ingested LSD is excreted via the liver, bile system and intestinal tract, with only about 8 percent appearing in urine. After two hours, only 1 to 10 percent is still present in the form of unchanged LSD; the rest consists of water soluble metabolites - such as 2-oxo-2,3-dihydro-LSD - which do not possess any LSD-type influence on the central nervous system. Psychic effects of LSD reach their peak about one to three hours following ingestion, when much of the substance has disappeared from the body's major organs, including the brain, though measurable amounts persist in the blood and brain for about eight hours.”

Another, important point is that LSD, of which plasma half-life is around 160 minutes, was reported to stay in the brain for only 20-40 minutes and then it is cleared out (Stafford, 1978; Hintzen, 2010 and www.erowid.org) long before its major effects start in several hours, but

the LSD-induced hallucinogenic “trip” starts 1 hour after the ingestion and lasts for 6-8 hours; this means that there is *substantially no* LSD (or very little) in the brain while a person is “tripping” on LSD; thus it cannot be *only* the molecular resemblance of LSD, which acts as a powerful hallucinogen even after 50 micrograms of an oral dose, to serotonin, to bind to 5-HT receptors as an agonist. So how does LSD exert an agonistic effect on 5-HT_{2A} and 5-HT_{2C} receptors during an 8-hour “trip”, after it is totally cleared up from the brain? Besides, many psychiatric anti-psychotic and anxiolytic medications stop the LSD trip, such as dopamine antagonist chlorpromazine and the powerful GABA_A agonist alprazolam, without having much antagonistic effect on 5-HT receptors. Thus, serotonergic mechanisms may play an important modulating role in the formation of psychedelic consciousness, but it is not likely that the 5-HT system is the *only* mechanism to explain H-ASCs.

The effects of hallucinogens can also be explained by an alternative hypothesis, such as “Gate-way Hypothesis”, as depicted in Figure 4. It may be possible that certain circuitries and loops in the brain (particularly in the limbic system) may have a capacity to experience psychedelic consciousness, working as a pacemaker, a specific area which we will coin as *Area Tempestas*. However, *Area Tempestas* is normally under the control of and inhibited by other hypothetical areas and circuits in the brain during normal daily life; some hallucinogens may be disinhibiting this gating mechanism, through an action which has not *yet* been discovered. Thus, some hallucinogens may trigger an innate mechanism in the brain, which already exists but becomes manifest during hyper-excitation states (probably, of several receptor systems and different pathways), to experience H-ASCs. Actually such a system exists in the brain; DMT is a natural neurotransmitter which is secreted from the pineal gland (Strassman, 2000); and the brain also has its own cannabinoid receptor system (CB-1, CB-2), to which THC binds, and there are endogenous cannabinoid ligands of these receptors, *anandamide* (arachidonoyl-ethanolamide) and *2-arachidonoylglycerol*, which exert hallucinogenic effects and were hypothesized to take part in the mechanism of psychosis (Koethe, 2009). There may be other endogenous hallucinogens which may be responsible of the formation of dreams and ASCs

(as in the case of hypnosis), along with DMT and endogenous cannabinoids.

A Forgotten Archaic Neurological Optic-Language (Visual Language)?

Let's go back to 90,000 years ago and let's imagine ourselves as cavemen/women of the Stone Age (let's call this man *sham-A*). We do not have a language, we can only mutter some sounds; there are no words, no sentences, no grammar, no alphabet and letters, no writing. Our technology is only fire and some tools of stone to hunt animals. The most important things in daily life and our only motivations are to find food and to mate for reproduction. But we have some concepts, which cannot be articulated. We have, say, 20 to 30 different sounds which may express those conceptualizations, such as: good, bad-evil, food, water, woman-reproduction, sun (or sun-god), moon, tool, baby, forest, sky, come, go, mate, eat, etc. We can draw some figures on the walls of the caves, using sharp edged stones. Just go back to those ages, put yourself in the place of the first *Homo sapiens*. Because of access to fire, and cooking meat and other foods, during the last couple of centuries, we have a more developed brain and motor control system of the neocortex, which has developed to make many conceptualizations, better hand movements and grasping. Most of our sensory and information input is visual and geometrical shapes, that we draw on the walls of the caves. We have some concepts, and we can add a group of concepts together, as the conceptualization of simple sentences; but we do not have numbers, syntax, grammar and abstraction of sentence making yet (Figure 6)! We put 3-5 concepts together to express ourselves in primitive sentences which can mean many things at the same time and we sometimes draw those symbolic shapes on the walls of the caves where we live.

Eighty to ninety percent of all the perception from the outer world was reported to be visual. The retina, which contains 150 million light-sensitive rod and cone cells, is actually an outgrowth of the brain. In the brain itself, neurons devoted to visual processing number in the hundreds of millions and take up about 30 percent of the cortex, as compared with 8 percent for touch and just 3 percent for hearing. Each of the two optic nerves, which carry signals from the retina to the brain, consists of a million fibers; each auditory nerve carries a mere 30,000 (Grady, 1993). The geometrical images,

which are distinguished between each other such as line, square, circle, ellipse, parallel lines, and concentric circles, are the main abstract geometrical shapes of our caveman. So he can make abstractions of the outer world in the shape of those images and geometrical forms to create conceptualizations to express himself. Throughout the thousands of centuries since 2,5 million years ago (the time of hominoids), until 90,000-80,000 years ago, those images have become ancestral information as building blocks in the nervous system for the abstract thinking of *Homo* species.

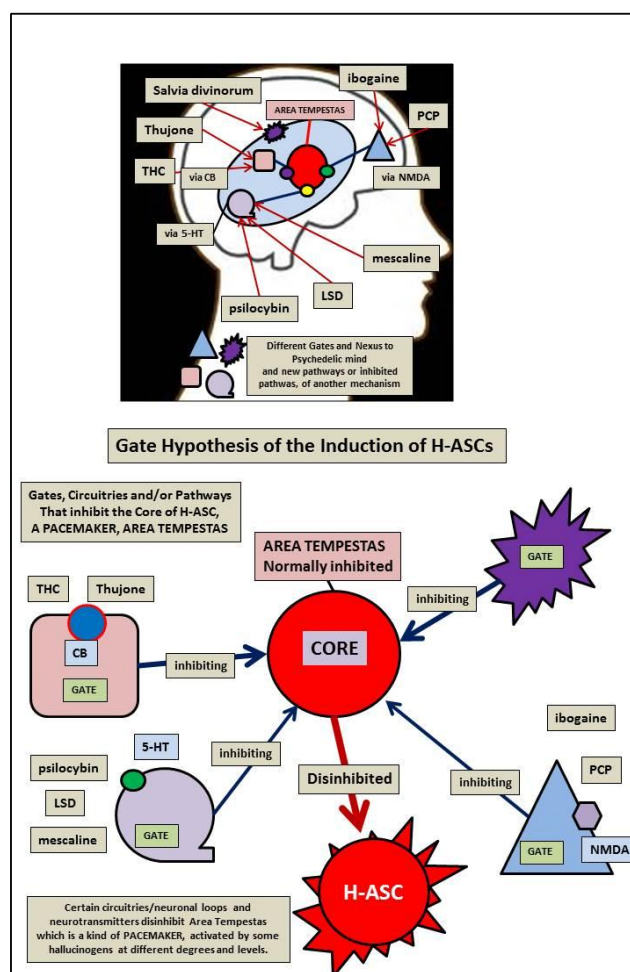


Figure 4. An alternative Gate-Way Hypothesis During the Induction of H-ASCs. Let's call this region in the limbic system as *Area Tempestas*, which is inhibited and dormant during normal life; but becomes active, as a pacemaker, when some hallucinogens disinhibit such a center, at different degrees and levels. *Area Tempestas* may also be disinhibited and activated by the shamans, by means of drumming, music, meditation, solitary confinement, sensory deprivation, self-hypnosis and other trance techniques to induce ASCs.

If we want to re-animate the ancient symbolism and cave art, and form a model for



the very old archaic information, Figure-6 depicts such a simple model. In the beginning there were very few abstractions, like food, good, bad, water, sun, moon, etc., whose expressions were important for the survival of the species. The early men and first shamans were aware of the importance of the sun, the source of energy for everything on earth. That is why since then; the sun was accepted as the creator, the *sun god*, as this first religious thought was repeated throughout the centuries.

The first concept of sentences was putting a couple of abstract figures together, as we see in the archeological findings in caves. However, those sentences could mean a lot of things as depicted in Figures-6-A and B (here we make up an explicit model, and none of the symbols, figures or syntaxes are real, as found in the old caves). 60 thousands years ago, there were probably some wise men, medicine men or shamans of the tribes; and they made some of those cave wall drawings about the most influential and important events of daily life (let's call these men *sham-B*). The first religion, depending totally on Nature, was important for the evolution and survival of *Homo sapiens* for many reasons.

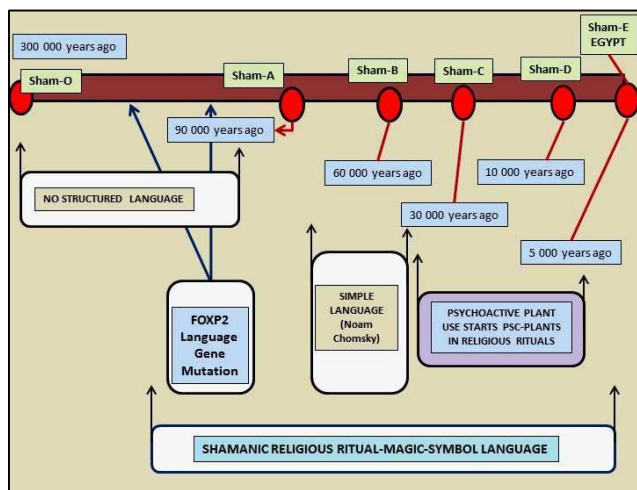


Figure 5. The time table that depicts some of the events during the last 300 000 years, related with hypothetical shaman ancestors Sham-O, Sham-A, Sham-B, Sham-C, Sham-D, Sham-E.

Probably, 25-30 thousand years ago, the medicine men and shamans were using psychoactive plants during their shamanic religious rituals, thus attaining a kind of ancestral information, which was important for the natural selection, adaptation of *Homo sapiens* (Let's call this man *Sham-C*). 10,000

years ago the ancient men established villages, domesticated animals, cultivated wheat and barley, made simple houses and still had those private religious rituals of shamans, sometimes with PSC-plants (Let's call this man *Sham-D*). The earliest psychoactive plants were probably ephedra, cannabis, opium and magic mushrooms, which were available for practical use everywhere (Merlin, 2003; Sayin, 2014). 5,000 years ago in Egypt, the shamans and wise men were able to write on papyrus (Let's call these Egyptian monks of Osiris *Sham-E*). Until 5,000 years ago, most of the entoptic images and the ancestral information were written on the walls of caves or villages; and/or on some stone tablets, sculptures and reliefs. If we call the first archaic *Homo sapiens Sham-O* (300,000 years ago, See Figure 5). Shams-A-B-C-D-E had the idea and information about the life experiences of Sham-O, even though there was no writing; maybe only the geometrical figures and drawings had an impact on passing on this information to *Sham-E*; however, if a kind of collective sub/unconsciousness existed, Sham B-C-D, somehow learned how to unravel this ancestral information while religious rituals and magic were a kind of means for such a recollection, and they had the urge or need to pass this information to the next generations by drawings, because this information was important for the survival of the species. They had to put the symbols and signs of psychoactive plants in the drawings, sculptures and reliefs everywhere to warn and inform the great grandson-shamans that this was the way to recollect some of the sacred information, because they were aware that in H-ASCs, they were perceiving the world differently, their philosophical thinking was changed; besides, they were speaking to the spirits of their ancestors (an unconscious delusion which made the limbic ancestral information free, in the form of spirits). Here the phosphenes and entoptic images must have played a very important role; since Sham-O, those geometrical shapes which were normal neurophysiological products of a computer system, such as neocortex, must have played a sign language to pass on the ancestral information. The only problem was, they were not perceived easily during daily life conditions; they emerged to consciousness when the shamans Sham-B-C-D were, most probably, ingesting those gods'-flesh sacred mushrooms or cactuses, or smoking *Ananda* (sacred) weeds (cannabis); they were sacred because they helped to release important ancestral

information, and of course they had to be kept very secret and discreet. We do not know yet what the structure of the language of the neuro-optic images could be, but such a neurological sign-symbol language would be essential to keep some conceptualizations in a certain format which could be passed over to the next generations when there was no real language, grammar, syntax and alphabet during the times of Sham-O and Sham-A or *even* Sham-B (Sham-B spoke a simple language).

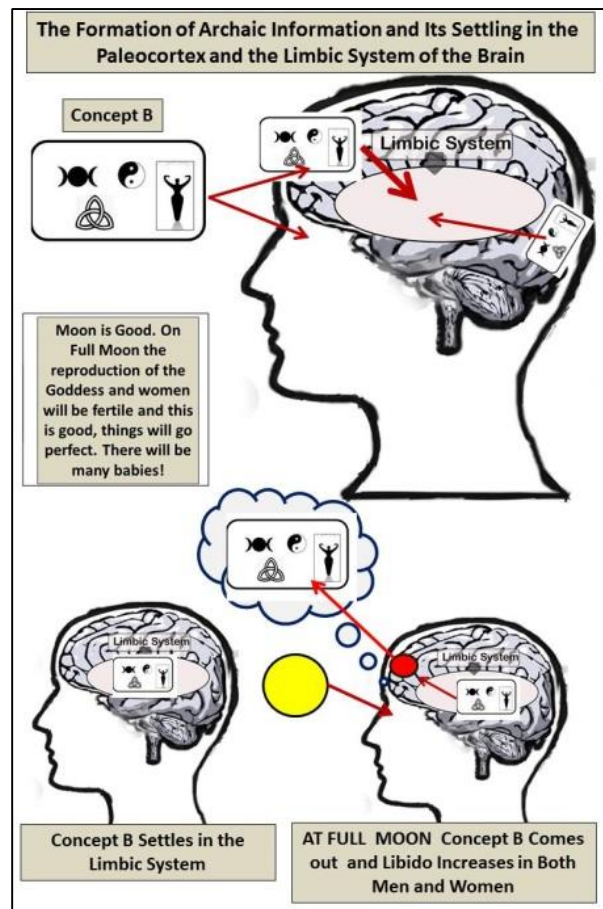
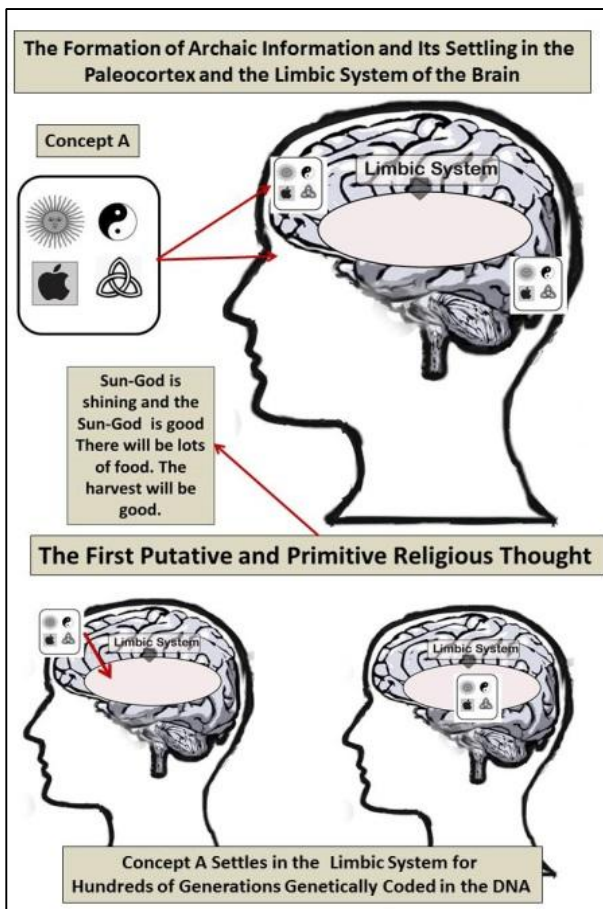
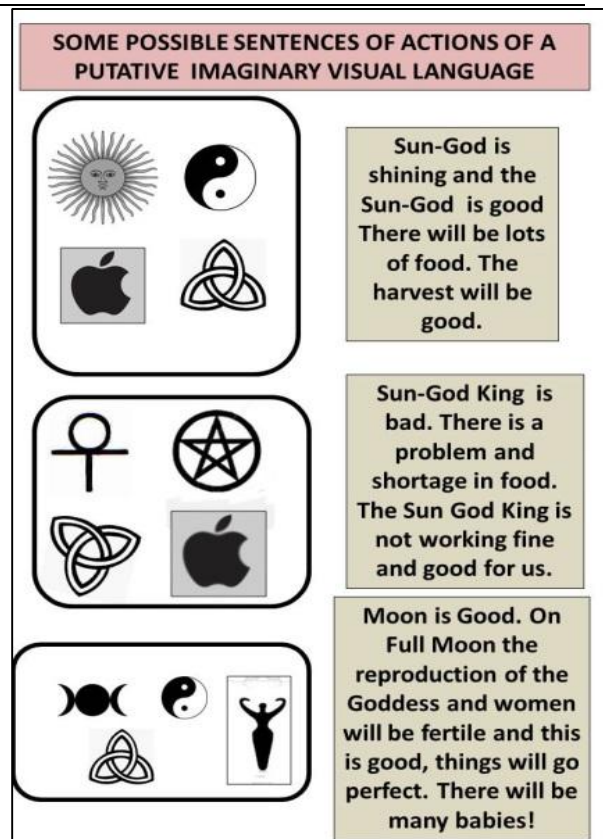
Conclusion

As the evidence provided above substantiates, a neurological innate symbol language, of which structure and wisdom are yet to be discovered, could have been effective to pass information to the next generations through unraveling of collective sub-un-consciousness since Neolithic Ages (Jung, 1968; 1981). The alphabet of this language consisted of, probably, the geometrical shapes which become overt in the form of entoptic images during religious rituals, when psychoactive plants were used to recollect ancestral information in some trance states.

Acknowledgements

I would like to thank Dr. Patricia Taylor for sharing her important information related with the phosphenes and entoptic images that emerged during expanded orgasms. I also would like to thank Prof. Carl Ruck and Prof. Carlos H. Schenck for reading, editing this and the former articles, and giving invaluable suggestions and insights.

Figure 6A. (Upper Left) Some putative simple expressions of the important conceptualizations in a primitive sign language. **Figure 6B.** (Upper Right) Some putative simple expressions of groups of the important conceptualizations in a primitive sign language, as the first primitive sentences. **Figure 6C.** (Lower Left) The primitive conceptualizations in symbols entered the consciousness of the primitive men (Sham-O, Sham-A, Sham-B). For nearly a couple of hundreds of centuries a kind of simple symbol language constructed by means of the experiences of daily life was perceived and recorded in the limbic system, coded in molecular forms and inherited to next generations (collective unconsciousness). This ancestral information was important for the survival of the species and transferred to next generations as unconscious coded-secret-sacred information which was not available to ordinary consciousness, but emerged during religious rituals, trance states of the medicine men and shamans. After the discovery of psychoactive plants, Sham-A and Sham-B used those plants in the religious rituals to unravel some ancestral information, while they thought they were speaking to the spirits of their ancestors during H-ASCs, induced by PSC-plants. Thus some important data base in the form of entoptic images and phosphenes (a neurological innate geometrical sign language) were transferred to grand-grand-grand-son shamans to protect and improve the species. **Figure 6D.** (Lower Right) The primitive conceptualizations in symbols entered the consciousness of the primitive men (Sham-O, Sham-A, Sham-B): Full Moon and its effects were important for the first primitive *Homo sapiens*. It is well known that some of the higher non-human primates and hominoids arranged their circadian physiological body cycles according to the Moon Phases, since it was very easy because of the bright light in the sheer dark nights of winters, even though Sham-O, Sham-A, Sham-B, had discovered fire. Some of the research on the female moon-phase dependent menstrual cycles showed that most of the females of the hominoids (until *Homo sapiens*) most likely had a trend to ovulate around a date close to or after full moon. So the intercourses and ejaculations were more likely to produce babies during the sexual interaction at the times of full moon. Thus through centuries this innate and trial-error learned information was carried to the next generations. This information was important for the survival of the species and it was kept in the molecular information format in the limbic system. Some *Homo sapiens* individuals were aware of this information instinctively; some became aware of this information during the religious rituals with PSC-plants, when the sacred ancestral information was transferred from the depths of the sub-un-consciousness. Moon phase and circadian rhythm case is only an example to clarify and to explain a possible model of the archaic neurological innate language. So only the appearance of the full moon made females uneasy and full of libido; while the sexual drives and libido in males and females (mostly) may have increased during the times of the full moon.



Please see previous page for **Figure 6** explanations

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