The cult of light, sun and fire, a psycho-physiological analysis

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Abstract:

Man has always been fascinated by light. The two main available natural sources of bright light are sunshine and fire.
Since the discovery of fire, Man was able to enjoy light and warmth not only by daytime but also by nighttime. The psychological effects of this new comfort had a deep impact on Man's primitive beliefs, mainly as a positive manifestation of the power of Nature.
By mastering the fire and especially its light, Man could establish a link with the almighty energy of the sun. Practically speaking, he could mimic sunshine.
Mime is recognized as an elementary act of magic, so the Master of Fire, who kept the flame going, was supposed to establish a privileged link and to communicate with the sun.
The shaman often communicates with other dimensions or other entities through trances or dreams, which include an important visual content.
These visions can be automatically produced, when staring to a bright light, by a physiological process called phosphene or after image. This is the result of the dazzle effect.
Phosphene appears after a short observation of any source of light. If this observation persists, the after image is superimposed on the source of light and its spontaneous variations of shape and color easily induce a trance, characterized by quite vivid visions.
This physiological process underlies all the traditional religious techniques implying the presence of a source of light, from the prayer in front of a candle to the cult of the sun.

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Since prehistoric time, Man has been fascinated by light. For him, the two main available natural sources of bright light were sunshine and fire. The most ancient traces of domestication of fire are dated from 450 000 years BC but its use has been generalized only 200 000 years after. We can admit that, since the discovery of fire, Man was able to enjoy light and warmth not only by daytime but also by nighttime. This implies the creation of an older than 250 000 years habit of being exposed to bright light.

Nowadays Man has even developed a form of addiction to the light. This photo dependency is observed in the symptoms of so-called "seasonal depression", mostly in western countries in autumn and winter, when Man lives under artificial lights and feels deprived of sunshine. The ordinary treatment is mere exposure to a bright lighting, reproducing the frequency spectrum of natural light.

The fascination for light is also present in all activities related to the observation of a luminous screen, from slide show to movie theatre and from television to computer. The observation of these light-emitting devices has become a very important part of Man's ordinary life. However, there is an important difference related to the nature of the light. The natural light, direct or reflected, is considered as relaxing, for example sunbathes, the reflection of sunrays on a lake or resting in

front of a fireplace. So is the reflected incandescent artificial light, which produces a cozy feeling.
The direct artificial light, especially neon lights produces tensions and fatigue, so do the television and computer screen. The main reason is the frequencies of the electrical AC power supply, which produce a flickering effect of 50 or 60 periods per second.
In Switzerland, at the beginning of this century, the hotels in high mountains were renowned for their peaceful atmosphere. They produced their own electrical power with DC generators and their lights were totally exempt of parasite flickering. Another example is the quiet stable light of a pocket lamp, working with DC batteries.

Man has domesticated the power of light. Artificial bright lighting of excellent quality is now possible 24 hours per day. Travels have become easier and easier, so it is possible to enjoy sunshine holidays all year round. Children and adults spend hours watching the television or playing computer games. The humanity is physically enlightened, unfortunately not yet in the spiritual sense.

However, this genuine quest for light has a psycho-physiological origin. A familiar but neglected side effect of the light is the dazzle.
This automatic physiological process forms a multi-colored luminous spot called phosphene, after image or subjective light.

There are different ways to produce phosphenes:

a. The after images following a dazzling effect by any source of light.
b. The phosphenes observed after rubbing the closed eyes or after a shock on the head, also called phosphenes by compression.
c. The phosphenes produced by electrical stimulation of the brain.

We will consider here only the first category: the phosphenes related to the observation of a light. The well-known example is the dazzle of the sun or the flash of a camera. As these experiences are rather unpleasant, we all tend to avoid them or to get rid, as soon as possible, of these colored parasites disturbing our field of vision.

In experimental protocols, the phosphenes are produced by a carefully controlled observation of an electrical light source.
The light of a halogen 50 watts DC bulb, filtered by a white silicate glass is turned on gradually during 10 seconds and observed during 20 seconds at a distance of one meter, then the light is switched off.
This after image is called post-phosphene, meaning consecutive to lighting. It stays visible during about 3 minutes with the eyes opened or closed. Total darkness in the room gives of course better result for exploratory observation. The shape of the phosphene is directly related to the shape of the light source. If the bulb is spherical, the after image will appear like a disc. If a triangular filter is placed in front of the bulb, the phosphene will look triangular.

When the light is off, the phosphene tends to move in apparently irregular movements, changes of colors, becomes darker and darker, then appears darker then its surrounding and gradually vanishes. It leaves finally a pale glimmer on the visual field, during about one more minute. This glimmer looks like a greenish cloud of a much bigger size than the phosphene.

During the first observations, it is necessary to become familiar with the experience and for example, to learn how to stabilize the after image. This happens with a simple act of will, by deciding to "bring back" the phosphene towards the center of the visual field. In daylight , with opened eyes, one could project deliberately the phosphene on an element of the visible surrounding and try to maintain it on this position before it vanishes.

The co-phosphene, coinciding with lighting is superimposed on the source of light and has the same properties as the post-phosphene. The co-phosphene is generally obtained by accidental dazzle or by staring voluntarily at a bright light, the sun or a fire.
In the physiological process of the production of a co-phosphene, there is a quite recognizable phase indicating that the after image becomes visible. After several seconds of observation of the light, the after image begins being superimposed to the light source with a distinctive blue shade. At this moment, it is no more necessary to stare at the light, the after image is perfectly formed.

In French language, the verb "éblouir", to dazzle, gives an interesting etymological perspective: "éblouir" comes from the popular Latin "exblaudire" which is related to the old German root "blaudi or blöde" meaning ocular fatigue. "Exblaudire" is also related to " bleu " the color blue. The phosphene was known as a direct consequence of the dazzle.

The colors of the phosphene change during the observation. Green and red are generally visible during the first minute, then the colors darken and loose their importance. The phosphene becomes an object quite distinct from the visual field. The mind tends spontaneously to focus on it and automatically concentrates on the observation of its variations of shape and color. This process induces easily a light trance, characterized by quite vivid visions appearing inside and around the phosphene. The visions seem to originate from the after image and can last much longer than the observation of the phosphene itself.

The after image reacts also to rhythmic movements exactly as if it was a physical object. When swinging the head from left to right at the rhythm of two second (one second forth, one second back), the phosphene follows exactly this rhythm by accompanying the movement of the head. At a faster or a slower rhythm, the phosphen stays immobile. This spontaneous body swinging on a rhythm of two seconds can be observed during meditation in many different cultures for example during the prayers of the Tibetan monks. Visions and rhythmic

movements are essential parts of trances and mystical experiences, which are the base of all religious systems.

This rhythm of two seconds influences also the thoughts. The rhythm is an essential component in poetry, litanies, prayers and spells. When given a rhythm, a thought gains precision, density, and power. Its intentionallity is reinforced and its suggestive or auto-suggestive properties become much more efficient.

The automatic physiological process of the phosphene can be analyzed as follow:

1. Voluntary or accidental observation of a source of light.
2. Spontaneous apparition of the after image.
3. Concentration on subjective visual field.
4. Focus of the attention on the after image.
5. Spontaneous rhythmic body movements.
6. Spontaneous rhythmic thoughts.
7. Trance, visions, mystical experience.

This process underlies all the traditional religious techniques implying the presence of a source of light, from the prayer in front of a candle to the cult of the sun. From prehistory, by mastering the fire, Man established a link with the almighty energy of the light. The Master of Fire, who kept the flame going, was spending most of his life watching the light. Through trances, he induced mystical experiences, which opened his mind to spiritual dimension.

In his book "Myths, dreams and mysteries", Mircea Eliade describes the mystical experience of the Eskimo Iglulik candidates to shamanism:
"Finally the candidate obtains the "flash", the "illumination" (qaumaneq) which is decisive. It brings to him a new sensitivity and reveals capacities of extra-sensory perception.
The qaumaneq consists in a mysterious light that the shaman feels suddenly, inside his head, in the center of his brain, like a bright fire, which allows him to see in the dark. Because now, even with closed eyes, he can see through the dark and know things and future events normally hidden to other men. Nothing is anymore hidden from him. He can also discover stolen souls even if they are kept in mysterious foreign countries or if they have been carried to the land of the Death."

The shaman cultures still consider that in general, anybody can become a shaman, as long as he follows a personal vocation. This idea implies that certain practical techniques or initiations allow learning how to become a shaman. The psycho-physiological process of the observation of the phosphenes is one of these techniques, quite remarkable by its simplicity.

All the cultures, which associate the prayer with the observation of a light, like the sun or the fire, have used this process voluntarily or not at a certain stage of their evolution. For example, this is true for:

- The Egyptians, who adored the sun during the reign of king Akhnaton.
- The Zoroastrians in ancient Persia, who worshipped the fire and prayed in front of it.
- The rites of initiation in Eleusis in ancient Greece.
- The religion of Mithra, where the future initiate should stare at burning torches in a dark cave.
- The hunters in some African tribes stare at the flames in the fireplace to find where is the game.
- The old Australian Aborigines who sit in front of their fire, trying to communicate mentally with distant people.
- The shepherds who pray at sunrise and sunset. Most of the miraculous apparitions in Roman Catholic Church happened to children shepherds.
- The witchdoctors in Burkina-Faso looking for a vision, who stare at the reflection of bright sunshine on the surface of a plate full of water.
- The soothsayers using mirrors, crystals or light reflection.

The process of the phosphenes was re-discovered and studied by Francis Lefébure (1916-1988), a French physician, from Paris. In 1960 he published a first study on the rhythms of the phosphenes, followed in 1963 by a new method of pedagogy and self-development based on the interaction of the phosphenes and the thoughts. From this time he worked essentially for the improvement of this method and proposed psycho-physiological explanations of many religious rites and initiations in "Phosphenes and the origin of religions".

I had the privilege to study neuropedagogy and work with Dr Lefébure during ten years. I want to honor his pioneering researches by dedicating this lecture to his memory. Dr Lefébure's original work shows a practical way to those who want to walk a step ahead on the stair of evolution and become Masters of Light.