

## Foundations of the Research

### The “Religious” Problem and the Origins of Consciousness

If by “religion” we mean (1) a structured system of repeated and repeatable cults and rituals, (2) a reference to alleged divinities or supernatural beings, (3) the existence of some kind of officiants’ hierarchy, (4) places specifically assigned to this purpose, and (5) a notable number of followers or believers who recognize themselves in these practices, then there is no doubt that such a religious or proto-religious form in so-called prehistory did not exist, at least until the Middle/Late Neolithic period. Moreover, the worldwide distribution of “advanced” religious forms took place gradually and in different and widely separated places. Extensive world areas were as yet excluded from it when such anthropological phenomena began to appear in India, Egypt, and the Middle East.

Leroi-Gourhan’s palaeontological researches systematically demolish the insubstantial “scientific evidence” about presumed cults of the bones, the mythical cult of the bear, and funerary rituals demonstrating with purported certainty the existence of postmortem expectations. The discovered finds are too scarce and the possible number of variables too high. He concludes, not without some justified sarcasm:

Prehistory is a kind of clay-headed colossus, whose fragility increases as one ascends from the ground to the head. The colossus’ feet, made up of geological, botanical and zoological evidence seem solid; but already the hands turn out to be more friable, since the study of prehistoric practices is marked by a large conjectural halo.

As for the head, this one, alas!, crumbles at the slightest touch . . . the prehistoric man modifies his own religious personality, and now appears as a bloody sorcerer, then devout collector of ancestors' skulls, and again rutted dancer or sceptical philosopher—according to the authors.<sup>1</sup>

The complete ignorance by many scholars of the role played in prehistory by *Non-Ordinary States of Consciousness* (henceforth NOSCs) and associated psychoactive substances has deep historical roots. None of the researchers from the end of the nineteenth century on have dealt with the “primitive mentality,” the epiphany of the “sacred,” archaic supernatural beliefs, or magic and proto-religious “visions.” None have ever dealt with the matter of the origin of the sacred from a point of view we may call “laic,” that is, as a result of knowledge acquired over a period of time employing actual tools able to act on the mental faculties, tools capable of enlarging the psyche of normal consciousness, the ordinary perception of reality.

Many are the renowned names involved, from Comte and Durkheim to Malinowski and Lévy-Bruhl, to Frazer and Eliade. We should not really be surprised by such ignorance in light of Enlightenment Positivism, Historical Materialism, and Judeo-Christian culture, each of which has established and different reasons, sometimes opposed, to evade recognition of the importance of the NOSC and its influence on human evolution.

It is quite clear that Palaeolithic prehistoric man was essentially a “technological man” driven by a condition of necessity aimed at resolving primary survival needs, and that this “habit of mind,” this practicality, predominated in his behavior even in areas not strictly linked to impelling material needs.

Giving a name to surrounding objects and phenomena is the first step in making them less dangerous and more intelligible; the next step lies in establishing cause and effect relations that work if they are repeatable and allow the “subduing” of objects, phenomena, or associations.

That fire burns, warms, lights, and cooks are facts that don't need scientific explanations, but that it could be initiated and controlled is already a subsequent shift to a relationship between fuel, supporter of combustion (oxygen), and tinder. That through either lightning or spontaneous combustion, regarding it as a “gift” from the heavens with a contribution of spirits of the air and Father Sun

is simply another way to signify the same concept that has nothing “religious” about it, even if it introduces as magical a vision of things prescientific:

It is true that remarkable differences in structure and functionality are found between religion and magic, between the priest’s and magician’s ritual practices, but the culture medium is the same, and one wouldn’t at all say that the differential characteristics disfavour magic. Ancient tradition, open to individual experience and creativity, the active initiative of making, the inventive and feverish practice of the “arts” and “works,” of industrious activities on natural phenomena and events, has for millennia often been typical of magical practices. We see evidence of such practices even in the late Middle Ages and the Renaissance, in pre- and para-scientific research. Mauss and Hubert wrote: “For its practical purposes, the mechanical characteristics of many of its applications, the pseudo-experimental appearance of some of its main notions, it [magic] resembles the laic techniques” (*General Theory of Magic*, pp. 86–87). And further: “Magic is essentially an art of doing and the magicians have carefully used their know-how, their *tour de main*, their manual skill. It was the future of pure production; it does with words and gestures what technicians do with work. Fortunately the magical art has never gestured in vain. It has dealt with matters pursuant to real experiences as well as discoveries” (p.139). The same magical attitude towards nature, acting upon it according to its laws, and even violating or modifying them as well, is generally a predisposition to scientific acting and technological inventiveness. This, in antithesis to the religious attitude of submission to the “sacred,” of dependence “as creatures,” subjects to the divine, etc.<sup>2</sup>

We may note also that the alleged “cult of the dead” is very far from a merely religious vision of the phenomenon. On the contrary, it seems consequent upon a quite material logic. The body without life is for a certain period persistent to the individual who has inhabited it. As such, it has to be preserved by burial, protecting it from carnivores’ forays. It has to be nourished with foods, herbs, and

supplied with tools that are stored in the tomb in order to allow the deceased a continuation. And finally, affection for the dead requires the preservation of the bones, nothing more and nothing less.

It is quite normal that in the first close-knit communities specialization of family and multifamily tasks were begun, the sturdier, braver, faster, healthier, the ones better endowed with a sharper sight and manual skills, became hunters and warriors. The women devoted themselves to bringing up the children, gathering and selecting herbs, tubers, roots, mushrooms, fruits. Early experimentation in this field must have been dramatic, especially in lean times, with the significant risk of ingesting poisonous and toxic substances, some with the deceit of pleasant tastes. And it is surely through such trial and error that the existence and use of psychoactive and hallucinogenic substances entered into our ancestors' store of knowledge and experiences.

Very probably the first discoveries and revelations about the "other" vegetal properties dealt with pain reduction and curative uses, but also other less-explored hypotheses are possible. For example, at low doses the *Psilocybe* mushrooms seem to enhance one's attention and concentration level and sharpen visual perception and discriminating abilities, a useful result for hunting. Other substances such as coca leaves, but also the fly-agaric, enhance resistance to fatigue and hunger, augmenting performance abilities for any tasks at hand.

Evolution generates new occupations and stores of knowledge that could be socialized and exchanged. The shaman-healer, man or woman, is one such agent or "employee," whose natural habitat was a specific metacommunicative context, the "wild nature" dimension<sup>3</sup> propaedeutic for entry into other dimensions inaccessible in the ordinary state of consciousness of daily routine.

To find today a "wild nature," a forest, taiga, or desert, we have to make long and expensive journeys and the charm of the place can be quickly extinguished by a passing aircraft or the untimely trill of a mobile phone. The same safety-ensuring conditions with which we travel, (weapons, food, medicines, various suitable technologies) make doubtful even the possibility of this particular relationship with nature.

During the prehistoric epoch it was sufficient merely to exit one's cave or hut to be plunged into this certainly dangerous but also undoubtedly exciting and imaginative dimension. It was in this not only geographical but also mystical place that the senses resounded, expanded—the emotions, discoveries, and curiosities fed not only the body but also the spirit.

From an ethnological point of view,<sup>4</sup> we identify three kinds of shamanism: (1) an elemental or primary one aimed at ensuring a positive outcome in hunting, good health, fertility, (2) a secondary complex shamanism dealing also with home, familiar, and community rituals, with a greater formal complexity and employing plenty of *paraphernalia*, and (3) a syncretic shamanism acting in parallel with complex religious systems (Lamaism, Hinduism, Shintoism, etc.), predominantly female. The clients of the first two typologies are restricted to family clans and the village, while the shaman's common features seem to be typically individualistic concerning both the powers exercised and the knowledge transmitted. He seems to operate in relative solitude, and there isn't in fact a shamanic coterie, a group of specialists who consult and collaborate.

In this case as well the hypothesis of a religious significance appears very feeble at best, if not nonexistent. That the shamanic tradition is ancestral and provides for the abundant use of psychoactive substances is acknowledged by the great majority of experts on this topic, and supporting references coming from the study of rock art are numerous. We will revisit this subject repeatedly in the following chapters. It remains here to understand how the origins of the religious problem arose.

It is merely hypothesis, but, paradoxically, it could be precisely the absence or the transcendence of the shamanic figure (also through forms of mythical deification, see Dionysus, Morpheus, Odin, etc.) and his substitution that has quickened this course.

In absence of the shaman-interpreter, the decoder of visionary mysteries, there is room for a plurality of points of view (this is in fact the meaning of the word *Darshana* in Hindu philosophy). This multiplicity requires wide-range cosmological and unifying systematization. It is significant that the authors of the most ancient texts, such as the Tantra and Taoist writings, are unknown, but the passage to such complex and still very laic forms, taking other roads in other contexts, studded with divinities to soothe and worship, is an evolution of the natural "spirits," both animal and vegetal.

But beyond the codification of spirituality, the sacred, and the mystic, a more mundane problem arises: the administration of the political power that follows.

The concept of a "visionary élite" implies the existence of a group invested with power that is preserved over time, through the political-religious management of the authority conferred by the

knowledge procured by the visions (as in psychopompic and funerary rituals of the Neolithic epoch). The result being that the rest of the population is excluded from direct experience and practices of the vision.

The élite's power concerns not merely the ability to manage ecstatic techniques, whether or not they employ supporting psychoactive substances. It is more complex, since it implies the political ability to extend to the group the "fruits" of the vision "metabolized" by the élite, and to manage the resulting power, creating an expectation in the larger group, the aforementioned "believers," who believe without directly sharing the vision itself.

The neuropsychological approach thus complements sociological accounts of the political role of megalithic tombs by identifying types of "spiritual" experience and showing how this experience and its imagery may have been manipulated and keyed into the structure of the tombs to reproduce social and economic domination.<sup>5</sup>

During the passing of time, the visionary élite sets itself up as a caste, obtains temporal power, generates affiliations and social structures, deepens and codifies its knowledge, and with the advent of writing historicizes the resulting religious edifice to make it temporally enduring. The result is that it becomes even more "true," increasing the consent of the masses, and also becoming productive from a material, economic, and political point of view. It aids the occupation of new territories, the management of the masses, the control of sexuality and male-female relationships, it invents prayers, sacraments, and apotropaic gestures, which replace the old magic with a new one, it purports to open a preferential channel with the divinity, drives away previous beliefs, and creates cult locations: The Age of Religions has arrived.

The use of psychoactives now becomes "sacramental" and continues as before, even more so and openly in, for example the pre-Columbian civilizations. It becomes masked by new denominations, the Moly in the mythical Kabiria, the Kykeon in Eleusis, the Babylonian Aradea, the Vedic Soma, the Persian Haoma . . . The suspicion is strong of the presence of such a feature in the Egyptian cults as well as in Buddhism, Mithraism, even Christianity, whose

iconography is studded with hallucinogenic mushrooms from as early as AD 500.<sup>6</sup>

Primitive mentality seems to be ruled by an elemental dualistic principle<sup>7</sup> very similar to what happens in the infantile differentiation process. The plurality of opposites introduces an order into the world and nature: night and day, hot and cold, hunger and satiety, pleasure and pain, sun and moon, rain and drought, male and female. These are the logical constitutive relationships of space-time of the individual and the group, the base elements around which there is collective agreement, a shared reality thus leading to culture construction.

The process primed by psychoactive substances in particular and more generally by NOSCs, involves a suspension of this shared reality, introducing unexpected variables, remodeling the dualistic scheme of thought, putting in a critical position the certainties of the consensus reality. The process certainly forces questions about existential complexity and the order of the world. The experience is the “dream” and dreamer’s dimension, a fruitful dimension, creative, also mystical and spiritual, even religious if set and setting promote such an outcome. But that was not the case with prehistoric man. It follows that

[t]he so-called technologies of the sacred are just this: technical devices, which are sometimes extremely refined, devices that redefine and confirm cultural equilibrium, devices that repair, metabolise and resist through recall, reconfirmation, and re-elaboration within the structure of the fundamental codes. Likewise, consider the induced NOSC as a passageway into the organism, by means of an individual or group representing a specific culture. A crisis, a questioning of the human organism or the shaping of the universe, all of these things are cognitised, thus making way to confirmation of the fundamental cultural regulators, to a neurovegetative retuning, to the expression of the emotions registered in the body.<sup>8</sup>

The Jungian analyst Erich Neumann devoted one of his texts to an extensive analysis of the origin of consciousness.<sup>9</sup> He takes into consideration the mythical aspects of the phenomenon and secondly the involvement of an analytical-clinical level. The two points of

view are somewhat removed from our psycho-anthropological evaluation presented here, but it is necessary to briefly sum up Neumann's idea of mythical evolution. At the beginning there was *Uroboros*, represented by the Egyptian symbol of the snake biting its tail. This symbol of "eternal return" preceded the arising of the opposites, and the meaning is also associated with the circle, the mandala, the womb and amniotic quietness (the first perinatal matrix according to Stanislav Grof). In the second stage, the archetype of the Great Mother dominates, who for Neumann is essentially a devourer and exacting "bad mother" who establishes a control on sexuality and fertility (Cybele and the castration rites). Overcoming her implies the separation of the rebel male from the Great Mother, who in the origins of *Uroboros* was both male and female at the same time.

This second stage therefore implies the "separation from the parents of the World," the origin of the opposites, in the spiritual sense the opposition between Light and Darkness, Me and You, male and female, the range of the opposed emotions and therefore also of a primitive recognition of the Self. As we consider the different mythical stages described by Neumann in more detail, we will find correspondences to aspects of biological and psychic species evolution.

Gebser's research on consciousness evolution is significant too.<sup>10</sup> He believes consciousness to have undergone restructurings during human history, with each phase marked by a different kind of awareness corresponding to four sequential mental sets:

1. *archaic*, entirely instinctive (before Neanderthal);
2. *magical*, pre-ego, intuitive, acting in the form of analogical thought, prerational (first cave paintings);
3. *mythical*, privileging symbols, creativity, feelings, irrational thought (birth of the great religions);
4. *mental*, based on reflective abilities, rational thought (Greek philosophers, but the existence of the mythical dimension remains).

Each mental structure conditions the interpretative context of reality of the period. According to Gebser, a fifth consciousness struc-



ture should be about to appear, defined as *integral*, incorporating the four previous ones yet at the same time transcending them, beyond rational thought.

Concerning the origin of consciousness, the researches of a group of linguists and philologists (Alinei, Costa, Harpending, and others) are of particular interest as well. This group proposes a *Palaeolithic Continuity Paradigm* (PCP), a new paradigm in contrast with the now obsolete theories on the Indo-European “exogenous” origin of the languages and populations present in Europe since the Neolithic era.

Concerning an evolutionary pathway that was independent from and in addition to the biological evolution of the cerebral cortex, Costa mentions the works by Merlin Donald<sup>11</sup> who considers miming behavior as a forerunner of verbal language. Socrates (469–399 BC) well represents, according to Costa, the watershed for the birth of the dialogic-verbal self-consciousness as we mean it:

We are not aware of any climatic or geographic factor which could have produced such a selective pressure to cause modern man’s appearance. . . .

Consequently, in all probability, “. . . the evolution of modern humans occurred in light of a cultural change, and perhaps the evolutionary pressure occurred when a cognitive innovation offered a group of hominids a meaningful cultural advantage over other groups.”<sup>12</sup>

As we shall see in the last chapter of this book, a possible answer regarding the above-mentioned cognitive input comes from research concerning psychoactive substances.

The “technological” prehistoric man has therefore also dealt with the “mind” (according to Gourhan); experiences in this realm have produced, first unintentionally and then by choice, variations of consciousness and subsequently new knowledge about himself and his fellow man, and on the nature surrounding them. In Table I.2 we have listed a long series of possible techniques and catalysts that can produce NOSCs. Any of these might theoretically have acted in such a way, but actually only two of these catalysts can be considered proved and provable scientific certainties: the entoptic phenomena and the psychoactive substances.

### The Entoptic Phenomena

In 1988, the archaeologists David Lewis-Williams of South Africa and the Englishman Thomas Dowson published an article in the American journal *Current Anthropology*<sup>13</sup> that caused considerable debate in the international scientific community. The authors established a link between elementary hallucinatory forms—the phosphenes—and the strange and unexplainable representations engraved on stone found in numerous sites, especially those of the Upper Palaeolithic and Neolithic epochs. Concentric circles, spirals, wavy and zigzag lines, grids, closed and open irregular geometric outlines, stars and cross-shaped forms not belonging to subsequent Christian religious symbols, etc.

Some years before,<sup>14</sup> a possible role for phosphenes in rock art had already been suggested as a “direct or indirect consequence of the ingestion of known psychoactive substances.” Cited examples were rock art in Almeria in Spain, from the Tukano Indians in Columbia, and from the Chumash in California.

Lewis-Williams and Dowson start from the postulate that the human nervous system is universal and that it underwent little change



Figure 1.1. Perimetric wall of small mound (Boyne Valley, Ireland)

from the Upper Palaeolithic to modern times. On certain occasions luminous perceptions independent from external sources are produced spontaneously, and they mention especially the researches of Klüver, one of the earliest psychedelic researchers on peyote and Gestalt psychology. Electrical stimulations, eyeball compression, fixation on luminous sources, hyperventilation, fatigue and sensory deprivation, prolonged rhythmic movements, hemicrania, mental diseases, and of course the psychoactive substances all can contribute to promote these phenomena. The so-called entoptic phenomena include therefore both phosphenes and geometric form constants (gratings, triangles, chequers, polygons, cobwebs, tunnels, funnels, vessels, cones, spirals). Along with the iconic hallucinations, subsequent to perceptive evolution, they are regulated by seven general principles: replication, fragmentation, integration, superimposition, juxtaposition, duplication, and rotation.

During a NOSC, mental imagery can develop through three stages of increasingly complex organization, passing from the entoptic phenomena to the iconic forms and lastly to iconic images, the latter being more structured, “true hallucinations” often linked to powerful



Figure 1.2. Carved rock before the entrance at Newgrange's mound (Boyne Valley, Ireland)

emotional changes. This neuropsychological model has been subjected to a verification with the San's shamanism and rock art in South Africa and with that of the Coso Shoshones in California. The two researchers find in these examples numerous confirmations for both the entoptic phenomena and for their evolution into the ensuing two stages, and have been induced to extend their hypotheses to the European Palaeolithic art at sites such as Les Trois-Frères, Niaux, Lascaux, and Altamira.

As for human images, it is difficult to know if the representations depict the artist himself or other persons. Some entoptic typologies seem to be linked to the author's somatognosic structure, for example the zigzags or the spirals that could well have been produced during the cenesthetic "trembling" that often precedes the entry into the shamanic trance.

The integration between human and animal in the therianthrope figures, already present at a level of the central nervous system and then activated by the NOSC, seems instead to be the result of two juxtaposed iconic images.

Moreover, Lewis-Williams and Dowson hypothesize that some entoptic phenomena can repeat themselves as afterimages "retained" for long periods and employed as such to paint the European caves. They write,

At one point between the Acheulian and the Magdalenian, the beginning of the Upper Palaeolithic, there was an intensification of production, an apparent increase in the artists' entoptic repertoire, the addition of representational images and, quite possibly, a new desire for durable depictions. The few early examples of engraved entoptic phenomena suggest that this intensification was not the result of changes in the human brain and nervous system. Rather, social circumstances changed, and in these new circumstances mental imagery, its projection and fixing, achieved new significance. Probably, new social forms provided a niche for an experience and associated practice that had its roots deep in the past.<sup>15</sup>

In a subsequent article published in 1993,<sup>16</sup> the two authors refer also to Bradley and Patton's researches on European megalithic art. Their neurophysiological model thus finds a logical extension in

the Neolithic, especially with regard to the phosphenes stage. The megalithic art in Brittany, England, and Ireland is spectacular in this sense, two such examples being the surrounding walls of the lesser tumuli and the stone put in front of the entrance door of the huge Newgrange tumulus in the Boyne Valley.

Lewis-Williams and Dowson underscore the role of duplication, which, starting from single elements, allows building large and complex fillings and filigrees. It is possible to see a good correspondence between the above-mentioned theories and the Phosphenes Table of Max Knoll, a psychophysicologist who had nothing to do with pre-historic rock art.

In an interesting and quantitative analysis carried out by Dronfield,<sup>17</sup> the presence of entoptic marks (spirals, circles, curves, lines, etc.) in the rock art of the Irish megalithic tomb entrances of the fourth millennium BC is described. The author has searched for links between these marks and possible inductors such as self-induced phosphenes, staring into the sun, hemicrania, and chemical ones, LSD and psilocybin, finding positive correlations as for these latter two inductors in the sites of Knowth 1, Newgrange, Knockmany, Sess Kilgreen, and Loughcrew. It is obvious that LSD wasn't present in that period but the author suggests ergot (its presence has been ascertained in two or three sites in Spain) as a possible inductor besides the psilocybin mushrooms surely present in Ireland in the Neolithic epoch.

Lewis-Williams and Dowson's arguments in this branch of science have come to be known as the *shamanic hypothesis*, and have been accepted as such by a large part of this scientific community, of course not without criticisms and remarks that for the most part can be shared.

We see that the "cultural" role of the third stage representational iconic images is underscored, and therefore partly uncoupled from the consequences of the purely neuropsychological hallucinations of the first two entoptic and iconic-formal stages. With regard then to European Palaeolithic parietal art, it seems moreover that it was often inspired by a kind of very real "impressionist" realism, especially for the zoomorphic representations. This also makes one think of a simple desire to reproduce what actually exists, framed within some ritual form, of course, but not always executed by means of "suggestions" drawn from a modified state of consciousness.<sup>18</sup>

Others maintain<sup>19</sup> that the evaluations carried out on the South African San's shamanic tradition are in the context of the present

ethnological moment and that as such they cannot be extended to the prehistoric epoch. We are not expert on the subject but think that the proximity relationship of present-day “primitive” populations with prehistoric man is an acceptable comparison in some limited cases. At least for the present case in which the San’s present shamanic iconographies are inscribed in the archaic tradition without substantial changes.

A strong, even somewhat resentful criticism has been published by a group of French researchers.<sup>20</sup> We feel that the shamanic hypothesis needs no counsel for the defense, but since these authors deal also with psychactives some clarification is needed, especially when they plainly reveal that they know little about the subject. They claim (p. 55) that *Amanita muscaria* was known in Europe only starting from the early Middle Ages (their reference is Albertus Magnus, *De Vegetalibus et plantis*, circa 1260), when in fact it is known that Pliny the Elder in the first century AD had already demonstrated knowledge of the mushroom in his *Naturalis Historia*: “The earth, in fact, produces first the womb or vessel for the mushroom, and then the mushroom inside, as the yolk in the egg” (Book 22, par. 46). Moreover, recent research on the phylogenetic origin of the fly-agaric<sup>21</sup> attests its presence starting from the Tertiary, and there is little doubt about the plurimil-

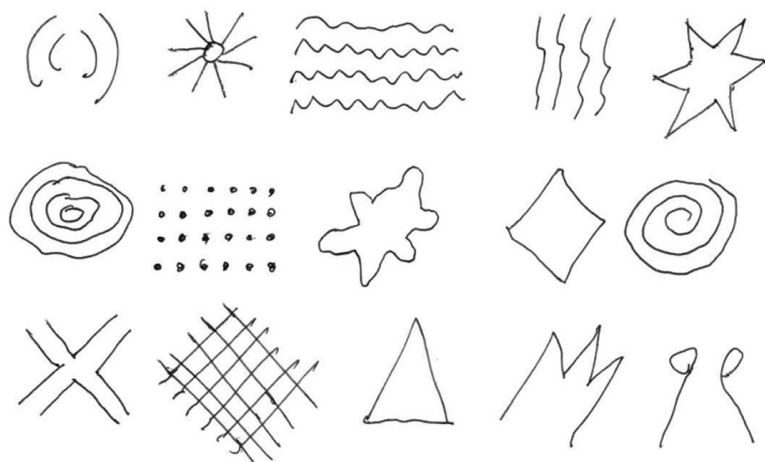


Figure 1.3. Max Knoll's Phosphenes Table

lenary presence of conifers and birches with which *A. muscaria* is in mycorrhizic relationship.

But if a valid criticism can be made on Lewis-Williams and Dowson it concerns precisely their basic neuropsychological approach, and not because it isn't correct and applicable, but because it is insufficient to explain the wide perceptive-visual evidence, at least (but not restricted to) that which is activated by psychoactive substances.

A typical example about how perception could be "deceived" in the state of normal consciousness of daily existence is given by mimicry phenomena in which the figure perceptually melts with the reference scheme, becoming invisible. Of particular interest are the equivocal figures for which an identical configuration can alternatively represent two different things, or the virtual three-dimensional figures perceived by looking "in depth" at specific bi-dimensional images designed specifically for the purpose.

In a certain sense, the perceptual process might be considered as the software of the neurophysiological sensory apparatus. We then have an illustrative model for visual perception of image depth that otherwise is not explainable solely in terms of the mechanics of the visual apparatus. It's the "filigree" texture of perceived objects that produces the sense of depth, exactly as when we look at a photograph or a painting and take in its vanishing point.

The perceptive modifications induced by psychoactive agents have to be thought of in terms of a wide range of factors acting in synergy. They have been described as a "retinal circus" to emphasize the variety and fullness of these experiences: the colors reach a maximum saturation, macro- and micropsia are produced, as well as cenesthetic sensory overlappings, optical illusions, and spatial distortions of form. These effects are not necessarily of a hallucinatory nature if the word is understood to mean a perception of purely endogenous origin without an external source involved.

The illusions consist in equivocally perceiving figures which aren't equivocal, experiencing multiple perceptive interpretations of simple everyday objects that stress even the ludicrous, as in infantile physiognomy or in anthropomorphism. For example, LSD does not always cause actual visual hallucinations, at least not with the eyes open. On the contrary, it causes many plays of perceptual illusion—that is to say transformations of a reality datum taking as a starting point perceptive details that take on additional meanings, or fuse together, or produce inversions between figure and background.

Illusions and distortions as the source of some therianthrope figures could therefore easily be an explanation at least as well founded as the hallucinatory hypothesis, especially if we do not overlook cultural aspects linked to the “mask,” the intent to transform, hide, to frighten, and could reproduce a viable shamanic reality.

Lewis-Williams and Dowson’s shamanic hypothesis shows itself after all excellent for the entoptic interpretation of the first stage graphic marks, but it becomes less valuable when one wishes to extend it to other more complex representations. It has, however, been a “revolutionary” development in the interpretation of prehistoric rock art.

### The Psychoactive “Psychedelic” Substances

The psychoactive substances found in nature are generally plants with a short stalk and often of a succulent nature. Roots, seeds, leaves and flowers, mushrooms, cacti . . . there are a great many, and the archaeobotanical data leave little doubt about their archaic and plurimillenary origins.

Their distribution is universal with the obvious exception of the areas of perennial ice, and their use is likewise essentially universal with the only proposed exclusion, which we consider unlikely, being the Australian continent. For climatic reasons about 70 percent of these substances are concentrated in Latin America, where their consumption was and is generally linked to magical-religious rituals, cult or therapeutic use, with the obvious exception of hemp, which also lends itself to ludic and popular use.

The psychoactive, psychedelic substances we deal with in our present context are solely those for which there is actual prehistoric archaeobotanical evidence, or representations and direct or indirect links to rock art for the time period extending roughly from the Epi-Neolithic to the beginning of the Iron Age. Some of these substances are no longer used today, replaced by other more effective or less dangerous ones from the point of view of their toxicity. As for dangers of a psychopathological nature, they seem to be a risk only in case of “unauthorized” use, outside of the ritualized and guided contexts of community rules and the contribution of the specialist: the shaman-healer.

It is hardly necessary to stress, but we shall nevertheless do so, that these substances have little to do with the so-called drugs of



abuse. Their effects are in part unforeseeable, a-specific, and frequent effective experience with them is not possible due to rapidly developed tolerance. Any sort of clinical dependence is therefore excluded and use for ludic-recreative purposes is mostly limited to the Western cultural context that began as the so-called “psychedelic revolution” of the 1960s, today of increasingly limited influence.

We will now consider in more detail some of these substances, starting with *Sophora secundiflora*, a shrub or small tree indigenous to warm-temperate tropical areas of both hemispheres.<sup>22</sup> The plant has a sweetish-scented blue-violet flower, and bears scarlet seeds called red beans or mescal beans, which were used by cults in Texas, New Mexico, and Northern Mexico (the beans known in this region as *frijolito*, *frixolillo*, or *colorin*). Various Indian tribes in fairly recent times used this substance for divinatory purposes, sometimes in combination with peyote, which subsequently replaced the *Sophora* bean completely, consigning this latter to a decorative role.<sup>23</sup>

Near the end of the nineteenth century, the first alkaloid of *S. secundiflora* was isolated and named sophorine. Further research showed it to be identical to cytisine. Its molecular structure and pharmacological effects have some similarity to those of nicotine. The bean can certainly be considered as psychoactive and possibly genuinely hallucinogenic since its use as such is historically certain but today its mechanism of action is not clear. Some maintain the possibility that the substance was used in association with long periods without sleep or nourishment.

The same is valid for the seeds of *Ungradia speciosa* catalogued by Endlicher in 1833, known in Mexico as *monillo* and in Texas as Mexican Buckeye. The seeds contain cyanogenetic compounds which make them psychoactive but also very dangerous.

As we have just mentioned, the use of these two substances has been supplanted by peyote, botanically known as *Lophophora williamsii*. This small cactus is considered, rightly, as the most complex and powerful of the natural psychoactive psychedelic plants. It is a spineless succulent that grows alone or in little groups, with an above-ground greenish round-shaped “head” on top of a conical root about ten centimetres long. Small white or lavender-colored flowers appear during the rainy season followed much later by oblong red fruits. It grows widely in Mexico in hill and mountain desert places, but recently some reports have sounded an alarm about its possible extinction due to “hunting” during the past thirty years by rather

un-ecological psychonauts coming mostly from the nearby United States. For ingestion the appropriately dried upper part is used.

In 1894, the German chemist Arthur Heffter succeeded in isolating some alkaloids from peyote, the most important being mescaline. The alkaloid was later synthesized by the Czech Ernst Späth in 1919, and perhaps the most important research on the many aspects of peyote, especially its use by New World aboriginals and cults, was accomplished by the American anthropologist Weston La Barre.

According to Piomelli,<sup>24</sup> a well-known Italian researcher who worked for a long period in the United States, the mushroom *Amanita muscaria* is without doubt the most ancient (and we should add perhaps the most widespread) pharmacological agent that has ever been used in religious and ritual primitive practices. The phylogenetic origin of the fly-agaric has been identified in the “Siberian-Beringian” region, corresponding moreover to the most ancient prehistoric representations. From there it would have been spread to North America and Eurasia and then throughout the rest of the world. The habitat of *A. muscaria* is most often among birches and conifers with which it maintains a mycorrhizic relationship.

Approximately ninety to one hundred *Amanita* species have been identified to date, of which only seventeen have been analyzed through a complete chemical screening. As for the fly-agaric, besides the already known presence of isoxazoles, simple amino acids and polypeptides, amavadin—a compound of the metal vanadium—was in 1972 found in very high concentrations, hundreds of times higher than commonly found in other plants.

Thanks to researches carried out by Eugster and Takemoto,<sup>25</sup> we know how the ibotenic acid of the fly-agaric is transformed into muscimol through the drying of the mushroom. The latter is at least five times more pharmacologically active and the principal, if not the only compound responsible for the fly-agaric’s psychoactive effects. These effects include psychomotor excitement, sensations of augmented physical strength, optical phenomena, and visions, after which a period of deep sleep with strong oneiric activity follows.

The largest number of psychoactive mushrooms are found in the genera *Psilocybe*, *Panaeolus*, and *Gymnopilus*, but all of these mushrooms have in common the active principles psilocybin and psilocin, alkaloids based on indole. These latter chemicals might be called “true psychedelics,” along with mescaline (peyote) and some lysergic

acid derivatives, for they are capable of delivering NOSCs of a particularly powerful nature without inducing such effects as delirium, somnolence, hallucinations, confused speech . . . effects much more common with toxic species. The large majority of the psilocybin mushrooms grow in Central America, North America, and Europe, in temperate and tropical regions. These agarics are generally small, difficult to mistake for edible species, and are potently psychoactive while being completely nontoxic. Their historical-cultural period of use was that of the pre-Columbian evolved societies, the Aztecs and Maya in particular.

Another type of psychoactive substance, a snuff called *yopo*, is obtained from the seeds of *Anadenanthera peregrina* indigenous to the Orinoco basin. A leguminous plant that can reach quite large dimensions, *A. peregrina* contains bufotenine and DMT, and in other Latin American regions the variety *colubrina* is found. Often the powder has other names, but most commonly it is known as *cohoba* and *cebil*. Until 1955, *Anadenanthera* was a subclassification of *Piptadenia*, so it is possible to find it in the literature still with this latter name.

*Trichocereus pachanoi*, known as San Pedro in Peru and *agua-colla* in Ecuador, is a large column-shaped and branched cactus that contains a significant quantity of the mescaline family of alkaloids. It grows naturally at an altitude between two and three thousand meters, but it is also widely cultivated in the Central Andes. It can also be commonly found in greenhouses and “exotic gardens” worldwide, for it makes an excellent rootstock for grafting otherwise difficult to grow cacti.

Other “psychoactive uses” of substances not usually classified in this category include tobacco (*Nicotiana tabacum*, *Nicotiana rustica*) and species from the genus *Trichocline*, known as *coro* in Quechua in northern Argentina.

Each one of the above-mentioned substances has its own set of characteristics concerning effects and uses; nevertheless, there are some psychoactive phenomena that seem to be of a general kind and, within certain limits, define a common denominator. Researches carried out in the 1950s with LSD provide strong suggestions in this sense. LSD is a semi-synthetic alkaloid but with strong links to natural products since its precursor is produced from ergot, a parasitic fungus of rye, and also since there are several species of *Ipomoea* whose seeds contain psychoactive amides of lysergic acid very similar to LSD.

The Czech psychiatrist Stanislav Grof<sup>26</sup> has been a pioneer in LSD research and his experimental work in particular illustrates the common phenomenology of the psychedelic experience. The entoptic phenomena, the illusions and perceptive distortions we have discussed above, are fully part of what are defined as *abstract and aesthetic experiences*. Grof provides for comparison a good number of important contemporary painters who, without the use of psychoactive substances, have portrayed a “surreal” and hallucinated image of the reality that is an excellent example of entopic phenomena. The paintings of Mondrian, Kandinski, Seurat, Van Gogh, but also of Matisse and Klimt, are examples. The perceptive distortions, on the other hand, remind one of the paintings of Picasso, Braque, and the Cubists in general.

Sooner or later, such altered sensory perceptions become emotionally associated and linked to actual events of one’s life. LSD and other psychedelics also have the ability to interrupt the continuity of time. One perceives “separated isles of experience,” independent moments of brief or long duration motivating one to live exclusively in the “here and now,” losing all sense of the normally experienced flow of time. Stanislav Grof has defined this kind of lived experience linked to psychodynamic aspects as the COEX (COndensed EXperience), and it’s in these stages that the good and bad of what we are can surface.

In the modified state of consciousness or NOSC, however—as overwhelming or radical as it may be—it seems that there always remains a part, even if small or reshuffled, of our ego that carries out the function of observer of what happens and preserves one’s critical and rational ability. Nevertheless, it is possible that in certain moments the ability is lost. This happens when the experience becomes a complete fusion with what is perceived—when perceptions, emotions, and lived experiences join around a central event that unconditionally fills consciousness. This level of consciousness is not always, or even frequently attained: according to Grof’s map of consciousness it is the *transpersonal stage*. The *transpersonal experiences* mature from an intense empathic sensitivity that allows one to “enter” what is perceived, intuitively and with great speed catching its unusual or extraneous and estranging aspects. “Strange and impressive” said Humphrey Osmond of the LSD experience, it was he who coined the word *psychedelic*.

It isn’t uncommon to come through this experience identifying, even profoundly, with living persons, animals, plants and inanimate