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Cross-Cultural Perspectives on Creative Behavior and the Use of Psychedelics

Abstract

In pre-Conquest Mesoamerica, art as a discipline and activity was embedded in such daily activities as the manufacturing of implements, the construction of tools, and the making of paraphernalia for the rituals and ceremonies that reinforced cultural myths. Creativity that was presumptively inspired by psychedelic plants also can be observed in ancient murals, architecture, sculpture, and literature. Contemporary examples include the association between the sacred use of psychedelic mushrooms and the poetic verses of the Mazatec shaman, MARÍA SABINA, of peyote and the yarn paintings of the Huichol shaman RAMON MEDINA SILVA, and of *ayahuasca* and the paintings of the mestizo shamanic healer PABLO AMARINGO. There is even some evidence of ritual psychedelic usage in the art forms of Late Neolithic Eastern Europe. The ritual use of psychedelics and the art associated with it can be contrasted with contemporary usage by Western artists, as identified in anecdotal accounts and in research studies. Paradoxically, psychedelics appear to foster creative behavior in traditional cultures by upholding their cultural myths, and appear to stimulate creativity among artists in industrialized societies by deconditioning them to their cultural myths, often freeing the imagination so that it can envision concepts and percepts outside the socially constructed cultural mainstream. Art involves the controlled structuring of a medium or a material to communicate as vividly as possible the artist's personal vision of experience. If art resonates with a larger public, it has succeeded in filling the gaps in social knowledge or in resolving cultural contradictions. This perspective may be useful in studying artistic productions associated with psychedelic substances in both traditional and industrialized societies.

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The conception of human creativity varies from culture to culture; some societies reward original work that serves a social function, while other societies criticize behaviors and products that deviate from cultural norms. This essay will utilize a definition of creativity that emphasizes the process by which disparities in a person's or social group's knowledge are identified and successfully addressed. The role of psychedelic (from the Greek words *psyche* and *deloun*, i.e., "mind-manifesting") substances in resolving these contradictions or filling these gaps is examined. The link between psychedelics and the creation and maintaining of cultural myths, the role of ritual in giving structure to the psychedelic experience, and the association between psychedelics and innovation in the arts are discussed, illustrated by material from the past as well as the present. The essay summarizes contemporary psychological research data on psychedelics and creativity, and concludes with a comparison of the Western and non-Western uses of psychedelics in creative processes.

Selectivity must be used in discussing this topic because the literature on creativity and psychedelics is extensive, encompassing vast distances of space and time. It is likely that the initiates of the Eleusinian Mysteries in ancient Greece used a potion containing a psychedelic fungus to glimpse what the poet Pindar called "the end of life and its god-sent beginning." India's Vedic hymns sing the praises of soma, an intoxicant "all-pervading, swift as thought," that might have been a psychedelic mushroom. Egypt's pharaoh Akhenaten may have used the mind-altering mandrake root in his cult of Aton, the benevolent sun (SMOLEY 1993). In recent times, both mescaline and LSD, as well as other substances such as psilocybin, have been linked to creative behavior and experience.

1. The Concept of Creativity

GUILFORD (1950) devoted his American Psychological Association presidential address to the topic of creativity, pointing out that only 186 out of some 121,000 entries in *Psychological Abstracts* had dealt with the topic. Since GUILFORD's remarks in 1950, the situation has changed dramatically; an average of 250 dissertations, articles, or books have appeared each year since 1970 (BARRON & HARRINGTON 1981). Several journals attest to the vigor of the field, e.g., *Gifted Child Quarterly*, *Imagination*, *Cognition and Personality*, *Journal of Creative Behavior*, *Journal of Mental Imagery*. Even so, the term "creativity" lacks a precise definition in psychology, and attempts to measure creativity have encountered controversy.

GERGEN (1985) observes that the terms in which the world is understood are social artifacts, "products of historically situated interchanges among people" (p. 267). For example, in Western civilization, not all individuals had equal opportunities for creative expression; indeed, women's creativity was not valued or encouraged. They were given few occasions to develop the skills (e.g., critical thinking) or life circumstances (e.g., solitude) on which creative productivity often depends (OSCHE 1991). Societies have constructed an assortment of terms to describe activities that resemble what Western psychologists refer to as "creativity." The first hexagram (or *kuan*) of the Chinese "Book of Changes," *I Jing*, is *Ch'ien*, "the Creative Principle." This hexagram expresses both the creative action of the "Source of All," which causes "objects to flow into their respective form"; and the "Superior Person," who interacts with these forms when the time is ripe. This "Creative Principle" functions when "Superior Persons" harmonize their way of life with the universal flow. Confucius added, "Great indeed is the generating power of the Creative; all beings owe their beginnings to it; this power permeates all heaven." Most Oriental, African, and Native American traditions used creative imagination to enrich and enhance everyday life; novel, original contributions were typically seen as gifts from deities or spirits who used humans as "channels" (a formulation not unlike SKINNER's [1972] notion that the creator adds nothing to creation but is merely the "locus" through which environmental variables act). Yet, in some of these societies an individual who conceived or produced something unprecedented (e.g., a mask) would have been censured for breaking with tradition. In these societies, talented crafts people were valued, but individuals with a flair for novelty were chastised.

The English word "creativity" is linked, historically and etymologically (from the Latin *creare*, to make, and the ecclesiastical Latin, *creator*, Creator), with the concept of origin itself (consider the related term "originality"). Some psychologists require products to be of social value or to have attained some other type of consensual agreement if they are to be called "creative," while other psychologists focus on the process by which these products come into being. Other attempts at definition conceptualize creativity as a unique achievement, ability, and/or attitude of a person or consortium of people. In each of these outlooks, there can be levels of accomplishment, utility, or originality, implying that some persons, groups, processes,

or objects can be more or less creative than others (GARDNER 1982). From the Western psychological perspective, "creativity" is a term that can be used to describe the process of bringing something new into being (MAY 1975) by becoming sensitive to gaps in human knowledge, identifying these deficiencies, searching for their solutions, making guesses as to a potential solution, testing one's hypotheses (sometimes modifying and refining the result of these examinations), and communicating the final product (TORRANCE 1962). However, the creative process is imperfectly understood; these steps may be linear or overlap, may occur in a planned sequence or spontaneously, and/or may be intentional or largely unconscious.

It could also be said that people, groups, or cultures are "creative" during those periods of time when they exhibit activities that are innovative for the specific group – that is, they yield concepts, items, or behaviors that address human needs (e.g., for survival, for enhanced work performance, for enjoyment, for esthetic satisfaction, for enriched quality of life) in ways considered valuable by a society. These novel concepts, objects, and behaviors (e.g., a scientific discovery, a mathematical theorem, a philosophical insight, an artistic masterpiece, a technological product, a military victory, a diplomatic accomplishment) can also be termed "creative," although one social group might arrive at a different consensus than another group. In other words, the term "creativity" is a social construct used to describe various social outcomes.

Attempts to measure degrees of creativeness have led to tests and rating scales of "divergent thinking" (e.g., MEEKER 1969), of "creative thinking" (e.g., TORRANCE 1966), of "creative perception" (e.g., KHATENA & TORRANCE 1976), and of "creative activity" (e.g., BULL 1960). Each of these attempts at assessment may be used for identifying highly creative individuals in order to offer them special instruction; entire programs in the United States – some of them state-wide – have been based on these or similar assessments. However, these measures have been criticized on the basis of content validity, construct validity, reliability, clarity of instructions, relevance to different populations, and comprehensiveness, as well as the proclivity for their results to be influenced by situational or contextual factors (e.g., AMABILE 1983; COOPER 1991). A number of promising outcomes have resulted from assessing level and/or type of creativity through the use of such naturalistic assignments as writing poetry or short stories, assembling collages, or spontaneous problem-solving (e.g., AMABILE 1983; DACEY 1989).

Despite their shortcomings, creativity tests have been utilized in many important research projects. BARRON & HARRINGTON (1981) collated 70 studies in which positive and statistically significant relationships were observed "between various divergent thinking test scores and reasonably acceptable non-test indices of creative behavior or achievement" (p. 447). Even so, in some studies creativity test scores failed to correlate significantly with creative behavior or achievement, suggesting the importance of identifying field-relevant thinking abilities in each professional area, and selecting the test accordingly (BARRON & HARRINGTON 1981: 448). Cognitive research has identified such qualities of creative thinking as the importance of extended work sessions, "playing" with ideas in various ways, using counter-intuitive strategies, analyzing paradoxical elements of a problem, and shifting back and forth between the general and the specific.

Future research studies need to identify the genetic markers for creative behavior, reconcile personality and cognitive research data in creativity, evaluate the part played by altered states of consciousness in creative ideation, determine the role of mental illness in blocking or facilitating creative expression, and specify what home and school variables are key factors in the development of highly creative persons. The need for creative solutions to the world's many social, economic, and environmental problems reflects the importance of this field, and of the psychologists who dedicate themselves to understanding the *I Jing's* "Creative Principle" as it manifests itself in human life.

Cross-cultural studies may be useful in this quest because it attempts to observe and uncover the reasons behind the differences and the commonalities among psychological phenomena occurring in different sociocultural contexts. A basic view held by cross-cultural scholars is that generalizations cannot be held universally on the basis of research conducted in one sociocultural context, but rather must be demonstrated through cross-cultural research. This position is especially pertinent when applied to such activities as creative behavior; Westerners are prone to take terms such as "creativity" with which they are familiar and superimpose them on phenomena in other cultures with which they are unfamiliar. An examination of the use of psychedelics in other times and places illustrates different approaches to creative processes.

2. Psychedelics and Creativity in Cultural Context

Mesoamerica

In pre-Conquest Mesoamerica, there was no "art for art's sake"; art as a separate discipline and activity had not been socially constructed. Instead, the creativity of the natives who inhabited today's Central America and south-central Mexico put their talents to use in the service of their religious beliefs. Aztec poets and musicians rhapsodized about the "dream flowers" that took them to another world; artisans erected flower-laden poles to commemorate the feast of Xochipilli, the god of flowers, and portrayed Xochipilli in statuary bedecked with psychedelic mushrooms, morning glory flowers, and other psychotropic plants (pointedly omitting datura and hops, whose mind-altering effects were quite different).

WASSON (1980, 1981) also has found evidence of creativity presumptively inspired by psychedelic plants in the murals and architectural arrangements of the immense buildings of Teotihuacán, the ancient city that may have been an important spiritual center. The stone carvings of mushrooms discovered in Guatemala at the end of the 19th century were not linked with the ingestion of sacred mushrooms until the 20th century when WASSON (1980: 179) observed the similarity of one figure carved under a mushroom to the position taken by practitioners during the preparation of these substances for a *velada* or all-night religious ceremony. The stone mushroom itself could have been used in the making of rubber balls for the sacred competitions held in the athletic courts that are an integral part of many pre-Conquest temples. WASSON suggests that the artisan, sitting on the ground with legs encircling the mushroom stone, could have applied by hand the latex in strips to the round mushroom cap (p. 196).

Specialists in the Nahuatl language have decoded poetry which praises psychedelic plants and their effects while ethnomycologists (specialists in the role played in cultures by psychedelic mushrooms) have identified mushrooms in pre-Conquest codices, the painted picture-writing of Mesoamerica. One such codice, painted in a Mixtec scriptorium, portrays a creation myth in which the god Quetzalcoatl is carrying a woman bedecked with mushrooms on his back, in the manner of a bridegroom carrying his bride. Another scene depicts seven gods and goddesses holding mushrooms they are about to ingest during a *velada*. Following the Conquest, the use of psychedelics was banned by the Spanish, but the Indians identified peyote with the infant JESUS as well as with ST. PETER, and decorated the walls of the churches they painted with morning glory vines and small children said to represent the spirit of the *hongitos* (i.e., little mushrooms) (WASSON 1980, chapter 7).

Mushroom Use among the Mazatecs. The use of psychedelic substances for spiritual purposes did not disappear completely. In some distant areas it continued, and escaped the Inquisition's

discovery and persecution. In 1955, WASSON and his party met MARÍA SABINA, a Mazatec *sabia* (wise one, or shamanic healer). Under pressure from a town official, she invited them to participate in a *velada* and ingest the mushrooms (primarily *Psilocybe mexicana*) with her. WASSON (1980) found SABINA to be "an artist in her mastery of the techniques of her office" (p. 8) and an example of "the extraordinary shaman [who] is entitled to be called a virtuoso. His [or her] voice, his [or her] verses filled with tradition ... phrases, his [or her] dancing, his [or her] percussive effects – these he [or she] works up in response to his [or her] little audience and in fulfillment of his [or her] genius" (p. 225).

MARÍA SABINA was later visited by ESTRADA (1977/1981) who spoke Mazatec and pieced together her autobiography. He also translated the spontaneous poetry she sang during her *veladas*, when she purportedly surrendered her body to the *hongitos* and gave them expression:

We are going to arrive there, ...
 We are going to prostrate ourselves, ...
 Our woman great vibrant-winged one ...
 Our little music woman, ...
 Our drum woman, ...
 Our little woman of the networks of light, ...
 Our little mistress of the mountains, ...
 Our little number woman beneath the water (p. 186).

ROTHENBERG (1981) studied SABINA's chants and declared her a "great oral poet" (p. 11) whose work has found its way into films, records, and poetry readings. He observes that in her initiatory vision, she saw an open book that grew until it reached the size of a person. She was told that "this is the Book of Wisdom. It is the Book of Language. Everything that is written in it is for you. The Book is yours, take it so that you can work" (p. 10). ROTHENBERG notes that in accepting this "call," SABINA became a woman of language. WASSON (1981) adds that her shamanic language demonstrates links with both her Siberian predecessors (where the mushrooms also "speak" through the mouth of the shaman) and the Nahuatl Wise Ones (who arrived at secret knowledge through the *amoxtli* or "book").

SABINA's oral autobiography describes how her role as *sabia* gave full expression to her creative gifts. Her father died when she was quite young; as a result she had to work in the fields, often with little food to sustain her. She observed her first *velada* when she was about six, and originally ate the *hongitos* to overcome hunger. Until the death of her second husband, SABINA's use of the mushrooms was sporadic because of the prohibition against sexual activity before their ingestion. She worked as an herbalist for several years, administering medical herbs to clients in the province of Oaxaca where she lived. However, her great grandfather, grandfather, great aunt, and great uncle had all been *sabios* or *sabias*. Her "call," therefore, was not unexpected, nor was it rejected by her community.

The social construction of her shamanic role took place over several decades, and is reflected by the changes in her activity. As a *sabia*, she no longer ate the mushrooms to assuage hunger but as a spiritual technology to assist her clients. As a *sabia*, she no longer dealt with medicinal herbs, only with sacred herbs. As a *sabia*, she monitored her dreams carefully, knowing that they might be an important source of power and knowledge for her. During my two interviews with SABINA in 1980, she demonstrated a presence that was both compassionate and regal, changing into her traditional robe, or *huipil*, before photographs were taken. She quickly administered a cleansing and blessing to a member of our party who began to weep uncontrollably after her exposure to SABINA's charisma (KRIPPNER & WINKELMAN 1983).

Peyote Use among the Huichols. RAMON MEDINA SILVA, another notable shaman/artist, was a member of the Huichols in central Mexico. FURST (1978) comments, "almost from the start,

he seemed to embody much of what has been written about the shaman as consummate artist of his or her society" (p. 23). MEDINA was the grandson of a *mara'akame* (or shaman) and the brother a female shaman. Among the Huichols, religion and the arts are intertwined, and MEDINA gained stature as a skilled reciter and singer of the sacred myths and songs. He played the violin, the guitar, various drums, and the native reed flute superbly, and was a consummate actor who assumed the roles of mythological characters in dramatic performances. It was MEDINA who transformed the Huichol art of yarn painting from a haphazard assembly of unconnected decorative symbols into a story-telling device that depicted the shaman's "inner vision of events" that disclose Huichol mythology (FURST 1978: 27). Many yarn paintings are intimately related to the annual pilgrimage made to the high plateau of Wirikuta, where they gather peyote and "find their lives" (MAYBURY-LEWIS 1992: 224). MEDINA's musical performances on both the bow drum and the log drum are associated with shamanic mythology. Their use is limited to the *mara'akame* because the Great *Mara'akame*, *Tatewari*, made the first drum and taught his fellow deities how to play it. These drum rhythms were felt to be especially useful in treating sick children. FURST (1978) reports that the Huichols believe that these rhythms transform the children, as well as the *mara'akame*, into birds. They can fly to Wirikuta, home of the divine Deer-Peyote, to meet the maternal goddess of fertility and of the life-giving earth. "This sacred drama, so crucial to the enculturation of children into 'being Huichol,' seems not to have changed substantially in form from its pre-Hispanic antecedents" (FURST 1978: 26).

Hikuri or Peyote (*Lophophora williamsii*) is an integral part of the Huichol religious experience. Peyote does not grow in the Mexican Sierras and must be obtained from the desert, some 350 miles from Huichol territory. A yearly pilgrimage is made to bring back the sacred cactus, and is accompanied by various religious paraphernalia. These include the *uru* – ceremonial arrows used to pierce peyote buds, and paraphernalia used in other Huichol ceremonies as well: *Rukuri* or votive bowls which are decorated with beads and beeswax figurines, and *tsikuri* or gods' eyes which are used most prominently in the harvest festival, and consist of two sticks tied together and woven colored yarn that forms diamond-shaped figures. Other paraphernalia includes *nearika* or woven shields, *upari* or ceremonial stools, *teapari* or round discs inscribed with symbols of the deities, and colorful pants, shirts, hats, shoulder bags, necklaces, bracelets, and blouses (MULLER 1978: 93-94). A yarn painting and various other types of ritual art center around peyote. EGER & COLLINGS (1978) observe, "So much cultural activity revolves around the peyote and its annual pursuit that few aspects of Huichol life do not relate to it either overtly or subtly" (p. 39). Peyote drawings are the most diverse and multitudinous forms of Huichol art, not only because of its religious importance, but because its symmetrical shape lends itself to artistic elaboration, especially when observed after the artist has ingested the cactus bud.

Conclusion. This brief survey of psychedelics and creativity in Mesoamerica has provided examples of creative *products* (e.g., codices, murals, poems), *processes* (e.g., the making of rubber balls utilizing mushroom caps carved from stone, the transformation of peyote visions into yarn paintings), and *persons* (e.g., MARÍA SABINA, RAMON MEDINA SILVA). In none of these examples is the psychedelic substance or experience divorced from its sacred purpose. Additionally, WASSON (1980) found similarities between the use of psychedelics in pre-Conquest Mexico and ancient Greece; both the *veladas* and the mysteries of Eleusis may have been sacred psychedelic rituals, and – per chance – psychedelic substance-inspired designs adorn both the vases of Attica and the architecture of Mitla. "There were two mushroom potions, in Greece derived from a *Claviceps*, in Mexico from a *Psilocybe*. The effect was the same and it was prodigious" (WASSON 1980: 174).

The Amazon

FURST (1976) suggests that the use of psychedelics in the upper Amazon dates back to at least 3000 B.C. REICHEL-DOLMATOFF (1972) reported that his informants told him that these substances are used to "travel" to the mythic world and "see" the cultural divinities (pp. 97-102). The best known psychedelic substance is a brew called *ayahuasca*, *yage*, *kahpi*, and a variety of other names, depending on the group that uses it. The universal ingredient in all of these concoctions is *Banisteriopsis caapi*, often called the "vine of the soul"; it is combined with other plants to potentiate its effect.

While conducting field work in the Peruvian Amazon in 1985, LUNA met PABLO AMARINGO, a former mestizo shamanic healer, who showed him a series of exquisitely detailed landscapes he had painted. When asked how he had learned to paint, AMARINGO replied that under the influence of *ayahuasca*, he had been shown how to combine colors to produce a panoply of hues. LUNA was familiar with artwork stimulated by similar brews, and asked AMARINGO if he would paint some of his *ayahuasca* visualizations. A few days later, AMARINGO completed the first two such paintings. The two men corresponded, and AMARINGO explained the content of each painting, most of it relating to Amazonian shamanism.

In 1987, LUNA visited AMARINGO again, and found that he had continued his painting, writing commentaries on his images. LUNA suggested that they co-author a book, and AMARINGO agreed. Using explanations provided by the artist as well as LUNA's own knowledgeable explanations, the book, *Ayahuasca Visions* (LUNA & AMARINGO 1991) explores the iconography of 49 paintings which present hundred of animals, plants, spirits, and mythological beings. Journeys to the various underwater, subterranean, and outer-space worlds are graphically detailed. AMARINGO's representations of his *ayahuasca* visualizations are significant works of art in their own right, but they also provide comparative material for mythologists, anthropologists, and psychologists, and comprise a stunning record of Amazonian flora, fauna, and shamanic traditions.

AMARINGO operates a school of painting in Pucallpa, Peru, dedicated to documenting the ways of life of the Amazon. The school's philosophy is the education of local youth in the care and preservation of the Amazon ecosystem. AMARINGO states that to execute his paintings he concentrates until he sees an image in his mind; he then projects this image upon the canvas, finally adding the colors. While painting, he often sings or whistles some of the sacred songs he used during his years as a shamanic healer. A comparison of AMARINGO's work with that produced by the Tukano (REICHEL-DOLMATOFF 1978), the Siona (LANGDON 1992), the Canelos Quicha (WHITTEN 1981), and the Shipibo (GEBHARDT-SAYER 1984) demonstrate that the images are influenced by the individual's cultural background. As such, they provide a great deal of relevant information about the artist's culture and its guiding mythology (LUNA & AMARINGO 1991: 43-44).

Late Neolithic Eastern Europe

The Mazatec, Huichol, and Amazon peoples have used psychedelic substances in structured ways, generally as the focal part of religious rituals. These procedures often function to help maintain the social order while attending to individuals as they pass from one stage of life to the other (HEIMBOCK & BOUDEWUNSE 1991). Rituals can be conceptualized as stylized, step-by-step performances of mythic themes; as such, they promote social solidarity, provide for rites of passage, and reinforce a society's values, belief systems, and rules of conduct. STAHL (1989) proposes that evidence of ritual psychedelic usage can be found in art forms of the Late Neo-

lithic period of Eastern Europe. STAHL (1989) infers psychedelic usage on the part of the artist from the motifs, colors, and apparent usage of the figurines. In reviewing pertinent literature, he has found supportive evidence in mushroom carvings and designs on masks and rattles in the Eastern Europe Neolithic period, and notes that the posture of various figurines is similar to those used to prepare for ecstatic "journeying."

During this period of time there was an increased reliance on domesticated food, an increment in sedentary communities, and an advance in technological and artistic sophistication. By the end of the fifth millennium B.C., Neolithic cultures had spread across Europe. By the middle of the Neolithic period, significant changes occurred in pottery styles and in the manufacture of clay figurines, the most celebrated being the Venus of *Kökénydomb*, an artifact of the Tisza culture in Eastern Europe. The use of psychedelics may have facilitated the cognitive shifts needed to cope with the social transformations that accompanied the rise of agriculture, and the art forms may reflect these attempts. The Venus figure was associated with a fertility cult and often took the form of vessels that may have been filled with water and used in agricultural rituals to insure high crop yields. STAHL bolsters his case for psychedelic usage by pointing out that psychoactive plants were available in several other European and Mediterranean areas, e.g., ergot in Greece, *Amanita muscaria* in Eastern Europe, Cannabis in Scythia and Assyria.

3. Research in Psychedelics and Creativity

There have been several anecdotal accounts by creative individuals in Europe, Canada, and the United States who claim that their creative behavior has been positively affected by ingestion of psychedelics. In 1796, the physician SAMUEL HAHNEMANN claimed that *Amanita muscaria* mushrooms heightened his poetic abilities. A century later, the neurologist S. WEIR MITCHELL rhapsodized on the properties of peyote, persuading the psychologist WILLIAM JAMES to try the cactus buds. However, JAMES became nauseous and remarked that he would have to take MITCHELL's visions "on trust" (MASTERS & HOUSTON 1966: 47). HENRI MICHAUX (1963), the French artist and writer, originally referred to mescaline as "a miserable miracle" but found that his nausea diminished with additional use of the chemical. Captain JOHN BUSBY reported using lysergic acid diethylamide (LSD) to solve an elusive problem in pattern recognition while developing equipment for a naval research project (ROSENFELD 1966). The Canadian architect KYO IZUMI (1970) took LSD during several visits to mental hospitals to determine the effects of their designs on people in altered states of consciousness. The result was a realization that traditional buildings were unsuitable, and Izumi designed a mental hospital that attempted to avoid reflective surfaces, shadows, and intimidating spaces.

Much of the initial research on creativity and psychedelics was based on the assumption that the drugs produced a "model psychosis". For example, TONINI & MONTANARI (1955) administered LSD and mescaline to an artist, asking him to paint during his sessions. They concluded, "the pictures do not contain any new elements in the creative sense, but reflect pathological manifestations of the type observed in schizophrenia" (p. 238). In summarizing his observations of LSD users, ARIETI (1976: 371) found the use of "primary process mechanisms" to be enhanced, but that the "secondary processing" needed to put the imagery to creative use was impaired. PITTEL (1970) administered Rorschach inkblots to frequent LSD users, finding that they usually gave highly imaginative, although bizarre, responses. When asked to describe the inkblots in objective terms, they were unable to comply. PITTEL concluded that they had a diminished capacity for spontaneous fantasy and that their ability to create spontaneously had been replaced by the use of drugs to recreate experiences. A number of additional studies of psyche-

delics and creative behavior have been reported with varying results, depending on the group investigated.

LSD and Creativity. BERLIN ET AL. (1955) studied the effects of mescaline and LSD on four graphic artists of national prominence in the United States. An impairment of finger-tapping efficiency and muscular steadiness was reported, but all were able to complete paintings. A panel of art critics judged the paintings to have "greater aesthetic value" than the artists' usual work, noting that the lines were bolder and that the use of color was more vivid. However, the technical execution was judged to be poorer than in the artists' usual work.

JANIGER (1959; JANIGER & DE RIOS 1989) asked a number of American actors, artists, musicians, and writers to paint a picture of an American Indian doll (a Hopi deer kachina) before ingesting LSD. One hour after their LSD ingestion, they again painted the doll. The 250 paintings were evaluated by a professor of art history on the basis of several artistic criteria; the judge observed that the craft of the LSD paintings suffered but many of them received higher marks for imagination. The most predominant changes were in color, line, and texture. Many of JANIGER's subjects felt that the LSD experience produced a desirable lasting change in their artistic development.

HARTMAN (KIPPHOFF 1969) administered LSD to 50 well-known artists at the Max Planck Institute in Munich, devoting about one week to each subject. The results varied; FRIEDRICH HUNDERTWASSER simply refused to paint while under the influence of LSD; C.O. GOETZ produced work that was indistinguishable from his typical paintings; the paintings of HEINZ TROCKES demonstrated an almost complete disappearance of form. The artists concurred that the experience was of value and the work was placed on display in a Frankfurt gallery. ZEGANS, POLLARD & BROWN (1967) investigated the effects of LSD on creativity test scores of 19 male graduate students as compared with a control group of 11 students. The test battery was given before LSD ingestion, and alternative forms of the same tests were administered two hours after ingestion. It was observed that most of the comparisons on the creativity tests favored the LSD group, although only one test result was statistically significant (a test measuring the originality of word associations). On the other hand, the LSD group did poorly on tests requiring visual attention. The authors concluded that LSD "would only be likely to enhance creative thought in those individuals who were meaningfully engaged in some specific interest or problem" (pp. 746f). MCGLOTHLIN, COHEN & MCGLOTHLIN (1967) conducted an intensive three-session study of 72 volunteer graduate students, one third of whom were administered a high dose of LSD, one third a low dose, and one third an amphetamine. A test battery was administered to each group prior to drug ingestion and again at intervals of two weeks and six months after the third session. The low LSD and amphetamine groups obtained similar scores, but the high LSD group bought more musical records, spent more time in museums, and attended more musical events. This group did not demonstrate higher scores on creativity tests.

Psilocybin and Creativity. BARRON (1963/1990) administered psilocybin to a number of highly creative individuals who engaged in creative behavior during their drug experience. On the basis of interview data, he concluded, "what psilocybin does is to ... dissolve many definitions and melt many boundaries, permit greater intensities or more extreme values of experience to occur in many dimensions." Of interest is one painter's statement, "I have seldom known such absolute identification with what I was doing – nor such a lack of concern with it afterward" (1963/1990: 251), suggesting that an artist is not necessarily able to judge the value of his or her work while under the influence of a drug. LEARY (1963) gave psilocybin to 65 artists, musicians, and writers, eliciting written reports from each subject. LEARY reported that the group as a whole, responded positively to the psychedelic sessions and postulated that creative persons must break

through their "game structures" (i.e., cultural conditioning) if they are to produce innovative productions that will be of artistic merit. FISCHER, FOX & RALSTIN (1972) dispensed psilocybin to 21 college-age volunteers, 17 of whom were able to complete a creativity test and a test for brain-damage before the session, as well as 90 and 270 minutes after drug ingestion. A significant inverse relationship between the scores on the two tests was reported. Sensitive, intuitive subjects with large perceptual-behavioral variability and a field independent cognitive style were judged to have "creative experiences" during the drug-induced state, while insensitive, practical, field dependent subjects with small perceptual-behavioral variability merely "got stoned."

Mescaline and Creativity. HARMAN ET AL. (1966) studied professional workers in architecture, engineering, commercial art, furniture design, mathematics, and physics. They were asked to bring to their mescaline sessions a problem that required a creative solution, preferably one on which they had worked without success. A creativity test battery was given before and during the mescaline session; on most tests the group showed a statistically significant increase in scores indicating enhanced fluency of ideas, direct visualization, and field independence. Interview and questionnaire data suggested that about half the group had accomplished a great deal more during the mescaline session than would have characterized their ordinary workday. All subjects reported positive reactions to mescaline but a large number of subjects were unable to concentrate on their projects because they were diverted by the experience itself. The subjective reports of HARMAN's group were analyzed and yielded 11 factors: a reduction of inhibition and anxiety under mescaline; the capacity to restructure a problem in a larger context; an enhanced fluency of ideas; a heightened capacity for visual imagery; an increased ability to concentrate; a greater empathy with external processes and objects; a heightened empathy with people; a greater accessibility of unconscious material; an increased motivation to obtain a solution; an ability to associate dissimilar ideas; a visualization of the completed solution. The last factor was illustrated by an architect's visualization of a shopping center he was to design: "I looked at the paper I was to draw on. It was completely blank. I knew that I would work with a property 300 feet square ... Suddenly I saw the finished project. I did some quick calculations ... it would fit the property and ... would meet the cost and income requirements ... I visualized the result I wanted and subsequently brought the variables into play which could bring that result about ... I could imagine what was wanted, needed, or not possible with almost no effort" (p. 224).

Psychedelic Drug Use Among Artists and Musicians. KRIPPNER (1970) surveyed 189 artists and musicians who had reported experience with psychedelic substances, utilizing MASTERS & HOUSTON's (1968) definition of a "psychedelic artist" as one "whose work has been significantly influenced by psychedelic experience and who acknowledges the impact of the experience on his [or her] work" (p. 17). Of the 162 artists questioned, 142 attributed a change in their artistic approach to psychedelic experience (e.g., greater depth of understanding, enhanced enjoyment, increased meaning or value), 114 stated that psychedelic experience had affect the content of their work (especially in regard to their use of mental imagery), and 131 said that their artistic technique had benefited (especially regarding the use of color). Of the 27 pop musicians (25 instrumentalists and 2 vocalists) interviewed, the professed effects on their work involved mood, lyrics, and complexity. More than half the musicians felt that psychedelics impaired the quality of their performance. These findings parallel those of BAUMEISTER's (1984) discussion of the features of "acid rock" that derived from drug use: "emotional ambiguity," "interest in novel sensations," and the "impatiently creative desire to explore complex and subtle elaborations" as the music assumes features that correspond to the novel mental states (p. 344).

Summary. These studies can not be considered conclusive as they differed in many ways, e.g., dosage, subjects, research questions. However, it is apparent that volunteer subjects can not expect their creative behavior to be enhanced as a result of their participation in an experiment with LSD, psilocybin, or mescaline. When individuals of demonstrated creativity are studied, however, there was a general enhancement of creative functioning. Nevertheless, it must be remembered that creative individuals are prone to take any new experience and use it in the service of their creative work, whether that experience be an encounter with nature, a romantic adventure, travel to an exotic locale, a personal triumph or tragedy, or an unusual alteration of consciousness – a vivid dream, an out-of-body experience, a near-death ordeal, or a psychedelic drug session (KRIPPNER 1985).

FORT (1970) comments favorably on the importance of creativity research with psychedelic substances, but warns, “unfortunately, there is no drug that will transform an ignoramus into a genius or a non-creative person into a creative one” (p. 120). Meanwhile, COHEN’s (1964) statement is worth considering: “Whether LSD does or does not increase creativity remains an open question. No systematic research is available to help in finding an answer ... All that can be said at this time about the effect of LSD on the creative process is that a strong subjective feeling of creativeness accompanies many of the experiences” (pp. 80-81). GRINSPOON & BAKULAR (1979) surveyed the research data and concluded that “a drug can never do the main work of creation.” At the same time, they found psychedelics to be “a new way to read the forgotten languages of the mind” and called for additional inquiry on the topic (p. 267).

4. Cross-Cultural Comparisons

BARBER, SPANOS & CHAVES (1974) have ascertained that the research literature on altered states of consciousness suggests associations “between responsiveness to test suggestions ... and propensity for involvement in imaginative activities” (p. 139). These relationships can be explained in terms of role models, demand characteristics of the task, and other factors. The chemical structure of psychedelic substances produce some common effects (WINKELMAN 1991: 17), but the data on psychedelics and creative behavior indicate that participants’ reactions are heavily influenced by expectancy, personality, and setting (MASTERS & HOUSTON 1968). This holds true both in experimental and informal settings, in native cultures, and in industrialized societies. SCHULTES & RAFFAUF (1992), in discussing the effects of “the vine of the soul,” comment that its effects differ, sometimes strikingly, “according to the environmental and ceremonial background against which it is taken; the additives, if any, that are used in its preparation, the amount of the drug imbibed, the strength of auto-suggestion on the part of the Indian and numerous other factors” (p. 29). It also applies to non-drug altered states; in the Tacan of Bolivia, shamans believe that they can transform themselves into jaguars not only by using intoxicants but also by such techniques as somersaulting (FURST 1977: 16).

Before their contact with Europeans, native people did not view art as a separate enterprise. Artistic creativity was embedded in such essential activities as the making of implements for food gathering and preparation, the fabrication of clothing and shelter, the construction of tools for healing and for warfare, and – perhaps most significantly – the execution of paraphernalia for the religious rituals and ceremonies that reinforced cultural myths and imbued peoples’ lives with meaning and direction. For example, the Amazon Cashinahua make feather headdresses that attempt to mirror the visual effects of *yage*’ (FURST 1992: 43) and the mestizo shamans of the Peruvian Amazon sing the healing songs (or *icaros*) that came to them during *ayahuasca* sessions (LUNA 1992). The potent red mescal bean (*Sophora secundiflora*) has been found with the remains of the extinct bison and the tools and weapons of early North American hunters

(FURST 1977: 20). Much of the rock art used ritually in the southwestern United States has been linked to the use of psychedelic plants (WELLMAN 1978). Many of the chants and poems used in ceremonies make great demands on the practitioner; the Yakut shaman in Siberia has a poetic vocabulary of some 12,000 words for use in *Amanita muscaria* rites, as compared to 4,000 in the ordinary language of the community. The Zuni rain priests of New Mexico have a special language with which they converse with spirit birds once they have ingested *Datura meteloides* (FURST 1977: 26).

The use of psychedelics was not a simple matter; they were not taken trivially, for hedonistic purposes, for momentary pleasures, or for "cheap thrills." Many native groups have maintained these standards; their brews require a lengthy period of time to prepare, and the mixture of ingredients must be precise if the result is to transport its user to "other worlds." Even then, there may be an initial period of bodily discomfort, physical pain, or vomiting, followed by encounters with dangerous entities who inhabit hazardous realms. All of these hazards are spelled out to the adept in the culture's myths, as are the rituals and safeguards which must be carefully followed to emerge safely from the ordeal.

In popular usage, myths are falsehoods or misunderstandings that are believed by large numbers of people. To students of mythology, however, myths are imaginative statements or stories that address existential issues (for a society, an institution, a family, or a person) and that have behavioral consequences. According to SULLIVAN, myths concern themselves with the details of natural and cultural phenomena, offering viable explanations and meanings for them all. "Myth is an integral part of reality not because it describes the world that is self-evident but because it characterizes and even directly participates in the imaginal world of beginnings, a world no longer apparent and, as such, the real world where the meaning of all apparent signifiers must now reside" (1988: 34). The initial custodians of a society's myths were the shamans, who emerged among hunting-gathering and fishing groups. Shamans can be defined as socially designated practitioners who alter their conscious functioning at will (by drugs, drumming, dancing, etc.), obtaining information not ordinarily available, using it for the benefit of their community. Some scholars hold that contemporary hunting-gathering and fishing communities with robust shamanic practices have fared better psychologically under the impact of European influence than those among whom the traditional shamanic system and cultural mythology had begun to deteriorate (e.g., FURST 1977: 25). Once groups became sedentary, a number of other magico-religious practitioners (e.g., priests, priestesses, seers, mediums, sorcerers, witches) took over many of the shaman's functions. However, the shamans who remained still attempted to heal the sick, search for "lost souls," aid the victims of malevolent hexes, and uphold the mythic rituals that provided continuity from one generation to another.

Throughout the world, one finds a clash of the use of psychedelics by indigenous peoples with western mythologies. The popularization of LSD and other psychedelic drugs in the 1960s and 1970s resulted in a similar mythic conflict; at the time, FORT (1970) observed that there was no field in American society, "with the possible exception of foreign policy ..., so pervaded by ignorance and hysteria as is the field of drug use and abuse" (p. 115). The opponents of psychedelic usage saw a threat to the predominant American mythic ideals of patriotism, hard work, family unity, and financial achievement. The proponents of psychedelic use replied by depicting U.S. society as "a conspiracy of money and power whose tentacles stretched into every nook and cranny of daily life" (STEVENS 1987: 292). In place of the myth that adulated personal conformity and social responsibility, STEVENS suggests that the proponents of psychedelics proposed a counter-myth that emphasized "letting go", exploring the depth of their personality, conformance to individual rather than social imperatives (p. 295), and a psychedelically-inspired struggle that would cleanse America of its "racist, imperialistic" tendencies (p. 307).

Paradoxically, psychedelics foster creative behavior among native people by upholding the cultural myths. LANGDON observes that the *yage*'-ingesting Siona shamans do not experience random images or unconscious free association; rather, the experience "is an ordering of the induced visions into culturally meaningful symbols and experiences, thus gaining increasing control over the visions and events occurring" (1992: 53). On the other hand, psychedelics stimulate creativity among artists in industrialized societies by deconditioning them to their cultural myths; in contrast to shamans, their images are likely to tap into their personal unconscious. In the first instance, psychedelics are used in a socially-sanctioned ritual that gives free rein to the imagination in ways that it can access the socially constructed nuances of the natural and supernatural worlds. In the second instance, to users in industrialized societies psychedelics typically ingest psychedelics in a contra-cultural manner. This practice has the potential of freeing the imagination so that it can envision concepts and percepts outside of the socially constructed cultural mainstream.

Art involves the controlled structuring of a medium or a material to communicate as vividly as possible the artist's personal vision of experience. Art is one aspect of creativity; as such, it communicates the artist's vision in such a way that disparities in that person's knowledge are identified and addressed. If art resonates with a larger public, it has succeeded in filling the gaps in social knowledge or in resolving cultural contradictions. In industrialized societies, the use of psychedelics is illegal except for strictly controlled experimental and psychotherapeutic uses. In those native cultures where the use of psychedelics is permitted, there is rigid control as well, but the spiritual purposes underlying the ritual use of psychedelics maintain cultural mythology rather than deflect it.

In industrialized societies, psychedelic drug use is regarded as "deviant behavior," but CLINARD & MEIER (1992) assert that deviance is not static or constant. Norms represent a social consensus that is relative to time and place; deviance is not a unique condition, but simply a common behavior that happens to offend some group and violates some norm (pp. 17f). Even the term "drug" is socially constructed, as are society's attitudes toward them. Native societies, over the millennia, have defined the norms that determine whether a particular drug should be used, and have developed rituals governing the methods to procure and administer drugs, the selection of physical and social settings for their use, activities after the drug is administered, and methods of preventing untoward drug effects (ZINBERG & JACOBSON 1976: 4). In industrialized societies, the illegal use of drugs is rarely so well structured; when it is, undesirable drug effects are minimized (DE RIOS 1984: 206).

The exceptions to illicit usage in industrialized societies are the scientific experiment and the psychotherapeutic session. In these instances, however, the results are strongly influenced by set and setting; an experimenter or psychotherapist who believes that LSD is "psychotomimetic" (i.e., psychosis-mimicking) will obtain different results from one who believes that LSD is "psychedelic" (i.e., mind-manifesting). WINKELMAN (1991) points out that in psychotherapy, psychedelics can "produce a depatterning influence which breaks up the individual's habitual experiences of the world, tending to increase the individual's suggestibility and susceptibility to re-programming" (p. 18). Yet, under the best of conditions, a controlled, well-guided psychedelic session can help an individual access a creativity-enhancing personal myth, the expression of which may have been blocked by his or her social conditioning (FEINSTEIN & KRIPPNER 1988).

If creativity involves completing incomplete gestalts, it could be asked whether the native usage of psychedelics is creative once a ritual has been concretized or a myth has been turned into an enduring narrative or performance. True, these cultural myths and rituals may not change appreciably for decades or even centuries, but the personal myths that emerge from these cultures may be strengthened or altered by a peyote session or a mushroom *velada*. Creativity may occur not only at a societal level but at a personal level; an individual who fills gaps

in his or her understanding and appreciation of the world through imaginative imagery, through participating in a ritual, or by developing a workable personal myth is engaging in creative behavior even if he or she repeats a process and treads a road that has responded to many previous footsteps throughout the generations. On the other hand, it is unlikely that the term "creative behavior" could be used to describe the jumble of images with little or no personal meaning produced by the illicit use of street drugs, or an adverse reaction that induces nothing but untoward effects, no matter how unique or original the content of these experiences might be. The structure of a mythic ritual, or even a well-guided session in a supportive environment, may be a prerequisite for making the most of what potentials the psychedelic plants, brews, and drugs offer their users. This suggests that the creative potentials of psychedelics may largely derive from the set and setting factors. Other pharmacological effects of psychedelics may contribute to creativity in disrupting habitual thought patterns, through accessing memories as elicited by situational factors, or by activating those neurological mechanisms involved in dreaming, reverie, fantasy, and other imaginative processes.

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