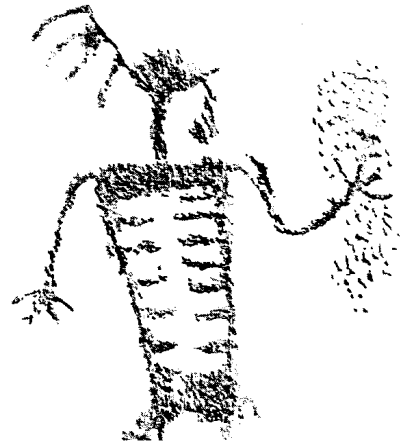


The Use of Hallucinogenic Plants by the Archaic-Basketmaker Rock Art Creators of the Palavayu, Northeast Arizona: The Case for Datura



Ekkehart Malotki

The Archaic-Basketmaker rock art tradition of the Palavayu Anthropomorphic Style (Pastyle) in northeastern Arizona has all the hallmarks of shamanistically-created visionary imagery. Much of its iconographic repertoire displays entoptic and iconic elements that fit the neuropsychological model proposed by Lewis-Williams and Dowson (1988).

Central to this model is the assumption that hunter-gatherer shamanism is anchored in institutionalized altered states of consciousness sought by shamans for the benefit of the people they serve. To achieve ecstatic trance states, shamans typically resort to techniques that range from non-chemical practices such as drumming, dancing, and sensory deprivation, to the use of psychotropic drugs.

Although no ethnographic information exists as to what techniques the ancient Pastyle shaman-artists employed to communicate with the spirit realm, there are pictorial clues in Pastyle iconography that suggest Datura may have been employed as a hallucinogenic catalyst for altered states of consciousness.

The Palavayu is a small geographic region of about 6,200 km² located along the southernmost reaches of the Colorado Plateau. Named after the traditional Hopi appellation for the Little Colorado River, literally denoting "Red River," the region is flanked by Petrified Forest National Park and Silver Creek on the east, and by the playa formations of Tucker Flat and the meandering course of Jacks Canyon on the west. Its northern frontier approximately parallels the southern edge of the Navajo Indian Reservation some twenty miles north of I-40. On the south, its border overlaps portions of the Coconino and Apache-Sitgreaves National Forests (Figure 1).

By connecting the major rock art sites along the periphery of the Pastyle theater, the resulting polygon yields an area of just 4,000 km², which amounts to less than two thirds of the 6,200 km² that make up the entire Palavayu. Based on a cross-cultural paradigm of hunters and gatherers, the population density of the early occupants of the Palavayu cannot have been very high. Steward (1938:48-49), for example, estimates that the average prehistoric occupation for the whole of Nevada was one person per 41 km². Applying this figure to the Pastyle territory, some one hundred people or four microbands, consisting of about twenty-five members each (Kelly 1995:205), may have lived in the shrub-steppe-

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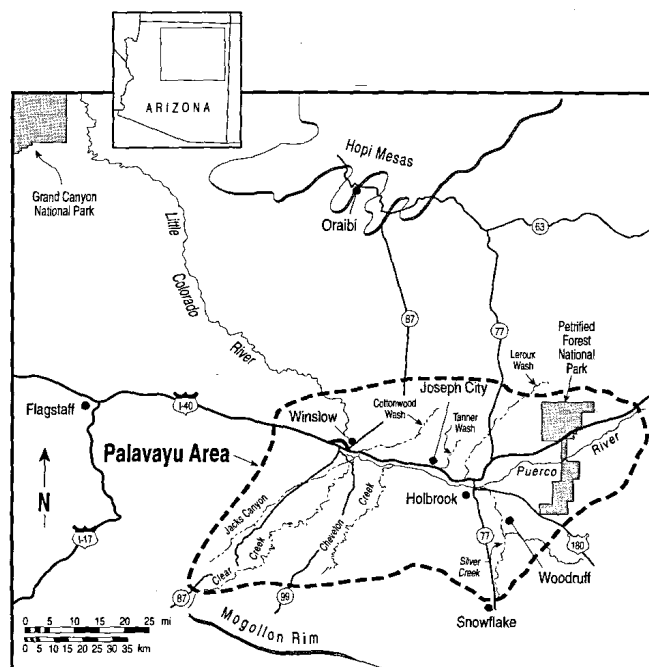


Figure 1. The rock art area of the Palavayu.

forest of the region at a given point in time. Depending on climate and resources available to them, especially during the Early Archaic (ca. 6000 to 3500 B.C.), this figure may have been even lower. Although one can assume that the ancient Pastyle inhabitants would have transgressed their rupestrial boundaries on occasion, one is struck by the relatively small size of the territory in which they lived for several thousand years.

At what point the semi-nomadic settlement pattern of the Pastyle hunters and gatherers may have been replaced by the more sedentary pattern associated with the incipient cultivation of corn, is not certain. It may well have happened at the onset of early Basketmaker II times which may actually have been around 1500 B.C. Iconographically, this time period falls into the Late or "Majestic" phase of Pastyle art. Smiley (1994:173) offers a series of new radiocarbon dates that place the introduction of maize in the area in or very near the 4th millennium B.P.

The Palavayu is home to a plethora of petroglyphic rock art sites whose stylistic variety and aesthetic quality are probably unrivaled in the rest of Arizona. Distinguished by a number of idiosyncratic motifs and diagnostic features, the parietal art of the Palavayu comprises iconographic traditions that run the entire cultural-taxonomic

gamut from the Archaic to the Protohistoric. While a photographic overview of the Palavayu's major rupestrial manifestations and themes has been presented in McCreery and Malotki (1994), Figure 2 is a first attempt to correlate the region's cultural chronology with iconographic examples from the various styles.

In the absence of reliable techniques for the scientific dating of petroglyphs (Beck et al. 1998)—the overwhelming corpus of Palavayu art consists of such rock engravings—this "chronographic" chart will inevitably contain certain subjective and simplistic assumptions. These unavoidable drawbacks are mitigated for the rock art of the Pueblo periods, however, by archaeologically datable images and motifs on pottery and mural frescoes, and in woven artifacts such as baskets and textiles. Palavayu art assigned to the Archaic and Basketmaker stages, on the other hand, can only rely on the established modes of indirect dating: stylistic comparisons with the parietal traditions of other areas, stratigraphy of superimposed design elements, and the differential repatination of these elements.

Important clues for the sequencing of the different traditions and styles also exist in the art itself. Thus, the presence of the spear-thrower or the absence of bow and arrow depictions help to set off the Archaic and early Basketmaker period styles from later Puebloan art. Additionally, Palavayu rock art features a sizable number of projectile point portrayals that can be compared to recognized archaeological point typologies and thereby provide vital information for the temporal placement of the art.

The Palavayu Anthropomorphic Style (Pastyle)

This paper is concerned with the Palavayu Anthropomorphic Style, probably the most distinctive of the identifiable traditions in the Palavayu rock art arena. Named for its incredible wealth of well over 2,000 anthropomorphic images at some 235 sites, Pastyle iconography, in its animate branch, also offers an impressive array of zoomorphs, most of them horned quadrupeds such as bighorn sheep, wapiti, deer, and pronghorn antelope. In addition, there exists a series of phantasmomorphs (my term for images believed to represent hybridic confections and other fantastical creatures) and a

small number of phytomorphs. While most of the latter look like generic leaves or trees, a few strongly resemble solanaceous *Datura* and its seed capsules.

In its inanimate branch, the Pastyle motif index is divisible into both geomorphs and reomorphs. While the former category subsumes "geometric" designs of every sort, including the standard set of endogenous phosphenes or entoptic phenomena (Kellog et al. 1965; Lewis-Williams and Dowson, 1988), the latter relates to objects that have a counterpart in the "real" world. Figure 3 details the entire Pastyle motif repertoire in accordance with these terminological concepts.

Archaeological Work in the Palavayu and the Age of Pastyle Art

Relatively little is known about the Paleo-Indian and Archaic occupants of the geographic region that contains the Pastyle sites. Granted, the archaeological past of Petrified Forest National Park has been explored and reported extensively; however, the entire park contains but one panel with Pastyle art. The only other archaeological survey (Plog et al. 1976) pertaining to the Palavayu was limited to the portion comprising the Chevelon Creek drainage.

Proof that humans occupied the Palavayu since the terminal Pleistocene stems from the recovery of fluted projectile points. Two Clovis point basal fragments have been found in the vicinity of Winslow (Huckell 1982:15). Both sites are situated along the westernmost border of the Palavayu (Rippey 1969; Sims and Daniel 1967). Hesse (1995:83) reports a reworked Clovis point found near Chevelon Ruin, southeast of Winslow. In addition, one Folsom point, retrieved from land bordering the eastern flank of Chevelon Canyon (Figure 4), was recently discovered in a private collection (Curtis Porter, personal communication 1995). From the same collection and area come three surface finds, a Cody knife, an Agate Basin point, and a Hell Gap point, that have also been identified as Paleo-Indian artifacts. These finds, together with two other Folsom point discoveries in Petrified Forest National Park (Tagg 1994; Wendorf 1953), support the presence of Paleo-Indians in the Palavayu.

The only excavated possible Paleo-Indian site in the Palavayu is O'Haco Rock Shelter, in the canyon depths of Chevelon Creek. Radiocarbon dates from charcoal unearthed in the lowest stratum of a test pit yielded ages of 6730 and 6150 years B.C. (Briuer 1977:96). On the basis of these results and a few pieces of non-native chipped stone found in the same stratum, Briuer (1977:100) concluded that the cave was used or occupied "at the very beginning of the Cochise period or perhaps as early as 8000 B.C."

Evidence for an Archaic (6000 B.C. to ca. 1500 B.C.) occupation of the Palavayu, which is marked by a shift from big-game hunting to a subsistence pattern including both hunting and foraging activities, is more firmly attested. Nine Archaic sites have been recorded in Petrified Forest National Park (Burton 1993:21), and Briuer (1976:116) reports a radiocarbon age of 4225 B.C. for a charcoal sample from a cave in Chevelon Canyon. Additional corroboration for an Archaic period occupation comes in the form of distinctive projectile points found throughout the Palavayu. Their morphology fits type styles generally assigned to the Archaic era: Jay, Bajada, San Jose, Pinto, and Elko (Burton 1993:139; Bruce Huckell, personal communication 1995).

As to the age of Pastyle rock art, even less information was available when, in 1993, I began to focus my research interests on this parietal complex. Early investigators, on the basis of only a handful of sites, had pronounced the art to be either of late Puebloan provenience (Ferg 1974:14) or assigned it to a Basketmaker horizon from 100 B.C. through A.D. 650 (Martynece 1985:71; Pillis 1975:5-6). Christensen (1992:41), operating with a data base of just five sites, was the first to suggest a late Archaic affiliation for Pastyle rock art.

My own studies, in the course of which I inventoried thousands of Pastyle petroglyphs and eventually determined the full extent of Pastyle diffusion, have led me to the conclusion that the incipient phase of this style may well be grounded in the middle or early Archaic (ca. 4500 B.C.). Many of the images that make up the Linear component of the Pastyle corpus show a strong affinity to Turner's Style 5 (Turner 1963). Placed by him into a time-frame of 4,000 to 8,000 years B.P. (Turner 1971:469), Style 5 was later renamed

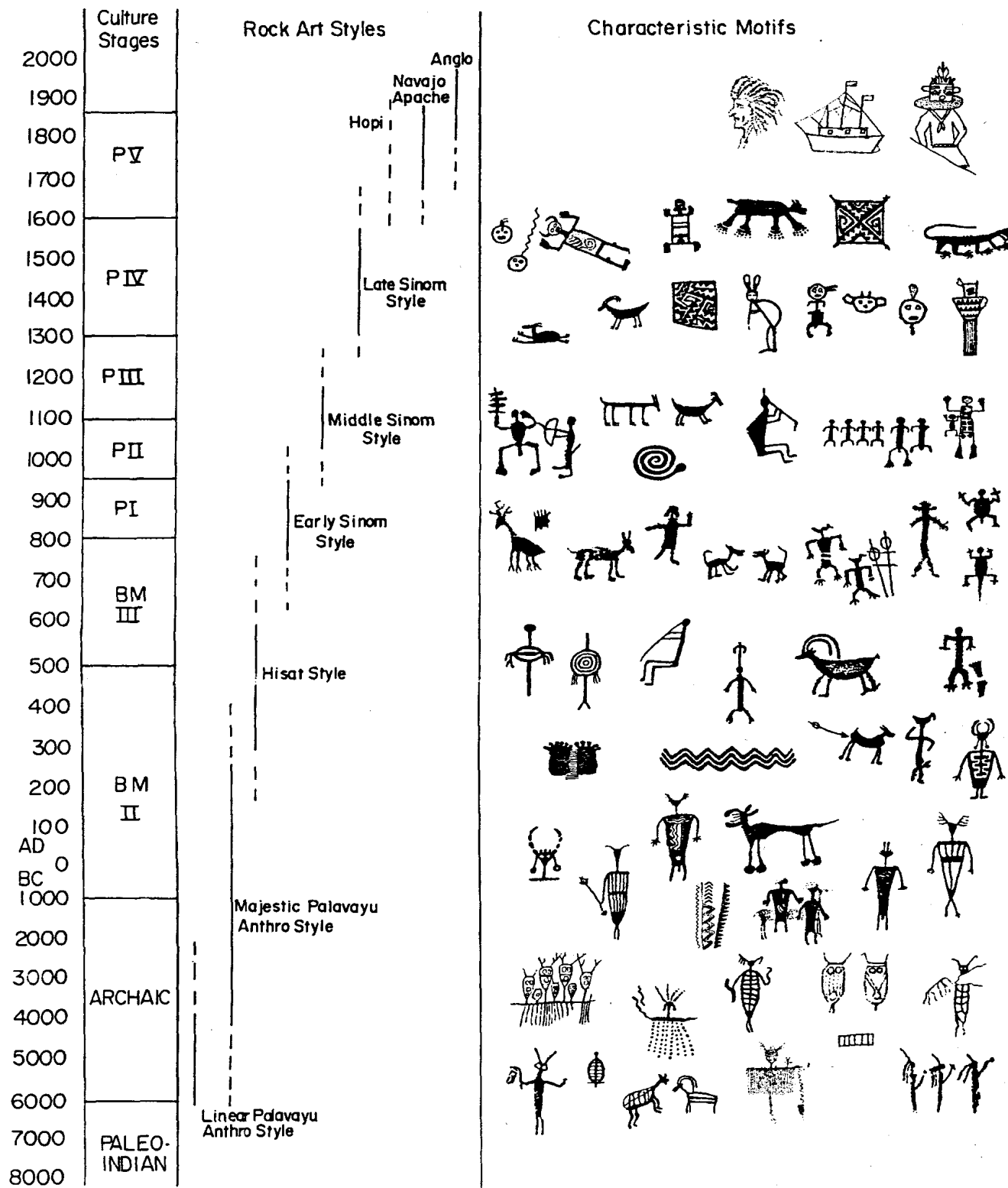


Figure 2. Chronographic chart of the Palavayu rock art styles.

PASTYLE MOTIF INDEX

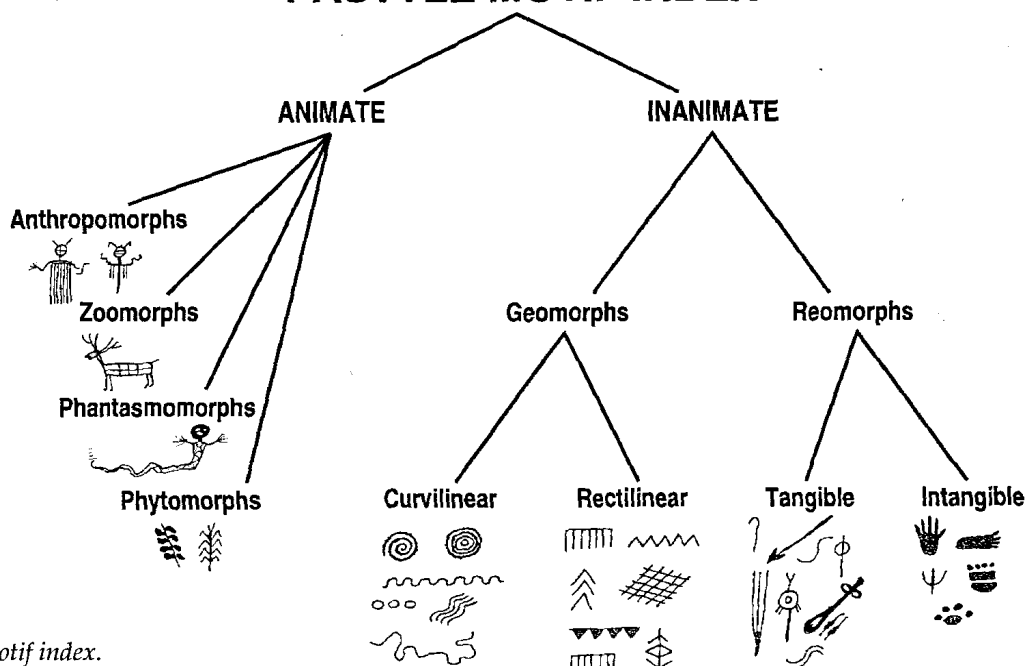


Figure 3. Pastyle motif index.

Figure 4. Folsom point from the Chevelon Canyon area of the Palavayu. Drawing by Curtis Porter.

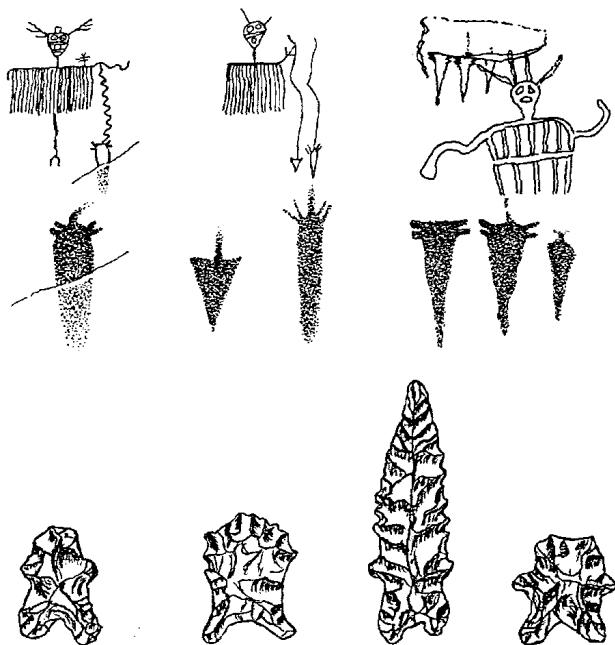
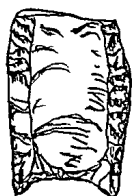


Figure 5. Pastyle projectile point depictions and archaeologically similar specimens from the Palavayu. Actual point drawings by Curtis Porter.

by Schaafsma (1980:72) as the Glen Canyon Linear Petroglyph Style.

Evidence supporting these temporal placements may be derived from a series of projectile points that are depicted on several Pastyle rock art panels. Some of them strongly resemble Elko Corner-Notched or even Elko Eared points (Huckell, personal communication 1998). Unfortunately, both types are poor time markers because they have a long period of manufacture and use, extending from as early as 8000 B.P. to Basket-maker times. Other points, more lanceolate in outline and characterized by double sets of protruding basal corners, are reminiscent of San Jose dart points, dated to between 3300 B.C. and 2000 B.C. (Irwin-Williams 1973:17). In Figure 5 several of this idiosyncratic type are illustrated.

Additional support for an Archaic placement of Pastyle art can be adduced from the stylistic and thematic features of the art itself. For example, certain quadrupeds, featuring bodies with interior parallel lines, bear striking similarities to split-twig figurines. With the oldest specimens radiocarbon-dated at 4100 B.P. (Schroedl 1977:255), these effigies are clearly associated with the Western Archaic.

Palavayu Hunter-Gatherers and the Shamanistic Hypothesis

Due to the lack of any kind of ethnographic information on the Archaic people who produced, over a span of several millennia, the vast legacy of Pastyle art, only general observations can be made in regard to their specific lifeways. Also, since little paleoclimatic data exist for the Palavayu, comments on the environment during the Middle and Late Archaic must remain conjectural. Briuer (1977:195), who excavated in two rock shelters in Chevelon Canyon, concludes, on the basis of faunal and pollen evidence, that cooler, wetter conditions may have prevailed during those periods. The presence of muskrat remains in the Archaic strata additionally suggests to Briuer (1977:227) that Chevelon Creek, during Archaic times, may have been a perennial stream with lush riparian vegetation.

Unlike the highly mobile Clovis and Folsom hunters who, in pursuit of big game, roamed across large areas of the American West, their Archaic successors lived in less far-ranging groups. Having to rely on a larger variety of foods, especially on plants whose locations were more predictable (Plog 1997:40), they gradually became less migratory. Such a reliance on an economy that was primarily oriented toward plant food, and only secondarily concerned with the acquisition of animal protein, seems to be borne out by the rather confined territory occupied by the people who made the Pastyle art.

Considering that "the phenomenon of shamanism is almost universal among extant hunter-gatherers" (Bahn in Smith 1992:IX), it is safe to presume that it was also the preferred belief system embraced by prehistoric hunting and gathering groups. La Barre, in one place (1979:11), calls shamanism the "Ur-religion" of all humankind; in another (1980:54), he characterizes it as "the religion of all hunting people." In accordance with his conclusion (La Barre 1979:11) that the shamanistic complex, after its Paleolithic origin, spread to the far corners of the globe, one can further assume that the Pleistocene religions introduced by the Paleo-Indians into the New World were fundamentally shamanistic.

An essentially shamanistic orientation can therefore also be postulated for the Pastyle hunter-

gatherer bands. To achieve his ends, which principally consisted in tending to the sick, influencing the weather, controlling the game animals, and assuring human, animal and vegetal fertility, the religious specialist or shaman in these bands must have operated by way of ecstatic trance states or altered states of consciousness (ASCs) typical of shamanism.

ASCs are a universal psychobiological phenomenon. Lewis-Williams (1996:126), in a decalogue of elements that he considers central to a generic characterization of hunter-gatherer shamanism, lists, as the defining criterion, the fact that it is based on "a range of institutionalized ASCs." According to Bourguignon (1974:231-232), a cross-cultural survey of nearly five hundred societies from around the world determined that 90 percent of them had institutionalized forms of ASCs. More to the point of this paper, it is significant that the incidence of institutionalization of ASCs for North American societies (Indian and Eskimo) was 97 percent.

As a near-universal mode of human behavior, ASCs must also have been available to the Archaic Pastyle shamans. While we have no ethnographic knowledge of how and to what extent ASCs were exploited within their overall ritual framework, the pictorial symbolism inherent in their rupestrian art is ample evidence that ASCs were used and therefore part of their ideological world view and value system. Of the many graphic indicators that suggest a hallucinatory genesis for the great majority of Pastyle imagery, the following must suffice here to underline my claim: depictions of hardwired phosphenes and other endogenous phenomena such as monsters and grotesques; the recurring and consistent mix of iconic and entoptic elements that convey the coherent concept of the ecstatic shaman, shamanic flight, animal familiars, and transformational themes; humans and animals portrayed in skeletonized fashion; animal metaphors for the idea of liminality; anthropomorphs with features of distortion and attenuation, possibly as a result of somatic hallucinations; pictorial clues for the trance-experienced sensations of macropsia and micropsia, polymelia, piloerection, and other tactile hallucinations. These shamanistic themes, that can be tested against the neuropsychological model devised by Lewis-Williams and Dowson

(1988), constitute a wealth of graphic evidence that much of Pastyle imagery is congruent with the ideology of a shamanic tradition.

Pastyle Shamans

The shaman, in his role as "broker" or "boundary player" (Bean and Vane 1978:127) between the domains of the sacred and the profane, is primarily a technician of ecstasy or altered states of consciousness (ASCs). To transport himself intentionally into the realm of the spirit world by means of a convincing trance experience, he resorts to a wide range of techniques. Among these are exposure to the elements; sensory deprivation brought on by physical exhaustion, sleeplessness, prolonged solitude, thirsting, and fasting; rhythmic and sonic driving such as drumming or dancing; hyperventilation, intense concentration, and sexual abstinence; and pain, self-mutilation, and self-torture such as bloodletting. In addition to these non-chemical means of ASC achievement, the shaman, equipped with an extensive psychopharmacological knowledge, can induce powerful botanical hallucinations through the use of psychoactive plants. Unlike Eliade (1964:401), who deems the use of narcotics "a vulgar substitution for pure trance," La Barre (in Furst 1976:2) actually argues that the early Native Americans were essentially "culturally programmed" for a conscious exploitation of hallucinogenic plants.

As Taylor (1996:94) points out, people in hunter-gatherer societies are exposed to a myriad of complex plant-based compounds and, on the average, utilize two hundred species of edible vegetation. In an Archaic subsistence economy that emphasized the gathering of plants over the hunting of animals, an intimate plant knowledge was a survival necessity. Without a doubt, the Archaic inhabitants of the Palavayu were thoroughly familiar with the flora of the various phytogeographical zones that made up their land. Their ethnobotanical expertise, acquired through a method of trial and error over thousands of years, must have included detailed information not only about a plant's growth cycle and seasonal availability, but also about its edibility and overall usefulness. Pastyle shamans, moreover, must have been versed in all aspects of a plant's medicinal properties and

capable of separating those that were beneficial from those that were harmful or even fatal. Their pharmacopoeia would, in all likelihood, have also contained an assortment of botanical hallucinogens. Although we have no direct ethnographic evidence that Pastyle shamans ingested psychoactive substances to facilitate ecstatic trance, evidence for the use of hallucinogenic plants may be obtained by drawing analogies to present-day Pueblo cultures of the American Southwest. I believe that such ethnographic analogies are justified even if no definitive case (Reid and Whittlesey 1997:183) can be made for continuity between the Pastyle hunting-and-gathering people and the much later Anasazi.

Ethnographic and Archaeological *Datura* in Arizona

Dobkin de Rios' and Winkelman's (1989:1) definition of shamanism as "a cultural adaptation of hunting and gathering societies to the biological potential for ASC" does not imply that shamanism became extinct along with the demise of the Archaic hunter-gatherer bands and the emergence of horticulturists and farmers, at least not where the American Southwest is concerned. While no longer a religious cornerstone among Puebloan culture groups, shamanism's survival was assured because agriculturists continued to have the same metaphysical, psychic, healing, and fertility needs as their Archaic predecessors. Weather magic, for example, as practiced by Pueblo rain priests, may not be radically different from the rituals performed by the Archaic shamans to influence meteorological events.

The number of ethnohistoric sources testifying to the persistence of shamanism in Arizona is relatively small. Even sparser is recorded information concerning the use of psychotropic agents as inducers of trances or ASCs. There exist, however, a number of references that clearly point to the use of alkaloid-rich *Datura* in the context of certain shamanistic practices and rituals. Boyd and Dering (1996:267-269), who see evidence in the ethnographic and ethnobotanical literature of the New World for "widespread use of the genus *Datura* by shamans for the purpose of divination, prophecy, ecstatic initiation, ritual intoxication, diagnosis,

and curing," single out for Arizona, the Navajo, Yuma, Paiute, and Zuni as some of the tribes whose pharmacopoeias contained this hallucinogenic herb. In addition the solanaceous plant was employed as a remedy for various afflictions by the Apache (Curtin 1984:85–86). Gayton (1928:24) cites a Pima "*Datura* song" that was sung to assure success in the deer hunt. While Walapai medicine men are said to have indulged in sacred intoxication to "utter prophecies" (Gayton 1928:25), White Mountain Apache added the root of the plant to a fermented corn beverage in order to increase its intoxicating effect (Gayton 1928:25). A similar result seems to have been sought by the Havasupai (Gayton 1928:25). Finally, La Barre (1975:35) mentions the Cocopa and Mohave as using *Datura*, without specifying the function of the hallucinogens, however.

In the large corpus of ethnographic data I have collected in the course of my own research among the Hopis, intimations of shamanic practices are tantalizingly few. Still, there is sufficient evidence that shamanism was once firmly institutionalized among these agriculturalists. Besides linguistic proof—terms are attested for "shaman" and shamanistically-oriented sodalities such as the *Poovost* (Malotki 1998a) and the *Yaya't* (Malotki 1993:186)—there exists a sizable body of oral literature whose black magic or witchcraft lore testifies to a one-time deeply-entrenched practice of white magic or shamanism among the Hopis (Malotki 1993:150–187). In addition, I have recorded a number of narratives that deal with such shamanic themes as death and rebirth in the context of initiation into the business of healing (Malotki 1998b).

Levy et al. (1987:171), confirming the existence of the above-mentioned Hopi shaman societies, believe, however, that they were eighteenth-century imports from the Zunis (Levy et al. 1987:29). While this may hold for the *Yaya't*, whose appellation has a foreign, non-Hopi ring, I do not think that this is the case for the *Poovost* society.

In a subsequent reappraisal of Hopi shamanism, Levy rejects Jorgensen's (1980:500) contention that Hopi shamans differed from the quintessential pattern of the North American Indian shaman in that they "did not use the trance state," and points to the actual utilization of *Datura* to induce ASCs (Levy 1994:310).

A list of specific *Datura* applications among the Hopis is found in Whiting (1966:89). While its use in medical diagnosis and treatment was primary, it was also employed to cure mean-spirited individuals of their "meanness" by holding them in a blanket over the smoldering leaves of the plant (Whiting 1966:37). Furthermore, it was customary to replace absent ears on kachina masks with *Datura* flowers (Colton 1959:14). Quite appropriately, one kachina who is always adorned with such ears, is the Maswikkatsinmana. Also known as Tsimonmana, "Jimsonweed Girl" (Wright 1973:253), it was her task to fetch Maasaw, the god of death, in the course of the Nevenwehekiw ceremony (Malotki and Lomatuway'ma 1987:133–138).

A reference to the Hopis' utilization of *Datura* of a more indirect sort is contained in an ethnographic episode collected by Beaglehole and Beaglehole (1935:9) where *poswiwimkyam*, "initiated members of the 'seer' or shamanic curing sodality," made use of a "medicine which made them stagger in their walk as if they were intoxicated." This happened while they were treating their patients by removing from them, with the aid of quartz crystals, pathogenic objects shot into the victims by sorcerers and witches. During a similar extraction of injurious objects, a Hopi medicine man gave the patient "something to chew that would cause him to dream and thus learn the identity of the witches who were after him" (Titiev 1972:54).

Reports on archaeological *Datura* sites in Arizona that might shed light on the ritual use of the herb by prehistoric people are extremely scarce. Cutler and Kaplan (1956:98) retrieved a single seed-pod fragment from a room at the Richard Caves site near Montezuma Castle which, according to Pierson (1956:96), was occupied during the initial half of the twelfth century.

Briuer's excavation of O'Haco Shelter in Chevelon Canyon yielded one *Datura meteloides* seed that dates to the first millennium B.C. (Briuer 1977:93, 156). A second seed was found by him at another rock shelter that I have named White Mana Cave (Malotki 1996). No radiocarbon dates are available for this site. It is significant to note here that both locations contain rock art that, in my eyes, does not meet the stylistic criteria for the Archaic-Basketmaker Pastyle complex.

Briuer (personal communication 1997) cautions against leaping to conclusions about human behavior on the basis of such a low *Datura* seed count and suggests that most of the identified ecofacts at the two shelters were in all probability artifacts of noncultural depositional processes. However, when considered within the scope of all existing evidence, including that for the larger Southwest—ethnographic, archaeological, as well as rupestrian (see below)—a consistent pattern emerges that strongly argues for a long history of *Datura* use among the ancient Arizonans.

In addition to the paleobotanical *Datura* remains mentioned above, the archaeological record appears to contain ceramic evidence for the use of *Datura*. As Litzinger (1979:146) explains, this evidence is based on “the hypothesis that ceramic representations of the characteristic spiny seed capsule of *Datura* were widely produced in connection with *Datura* use.” According to Gladwin et al. (1938:Plate CXXXVII), vessels with distinctively “spiked” or “hobnail” surface treatment are common in the late Sedentary (A.D. 1000–1100) and early Classic (A.D. 1100–1250) periods of Snake-town. However, Haury (1976) has shown that they already occur in the early Sedentary (A.D. 900–1000) and the Colonial (A.D. 500–900) periods. Fish et al. (1992:65), for example, unearthed fragments of six different vessels with exterior spikes at a Hohokam platform mound site in the northern Tucson Basin. Downum (1993:120) remarks in this context that “considering the hallucinogenic properties and ethnographically documented religious significance of the *Datura* plant, this may provide evidence of a previously unsuspected use of platform mounds for vision quests or similar rituals.” In northern Arizona, a pottery fragment with knobby applique stems from a site in the vicinity of Red Lake Trading Post, Arizona, that dates to the Basketmaker III period, approximately A.D. 600 (Chris Downum, personal communication 1998). Three knobby applique specimens in the ceramic collections at the Museum of Northern Arizona in Flagstaff also hail from northern Arizona. One, a Tusayan Gray Ware vessel from the Wide Ruin site near Kintiel Trading Post, is believed to be of Pueblo III/IV provenience (Figure 6). Although there are no archaeological clues as to what functions these vessels served, it is quite

likely that they were once in the possession of shamans who stored *Datura* seeds or roots in them for the purpose of trance inducement. Overall, they can therefore be considered to round out the evidential mosaic for prehistoric *Datura* use in Arizona.

Datura and Pastyle Rock Art

To determine whether the *Datura* plant is actually depicted in petroglyphic Pastyle art, it will be necessary to briefly sketch its appearance and describe its psychotropic characteristics. Being the generic name for several species of herbaceous perennial weeds, *Datura* belongs to the *Solanum* or nightshade family. Among the *Solanaceae* one finds the Old World representatives of belladonna, mandrake, and henbane, feared for their narcotic properties. However, the *Solanaceae* also include such nonpoisonous New World plants as the potato, tomato, and egg plant. Ranking among the most famous medicinal and hallucinogenic herbs in the world, *Datura* is known by a host of common names that include jimsonweed, thorn apple, Gabriel’s trumpet, devil’s weed, stink weed, mad apple, Indian apple, moon flower, and others. *Toloache*, which is widely used for *Datura* in Californian ethnohistories (Furst 1976:143), is a corrupted form of Nahuatl *toloatzin*, “inclined head” (Litzinger 1979:147).

Datura is native to the tropical and warm temperate regions in both hemispheres (Safford 1920; Schultes 1972; Schmutz 1979). As Schultes (1972:46) points out, however, “the New World can boast a greater number of species valued for their psychotomimetic properties and for the intensity of

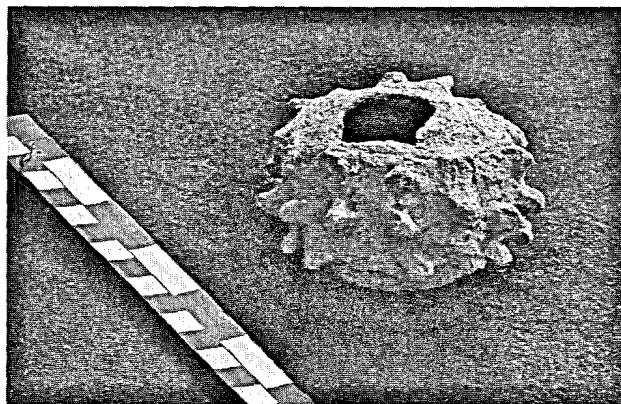


Figure 6. Knobby pot from Northern Arizona. Courtesy Museum of Northern Arizona.

their role in aboriginal societies." For its habitats, the plant favors disturbed soil—the edges of trails or other roadways, trash mounds, abandoned fields, and the enriched earth of burial grounds (Wilbert 1994:50). Litzinger's claim (1979:146), however, that the plant's mode of dispersal may depend solely on human involvement, seems overstated. In the Palavayu, where *Datura* occurs at many rock art sites (Figure 7), periodic flooding and action by game animals along the riverine banks of the area's canyon system must equally have contributed to its propagation.

A comparison with herbarium species at Northern Arizona University indicates that the species most frequently encountered in the Palavayu are *Datura meteloides*, whose preferred scientific appellation is now *Datura wrightii* (Lehr 1978), and *Datura stramonium*. Growing to a height of between 0.6 m and 1.5 m, the rank herbage supports showy white flowers whose fragrant funnellform corollas produce round to ovoid fruit. Consisting of prickly capsules that can either be nodding, as in *Datura wrightii*, or stand erect, as in *Datura stramonium*, the fruit, with its innumerable spines, apparently inspired the term "thorn apple." The fruits are filled with seeds, which are released as the spiny pods crack open (Millsbaugh 1974; Safford 1920; Schmutz 1979).

All parts of the plant are poisonous, with the highest degree of toxicity lodged in the seeds and the roots. Merely touching the leaves may trigger dermatitis in susceptible persons (Kearney and Peebles 1951:759). This toxicity results from the plant's tropane alkaloids hyoscyamine, atropine, and scopolamine (Litzinger 1979:147). Apparently, the proportions of these chemical constituents vary not only among the different species, but also depending on the localities where they are collected, rendering the plant "highly unreliable even in trained hands for internal use" (Moore 1979:91).

The physiological effects caused by *Datura* intoxication, even at lower doses, include visual and auditory hallucinations, usually of a terrifying kind, disorientation, combativeness, delirium, apparent insanity, convulsions, and nausea. Higher doses will cause coma, and, in severe cases, death. A whole series of symptomatic effects pertain to the eyes: mydriasis (pupil dilation), photophobia (abnormal intolerance of light), diplopia



Figure 7. *Datura* growth at the Costar site.

(double vision), and hemeralopia (day blindness) (Avery et al. 1959; Klein-Schwartz and Odera 1984; Millsbaugh 1974; Schmutz 1979). An interesting side effect worth noting is that the sexual functions of *Datura* ingestors are often heightened, with women experiencing nymphomania (Malotki 1983) and men priapism (Whitley 1996:76).

Discussion of Evidence

In addition to the ethnographic and archaeological evidence, the rupestrial data base that I have compiled to date on the Pastyle complex contains ample proof, in my opinion, that its artists exploited hallucinogenic *Datura* as a consciousness-altering agent. In discussing it, I will first present evidence that relates directly to the physical properties of the plant. The remainder is based on its symptomatology and is therefore of an indirect nature.

Only one image realistically resembling the actual *Datura* plant has been found so far in the Palavayu (Figure 8). It is identifiable by the trumpet-shaped corollas with their pointed sinuses. The rendition, which seems to depict the entire plant, including the roots, shows some of the flowers in



Figure 8. Plant motif resembling *Datura* from the Tsimona site. Size 31 cm.

an erect position with stamen sticking out, others drooping as they characteristically occur when in a withered state. Deeply varnished, it appears to be of considerable antiquity. Since, contextually, the image is not immediately associated with Pastyle anthropomorphs—the closest Pastyle panel is approximately 100 m away—I am not certain with what degree of confidence the plant portrayal can be assigned to the Pastyle tradition.

Unmistakably linked to the Pastyle complex, on the other hand, are a number of stafflike objects (Figure 9) whose circular distal ends consist of numerous stipple or dint marks. Held by anthropomorphic figures, they were originally thought to represent bouquets of flowers, reed grass, or emblems of shamanic authority (McCreery and Malotki 1994:18, 26). I now believe that they symbolize the stems and spinescent seed pods of *Datura*, especially after the identification of similar motifs in the Archaic pictographs of the Lower Pecos River in Texas (Boyd and Dering 1996:268). This interpretation appears justified in light of the morphology of the anthropomorphs that hold the plants. Endowed with skeletonized bodies, they thematically allude to the death and resurrection experience of trancing shamans who, in this case,

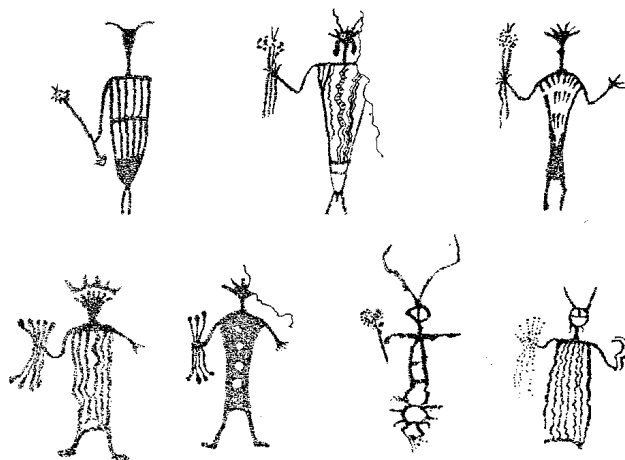


Figure 9. Pastyle anthropomorphs with staffs topped by objects resembling *Datura* seedpods.

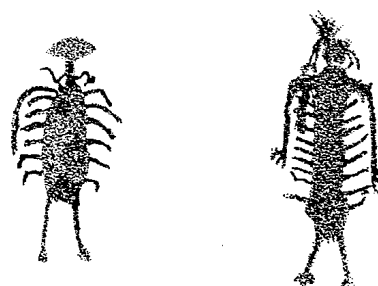


Figure 10. Pastyle anthropomorphs with fully spined bodies.

probably resorted to the psychodynamic assistance of hallucinogenic *Datura* to induce their power or vision quests.

Interestingly enough, in Figure 9, two of the human "decobods" appear to be echoing the symbolism of the spiny seed pods in the rayed tops of their heads. Numerous other examples of Pastyle patterned-body anthropomorphs with this spiny or rayed-head motif have been identified, generally though, without the hand-held staffs. I am tempted to equate the motif, in this context, with the thorn apple fruit of the *Datura*. However, the cephalic projections, which are said to be common somatic hallucinations during ASCs (Whitley 1994:26), could also be interpreted as representing the shaman's vital energy field, radiating from the head (Turpin and Zintgraff 1991:44).

A third exegesis, which to my mind has not been advanced before, is closely linked with ethnographic lightning lore that I was able to record in the course of my Hopi field research. Thus, in Hopi culture, a person who survives a lightning

strike without the help of others, is believed to be instantly qualified for the office of the shaman. As is well known, prior to a nearby lightning strike, victims will typically experience their "hair standing on end" due to the electrically charged air. Since the ancient Pastyle people also must have survived lightning strikes on occasion, one can hypothesize that such "hair-raising" experiences were seen as divine omens or initiatory events for a shamanic specialization and hence incorporated into the art.

Outside of the lightning-strike theory, spiny human heads can, of course, also be explained on the basis of tactile hallucinations. One such abnormal skin sensation, termed piloerection, results in the feeling of hair standing on end. This tactile

sensation may ultimately be also responsible for the phenomenon of lycanthropy. Since it involves animal transformation, it neatly fits the neuropsychological model of shamanistic imagery. Fully spined anthropomorphs are extremely rare in Pastyle art. Two examples are shown in Figure 10.

A fourth piece of proof for the presence of *Datura* elements in Pastyle art may be the so-called dint-splotches. Dint-splotches is my term for the randomly-pecked stipple patches that occur, not infrequently, either in isolation or integrated into Pastyle rock art panels. Two good examples from the Biface site are shown in Figures 11a and b.

In the context of *Datura* evidence at issue here, the stipple patterns may relate to the plant's violently hallucinogenic seeds stored in the dehiscent



(11a)



(11b)

Figures 11a and b. Examples of Pastyle dint-splotches from the Biface site.

capsules. Secondly, with the rock surface of the boulder or cliff assumed to constitute a veil (Lewis-Williams 1995:17) or membranous divide between the world of mortals and supernatural spirits (Clottes and Lewis-Williams 1996:86), the dint-splotches may simply have originated when the shaman attempted to contact the powers that be in the Otherworld. He may have accomplished this by indiscriminately pounding on the rockface with a sharpened hammerstone. Thirdly, since in my view Pastyle shamans were essentially rain shamans, a fact that is borne out by the high percentage of Pastyle symbols associated with water (Malotki 1994, 1997), the dints may also represent moisture in the form of dew or raindrops. Finally, the splotches of tiny dints or flecks may be due to a common tactile hallucination known as formication (from Latin *formica* "ant"). Accompanied by tingling feelings, it generally involves the abnormal sensation of ants or other insects running over the skin (Sacks 1985:79, 244).

While I am aware that the four interpretations I offer for this rupestral phenomenon are rather speculative, they have, nonetheless, a certain degree of viability within the context of the shamanistic hypothesis that I posit for the origin of the majority of Pastyle art.

In addition to the vegetal features of *Datura* captured by the Pastyle shaman-artists, the iconography contains graphic portrayals of the physiological effects of the plant. Most prominent among these are pupil dilation, the sensation of flying, and priapism. Together, they indirectly corroborate the ingestion of the hallucinogen by the Pastyle artisans.

I have previously argued (Malotki 1998a:12) that owl images are singularly predestined to become one of the defining metaphors for the shaman. Owls are nocturnal, and shamans seem to prefer the dark of the night for serious curing sessions. Because of the bird's legendary visual acuity, it is easy to suggest that the owl might have come to represent, in the minds of Archaic hunters and gatherers, a sort of shamanic ability to "see into" the other, hidden world of spirits or "see beyond" the ordinary, visible world. Conceived of as a liminal creature that is at home in the realms of both light and dark, just like the shaman who commutes between the secular and supernatural

world, it comes as no surprise that nearly ninety owl images have been counted in Pastyle rock art to date.

Rendered in rigid, frontal posture, Pastyle owls have large, globular eyes (Malotki 1998a:13-14). Of the obvious physiological symptoms that have been observed in patients suffering from *Datura* intoxication, mydriasis or pupil dilation may have been a highly motivating factor for the Pastyle shaman-artist to select the owl as one of his alter egos. Extreme pupil dilation causes photophobia (Millsbaugh 1974:502) to the point that a patient will gain the ability to see clearly at night, but be abnormally intolerant of daylight. This effect of *Datura*-triggered pupil dilation may, ultimately, also explain why so many Pastyle anthropomorphs are bug-eyed, i.e., rendered with eyes that are wide open and staring (Figure 12).

The likelihood that the Archaic Pastyle shamans intentionally utilized *Datura* as a sight and vision-altering drug is strong, considering that both the Hopis and Zunis, Native American tribes inhabiting the immediate vicinity of the Palavayu, are reported to have practiced this technique into the early part of this century. The plant extracts were apparently inserted directly into the eye. Thus, Stevenson (1904:386) relates that the Zunis

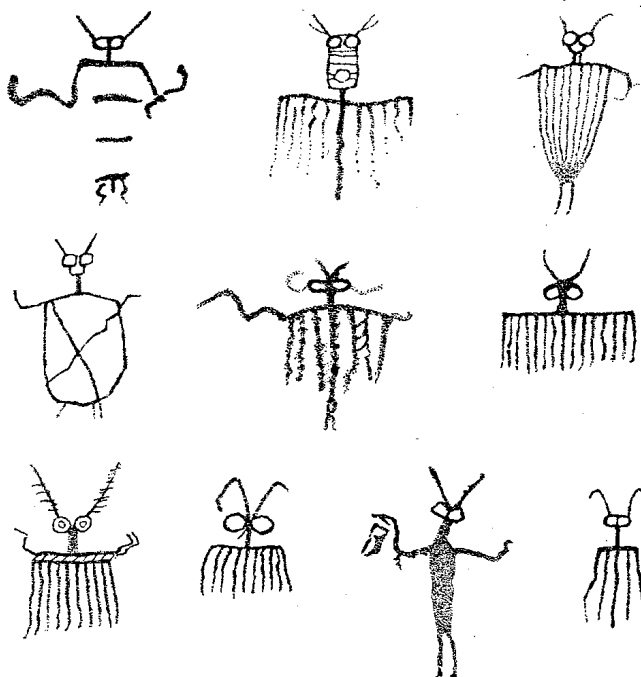


Figure 12. Pastyle anthropomorphs with enlarged staring eyes.

employed bits of the powdered root. For the Hopis my recorded statement (Malotki 1998a:11) simply indicates that the shaman "smeared something across his eyes, whereupon it got as clear as day for him." Unfortunately, the plant involved in the procedure is not specified. I strongly suspect, however, that the Hopis too were familiar with the powerful belladonna alkaloids and employed them for the mydriatic effect. These alkaloids derive their epithet, of course, from the Renaissance custom of Italian women who thought of turning themselves into sexually irresistible "belladonnas" or "beautiful ladies" by enlarging the pupils of their eyes (La Barre 1980:63).

Hyoscyamine, one of the powerful alkaloids in *Datura*, conveys the peculiar sensation of flying (La Barre 1980:63). It is this kinesthetic effect of weightlessness that suggests to the shaman that his soul is departing from his body and embarking on an extracorporeal voyage to the spirit world. As one of the central somatic hallucinations that a shaman can experience, shamanic flight is widely featured in Pastyle iconography. Many of the human figures actually occur without legs or feet and appear to be hovering in mid-air. Others are equipped with wings or are portrayed in the moment of avian metamorphosis. Figure 13

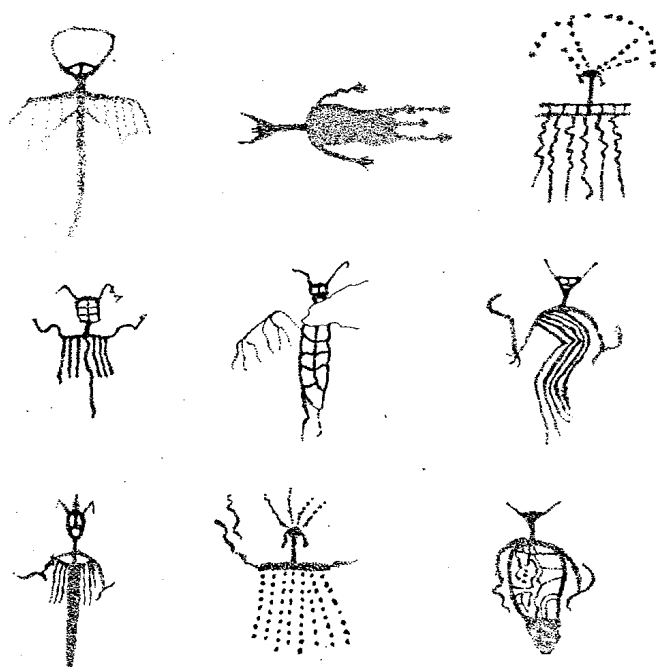


Figure 13. Pastyle anthropomorphs suggestive of shamanic flight.

provides a sampler of shamanic flight motifs from the Palavayu. Note that the figure from the Soxoff site is floating horizontally, an extremely rare depiction in Pastyle art.

Of the more than 2,000 anthropomorphs that I have counted to date within the Pastyle complex, the majority is depicted without gender characteristics. However, while there is a complete absence of female genitalia, which renders any identification of female figures impossible, males are frequently marked by pendant phalli. Only occasionally are ithyphallic poses depicted. While such priapic gestures may imply some fertility associations, *Datura* is known to act as an aphrodisiac (Stone 1932:55). It is thus likely that these depictions occur as a result of *Datura* ingestion and provide one additional piece of evidence for the use of hallucinogenic *Datura*.

Conclusion

For several years now I have argued (Malotki 1994, 1997, 1998, n.d.) that the Archaic-Basketmaker rock art of northeastern Arizona was essentially the product of shaman-artists. I wish to state clearly, however, that I do not propose the shamanistic origin hypothesis as an unconditional, monocausal explanation for all forms of Pastyle art. Still, when applied as a heuristic vehicle, I find the neuropsychological model to be an intellectually sound and reliable framework that avoids rampant speculation and provides more insights for many enigmatic ingredients of the art than any alternative theory. According to the three-tiered model suggested by Lewis-Williams and Dowson (1988)—stage-one entoptic phenomena, stage-two construed geometrics, and stage-three iconics—I see a multitude of internal clues that a large portion of Pastyle imagery reflects the hallucinatory mindscapes of their shamanic hunter-gatherer creators.

In addition to *Datura* sp., among the hallucinogenic plants available to Pastyle people within the confines of northeastern Arizona, were Indian tobacco (*Nicotiana trigonophylla*), Four o'clock (*Mirabilis multiflora*), and the mushroom species psilocybe (*Psilocybe coprophila*) and fly-agaric (*Amanita muscaria*) (Hevly, personal communication 1998). Of these, *Datura* appears to be the most

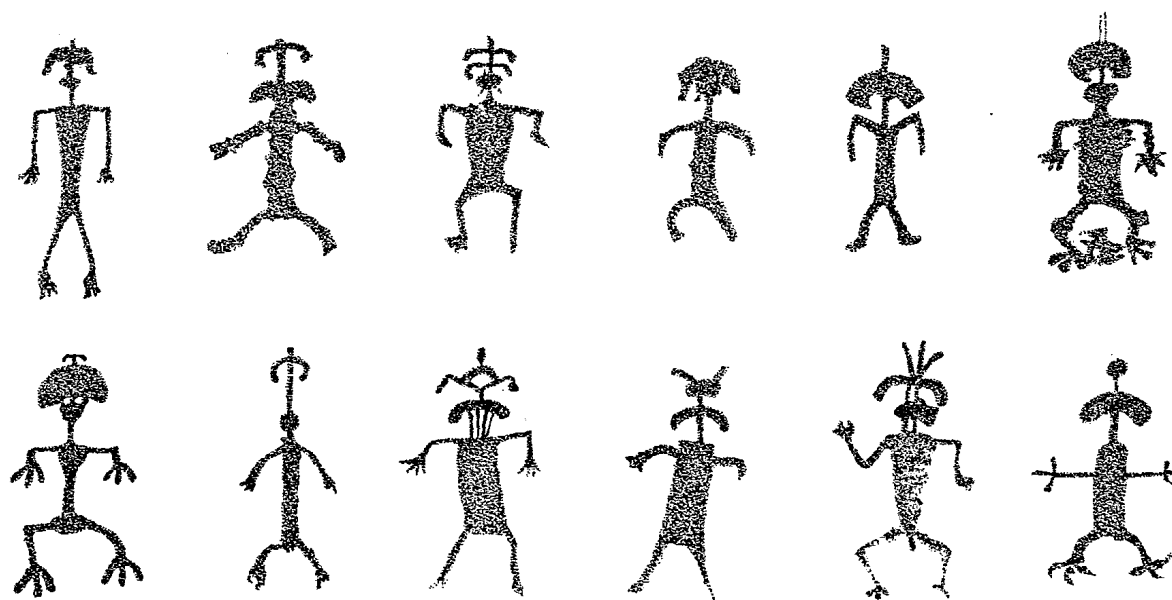


Figure 14. Crescent-headed anthropomorphs or "mycanthropes" from the Palavayu Hisatstyle tradition.

qualified to have served the ancient hunters and gatherers in their exploitation of hallucinogens and their consciousness-altering agents.

One of the later stylistic rock art manifestations in the Palavayu is distinguished by crescent- or mushroom-headed anthropomorphs (Figure 14). Probably created by Basketmaker people who succeeded the Pastyle bands, these images suggest that fungi as mood-altering drugs may have played a role in the production of the art. No evidential support exists for such a claim in regard to the body of Pastyle art. The same observation holds for the potential use of Four o'clock and tobacco.

Methodologically, to establish proof for the use of *Datura* by the Pastyle hunter-gatherer artists, I first made use of the ethnographic analogy approach. By drawing on ethnographic information from present-day Native American cultures in Arizona, a general context emerges for intimate familiarity with the psychotrope *Datura*. This context is further strengthened and chronologically extended when evidence from the archaeological record is taken into account. Not only do seed remnants testify to the use of the plant, but the existence of spiked vessels resembling its thorn apple fruit actually intimate a ritual framework for the use. On this platform of ethnographic and archaeological evidence, finally, rest all of the iconographic clues inherent in Pastyle art itself

that I adduce as proof. Specifically, three major conclusions can be drawn from my analysis:

- 1.) The Pastyle rock art complex exhibits a number of depictions that relate to botanical properties of *Datura*. Besides fairly realistic portrayals of the plant, there are allusions to its seed capsule. The latter is found in conjunction with hand-held staffs and echoed in the spiny heads of anthropomorphic figures. So-called dint-splotches may actually represent the seeds of the plant.
- 2.) In addition to such direct testimony, indirect evidence is seen in several of the art's motifs that intrinsically relate to the physiological effects of the herb. Thus, depictions of bodily levitation, very pervasive in the art, pertain to the somatic sensation of flying and account for the shamanic capability of extracorporeal journeying to the world of the supernatural. In addition to the occasional occurrence of ithyphallic males, attributable to the plant's aphrodisiac effect, a symptom frequently captured in the art seems to be that of pupil dilation. Testifying to the shaman's extraordinary visionary powers, this phenomenon is found not only in anthropomorphs but also in the images of owls. One of the interpretations that I provide for the latter (Malotki 1998a:12) regards the birds as metaphors for the shaman.

3.) The parietal archives of Pastyle art constitute one of the richest storehouses of Archaic petroglyphs in the whole of the American Southwest. This art bears all the hallmarks of a shamanistically-motivated iconography, and I argue that most of it was created by shaman-artists within the ideological context of Archaic hunting and gathering people. By combining three strands of evidence—ethnographic, archaeological, and iconographic—and analyzing them against the shamanistic hypothesis, a convincing argument can be made that *Datura* was a hallucinogen of great significance to the Pastyle shaman-artists of the Palavayu some 6,000 to 3,000 years ago.

The contextual clues inherent in Pastyle rock art are the most compelling ingredient for the argument for *Datura* use by the ancient hunters and gatherers. On their basis we can assume that the supernatural benefits obtained from the plant's psychoactivity must have outweighed the risks of serious physiological harm. A host of questions remain, of course. Was the plant considered sacred by them? How did the people account for its ecstatic potency? Was the plant thought to be inhabited by spirit beings who were held responsible for the visionary experiences? Were there ever specialists organized in shamanic *Datura* medicine societies? Obviously, we will never know all of the answers, just as the meaning of many rock art images will continue to elude us. Optimistically, uncovering insights, such as the ones presented in this paper, beyond the tangible objects of material culture, will justify our ongoing in-depth study of rock art.

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