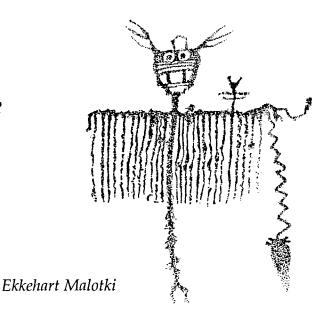
The Dragonfly:
A Shamanistic Motif in the
Archaic Rock Art of the
Palavayu Region in
Northeastern Arizona



The rich and variegated rock art complex that is emerging in the Palavayu of northeastern Arizona (Figure 1) features a geographically well demarcated style which is dominated by an imposing array of patterned-body anthropomorphic petroglyphs. Since the total count of anthropomorphic figures presently exceeds the 1600 mark at some 125 sites, I have termed the style "Palavayu Anthropomorphic Style" (PASTYLE). This designation is chosen in analogy to Schaafsma's "San Juan Anthropomorphic Style" (1980:109) and Tipps' "Barrier Canyon Anthropomorphic Style" (1995:153), rock art manifestations of Basketmaker and Archaic provenance whose centers are located, respectively, about 270 and 520 kilometers north of the Palavayu area.

Although the zoomorphic repertoire of the PASTYLE iconographic inventory consists primarily of horned ungulates—bighorn sheep, elk, deer, and pronghorn antelope, it also includes numerous snakes (Malotki 1994), birds, represented almost exclusively by owls (Malotki 1995), a few myriapods (centipedes or millipedes), one turtle, one isolated arachnid that resembles a spider, and over fifty symbols whose "phone-pole" configuration readily identifies them as dragonflies.

Created by hunter-gatherers, PASTYLE rock art is thought to be anchored in the ideology of shamanism. In the context of the shamanistic hypothesis, which is posited as the prime motivating force behind this parietal art style, petroglyphic dragonflies are seen as a significant piece of internal evidence for this conclusion. They can be interpreted either as graphic metaphors for the shaman-artists themselves, or perhaps as animal familiars enabling them to secure supernatural power from the spirit world.

Dragonfly images from a number of rock art sites distinguished by the Palavayu Anthropomorphic Style, and ethnoentomological data are presented to suggest this shamanistic hypothesis.

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Palavayu Anthropomorphic Style,
an Archaic rock art tradition in
Northern Arizona, and analyzing
its imagery against the
hypothetical model of
Shamanistic origin.

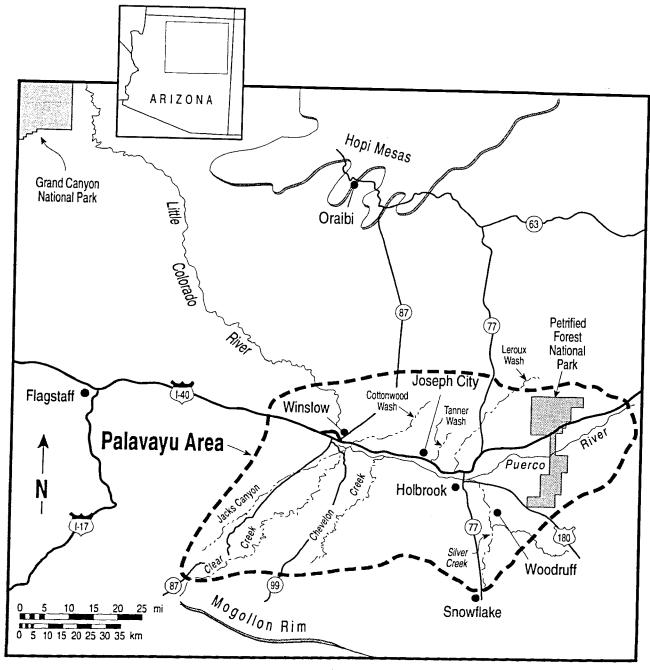


Figure 1. The Palavayu rock art area of northeastern Arizona.

Insects and Cultural Entomology

The myriad world of insects, which broadly includes such invertebrate animals as spiders, scorpions, and centipedes, has profoundly impacted human consciousness from earliest times. Although absent from the inventory of animals in Ice Age wall art (Marshack 1991:169), insects are nevertheless attested on mobiliary materials. One of the oldest representations of insects appears to be a Paleolithic

bone engraving of a grasshopper from the cave of Enlène (Montesquieu-Avantès, Ariegè) dating from the Middle Magdalenian (approximately 13,500-14,000 BP) (Jean Clottes, personal communication 1996). One of the best known insect cults in antiquity was that revolving around the sacred dung beetle or scarab in ancient Egypt (Swift 1931:2). The largest pictorial rendition of an insect from early cultures is probably the famous giant geoglyph of a spider on the plain of Nazca, Peru (Hadingham 1987:77).

In modern times, however, scientists in the field of entomology have mostly ignored the fascination that insects have exerted on the human mind, and the academic pursuit of the influence of insects in the humanities has only recently gained momentum. This new field of endeavor, pioneered by Charles Hogue, has been called "cultural entomology" (Hogue 1980), and has amply illustrated (Hogue 1987) the influence of insects in the humanistic realms of art, religion, folklore, language, history and philosophy. In the fields of literature, music and the performing arts, Kafka's "Metamorphosis," Puccini's "Madame Butterfly," and Sartre's "The Flies," are illustrative examples of the modern cultural use of insect motifs.

Given this ancient cultural influence, continuing into modern times, it is not surprising that Hopi culture, resident in the general area of the petroglyphs to be discussed, is full of references to insects. Kookyangwso'wuuti or "Old Spider Woman," a veritable culture heroine and ubiquitous dea ex machina (Malotki 1987:2), intercedes on behalf of all good people in distress, and has all the makings of an earth goddess (Malotki 1978:208). Spider Woman, an insect herself, has magic control over growth-promoting heat through another insect, the cicada. The Hopi kachina pantheon, furthermore, contains several deified insects, other than the dragonfly, all of whom are prayed to as bringers of life-sustaining moisture in the form of rain: Kookopölö, "Robber Fly;" Maahu, "Cicada;" Taatangaya, "Yellow Jacket;" Momo, "Bee;" Sösööpa, "Jerusalem Cricket;" and Putskoomoktaqa, "Scorpion." Poliikatsina, "Butterfly kachina," alludes to povolhoya "the butterfly," and mastootovi, "the big shiny housefly," underlies the kachina name Mastopkatsina.

The Dragonfly and Dragonfly Lore

The dragonfly figures prominently among the many insects that have captured the human imagination. It dates at least from the Carboniferous period, some 250 million years ago, where the fossil record includes the Meganeura, a giant (wing span up to 80 cm) dragonfly, perhaps the largest insect ever known. Taxonomically, dragonflies, and the smaller but similar damselflies, constitute the order Odonata. Clausen (1954:141) attributes this name, based on the Greek word odon, "tooth," to "the tusklike appearance of the abdomen of these insects." Needham and Westfall (1975:3), on the other hand, hold that it alludes to "the strong and sharply toothed jaws that are the outward sign of their predatory habits."

Dragonflies are distinguished by large eyes and heads, elongated slender bodies, and four stiffly outspread cellophane-like wings with a multitude of veins, unlike true flies, which have only one pair of flying wings. Linsenmaier (1972:348) suggests that the dragonfly/damselfly may be the best flying machine on the planet. A master aerialist with great maneuverability, it can reach speeds up to 60 miles an hour, and can not only hunt on the wing, but can also lay eggs on the fly while crossing water.

The ugly visage of the dragonfly, with its ogrelike expression, may have given rise to the many negative, even sinister names applied to it in the West; Kiauta-Brink (1976:150) believes this is reflected in the very term *dragon*fly. Other appellations are even more sinister. For example "darning needle" or even "devil's darning needle" are thought to come from the creature's alarming reputation of being able to sew up the mouths of profane men and women (Cavendish 1995:1345) or any of various other cavities of the human body (Clausen 1954:141).

Ethnoentomological information on the dragonfly is not easily located, sparse, and widely scattered throughout the literature, usually in works that deal with matters other than entomology. A brief crosscultural sampler must then suffice to provide some insight into the attitude of human beings toward this insect. Contrasted to the West, the dragonfly was regarded with great admiration in the Far East, where in China and Japan it gained a culturally important place, was accepted as an object of natural beauty, used as symbols of happiness and victory (Kiauta-Brink 1976:150), and even employed in an ancient poetic name (Akitsushima or "Dragonfly Island") for Japan (Clausen 1954:143).

Dragonflies in the Southwest

Dragonflies have long been symbolically significant in the American Southwest. They were so important in the Navajo world that in stories of the creation, the first of the four underworlds that existed before the present Fifth World was portrayed as entirely inhabited by Insect People, among them Dragonflies (Matthews 1897:63).

The Dragonfly was especially important in the Puebloan cultures of the American Southwest, where Parsons (1938:337) rates the overall status of the insect as "sacrosanct." At Zuni, she claims, the dragonfly was called Shumaikoli and functioned "as the kachina patron of the Shuma'kwe society," the masked initiates of which impersonated the insect (Parsons 1939:191), while Benedict (1969:9) also states that killing it was taboo.

In a dragonfly story recorded by Bunzell (Benedict 1969:1-9), the insect, through its magic, helps two abandoned Zuni children survive and is ultimately responsible, together with its supernatural kachina kin, for the renewed fructification of the earth. "That is why," the narrator concludes didactically, "we worship the dragonfly, and why no one is allowed to kill it." In an actual dragonfly origin myth, also of Zuni provenience, the reader learns that the insect is emblematic of summer, for it "comes in early summer when the corn tassels bloom" (Cushing 1920:121).

The dragonfly also figures prominently in Hopi culture, in addition to those insects in the Hopi kachina pantheon, previously discussed. The most common Hopi word for "dragonfly" is moosa, "cat," presumably because of the insect's long tail. Also attested are siilatatsi, paalatatsiw or paatalatsi, depending on whether the term is used by speakers of Third, Second, or First Mesa dialects. All of my Hopi consultants concurred that none of these terms is ever used for a kachina, so it is appropriate to point out here, as an aside, that Colton's (1959:34) identification of Sivutootovi, "Soot Fly" as "Dragon Fly Kachina," repeated by Wright (1973:229), is erroneous.

Most Hopi ethnoentomological details concerning the dragonfly are found in Stephen's work, all of which was published posthumously. Thus, in Wade and McChesney (1980:17), he reports that the dragonfly, as a servant to the "Cloud" deity Omau [correctly Oomaw], will unlock water from springs destroyed in earthquake-caused landslides or "lead the people to the place of a new spring." At another place (Wade and McChesney 1980:26), Stephen, in summarizing a Hopi legend, relates that a youth who had been sacrificed "reappeared a long time afterward during a great drought. He was seen for four mornings just before sunrise extended against the eastern sky. On the fourth day a great storm arose and the youth, in the form of a gigantic dragonfly, was seen leading the rain cloud over the land of the Hopitu [correctly Hopiitu], and [the] plenteous rains [that] ensued relieved the people from their sufferings."

A second legendary account is found in Patterson (1994:157) who cites from an unpublished manuscript by Stephen (1890:49-51). Once again, at the occasion of a famine, Oomaw, "Cloud," is petitioned, this time by the religious society of the Kwaakwant, "members of the Kwan society." At the request of Oomaw, consecrated kernels of maize are planted in holes made by a swarm of dragonflies that the god

had commissioned for this labor. Fanning the magically growing corn plants for four days, the dragonflies ensure their ultimate ripening and thereby prevent the starvation of the migrating Hopis.

Fewkes (1898:680), who was familiar with Stephen's ethnographic recordings, consequently characterized the dragonfly as "a symbol of water" with which "are associated many legends connected with the miraculous sprouting of corn in early times."

Finally, Curtis (1922:43) cites a Hopi Dragonfly song in which "Yellow Dragonfly Boys" and "Blue Dragonfly Maids" occur in the context of rain, clouds, and corn.

Non-Parietal Dragonfly Iconography in the Puebloan Southwest

Dragonfly images in contexts other than rock surfaces are well documented in the literature, to a point in fact that a veritable "odonatochronology" or dragonfly timeline can be construed for ceramic ware alone in the Southwest.

The initial phase of this ceramic sequence is taken up by the aesthetically sophisticated pottery designs of the Mimbres, a late Mogollon Pueblo culture whose people inhabited the Mimbres River Valley area of southwestern New Mexico and southeastern Arizona, and whose "classic" period reached its zenith about A.D. 1050-1150. Exquisite dragonfly depictions on Classic Mimbres Black-on-White Style III are illustrated in Brody et al. (1983:83) and also in Cosgrove (1932:Plate 199), images that were never surpassed by subsequent pottery styles. Temporally part of this early phase, though culturally outside the Puebloan realm, is a shell dragonfly that the Hohokam (ca. A.D. 1200-1400) fashioned in the shape of a pendant (Bird 1992:XVIII).

The next major period in which ceramic creations feature dragonfly motifs basically comprises the entire Pueblo IV period, from about A.D. 1375 to the Spanish Entrada in the middle of the 16th century. Examples listed in tentative chronological order are: Jeddito Black-on-Yellow (Martin and Willis 1940:Plate 38, Figure 2); Sikyatki Polychrome (Brody 1990:Figure 24; Fewkes 1898: Plates CXX, CXL, CLXIII; Wade and McChesney 1980:26); Hawikuh Polychrome (Brody 1990:195; Smithetal. 1966: Figure 76); Kechipawan Polychrome (Smith et al. 1966: Figure 48 and 50); Matsaki Polychrome (Smith et al. 1966: Figure 61); Rio Grande Glaze C (Brody 1990:195); and Pottery Mound Glaze Polychrome (Brody 1990:195).

In the realm of Pueblo painting, no other kiva murals seem to feature the insect motif more frequently than those from Pottery Mound, "a Pueblo community which thrived from about A.D. 1300 to 1475" (Hibben 1975:XII). Hibben (1975:115) has counted the dragonfly "in over thirty paintings." As a rule, they appear as simple double-bar crosses (Hibben 1975:58, 62, 72, and 83); at other times, quite unusually, they are spotted (Hibben 1975:53 and 114). Apparently, "dragonflies were also carved into stone floor slabs in two of the kivas" (Hibben 1975:115). The graphically most intriguing dragonfly image is an anthropomorphized version that Acoma informants identified as the "dragonfly man" (Hibben 1975:114).

Though sparse, dragonfly motifs are also encountered in the murals of Awatovi and Kawaika-a, Hopi Pueblo towns on Antelope Mesa dating from the Pueblo IV period. As Smith (1952:126) points out, the insects "are usually not a component part of the design as a whole, but are added rather haphazardly as embellishments to other and larger elements" in the paintings. While all the examples display the conventional "phone-pole" arrangement of straightline body dissected by two pairs of wings (Smith 1952: Figures 62 and 68), on one Kawaika-a fresco the dragonfly appears in the mouth of a fish (Smith 1952: Figure 55).

Pottery ware with dragonfly ornaments from Pueblo V times includes San Bernardo Polychrome (Patterson 1994:68) and Payupki Polychrome (see Patterson 1994:156). Examples from turn-of-the-century ceramics at Hopi belong to the Polacca Polychrome style complex (Wade and McChesney 1980:27 and 98). Zuni vessels with dragonflies from about the same time period are illustrated in Bourke (1984:Plate XXI), Young (1988:126-127), and Bunzel (1972:93 and 101).

In addition to appearing on ceramics, both ritual and domestic, the dragonfly at Hopi is, as Fewkes (1898:680-681) contends, "a constant symbol on modern ceremonial paraphernalia, as masks, tablets and pahos." Thus, two rectangular tiles leaning against the wall adjacent to the Masilen or "Gray Flute" society altar at Mishongnovi are decorated with raincloud symbols and dragonflies (Fewkes:1896: Plate II). Fewkes' observation also holds for Zuni. Stevenson (1985: Plates LXX and CXXVII), for instance, shows the dragonfly emblem portrayed on a kachina mask and on altar slats. It is worth noting in this context that similar dragonfly-decorated stone slabs were found in graves during the excavation of Kawaika-a (Smith 1952: Figures 22 and 23).

Two pieces of Hopi cloth, dating from the end of the last century, also bear the dragonfly design. One, according to Stephen, was decorated by Hopi clowns and used in ceremonial contexts (Patterson 1994:73). The other represents a typical altar cloth which, when set up in the form of a screen, served as backdrop for marionette-like puppet dramas such as the Paalölöqangw or "Water Serpent" (Broder 1978:10), staged in kivas on the occasion of kachina night dances.

To the best of my knowledge, contemporary Puebloan potters no longer include the dragonfly in their repertoire of designs. At least, I'm aware of only one example, a Zia pottery vessel, in the published literature (Hoffmann 1985:320). However, the insect is still found occasionally in modern Hopi paintings. Thus, the "Artist Hopid," a group of painters who are heavily influenced by prehistoric and protohistoric kiva mural iconography, have incorporated the insect motif in their symbolic paintings. One tiny dragonfly in a pictorial "statement on the importance of germination and regeneration in the Hopi world" (Broder 1978:214) thus lives on in Neil David Sr.'s "Awatovi Ceremonials" (Broder 1978:219).

Parietal Dragonfly Iconography in the Puebloan Southwest

Anyone looking for dragonfly imagery in the published rock art literature will be disappointed. With a few exceptions, most rock art books neither list the insect in their indices nor do they include it in their illustrative materials. Young (1988:299) does mention dragonflies in her index. Upon consulting the appropriate Figures 49 and 50, however, dragonfly-decorated Zuni jars take the place of the expected rock art examples from the Zuni-Cibola region. Packard and Packard (1974:22), claiming frequent occurrence for the motif throughout the Southwest, relate that "in some places these dragonfly carvings cover an entire wall of a cave or the face of a cliff." Unfortunately, however, their photo (Packard and Packard 1974:Figure 35) from a petroglyph site near Velarde, New Mexico, only portrays a single dragonfly. A second example, clearly visible in Packard and Packard (1974: Figure 59), which equally features the stylized insect pole with two crossbars, is not specifically pointed out. Schaafsma (1992: Figure 39) explicitly highlights dragonfly designs in the context of a star ceiling from a rock art site at Penistaja, south of Cuba, New Mexico. Another well-defined dragonfly from the Gobernador Phase can be viewed in Schaafsma (1992:Figure 35), although no mention is made of the insect in the caption .

I have personally observed dragonflies at various rock art sites in New Mexico, notably at Cieneguilla and Lyden. Care must be taken, however, that the Latin cross with its two crossarms is not mistakenly identified as the insect motif. An outstanding example of such Latin crosses in the form of petroglyphs is provided by Schaafsma (1992: Figure 185). Bird (1992:18) essentially suggests that the reason why New Mexico's Pueblo Indians so readily adopted the Christian cross may rest on the fact that the frequent double-bar cross was interpreted as a dragonfly by them. In a considerable number of New Mexico rock art panels, Christian crosses of Hispanic origin seem to have been added to the existing imagery at a later time, perhaps to exorcise the "pagan" imagery that was regarded as idolatrous. These Christian crosses are readily discernable from the fact that they appear less revarnished. A likely petroglyphic example of this phenomenon is in Packard and Packard (1974:Figure 58).

One explanation for the dearth of dragonfly images in the rock art literature may have to do with the impression that, overall, the insect design does not rank high on the ladder of visual or aesthetic appeal. But the motif is possibly also less wide-spread in the context of Southwestern rock art than the ceramic record would lead one to expect. Thus, in all of northern Arizona, with the exception of the Palavayu area, I know of only four sites with dragonfly images. Two of these, petroglyphs, are of Hopi provenience. The first, published in Michaelis (1981:4), is from the Hopi "Clan Rocks" site near Willow Springs. Here, Hopi men once incised their totemic signatures to commemorate their participation in a salt-

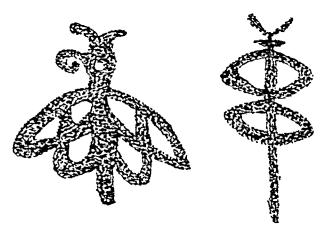


Figure 2. Butterfly and dragonfly motifs along the Hopi Salt Trail to the Grand Canyon.

gathering expedition to the Grand Canyon. The insectile icon is unique in that it features four ellipsoidal pairs of wings. The second occurrence is distinguished by a dragonfly with only two ellipsoidal cross elements and adorns a rock slab in a side canyon of the Little Colorado (Figure 2). Years ago, Hopi salt farers had to negotiate it in order to reach the salt deposits along the Colorado River approximately two miles south of its juncture with the Little Colorado River. Both designs were probably produced in late Pueblo IV or early proto-historic times. The third dragonfly example is a pictograph in upper Jacks Canyon in the vicinity of Chavez Pass. Executed in red, it is typical of the Mogollon Red Style that encompasses an estimated time span of A.D. 600-1250 (Schaafsma 1980:186). The fourth site, finally, located near Show Low, lies just north of the traditionally assigned Mogollon culture area. The panel, which features four dragonflies in vertical alignment (Morgan and Dosh 1995: Figure 58), may be of Pueblo II (A.D. 900-1150) affiliation, although it is impossible to tell if the specific petroglyphs are associated with the datable artifacts occurring at the site.

As to the entire region of the Palavayu and its hundreds of rock art sites, only one dragonfly motif has been recorded in the context of Puebloan rock art. Temporally most likely of Pueblo IV affiliation, it can be seen in McCreery and Malotki (1995: Figure 5.44). With the exception of Mimbres-type art, which features dragonfly motifs in the eleventh century, most other Puebloan traditions apparently do not incorporate the emblem until late Pueblo III or Pueblo IV times, both on ceramics and rock surfaces.

In the light of this general sparsity of dragonflies in Puebloan-type rock art, the relatively frequent manifestation of the insectile motif in the Palavayu Anthropomorphic Style is all the more surprising. With PASTYLE rock art believed to have been produced in the Archaic period, perhaps 3,000 to 5,000 years ago, a temporal hiatus of at least 2,000 years separates the Puebloan rock art dragonflies from those of the Archaic period in the same region. This temporal anomaly was previously noted in McCreery and Malotki (1995:84), although at the time only two PASTYLE dragonfly depictions were known. Both are located at "Biface," one of the type sites for the style (McCreery and Malotki 1995: Figure 2.4). My ongoing field research in the Palavayu, in the meantime, has led to the discovery of dozens of new PASTYLE sites that to date have yielded over forty new dragonfly depictions.

Dragonfly Images in the Palavayu Anthropomorphic Style

In 1991, when I began systematically to explore the rock art theater of the Palavayu, a mere handful of sites that exhibit the hallmarks of the PASTYLE complex were known. Ferg (1974) mentions one site, Pilles (1975) three, and Martynec (1985) and Burton (1990) both one, namely the site that occurs in the Petrified Forest. Christensen (1992), who was the first investigator to suggest that the Linear Style rock art—the PASTYLE—might be late Archaic in age and hence predate the definable Basketmaker culture of the region, lists five sites in all.

At present, I can draw on a data base of over 125 separate PASTYLE locations with thousands of elements. The overwhelming majority of these sites can be characterized as riverine, i.e., they are situated in the canyon depths of Silver Creek, Chevelon Creek, and Clear Creek, all of which drain into the Little Colorado River. One PASTYLE site that was recently discovered in Jacks Canyon represents the only one known to date from this westernmost boundary of the Palavayu. The sixteen attested dragonfly sites, all of them exclusively riverine and only occurring in Chevelon and Clear Creek, are geographically limited to a triangular area measuring 38 x 30 x 19 kilometers. Yielding a total of 53 dragonfly depictions, twelve of the sites are found in Chevelon with the following dragonfly counts: "Lyons Crescent" (12), "Blypool" (1), "Choir Boys" (3), "Hootenanny" (4), "Fireworks" (5), "Chain Gang" (3), "Slim Jim" (3), "Napkin" (1), "Jabberwocky" (8), "Black Raptor" (1), "High Hitch" (1), "Sudden Deer" (1), and "Biface" (2). Clear Creek, which constitutes the longest side of the "Dragonfly Triangle" at 38 kilometers, has the following dragonfly sites: "Sandlot" (1), "Icebreaker" (2), "Long John Silver" (3), and "Helmsway" (2).

In light of the fact that the entire Palavayu comprises a territory of over 7000 square kilometers, this highly concentrated occurrence of the dragonfly, confined to a triangular segment of only 280 square kilometers, is quite remarkable and may be due to the predilection of a few shaman-artists for this motif. A similar idiosyncratic concentration was observed for the owl motif (Malotki 1995). It is noteworthy in this connection that dragonflies coexist with owls on the same panel at three sites and occur in their immediate vicinity at six sites.

All of the dragonfly designs are executed as petroglyphs and generally consist of fully-pecked lines. The one exception is the two dragonflies at "Long John Silver," since their designs are merely

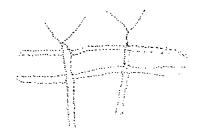


Figure 3. Twinned dragonflies in dinted technique from the Long John Silver site. Height 45 cm.

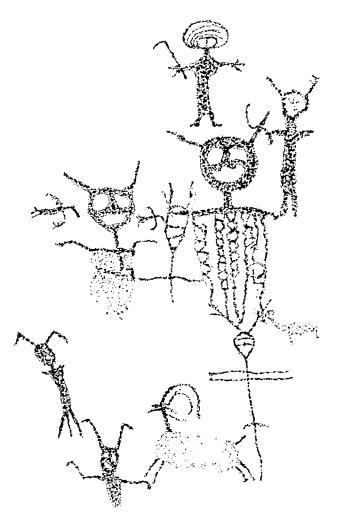


Figure 4. Anthropomorphized dragonfly at Slim Jim site. Height 45 cm.

dinted (Figure 3). Placed so closely adjacent to each other that their lower wing pairs merge, the twin insects measure 52×79 cm, the largest dragonfly design on record. Only slightly shorter in height (45 cm) is the dragonfly at "Slim Jim" (Figure 4). It differs from all the others in that its outlined head

is marked by two horizontal lines that give it the impression of facial features, and which bestow a certain anthropomorphic appearance on the insect.

The remaining dragonfly icons are much smaller in size, measuring between 8 to 20 cm. Most of them are stylized with a central axis for the body and one, two, or three perpendicularly-set crossbars that symbolize the wings. The anterior ends are usually tipped with tiny "V"s that may represent horns or antennae. Sometimes the heads constitute but small bulbous swellings from which in turn may emanate the Vconfigurated projections. The fact that most dragonflies are delicately pecked with neatly separated wing lines is evidence, in my opinion, that they are the result of indirect percussion techniques involving some sort of stone or bone chisel. Many have acquired various degrees of patination, with some completely melding into the black of the original rock varnish, thereby betraying their great antiquity. Several, looking relatively fresh, must have been repecked at the hands of later, Puebloan artists, who left their visual calling cards not only by refreshing some of the darkened designs but also by superimposing or juxtaposing their own. Such repecked dragonflies are in general much cruder and coarser in appearance than the undisturbed heavily repatinated dragonflies.

More often than not the insects occur bunched in groups of three or four, and are sometimes meticulously aligned in a row. Whether engraved singularly or in multiples, they are generally encountered in association with the various other anthropomorphic, zoomorphic and geometric elements that are

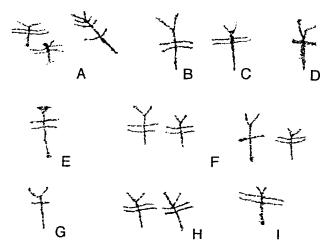


Figure 5. Dragonfly images in the Palavayu Anthropomorphic Style. Not to scale. A: Choir Boys; B: High Hitch; C: Jabberwocky; D: Blypool; E: Biface; F: Lyons Crescent; G: Long John Silver; H: Helmsway; I: Sandlot.

the hallmark of the PASTYLE. Figure 5 provides a graphic overview of the range of dragonfly configurations characteristically found in the style.

Interpretation of PASTYLE Dragonfly Images

The huge temporal "dragonfly hiatus" alluded to above that exists in the iconography of Archaic and Pueblo-type dragonflies in the rock art of the Palavayu area is extraordinary. To determine whether this hiatus of more than 2,000 years is a wide-spread phenomenon in Western North America, I simply lack sufficient data at this time. With one exception, all of my attempts to obtain information on dragonfly depictions from Archaic rock art traditions proved fruitless. David Whitley (personal communication 1996) was unaware of the dragonfly motif in the Coso rock art of southern California. Ken Hedges (personal communication 1996) did not think he had seen the dragonfly image in all his visits to Great Basin rock art sites from Reno on south, in California and Nevada. Nor did he recall observing it in Utah, where Fremont Tradition rock art often shares iconography with Anasazi Tradition rock art. Mary Allen (personal communication 1996), also could not confirm the existence of the insect among Grand Canyon Polychrome pictographs. Nor could Solveig Turpin (personal communication 1996) recall any flying figures with double wings in Lower Pecos or northern Mexico. Apparently, winged creatures are quite plentiful, but none are clearly dragonflies. According to her, the insect population of the Lower Pecos region rock art usually constitutes "a takeoff on some lethal creature like centipedes or some grotesque insect-looking figure of dubious taxa." Quite a few elements, however, that occur in Pecos River style paintings look suspiciously like dragonflies to me. For example, whether the single-bar crosses from the "Brazos Fuerte Shelter" (Turpin 1994a:92) should be interpreted as "flying figures" as Turpin does, or as dragonflies as I would tend to do, will unfortunately have to remain unanswered here. Nor will we ever know if some of the shamanic flight metaphors in Zintgraff and Turpin (1991: Figures 22, 32) are modeled after birds or the insect.

Polly Schaafsma, while not immediately aware of any dragonfly representations in the San Juan Anthropomorphic Style, was able to steer me, nonetheless, to the one exception referred to above: the famous Courthouse Wash painting near Moab, Utah. Regarded as an outstanding example of the Barrier Canyon Anthropomorphic Style (Schaafsma 1994:70), its pictographs contain, on the far right, a

classic dragonfly schematization with two pairs of wings. Like many PASTYLE portrayals of the insect, the head portion is marked by a V-shaped display of antennae or horns. With the recent acquisition of AMS radiocarbon dates for the polychrome pictographs of the Barrier Canyon Anthropomorphic Style, which place the style "squarely in the Terminal Archaic period" (Tipps 1995:163), the Courthouse Wash dragonfly is most likely younger than its PASTYLE counterparts. Still, its Archaic attestation speaks for the longevity of the motif in the Southwest beyond the boundaries of the Palavayu. However, to suggest a possible connection of the motif from northeast Arizona with that of southern Utah, without recourse to a great many more rock art dates, I consider premature at this stage.

There is increasing evidence for the premise that much of the Archaic rock art stratum in western North America is essentially shamanistic in origin (Turpin 1994b). As a result of my ethnolinguistic work with the Hopi Indians, in the course of which (Malotki 1983) I was able, among other things, to falsify Whorf's sensational claim that Hopi is "a timeless language" (Carroll 1971:216), I have become a strong subscriber to the existence of linguistic and other human universals. Brown (1991:130-141) in his "Human Universals," probably the most exhaustive study of this topic to date, devotes an entire chapter to the notion of a "Universal People." In his opinion, the "UP," as he refers to them, share a whole catalog of traits, and he posits that human biology is the principle "key to understanding the many human universals" (Brown 1991:6). Even aspects of religion and ritual appear, in part, to be explainable in evolutionary and biological terms.

The UP have religious or supernatural beliefs in that they believe in something beyond the visible and palpable. They anthropomorphize and (some if not all of them) believe things that are demonstrably false. They also practice magic, and their magic is designed to do such things as to sustain and increase life and to win the attention of the opposite sex. They have theories of fortune and misfortune. They have ideas about how to explain disease and death. They see a connection between sickness and death. They try to heal the sick and have medicines for this purpose. The UP practice divination. And they try to control the weather. [Brown 1991:139]

The UP also "dream and attempt to interpret their dreams" (Brown 1991:139) and, "to alter their

moods or feelings" they will resort to psychotropic substances such as stimulants, narcotics, or intoxicants (Brown 1991:136).

Chomsky's claim (Pinker 1994:232) that, in spite of the tremendous linguistic diversity existing today, "a visiting Martian scientist would surely conclude that aside from their mutually unintelligible vocabularies, Earthlings speak a single language," also implies that most of the cultural differences, so touted by anthropologists, are rather superficial and negligible compared to their similarities. The same holds, in my view, for rock art, especially rock art produced by huntergatherer societies.

There exists today, more or less, a consensus among scientists, particularly those devoted to the understanding of Archaic ontology, that, the world over, simple hunter-gatherers, whether of prehistoric antiquity or still surviving, practice a shamanistically-oriented brand of religion. This is true also for the earliest immigrants into the Americas. According to La Barre (1972:273), all evidence, be it archaeological, linguistic, cultural or folkloristic, is in concord with the physical-anthropological one today that "the American Indians were unspecialized Mongoloids bearing a late-Paleolithic and Mesolithic paleo-Siberian hunting culture and religion." As they reached the New World via the Bering land connection, they brought with them shamanism as the ur-religion of all hunting peoples. The shaman who, in his role as religious specialist, communicates with the spirit world on behalf of the group he leads, needs to resort to supernatural power to effectively accomplish his main responsibilities. These include, among others, the curing of disease, assuring sustenance in the form of sufficient game, and controlling the weather, most critically by making it rain.

In what manner the ancient Palavayu shamanartists effected these tasks, and what role rock art played in this endeavor, will perhaps never be known. Obviously, the shaman creators of PASTYLE rock art have been extinct for several millennia and can no longer be questioned as to their motivations for including the dragonfly in their iconography. All conclusions reached here must therefore remain somewhat speculative.

During the summer months when perennial pools intermittently dot the various canyons of the Palavayu, dragonflies are encountered in great numbers. Of the six to ten species that inhabit the area, the most prominent are the red *Libellula saturata* and the blue *Anax junius*. The latter is known by the common name of "Green Darner" (Peter Price,

personal communication 1996). Whether the Archaic Palavayu hunters had a culinary interest in the insect will never be known, for dragonflies are reported to have supplemented the diet in certain primitive societies. Clausen (1954:143), for instance, relates that the dragonfly was a menu item for the natives of the Island of Bali.

Marshack (1991:172), in his chapter on "timefactored art," has stressed the "seasonality" of certain images, indicating that some were perhaps "dramatic 'signs' of the coming of spring." The grasshopper on a bone fragment from Trois Frères (Marshack 1991:185)—to name one of the few insects attested in Ice Age art—may have been part of a "seasonal" composition. I do not believe, however, that the prehistoric people of the Southwest depicted dragonflies as "seasonal indicators." Working from the premise of ethnographic analogy, in this case drawn from the Puebloan cultures of the Southwest, it seems much more plausible that the dragonfly was important to the ancient hunters of the Palavayu because of its close association with water. Though I have never personally recorded Hopi folk beliefs concerning the insect, Hopi iconography on

ceramics and other material culture items clearly shows this aquatic connection. To acquire supernatural potency, the shaman typically calls upon certain animal spirit helpers that he may have received in the course of visionary sightings. For this reason, I propose that the dragonfly was one of the animal familiars that fulfilled this role for the Archaic shaman hunters and gatherers of the Palavayu. Once again I resort to ethnographic analogy. I do so even though there is no "iconographic bridge" for the "dragonfly hiatus" that exists between the Archaic Palavayu hunters and their possible Puebloan descendants. There is ample proof, however, especially from the large body of witchcraft lore, that shamanism continued to live on after the "tribal shamans in the agricultural Pueblos of North America... became rain priests, because weather control (now still more needed) was one attribute of the old shaman prototype among hunters" (La Barre 1990:136).

Parsons (1939:191) characterizes the function of the dragonfly as that of a "shamanistic creature" in the context of a mythic tale from the Rio Grande pueblo of San Juan. Strong evidence for a similar role in the PASTYLE can also be derived from two rock

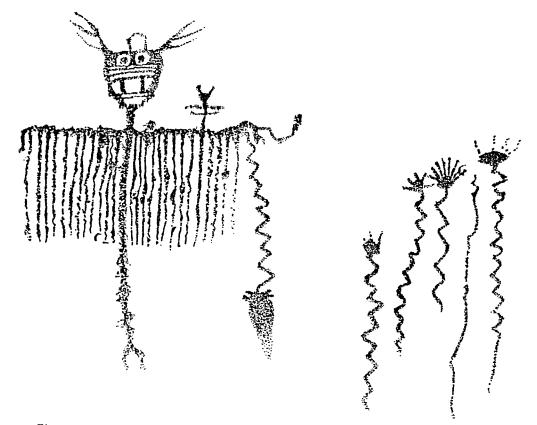


Figure 6. Dragonfly resting on shoulder of rake-bodied anthropomorph at Lyons Crescent site.

Anthropomorph 65 cm tall.

art panels that actually show the dragonfly standing on the shoulders of rake-bodied anthropomorphs (Figures 6 and 7). With the "rake-bods," as I prefer to refer to the latter in more succinct form, perhaps representing symbolic portrayals of rain-shamans or anthropic rain deities, this spatially intimate relationship with the insect seems to underscore its significance as an aquatic or pluvial icon. The insect may have been petitioned in rain-making rituals or revered as some guarantor of moisture, thus ultimately of a life-sustaining force.

Additionally, it needs to be pointed out that many PASTYLE dragonfly images mark the head portion with V-shaped excrescences that may stand for horns. Horned projections from the head are observed in PASTYLE rock art not only with all the pecked ungulates, for whom they are a natural attribute, but also on the majority of anthropomorphs, on nearly all the owls, and on several snakes. Horns, universally conceived as symbols of power, thus appear to mark the dragonfly with a sign of potency that emphasizes its role as shamanistic spirit helper.

But there is more to the dragonfly than a symbolic connection with water. The insect must have

attracted the attention of early man with its iridescent eyes and glistening wing membranes. Vivid, shimmering colors of this kind may have reminded the shaman-artist of the scintillating phosphene designs that are characteristically experienced in connection with hallucinatory visions in altered states of consciousness. Termed entoptic phenomena by Lewis-Williams and Dowson (1988:202), because they originate within the human optic system without the aid of an external light source, they typically manifest themselves during the first stage of the neuropsychologically-conceived trance model that Lewis-Williams and Dowson propose for the perception of mental imagery. The dragonfly, as an embodiment of these luminous percepts that occur in incandescent, shimmering, moving and rotating patterns (Lewis-Williams and Dowson 1988:202), must have fascinated early Palavayu man and instilled in him an attitude of awe toward the insect.

The importance of the dragonfly is further corroborated by ethnoentomological information that Keyser and Cowdrey (1995) present for the Indians of the Northwestern Plains. Incorporation of the insect into shield decorations, for example, (Keyser

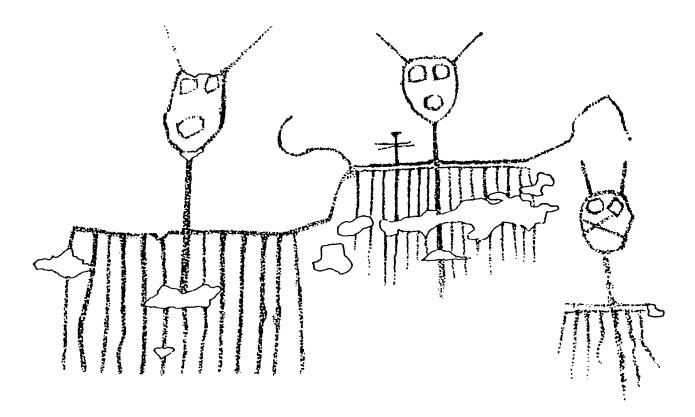


Figure 7. Dragonfly resting on shoulder of rake-bodied anthropomorph at Napkin site. Largest anthropomorph 110 cm tall.

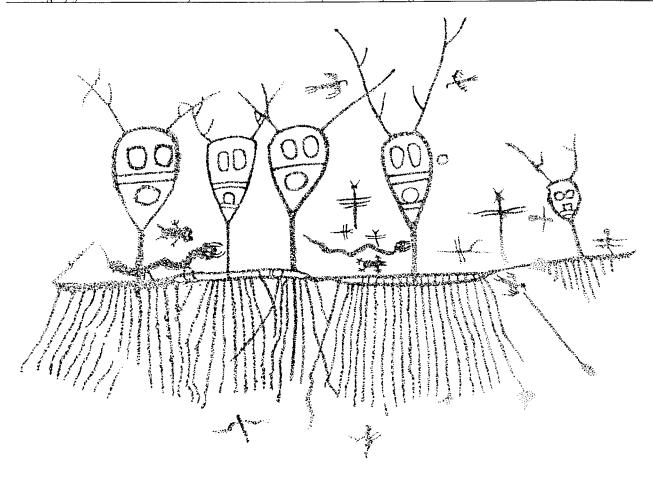


Figure 8. Dragonflies at Jabberwocky site. Length of fringed line 158 cm.

and Cowdrey 1995:Figure 4) clearly illustrates its function as a spirit helper. Citing a passage from Maurer (1992:140), Keyser and Cowdrey (1995:5) convincingly demonstrate that dragonflies figured prominently in the panoply of Plains warriors' animal familiars. "The image of the dragonfly was often used by warriors throughout the Plains because dragonflies are quick and difficult to kill, and when they fly near the ground they create [a puff of] dust that makes them hard to see. To acquire this protective power, warriors adorned themselves with the dragonfly image."

There remains one final aspect about the dragonfly that needs to be considered to explain the recurring presence of the insect in the PASTYLE rock art. It supplies one more argument to confirm my theoretical premise that this rock art was shamanistically motivated. One of the standard physical sensations connected with the shaman's altered state of consciousness is a feeling of spatial dislocation. Variously referred to as religious ecstacy or extracorporeal experience, it is more popularly known as magic flight. Through it the shaman gains access to the spirit world. As a rule, it is believed that it is his soul that embarks on this out-of-body phenomenon. To articulate this sensation graphically, PASTYLE shaman-artists have drawn on a variety of metaphorical expressions. The majority of them are avian in nature, such as birds, bird-headed humans, or simply stylized representations of wings. Frequently, anthropomorphic figures are portrayed simply as footless or legless torsos to mimic the sensation of a floating body.

The dragonfly fits easily and naturally into this symbolic vocabulary. Eminently qualified to serve as a metaphor for shamanic flight, it is frequently found hovering next to patterned-body anthropomorphs, which are so often encountered in

PASTYLE imagery. Outstanding examples in conjunction with levitating "rake-bods" are observable at the "Jabberwocky" site (Figure 8), and with floating "deco-bods" at "Slim Jim" (Figure 4). At both locations, tiny unidentifiable birds reinforce the shamanic symbolism that, in my view, permeates all aspects of the sites.

Conclusion

The frequent occurrence of the dragonfly motif in the PASTYLE iconography, though limited to the geographically small region here termed "Dragonfly Triangle," comes somewhat as a surprise considering its relatively sparse attestation in Puebloan rock art. With PASTYLE rock art chronometrically anchored in the Archaic period, the dragonfly images appear to be the oldest ones now known in western North America. Separated from their Puebloan rock art descendants by some 2,000 years, they are interpreted here as shamanic spirit helpers or seen as pictorial metaphors for the shamans ecsomatic flight to the spirit world. As such the icon of the dragonfly elegantly fits the shamanistic origin hypothesis that I posit for the PASTYLE complex. Most likely not an essential food source, the insect's depiction is definitely not the product of ancient hunters who were anxious to while away the time or give a demonstration in entomology. Rather, the dragonfly's fundamental link with water, as well as its superbly iridescent coloration as a living embodiment of the phosphenic aspects of the trance experience, seem to have made the insect an irresistible candidate as a power animal for the shaman-artist. Contemporary ethnography and iconography from Hopi, Zuni, and the Rio Grande pueblos, applied here according to the principle of ethnographic analogy, corroborate this conclusion. Ultimately, they confirm the fundamental insight that humans, regardless of temporal or geographical location in the course of their history, tend to respond ideologically to aspects of their environmental reality in rather similar fashion.

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References Cited

Benedict, Ruth

1969 Zuni Mythology. Columbia University Contributions to Anthropology, 21. Vol.2. AMS Press, New York.

Bird, Allison

1992 Heart of the Dragonfly: The Historical Development of the Cross Necklaces of the Pueblo and Navajo Peoples. Avanyu Publishing, Albuquerque.

Bourke, John G.

1984 Snake-Dance of the Moquis of Arizona. University of Arizona Press, Tucson.

Broder, Patricia J.

1978 Hopi Painting: The World of the Hopis. Brandywine Press, New York.

Brody, J.J.

1990 The Anasazi: Ancient Indian People of the American Southwest. Rizzoli, New York.

Brody, J.J., Catherine J. Scott, and Steven A. LeBlanc 1983 Mimbres Pottery: Ancient Art of the American Southwest. Hudson Hills Press, New York.

Brown, Donald E.

1991 Human Universals. Temple University Press, Philadelphia.

Bunzel, Ruth L.

1972 The Pueblo Potter: A Study of Creative Imagination in Primitive Art. Dover Publications, New York.

Burton, Jeffery F.

1990 Archeological Investigations at Puerco Ruin, Petrified Forest National Park, Arizona. Western Archeological and Conservation Center Publications in Anthropology 54. National Park Service, Tucson.

Carroll, John B., ed.

1971 Language, Thought, and Reality: Selected Writings of Benjamin Lee Whorf. M.I.T. Press, Cambridge, Massachusetts.

Cavendish, Richard, editor-in-chief

1995 Man, Myth & Magic: The Illustrated Encyclopedia of Mythology, Religion and the Unknown. Marshall Cavendish, New York.

Christensen, Don D.

1992 Pre-Pueblo Rock Art in the Little Colorado River Drainage. In *American Indian Rock Art*, Vol. 17, edited by Don E. Weaver, pp. 36-43. American Rock Art Research Association, El Toro, California.

Clausen, Lucy W.

1954 Insect Fact and Folklore. The Macmillan Company, New York.

Colton, Harold S.

1959 Hopi Kachina Dolls with a Key to Their Identifica tion. University of New Mexico Press, Albuquerque.

Cosgrove, H.S. and C.B.

1932 The Swarts Ruin: A Typical Mimbres Site in Southwestern New Mexico. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, Vol.15, No.1. Cambridge, Mass.

Curtis, Edward S.

1922 The Hopi. In Vol. 12 of The North American Indian. Reprint by Johnson Reprint Corporation, New York and London.

Cushing, Frank H.

1920 Zuni Breadstuff. Indian Notes and Monographs 8, pp. 1-673. Museum of the American Indian, Heye Foundation, New York.

Ferg, Alan

1974 Petroglyphs of the Silver Creek-Five Mile Draw Confluence Snowflake, Arizona. Ms. on file, Department of Anthropology, University of Arizona, Tucson.

Fewkes, Jesse Walter

1896 The Miconinovi Flute Altars. *Journal of American Folk-Lore* 9(35):241-256.

1898 Archaeological Expedition to Arizona in 1895. Seventeenth Annual Report of the Bureau of American Ethnology. U.S. Government Printing Office, Washington, D.C.

Hadingham, Evan

1987 Lines to the Mountain Gods: Nazca and the Mysteries of Peru. Random House, New York.

Hibben, Frank C.

1975 Kiva Art of the Anasazi at Pottery Mound. KC Publications, Las Vegas.

Hoffmann, Gerhard

1985 Indianische Kunst im 20. Jahrhundert. Prestel-Verlag, München.

Hogue, Charles L.

1980 Commentaries in Cultural Entomology 1. Definition of Cultural Entomology. Entomological News 91:33-36

1987 Cultural Entomology. Annual Review of Entomology 32:181-199.

Keyser, James D. and Mike Cowdrey

1995 Northern Plains Biographic Rock Art: Ethnography Written on Stone. Unpublished ms. in possession of authors.

Kiauta-Brink, M.A.J.E.

1976 Some Tibetan Expressions for Dragonfly, with Special Reference to the Biological Features and Demonology. *Odonatologica* 5(2):143-152.

La Barre, Weston

1972 Hallucinogens and the Shamanic Origins of Religion. In *Flesh of the Gods: The Ritual Use of Hallucinogens*, edited by Peter Furst. Praeger, New York.

Lewis-Williams, J. D. and T. A. Dowson

1988 The Signs of All Times. *Current Anthropology* 29(2):201-245.

Linsenmaier, Walter

1972 Insects of the World. McGraw-Hill Book Company, New York.

Malotki, Ekkehart

1978 Hopitutuwutsi-Hopi Tales: A Bilingual Collection of Hopi Indian Stories. Museum of Northern Arizona Press, Flagstaff, Arizona.

1983 Hopi Time: A Linguistic Analysis of the Temporal Concepts in the Hopi Language. Trends in Linguistics. Studies and Monographs 20. Edited by Werner Winter. Mouton Publishers, New York.

1987 Earth Fire: A Hopi Legend of the Sunset Crater Eruption. Northland Press, Flagstaff, Arizona.

1994 Water Magic: Serpent Iconography at a Basketmaker II Site in the Palavayu of Northeastern Arizona. Ms. in possession of author.

1995 Giving a Hoot: Owl Imagery in Basketmaker II Rock Art of the Palavayu, Northeastern Arizona. Ms. in possession of author.

Marshack, Alexander

1991 The Roots of Civilization: The Cognitive Beginnings of Man's First Art, Symbols and Notation. Moyer Bell Limited, Mount Kisco, New York. Martin, Paul S. and Elizabeth S. Willis

1940 Anasazi Painted Pottery in Field Museum of Natural History. Anthropology Memoirs 5. Field Museum of Natural History, Chicago.

Martynec, Richard J.

1985 A Synthesis of Petrified Forest National Park Rock Art and Ceramics. *Museum of Northern Arizona Bulletin* 54:69-74, Flagstaff, Arizona.

Matthews, Washington

1897 Navaho Legends. Memoirs of the American Folk-Lore Society 5. New York.

Maurer, Evan M.

1992 Visions of the People. A Pictorial History of Plains Indian Life. The Minneapolis Institute of Arts, Minneapolis.

McCreery, Patricia and Ekkehart Malotki 1994 Tapamveni: The Rock Art Galleries of Petrified Forest and Beyond. Petrified Forest Museum Association, Petrified Forest, Arizona.

Michaelis, Helen

1981 Willowsprings: A Hopi Petroglyph Site. *Journal* of New World Archaeology 42(2):2-23.

Morgan Christopher T. and Deborah S. Dosh 1995 Ned Lake Cultural Resource Survey, Lakeside Ranger District, Apache-Sitgreaves National Forests, Navajo County, Arizona. Technical Report No.60. Kinlani Archaeology, Flagstaff, Arizona.

Needham, James G. and Minter J. Westfall, Jr. 1975 A Manual of the Dragonflies of North America (Anisoptera). University of California Press, Berkeley.

Packard, Gar and Maggy

1974 Suns and Serpents: The Symbolism of Indian Rock Art. Packard Publications, Santa Fe.

Parsons, Elsie Clews

1938 The Humpbacked Flute Player of the Southwest. *American Anthropologist* 40:337-338.

1939 *Pueblo Indian Religion.* University of Chicago Press, Chicago.

Patterson, Alex

1994 Hopi Pottery Symbols. Johnson Books, Boulder.

Pilles, Peter J. Jr.

1975 Petroglyphs of the Little Colorado River Valley, Arizona. In *American Indian Rock Art*, Vol. 1, edited by Shari T. Grove, pp. 1-26. San Juan County Museum Association, Farmington, New Mexico.

Pinker, Steven

1994 The Language Instinct: How the Mind Creates Language. William Morrow and Company, New York.

Schaafsma, Polly

1980 *Indian Rock Art of the Southwest*. University of New Mexico Press, Albuquerque.

1994 The Rock Art of Utah. University of Utah Press, Salt Lake City.

Smith, Watson

1952 Kiva Mural Decorations at Awatovi and Kawaika-a. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, 37. Cambridge, Massachusetts.

Smith, Watson, Richard B. Woodbury, and Nathalie F.S. Woodbury

1966 The Excavation of Hawikuh by Frederick Webb Hodge: Report of the Hendricks-Hodge Expedition 1917-1923. Museum of the American Indian, Heye Foundation, New York.

Stephen, Alexander

1890 Pottery of Tusayan: Catalogue of the Keam Collection. Unpublished manuscript, 3282 Archaeology, Bureau of American Ethnology. National Anthropological Archives, Smithsonian Institution, Washington, D.C.

Stevenson, Matilda Coxe

1985 The Zuni Indians. 23rd Annual Report 1901-02, Bureau of American Ethnology. Reprint by Rio Grande Press, Glorita, New Mexico.

Swift, R.H.

1931 The Sacred Beetles of Egypt. Bulletin of the Southern California Academy of Sciences 30:1-14.

Tipps, Betsy L.

1995 Holocene Archeology Near Squaw Butte, Canyonlands National Park, Utah. National Park Service Rocky Mountain Regional Office, Denver.

Turpin, Solveig A.

1994a On a Wing and a Prayer: Flight Metaphors in Pecos River Art. In *Shamanism and Rock Art in North America*, edited by Solveig A. Turpin, pp. 73-102. Special Publication 1, Rock Art Foundation, San Antonio, Texas.

1994b Shamanism and Rock Art in North America. Special Publication 1, Rock Art Foundation, San Antonio, Texas.

The Dragonfly: A Shamanistic Motif in the Archaic Rock Art of the Palavayu Region in Northeastern Arizona

Wade, Edwin L. and Lea S. McChesney
1980 America's Great Lost Expedition: The Thomas
Keam Collection of Hopi Pottery from the Second
Hemenway Expedition, 1890-1894. The Heard
Museum, Phoenix.

Wright, Barton

1973 Kachinas: A Hopi Artist's Documentary. Northland Press, Flagstaff, Arizona.

Young, Jane

1988 Signs from the Ancestors: Zuni Cultural Symbolism and Perceptions of Rock Art. University of New Mexico Press. Albuquerque.

Zintgraff, Jim and Solveig A. Turpin 1991 Pecos River Rock Art: A Photographic Essay. Sandy McPherson Publishing Company, San Antonio, Texas.