

HOPI *HU KATSINA* ICONOGRAPHY IN ROCK ART AND MATERIAL CULTURE: TRACING THE AVIAN SOLAR DEITY FROM FORMATIVE MESOAMERICA©

According to Hopi oral traditions, clans from central Mexico brought *katsinam*, ancient guardian spirits, with them to the Colorado Plateau (Ferguson and Lowa'omvaya 1999:79, Table 6; Kealiinohomoku 1989:52–53; Lyons 2003; Nequatewa 1967). Jane Young and other scholars point out striking similarities between Puebloan and Mesoamerican ideology and iconography, including “anthropomorphized deities” depicted on pottery and rock art with the Katsina Cult, ca. A.D. 1300 (Young 1994:107–108, check her references). However, to date they support the claim that evidence of precursors of kachinas and their iconography have not been identified in the rock art of the Colorado Plateau (Schaafsma 1994:65; Schaafsma and Schaafsma 1974). Alternatively, some scholars present limited evidence that populations in the Southwest represented “anthropomorphized deities” in pottery and rock art before the Kachina Cult, ca. A.D. 1300s (Crown 1994:218; also see Anderson 1955; Cole 1996, 2009; Ellis and Hammack 1968; Parsons 1933, 1936; Thompson 1994).

Expanding upon Hays-Gilpin and Hill's (1999, 2000) Uto-Aztecan (UA) Flower World Complex research, this paper attempts to extend the database of Flower World iconography to include one of several anthropomorphized deities (*katsinam*) that harken back to Formative Otomanguean (“Olmec”) maize religion. It explores the cultural transmission and modification of the avian solar (sun-eagle) deity that is represented in multiple media in material culture spanning Basketmaker II/III, Fremont, Ancestral Puebloan, and present day Hopi cultures. I argue that the UA Flower World religion, an adaptation of Formative “Olmec” maize religion cultural traits (memes), was

culturally inherited along with maize agriculture, spreading temporally and geo-graphically to populations representing various archaeological cultures on the Colorado Plateau.

MESOAMERICAN MAIZE RELIGION¹ (OVERVIEW)

I am arguing that this previous body of work overlooks the congruence of Western Puebloan anthropomorphized deity iconography depicted in multiple media with that of the Old Uto-Aztecan (UA) Flower World Complex (Hill 1992). Originating in the western coastal Sierra Madre Occidental corridor, the UA Flower World Complex adapted a pan-regional Formative Otomanguean (“Olmec”) maize religion that diffused from Central Mexico ca. 1500 B.C. Moreover, the reason scholars have not recognized anthropomorphized deities (*katsinam*) in Ancestral Puebloan material culture on the Colorado Plateau is due to their having undergone meme mutations over time.

From Formative western “Olmec” culture (Central Mexico), anthropomorphized deity² iconography (specifically, maize, sun-eagle, and rain-bird wing) diffused by way of Southern Uto-Aztecan (SUA) and Ancestral Hopi immigrants to the Colorado Plateau (lower San Juan River and Little Colorado River drainages), and appears in Western Basketmaker II material culture, including rock art (Cole 2009:25–27). In a longer companion paper (McNeil 2010a), I reconstruct the social (macro-processes) and cognitive (micro-processes) involved in the cultural transmission of Otomanguean (“Olmec”) maize religion. Formative Olmec (Otomanguean) maize religion, with its iconic suite of

“anthropomorphized deities,” diffused to Southern Uto-Aztecan (SUA) speech communities inhabiting Sinaloa-Sonora, ca. 1500 B.C. Certain SUA communities with genetic and linguistic ties to Otomanguean speech communities in Central Mexico (Merrill et al. 2009:21021) adapted this maize religion and iconography (Marcus 1989:150; Niederberger 1996; Pool 2007; Taube 1996, 2000), thereby constructing their own religious belief system, the Old UA Flower World Complex (Hill 1992).

While to date most archaeologists agree that Chapalote maize first appears in Arizona and New Mexico ca. 2100 B.C. (LeBlanc 2008; Mabry 2005, 2008; Merrill et al. 2009:21019), the method and timing for its diffusion is still under debate (Merrill et al. 2009:21025; Bellwood-Hill hypothesis in Hill 2001, 2006). Notably for this study, however, the sites in which an earlier, less-productive race of Chapalote appears were understandably devoid of evidence of Mesoamerican influences, given that it preceded the northern diffusion of Formative Otomanguean religion (Merrill et al. 2009:21022). Instead, this paper focuses on the subsequent Basketmaker II phase (ca. 1000 B.C. to A.D. 400) diffusion and the in situ coevolution of more productive variety of maize, *Zea mays*, L. (Doolittle and Mabry 2006:116, Table 8-3, 118; Simms 2008:201, Figure 5.4, 204–206) and Mesoamerican maize religion in the region from Sinaloa-Sonora to the Mogollon Rim (Carpenter et al. 2002:252, Figure 16.4 map).

ORIGIN OF OLD UA FLOWER WORLD

SUA and ancestral Hopi groups inhabiting the western coastal Sierra Madre Occidental corridor ca. 2500 to 1500 B.C. appear to have acquired and modified Formative Otomanguean (“Olmec”) ideology and iconography (Marcus 1989:150–151, 153) into their own belief system, thus creating the Old Uto-Aztecan Flower World Complex. Linguist Jane H. Hill (1992) attests to the antiquity of the Old Uto-Aztecan Flower

World belief system and iconography, positing that the Complex probably first appeared in an “Old Uto-Aztecan language family speech community—perhaps not the proto-community itself, but certainly communities that date to a very early period, in which the Hopi, and perhaps some of the Takic groups, were still in contact with a proto-southern Uto-Aztecan community” in western coastal Mexico (Hill 1992:126; Hill 2001).

Weighing the possible origins of this ancient Flower World Complex based upon SUA (Pima, Yaqui, Tohono O’odham) song imagery, Hill (1992) considers two hypothetical scenarios: (1) its origin in southern Mesoamerica, “diffusing into the Old Uto-Aztecan community along with agriculture” (ca. 1500 B.C.); or (2) “a foundational complex with associations of flowers with fire, spiritual power, and the land of the dead” developing among Old Uto-Aztecs, and being elaborated into the full Flower World complex in Mesoamerica, spreading south to the Mayans, and north to Western Puebloans (Hill 1992:127).

Old Uto-Aztecan Flower World Complex

In this section, I argue that the Old Uto-Aztecan Flower World Complex reflects the first scenario proposed by Hill (1992), that is, SUA borrowing cultural traits from Otomanguean (“Olmec”) maize religion, followed by their diffusion ca. 1200 B.C. into the U.S. Southwest. While chromaticism associated with natural phenomena (e.g., nacreous shell, magnetite mirrors, rainbows, etc.) is central to both Olmec and Flower World complexes, anthropomorphized nature deities are typically implied in SUA and Hopi oral traditions. These nature “spirits” or “vital forces,” associated with the realms of “earth” and “sky” (e.g., sun, rain, lightning, thunder, earth and its agricultural products) are often regarded in kinship terms or as ancestors in Formative Otomanguean religion (Marcus 1989:150–154, 193). Similarly, in Western Puebloan (Hopi) religion “beneficent spirit beings” (*katsinam*) correspond to clan

affiliations (e.g., *Taawangyam* [Sun Clan], *Patkingyam* [Water Clan], *Qa'ongyam* [Mature Corn]) and act as guides who advise the people regarding how to lead an ethical life (Sekaquaptewa and Washburn 2001:470).

A plausible reason for the tacit reference to nature deities in the Old Uto-Aztec Flower World songs may pertain to their primary role as first-person narrators and spiritual advisors. Reflecting the taboo in middle range cultures against uttering the name of a sacred being, often *katsinas* are only referred to metaphorically in *katsina* songs (Barber and Barber 2004:19). For example, in Uto-Aztec Flower World songs from the Yaqui, Tohono O'odham, and Pima, anthropomorphized nature deities or spirit beings (Deer, Gopher, Corn Man, Rain-Cloud Maiden) act as first-person narrators, usually only mentioned explicitly in the song's title (Eggen 1994:9; Hill 1992:123–126).

Similarly in the Hopi Flower World religion, while *Máasaw* (deity of Earth, Life, Death, and Fire) and *Muy'ingwa* (god of Germination) are mentioned explicitly, anthropomorphized nature deities (e.g., Maize, Rain) are typically referred to only metaphorically in Hopi *katsina* songs. For example, during *Powamuya*, the spring purification and planting rites, “The pouring water metaphor is a reiteration of the idea that *katsinas* are clouds that [in reciprocity for Hopi hard work by hand; phrase inserted] pour their water on the fields” (Sekaquaptewa and Washburn 2001:468, Song 81) and “Their dipper of water, from there, they will pour, to you, here” (Sekaquaptewa and Washburn 2001:471). Embodying this metaphor during *Powamuya*, the *Hahai-i Wu'ti Katsina* (“Pour Water Woman”) douses the children with water in the open plaza pre-Katsina Initiation rites.

NORTHERN TRANSMISSION OF “OLMEC” RELIGION

Formative “Olmec” maize religion diffused from Otomanguean to Uto-Aztec speakers ca. 1500 B.C., a period of major influx of Mesoamerican

influence on SUA groups inhabiting western coastal Sierra Madre Occidental (Marcus 1989:148; Schaafsma and Taube 2006; Taube 1983, 1996, 2000). Distributed throughout Central Mexico (Oaxaca, Guerrero, Morelos, Puebla, Basin of Mexico), it represented pan-regional beliefs and ritual practices shared by Olmec Otomanguean and Mixe-Zoquean speakers (Hopkins 2006:612; Marcus 1989:150; Marcus et al. 1983).

Formative Zapotec scholar, Joyce Marcus, identifies the core beliefs and associated “mythico-symbolic deities” as those natural and supernatural “forces” related to lightning, rain, earth, and the ancestors who reside in caves or springs (1989:151–152). Iconography related to these natural forces (or “deities”) and to the earth's four directions appeared on incised jadeite celts, funerary ceramics (which fall into two types along lines of deity-kinship affiliation), and on Mixtec codices. Other “Olmec” highly chromatic and symbolically significant objects produced in household craft industries, such as pectoral pendants worn by elites (priests, chiefs), included magnetite mirrors (San José Mogote) and *Spondylus* (pearl oyster) shell (Teopan-tecuanitlá Oaxaca) ca. Tierras Largas, 1400 to 1150 B.C., the San José Mogote 1150 to 850 B.C., and in the Basin of Mexico (Coapexco and Tlatilco in Tolstoy [Marcus 1989]). Similar ritual objects have been recovered at early Hohokam horizon sites in Arizona (Bayman 2001:268).

The Old Uto-Aztec Flower World Complex, therefore, may represent a secondary elaboration (or restructuring) of a pan-regional Early Formative “Olmec” (ca. 1600 to 1200 B.C.) shared belief and representational style (Lesure 2004:74–75, 89–91; Marcus 1989:152–153). The diffusion of this SUA religion, iconography, and related ritual paraphernalia would have occurred primarily through macro-processes or social pathways, such as interregional exchange, intermarriage (haplogroup A distributions among SUA populations), and bilingualism

(Otomanguan loan words in SUA maize lexicon) involving western “Olmec,” Oaxacan, and other Otomanguan speaking communities in Central Mexico (Hill 2006:634; Merrill et al. 2009:21021). (See Figure 1.)

Based upon inferences drawn from the correlation of genetic and linguistic evidence, as well as from San Pedro-Western Basketmaker II phase archaeological evidence (Berry and Berry 1986; Charles and Cole 2006; Matson 1991, 1999, 2005), one can infer the following scenario:

- Otomanguan speaking men co-resided or intermarried with SUA and Ancestral Hopi women;
- Subsequently, these marriages developed bilingual communication, providing the vehicle for the oral transmission of Olmec maize

religion (i.e., beliefs and representations in oral tradition and material culture) to SUA and Ancestral Hopi speech communities, initially on an individual scale, and have been identified in Old UA Flower World Complex song imagery (Hill 1992) and in U.S. Southwest material culture and iconography, as early as Western Basketmaker II culture, ca. 1000 B.C. to A.D. 400 (Cole 2009:25–27) (See Figure 2).

Western and Eastern Basketmaker II cultures represent distinct populations, as Steven Simms explains, “Basketmakers were not all of a cloth and had local peculiarities of lifeway. They varied in ethnic and linguistic identities that developed for centuries before there were any traces of farming north of the Colorado River” (Simms 2008:198).

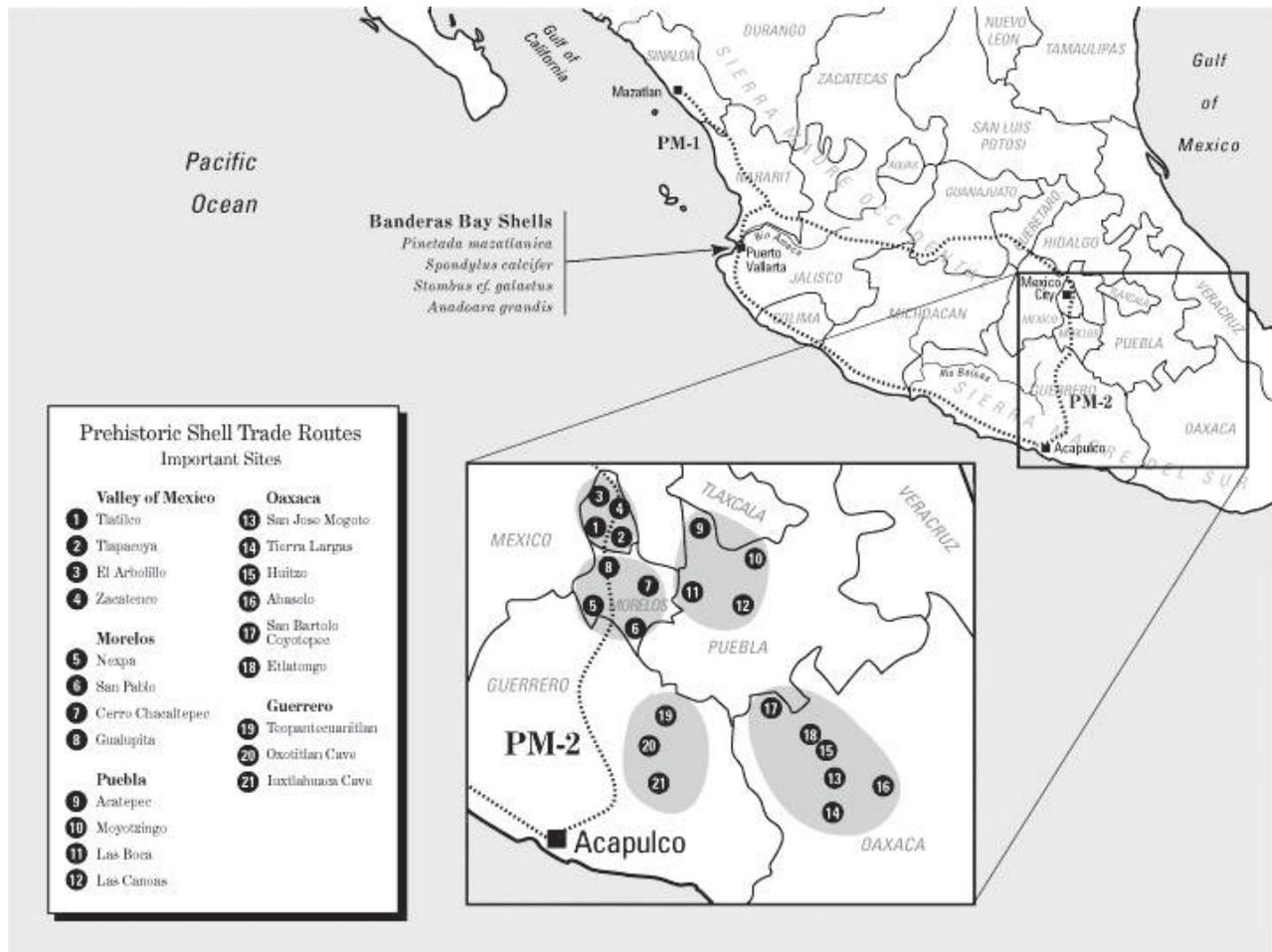


Figure 1. Trade Map of Central Mexico during Formative Period.

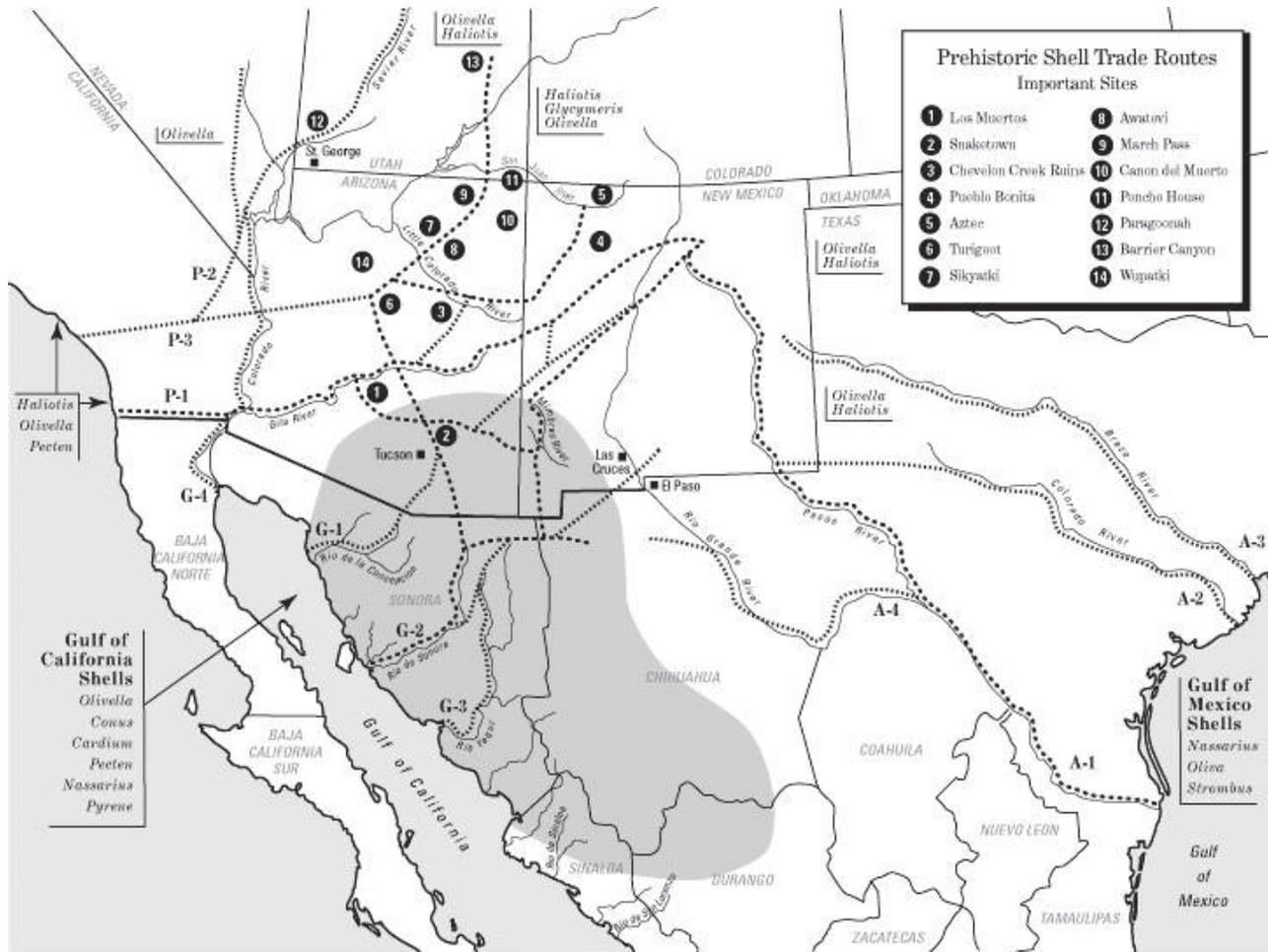


Figure 2. Trade Map of Sonora and U.S. Southwest during Early Agricultural Period.

UA FLOWER WORLD AND CULTURAL MEMES

Like an “environmental mosaic model” for the spread of maize in the U.S. Southwest (Doolittle and Mabry 2006:118), Formative maize religion’s “cultigens” or “memes” (Dawkins 1990) took root and evolved in localized cultural “micro-environments” that included maize farming (alluvial fans, etc.). Just as maize varieties appear to have evolved in geographic isolation (Doolittle and Mabry 2006:116), maize religion memes (e.g., representations of deities) within a given archaeological culture display local stylistic traditions distributed within a limited area. For example, a number of varieties of Basketmaker II stylistic traditions have been identified: Palavayu “Majestic” Basketmaker II style on the

Middle Little Colorado drainage in east-central Arizona; San Juan Basketmaker II style on the lower San Juan River in southeastern Utah; and Abajo-La Sal Basketmaker II/III style in the Abajo and La Sal Mountain area of eastern Utah.

This section focuses on cultural transmission (learning) between individuals, which is then transmitted to the group (Bettinger 2008:2–3). Anthropologist Pascal Boyer’s cognitive approach to religious ontology sheds light on combined “culturally evoked” (universal, innate capacities) and “culturally acquired” cognitive micro-processes involved in the cultural transmission of religious ideas and representations (Boyer 1998:876). [In the past, anthropologists have assumed that religious ideas were either universal or empirical (*in situ*).] UA Flower World religious

ontology and iconography, including anthropomorphized deity representations, reflect predictable social and cognitive processes of variation or meme mutation during cultural transmission.

According to Boyer, “micro-processes of cognition and interaction impose strong constraints on the diffusion and transmission of religious assumptions, thereby leading to the recurrence of ideas (or representations) observed in the religious domain” (Boyer 1994:876). Put simply, the religious knowledge domain is unique in that it combines: (1) universal, intuitive (INT) principles (innate capacities, e.g., categorizing, reciprocal behaviors among kin), and (2) culturally acquired (remembered, transmitted) counterintuitive (C-IN), attention-grabbing assumptions that violate normal expectations.

Within these constraints, one can make “meaningful predictions about cultural fitness” or recurrence of religious representations, explaining how culturally acquired religious ontology, expressed in mental and material representations, gains its “staying power” (or “recurrence above chance”) (Boyer 1994:404–407, 1998:885). First, these representations are grounded in universal (innate) principles of human intuitive ontology (e.g., categorizing, inference drawing). These intuitive principles provide the structure (analogous to computer hardware) for human assumptions and expectations, which are, in turn, fleshed out by cultural input (analogous to computer software). Under certain circumstances when non-intuitive (or counter-intuitive) assumptions are not successfully transmitted, these intuitive principles are predictably activated by default.

To give an example, cross-cultural folk biology (taxonomy) categorizes specific species of birds (e.g., ravens, *corvides*) in the BIRD knowledge domain, although any given cultural/ecological

context restricts the kinds of plants included in the category. In forming a culturally-specific religious ontology, these intuitive (INT) assumptions combine with “attention-grabbing” counter-intuitive (C-IN) assumptions (correlated with better memory storage) that violate intuitive ontological categories. For example, a religious ontology takes form when the intuitive, subordinate category EAGLE > BIRD is combined with the SUN > CELESTIAL OBJECT category (compressed by association, Barber and Barber 2004:248), and then are conflated with the PERSON category, which captures human agency and biological needs. Taken as a conceptual unit, the “INT plus C-IN” assumption, SUN-EAGLE + PERSON (= DEITY), violates ontological assumptions about BIRDS, yet in doing so increases the chance that this assumption will be acquired, recalled, and culturally transmitted. Consequently, this anthropomorphized avian solar deity concept and its material representations combine universal intuitive principles with counter-intuitive, culturally acquired assumptions that, in part, violate these principles. By joining INT with C-IN assumptions, these types of representations predict for their “cultural fitness” or recurrence during the process of transmission between individuals and culturally-related groups.

What happens, however, when an individual artist forgets or lacks direct exposure to the Olmec religious representation of the avian solar deity as a “feathered circle”? In this case, the “INT plus C-IN” assumption predictably defaults to the intuitive or locally observed, naturalistic principle (e.g., UA Flower World “sunflower” motifs), which is hardwired in human cognition (Barber and Barber 2004:19, 22, 245; Boyer 1998:878–879, 2001:89). In this case, the default activates the intuitive domain—such as a subset of circular shapes—which would have been restricted to natural phenomenon known to SUA artists or singers in ecological context, such as “sunflowers” or “sunbursts.”

SUN-EAGLE DEITY HEADDRESS MOTIFS

Like the Uto-Aztec Flower World Complex, Otomanguan (“Olmec”) religion involved the worship of anthropomorphized nature deities identified by headdress motifs (Marcus 1989: 151–152, 154). One of the leading Olmec nature deities was the “Bird Monster” or crested harpy eagle (*Harpia harpyja*) (Diehl 2004:102, fig. 64; Taube 2000:304). As discussed earlier, the Olmec avian solar (sun-eagle) deity motif conflates sun and crested harpy eagle images, the latter being a large raptor indigenous to central Mexican tropical forests (Joralemon 1971:67–70 on God III; Taube 2000:303, Figure 6). The Sun-Eagle (or crested harpy eagle) deity, represented in Early Formative Olmec material culture, ca. 1500 to 1200 B.C. diffused north, via the social pathways mentioned earlier, to SUA and Ancestral Hopi speakers living in western coastal Sinaloa-Sonora (Mexico). There it was adapted (modified) into the Old Uto-Aztec Flower World Complex before emerging along the Little Colorado River and San Juan River drainages with Basketmaker II culture ca. 1000 B.C. (Table 1:a¹ to a³).

Sun-Eagle Meme Mutation

Uto-Aztec Flower World ideology and iconography reflect a predictable process of default activation from Formative Olmec deity representation and its meta-representation or symbolic meaning to intuitive principles. According to Deborah Washburn, mutations in imagery reproduced from memory occur either due to a lack of direct exposure to the imagery (e.g., the harpy eagle, which is not found in western coastal Sierra Madre Occidental corridor) or due to a lack of cultural knowledge important to understanding of the correct reproduction of the imagery (e.g., the feathered circle representing an avian solar deity) (VanPool, et al. 2008:80; Washburn 2001:77–83;). The C-IN representation of the “feathered circle,” symbolizing the avian solar deity (crested harpy eagle), predictably

defaults to the domain of analogous circular objects with radiating “spokes,” such as the “sunflower” or “sunburst” motif.

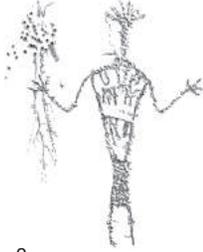
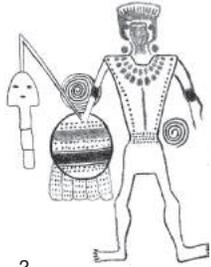
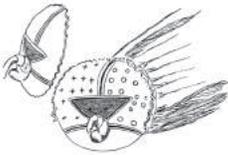
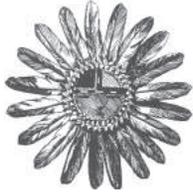
As scholars studying the Flower World Complex in material culture and iconography of the U.S. Southwest have attested, ubiquitous “sunburst” and “sunflower” imagery are often stylistically difficult to decipher (Ellis and Hammack 1968, in Hays-Gilpin and Hill 1999:9–10, Figures 4a and 4c; Kidder and Guernsey 1919). For example, “sunflower” and “sunburst” imagery has been cross-referenced in descriptions of imagery in Hohokam, Salado, Sinagua, Mimbres, Mogollon, Chaco, and Hopi (Pueblo IV) material cultures (Hays-Gilpin and Hill 1999:22–23; and Crown 1994:150, 158 on Salado pottery iconography).

It is reasonable to infer, then, that the Flower World Complex’s focus on “sunflowers” suggests that default to the intuitive (i.e., from sun-eagle as feathered circle to sunflower or sunburst) occurred during horizontal transmission from Otomanguan to UA individuals and communities. Conversely, in cases where individuals in certain groups (e.g., Hopi, Zuni) more accurately reproduced feather-circle images over time, it is probable that these artists experienced sustained exposure to representations or to cultural knowledge that connected the feathered-circle image with an avian-solar deity.

ROCK ART: SUN-EAGLE ICONOGRAPHY

On the Colorado Plateau, the earliest recognizable iconographic evidence of the feathered circle or “rayed” headdress motif appears along the Middle Little Colorado River drainage (Chevelon and Silver Creeks) on anthropomorphs in early Basketmaker II “Palavayu Majestic Style” rock art, ca. 1000 to 500 B.C. (Table 1:b¹ and b²) (Conkey and Hastorf 1990; McCreery and Malotki 1994). These early Basketmaker II figures wearing “rayed” headdresses appear at sites with stylistically similar anthropomorphs wearing “maize leaves or v-clef,” “bird-wing,” and “rain-

Table 1. Sun-Eagle Deity Iconography

<p>Formative Olmec 1600 to 1100 B.C.</p>	 <p>a¹</p>	 <p>a²</p>	 <p>a³</p>	
<p>Basketmaker II 1000 to 500 B.C.</p>	 <p>b¹</p>	 <p>b²</p>		
<p>Fremont A.D. 500 to 1200</p>	 <p>c¹</p>	 <p>c²</p>	 <p>c³</p>	
<p>Hopi A.D. 1899 to 1905</p>	 <p>d¹</p>	 <p>d²</p>	 <p>d³</p>	 <p>d⁴</p>

(a1) Olmec avian solar deity, crested harpy eagle (*Harpia harpyja*), Mesoamerican lowland tropical forests; (a2) Oxtotitlan cave (Guerrero, Mexico) painting, feathered circle image (Grove 1970:Figure. 21, cited in Taube 1983:171 Figure 23b); (a3) owl or eagle with rayed (possible mosaic mirror) headdress, after Codex Bodeley, Plate 36, cited in Taube 1983:171 Figure 22b; (b1) Majestic Basketmaker II petroglyphs, Middle Little Colorado River drainage (photo by Jim McNeil); (b2) Majestic Basketmaker II petroglyph, Middle Little Colorado River drainage, Bellbottom site, drawing by Bernie Jones; (c1) Fremont style petroglyph, Steinacker Reservoir, northeast Utah, in Castleton 1984:33, Figure 2.37; (c2) “The Three Kings” panel petroglyph, Ashley Dry Fork, Castleton 1984:18, Figure 2.6; (c3) Uintah Fremont style, Dinosaur National Monument, Cole 2009:253, Figure 109A; (d1) Ahu'l Katsina mask (Oraibi), Stephen 1936:163 Figure 94; (d2) Ahu'l Katsina drawing by Hopi artist (Walpi), Fewkes 1903:124; (d3) Tawa (Sun) Katsina, Joseph J. Mora watercolor 1905, Smithsonian 1979:Cat. #264538; (d4) Ahu'l shield image, Fewkes 1899:Plate 25.

fringe” headdress motifs (McNeil 2008, 2010a, 2010b). In contrast, Uintah Basin Fremont Classic Vernal style rock art figures, ca. A.D. 900 to 1300, are depicted with a variety of meme mutations (or innovations) of the “rayed” headdress motif (e.g., rayed “crown”), while holding “rayed-sun” or “feathered circle” shields, often with “trophy heads” (Table 1:c¹ to c³). These Fremont mutations of UA Flower World “sunburst/ sunflower” headdress motifs suggest that Flower World cultural traits (memes) diffused horizontally from UA speakers to Fremont (non-kin) groups, possibly Kiowa-Tanoan speakers (Hill 2008; Simms 2008:202,206), who had adopted and modified UA Flower World iconography and possibly ideology.

Unlike Uintah Basin Fremont artists, Ancestral and Historic Hopi produced fairly accurate replications of the feathered circle motif, such as the sun *katsina*, *Ahü’l’s* headdress and its representations in multiple media (Fewkes 1899:Plate XXV a,d, 1903:124, Plate VII; Stephen 1936:163, Figure 94), *katsina* doll (*tihu*) (Voth 1901:Plate LIX b,c,d), feathered sun shields (Ferguson and Schachner 2003:138, Figure 30; Fewkes 1900:Plate LX, 139, Table 16 on sun shield in Hopi ceremony), and numerous depictions on kiva murals (Smith 1952) and altar screens or altar boards (Stephen 1936:297, Plate X, 299, Plate XI on *Pa’lülükona* curtain, 337 altar board), and water color painting of *Tawa Katsina* (Smithsonian 1979:Cat. no. 264538) (Table 1:d¹ to d⁴). While sustained exposure to feathered circle imagery may account for accurate reproductions up to the present, the original avian solar deity meaning, which depends upon knowledge of Olmec ideology appears to be only tacitly understood, if not lost entirely.

Hu (Tunwap) Katsina Headdress Motifs

The process of meme mutation is apparent in the *Hu* (Oraibi) and *Tunwap* (Walpi) “Whipper” *katsina* headdress motifs over the period of settlement of Hopi First and Third Mesas. Initially,

the *Hu katsina* headdress motif most likely represented a secondary elaboration of the Hopi sun deity (*Ahu’l*) feathered-circle motif headdress, to which a crescent moon or “two horn” motif had been appended (Table 2:d¹ to d²). The Oraibi style *Hu Katsina* headdress reflects the mnemonic process of elaboration by combining solar and lunar referents related to the Hopi ritual calendar. Specifically, the horizontal crescent moon that precedes the vernal equinox (Stephen 1936, Vol. I:239, note 1; Vol. II:1010, Figure 495) signals the beginning of Hopi *Powamuya*, the spring purification and planting rites. The *Hu Katsina* headdress style, therefore, combines the sun-eagle (feathered-circle) motif with late February horizontal crescent moon. As evidence of the connection between the *Hu Katsina* and the avian solar deity, Fewkes includes the image of the “big horn solar god” wearing the *Hu Katsina* headdress in his article about the Aalósaka Cult (Fewkes 1899:Plate 25b).

In its traditional form at Oraibi, the *Hu Katsina* representations have side extensions that resemble the “horns” of the horizontal crescent or “moist moon” (*Powa’müriyawü*). The *Hu Katsina* with traditional (Oraibi, Third Mesa) headdress is depicted in multiple media, for example: as *katsina* doll (*tihu*) (Voth 1901:Plate LIX b, c, d), on the *Katsina* Initiation sand mosaic at Oraibi (Voth 1901:Plate LII, Figure 8 a–f, Plate LXII a, and Plate LXIX b), on the *Powamuya* Altar (Voth 1901:Plate XXXVIII); and on the Hopi *Niman* altar cloth (Stephen 1969:Figure 314) (Table 2:d¹ to d⁵). In contrast at Walpi, *Tunwap*, the First Mesa form of the *Hu Katsina*, wears a headdress showing horizontal (etic) modification with up-curving “bison” horns (Cole 1989:Figure 3a; Fewkes 1903:124, Plate VII [Hopi drawings of *katsinam*]; Voth 1901:Plate 73).

While *Hu* (Oraibi) or *Tunwap* (Walpi) *Katsinas’* role in open plaza crying rites remains unchanged, the iconic mutation that took place during imagery reproduction by artists at Walpi reflects the infusion of cultural knowledge from the eastern

Table 2. Hu (Tunwup) Katsina Iconography

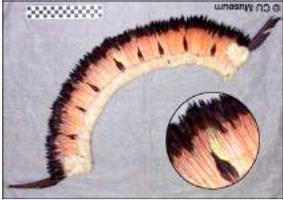
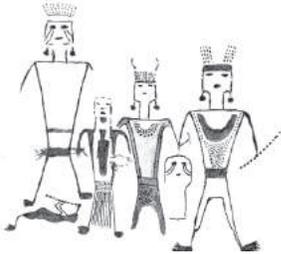
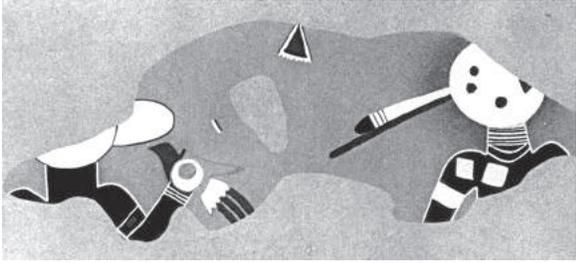
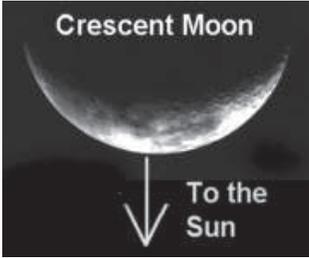
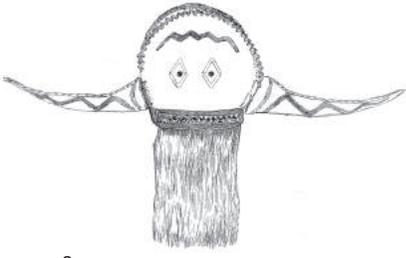
<p>Basketmaker III A.D. 500 to 700</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>a¹</p> </div> <div style="text-align: center;">  <p>a²</p> </div> </div>
<p>Fremont A.D. 500 to 1300</p>	<div style="display: flex; flex-wrap: wrap; justify-content: space-around;"> <div style="text-align: center; width: 45%;">  <p>b¹</p> </div> <div style="text-align: center; width: 45%;">  <p>b²</p> </div> <div style="text-align: center; width: 45%;">  <p>b³</p> </div> <div style="text-align: center; width: 45%;">  <p>b⁴</p> </div> </div>
<p>Late Pueblo IV A.D. 1375 or 1400 to 1540, 1628 Hopi</p>	<div style="text-align: center;">  <p>c¹</p> </div>
<p>Hopi A.D. 1628 to present</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>d¹</p> </div> <div style="text-align: center;">  <p>d²</p> </div> </div>

Table 2. *Hu (Tunwup) Katsina Iconography (continued)*

<p>Hopi A.D. 1628 to present (continued)</p>	 <p>d³</p>	 <p>d⁴</p>
	 <p>d⁵</p>	 <p>d⁶</p>

February horizontal crescent moon prior to Vernal Equinox (3rd week of March). (a1) Moab, Utah 42GR408; (a2) Moab, Utah 42GR318; (b1) Flicker (*Colaptes ssp*) feather headdress, cal. A.D. 996 to 1190, Mantles Cave (5MF1), in CU Museum; (b2) Ferron Box, Castleton 1984:115, Figure 3.8; (b4) Willow and Hill Creek, Castleton 1984:80, Figure 2.118; (b3) Ashley Dry Fork site #1, Castleton 1984:21, Figure 2.10; (b4) Moab Golf Course site, Castleton 1984:80, Figure 5.51; (c1) Possible Hopi *Hu* and *Hahai-i Katsinam*, Awatovi, kiva mural, room 788, Smith 1952:297, Figure 27(l), Figure 80(a); (d1) *Powa'müriyawû* (February “moist” moon); (d2) Broad Face (*Hu*) Katsina mask (incomplete), drawn from Stephen (1936), Vol. 1:240, Figure 147; (d3) Hopi *Hu* and *Hahai-i Katsinam*, Katsina Initiation sand mosaic, Voth 1901:Plate LII; (d4) Water color painting, Joe Mora 1904-1905, Smithsonian 1979:Cat. #D264511; (d5) Hopi *Tunwup* Katsina painted on altar cloth for 4th day of *Niman*, from Stephen 1969:Figure 314; (d6) *Tunwup* Katsina twins (*Walpi*), Fewkes 1903:124.

Pueblos. Later, during the horizontal transmission with the migration of non-kin Tewa speakers to First Mesa, subtle modification of the *Hu Katsina* headdress' crescent horns occurred as a result of default activation or innovation (Table 2 d⁶). At Walpi, *Powamuya* coincides with the February women's Buffalo dances (Stephen 1936:239). By depicting the “crescent moon” element of the headdress as a “bison-horn,” the Walpi artist most likely possessed cultural knowledge related to February bison dances from the nearby Eastern Pueblos (Stephen 1936:239).

In the rock art medium, the traditional (“crescent moon”) *Hu Katsina* headdress motif appears in Basketmaker III (ca. A.D. 500–700) Style rock art (Moab, Utah) (Table 2: a¹ and a²) and at Pictograph Point, Mesa Verde (Olsen 1985:28, Figure 4). Moreover, the *Hu Katsina* headdress motif (Moab, Utah) closely resembles the red- and yellow-shafted flicker (*Colaptes spp.*) feather headdress (Table 2:b¹), recovered from Mantle's Cave in Dinosaur National Monument (Burgh and Scoggin 1948:38, Plate 13) and radiocarbon (cal.) dated to A.D. 996 to 1190 (Truesdale 1996:30–

31). Using a pair of magpie or raven (?) tail or wing feathers putatively to represent the arc of the “crescent moon,” the flicker headdress reflects, in my view, the process of horizontal transmission from Basketmaker immigrant farmers to indigenous foragers³. Examples of varying degrees of mutation of the BM III “solar-lunar” headdress motif (Table 2:a¹, a²) appear in Fremont style anthropomorphs at Ferron Box, McConkey Ranch, and Moab, Utah (Table 2:b² to b⁴).

The identification of *Hu Katsina* headdress imagery in Basketmaker III style and Ancestral Hopi petroglyphs and material culture suggests that they observed planting rites timed in conjunction with the crescent moon around the time of the vernal equinox (Ferguson and Lowa’omvaya 1999:128 on *Powamuya* as a solar-lunar ceremony). Also apparently related to planting rites, the Sundagger Site (ca. A.D. 900–1300) on Fajada Butte in Chaco Canyon has been identified as a solar-lunar calendar (Sofaer 2009). Watson Smith (1952) identifies a possible *Hu Katsina* headdress at Awatovi, kiva mural room 788 (Table 2:c1). After the coalescence of migrating peoples on the Hopi Mesas, post-A.D. 1628, the *Hu Katsina* would figure centrally in *Powamuya* open plaza ceremonies, as well as in kiva *Katsina* Initiation rites (Stephen 1936; Voth 1901).

CONCLUSION

This paper addresses the claim that *katsina* iconography is non-existent (or unrecognized) on the Colorado Plateau prior to A.D. 1300. Conversely, the paper traces the social pathways and mnemonic processes involved in the possible cultural transmission of iconography related to the avian solar anthropomorphized deity, diffused from Formative Olmec maize religion to the Old Uto-Aztecan Flower World Complex ca. 1500 B.C. This period of cultural transmission was concurrent with the Early San Pedro-Basketmaker II phase of the Hohokam horizon (ca. 1500–1200

B.C.) along the western coastal Sierra Madre Occidental corridor and into the U.S. Southwest (Matson 1999:10–11; Simms 2008:200).

The mechanisms for the diffusion of maize with religion and iconography into the U.S. Southwest appear to have centered on Formative period interregional exchange, as well as intermarriage and resulting bilingualism between Otomanguan and SUA and Ancestral Hopi individuals living in small groups. During the Early Formative/Agricultural Period, SUA and Ancestral Hopi speakers integrated and modified Olmec maize ideology and iconography, creating their own religion, the Uto-Aztecan Flower World Complex, which persisted to varying degrees in U.S. Southwestern cultures.

Beginning with Basketmaker III (A.D. 500–750), rock art and material culture represent a secondary elaboration of “Olmec” sun-eagle deity iconography when the crescent moon element was added to the avian solar or “rayed” headdress style. The “Olmec” sun-eagle headdress style underwent replication (*Ahu’l Katsina* feathered circle), followed by modification when the *Hu Katsina* crescent moon “horns” were appended to the rayed-sun motif. When Eastern Puebloan peoples settled on Hopi First Mesa ca. A.D. 1700, the Oraibi *Hu* (“Whipper”) *Katsina* headdress style underwent further modification (e.g., Walpi’s *Tunwap Katsina*) as the result of horizontal transmission of iconography (bison’s upward curving horns), perhaps influenced by the Buffalo Dances from the Eastern Pueblos.

In closing, variations in avian solar deity headdress motif iconography possibly reflect the mental and behavioral processes whereby incipient farmers combined solar and lunar ritual calendars associated with maize agriculture. As Hopi oral tradition attests, *Powamuya*, and by association the *Hu Katsina*, did not originate in their present forms in the South (Central Mexico). Alternatively, created during their migrations in the Southwest, they reflect the behavioral and

iconographic innovation of diverse peoples who would become Hopi (*Hopisinom*) as they adapted to the challenges of maize farming on the northern Colorado Plateau.

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END NOTES

¹ I use quotes around the name "Olmec" to suggest the problematic relationship between western Olmec Otomanguean speakers and Gulf Coast Mixe-Zoquean speakers. The reference to Early Formative "Olmec" maize religion used in this paper denotes a pan-regional Otomanguean religion, emerging at least by 1500 B.C. From this period, incipient agriculturalists of various ethnicities and languages (including Gulf Coast Mixe-Zoquean), associated successful maize production with a maize religion, nature deities, ritual practices and paraphernalia (Marcus 1989:152–153; Taube 2000:297).

² The term "anthropomorphized deity" used in this paper refers primarily to animistic nature deities associated with successful crop production (sun, rain, and maize) in both Mesoamerica and

the U.S. Southwest. To the extent that these "deities" are implicated in agricultural success, the term captures all Beings who control weather and sources of rain in ground water from mountain caves and springs. Based upon ethnographic analogy, ancestor worship is often integral to agricultural religions in Mesoamerica, as well as in the Old World (Greece, Europe), Africa, and China (Eliade 1958:58–59, 110; Monaghan 1990:563–564).

³ Steven R. Simms (2008:203, 205) provides DNA and material cultural evidence that Fremont culture resulted from processes of interaction, such as intermarriage, between immigrant Basketmaker maize farming males and indigenous forager women with Archaic roots. Intermarriage as a mechanism for cultural transmission in the Southwest mirrors that in Formative Mesoamerica between Otomanguean-speaking farming males and SUA forager women.

REFERENCES CITED

- Anderson, Frank G.
1955 The Pueblo Kachina Cult: A Historical Reconstruction. *Southwestern Journal of Anthropology* 11:404–419.
- Barber, Elizabeth W., and Paul T. Barber
2004 *When They Severed Earth From Sky: How the Human Mind Shapes Myth*. Princeton University Press, Princeton, New Jersey.
- Bayman, James M.
2001 The Hohokam of Southwest North America. *Journal of World Prehistory* 15(3):257–311.
- Berry, Michael S., and C.F. Berry
1986 Chronological and Conceptual Models of the Southwestern Archaic. In *Anthropology of the Desert West: Essays in Honor of Jesse D. Jennings*, edited by Carol J. Condie and Don D. Fowler, pp. 253–327. Anthropological Papers 110. University of Utah, Salt Lake City.

- Bettinger, Robert L.
2008 Cultural Transmission and Archaeology. In *Cultural Transmission and Archaeology: Issues and Case Studies*, edited by Michael J. O'Brien, pp. 1–9. Society for American Archaeology, Washington, D.C.
- Boyer, Pascal
1994 Cognitive Constraints on Cultural Representations: Natural ontologies and religious ideas. In *Mapping the Mind: Domain Specificity in Cognition and Culture*, edited by Lawrence A. Hirschfeld and Susan A. Gelman, pp. 391–411. Cambridge University Press, New York.
1998 Cognitive Tracks of Cultural Inheritance: How Evolved Intuitive Ontology Governs Cultural Transmission. *American Anthropologist* 100(4):876–889.
2001 *Religion Explained: The Evolutionary Origins of Religious Thought*. Basic Books, New York.
- Burgh, Robert S., and Charles R. Scoggin
1948 *The Archaeology of Castle Park, Dinosaur National Monument*. Series in Anthropology No. 2. University of Colorado, Boulder.
- Carpenter, John P., Guadalupe Sanchez, and Marie Elisa Villalpando
2002 Of Migration and Maize: Mode and Tempo in the Diffusion of *Zea Mays* into Northern Mexico and the American Southwest. In *Traditions, Transitions, and Technologies: Themes in Southwestern Archaeology*, edited by Sarah H. Schlanger, pp. 245–258. University of Colorado Press, Boulder.
- Castleton, Kenneth B.
1984 *Petroglyphs and Pictographs of Utah. Volume One: The East and Northeast*. Utah Museum of Natural History, Salt Lake City.
- Charles, Mona, and Sally J. Cole
2006 Chronology and Cultural Variation in Basketmaker II. *Kiva* 72(2):167–216.
- Cole, Sally J.
1989 Katsina Iconography in Homolo'ovi Rock Art. *The Kiva: The Journal of Southwestern Archaeology and History* 54(3):313–329.
- Cole, Sally J. (continued)
1996 Middle Little Colorado River Rock Art and Relationships with the San Juan Anasazi. In *River of Change: Prehistory of the Middle Little Colorado River Valley*, edited by C. Adams, pp. 107–139. Arizona State Museum Archaeological Series 185. University of Arizona, Tucson.
2009 *Legacy on Stone: Rock Art of the Colorado Plateau and Four Corners Region*. (Revision of 1990 edition.) Johnson Books, Boulder, Colorado.
- Conkey, Margaret W., and Christine A. Hastorf
1990 Experimenting with Style in Archaeology: Some Historical and Theoretical Issues. In *The Uses of Style in Archaeology*, edited by Margaret Conkey and Christine Hastorf, pp. 5–17. Cambridge University Press.
- Crown, Patricia
1994 *Ceramics and Ideology: Salado Polychrome Pottery*. University of New Mexico Press, Albuquerque.
- Dawkins, Richard
1990 *The Extended Phenotype: The Long Reach of the Gene*. (Originally published 1976.) Oxford University Press, Oxford.
- Diehl, Richard A.
2004 *The Olmecs: America's First Civilization*. Thames and Hudson, London.
- Doolittle, W. E., and J. B. Mabry
2006 Environmental Mosaics, Agricultural Diversity, and the Evolutionary Adoption of Maize in the American Southwest. In *Histories of Maize: Multidisciplinary Approaches to the Prehistory, Linguistics, Biogeography, Domestication, and Evolution of Maize*, edited by J. E. Staller, R. H. Tykot, and B. F. Benz, pp. 109–121. Academic Press, New York.
- Eggan, Fred
1994 The Hopi Cosmology or World-View. In *Kachinas in the Pueblo World*, edited by Polly Schaafsma pp. 7–16. University of New Mexico Press, Albuquerque.

- Eliade, Mircea
1958 *Rites and Symbols of Initiation: the Mysteries of Birth and Rebirth*. Translated from French by W. R. Trask. Spring Publications, Woodstock, Connecticut.
- Ellis, F. W. and L. Hammack
1968 The Inner Sanctum of Feather Cave, a Mogollon Sun and Earth Shrine Linking Mexico and the Southwest. *American Antiquity* 33:25-44.
- Ferguson, T. J., and Micah Lowa'omvaya
1999 *Hoopoq'yaqam Niqw Wukoskyavi (Those Who Went to the Northeast and Tonto Basin): Hopi-Salado Cultural Affiliation Study*. Report on file at the Hopi Cultural Preservation Office, Kiqötsmovi, Arizona.
- Ferguson, T. J. and Gregson Schachner
2003 *Yep Hisat Hoopoq'yaqam Yeesiwa (Hopi Ancestors Were Once Here): Hopi-Hohokam Cultural Affiliation Study*, edited by T. J. Ferguson. Hopi Cultural Preservation Office, Kykotsmovi, Arizona.
- Fewkes, Jesse Walter
1899 The Alósaka Cult of the Hopi Indians. *American Anthropologist* 1(3):522-544.
1900 Tusayan Migration Traditions. In *Nineteenth Annual Report of the Bureau of American Ethnology for Years 1900-1901 (Part I)*, pp. 3-195. Washington, D.C.
1903 Hopi Kacinas Drawn by Native Artists. *Annual Report of the Bureau of American Ethnology* 21:3-126.
- Hays-Gilpin, Kelley, and Hill, Jane H.
1999 The Flower World in Material Culture: An Iconographic Complex in the Southwest and Mesoamerica. *Journal of Anthropological Research* 55(1):2-37.
2000 The Flower World in Prehistoric Southwest Material Culture. *The Archaeology of Regional Interaction: Religion, Warfare, and Exchange Across the American Southwest and Beyond*, pp. 411-427. Proceedings of the 1996 Southwest Symposium.
- Hill, Jane H.
1992 The Flower World of Old Uto-Aztecan. *Journal of Anthropological Research* 48:117-135.
2001 Proto-Uto-Aztecan: A Community of Cultivators in Central Mexico? *American Anthropologist* 103(4):913-934.
2006 The Historical Linguistics of Maize Cultivation in Mesoamerica and North America. In *Histories of Maize: Multidisciplinary Approaches to the Prehistory, Linguistics, Biogeography, Domestication, and Evolution of Maize*, edited by John E. Staller, Robert H. Tykot, and Bruce F. Benz, pp. 631-645. Academic Press, New York.
2008 Northern Uto-Aztecan and Kiowa-Tanoan: Evidence of Contact between the Proto-languages? *International Journal of American Linguistics* 74:155-188.
- Hopkins, Nicholas.
2006 The Place of Maize in Indigenous Mesoamerican Folk Taxonomies. In *Histories of Maize: Multidisciplinary Approaches to the Prehistory, Linguistics, Biogeography, Domestication, and Evolution of Maize*, edited by John E. Staller, Robert H. Tykot, and Bruce F. Benz, pp. 612-622. Academic Press, New York.
- Joralemon, P. David
1971 A Study of Olmec Iconography. In *Studies in Pre-Columbian Art and Archaeology*, 7. Dumbarton Oaks, Washington, D.C.
- Kealiinohomoku, Joann W.
1989 The Hopi Katsina Dance Event "Doings." In *Seasons of the Kachina: Proceedings of the California State University Hayward Conferences on the Western Pueblos, 1987-1988*, edited by Lowell John Bean, pp. 51-64. Ballena Press, Menlo Park, California.
- Kidder, Alfred V., and Samuel J. Guernsey
1919 *Archaeological Explorations in Northeastern Arizona*. Bureau of American Ethnology Bulletin 65. Government Printing Office, Washington, D.C.

LeBlanc, Steven A.

2008 The Case for an Early Farmer Migration into the Greater American Southwest. In *Archaeology Without Borders: Contact, Commerce, and Change in the U.S. Southwest and Northwest Mexico*, edited by L. D. Webster and M. E. McBrinn, pp. 107–142. University Press of Colorado, Boulder.

Lesure, Richard G.

2004 Shared Art Styles and Long-Distance Contact in Early Mesoamerica. In *Mesoamerican Archaeology: Theory and Practice*, edited by J. A. Hendon and R. A. Joyce, pp. 73–96. Blackwell, Malden, Massachusetts.

Lyons, Patrick D.

2003 *Ancestral Hopi Migrations*. Anthropological Papers of the University of Arizona, No. 68. University of Arizona Press, Tucson.

Mabry, Jonathan B.

2005 Changing Knowledge and Ideas About the First Farmers in Southeastern Arizona. In *The Late Archaic Across the Borderlands: From Foraging to Farming*, edited by Bradley J. Vierra, pp. 41–83. University of Texas Press, Austin.

2008 What's So Archaic About the Late Archaic? Recent Discoveries in Southwestern North America. *SAA Archaeological Record* 8(5):36–40.

Marcus, Joyce

1989 Zapotec Chiefdoms and the Nature of Formative Religions. In *Regional Perspectives on the Olmec*, edited by Robert J. Sharer and David C. Grove, pp. 148–197. Cambridge University Press, New York.

Marcus, Joyce, Kent V. Flannery, and Ronald Spores

1983 The Cultural Legacy of the Oaxacan Preceramic. In *The Cloud People: Divergent Evolution of the Zapotec and Mixtec Civilizations*, edited by Kent V. Flannery and Joyce Marcus, pp. 36–39. Academic Press, New York.

Matson, Robert G.

1991 *The Origins of Southwestern Agriculture*. University of Tucson Press, Tucson, Arizona.

1999 The Spread of Maize to the Colorado Plateau. *Archaeology Southwest* 15(1):10–11.

2005 Many Perspectives But a Consistent Pattern: Comments on Contributions. In *The Late Archaic Across the Borderlands: From Foraging to Farming*, edited by Bradley J. Vierra, pp. 279–299. University of Texas Press, Austin.

McCreery, Patricia, and Ekkehart Malotki

1994 *Tapamveni: The Rock Art Galleries of Petrified Forest and Beyond*. Petrified Forest Museum Association, Arizona.

McNeil, Lynda D.

2008 Behind 'Smoking Mirror' Pendants and *Powamuya*: Hopi-Fremont Cultural Affiliation. Paper presented at the seventy-third Society for American Archaeology Annual Meeting, March 29, 2008, Vancouver, British Columbia.

2010a Journey of the *Katsinam*: Tracing Maize Religion and Iconography from Formative Mesoamerica to Hopiland. Under review, 2010. Access at Office of the Program for Writing and Rhetoric, University of Colorado, Boulder.

2010b The Spread of Old Uto-Aztecan Flower World Complex into the American Southwest: Anthropomorphized Cult Deities in Rock Art and Other Media. Paper presented at the seventy-fifth Society for American Archaeology Annual Meeting, April 15, 2010, St. Louis, Missouri, in the session Archaeology with Style: Celebrating the Research Career of Margaret W. Conkey.

Merrill, W. L., R. J. Hard, J. B. Mabry, G. J. Fritz, K. R. Adams, and J. R. Roney

2009 The Diffusion of Maize to the Southwestern United States and its Impact. *Proceedings of the National Academy of Science*, vol. 106(50): 21019–21026.

Monaghan, John

1990 Sacrifice, Death, and the Origins of Agriculture in the *Codex Vienna*. *American Antiquity* 55(3):559–569

- Nequatewa, Edmund
1967 *Truth of the Hopi: Stories Relating to the Origin, Myths and Clan Histories of the Hopi*, edited by Mary-Russell Ferrell Colton. Originally published in 1936 as Truth of the Hopi and Other Clan Stories of Shungopovi, *Museum of Northern Arizona Bulletin* 8, Northern Arizona Society of Science and Art, Flagstaff.
- Niederberger, C.
1996 Olmec Horizon Guerrero. In *Olmec Art of Ancient Mexico*, edited by Elizabeth P. Benson and Beatriz de la Fuente, pp. 95–103. National Gallery of Art, Washington, D.C.
- Olsen, Nancy
1985 *Hovenweep Rock Art: An Anasazi Visual Communication System*. Occasional Paper 14. Institute of Archaeology, University of California, Los Angeles.
- Parsons, Elsie Clews
1933 Some Aztec and Pueblo Parallels. *American Anthropologist* 35:611–631.
1936 Introduction. In *Hopi Journal of Alexander M. Stephens*, Vol. 1, edited by E .C. Parson, pp. xxv–lii. *Columbia University Contributions to Anthropology* 23. Columbia University Press, New York.
- Pool, Christopher
2007 *Olmec Archaeology and Early Mesoamerica*. Cambridge University Press.
- Schaafsma, Polly
1994 The Prehistoric Kachina Cult and its Origins as Suggested by Rock Art. In *Kachinas in the Pueblo World*, edited by Polly Schaafsma, pp. 63–80. University of New Mexico Press, Albuquerque.
- Schaafsma, Polly, and Curtis F. Schaafsma,
1974 Evidence for the Origins of the Pueblo Kachina Cult as Suggested by Southwestern Rock Art. *American Antiquity* 39(4):535–545.
- Schaafsma, Polly, and Taube, Karl A.
2006 Bringing the Rain: An Ideology of Rain Making in the Pueblo Southwest and Mesoamerica. In *Pre-Columbian World*, edited by Elizabeth P. Benson and Beatriz de la Fuente, pp. 231–285. Dumbarton Oaks Research Library and Collection, Washington, D.C.
- Sekaquaptewa, Emory, and Dorothy Washburn
2004 They Go Along Singing: Reconstructing the Hopi Past From Ritual Metaphors in Song and Image. *American Antiquity* 69(3):457–486.
- Simms, Steven R.
2008 *Ancient Peoples of the Great Basin and the Colorado Plateau*. Left Coast Press, Walnut Creek, California.
- Smith, Watson
1952 Mural Decorations at Awatovi and Kawaika-a. *Kiva: The Journal of Southwestern Archaeology and History. Papers of the Peabody Museum of American Archaeology and Ethnology* 37. Harvard University, Cambridge.
- Smithsonian Institution
1979 *The Year of the Hopi: Paintings and Photographs by Joseph Mora, 1904–1906*. Washington, D.C.
- Sofaer, Anna
2009 *Chaco Astronomy: An Ancient American Cosmology*. Ocean Tree Books, Santa Fe.
- Stephen, Alexander M.
1936 *Hopi Journal of Alexander M. Stephen*, edited by Elsie Clews Parsons, Columbia University Contributions to Anthropology 23 (2 vols.). Columbia University Press, New York.
1969 *Hopi Journal of Alexander M. Stephen*, edited by Elsie Clews Parsons. AMS Press, New York.
- Taube, Karl A.
1983 The Teotihuacán Spider Woman. *Journal of Latin American Lore* 9(2):107–189.
1996 The Olmec Maize God: The Face of Corn in Formative Mesoamerica. *Res* 29/30:39–81.

Taube, Karl A. (continued)

2000 Lightning Celts and Corn Fetishes: The Formative Olmec and the Development of Maize Symbolism in Mesoamerica and the American Southwest. In *Olmec Art and Archaeology in Mesoamerica: Studies in the History of Art* (58), edited by J. E. Clark and M. E. Pye, pp. 27–331. National Gallery of Art, Washington, D.C.

Thompson, Marc

1994 The Evolution and Dissemination of Mimbres Iconography. In *Kachinas in the Pueblo World*, edited by Polly Schaafsma, pp. 93–105. University of New Mexico Press,.

Truesdale, James A.

1996 A Radiocarbon Age for the Flicker Feather Headdress from Mantle's Cave (5MF1), Dinosaur National Monument, Utah-Colorado. *Southwestern Lore* 59(3):26–33.

VanPool, Tod L., C. T. Palmer, and C. S. VanPool

2008 Horned Serpents, Tradition, and the Tapestry of Culture. In *Cultural Transmission and Archaeology: Issues and Case Studies*, edited by Michael J. O'Brien, pp. 77–90. Society for American Archaeology, Washington D.C.

Voth, Henry R.

1901 The Oraibi Powamuya Ceremony. Field Columbian Museum Publication No. 61; *Anthropological Series* 3 (2). Field Columbian Museum, Chicago, Illinois.

Washburn, Dorothy K.

2001 Remembering Things Seen: Experimental Approaches to the Process of Information Transmittal. *Journal of Archaeological Method and Theory*, 8(1):67–99.

Young, M. Jane

1994 The Interconnection Between Western Puebloan and Mesoamerican Ideology/ Cosmology. In *Kachinas in the Pueblo World*, edited by Polly Schaafsma, pp. 107–119. University of New Mexico Press, Albuquerque.