
Petroglyphs and Bell Rocks at Cocoraque Butte: Further Evidence of the Flower World Belief Among the Hohokam

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The Flower World is an ancient and widespread Uto-Aztecan belief system that is apparent in the iconography of the pre-Hispanic American Southwest and remains so today. Prior to A.D. 1300, archaeological evidence of the Flower World Complex is clear among Ancestral Puebloan and Mimbres people but not among the Hohokam. We recently reported the presence of Hohokam Flower World imagery including flowers, birds, butterflies, and certain abstract forms representing flowers in petroglyphs at Sutherland Wash Rock Art District near Tucson. A new recording project, at Cocoraque Butte, revealed similar Flower World imagery. Taken together, these data suggest that belief in the Flower World may have had broad distribution in the Tucson area. In addition, we recorded a large number of bell rocks that produce a range of tones and could have been used to create music.

We recently reported that Flower World imagery is present among the Hohokam petroglyphs in the Sutherland Wash Rock Art District (Hernbrode and Boyle 2013b). This finding is significant because previous work suggested that, although there is ample evidence for the Flower World among the Ancestral Puebloans and for the Mimbres, there is little material culture evidence for the presence of the “Flower World Complex” among the Hohokam prior to A.D. 1300 (Hays-Gilpin and Hill 1999). Based on a review of the surface ceramics at Sutherland Wash (Henry Wallace, personal communication 2011), we believe that predominant use of that site peaked in the Rincon Period probably centering on the middle Rincon Period, circa A.D. 1000–1100, thus predating most evidence of Flower World belief among the Hohokam by about 200–300 years.

The Flower World forms part of the belief system evident in the songs and material culture of 30 present day tribes located in the American Southwest and Mesoamerica that speak Uto-Aztecan based languages as well as neighboring Puebloan and Mayan peoples (Hays-Gilpin and Hill 2000; Hill 1992). The Flower World is a spiritual place evoked through songs, prayers, and hard work (Hays-Gilpin with Sekaquaptewa 2006). Flower World imagery serves as a visual metaphor for the Flower World, characterized by chromatic and iridescent components of the natural world such as birds, butterflies, dragonflies, rainbows, and sparkling crystals (Hays-Gilpin and Hill 1999; Sekaquaptewa and Washburn 2004, 2006). This collection of imagery, often termed “the Flower World Complex,” has been observed in ancient cultures in the Southwestern United States in kiva murals, ceramics,

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jewelry, rock art, and certain perishables (Hays-Gilpin and Hill 1999). Hays-Gilpin and Hill (1999) concluded that the Flower World Complex is widespread in the Southwest after A.D. 1300, but prior to that was limited to the Mimbres and Ancestral Puebloan areas. However, our finding that Flower World imagery was present at Sutherland Wash at about A.D. 1000–1100 suggests that the Flower World belief system might have been present among the Hohokam as well. The question remains as to whether Sutherland Wash is a unique site or, alternatively, that the same imagery might exist in petroglyphs at other sites. Interestingly, in her initial paper on the Flower World, Jane Hill (1992) suggested studying petroglyphs for additional indications of the Flower World Complex.

After our work at Sutherland Wash, we became interested in Cocoraque Butte, another extensive petroglyph site near Tucson, as a possible Flower World site. We were aware of several photographs of petroglyphs clearly depicting flowers that had been taken by Steve Larson at Cocoraque Butte in the 1970s. Additionally, T. J. Ferguson (2003) published several images of petroglyphs representing flowers that are located nearby on private land adjacent to our project area.

But the Flower World is not only visual—music and song are an important way of evoking the Flower World among modern peoples (Hill 1992; Sekaquaptewa and Washburn 2004, 2006, 2010). Songs are considered “flowers for the ears” among the Tohono O’odham, a descendant group of the Hohokam (Hill 1992). Both sites, Sutherland Wash and Cocoraque Butte, have sound properties. At Sutherland Wash, we noted several indicators of the importance of sound (Hernbrode and Boyle 2013b) including a canyon with reverberating sound, a rock formation that functions as a megaphone, and petroglyphs depicting sound. These are in addition to the large cache of copper bells found at Sutherland Wash reported by Haury and Gifford (1959). At Cocoraque Butte, there are many “bell rocks,” boulders that produce a bell-like tone when struck (Hedges 1993; John Madsen, personal communication 2014). Some of these were professionally recorded in 1993 (Madsen

1995), and it is clear from these recordings that the boulders produce a variety of tones.

Perhaps because of Cocoraque Butte’s physically challenging landscape, only a small portion of the petroglyphs had been recorded previously (John Madsen, personal communication 2014). As a result, we assembled a group of volunteers to record the petroglyphs at Cocoraque Butte located on the public portion of the site managed by the Bureau of Land Management. Our hypothesis was that Cocoraque Butte would contain a significant quantity of imagery related to the Flower World as well as features relating to sound production, just as there are at Sutherland Wash (Hernbrode and Boyle 2013b).

The study area included seven isolated boulder-covered hills that, geologically, are exposed rock masses that have not worn away, termed “inselbergs” (Figure 1). Skotnicki and Pearthree (2000) have identified the rock masses as “Cocoraque granodiorite,” a specific form of granodiorite, a common rock of the Earth’s Crust (Scarborough 2000). The inselbergs rise over alluvial fans emanating from a very large butte located immediately to the south and west of our study area. The hills rise abruptly from the desert floor with little transition from the sandy lowland to the large rounded boulders of the slopes.

This Sonoran Desert Upland landscape consists of plant communities primarily of ironwood, mesquite, and palo verde trees along with several species of cactus including saguaro, cholla, and prickly pear,



Figure 1. South face of Locus A, the largest of the seven hills in the project area. For scale note the two researchers on the bottom left. Locus A has 68 percent of the petroglyphs and 81 percent of the bell rocks.

interspersed with flowering shrubs. An artesian spring exists on the west side of the Butte just to the south of loci A through D, on private land.

Methods

The site is located within Ironwood National Monument and is administered by the Bureau of Land Management. BLM was specifically interested in documenting the location and current condition of all petroglyphs at the site. Thirteen volunteers were recruited and trained in data collection, and two of them were selected to photograph the petroglyphs. With the formal approval of BLM, data recording began in January 2014 and was completed in March 2015 (Figure 2).

All petroglyphs, bell rocks, grinding features, and artifacts found on the hills designated A to G were recorded. All were photographed and drawn, and GPS coordinates were recorded for each boulder containing petroglyphs and/or grinding features and/or use wear indicating use as a bell rock. Tabulations were made in the field of all element types relating to the Flower World (Hernbrode and Boyle 2013b) and selected other element types of interest (Hernbrode and Boyle 2013a). Given the size of the hills and the physi-

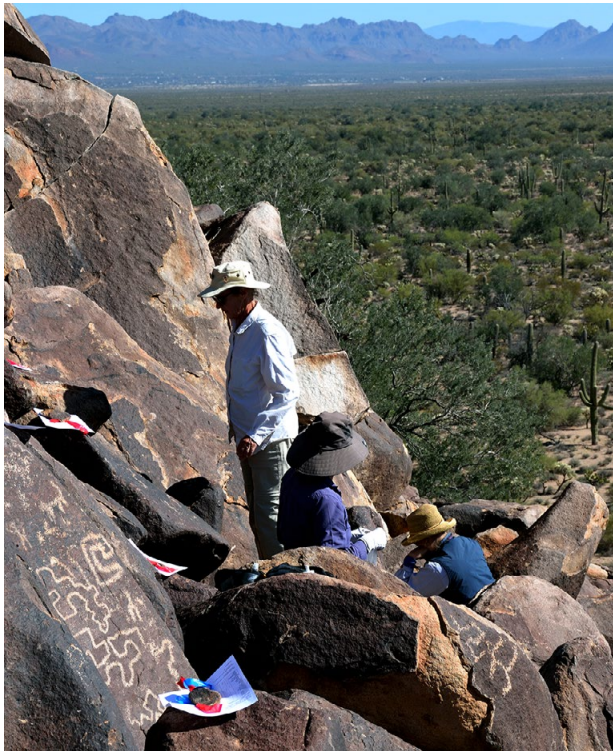


Figure 2. Volunteers recording rock art about two-thirds of the way to the summit of Locus A. Below is the saguaro cactus- and tree-covered desert floor with the Tucson Mountains in the background.

cal difficulty of working there, we did not tabulate all elements in the field. To do so would have made the project duration unreasonable; if necessary, other element types can be tabulated from the drawings and photographs. Additionally, we recorded information regarding patination, superimposition, and inclusion of natural features within glyphs.

Figures 3, 4, and 5 are drawings of petroglyphs from four large Hohokam sites in the Tucson area illustrating the range of Flower World imagery we have observed. Figure 3 illustrates the various glyphs interpreted as probably representing flowers, both realistic and abstract. Figures 4 and 5, respectively, are drawings of what appear to be butterflies and birds from the same sites. Note that the glyphs are not stereotypical—rather, they illustrate the concept of flowers, birds, or butterflies in a variety of ways. Figure 6 illustrates drawings of flower imagery on Hohokam ceramics that are very similar to the petroglyphs, showing that the same imagery was utilized in both media.

We recorded all bell rocks that met two criteria: they produced a tone, and they showed evidence of use in the form of strike marks. We gathered the same information as for petroglyphs (photos, drawings of the boulder and strike marks, patination, superimposition, etc.). In addition, we made observations regarding the boulder itself, such as its dimensions, geometry, and whether it is suspended in some fashion (such as spanning two other boulders), all of which are factors that affect tonal quality. Further, for each bell rock, we made audio recordings of the tone(s) produced and, using Fast Fourier Transform (FFT) spectrum analysis, measured the frequencies of the corresponding sound waves. Detailed results of the bell rock recording work will be reported separately.

Results and Discussion

A Google Earth map of the project area (Figure 7) shows the location of the petroglyphs and bell rocks on the series of seven hills in the project area. The hills vary considerably in elevation and, for purposes of our study, were identified with the letters A to G. The tallest of the formations, A and G, contain the largest concentrations of both petroglyphs and bell rocks. On this map, red dots represent petroglyph panels, and blue dots represent bell rocks. In total we recorded 796 petroglyph panels with 1888 elements and 83 bell rocks.

We categorized Flower World imagery using the same approach we utilized previously at Sutherland Wash (Hernbrode and Boyle 2013b). In that project,

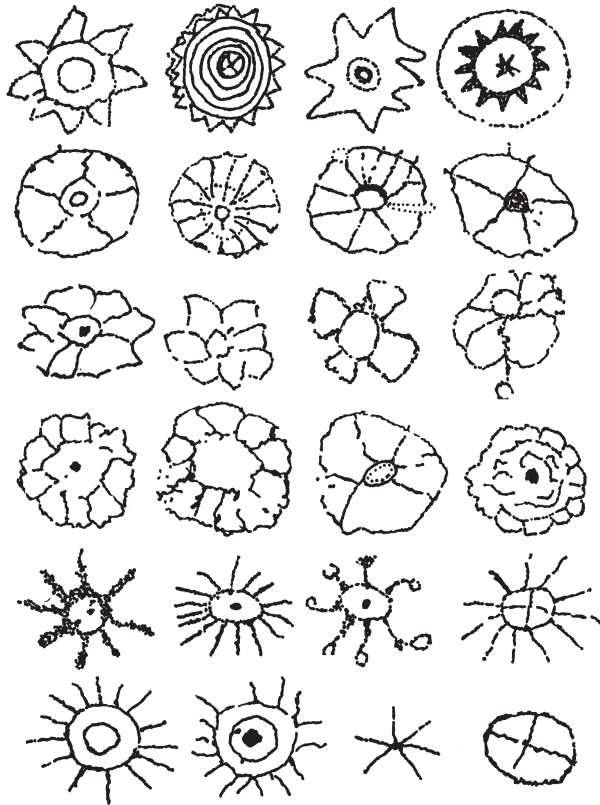


Figure 3. Representations of a variety of ways flowers are depicted in the Tucson area. Row 1: Realistic flowers with zigzag edges; Row 2: Realistic flowers in the form of concentric circles with spokes; Rows 3 and 4: Realistic flowers with petals; Rows 5 and 6: Various abstract images representing flowers based on ethnographic information detailed in the text.

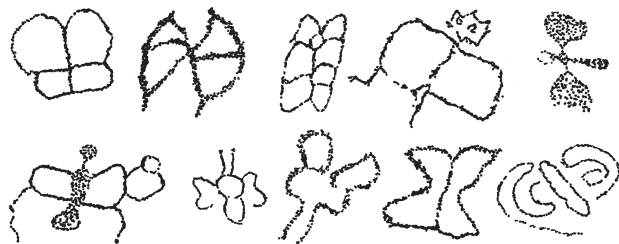


Figure 4: Butterfly imagery from petroglyphs in the Tucson area demonstrating the wide variation in the way butterflies are depicted.

we defined Flower World imagery as including 1) realistic flowers, petroglyphs that resemble local flowers; 2) abstract flowers, geometric images that have been interpreted as representing flowers based on ethnographic information; and 3) images of colorful and/or iridescent fauna such as birds and butterflies as well as natural features such as rainbows and sparkling rocks. This approach is based on the work of Hays-Gilpin and Hill (1999), who used similar criteria to iden-

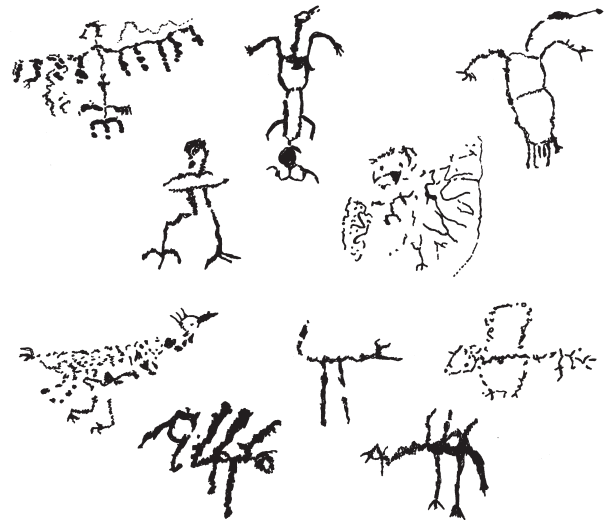


Figure 5: Bird imagery from petroglyphs in the Tucson area. Top: Front view; Bottom: Side view. Note there is little standardization of form.

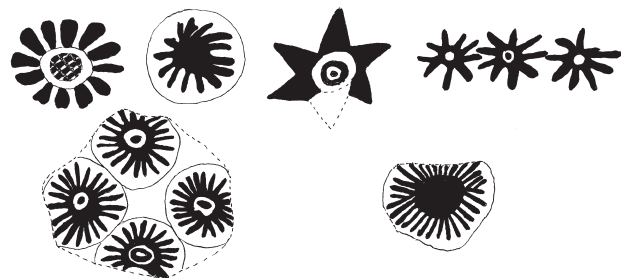


Figure 6: Drawings of realistic and abstract flower imagery on Hohokam ceramic sherds very similar to the petroglyphs depicted in Figure 3, illustrating that the same images are used in both media.

tify archaeological evidence for belief in the Flower World in the American Southwest. Table 1 presents the results of this analysis and is a tabulation of the 106 petroglyphs recorded at Cocoraque Butte that we interpret as representing the Flower World.

We divided realistic flowers into the same three types we used at Sutherland Wash. Realistic flower petroglyphs strongly resemble the flora from the local landscape; to illustrate this, we have paired them with flowers found at Cocoraque Butte. The first type of realistic flowers includes images built from circles, either with spokes or zigzag outer edges. Figures 8 and 9 are two circles with spokes from Cocoraque Butte and local flowers that they resemble. Note that the raised inclusion on the petroglyph in Figure 9a is quite like the stamen column of the pink velvet mallow. At Sutherland Wash, there are three prominent examples of circles with zigzag outer edges, but no examples were found at Cocoraque Butte.

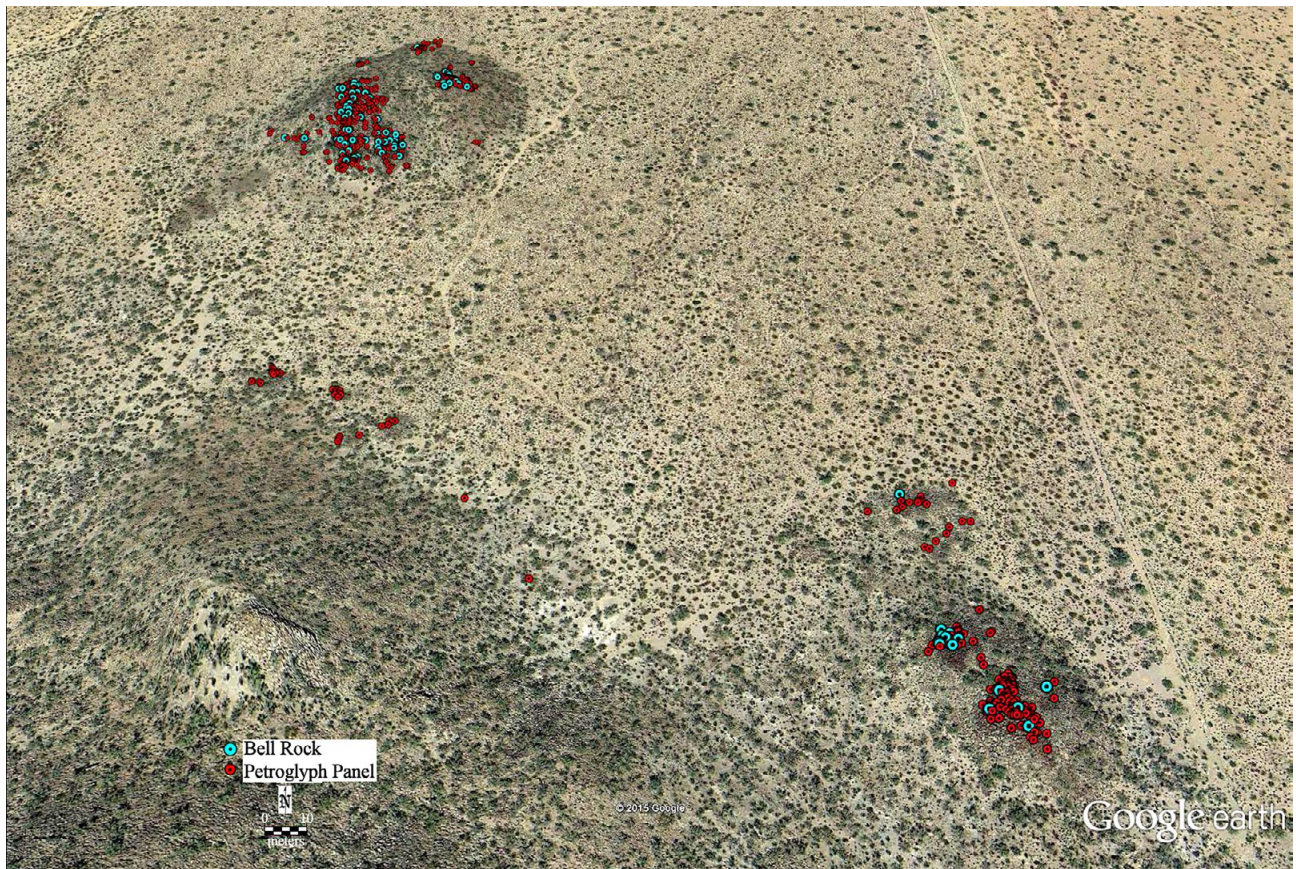


Figure 7: Map showing the distribution of petroglyphs (in red) and bell rocks (in blue) on the seven hills of the project area. Locus A is the hill located in the top left hand portion of the map, Loci B, C, and D are the small hills in the center left portion, and Loci E, F, and G are the hills in the lower right portion. Map by Lance K. Trask

Table 1. Flower World imagery.

Imagery	Number
Realistic Flowers	
Spoked	5
Petalled	9
Other	5
Abstract Flowers	
Rayed Circle	26
Rayed Circle Dot	12
Asterisk	6
Divided Circle	6
Other Representational	
Birds	18
Butterflies	19
Total	106

The second type of realistic flower is the most abundant class at Cocoraque Butte: flowers with petals. The petroglyph shown in Figure 10 occupies a bulge on the rock, giving the petals a drooping look similar to the white zinnias of the Sonoran desert pres-

ent at Cocoraque Butte. Another example of this type is the faint flower glyph represented by the tracing in Figure 11, shown in comparison to the cholla cactus blossom. Cholla buds were a major food source for the Hohokam and remain one of the traditional foods of the Tohono O’odham today.

As at Sutherland Wash, the last type of realistic flowers is termed “other.” The five petroglyphs of this type found at Cocoraque Butte resemble natural flowers but do not fit into the types defined above and are too dissimilar to form a definable category.

Abstract flowers are also present at Cocoraque Butte: Hays-Gilpin and Hill (1999) defined a number of elements based on ethnographic and archaeological data that represent flowers and, metaphorically, the Flower World. The first type, rayed circles, is the most abundant of the abstract flowers, totaling 26. The panel pictured in Figure 12 includes two rayed circles. Although rayed circles may also represent the sun, two appearing together more likely represent two flowers rather than two suns.



Figure 8: Realistic flower image in comparison to local flora: (a) petroglyph consisting of concentric circles with spokes; (b) *Erigeron divergens* (spreading fleabane).



Figure 9: Another example of a realistic flower image compared to local flora: (a) petroglyph consisting of concentric circles with spokes. Note the raised inclusion utilized as the center of the flower image; (b) *Horsfordia alata* (pink velvet mal-low). Note that the raised portion of the flower (the stamen column) resembles the inclusion in the petroglyph.



Figure 10: Realistic flower image in comparison to local flora: (a) petroglyph of a realistic flower with petals utilizing a bulge in the rock that creates an impression of drooping petals; (b) *Zinnia acerosa* (white zinnia).



Figure 11: Illustration of realistic flower image in comparison to local flora: (a) petroglyph of a realistic flower with petals; (b) *Cylindropuntia* spp. (cholla cactus).



Figure 12: Petroglyph panel with two rayed circles interpreted as abstract representations of flowers.

Rayed circles with a dot in the center (Figure 13), the second type of abstract flower, are similar to rayed circles but are considered separately because the presence of the dot may have important symbolic meaning. Sekaquaptewa and Washburn (2010) have suggested that such dots represent seeds and the power to reproduce, based on their analysis of Hopi imagery present in ceramics and kiva murals created prior to European contact.



Figure 13: Petroglyph panel that includes a rayed circle with dot in the center (lower left corner). The dot has been interpreted to represent seeds and the power to reproduce.

Cocoraque Butte also has some interesting elaborated rayed circles with a dot in the center. Figure 14 shows an example with concentric circles and a greatly emphasized central dot. The circles, the dot, and the rays seem to correspond to the coloration and physical properties of the prickly pear cactus photographed at Cocoraque Butte.

The third type of abstract flower, the divided circle, is a purely abstract symbol that might not be recog-



Figure 14: Abstract representation of a flower in comparison to local flora: (a) elaborated rayed circle with an emphasized dot in the center; (b) *Opuntia* spp. (prickly pear cactus) Note the remarkably similar geometric pattern.

nized as a flower without the support of ethnographic and archaeological literature. This imagery has been identified by Hays-Gilpin (2011) and Sekaquaptewa and Washburn (2006) as an abstract representation of a flower. Both Cocoraque Butte (Figure 15) and Sutherland Wash have divided circles.



Figure 15: Divided circle (left center of panel) has been interpreted as an abstract representation of a flower based on ethnographic information.

Some examples of divided circles used to represent flowers in both Hopi contemporary art and in ancestral Hopi kiva murals can be found in an article by contemporary Hopi artists (Lomawywesa et al. 2006:58, 62). The illustrations show a modern kiva mural with divided circles unambiguously representing flowers because they appear at the end of green stems and are nestled with other more realistic looking flowers. The authors juxtaposed this contemporary image with another example of divided circles from a kiva mural at Awat'ovi, an ancestral Hopi site dating from the 1400s.

With this as background, we can better understand the petroglyph pictured in Figure 16, another case of an elaborated rayed circle. The illustration is a wonderful combination of two symbols for flowers in a single element combining both a divided circle and a circle with rays.



Figure 16: Two abstract representations of flowers combined into a single element, a circle with rays and a divided circle.

A final example of abstract flower imagery pointed out originally by Hays-Gilpin and Hill (1999) is the asterisk. Asterisks resemble a number of desert flowers like the coral bean (*Erythrina flabelliformis*) and were more abundant at Sutherland Wash than at Cocoraque Butte.

Hays-Gilpin and Hill (1999) emphasized that documentation of the Flower World requires more than just the presence of images of flowers; it is important not only to identify the flower imagery but also other chromatic elements that contribute to the Flower World Complex. They propose, and we agree, that it is the combination of different images related to the Flower World that suggests belief in the Flower World within a particular archaeologically defined culture. In addition to flowers, the Flower World Complex includes other chromatic and iridescent parts of the natural world such as images of birds, butterflies, and rainbows. Of course, petroglyphs themselves are not colorful, but they can depict colorful parts of nature.

Abundant bird and butterfly imagery exists at Cocoraque Butte (Table 1). Birds are depicted both from a front view with wings spread and from the side, most often with wings as single lines or little indication of wings at all. Figures 17 and 18 are examples of petroglyphs at Cocoraque Butte representing birds. Easily identified butterfly imagery is also present. Butterflies appear either as single entities (Figure 19) or integrated into more complex panels (Figure 20).

In summary, imagery of both realistic and abstract flowers plus the related complex including birds and butterflies is present at Cocoraque Butte, just as it is



Figure 17: Birds are an additional element of the Flower World Complex: here, a petroglyph depicting a bird with wings outstretched.

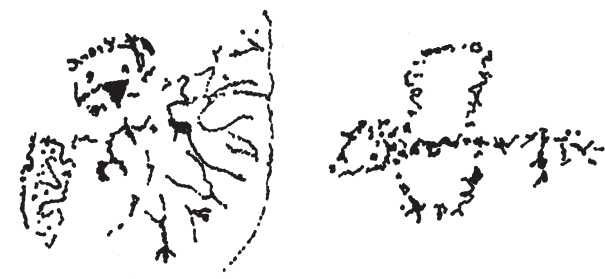


Figure 18: Drawings of two petroglyphs representing birds: left, a front view; right, a side view.

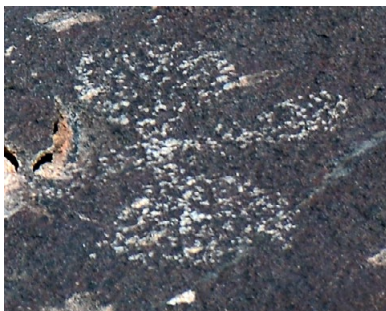


Figure 19: Butterflies are an additional element of the Flower World Complex: petroglyph with a delicate rendering of a butterfly.



Figure 20: Complex panel that includes a butterfly image in bottom center.

at Sutherland Wash. But what about the ritual uses of sound analogous to the sounds of bells in the Flower World? Sutherland Wash has areas of reverberating sound and rock art depicting sound in addition to a large cache of copper bells, most likely from West Mexico. Cocoraque Butte, as far as we know, had no stash of imported bells, but they were not needed because, as improbable as it may seem, the sizeable tonal boulders there provide the sound of bells.

Both Ken Hedges (1993) and John Madsen (personal communication 2014) observed and reported the presence of bell rocks at Cocoraque Butte in the 1990s. Madsen oversaw professional recordings of some of the bell rocks in 1993 (Madsen 1995). In our study we recorded 83 bell rocks. Of the 83 bell rocks about half of them (41) are located on boulders with petroglyphs. Figure 21 is an example, which we find fascinating, that has clear strike marks on the upper edge and a petroglyph of an anthropomorph with hands raised and appearing to hold a round object, a natural spall incorporated into the glyph, perhaps to represent a striking stone, as might have been used to produce sound.



Figure 21: Boulder that produces a bell-like tone ("bell rock") with small strike zone on the uppermost portion of the boulder and a petroglyph of an anthropomorph with arms raised, appearing to hold a round object, perhaps a striking stone.

We analyzed only bell rocks with strike marks; there are boulders present at this site without strike marks that ring, but these were not included in the present study. Beyond this, we know there is present-day use of the bell rocks so it is important to distinguish recent from ancient use. We were often able to distinguish between the two through an analysis of patination and superimposition. Figure 22 shows a bell rock with many strike marks with clear patination differences. This photo shows lightly patinated (more recent) strike marks superimposed over darker, older, strike marks. In this specific example the darker patination is very similar to the patination of nearby petroglyphs. Based on our analysis we concluded that 60 of the total of 83 bell rocks showed evidence of use at around the same time the rock art was made. The remaining 23 bell rocks may have been used in the same time frame, but we cannot conclude so based on this analysis. For example, in some cases new strike marks may have totally obscured earlier use.



Figure 22: Bell rock with large strike zone. Older strike marks with dark patination are underneath lighter, more recent strikes.

The bell rocks are generally large granodiorite boulders which differ substantially in size from the slender, elongate Kiva bells composed of many different types of rock that have been reported in the Puebloan region (Brown 2014). We estimated the weight of the bell rocks based on their dimensions and the density of granodiorite. For this paper, we have converted the dimensional data to cubic feet to help with visualization of scale and the variation in size. The median volume of the bell rocks is 7.1 cubic feet (range 0.8 to 49.2); the median estimated weight is 1009 pounds (range 79 to 5,015).

Figure 23 is a photo of a large bell rock we estimate weighs approximately 2,100 pounds. In the photo, two members of the research team are recording the sound



Figure 23: Two researchers recording sound produced when a large bell rock is struck. A wooden mallet is used rather than a striking stone to avoid damaging the surface of the boulder.

produced when the bell rock is struck. Note that a wooden mallet is being used to ring the boulders. It is important to do this because striking the boulders with a stone damages the surface and produces strike marks. Wooden mallets do not damage the boulder but produce the same pitch as occurs when the boulder is struck with a stone. Some of the boulders are so sensitive they will produce a tone when tapped with fingers.

As noted above, details regarding the tones produced by the bell rocks will be the subject of a future report, but Figure 24 can serve as an example of the type of patterns emerging from our analysis. Figure 24 shows three bell rocks in close proximity to each other, each of which produces a different pitch. Since the three boulders are within reach of a single individual, that person could produce combinations of different pitches consecutively or simultaneously and, therefore, produce tonal music. That is, they could be



Figure 24: Three bell rocks in close proximity. Each boulder produces a different tone (pitch); the three boulders easily could have been struck by a single individual in a variety of ways to produce tonal music.

played one at a time, in combinations of two together, in combination of all three, resulting in seven different tones. These can then be combined into different patterns to form music. If several musicians were simultaneously engaged along with singers they could have produced considerable complexity in music, perhaps performed at ceremonial or celebratory events. Images of flute players appear both on Hohokam ceramics (Haury 1976) and in Hohokam petroglyphs (Bostwick and Krocek 2002). Since flutes are tonal instruments, their representation in the imagery produced by the Hohokam provides independent evidence that the Hohokam had the means to produce tonal music and, in our opinion, likely did so.

The distribution of bell rocks and that of the petroglyphs is shown in both Figures 7 and 25. Figure 7 includes the entire study area and illustrates the similar distributions of the two feature types. Figure 25 shows the detail for Locus A where 68 percent of the petroglyphs and 81 percent of the bell rocks are located. Even at this level of detail, the distribution of bell rocks and petroglyphs is very similar. The majority of

both are on the south face, but smaller clusters occur on the east, north, and to a lesser extent on the west.

However, Table 2 presents an interesting difference in the spatial distribution of three major groups of motifs. Flower World imagery comprised 6.3 percent of the glyphs in Locus A, which is about 50 percent higher than the concentration at the other loci. In contrast, the percentage of anthropomorphs and zoomorphs is considerably lower at Locus A than at other locations. Our working hypothesis is that this differential distribution of imagery may reflect differences in how the areas were utilized.

Table 2. Percentage of major motifs in relation to location.

Locus	A	B,C,D	E,F,G
Flower World Imagery	6.3	4.4	4.2
Anthropomorphs	14.3	36.8	35.1
Zoomorphs	8.1	11.8	11.3

Figure 26 presents additional data consistent with this idea. The graph depicts the spatial distribution of three feature types—petroglyphs, bell rocks, and grinding features—as well as the spatial distribution

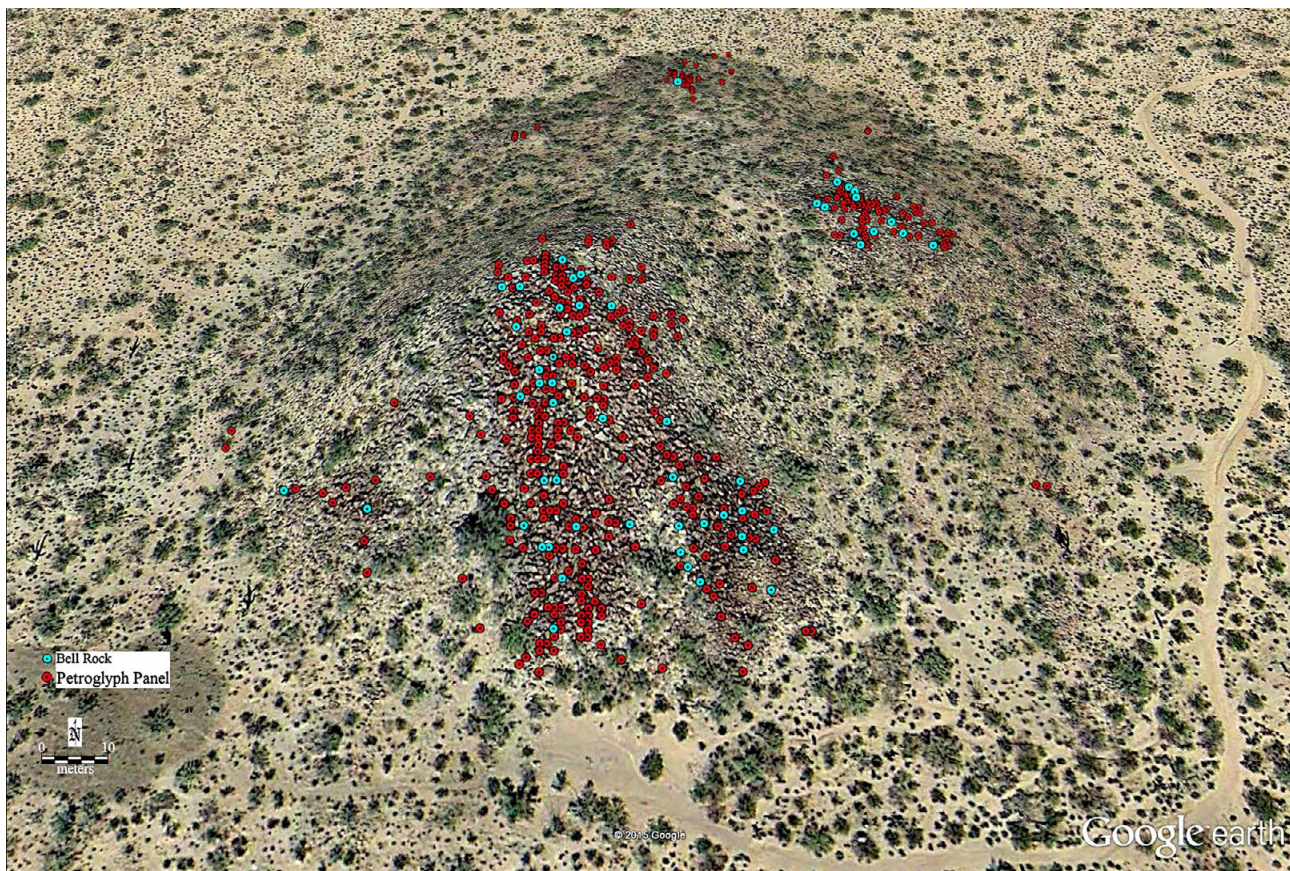


Figure 25: Map of Locus A showing petroglyph panels (in red) and bell rocks (in blue). Note both types of features have a similar distribution, and there is no clustering of either type. Map by Lance K. Trask.

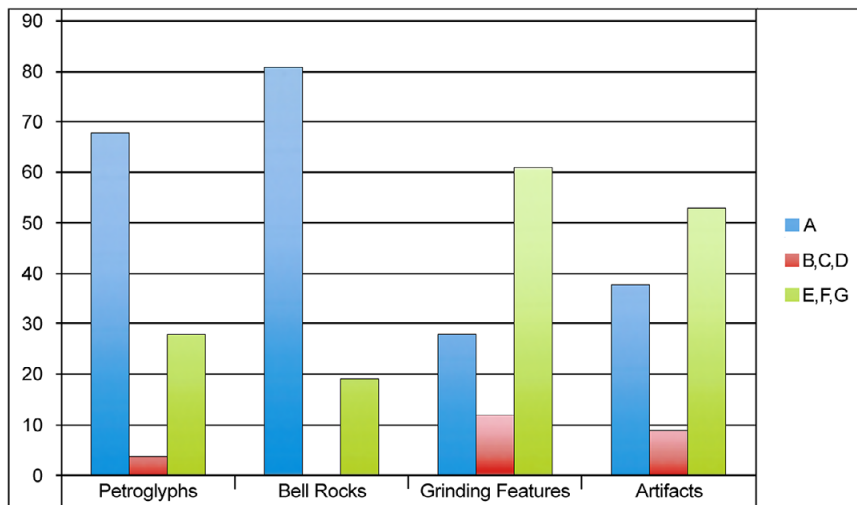


Figure 26: Graph showing spatial distribution of petroglyphs, bell rocks, grinding features, and artifacts. Note that petroglyphs and bell rocks are concentrated at Locus A while grinding features and artifacts are concentrated at Loci E, F, and G.

of artifacts such as sherds, lithics, and groundstone. As mentioned above, Locus A has the largest concentration of both petroglyphs and bell rocks; however, the largest number of grinding features and artifacts is found elsewhere at the site, primarily at the group of hills comprising Loci E, F and G. We suggest that this may indicate that people carried out many of their daily activities on the south side of the site where Loci B through G are located. In contrast, we suspect that much of the group ceremonial activity may have occurred at the base of Locus A, at the south face of the tallest, most impressive hill with the greatest collection of both petroglyphs and bell rocks with strike marks. Immediately to the south of this location there is a large, accessible flat area suitable for a sizable gathering of people of all ages. It is worth noting that the tones created by striking the bell rocks carries for some distance. Thus it is easy to envision that the musical “performances” of individuals striking the bell rocks would be heard throughout the project area.

It is clear from our non-systematic survey of the site that there are many architectural features near and just to the south of Loci B–G. There appears to be a mix of pit houses, walls, agricultural features, and other features that cannot be identified without further study. We have not observed this same pattern nearer Locus A, where the light sherd scatter and few grinding features are the only obvious surface evidence suggesting domestic activity. Having said that, Loci A and G are similar in some ways. Both have a substantial number of petroglyphs and bell rocks as well as small circular clearings at the summit that may

have been ritual areas, a common finding at hilltop sites in Southern Arizona (e.g., Pailes 2014). But we must emphasize that neither we nor anyone else has conducted a systematic survey of Cocoraque Butte. Consequently, at this point interpretation of site usage must be considered speculative.

It is possible that the spatial differences in motifs, features, and artifacts reflect a difference in time rather than a difference in usage. We cannot rule this out, but we have no data consistent with that interpretation. The clearly identifiable painted sherds located thus far are of one type, Tanque Verde

red-on-brown, which dates to A.D. 1150–1300. While it is likely that the site was used prior to this time, the data presently available suggest that the period of heaviest use was during the Tanque Verde Period. If this is correct, then Cocoraque Butte is a later site than Sutherland Wash where the period of heaviest use was estimated to be the Middle Rincon Period (A.D. 1000–1100), based on the surface ceramic scatter found there. Taken together these observations suggest that the Flower World belief system endured among the Hohokam for at least these 300 years from A.D. 1000 to 1300.

As noted above, the preponderance of petroglyphs and bell rocks occur within clusters in Locus A in what appears to be a diffuse pattern (Figure 25). Flower World imagery is distributed in a similar fashion (Figure 27). But, while the clustering is the same, comparison of Figures 25 and 27 suggests an area where there is an unexpectedly high concentration of Flower World imagery in a small cluster on the north slope. Indeed, Flower World imagery comprises 11.8 percent of the petroglyphs in this cluster in comparison to an average of 6.3 percent for all of Locus A. Relatively high concentrations of Flower World images were noted in a similar area at Sutherland Wash. This may represent a specialized usage of a small area.

Nonetheless, the overall distribution of Flower World imagery is quite similar to the distribution of all petroglyphs. We have observed this diffuse pattern at Sutherland Wash, and it suggests to us that many individuals were involved in the production of petroglyphs, including petroglyphs with religious significance, over

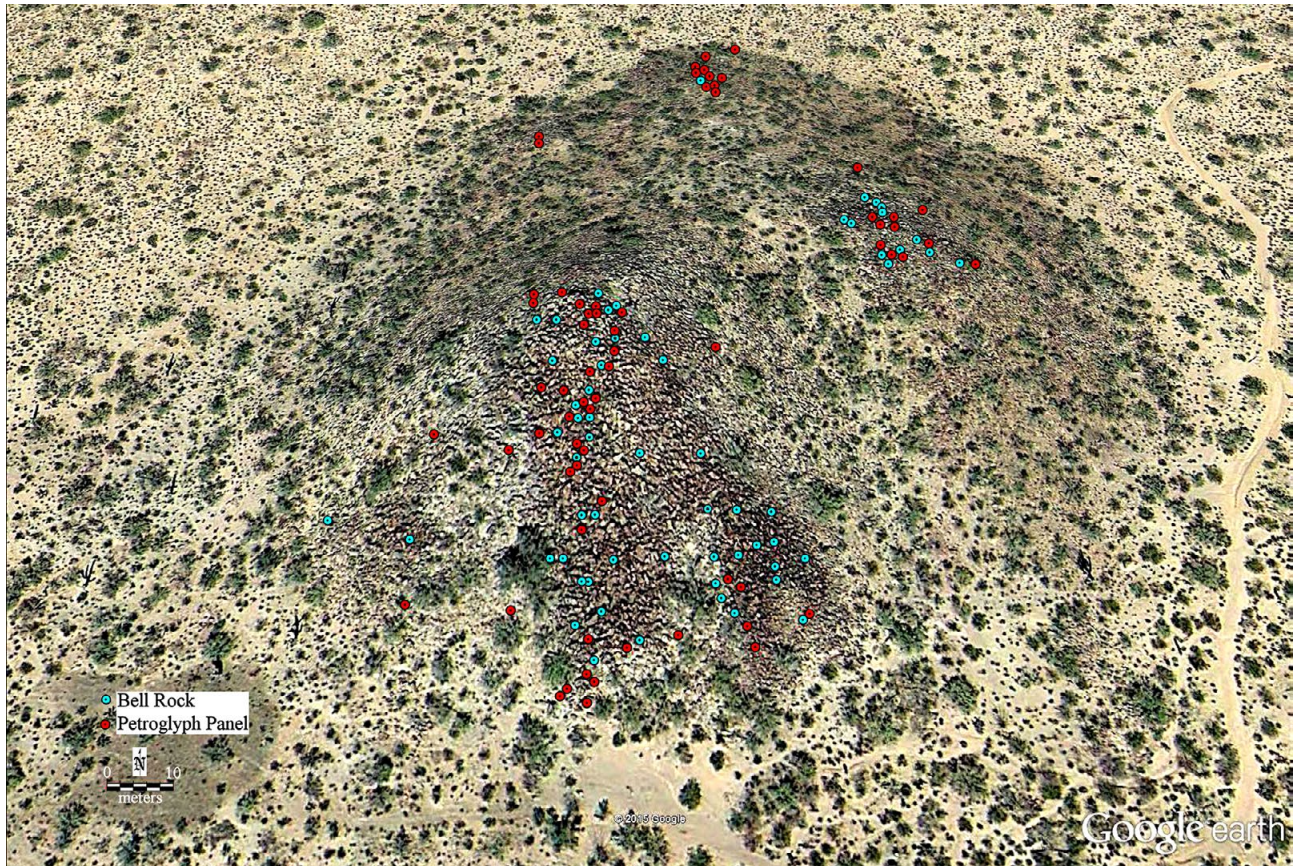


Figure 27: Map of Locus A showing petroglyphs with Flower World Complex imagery (in red) and bell rocks (in blue). Note they have similar distribution. The small cluster on the north slope has a disproportionately high density of Flower World imagery. Map by Lance K. Trask.

a long period of time. Following Wright (2014), we infer that at Cocoraque Butte religious leadership was likely distributed among numerous individuals rather than limited to an elite, as would later become the case in Hohokam culture.

General Discussion

In this report we have employed an approach developed by Hays-Gilpin and Hill (1999) that quantifies the presence of certain categories of imagery in the material culture to indicate a particular belief system. We interpret the presence of images depicting flowers, butterflies, and birds, intermixed as they are with a large number of bell rocks, as indicative of belief in the Flower World among the Hohokam. These same indicators occur in the ethnographic record of descendent populations and are still in evidence today among groups such as the Hopi, Tohono O’odham, Yaqui, and many others.

Sometimes the methods we use as rock art researchers make it difficult to recognize patterns such

as these. Too much focus on the unique differences of each glyph and the resultant lengthy list of element types may prevent us from recognizing that a flower, for instance, may be represented in many different ways. But, regardless of the specific representation, all of these images represent the idea of “flower” (Figure 3) and, in some cultures, flowers may have special significance. Sometimes, no doubt, a depiction of a flower represents no more than a flower. But in other cases, when accompanied by additional imagery relating to a complex belief system, flowers may have a much deeper meaning, serving as a metaphor for the entire belief system as suggested by Sekaquaptewa and Washburn (2004, 2006, 2010).

We have found it very helpful to reproduce real world examples of the various ways of depicting a particular object, such as we have done in Figures 3, 4, and 5. While keeping in mind the details that distinguish these various glyphs, it helps us see the connections and recognize when different glyphs represent the same object or idea. It is worth noting a similar varia-

tion exists in depictions of Hopi clan symbols, both for ancient and contemporary imagery. The work of Russell and Wright (2009) collects Hopi clan symbols and totemic signatures from the works of Bernardini, Nequatewa, Colton, Fewkes, Forde, Olsen, Mallory, Michaelis, and Titiev. Similar to our flower illustrations (Figure 3) and unlike modern branding icons, the range of different motifs representing the same clan indicates minimal standardization and a variety of ways to represent the same group with most, if not all, of the motifs sufficiently representational to be easily identified.

It might seem that religion is too intangible to be inferred from petroglyphs. However, we would point to a growing number of archaeologists who have been drawing inferences about belief systems based on the imagery in the material record (e.g., Crown 1994; Doyel 1994; Fogelin 2008; Hays-Gilpin and Hill 1999). More recently, a number of authors have utilized this general approach to characterize ancient belief systems and their role in social transformations (Glowacki and Van Keuren 2012; Mathiowetz 2011; Wallace 2014). In our view, rock art research can contribute an added dimension to this expanding body of information.

One final point requires discussion. This report has focused on Flower World imagery, which includes only 5.6 percent of the petroglyphs at Cocoraque Butte. Is it legitimate to draw inferences about beliefs at this site from this relatively low percentage of imagery? Actually, this parallels the situation with other media where Flower World imagery also occurs at a fairly low level of incidence (Hays-Gilpin and Hill 2000). Hill (1992), and subsequently Hays-Gilpin and Hill (1999, 2000), have suggested that the Flower World should not be interpreted as a religion in its own right, but rather should be viewed as one of several “part ideologies” that were combined with other ideas by Southwestern people over a long period of time.

Conclusions

We have presented evidence that the belief in the Flower World among the Hohokam was not unique to Sutherland Wash but was also present at Cocoraque Butte, showing it was a more broadly based belief system among the Hohokam that extended over a long period of time. The Flower World complex is illustrated in the petroglyphs by both realistic flowers and abstract representations of flowers as well as related chromatic imagery such as birds and butterflies. Very interestingly, these petroglyphs are intermixed with a

large number of bell rocks that produce a wide array of tones with which music might well have been produced. Thus, as at Sutherland Wash, Cocoraque Butte evokes the Flower World metaphor both with visual imagery and the sound of bells.

The presence of Flower World imagery at Cocoraque Butte adds to the even larger body of such imagery at Sutherland Wash that we have previously described (Hernbrode and Boyle 2013b). Taken together these two studies add significantly to the material evidence for the existence of the Flower World complex among the Hohokam in Southern Arizona before A.D. 1300. As has been the case with ceramics, rock art can be an important tool in understanding the belief systems of ancient peoples.

Both at Cocoraque Butte and at Sutherland Wash, the distribution of Flower World imagery was generally very similar to the overall distribution of petroglyphs. This diffuse pattern suggests that Flower World imagery was both public and produced by a range of individuals and was probably not the province of an elite group. At the same time, a small area with a higher concentration of Flower World imagery was noted at both sites and may suggest an area of special use.

In our view this work has methodological implications. Identification of the Flower World complex involves location of a specific set of related motifs, each of which can be expressed in a number of ways. For example, flowers can be depicted with a number of realistic graphic forms that resemble various flowers found on the landscape, or they can be expressed as abstract symbols known from the ethnographic literature to represent flowers. All of these images represent flowers and to some people are imbued with deep meaning. In conducting rock art research, we believe it is important to recognize such commonalities in images and group them accordingly rather than dividing the petroglyphs into a multitude of element types and potentially missing their interrelationships and meaning.

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