



Type 4 Complex Face
Batey Delfin del Yaguez,
Municipio of Mayaguez



Type 20
Zoomorph



Type 22
Spiral



Type 4b
Complex Facial Design

Puerto Rican Rock Art Types:
Their Distribution And Significance

Abstract

Puerto Rican rock art images present a wide range of individual design elements, motifs and locations. The authors have employed the typological approach as a means of organizing this diverse database. The resulting types, ranging from anthropomorphic to geometric designs, represent elemental units of analysis. Exploration of the distributional and associative patterns of the types is intended to provide insights into the relationships of images to the wider religious and socio-political prehistoric contexts of the island.

Resumen

El arte rupestre Puertorriqueño presenta un amplio rango de elementos individuales de diseño, motivos y ubicaciones. Los autores han utilizado el acercamiento tipológico como un medio de organización para esta diversa base de datos. Los tipos resultantes, abarcando desde antropomórfico a diseños geométricos, representan unidades elementales de análisis. La exploración de los patrones de distribución y asociación de los tipos, tiene la intención de proveer un acercamiento a las relaciones de imágenes de un amplio contexto religioso y socio-político de la época prehistórica de la isla.

Résumé

Les images des arts en roches portoricaines présentent une portée vaste des éléments des dessins individus, motifs, et les emplacements. Les auteurs ont utilisé l'approche typologique pour organiser cette base de données diverse. Les résultats sont les types qui s'échelonnent entre les dessins anthropomorphes et géométriques. Et elles représentent les unités élémentales de l'analyse. L'exploration des motifs distributifs et associatifs de ces types a l'intention de pourvoir défoulement au rapport des images aux plus larges contextes préhistorique religieux et socio-politiques de l'île.

Introduction

Studies of Puerto Rican rock art have tended to focus on the description and interpretation of the carved and painted images with limited cross-site comparisons (Oliver 1998; Roe et al. 1999). Studies which have had a comparative focus such as those by Frassetto in 1960, Bullen in 1974, and Rodríguez in the early 1990s (1991, 1993) employed differing typological categories to first order the data and then to examine the resulting types. We have argued elsewhere (Hayward and Cinquino 2001) that image classifications need to be updated due to the accumulation of new data on the number, location and variety of design elements.

Our goal in this paper is to examine similarities and differences among the island's rock art sites. We also take as the organizing principle typologically ordered images at each site, where the types are assumed to represent or capture enough of the site's character to be representative. Our initial typology of 26 anthropomorphic, zoomorphic and geometric images (Hayward et al. 2002) for this analysis has been increased to 48 to reflect the diversity in facial/body designs. We employed a simple correlation matrix of paired sites to delineate distributional patterns. As others have pointed out (e.g., Tratebas 1995), statistical procedures can be a critical analytic tool for rock art studies, alone or in combination with manual or intuitive methods.

Database

Twenty-two sites were selected for comparison. Four sites were documented by one of the authors and the remaining sites by other researchers. Information for the additional sites comes from published sources which contained good quality drawings and descriptions. Classification of these images was made by the authors; in unclear cases, the interpretation of the original author was

normally followed. The sample contains only 15 or 19 percent of the 79 municipios and is not considered representative of this criterion.

The sampling of major rock art island locations improves, as Table 1 indicates, with sites from rivers, caves, ball courts and ocean edges. The number of images and the number of image types per site is given, with the former ranging from 4 to 89 and the latter from 2 to 24. The total number of images is 571, averaging 26 per site.

Methods

To calculate the relationship between the image assemblage or counts by type at each site, we used a simple correlation (r), which measures the linear relationship between two variables. A correlation of +1 indicates a perfect direct relationship between two variables while a value of -1 indicates a perfect inverse relationship. A value of 0 indicates the lack of a linear relationship. r^2 , expressed as a percentage, is often used as an estimator of goodness-of-fit. An r^2 value of 50%, equating to an $r=0.7$ is, as a rule of thumb, considered to be meaningful.

Since many of the types are absent from the sites, this results in a large number of zero-zero pairs when comparing two sites. The consequence is a positive moderation of r values. Several test runs showed that the effect of the double zero pairs tended to increase the value of r by 0.04 to 0.05. Based on this, we decided to increase our meaningful r value to 0.75 to judge associations among the cave, rock panel, river boulder and ball court locations.

Results

A portion of the correlation matrix is given in Table 2a. A reordered matrix is presented in Table 2b in a more intuitively-friendly manner. Each column is headed by a site followed by its r value in descending order relative to the other 21 sites.

Interpretation

We view the results of the correlation matrix as indicating two components of rock art site distribution on Puerto Rico: the unique nature of each location combined with instances of strong positive associations. A simple inspection of the image type distributions at the sample sites, Table 1, belies the distinctive aspect of sites vis-a-vis other locations. For example, Rio Guacio (Figure 1a) contains 10 percent of the image types consisting of 76 percent incomplete faces with only eyes and mouths indicated, 20 percent simple faces with only these elements enclosed to outline facial images, and 2 percent or one each of a more detailed anthropomorphic face and a simple face on a body with arms.

In contrast, La Piedra Escrita exhibits 40 percent of the image types including a wide range of facial designs from incomplete to detailed, along with zoomorphic and the highest number of geometric glyphs at any one site (Figure 1b). The relatively low number of positive site associations suggested by the correlation matrix run and the high number of medium to low r values serves to corroborate the visible or intuitive impression. This uniqueness aspect of the distributional pattern may be somewhat artificial or overemphasized, since our sample size is small. Some 500 rock art sites on the island have been registered with the expectation that additional sites will present more likenesses or similarities among the locations.

Five positive associations among sites are indicated by r values above 0.75 (see Table 2b). Only two are discussed in this presentation. Rio Guacio, a river boulder petroglyph complex in the central west portion of Puerto Rico, exhibits a strong correlation with Batey el Delfin del Yaguez in the same geographic area and a nearly equal correlation with Las Abejas in the center of the island.



Both of the latter represent ball court sites.

A review of the image type distribution and inspection of the petroglyphs suggests the association results from a relatively high frequency of incomplete anthropomorphic faces, other less developed faces, and a low range of image types. The Rio Guacio assemblage (see Figure 1a) contains 76 percent incomplete faces, with the corresponding figures for Las Abejas being 48 percent and Batey del Yaguez 67 percent. Figure 2a illustrates two incomplete faces and a Type 3 simple face from Las Abejas; and a Type 4 complex face and a series of incomplete faces on a rock boulder from Batey Yaguez.

The evidence for a strong similarity among the three sites does not necessarily indicate the reason for the association. Geographic or physical medium do not appear to have played a role, since the assemblages come from different island regions and river versus ball court locations. The function of ball courts is considered to reflect communal village activities and the open, accessible nature of a river suggests the rock art could have been produced for similar events. A temporal component is also possible.

A second strong association involves a grouping of sites which cross-cuts physical media and municipio locations, but is nonetheless concentrated in the southeast portion of the island. La Iglesia, Cuevas de Bina, La Piedra, and Las Planadas are located in the same general area in the municipio of Cayey. The first two sites contain petroglyphs in cave settings, while La Piedra exhibits carved images on an isolated rock panel and those of Las Planadas are associated with a ball court. El Palo's petroglyphs are found on a boulder at the river's edge in the municipio of Guayama, and those of Cueva del Indio have been carved into the faces of a very large boulder enclosure in the municipio of Las Piedras.

These sites form a grouping based on a high frequency of Type 3 simple faces, other facial images with or without bodies which are minimally more detailed, and a high overall incidence of anthropomorphic designs. The descending order of Type 3 simple face percentages among the sites is: Cuevas de Bina, 85 percent; La Iglesia, 80 percent; Cueva del Indio, 58 percent; Las Planadas 50, percent; El Palo, 50 percent; and La Piedra, 35 percent. Figure 2b depicts examples of the petroglyphs from each of the sites: interconnected Type 3 simple faces from La Iglesia; a simple face from Cuevas de Bina; a Type 3 simple face and a Type 5a multiple-enclosed face with eyes from El Palo; a complex face on an enclosed body from La Piedra; a similar layout to the La Piedra image from Las Planadas and a series of interconnected simple faces from Cueva del Indio.

In this example, the similarity in design frequencies indicates a particular geographic focus, perhaps execution over a similar period and for a variety of reasons to judge by the cave, river boulder, rock panel and ball court locations.

Conclusion

We consider these distributional patterns provisional. Our assumption regarding the use of a typology to reflect the character of a rock art site appears workable, although changes in or a rethinking of the typology are not ruled out. The sample size is small; the addition of other sites are expected to yield more associations and more complex ones. Inferences as to the resulting patterns relating to geographic, functional or temporal variation are possible when placed in the local cultural context.



Sources Cited

Ayes Suárez, Carlos M.

1989 Las Abejas: A Ceremonial Ball Court from the "Santa Elena" Phase of the Taíno Culture. Type Phase 2 Study. Asomante, Aibonito, Puerto Rico. Ayes: Investigaciones Arqueológicas. Vega Baja, Puerto Rico.

Bullen, Ripley P.

1974 Certain Petroglyphs of the Antilles. Proceedings of the International Congress for the Study of the Pre-Columbian Cultures of the Lesser Antilles 5:94-109. St. Johns, Antigua. Frassetto, Monica Flaherty

1960 A Preliminary Report on Petroglyphs in Puerto Rico. American Antiquity 25(3):381-390. Garrow, Patrick, Charles McNutt, Jr., Guy Weaver, and José Oliver

1995 Iglesia de Maraguez (PO-39): Investigation of a Local Ceremonial Center in the Cerrillos River Valley, Ponce, Puerto Rico. Garrow and Associates, Inc., Atlanta, Georgia. Hayward, Michele H., Marisol J. Meléndez Maíz, and Marlene Ramos Vélez

1992a Informe Preliminar I. Documentación de Tres Sitios de Arte Rupestre: Piedra Escrita, Jayuya; Cueva del Indio, Las Piedras; Quebrada Maracuto, Carolina. Centro de Investigaciones Arqueológicas, Instituto de Cultura Puertorriqueña. San Juan, Puerto Rico.

1992b Informe Final. Documentación del sitio LM-4 de Arte Rupestre: Río Guacio, Las Marias. Centro de Investigaciones Arqueológicas, Instituto de Cultura Puertorriqueña. San Juan, Puerto Rico.

Hayward, Michele H., and Michael A. Cinquino

2001 Puerto Rican Rock Art: Towards a Comprehensive Interpretive Framework. Paper presented at the 66th Annual Meeting of the Society for American Archaeology, New Orleans. Hayward, Michele H., Frank Schieppati, and Michael A. Cinquino

2002 Puerto Rican Rock Art Classification Approaches. Paper presented at the 67th Annual Meeting of the Society for American Archaeology, Denver.

Meighan, Clement, and Lance K. Trask

1994 Rock Art at Roosevelt Roads, Puerto Rico. Manuscript on file in the Cultural Resources Office, U.S. Naval Station, Roosevelt Roads, Ceiba, Puerto Rico.

Oliver, José R.

1998 El centro ceremonial de Caguana, Puerto Rico. BAR International Series 727. British Archaeological Reports, Oxford.

Rivera Fontán, Juan, and Daniel Silva Pagán

1997 Proyecto Arqueológico Bo. Quemado, Mayaguez (Batey Delfin del Yaguez). Ocho Trabajos de Investigación Arqueológica en Puerto Rico. Segundo Encuentro de Investigadores, pp. 53-64. División de Arqueología, Instituto de Cultura Puertorriqueña, San Juan, Puerto Rico. Rivera Meléndez, José A.

1996 Apuntes para el Estudio de la Prehistoria de Cayey. M.A. Thesis. Centro de Estudios Avanzados de Puerto Rico y El Caribe. San Juan, Puerto Rico.

Rodríguez Alvarez, Angel

1991 A Preliminary Petroglyph Survey along the Blanco River: Puerto Rico. Proceedings of the International Association for Caribbean Archaeology 13(Part 2):898-926. Curacao, Netherlands Antilles.

1993 A classification scheme for the Puerto Rico petroglyphs. Proceedings of the International Association for Caribbean Archaeology 14:624-636. Barbados.

Rodríguez Miranda, Marisol

1999 Arte Rupestre del Cibuco. In Trabajos de Investigación Arqueológica en Puerto Rico. Tercer Encuentro de Investigadores, pp. 35-46. División de Arqueología, Instituto de Cultura Puertorriqueña, San Juan, Puerto Rico

Roe, Peter G.

1991 The petroglyphs of Maisabel: A study in methodology. Proceedings of the International

- Association for Caribbean Archaeology 12:317-370. Cayenne, French Guayana.
- Roe, Peter G., José Rivera Meléndez
 1995 Recent Advances in Recording, Dating and Interpreting Puerto Rican Petroglyphs. Proceedings of the International Association for Caribbean Archaeology 16:444-461. Basse Terre, Guadeloupe.
- Roe, Peter G., José Rivera Meléndez, James Byerly and Nicole Cornell
 1999 The Cueva de la Momia (Comerio, PR) Petroglyphs: A Case Study in Field Technology. Proceedings of the International Association for Caribbean Archaeology 18:311-339. St George Campus, Grenada.
- Roe, Peter G., José Rivera Meléndez, and Peter DeScioli
 1999 The Cueva de Mora (Comerio, PR) Petroglyphs & Pictographs: A Documentary Project. Proceedings of the International Association for Caribbean Archaeology 17:20-59. Nassau, New Providence, Bahamas.
- Tratebas, Alice M.
 1995 Using Statistics to Reach Beyond Subjective Analysis of Rock Art Data. Paper presented at the NEWS 95 International Rock Art Congress, Turin, Italy.
- Tronolone, Carmine A., and Michael A. Cinquino
 1985 Ceiba 3. National Register Nomination Form. Manuscript on file in the Cultural Resources Office, U.S. Naval Station, Roosevelt Roads, Ceiba, Puerto Rico.



Table 1. Site Summary

Site Name	Municipal Location	Site Type	No. of Images	No. of Image Types Present
Piedra Escrita (Hayward et al. 1992a)	Jayuya	River Boulder	89	19
Quebrada Maracuto (Hayward et al. 1992a)	Carolina	River Boulder	31	14
Cueva del Indio (Hayward et al. 1992a)	Las Piedras	Cave	65	10
Rio Guacio (Hayward et al. 1992a)	Las Marias	River Boulder	41	5
Cueva de Mora (Roe et al. 1999)	Comerio	Cave	68	24
Maisabel (Roe 1991)	Vega Baja	Ocean Edge	35	14
Tibes (Oliver 1998)	Ponce	Ballcourt	11	5
El Bronze (Oliver 1998; Robinson et al. 1985)	Ponce	Ballcourt	11	6
Caguana (Oliver 1998; Roe 1993)	Utua	Ballcourt	26	12
La Iglesia Maraguez (Garrow et al. 1995)	Ponce	Ballcourt	5	4
El Palo (Roe and Rivera 1995)	Guayama	River Boulder	24	7
Cibuco CO4 (Rodriguez 1999)	Corozal	River Panel	21	13
Las Abejas (Ayes 1989)	Aibonito	Ballcourt	61	13
Batey del Yaguez (Rivera and Silva 1997)	Mayaguez	Ballcourt	12	4
La Iglesia (Rivera 1996)	Cayey	Cave	5	2
Las Cuevas de Bina (Rivera 1996)	Cayey	Cave	13	3
El Cidro (Rivera 1996)	Cayey	River Boulder	9	5
La Piedra (Rivera 1996)	Cayey	Rock Panel	17	9
Las Planadas (Rivera 1996)	Cayey	Ballcourt	4	3
Roosevelt Roads 3 (Meighan and Trask 1994)	Ceiba	Ocean Edge	9	4
Ceiba 3 (Tronolone and Cinquino 1985; Meighan and Trask 1994)	Ceiba	Ocean Edge	8	6
Cueva del la Momia (Roe et al. 1999)	Comerio	Cave	6	3
Total Number of Images:			571	
Total Number of Sites:			22	
Average Number of Images per Site:			26	



Table 2a. Portion of the Correlation Matrix

SITE	<i>Piedra Escrita</i>	<i>Quebrada Maracuto</i>	<i>Cueva del Indio</i>	<i>Rio Guacio LM4b</i>	<i>Cueva de Mora</i>	<i>Maisabel</i>	<i>Tibes</i>
Maisabel	0.094	0.315	0.327	0.021	0.559	1.000	
Tibes	0.084	0.190	0.130	-0.053	0.043	0.017	1.000
El Bronze	0.352	0.530	0.682	0.108	0.722	0.231	0.225
Caguana	0.106	0.213	0.208	-0.020	0.155	-0.032	0.001
La Iglesia Maraguez PO 39	0.198	0.292	0.194	0.331	0.174	-0.059	0.371
El Palo	0.430	0.526	0.846	0.265	0.688	0.284	-0.037
Cibuco CO 4	0.287	0.485	0.615	0.082	0.549	0.209	0.071
Las Abejas	0.330	0.414	0.540	0.947	0.448	0.166	0.032
Batey del Delfin del Yaguez	0.125	0.151	0.081	0.923	0.086	0.003	-0.042
La Iglesia	0.538	0.562	0.917	0.224	0.646	0.278	-0.055
Las Cuevas de Bina	0.448	0.579	0.943	0.230	0.683	0.297	0.018
El Cedro	0.159	0.453	0.301	0.498	0.266	0.295	0.044
La Piedra	0.388	0.641	0.830	0.313	0.803	0.408	-0.054
Las Planadas	0.340	0.480	0.760	0.173	0.520	0.195	-0.075

Table 2b. Reordered r values for 22 Puerto Rican Rock Art Sites

SITE	<i>Cueva del Indio</i>	<i>Rio Guacio LM4b</i>	<i>El Palo</i>	<i>Las Abejas</i>	<i>Batey del Delfin del Yaguez</i>	<i>La Iglesia</i>	<i>Las Cuevas de Bina</i>	<i>La Piedra</i>	<i>Las Planadas</i>
Cueva del Indio	1.000								
Rio Guacio	0.313	1.000							
El Palo	0.846	0.265	1.000						
Las Abejas	0.540	0.947	0.456	1.000					
Batey del Delfin del Yaguez	0.081	0.923	0.019	0.831	1.000				
La Iglesia	0.917	0.224	0.879	0.439	-0.038	1.000			
Las Cuevas de Bina	0.943	0.230	0.902	0.446	-0.036	0.961	1.000		
La Piedra	0.830	0.313	0.811	0.530	0.138	0.799	0.819	1.000	
Las Planadas	0.760	0.173	0.870	0.369	-0.051	0.785	0.804	0.710	1.000

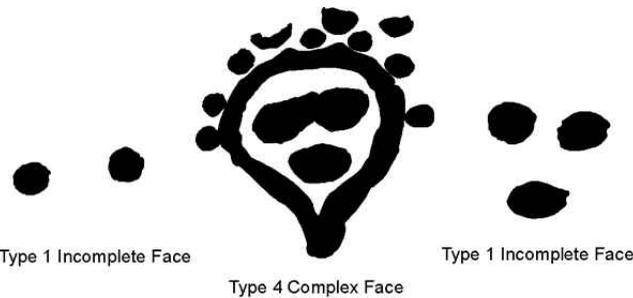


Figure 1a. Examples of petroglyph types from Rio Guacio, Municipio of Las Marias, Puerto Rico.

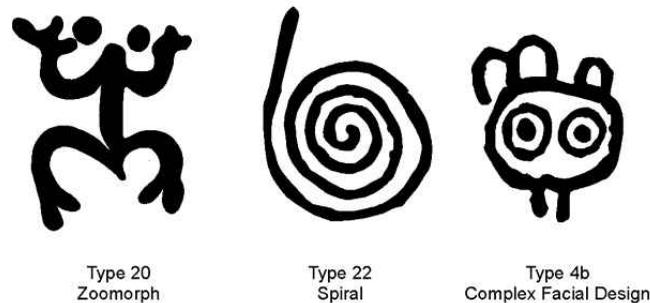


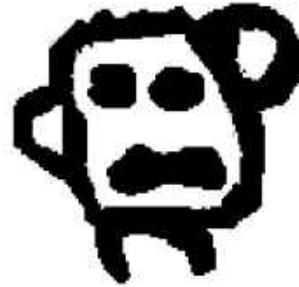
Figure 1b. Examples of petroglyph types from Piedra Escrita, Municipio of Jayuya, Puerto Rico



Type 3
Simple Face



Type 1
Incomplete Faces

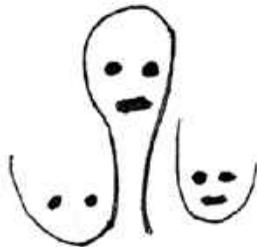


Type 4 Complex Face
Batey Delfin del Yaguez,
Municipio of Mayaguez



Type 1 Series of Incomplete Faces
Batey Delfin del Yaguez, Municipio of Mayaguez

Figure 2a. Examples of petroglyph types from two Puerto Rican sites.



Type 3 Simple Faces
La Iglesia, Cayey



Type 3 Simple Face, and
Type 5a Multiple Enclosed
Face, El Palo, Guayama



Type 10
Complex Face on Body
La Piedra, Cayey



Type 4 Complex Face
Las Planadas, Cayey



Type 3 Simple Face
Las Cuevas, Cayey



Type 3 Simple Faces
Cueva del Indio, Las Piedras

Figure 2b. Examples of petroglyph types from six Puerto Rican sites.