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# ASTRONOMY AND RITUAL IN THE PROTOHISTORY OF THE SOUTHEAST OF THE IBERIAN PENINSULA

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## ABSTRACT

Along the first millennium BCE and up to the beginning of the Roman conquest at the end of III century BCE, the southeast part of the Iberian Peninsula was colonized by Phoenicians, Greeks and Punics. All these cultures influenced the religious and funereal world of the indigenous peoples. Tartessians and Iberians were the main Protohistoric cultures product of such external influences in this geographical area. In this paper, I review the main results of archaeoastronomical works I have carried out in Protohistoric archaeological sites of the south and southeast of the Iberian Peninsula. These works give pieces of information that provide a diachronic view of the role of astronomy in the ritual during the first millennium BCE. The Tartessian/Phoenician sanctuaries of the Guadalquivir Valley show evidences that the cult to Baal and Astarte may have rituals related to the sun at solstices and Venus at its southernmost setting, respectively. Solstices seem also to be present in the ritual held in coastal sanctuaries of the Andalusian coast and in other early sanctuaries of the Iberian Culture. A change in the astronomical elements of the ritual seems to appear around the IV century BCE. Many Iberian sanctuaries dated at or after that century show equinoctial orientations and/or markers on topographic features of the horizon. Iberian cave-sanctuaries tend to be oriented westerly and some of them show orientations toward the sunset at equinox or solstices. Striking illumination phenomena have been found in some cases, they could have been used as elements in the ritual or even to recreate a perceptive experience of the divine among the Iberians.

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**KEYWORDS:** Archaeoastronomy, Protohistory, Iberian Peninsula, Iberians, Phoenicians, Punics, Sanctuaries

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## 1. ORIENTATIONS IN LATE PREHISTORY OF THE SOUTHEAST OF THE IBERIAN PENINSULA

The Iberian Peninsula is a territory rich in megalithic funerary monuments with a chronology that covers from the sixth to the second millennium BCE. There are precise measurements of the orientation of the corridors or symmetry axes of more than a thousand of such structures (see Hoskin, 2001; González-García, 2009) and most of them, especially in the southern and western areas, point systematically to a relatively restricted zone of the eastern horizon, indicating a non-random orientation pattern. One of the most convincing hypotheses is that the target of this custom is the rising or setting points of a given celestial body, perhaps the sun or moon throughout the year or in certain moments of special calendrical or ritual significance (e.g. Ruggles, 1999; Hoskin, 2001).

There are some recent findings that confirm the importance of the solstices in late Prehistory of the southern half of the Iberian Peninsula. In the Chalcolithic Andalusian caves of Cueva del Sol (Tarifa, Cádiz) and Cueva del Toril (Otívar, Jaén), Versaci Insúa et al. (2017) and Serrano Araque et al. (2018), respectively, have found striking correspondences between the sunlight spot projected just at the winter solstice sunset and relevant motives of the rock art depicted in the walls of the caves. Another example has been found in the impressive tumular funerary complex of Castillejo del Bonete, dated in 2465-1565 cal BCE (Benítez de Lugo et al., 2015). Esteban and Benítez de Lugo Enrich (2016a) found that, from the precise location of the main tumulus, the winter solstice sunrise occurs just over a conspicuous mountain with a curious squared profile. The monument has also some corridors oriented to the rising or setting points of the sun at solstices and equinoxes.

## 2. THE ORIENTALISING PERIOD. VENUS AND THE SOLSTITIAL SUN

During the Early Iron Age (first half of the first millennium BCE), Phoenician navigators and settlers come into contact with indigenous Bronze Age people of the southern half of the Iberian Peninsula, giving rise to the so-called Orientalising period. In the zone of Andalusia, this period was coincident with the development of the Tartessian Culture. The contact had a strong impact on the culture and ideology of the indigenous societies that perhaps also affected their astronomical knowledge and celestial conceptions. The astronomical aspects of the religious and funerary world during this period have been scarcely investigated to date.

Several studies point out that most of the tombs of the Phoenician archaic period in the Iberian Peninsula were arranged with their longitudinal axes close to the east-west line (Ramos Sainz, 1986) and even showing two well differentiated peaks, respectively related to sunrise in the winter solstice and equinoxes as in the cases of the coastal sites of Villaricos and Málaga (Belmonte, 1999; González-García et al., 2007). Fernández Valenzuela and Sánchez de Miguel (2012) and Esteban (2014) find also non-random distributions of orientations in necropolises of the Orientalising period in zones of the interior of Andalusia. Although one might be tempted to think that the orientation patterns of the tombs of the Orientalising period could be the product of the survival of the ancient indigenous customs mentioned in the previous section, archaeoastronomical studies indicate the existence of fairly similar orientation patterns in Phoenician and Punic necropolises of the western Mediterranean (see Belmonte et al., 1998; Ventura, 2000; Esteban, 2003; González García et al., 2007).

Escacena (2007, 2009) was the first researcher to explore astronomical relationships in Tartessian (or Phoenician) sanctuaries of the Guadalquivir valley, such as El Carambolo (Camas, Sevilla) and Coria del Río (Sevilla), both containing an altar shaped like a bull's hide, finding possible orientations towards the summer solstice sunrise that, according to this author, would be related to annual rites dedicated to the death and resurrection of the Semitic god Baal, divinity who had strong solar attributes (see Escacena, 2015). Esteban and Escacena (2013) carried out an archaeoastronomical study of several Tartessian-Phoenician sanctuaries in the Guadalquivir valley, finding that all of them show a major axis of symmetry in the line defined by the azimuth  $55^\circ/235^\circ$  which, to the east, could be related to the general direction of the summer solstice sunrise (as proposed previously by Escacena and assuming a symbolic orientation not a precise one) or, to the west - with higher precision - with the setting of the planet Venus at its southernmost position (most negative declination, about  $-26.5^\circ$ ). If the westerly orientations were the correct ones in these sanctuaries, this would indicate their possible dedication to the Phoenician goddess Astarte. Some ancient writers refer the existence of temples consecrated to Venus/Aphrodite on the coast of the Iberian Peninsula, sites that have traditionally been related to Astarte (Pérez López, 1998; Corzo, 2000).

Esteban and Escacena (2013) also studied the urban sanctuary (room IIIJ1) of the Iberian settlement of El Oral (San Fulgencio, Alicante) because it contains a bull's hide-shaped altar very

similar to those found in some earlier Tartessian sanctuaries. El Oral is dated in the first half of the V century BCE, one of the oldest Iberian settlements in southeast Spain. The major axis of the temple is aligned with the 55°/235° line, consistently with the pattern of the Phoenician-Tartessian cult buildings of the Guadalquivir valley. This finding suggests the survival of elements of the Venus/Astarte cult in an early Iberian coastal site, which is very close to other Phoenician settlements such as La Fonteta (Guardamar del Segura, Alicante), dated between the VII and VI centuries BCE.

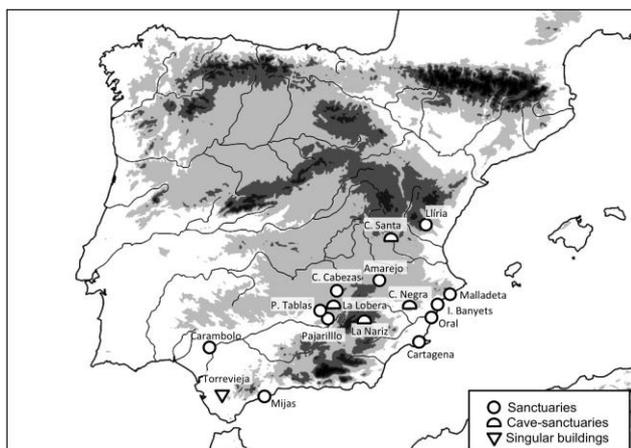


Figure 1. Map of the Iberian Peninsula with the location of some of the sites mentioned in the text.

Following the results of Esteban and Escacena (2013) for the Phoenician-Tartessian cult buildings, Esteban and Iborra Pellín (2016) made a compilation of orientations of different temples dedicated to Astarte (or a goddess assimilable to her) along the Mediterranean. These authors find that most of the temples - four out of six - follow an orientation pattern towards the rising of the sun or moon, although two of them, precisely that of Baalat Gebal of Byblos (Lebanon) and the so-called B temple of Pyrgi (Cerveteri, Italy), show westerly orientations related to the setting of Venus at its southernmost position, consistent with the aforementioned pattern of the Phoenician-Tartessian temples of the Guadalquivir valley. It is important to keep in mind that in the sanctuaries of El Carambolo, Coria del Río, Baalat Gebal and Pyrgi, is the west half of the horizon, which provides the clearest views of the diurnal path of celestial bodies close to the horizon.

There are several further results indicating that solstices could also be important elements in the ritual in areas of Phoenician and Punic influence in the southeast of the Iberian Peninsula. Apart from the possible orientations toward Venus setting, Esteban and Escacena (2013) also find that one of the chapels of the important Tartessian/Phoenician sanctuary of El Carambolo fits with the summer

solstice sunrise toward the east or the winter solstice sunset to the west. This could be interpreted as an indication of a possible double cult dedicated to the divine couple Baal/Astarte, where the god Baal would be related to the Sun and Astarte to Venus (Esteban and Escacena, 2013). Esteban (2017) reports about other sites dated in the Orientalising period that may have solstitial relations. These are the singular building located in the upper area of the settlement of Torrevieja (Villamartín, Cádiz) and the cult building of La Muela, in the important settlement of Cástulo (Linares, Jaén). In this context, it is interesting to highlight the recent evidences of the importance of solstitial orientations in ancient cult buildings of the Levant, homeland of the Phoenicians. Polcaro (2015) finds that the Temple of the Obelisks in Byblos, built in the Middle Bronze Age, around 1600 BCE, seems to be oriented in the direction of the solstitial line (summer solstice sunrise - winter solstice sunset). Another example of the Middle Bronze is the temple of Pella (1800-1450 BCE), in the Jordan Valley (Jordan), where Polcaro et al. (2013) found that the major axis and entrance of this building is facing the summer solstice sunrise. These authors also found archaeological evidences indicating that the temple of Pella was dedicated to the god Baal and that rituals related to the death and rebirth of this god would be celebrated there. This conclusion connects with the aforementioned proposal outlined by Escacena (2007; 2009) about the cults dedicated to Baal during the solstices in the Tartessian/Phoenician sanctuaries of the Guadalquivir valley.

Solstitial relations have also been found in religious buildings of the second half of the first millennium BCE, the so-called Iberian Iron Age, where the Greek and Punic influences were strong in the southeast of the Iberian Peninsula. The coastal temple B of Illeta dels Banyets (El Campello, Alicante) had its axis oriented along the solstitial line. A similar orientation shows the possible cult building of La Escuela (San Fulgencio, Alicante) very close to the aforementioned earlier Iberian site of El Oral (Esteban, 2002). An interesting case is the recently discovered sanctuary of Mijas (Málaga), where two bronze ex-votos were found with motifs that have been identified as "eyes of Astarte", which led the archaeologists to claim its Phoenician-Punic character. This cultic place is located in a spectacular viewpoint on the coast of Málaga, from which the summer solstice sunrise occurs just between two peaks of Sierra de Don Pedro, just over the highest zone of the eastern horizon.

These relations between solstices and mountains in the peninsular Phoenician-Punic colonial context could have an end-point in the planning of the city

of *Qart Hadasht* (Cartagena), the capital of the Punic territories in the Iberian Peninsula founded by the Barcid family at the end of the III century BCE and. González-García et al. (2015) find that, from Cerro del Molinete, the ancient acropolis or *arx Hasdrubalis*, would be aligned along the solstitial line with Cerro Sacro, a hill consecrated to the god Kronos/Baal Hammon. In fact, these authors confirm that, from the Punic/Roman sanctuary of Atargatis, in Cerro del Molinete, the summer solstice sunrise occurred on the northern slope of Cerro Sacro. These solstitial orientations were maintained and even emphasized in the urban layout of the Roman Cartago Nova (González-García et al., 2015). This orientation pattern towards the solstices in the areas of Punic influence of the Iberian Peninsula might have its origin in the Punic motherland. Esteban et al. (2001) found that one of the axes of symmetry of the urban layout of the Punic city of Cartaghe, the *decumanus maximus* of the Roman city as well as the foundations of the Roman constructions of the acropolis of the hill of Byrsa are oriented towards the solstitial line (winter solstice sunrise-summer solstice sunset). Moreover, Esteban (2003), from a compilation of orientations of Punic and Neopunic religious buildings of North Africa and Sicily, found that an important fraction of them point towards or very close to this solstitial line.

### 3. THE EQUINOX IN IBERIAN SANCTUARIES

Archaeoastronomical studies show that, in the Iberian Iron Age, there is a substantial change in the pattern of orientation of the cult places and their associated astronomical markers in relation to what is found in the first half of the first millennium BCE. The typology of the Iberian sanctuaries is very diverse, they consist in open-air deposits without any sign of construction, cult buildings or temples outside or inside settlements that can be isolated or forming part of the urban layout and a considerable number of caves-sanctuaries. Since the end of the 90s and in collaboration with archaeologists, I have carried out archaeoastronomical studies of sanctuaries throughout the Iberian territory. The description of the results obtained for each individual site can be found in Esteban (2002, 2013, 2015), Esteban and Benítez de Lugo Enrich (2016b), Esteban and Cortell Pérez (1997), Esteban and Moret (2006), Esteban and Ocharan Ibarra (2016), Esteban and Poveda Navarro (1997-1999), Esteban et al. (2014a y b) and Pérez Ballester and Borredá Mejías (2004). In the SEAC 2015 meeting in Rome, I presented a review of the main results related to the equinoctial orientations and markers found in Iberian sanctuaries (Esteban, 2016).

In the next paragraphs, I summarize the main results regarding this orientation custom.

The main characteristic of the Iberian sanctuaries related to the equinox is the presence of an equinoctial marker, i.e. the sunrise at or very close to that particular moment of the year occurs exactly on a topographic feature of the local horizon, usually the peak of a distant mountain. Three of these sanctuaries also contain a temple oriented to the equinox. Although we generically call them "equinoctial markers", most of the evidences indicate that the target of the orientations should be the temporal midpoint between solstices (hereinafter TMPS) also known as "megalitic equinox", introduced by Alexander Thom (1967). This corresponds to the day just in the middle between the exact dates of summer and winter solstices and occurs between one or two days after spring equinox or before the autumn equinox. The declination of the sun is between  $+0.3^\circ$  and  $+1^\circ$  (see Ruggles, 1997) in the moment of the sunrise closer to the TMPS. Therefore, the TMPS permits to divide the year in four equal parts that coincide with our seasons at intermediate latitudes, and seems to be an intuitive concept with more practical utility than the equinox. The analysis of the offerings of the ritual well of El Amarejo indicates that a) they were burned and distributed in apparently periodical layers of ashes inside the well, b) the most common vegetal offerings - acorns - show the degree of maturation typical of early autumn. Therefore, this independent clue suggests that the ritual in this Iberian sanctuary, was probably held at autumnal equinox.

In some places, the equinoctial markers are spectacular, as in El Amarejo (Esteban, 2002) or La Malladeta (Esteban and Espinosa Ruiz, 2018) but most of them lack of spectacularity, indicating that it should be better used as a practical tool for pinpointing the calendar and not for a public ritual. These have been found in Tossal de Sant Miquel (Llíria, Valencia; Esteban and Moret, 2006), La Carraposa (Rotglá i Corbera, Valencia; Pérez Ballester and Borredá Mejías, 2004), La Serreta (Alcoi, Alicante; Esteban and Cortell Pérez, 1997), Cueva Negra (Fortuna, Murcia; Esteban and Ocharan Ibarra, 2018), Cerro de las Cabezas (Valdepeñas, Ciudad Real; Esteban and Benítez de Lugo Enrich, 2016b) and Torreparedones (Morena López and Abril Hernández, 2013). On the other hand, at El Pajarillo (Huelma, Jaén, Esteban *et al.*, in preparation) and Cueva del Moro (Ayora, Valencia; Esteban and Ocharan Ibarra, 2018) the equinoctial markers are related to the sunset instead of sunrise. This fact may be related to the different character of these two sites with respect to the other Iberian

sanctuaries. El Pajarillo is interpreted as a rural *heroon* or a funerary monument and Cueva del Moro is a sanctuary in a rocky shelter (see next section about Iberian cave-sanctuaries).

The archaeological excavations at the equinoctial sites have provided some information about the rites carried out at the sanctuaries. For example, in Tossal de Sant Miquel and El Amarejo, there were wells plenty of burned ritual deposits. In La Malladeta, very close to the temple building, just at its east side, there was an open-air area plenty of ashes and dedicated to cremation rituals (Moratalla et al., 2014). In addition, the excavations have revealed an abnormal large number of lucernes at La Malladeta, indicating that nocturnal activities were common at the site (Espinosa and Marcos, 2014). We speculate that the lucernes might be used to illuminate gatherings held before dawn to witness the spectacular sunrise at the TMPS and/or perhaps to perform other night-time observations.

The archaeological findings at the sanctuaries showing equinoctial markers indicate that they were dedicated to a fertility goddess (see references in Esteban 2013). Festivities related to agricultural fertility were common in the ancient Mediterranean, such as those dedicated to the "resurrection" or *eger-sis* of Melkart that were held in Tyre (and perhaps also in Gades) or the Great Mysteries at Eleusis related to the Greek goddess Demeter. These mysteries represented the annual growth cycle through the myth of the descent and return of Kore from the underworld. A similar mythic narrative, where the protagonist is a possible hero-god of vegetation, is shown in the reliefs of the Iberian funerary monument of Pozo Moro, that have been interpreted as a representation of the Labours of Heracles (Moneo, 2003). The symbol of the natural cycle of death and resurrection might be inspired in the annual solar motion on the celestial sphere. The moments of death and descent of the divinity to the underworld and her subsequent rebirth or return to earth might be related to the autumnal and spring equinox, respectively. In a sanctuary located at one of the main gates of the Iberian settlement of Puente Tablas (Jaén), Pérez Gutiérrez et al. (2016) have found that, just at the equinox sunrise, the sunlight that enters through the gate illuminates a stele representing a female divinity. The presence of a cave in the interior of the sanctuary also indicates the relation of the divinity with the underworld.

The sanctuaries with equinoctial markers show a chronology in the interval from about mid IV until II century BCE (see Esteban 2013 for references). The absence of sanctuaries of this kind with earlier dating indicates a date *post quem* such rituals related to the equinox appeared in the Iberian world.

According to different authors, the beginning of the IV century BCE was a moment of consolidation of the aristocratic system and territorial expansion of the Iberian urban settlements, as well as the emergence of an ideological model based on the figure of a heroized ancestor (e.g. Rueda, 2011). The relation between these changes in the social organization and astronomical aspects of the ritual is an interesting field of future investigation.

#### 4. IBERIAN CAVE-SANCTUARIES AND THE SUNSET

Esteban et al. (2014a, b) conducted an archaeoastronomical study of the Iberian cave-sanctuary of La Lobera (Castellar, Jaén) in which they found that the innermost part of the cave, a kind of natural niche located at its eastern end, is illuminated just before sunset on dates around the equinoxes. The patch of sunlight that projects an opening in the western end of the cave fits the niche just on the day of the TMPS. Moreover, the shape of the patch in the last moments before the sunset recalls the profile of some *ex votos* from Castellar and other Iberian sanctuaries. This kind of figurines represents schematically the typical aristocratic female image of the Iberians, which has been sometimes assimilated with a representation of a divinity (Olmos 2000-2001; Rueda 2011). The resemblance is especially remarkable in the zones of the patch of light that can be interpreted as the head, headdress and the chest, essential parts of the archetypal representation of the Iberian woman as the *Dama de Elche*, the masterpiece of Iberian stone carving. This finding is very suggestive, because the window that gives shape to the patch of sunlight was very probably altered by the hand of man (Nicolini et al. 2004). At La Lobera, we could be facing the dramatization of a perceptive experience of the divine among the Iberians, an element that would greatly enhance the symbolic and sacred character of the cave (see discussion in Esteban et al., 2014a).

Esteban and Ocharan Ibarra (2016) report another suggestive illumination phenomenon at the Iberian cave-sanctuary of La Nariz, located in the Umbría de Salchite (Moratalla, Murcia). The excavations carried out by J. A. Ocharan Ibarra indicate that the sanctuary was in use between the III century BCE and I century CE, although there is some evidence of earlier use during the Bronze Age. This cave has a striking symmetrical morphology, with two parallel cavities with very similar proportions. It is hanging on the west side of the mountain known as Calar de la Cueva de la Capilla, in an area of rather difficult access. Both cavities have water springs inside and have carved basins to collect the water. Through

direct observations at the site, Esteban and Ocharan Ibarra (2016) found that, from the north cavity, in the winter solstice, just in the last minutes before sunset, a patch of sunlight illuminates the basin, fitting its shape and that of some carved drain canals radiating from the basin. Just for a few instants, the very last reddish sunrays of the day illuminate tangentially the surface of the water that fills the basin. The solar illumination of the innermost area of the cave is produced only around 15 days before and after the winter solstice.

A third Iberian cave-sanctuary with a clear astronomical orientation is Cueva Santa del Cabriel (Mira, Cuenca). Machause López et al. (2019) have reported that the 12m long access corridor of the cave is very precisely oriented to the local summer solstice sunset. As in the other sites of La Nariz and La Lobera, only the sunlight at the last minutes before sunset enters the cave. However, in this case, a reported alteration in the height of the corridor made after 1787 makes impossible to know how was the precise illumination pattern inside the cave in Iberian times. We will never know whether a phenomenon of coincidence between the patch of light and an structural element of the interior of the cave occurred in this cave.

Taking into account the striking archaeoastronomical results, all the three caves discussed above seem to be chosen as sanctuaries because of their natural orientation towards the sunset on singular dates (although different) of the solar calendar. In addition, the apparent alteration of certain structural elements of some of the caves in order to improve their fit with the patch of sunlight, indicates the will to dramatize the illumination phenomenon. The ritual - perhaps a hierophany - would have a certain public dimension, but directed to a small selected audience due to the modest size of the caves. The illumination phenomenon is especially evocative in the case of La Lobera, where the progressive appearance and subsequent disappearance of the image of the divinity might be recreated.

Most of the caves considered as Iberian cave-sanctuaries show a westerly orientation. This contrasts with the orientation pattern of the Iberian temples or open-air sanctuaries, which face predominantly to the east. Moreover, the astronomical markers associated with these kinds of cultic sites are in most cases located in the eastern part of the horizon, toward sunrise at singular moments of the solar calendar. This dichotomy between cave and open-air sanctuaries is probably associated with different characteristics of the cult carried out in both kinds of sites. The westerly orientation of cave-sanctuaries might be related to the chthonic charac-

ter of the rites carried out in them. However, in Iberian temples or open-air sanctuaries we would have an emphasis on cosmic aspects of the worship. This is a research field in Iberian religiosity that merits to be further explored.

## 5. CONCLUSIONS

In this paper, we present a compilation of archaeoastronomical results obtained for sanctuaries and temples built along the Iron Age (first millennium BCE) in the south and southeast of the Iberian Peninsula. Although we have conclusive data indicating that the megalithic funerary monuments (dated from the Neolithic and Bronze Age) of this geographical area could have orientations related to the sunrise (or moonrise), the first cultic buildings built by oriental colonizers or by orientalized indigenous peoples also seem to present certain orientation patterns. The Tartessian-Phoenician temples of the Guadalquivir valley of the first half of the first millennium (as well as some later cult buildings) could be oriented towards the setting of Venus in its extreme southern position, a feature that can be related to the cult to the Phoenician goddess Astarte. On the other hand, other sanctuaries located mainly in Andalusia that can be dated from the whole Iron Age, could be related to the sunrise or sunset at the solstices, indicating, perhaps, elements of the cult to the Phoenician/Punic god Baal. This orientation pattern could have its endpoint in the urban layout and the relative disposition of the temples of the capital of the Punic empire of the Iberian Peninsula, Qart Hadasht (Cartagena).

Apparently, from the end of the V century or the beginning of the IV BCE a new pattern appears in many Iberian sacred places: the orientation of the temples and/or the presence of markers on the local horizon related to the sunrise at a date close to the equinoxes, possibly the PMTS. This element suggests the existence of rites associated with seasonality, perhaps fertility festivities similar to other well-known ones of the ancient Mediterranean, such as the mythical cycle of the rape of Koré.

The Iberian cave-sanctuaries, although still little studied, seem to have strong astronomical implications in the sense of containing phenomena of illumination in singular dates of the solar calendar. Most of them are oriented towards the west, a characteristic that differentiates them from temples and open-air sanctuaries that show relations with the east and the sunrise. This would indicate different characteristics of the rite that would be carried out in both kinds of sites.

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