AGRICULTURAL RHYTHMS AND RITUALS: ANCIENT MAYA SOLAR OBSERVATION IN HINTERLAND BLUE CREEK, NORTHWESTERN BELIZE

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Agriculture in prehispanic Mesoamerica necessitated not only a wide range of knowledge regarding soil types, fertility, and the growing cycles of different plants, but also the attendant rituals that firmly situated agrarian production into a shared Mesoamerican worldview. Due primarily to archaeological visibility, those attendant rituals have traditionally been investigated within the context of large centers. Recent investigations at the site of Quincunx, a hinterland architectural complex in northwestern Belize of the Maya Lowlands, provide evidence that some rural communities may also have had access to and control over esoteric knowledge in agricultural practice in the Late Classic period. Our findings are discussed in the context of ethnographic accounts and archaeological data that reveal the deep significance of quincuncial designs in Maya society and Mesoamerican ritual practices.

La agricultura en Mesoamérica prehispánica no necesitaba solamente el conocimiento de los tipos de suelo, la fertilidad, y los ciclos de crecimiento, sino también los rituales acompañados que establecieron la producción agrícola en una cosmovisión común entre los mesoamericanos. Principalmente por su visibilidad en el registro arqueológico, las investigaciones sobre esos rituales se han restringido a los centros más grandes de los mayas. Investigaciones recientes del sitio de Quincunx, un complejo arquitectónico en el camino del noroeste de Belice, presentan evidencia que algunas comunidades rurales pudieran tener acceso y control sobre el conocimiento esotérico con respecto a la agricultura durante el período Clásico Tardío. Parece que era importante en varios niveles la ubicación y configuración única del complejo de Quincunx a los poblados circundantes. Su plano arquitectónico de cinco estructuras con énfasis en intercardinalidad imita las concepciones del cosmos que existen entre muchas comunidades actuales e históricas de los mayas. Se discuten nuestras conclusiones dentro del contexto de cuentos etnográficos y datos arqueológicos que revelan el significado profundo de los diseños quincunciales en la sociedad maya.

Successful, sustained agricultural production in prehispanic Mesoamerica necessitated a wide range of knowledge regarding soil types, fertility, regulation of moisture levels, and the growing cycles and requirements of many subsistence and economic crops. Yet, the component of ancient agricultural behavior that is probably least understood by archaeologists involves the attendant rituals that were deeply embedded in a worldview focused to a very large degree on the cosmos, marking the cyclical passage of time, and defining the role of living people in relation to the supernatural. Elements of agricultural ritual that stand out in particular in Mesoamerica include aspects of sacrifice and ritual performance related to fertility and water management (Joyce 2000; Monaghan 1990; Scarborough 1998; Schele and Freidel 1990; Vogt 1969), and the ability to track seasonal change through the movements of celestial bodies across the sky (Aveni 1981; Coe 1975; Freidel et al. 1993; Sprajc 2000).

In the absence of glyphic or iconographic evidence, indications of these behaviors can be difficult to detect. However, recent investigations at the Quincunx site, a Late Classic architectural complex in northwestern Belize (Figure 1), provides some evidence that rural farmers may have practiced rituals and conducted solar observations associated with hinterland agricultural production—that is, production removed from any site center and its immediate political and economic influence. The Quincunx architectural complex is situated approx-

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imately 2.5 km south-southwest of the Maya center of Blue Creek, in upland terrain within 500 m of the Rio Bravo escarpment. Unlike commonly encountered Maya residential patio and house groups, this complex consists of a central masonry room block and four low, broad, circular cobble platforms positioned in intercardinal directions (i.e., to the northwest, northeast, southeast, and southwest). Each of the outlying cobble platforms is located approximately 20 m from the central building, though they are not equidistant from each other, creating an asymmetrical layout (Figure 2). Survey during the 2001 and 2002 seasons demonstrated that this group is surrounded by light to moderately dense but generally small-scale settlement for at least 500 m in all directions (the limit of the surveyed area). In addition to these scattered residential remains, numerous terraces, berms, modified depressions, and other soil and water control features associated with hinterland agricultural production surround Quincunx; no administrative centers of any size or buildings that appear to have functioned in anything other than a residential capacity were located. Given its hinterland context among scattered small-scale residential remains and presumed agricultural landscape modifications, it seems unlikely that Quincunx was administered by anyone other than the occupants of this hinterland zone.

Research suggests that the site was designed and constructed to fulfill several intimately related purposes in the context of hinterland agrarian pro-
duction. These included monitoring movements of the sun across the sky throughout the year in accordance with a solar-based agricultural calendar, while also serving as a representation of the cosmos in miniature. Our multiple lines of supporting evidence derive from (1) Mesoamerican ethno- graphic and ethnohistoric accounts and, specifically, Maya ritual behavior associated with solar astronomy and agricultural production; (2) the peculiar, five-part (quincuncial) configuration of the site's architectural design; and (3) actual solar observations at the site during the summer solstice on June 21, evaluated in the context of architectural elements and features that appear to have marked sight lines denoting important events. The results of our investigations bear potentially significant implications for how archaeologists view the manner in which ancient belief systems were called upon to provide meaning not only for people's relationships with the supernatural, but also for their positions in society and for the administration of important celestial knowledge required for the timing of successful food production.

**Cosmological and Agricultural Significance of Quincunx Designs**

The architectural plan of Quincunx consists of five
parts, including the central building and four surrounding mounds. This plan is rather unusual in our experience and appears to be distinctly nonresidential; Maya house groups are commonly mapped either as individual structures or multiple associated buildings that cluster around a formal or informal patio area (see Ashmore 1981). Interpretation of the Quincunx plan comes from ethnographic accounts of the Maya cosmos, in which the universe consists of a center and four corners. Vogt (1993) describes the Zinacanteco practice of building houses and laying out agricultural fields mirroring the five-part structure of the cosmos. The four corners are supported by *vaxakmen*, or standard bearers, whose positions designate the center, which is also considered the navel. Vogt (1993:58) observes that “houses have corresponding corner posts and precisely determined centers; fields emphasize the same critical places, with cross shrines at their corners and centers.” The belief that all five elements need be present for the scheme to be complete is underscored by Hanks’s (1990) study among contemporary Yucatecan communities. Speakers make clear distinctions between cardinal directions, which are defined in reference to the ego or speaker positioned at the indexical center, and cardinal “places,” which are viewed as absolute entities existing somewhere over the horizon (Figure 3). The outer elements correspond with the four corners of the universe, while the center is analogous to a fifth cardinal place. Hanks (1990:299) notes that “in most socially significant spaces, including towns, homesteads, plazas, and traditional cornfields the four corners plus the center define the space as a whole.” While accounts differ within the larger Maya region as to where the corners of the universe are positioned, many communities view them to be in the intercardinal directions; examples have been found among the Tzotzil, Lacandón, and Quiché Maya (see Milbrath 1999).

Cardinal directionality embedded in Maya cosmic diagrams is also often associated with colors and symbolic aspects of fertility and famine, two potentially significant themes among agricultural communities. As with the importance of cardinal versus intercardinal direction, ethnographic accounts vary among communities in terms of which color is associated with which direction. For instance, as Milbrath (1999:17) summarizes, the Maya of San Andrés Larraínzárra associate north with white and the god of maize, south with red and the god of wind, east with white and the god of rain, and west with black and the god of death.

Figure 3. Different conceptualizations of cardinal directions and places based on accounts of referential practice from some contemporary Yucatecan communities (after Hanks 1990: Figures 7.1, 7.2).
(Holland 1964:16); in this case, the bearers of heaven are associated with the intercardinal directions. Similarly, accounts of the Tzotzil at Chenalhó relate north to the color white and children, south to the color yellow and maize, east to the color red and men, and west to the color black and women (Guiteras Holmes 1961:287). Importantly, Milbrath (1999:17) notes that three of these colors, black, red, and white, relate to famine or scarcity of maize, while the fourth, yellow, relates to the abundance of maize. Thus, cosmic diagrams are often tightly interwoven with concepts of fertility, abundance, and famine, all central themes in agrarian societies.

The links between cardinal direction, a quincuncial cosmos structure, and agricultural ritual are perhaps best illustrated by the Cha’a-chak ceremony, observed and described by David Freidel (Freidel et al. 1993) among the Yaxuná community in central Yucatán. Members of the community perform this ceremony to call upon the gods to bring rain during periods of drought or famine. On one occasion, the altar consisted of a table and four corners, and during the ceremony, four young men sat at each of the corners, imitating sounds of thunder. Upon the altar were offerings of bread, cooked meat, and wine. Freidel (Freidel et al. 1993:31) comments that the altar looked simple, no more than “a shaky table of poles held together with vines.” During the ceremony, however, it would become “the center of the cosmos” (Freidel et al. 1993:31). Through the table and four corners, the five parts of the cosmos were reproduced during this ceremony, with the specific intention of summoning rain for, among other things, agricultural production. Based on these accounts, re-creating a five-part cosmological scheme to ensure rainfall appears to be a theme of deep importance to agricultural communities across the Maya area.

Diagrams of a quincuncial cosmos also emphasize the daily movement of the sun from east to west, along with the seasonal, or solstitial, movement of the sun from north to south along the horizon. Some ethnographic narratives (e.g., Vogt 1997:111) conceive of the intercardinal positions not only as the corners of the universe, but also as the extreme horizon points of sunrise and sunset events on both winter (about December 21) and summer (about June 21) solstices. Milbrath (1999:19) comments that “an idealized diagram of the Maya cosmos traces out a quincunx of five points, with the four corner points linked to the solstices.” According to Vogt (1997), for Zinacantepec the point where the imaginary lines between (a) summer solstice sunrise and winter solstice sunset and (b) winter solstice sunrise and summer solstice sunset come together represents the navel of the universe, or mishik’ balam’il (Figure 4). The solstice positions of the sun are grounded in five-part diagrams of the Maya cosmos and represent the vaakmen or standard bearers upholding the corners of the universe as it was first created.

Besides marking solstice events, elements of quincunx symbolism pertaining to the passage of time are also of relevance for solar zenith events when the sun is vertical to the earth’s surface at the location of the observer. These events occur twice a year between the Tropics of Capricorn and Cancer, and while archaeological evidence remains scarce, they may have been noted prehistorically by the use of a gnomon (an upright marker) that casts no noon shadow on the days of the zenith (Milbrath 1999:13). Alternative methods of marking zeniths could have involved vertical shafts or subterranean chultuns in which no light was cast on the sidewalls as the sun passed directly overhead (e.g., Aveni and Linsley 1972). Precise determination of zenith passages, however, is complicated, due to, among other things, the difficulty of establishing the vertical direction for particular measuring devices (Aveni et al. 2003:175). Specific dates for these events depend on latitude; the farther north one travels, the closer the first zenith falls to the June solstice, while more time elapses between the first zenith event and the June solstice as one moves south. The significance of the zeniths and solstices to agricultural cycles varies both with latitude and with local terrain and elevation. Some regions within the larger Maya area, such as highland Chiapas, are well suited for March planting, while farmers at lower elevations might wait until May to plant their first maize crop (see Milbrath 1999:14). In southern Mesoamerica, the first zenith passage (between late April and early May) signals the onset of the rainy season, while the second is linked to rains beginning in early August, following the canícula or brief dry season that often occurs near the end of July (Milbrath 1999:13). Tedlock (1992:173) notes that annual zenith passages are used in Momostenango to determine dates for sowing and harvesting crops. Of importance, recent
research regarding E-group complexes in the Maya region suggests that a solar zenith-based calendar most likely grew in importance during the Early Classic period after a Late Preclassic emphasis on the passage of the solstices (Aveni et al. 2003).

These four solar events, two zenith passages and two solstices, are all significant for planting and harvesting first crops and, in some cases, second crops, and also for field preparation involving weeding, cutting, and burning. Indeed, the first solar zenith passage in lowland southern Mesoamerica may hold the greatest significance for agricultural communities, signaling the onset of the rainy season in early May (Aveni et al. 2003:162). By tracking any of these events from one year to the next it is possible to maintain a count of 365 days. Depending on when the zenith occurs, spans of time closer to 260 days can also be tracked with fair precision. These numbers (260 and 365) correspond to the two cycles of time known as the 365-day Haab or Vague Year and the Tzolkin or 260-day Sacred Almanac that articulate to form the 52-year Calendar Round. Along with the Long Count, these two cycles were the primary means of tracking time in the precolumbian era (see Sharer 1994:560–564), and a number of buildings across Mesoamerica were designed to keep a count of days (see Aveni 1981, 2001; Aveni et al. 1975; Coe 1975; Milbrath 1999; Sprajc 1995, 2000, 2001). One example can be found at Xochicalco, where the sun shines into a cavern near the site center for a total of 105 days, remaining outside for the other 260, which consequently marks periods of 13 and 20 days (Sprajc 2001:267). Similar multiples were tracked at Teotihuacan by watching sunrise events along building alignments, as well as from architecture to noteworthy points along the horizon, such as the nearby prominent peak of Cerro Colorado. Though these dates do not always correspond to solstices or zeniths, together they would have allowed Teotihuacanos to maintain what Sprajc (2000:404) calls an observational calendar, allowing people to know in advance as important moments of the agricultural cycle were approaching (Sprajc 2000:413).

Because the specific dates of zenith events vary across the Maya region, and also because of local constraints on agricultural production due to temperature variation by elevation, it is impossible to draw sweeping generalizations about how ancient Maya farmers might have integrated observations of these annual moments into their agricultural tasks. Aveni and Hartung (1986) have noted latitudinal variation in the orientations of significant Maya buildings and city plans that appears to correspond with the different azimuths for sighting or record-
ing important celestial events between the northern and southern extremes of the Maya area. Milbrath (1999:15–17) also summarizes the postcontact variety of local festivals and their schedules that are kept in different communities so as to coincide with the zeniths and nadirs, solstices, and the agricultural cycle, a point that should also serve as a caution to archaeologists seeking to understand prehispanic agricultural organization. However, based on ethnographic accounts, it is clear that people timed most, if not all, farming activities around these events. It is reasonable to suggest that the ability to note the passage of these moments would also have constituted a significant component of ancient agricultural practice, be it through precise measurement arising through structural alignments, significant points on the horizon, and use of shadows, or through ceremonial observance of such events in ritually charged contexts that relate to the cosmos, rainfall, fertility, and the passage of the sun at significant moments in the solar calendar.

Deep History of the Quincunx

While we understand much of the symbolism and meaning of quincunx planning through these ethnographic accounts, ethnohistoric and archaeological data reveal the antiquity of this idea in Mesoamerica and also its central role in the expression of indigenous worldviews. Notably for archaeologists, as Mathews and Garber (2004) have discussed, these worldviews are expressed at an extraordinarily wide range of scales, signifying their pervasiveness throughout society. Contact-period documents describe the quincunxial layout of regional political realms, with capitol at the center and important outlying secondary centers at cardinal places (Marcus 1993). Other researchers (e.g., Ashmore 1991; Ashmore and Sabloff 2002; Coggins 1980; Houk 1996; Wagner 2000) have described the plans of plazas and site centers as expressing elements of cardinality and directional planning throughout the Classic period. An excellent example comes from La Milpa, where Late to Terminal Classic city planners constructed outlying monumental components almost exactly 3.5 km in cardinal directions from Temple 1 in the main plaza (Tourtellot et al. 2000). Smaller scale examples of quadripartite planning can be found in single buildings, carved on monuments, or in the arrangements of artifacts in caches, and even on individual artifacts. For instance, quadripartite pecked crosses were found to hold calendrical significance at both the Early Classic centers of Teotihuacan and Uaxactún, marking the intervals between equinox and zenith passages, or between equinox and solstice events (Aveni et al. 2003:170–171). Elsewhere, spindle whorls recovered from the Blue Creek area in northwestern Belize show quadripartite incising that, together with the center hole for the spindle, re-create the basic quincunxial design of the cosmos (Figure 5).

One striking example of such a plan is the Castillo at Chichén Itzá (Marquina 1951: Figure 261). Four radial staircases appear to divide this building into quadrants, though when viewed from above, these stairs converge at the superstructure atop the large pyramidal platform and form a well-defined five-part plan. In this case, as with other motifs identified as quadripartite, we see the primary emphasis as not on the quadrants of the Castillo, but rather on the five points in space linked by the stairs. This building is also well known for marking the sunset events on the spring and autumn equinoxes, when the sun casts a jagged shadow across the stepped pyramid onto the staircase balustrade with enormous carved stone serpent heads at the plaza level, to form the image of a great snake descending from the top of the building (see Aveni 2001; Milbrath 1999:66). It is noteworthy that each of the four staircases has 91 steps that, when added to the top platform, represent the 365 days of the solar year (Milbrath 1999:66), making the Castillo perhaps the largest calendar device in the Maya area. Additionally, the orientation of the summit temple of the Castillo suggests its relationship to both the solar zenith (May 25, July 20) and to the solar nadir or lowest position of the sun (November 22, January 21) at the latitude of Chichén Itzá (Milbrath 1999:66–68).

A number of important building alignments and ties between architecture and cardinality are also noted at Tikal (Aveni and Hartung 1988; Coggins 1980). In particular, Coggins (1980) has argued that the twin-pyramid groups represent the east-west movement of the sun across the sky. As with the Castillo, the meaning embedded in these arrangements reveals intimate associations between cardinality and the passage of time and the seasons, mirroring many of the ethnographic accounts.
described above. Nine-doorway buildings symbolize the underworld and line the south edge of the twin pyramid complex, while stela clusters venerate ancestors and the heavens and define the north edge. As the sun traverses the plaza, north and south elements conceptualize the zenith and nadir rather than the cardinal directions “north” and “south” (Coggins 1980).

Elsewhere, Bricker’s (1983) analyses of directional glyphs in Maya codices and inscriptions provide phonetic interpretations of “north and south” as “zenith and nadir,” while Tedlock (1992: 175–176) summarizes additional glyphic support from the site of Rio Azul for reading “north” as zenith and “south” as nadir. There, directional glyphs are found painted in their appropriate cardinal and intercardinal places around the Tomb 12 chamber (see Adams 1999: Figure 3–15). Tedlock (1992: 174) argues that north and south glyphs refer to the moon and Venus at moments of opposition, above and below the horizon (zenith and nadir), as these celestial bodies were never visible together during the interment date (March 6, 502) suggested for the tomb. This renders the reading of these glyphs not simply as “north” and “south” but as somewhat more complex directional indicators “up” and “down” (also see Ashmore 1991; Bricker 1983).

As expressed in monumental architecture and in certain elite mortuary contexts, strong associations appear between east and west as defining the sun’s rise and set, especially during key events such as solstices, and of north and south as defining moments and elements of opposition seen in the zenith and nadir, up and down, and the heavens and the underworld. These associations make it clear

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Figure 5. Spindle whorls from the Blue Creek area of northwestern Belize, showing incised quincuncial motifs. Drawn by Candida Lonsdale.
that ancient Maya concepts of cardinal direction were embedded with far more meaning than simply defining spatial boundaries; they were also laden with complex and subtle beliefs involving different aspects of symmetry and opposition, what Vogt (1993:12) refers to as binary oppositions. When considered in light of ethnographic accounts, the elaborate prehispanic integration of cardinality, opposition, seasonality, the passage of time, and the movements of celestial bodies provided powerful instruments for conveying notions of wholeness, completion, the cyclical nature of time and creation, and of fertility and renewal, all significant themes that pervaded more than strictly agricultural or strictly ritual aspects of daily Maya life. Moreover, it is clear that the ancient Maya were highly flexible in terms of how an idea could be expressed or in the number of ideas expressed in one venue, such as Tikal’s twin-pyramid groups or the Castillo at Chichén Itzá.

The Quincunx Group, Hinterland Northwestern Belize

The Quincunx group was identified at the western base of a low hill during reconnaissance of a field that had been cleared for cattle grazing. Upon first discovery, the site was considered noteworthy because of its unusual five-part design. Because of the historical significance of quincunxial designs in Maya beliefs about the cosmos and for marking important moments during the solar year, initial hypotheses were that it might have served in a symbolic capacity for nearby households, perhaps conveying concepts such as re-creation of the cosmos, and serving as the locus of supra-household ceremonies relating to fertility, rain, and famine, and even the annual motion of the sun. In particular, we considered that the sunrise event of the summer solstice (during which we were present) might be defined by architectural alignments.

To test these hypotheses, investigations included broad horizontal exposures necessary for documenting potential sightlines (defined by building corners and doorways or from outlying mounds to the central structure) that may have marked important astronomical events. Excavations also were designed to record patterned artifact deposits indicating the kinds of activities that might have taken place. While no such patterned deposits were immediately evident, it is possible that they could have been disturbed by modern land clearing and cattle grazing. Through vertical excavations we recorded stratigraphy and gained an understanding of chronology.

Investigations and Observations at the Quincunx Group

Even though the land had been cleared with heavy machinery, causing damage to the site, during two excavation seasons we documented the basic construction techniques and plans of the five buildings. The central structure, Structure 1, was well built of cut limestone blocks and mortar and was finished with a fine coat of plaster; it measures approximately 11 by 7 m and is oriented 87 degrees east of true north. Structure 1 contains large north, south, and east rooms, and a relatively minor room at the northwest corner that is accessed through a small opening or passage from the north chamber. The central rooms of this building are entered from two entrances: a relatively wide doorway provides entry to the south room, and a considerably narrower doorway provides entry to the east room. An east-west spinal wall separates the south room from the north room, which is accessed from the southern room through a wide internal doorway (see Figure 2).

In contrast to Structure 1, the outlying mounds proved to be low, open, circular cobble platforms without standing masonry. Three of these, the northwest, northeast, and southeast, had been disturbed to varying degrees by land clearing, though segments of intact architecture encountered at each allowed us to reconstruct their original form to some degree. The southwest mound was the best preserved, appearing virtually intact. Horizontal exposures revealed circular alignments of faced stones set within the cobble platforms. The platforms measured approximately 9 m across, while each faced alignment measured approximately 5 m across (Figure 6). The intact condition of the southwest mound proved significant, as we documented an abnormally large stone remaining in situ and set into the platform’s north edge.

During the 2001 field season, an important relationship between Structures 1 and 2 was observed at sunrise on the June solstice, when a person’s shadow was cast from approximately the south doorway of the central building to the northern edge of the southwest mound (Figure 7). In 2002,
Figure 6. Looking south at the southwest mound, Structure 2, after complete horizontal exposure. Note the large stone remaining in situ at the north edge of the platform.

Figure 7. Photographer's shadow cast from Structure 1 over northern edge of Structure 2 at sunrise on the summer solstice, June 21, 2001. This alignment falls across the large stone visible at the north edge of the platform in Figure 6. Arrow points to large stone at northern edge of platform; photographer's shadow is emphasized with dashed white line.
excavations of Structure 1 and 2 and additional observations defined this alignment more precisely. Our excavations completely exposed the south room of Structure 1 and uncovered well-preserved architectural features, including a bench at the west end of the room (see Figure 2) and a posthole approximately 25 cm in diameter just inside and to the east of the south doorway (Figure 8). It is unlikely that the posthole held a roof support beam, as no similar features were uncovered elsewhere in the structure. On the morning of the June solstice, as viewed from the large stone in Structure 2, the sun was observed to rise over a stadia rod placed in this hole; this alignment mimics the less-precise observation made in 2001. We suggest that the hole supported a vertical beam that, even if only 3 m high, would have cast a shadow across the large stone in the southwest platform as the sun appeared over the eastern horizon.

While this relationship was noted through direct observation, subsequent excavation further confirmed that the location and layout of the five structures, and particularly the positions of the posthole and the large stone in Structure 2, were important components of the Quincunx group for monitoring (minimally) the sunrise event on the summer solstice. Excavations of Structure 1 yielded stratigraphic evidence of at least five construction episodes (Figure 9) that all appear to date between approximately A.D. 650 and 750, based on ceramic information (Laura Kosakowsky, personal communication, 2002). While the posthole was most clearly visible in the uppermost plaster floor, the sequence of floors in profile suggests that the posthole did not merely intrude into the latest construction phase; rather, its location was defined and maintained through successive floors as the building was remodeled.

The construction history of Structure 1 began with placement of the earliest ballast on top of undulating bedrock, under Floor 1 (Figure 10). Subsequent builders then cut through these initial layers in a limited area that coincides with the position of the posthole visible on the uppermost floor of the sequence, before depositing a layer of gravel-size sub-floor fill and the second plaster floor. Floor 2 was almost black, presumably from burning that occurred in this portion of the building. Floor 2 was re-plastered without intervening ballast or fill; remodeling consisted only of resurfacing and the addition of perhaps a bench or step. The next construction event was a truncation of the step or bench and an intrusion into the first two floors in a fairly circumscribed area, again near the final posthole,
Figure 9. North profile (left) and photo (right) of excavation into Structure 1 showing five episodes of construction and remodeling.

Figure 10. Excavation plan (left) and photo (right) of 1-x-2-m unit around the posthole visible in Figure 8. Each successive intrusion and remodeling episode marks the posthole's final location, suggesting that it was deemed significant through the entire construction history of the building. Floors 4 and 5, shown in Figure 8, were completely excavated when this plan was drawn and so are not visible. Both views are facing south.
and with this excavation was marked by large stones (Figure 10). This phase also includes a deposit of medium-size ballast and a yellowish-colored sediment, possibly for leveling, followed by a thin layer of plaster (Floor 4). The last construction phase consisted of the addition of small gravel ballast and a final plastering episode. The posthole was left as an opening approximately 20 to 25 cm in diameter through the uppermost plaster surface. The fact that this location was marked in some manner at each successive phase suggests that it was significant throughout the history of the building, even while rapid changes and modifications took place.

In addition to the posthole’s location, patterns of construction fill in the outlying platforms suggest that their specific positions were also important in the overall design of Quincunx. Fixing their precise locations in relation to each other and the central structure took precedence over labor efficiency in determining the group’s overall layout. Excavation of the southwest mound revealed a circular alignment perhaps from an earlier construction phase (Figure 11), and also shallow bedrock beneath approximately 30 cm of construction fill. Conversely, excavations in the southeast mound encountered bedrock under fill at a depth close to 80 cm, considerably deeper than that underlying the southwest and northeast mounds. Bedrock was not encountered under the northwest mound, although excavations were conducted to a depth of nearly 1 m. Because these outer cobble platforms were positioned without regard for a convenient depth of bedrock, which would have greatly facilitated their construction, we suggest that their placement was determined by factors other than the natural terrain. In other words, the southeast mound appears to have been purposefully built in a predetermined location, even though nearly 80 cm of construction fill were required to level its surface, while other mounds were within 30 cm of bedrock. By extension, the location of the southwest mound (and northwest and northeast mounds) also may have been important irrespective of the depth of bedrock.

Although the role of the chultun to the east of Structure 1 remains uncertain, it may have been used to help monitor the passage of the solar zeniths. It is directly aligned with the south wall of Structure 1, approximately 20 m to the east. Many chultuns across the Maya area served to capture and store water, but the topographic position of this chultun in the middle of a gentle slope is not advantageous for capturing water. Furthermore, its interior walls display no evidence of plastering or sealing for such purposes. It is conceivable that, as with the proposed zenith sighting tubes at Xochicalco and Monte Albán, the sun’s rays shined into or upon a portion of this chamber for certain lengths of time involving multiples of 13 or 20. Though such an interpretation is hypothetical, excavations revealed modifications that included a low “lip” dividing the primary chamber from a second one extending south. This other chamber could have provided a vantage point for monitoring the sun’s passage (Figure 12).

Discussion and Conclusions

Clearly, a number of themes are bundled together into larger Mesoamerican belief systems about the cosmos and the importance of monitoring celestial events such as the solstices and solar zeniths, both of which are significant moments for the scheduling and ceremonial observation of local agricultural calendars. Particular themes were emphasized in some instances while other themes appear to have been more important on other occasions. However, each instance shares common elements including the division of horizontal space into five parts representing the four corners of the universe (signified by solstice sunrise and sunset positions) and the universal navel, and the passage of various cycles of time throughout a 365-day solar year. A challenge for archaeologists concerned with the expression of these ideas in ancient communities as a reflection of social standing is to understand how such elaborate symbolism was represented from one context to another. It is evident that some quinuncial expressions (such as the Castillo) were designed to monitor precisely the passage of time while also representing miniature versions of the cosmos. Others, such as Tomb 12 at Río Azul (Adams 1999), highlighted the role of paramount individuals in uniting creation and serving as the pivot around which the universe revolved. At yet other sites such as Teotihuacan, architectural investments were made more specifically to monitor sunrise events in accordance with an agricultural cycle that revolved around seasonal changes in a solar
year (Sprajc 2000). Whether or not the intent of such architectural complexes included precise measurement of the sun and other celestial bodies at particular moments in the solar year, it seems clear that observance of these events and ceremonial participation surrounding them were important associated elements (for a discussion of scientific vs. ceremonial observatories, see Aveni et al. 2003:172).

Such contextual differences among the many examples of Maya quincuncial design or in the calendrical principles embodied in Mesoamerican architecture are critical for helping archaeologists to better understand the accessibility of ideas and information across ancient society. Webster (2002:79), for example, places management of “calendars that emphasize recurrent cycles, including a linear passage of a 260-day ritual calendar and a 365-day solar calendar” within the elite-focused Mesoamerican “Great Tradition.” The Late Preclassic Structure 5C-second at Cerros exhibits one of the most elaborate early depictions of themes of cardinality and the cyclical passage of the sun, in support of this assessment. It is a pyramid decorated with images of the rising Morningstar and setting Eveningstar (both names for Venus) and the sun rising in the east and setting in the west (Schele and Freidel 1990:Figure 3:6). Here, early rulers mirrored the east-to-west path of the sun and Venus in their own counterclockwise ritual movements.
Figure 12. Profiles of chultun located to the east of Structure 1, showing modified chamber extending to the south of the opening, from which it might have been possible to monitor the sun’s passage around the solar zeniths.

through the inner chambers of the superstructure on top of the pyramid (Schele and Freidel 1990:111). During this same period, caches that evidenced quincuncial concepts expressed in jade, Spondylus shell, and other exotic materials also were being deposited (Freidel et al. 2002).

Nearly all instances of celestial observation recorded across Mesoamerica have been associated with monumental architecture, often viewed by scholars as another component of the “Great Tradition” (e.g., Trigger 1991). Among the variety of ways in which the 260- and 365-day Mesoamerican calendars was expressed are the E-Group architectural plan, recognized early on at Uaxactún and nearby sites (Aveni et al. 2003; Ruppert 1940); the calendrically proportioned measurements (including metric ratios of 260 and 365) from Monte Albán’s Building J to its two main ballcourts (Peeler and Winter 1995) as well as from the Zapotec Barrio to the Temple of Feathered Serpent and Pyramid of the Moon at Teotihuacan (Sugiyama 1993); and the Castillo at Chichén Itzá, discussed above.
To further complicate these bundled beliefs, many architectural symbols were embedded with other elements of Maya or Mesoamerican cosmology, or integrated seamlessly with the surrounding terrain (e.g., Aveni et al. 1988; Iwaniszewski 1994) such that built and natural environments became but elements of a larger landscape.

However, the identification of some elements in this elaborate belief system in caches, artifacts, and architectural plans that are associated with Maya commoners (e.g., Lohse 2002; Robin 2002) suggests that distinctions between elites and non-elites based on access to this information were not so great (e.g., Mathews and Garber 2004:18). Additionally, the known time depth of quincuncial designs pushes this practice back to the very formative beginnings of complex society, and many of the earliest examples are found in communal or daily domestic contexts rather than elite ones. One of the earliest documented examples of this plan from the Maya area is Cache 7 at Seibal, a cruciform-shaped deposit uncovered in the center of the Main Plaza and dating to around 900 B.C. (Smith 1982). At Blackman Eddy in the Belize River Valley, excavators recovered early Middle Preclassic (Kanocha phase) pottery associated with radiocarbon dates of ca. 1200 to 850 B.C. and with incised cruciform designs that could also represent the quincuncial motif we describe here (Garber et al. 2002).³ Elsewhere in Mesoamerica, the longevity of these concepts is indicated by excavations at Household C3 in San José Magote, Oaxaca. There, Marcus (1999) describes painted pits, with colors corresponding to cardinal places, which might have been used in divining ceremonies between 1700 and 1400 B.C. Finds such as these establish the origins of this elaborate belief system prior to the development of pronounced social differentiation among local communities. They also demonstrate the widespread accessibility of such concepts to nearly all spectra of society.

When symbolic representations of the cosmos are combined with celestial observations, questions of control and application of important knowledge in ancient societies become even more complex. In this context, our work at the Quincunx group represents another example of precolumbian efforts to re-create the cosmos, together with its deep directional, seasonal, and astronomical significance, through architectural constructions, though this may be the first example of such an arrangement employing architecture documented well outside a monumental center. The location and unique configuration of the Quincunx group appear to have served the surrounding hinterland populations on multiple levels. Its five components emphasizing intercardinality emulate conceptualizations of the cosmos that permeate many later Maya communities; this plan also embodies ethnographic Maya beliefs and rituals involving rainfall, agricultural production, fertility, and observance of solstice and/or zenith passages in the solar year. Quincunxes can be observed at a multitude of scales, both in modern society and in the prehispanic past, ranging from individual artifacts to political regions. We suggest that it was the basic principle upon which nearly all expressions of space, both sacred and mundane, were founded.

Based on these beliefs, and because of its considerable distance from any site center representing immediate oversight by urban elites, we argue that the Quincunx architectural plan was the result of a hinterland communal effort to re-create the cosmos through architecture and ceremonial space. Additionally, it served the purpose of monitoring and ceremonially observing at least the passage of the June solstice event and perhaps also the solar zeniths. These three events are known to be significant moments of the 365-day solar year and in some communities are also used to track the 260-day sacred almanac. These multiple lines of evidence suggest that the hinterland Maya in this part of northwestern Belize tended to at least some of their own needs concerning ritual expression; these rituals followed the same seasonal and annual rhythms that continue to integrate communities and shape agrarian production across much of Mesoamerica. With these elements of the agricultural cycle satisfied, Late Classic Maya farmers at Quincunx would have been free to engage in food production within the framework of a worldview shared by other members of society, a worldview that focused at once on the heavens and earth and all that surrounds them.

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References Cited

Adams, Richard E. W.

Ashmore, Wendy

Ashmore, Wendy, and Jeremy A. Sabloff

Aveni, Anthony F.
2001 *Skywatchers*. University of Texas Press, Austin.
Aveni, Anthony F., Edward E. Calnek, and Horst Hartung

Aveni, Anthony F., Anne S. Dowd, and Benjamin Vining

Aveni, Anthony F., Sharon L. Gibbs, and Horst Hartung

Aveni, Anthony F., and Horst Hartung

Aveni, Anthony F., and Robert M. Linsley

Bricker, Victoria B.

Closs, Michael P.

Coe, Michael D.

Coggs, Clemency
1980 *The Shape of Time: Some Political Implications of a Four-Part Figure*. *American Antiquity* 45:727–739.

Freidel, David A., Kathryn Reese-Taylor, and David Moramar

Freidel, David, Linda Schele, and Joy Parker

Garber, James F., M. Kathryn Brown, and Christopher J. Hartman

Gutiérrez Holmes, Calixta

Hanks, William F.

Holland, William

Houk, Brett A.
1996 *The Archaeology of Site Planning: An Example from the Maya Site of Dos Hombres, Belize*. Unpublished Ph.D. dissertation, Department of Anthropology, University of Texas, Austin.

Iwaniszewski, Stanisław

Joyce, Arthur A.

Lohse, Jon C.

Marcus, Joyce
1999 *Men’s and Women’s Ritual in Formative Oaxaca*. In

Marquita, Ignacio
1951 Arquitectura prehispánica. Instituto Nacional de Antropología e Historia, México, D.F.

Mathews, Jennifer P., and James F. Garber

Milbrath, Susan

Monaghan, John

Peeler, Damon E., and Marcus Winter

Robin, Cynthia

Ruppert, Karl

Scarborough, Vernon L.

Schele, Linda, and David Freidel

Sharer, Robert J.

Smith, A. Ledyard

Sprajc, Ivan


2001 Orientaciones astronómicas en la arquitectura prehispánica del centro de México. Serie Arqueología, Instituto Nacional de Antropología e Historia, Mexico D.F.

Sugiyama, Saburo

Tedlock, Barbara

Tourtellot, Gair, Marc Wolf, Francisco Estrada-Belli, and Norman Hammond
2000 Discovery of Two Predicted Ancient Maya Sites in Belize. Antiquity 74:481–482.

Trigger, Bruce G.

Vogt, Evon Z.


Wagner, Elizabeth

Webster, David
2002 The Fall of the Ancient Maya. Thames and Hudson, London.

Notes

1. Michael Closs (1988) offers a different, phonetic interpretation for these glyphs, specifically the one found on the chamber’s north wall, which he reads as xa-ma-n(a), Yucatec for xaman, or north. He concludes that the Maya indeed had terms for north and south, and that these concepts were not merely glossed as “up” and “down” or “zenith” and “nadir.”

2. It is possible that the southeast, northeast, and northwest mounds were also positioned to observe solar events such as sunrise or sunset on solstice days, either by sightlines with elements of Structure 1 (such as corners or doorways) or with other mounds. However, the area has been disturbed by modern activities to the point that precise locational fixtures, such as the large stone documented in Structure 2, could not be detected. While the positions of these mounds appear close to the appropriate locations for suspected solar alignments, the limited spatial extent of the group, together with the currently uneven and restricted visibility of the horizon, preclude an accurate assessment from our mapped data.

3. James Garber, M. Kathryn Brown, and Christopher Hartman (2002), in their report to the Foundation for the Advancement of Mesoamerican Studies, Inc., interpret these motifs as quadripartite and not quincunical. It is possible that variations in this motif may convey important differences in terms of symbolically expressed views of the cosmos, universe, or of themes of renewal and completion.

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