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Cenotes as conceptual boundary markers at the ancient Maya site of T'isil, Quintana Roo, Mexico

Scott L. Fedick, Jennifer P. Mathews, and Kathryn Sorensen

Ancient Maya communities, from small village sites to urban centers, have long posed problems to archaeologists in attempting to define the boundaries or limits of settlement. These ancient communities tend to be relatively dispersed, with settlement densities dropping toward the periphery, but lacking any clear boundary. At a limited number of sites, the Maya constructed walled enclosures or earthworks, which scholars have generally interpreted as defensive projects, often hastily built to protect the central districts of larger administrative centers during times of warfare (e.g., Demarest et al. 1997; Inomata 1997; Kurjack and Andrews 1976; Puleston and Callender 1967; Webster 2000; Webster et al. 2007). As another response to conflict in the southern lowlands, small villages or hamlets are reported to have been established on defensive hilltop locations and surrounded by palisades (Demarest et al. 1997; O'Mansky and Dunning 2004). At some walled sites, walls may have served more to define "gated communities" in the modern sense of the phrase; a boundary that separates an elite community from the more common folk living just outside of the walls.

Another line of research explores the possibility of identifying symbolic, conceptual, or cosmological aspects of boundary maintenance and spatial order expressed by the ancient Maya. Ethnographic studies have established that the Maya concept of world order includes a horizontal division of the world with four corners pivoting around a central point, or axis mundi. Each corner of the universe is associated with a cardinal direction (Gossen 1974; Hanks 1990; Sosa 1985). For the Maya, this basic quincunx conceptual pattern of organization applies not only to the structure of the earth, but to nested scales of spatial organization expressed from the placement of offerings at an altar, to the boundary of an agricultural field, and up through the cosmos. In physical expression, the referential points of the quincunx are often fixed by features of the natural environment, and are therefore conceptual cardinal places rather than strictly cardinal directions and precise geometric forms (Hanks 1990:299–302). Conversely, characteristics of the natural world could be conceptually corrected by human action, as in the case where Maya farmers planted coral trees at the four corners of new *milpas* (agricultural fields) to make up for the fact that the land was hilly and fields could not be laid on in precisely square plots (Wisdom 1940:40; see also Redfield 1941:120).

It has been suggested that this quincunx pattern and quadripartite division is represented in the ancient Maya built environment and organization of space at scales ranging from caches (Estrada-Belli 2006; McAnany 1995:104) and individual buildings (Coggin 1980), to the spatial organization of ceremonial centers (Ashmore 1991), communities (Maca 2006; Tourtellot et al. 2000, 2002), and regional political organization (Marcus 1976; Mathews and Garber 2004). Our recent mapping at the site of T'isil, in the Yalahau region of northern Quintana Roo, Mexico (Figures 1 and 2), has revealed what may be a quincunx pattern of *cenotes* (sink holes)

at the site, forming a center and four corners of a conceptually centered and bounded community.

The Quincunx Pattern of Maya Communities

At the level of the community, Michael Coe (1965) has summarized the ethnographic and ethnohistoric sources that describe a quadripartite organization for Maya towns, and suggested this model might apply to ancient Maya sites as well. For example, Robert Redfield and Alfonso Villa-Rojas (1934) describe this layout at Chan Kom, where roads leading to the village from cardinal directions were marked with crosses placed at the four corners, marking not only the quadripartite division of the community, but also marking the boundaries of the village as well. Many other ethnographic examples describe the four symbolic entrances to a community being marked by piles of stones, with trails leading to the center of the community where temples or shrines are located. Other ethnohistoric studies of quadripartite organization of Maya communities illustrate how the cardinal, as well as the intercardinal, directions are used as organizing principals (e.g., Garcia-Zambrano 1994). In the Northern Maya Lowlands, numerous ethnographic accounts describe the symbolic center of communities as *cenotes* or caves, which in Maya belief represent entrances to the underworld and conduits of communication with the ancestors (see Vogt and Stuart 2005). Chan Kom is a well-known ethnographic example of such a *cenote*-centered community (Redfield and Villa Rojas 1934). In the relatively featureless plain of the Northern Maya Lowlands, *cenotes* and caves are also described in ethnographic and ethnohistoric accounts as marking the boundaries of communities or territories (e.g., Roys 1957).

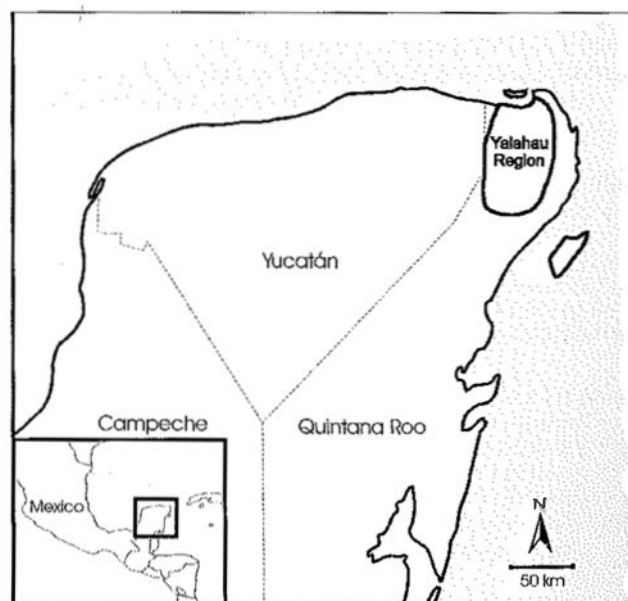


Fig. 1. Location of the Yalahau region in northern Quintana Roo, Mexico.

The Site of T'isil

The site of T'isil was first identified in 1993 by Scott Fedick as part of an initial reconnaissance conducted during the first year of the Yalahau Regional Human Ecology Project (Fedick and Mathews 2005). When the site of T'isil was first discovered, knowledge of it was limited to the remains of residential foundations that were visible in several cleared agricultural fields and pastures on the property known as Rancho Santa Maria. In 1997, the new owner of Rancho Santa Maria, Mr. Michael Baker, invited Yalahau project members to visit the site and to provide guidance on protecting the ruins while he was planning for development at the ranch. With funding provided by Mr. Baker (and other sources), mapping and surface collection at the site began in 1998 within an east-west line of abandoned fields that were being cleared of dense secondary growth. Initial reconnaissance found the largest structures at the site to be clustered adjacent to a seasonally flooded *cenote* (Fig. 3), within which grew a profusion of vanilla orchids (*Vanilla* sp. Mill.). We named the site, and the *cenote*, "T'isil", the Yucatec Mayan term for vanilla. It is traditional for many historic Maya communities of the northern lowlands to be named after the *cenote* that often marks the center of town. Project members conducted mapping, surface collection, and test excavations at the site sporadically over the next several years. The emerging picture was of an ancient community covering about 237 ha, lacking impressive monumental architecture, but proving to be one of the most densely occupied sites in the Maya Lowlands. Cross-dating of ceramics recovered at T'isil indicate that the site was initially occupied sometime during the Middle Preclassic period (ca. 700 B.C.–200 B.C.). During a time that has been referred to as the Terminal Preclassic for the northern lowlands (ca. 75 B.C. to A.D. 400; following Glover and Stanton 2010) it grew into

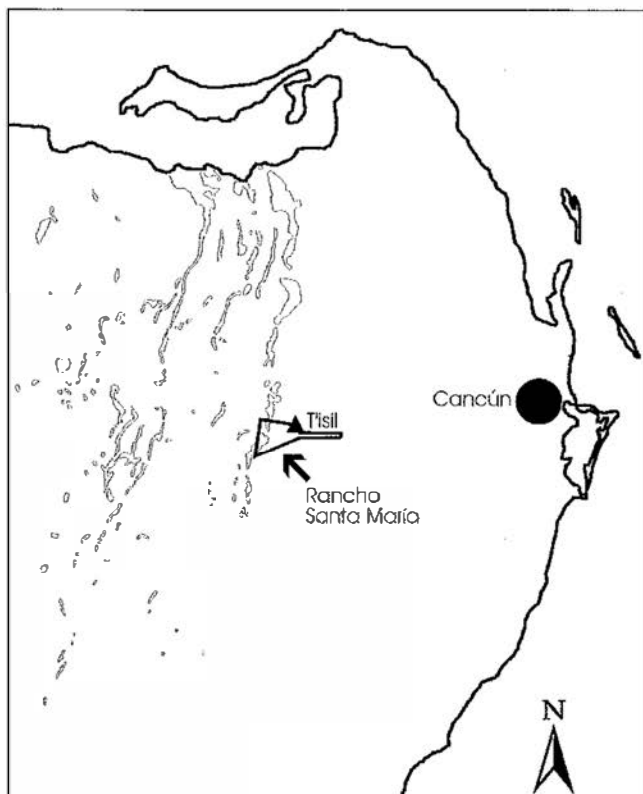


Fig. 2. Location of T'isil and Rancho Santa Maria in northern Quintana Roo, Mexico.

a community of perhaps more than 6,000 inhabitants, and was largely abandoned by about A. D. 400. There is little evidence of occupation at the site again until the Postclassic, when it was reoccupied beginning about A.D. 1250. Occupation lasted perhaps as late as the seventeenth century, although no artifacts of European origin have been recovered.

We had assumed since our earliest reconnaissance at the site that Cenote T'isil was at or near the geographic center of the ancient community. Cenote T'isil (Fig. 3) is a seasonally flooded *cenote*, about 45 m X 40 m in diameter, and with a 3 m drop from the surrounding ground surface to the bottom of the sinkhole. Most of the largest ancient structures at the site are clustered relatively close to Cenote T'isil. This caused us to be interested in looking at the internal structure of the community to see if there was evidence to suggest that the quadripartite model (or other organizational models) might be expressed at the site (Fedick and Mathews 2005; Sorensen 2010). We did not expect to find features physically marking the corners of a quadripartite settlement, but rather, four-part divisions in the settlement distribution, marked perhaps by open spaces or cardinally-oriented roads, or quadruple sets of distinctive structures divided among four zones of the community. However, as we continued our mapping process, we began to realize the significance that *cenotes* may have played in this ancient community.

Cenotes and Bedrock Cavities

From early reconnaissance at the site, we had known of three other *cenotes* in addition to Cenote T'isil. Located 890 m northwest of Cenote T'isil, a deep-water *cenote*, referred to by the landowners as the "Swimming Cenote" (Fig. 5), has modern improvements constructed around it to facilitate swimming and leisure activities. The Swimming Cenote is 17.9 m x 13 m in diameter, has a drop of about 4 m from the ground surface to the water and is about 12 m deep.

A short distance northwest of the Swimming Cenote, and 1130 m northwest of Cenote T'isil, is a large, seasonally-flooded *cenote* referred to by the landowners as the "Battlefield Cenote" (Fig. 5). It is so named because of the numerous historic/modern semi-circular rock-wall features that surround the *cenote* and appear to be defensive features. The Battlefield Cenote is 62 m X 50 m in diameter, with a drop of 3 m from the surrounding ground surface to the interior floor. The Battlefield Cenote is filled with a deep deposit of



Fig. 3. Cenote T'isil. The southern edge of the *cenote* is visible in the foreground.



Fig. 4. Mapping the artificial *cenote* in the southwest of T'isil.



Fig. 6. Field crew after discovery of the Northeast Cenote.

organic-rich soil and has a distinctive vegetation association dominated by annona trees (*Annona glabra* L.).

Another large, seasonally-flooded *cenote* is situated 1200 m southeast of Cenote T'isil, which project members identified during reconnaissance of the Rancho Santa Maria property line. At the time of its discovery, it was not known how the location of the *cenote* related spatially to the site of T'isil. The *cenote* is 84 m X 55 m in diameter, and drops about 3 m from ground surface to the interior floor. We refer to this *cenote* simply as the "Southeast Cenote" (Fig. 5).

In addition to these three large *cenotes*, we recorded two other features that provide access to the water table. The first is a bedrock cavity (designated feature 12S-CN-1) located at about 560 m east of Cenote T'isil (Fig. 5). The mouth of the cavity is about 2.5 m x 1.5 m in diameter, and leads into a rough and broken limestone interior, with a shaft that widens slightly near the bottom. It is likely that this feature represents an excavated well, or natural cavity that has been enlarged to facilitate easy

access. The broken, angular appearance of the shaft wall is similar to excavated wells recorded elsewhere in the Yalahau

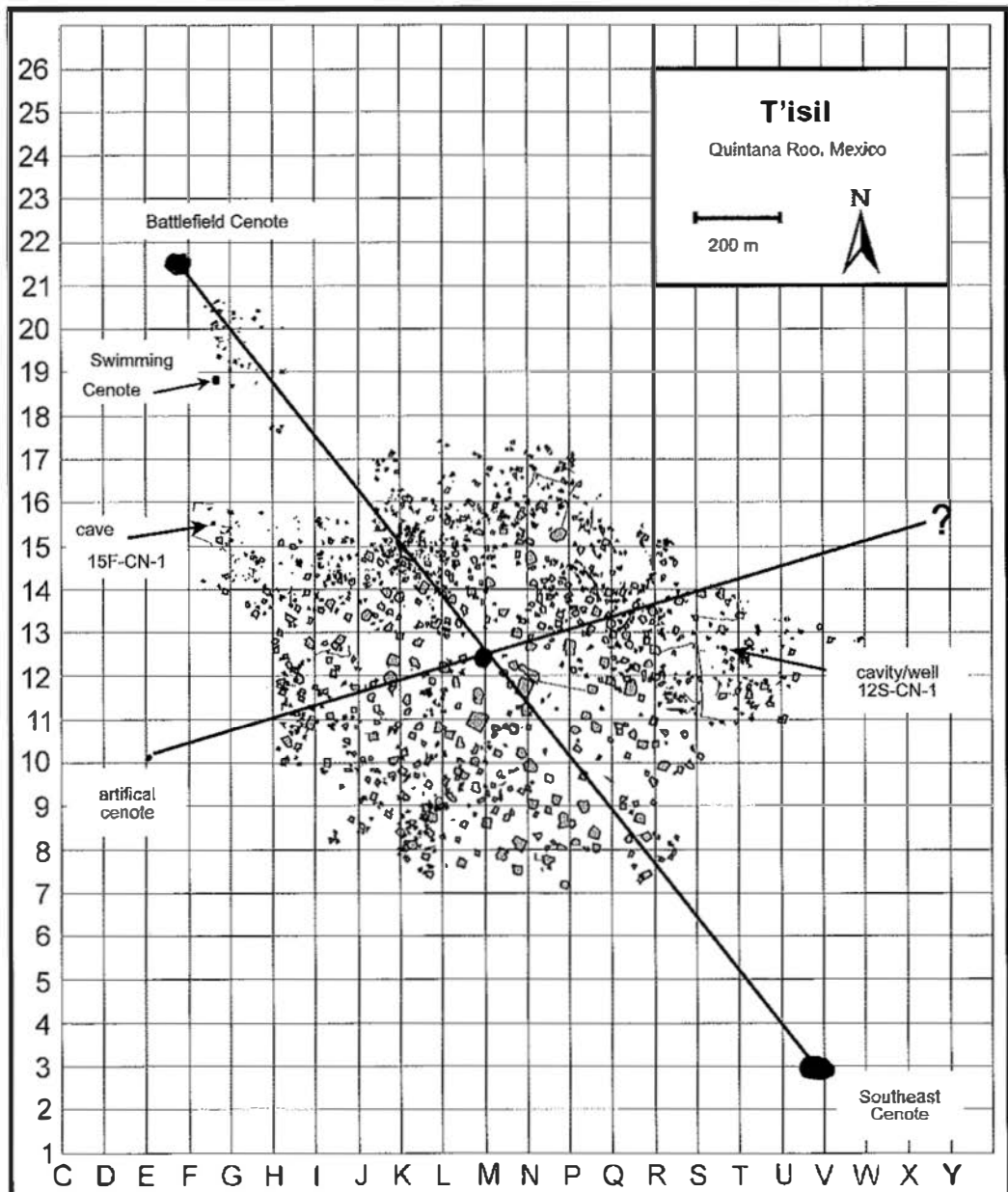


Fig. 5. Map of T'isil at the end of the 2005 field season. Cenote T'isil is at the intersection of the two lines. One line connects the Battlefield Cenote and the Southeast Cenote. A second line is projected from the artificial *cenote*, through Cenote T'isil, and out through the unmapped area to the northeast.

region (Winzler and Fedick 1995). This cavity reaches the water table, even during the dry season, and has been used by ranch employees as a drinking-water source, accessed by an improvised wooden ladder.

The other feature that provides access to the water table is a small cave, designated feature 15F-CN-1, located about 700 m northwest of Cenote T'isil (Fig. 5). The cave mouth, about 1.5 m in diameter, faces west and is situated on the lower edge of a very slight escarpment that likely represents a karst collapse feature on the west side. The entryway drops down to the east and meets the water table about 2 m into the cavern, providing access to a small underground pool. The roof of the cavern, which has many small stalactites, meets the water line about 6 meters to the east. We have not yet investigated the depth of the water, nor the distance that the cavern may continue to the east, below the surface of the water. The slop-

ing entrance to the cave appears to have been filled with small limestone rubble to form a more even access ramp. A scatter of old cans and bottles in the entryway indicate it has been used in recent times as a water source.

A Pattern Begins to Emerge

As mapping at T'isil progressed in 2005, we noticed some interesting attributes concerning the boundary of the site. Settlement density at T'isil seemed to drop off sharply, as opposed to most other lowland Maya sites, where boundaries are diffuse and difficult to define. Additionally, reconnaissance survey lines and formal mapping indicated that ancient settlement extended to near, but not beyond, both the Battlefield Cenote in the northwest, and the Southeast Cenote. During the 2005 season, we mapped an interesting feature that appears to be an excavated pit located outside of the southwest margin of

ancient settlement (Fig. 4). The pit is 11.6 m x 13.8 m in diameter at the surface, and reaches a maximum depth of 4 m, with a stepped funnel-like shape that constricts with depth. The pit reaches below the rainy-season water table, and numerous modern bottles and cans scattered around the opening indicate that it has been used as a water source in recent times. A small semi-circle of rubble lies around the opening, likely stemming from a past cleaning of the pit (there is not enough rubble to account for all of the excavated material). The mouth and walls of the pit are rough and broken, and do not exhibit the smoothly-eroded bedrock that is typical of natural sinkholes. The funnel-like pit also lacks the straight vertical walls and wide

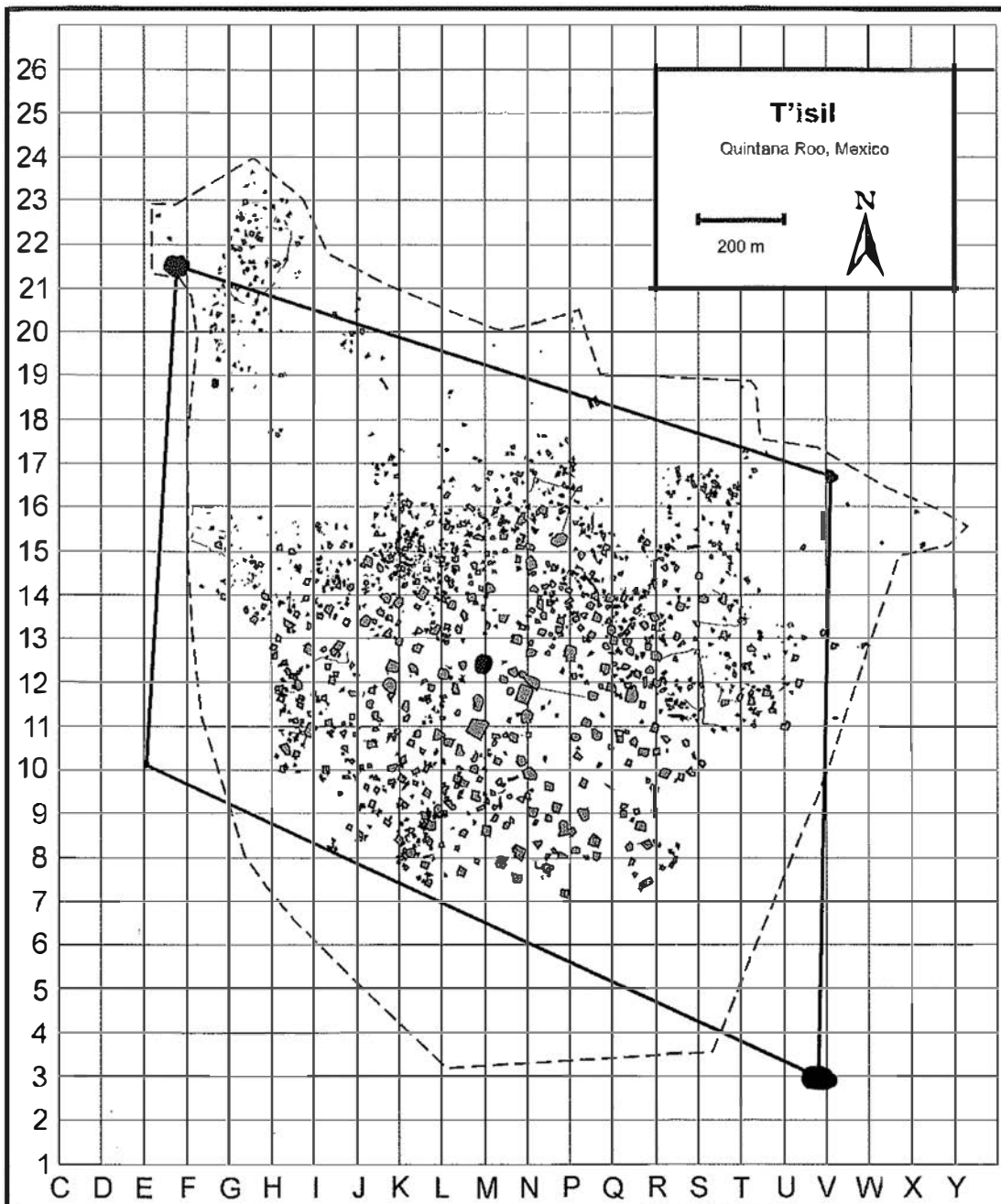


Fig. 7. Map of T'isil as of 2007 with estimated settlement boundary (dashed line) and lines projected between cenotes. Note that the southern-most area of the site has not yet been formally mapped, and the settlement boundary in that area is estimated from survey transects.

bases of the ancient wells that are common in the region (Winzler and Fedick 1995). The location of the pit away from any architecture, and the high ratio of depth to circumference, suggests that the pit does not represent an ancient quarry. For lack of a better functional designation, we refer to the pit as an artificial *cenote* (Fig. 5).

After inputting the data from the 2005 season into the computerized mapping program (Fig. 5), we noted an interesting pattern. Not only did Cenote T'isil fall almost exactly at the midpoint between the Battlefield Cenote and the Southeast Cenote, but the extent of ancient settlement appeared to be bounded by these natural *cenotes* to the northwest and southeast, as well as by the artificial *cenote* in the southwest. Ancient settlement at T'isil may have conformed to a conceptual quincunx with *cenotes*, both natural and constructed, defining the boundaries. Construction of an artificial *cenote* as a landmark in a sacred landscape would not be unexpected or unique. There are numerous examples from the Maya area and elsewhere in Mesoamerica of artificial caves being constructed and incorporated into sacred landscapes (see Prufer and Kindon 2005). Did another *cenote*, either natural or artificial, mark the northeast corner of a quincunx at T'isil? At the time, we had not yet systematically mapped the extent of settlement in the northeast, however, extending a line from the artificial *cenote* through Cenote T'isil and out to the northeast might predict the location of such a boundary marker (Fig. 5).

Completing the Quincunx at T'isil

During the 2007 field season we completed mapping in the north of T'isil, with systematic mapping extending well beyond the limits of settlement. (We have not yet been able to complete mapping in the southern end of the site due to thick regrowth following a major wildfire of 2006). On June 8, 2007 a survey crew reported finding a *cenote* in the northeast area (Fig. 6). This *cenote* is 33 m x 27 m in diameter, with a depth from ground surface to the seasonally flooded floor of about 3 m. The northeast *cenote* is located 903 m from Cenote T'isil. When plotted on the map, this new *cenote* fell very close to the line extending from the artificial *cenote* through Cenote T'isil, and to the northeast. This new *cenote* completed a quincunx (Fig. 7), and is likely to have been used by the ancient Maya to determine the location for the artificial *cenote*, in a process opposite of what we had used to predict the location of the northeast *cenote*.

It is interesting to note that the only deep-water *cenote* within the site, the Swimming Cenote, was not used as the center-point for the ancient community, even though it offered the most reliable water supply. We suggest that Cenote T'isil was selected as the center because it provided an axis point for the three large, natural *cenotes* that surround it, and, with the addition of the artificial *cenote* in the southwest, formed a quincunx.

We recognize that the settlement pattern at T'isil is not a precise fit to an ideal quincunx pattern. There are some structures that fall just outside of the proposed quincunx, and the geometry of the pattern is not precise. Similarly, we can not conclusively say that the generally-fitting pattern we are calling attention to represents an intentional effort by the Maya to plan their community in conformance with a cosmological template (see Smith 2005). However, considering

the excavation of an artificial landscape feature that appears to complete the conceptual pattern, it does seem to be a plausible hypothesis.

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RESUMEN: El antiguo sitio maya de T’isil ha sido mapeado por el Proyecto Regional Yalahau de Ecología Humana durante varias temporadas de trabajo de campo. Un hallazgo inesperado del proyecto ha sido la evidencia de planificación de la comunidad en base a un modelo conceptual de tresbolillo (quincunx). El patrón de tresbolillo consiste en cenotes (pozos naturales) que marcan un punto central y tres esquinas, con una cuarta esquina definida por un hoyo excavado que parece imitar a un cenote. Si bien se han identificado principios de planificación de sitios en los principales centros cívico-ceremoniales mayas del período clásico, la disposición de tresbolillo de T’isil es un ejemplo de los principios de planificación de sitios aplicados en una comunidad relativamente pequeña por lo menos desde el período Preclásico Terminal.

ZUSAMMENFASSUNG: Die antike Maya-Stätte von T’isil wurde durch das Yalahau Regional Human Ecology Project im Verlauf mehrerer Feldkampagnen kartiert. Ein unerwartetes Ergebnis der Kartierung bestand in der Erkenntnis, dass der Planung des Ortes ein so genanntes Quincunx-Konzept zugrunde zu liegen scheint. Das Quincunx-Muster in T’isil wird von einem zentralen Cenote gebildet, um den herum drei weitere Cenotes sowie eine künstlich angelegte Grube ein symmetrisches Muster bilden – wobei die Grube an ihrer Stelle fehlenden natürlichen Cenote nachzuahmen scheint. Während in den größeren Maya-Zentren der Klassik häufig Kriterien der Raumplanung identifiziert wurden, ist das Quincunx-Layout von T’isil ein Beispiel für die Raumplanung einer kleineren Gemeinschaft dar, die mindestens bis auf die Späte Präklassik zurückgeht.

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