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Special Section: Recent Research on Iron Ore Mirrors in Mesoamerica and Central America

Mirrors and reflective objects at Kaminaljuyu

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Abstract

Slate disks have been reported from various excavations in the Maya Highlands. These artifacts have typically been described as supports or backings for iron-ore and pyrite mirrors. A number of these objects have been recovered in context at Kaminaljuyu, Guatemala. Whenever objects with reflective surfaces are identified in the field, they tend to be interpreted as mirrors, but they may have been worn as insignia on clothing. Recent finds at Kaminaljuyu, such as special deposits associated with Ballcourt B, suggest the use of reflective objects as part of the ballgame player's paraphernalia. The ballgame was an important ritual practice at Kaminaljuyu, as exemplified by the 13 ballcourts reported at the site. Archaeological evidence for this new interpretation will be presented, as well as a review of other examples excavated throughout the highlands, as part of an exploration of the exchange networks connected to regional trade in these exotic goods.

Resumen

Varias excavaciones arqueológicas en sitios del altiplano maya han reportado la presencia de discos de pizarra, algunas veces con una cara de pirita. Estos han sido descritos como la base de espejos de pirita o algún otro mineral de hierro. Algunos de estos discos se encontraron en las excavaciones de los Montículos A y B de Kaminaljuyu. Generalmente, estos objetos se identifican en el campo como espejos; sin embargo, es posible que los mismos hayan sido utilizados cosidos a trajes e interpretados como insignias. Hallazgos recientes en excavaciones de Kaminaljuyu incluyen depósitos especiales asociados a la cancha de juego de pelota B del sitio, sugiriendo que los discos de pizarra fueron objetos reflejantes utilizados como parte de la parafernalia del juego de pelota. Este trabajo presenta información sobre estos recientes hallazgos, así como una discusión de otros ejemplos excavados en varios sitios del altiplano que formaron parte de una red de intercambio de estos bienes exóticos de la región.

Introduction

Kaminaljuyu is located in the central Maya Highlands of Guatemala, buried beneath modern Guatemala City. The site has a history of occupation tied to the now extinct Lake Miraflores. Its strategic location and access to resources such as obsidian, jade, and cacao allowed Kaminaljuyu to become a critical site for developments in the broader Maya area. Its uninterrupted occupation, beginning around 1000 B.C. and continuing until A.D. 900, underscores its relevance in Mesoamerican prehistory. Kaminaljuyu's occupation witnessed cycles of rise and fall, linked to larger developments occurring in greater Mesoamerica. Perhaps the key occupation at the site occurred during the Preclassic, around 800 B.C., when large pyramids were built amid plazas and courts attesting to the wealth and importance of this ancient site. By 600 B.C., Lake Miraflores was part of a large-scale hydraulic system, used to distribute water to agricultural fields in the southern section of the site (Popenoe de Hatch 1997) and to the site center, creating aquatic landscapes that surrounded the most important buildings (Arroyo and Henderson 2020). Kaminaljuyu's population increased dramatically towards 200 B.C., impacting the water resource of Lake Miraflores. By A.D. 150, several problems arose, including overpopulation, a regional drought, and other events, which caused the first decline at the site. Despite these crises, the Kaminaljuyu emerged again in A.D. 350, signaled by a vigorous building program. Around A.D. 400, construction of Mexican-style talud-tablero structures appear at the Acropolis, Palangana, and Mounds A and B, the latter containing rich tombs with Teotihuacan-style offerings, suggesting the presence of a foreign enclave or elite alliances (Braswell 2003). Around A.D. 600, most talud-tablero buildings were defaced and renovated, integrating stone slabs and river cobbles in some of their new surfaces. Kaminaljuyu was finally abandoned around A.D. 900 (Arroyo et al. 2020; Inomata et al. 2014). Despite its original size and relevance in the Maya area and southeastern Mesoamerica, present-day Guatemala City has obscured the site's long and critical history.

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Figure 1. Map of Kaminaljuyu showing the location of sections mentioned in the text that include mirror or reflective objects. Map by the author.

The tombs discovered in Mounds A and B of Kaminaljuyu (Figure 1) were systematically excavated during the 1940s and contained abundant finds (Kidder et al. 1946). Some tombs had offerings of slate disks with pyrite surfaces, suggesting the use of mirrors or objects with reflective functions. Only a few reports document the presence of such

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artifacts beyond these tomb contexts (Velásquez 2006). Recent excavations just northeast of Ballcourt B by Arroyo and colleagues of the Zona Arqueológica Kaminaljuyu (ZAK) Project discovered a number of slate disks, some with pyrite remains, suggesting their use as offerings with human remains excavated in an earthen platform located only 40 m east of Ballcourt B (Arroyo and Ajú 2023). Here follows a summary of the objects with reflective surfaces or mirrors found at Kaminaljuyu, along with an interpretation of their function, and a comparison of such objects found at other sites in the Maya Highlands, with the goal of understanding the potential distribution network of these objects. The ballgame, and its associated performance rituals, is critical to understanding the possible uses of reflective surfaces.

Mirrors in the Maya area

Mirrors were vital objects for the ancient Maya, used as ornaments of dress, cosmetic accessories, and instruments of divination (Miller and Taube 1993:114). In Maya art, mirrors are hand-held, mounted on stands, or paraded by dwarves before elite individuals. Hieroglyphic decipherments relate to their central function as scrying instruments. Mirrors have been interpreted as portals connecting the multiple layers of the Maya world, allowing for communication with the gods, and serving as channels through which the ancestors entered man's reality (Taube 2016:304). These were and are seemingly widespread ideas, as Huichol ethnographic studies in northern Mexico document that shamans used mirrors to gaze into their transcendental realm (Negrín 1975:19). The bright elements of reflective surfaces and other shiny elements, such as water reflection, were considered windows or passageways to the soul and to the gods (Taube 2016:306).

Mirrors or reflective objects are common in archaeological contexts in the Maya Highlands, including the sites of Guaytan (Smith and Kidder 1943), Kixpek (Mason 1927), Kaminaljuyu (Kidder et al. 1946), La Lagunita (Ichon and Viel 1984), Nebaj (Smith and Kidder 1951), Quen Santo and Zacualpa (Wauchope 1975), Zaculeu (Woodbury and Trik 1953), and, less frequently, at Lowland Maya sites, like Peru-Waka' (Freidel et al. 2013), Río Azul (Adams 1999), Piedras Negras (Scherer 2015), and Tikal (Laporte 1989). The greater occurrence of these objects in the highlands may reflect easier access to the original sources of slate and pyrite for inhabitants in this region, which in turn led to this area becoming a manufacturing center. Mirrors and reflective objects were unique items sought by Maya Lowland elite groups for special ceremonies that served to transport individuals through sacred realms (Taube 2016).

Kaminaljuyu and reflective objects

Contemporary mirrors are defined by the Merriam-Webster (2021) dictionary as a reflective surface or anything that gives a true image of a person or thing. In ancient Maya times, mirrors consisted of mosaic surfaces of polished iron-ore fragments adhering to a solid backing of wood, ceramic, or, most commonly, stone (Blainey 2007:2). Reflected images were viewed as profound and mirrors were used as divinatory or magical portals to communicate between parallel dimensions, worlds, or realities, including gods and ancestors, but they were also notable as wearable objects in costumes (Gallaga 2016:4; Taube 1992:171). Prehispanic reflective objects or mirrors at Kaminaljuyu were used in a variety of roles.

The reflective surface of Mesoamerican mirrors was made of hematite, mica, obsidian, or pyrite (Gallaga 2016:4; Taube 1992:170). These materials may have been attractive for the shine and reflective surface of these objects, not only to reflect the image of an individual. They were likely used as insignia, objects for special rituals, and/or to travel throughout a number of realms.

The oldest examples of pyrite-incrusted plaques were recovered in Tomb II of Mound E-III-3 at Kaminaljuyu (Figure 1), dating to the Late Preclassic (Shook and Kidder 1952). Here, fragments of two or possibly three backings, made from sherds, held rectangular pieces of pyrite. The pyrite elements had deteriorated and only a small fragment measuring 3.0 × 3.5 cm was recovered. These pyrite elements were square, in contrast to later polygonal examples recovered in plaques from tomb offerings in Mounds A and B at the site. Another example of pyrite was recovered from the roof of Tomb I, with a sherd backing containing traces of yellow adhesive and crusty yellow elements resulting from the disintegration of the pyrite (Shook and Kidder 1952:116). Contemporary to Mounds A and B mirrors at Kaminaljuyu, Teotihuacan has a significant number of these artifacts, including iconographic representations of them in murals and ceramics, highlighting their pertinence as instruments of dress and divination (Taube 1992:171).

Excavations carried out by Estrada (Arroyo et al. 2012) at the southwest corner of the Palangana (Figure 1), the sunken court located within the Parque Arqueológico Kaminaljuyu, uncovered a large fragmented mica slab, with a burial linked to a ritual event that took place at the end of the Preclassic period (Figure 2). This slab, measuring 15 × 15 cm, was placed as an offering in the burial

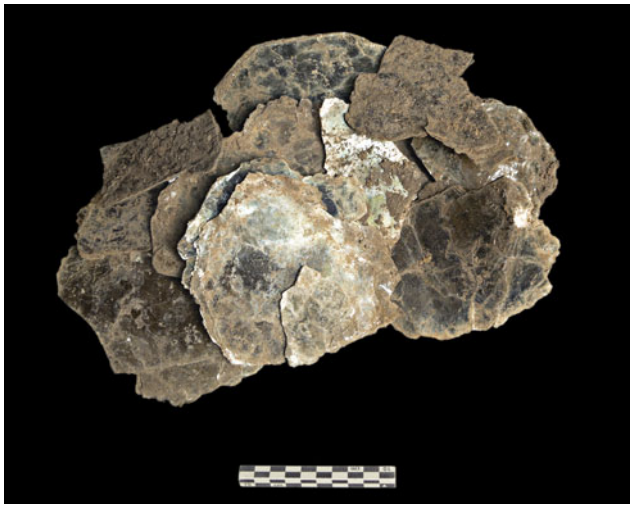


Figure 2. Fragmented mica slab recovered at the southwest corner of La Palangana, Kaminaljuyu, Guatemala. Photograph by Tojin Benito (ZAK).

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of a child whose leg was mutilated. It was a brilliant object, which probably had a wooden support or other perishable material that decomposed over time. Its large size suggests that it was some sort of mirror or reflective object.

Excavations by Kidder and colleagues (1946) of tombs in Mounds A and B recovered what were interpreted as mirrors, including 35 stone discs measuring 7.5–25.0 cm in diameter and 0.5 cm thick, which were located on top of and surrounding the skeletal remains. One surface of each disk was covered with a mosaic of polygonal plates or pyrite agglomerates, while the other was either painted red or stuccoed and then painted with designs. The large discs appeared to have been attached to the breast of the corpse, but several had been laid upon the tomb floor. Smaller plaques were apparently attached to the shoulders or the upper part of some bodies. Unfortunately, all of the plaques were in a poor state of preservation, and some were completely disintegrated. The pyrite mosaics were reduced to crumbly yellow masses, and the stone backings had been crushed by the overlying pressure of dirt or affected by the sulfurous acids released by the erosion of the pyrites (Kidder et al. 1946:126). Their poor condition forced the excavators to recover some of these mirrors by placing a layer of wax on their surfaces, limiting present-day chemical analyses of these pyrite remains.

The stone backings found at Mounds A and B were of a single-source slate or shale, cut in a circular fashion, and pierced by conical attachments or suspension holes, almost always in pairs. The polygonal pyrite plates had been glued to the stone using a fine clay mixed with some organic adhesive (Kidder et al. 1946:126–127). These objects date to the Early Classic period. Some examples recovered from Mounds A and B had Teotihuacan-style paintings on their backings. Kaminaljuyu and Teotihuacan had intense contact during the Early Classic period (Taube 1992:171).

Jades or other greenstones were found on or near almost every plaque, apparently always in association with the disk's reflective face. These included miniature earplug-like assemblages, a single flare, one or more beads, as well as shell ornaments. A few other disks were more elaborate in design and are referred to as compound plaques, including mosaics with shell and jade. These items include artifact number 35 in tomb A-II, artifact number 23 in tomb A-III, artifact number 26 in tomb A-VI, and artifact 29 in tomb B-II (Kidder et al. 1946:56, 72–73).

Additional examples of slate disk fragments were recovered by salvage excavations at La Trinidad (Figure 1; Velásquez 2006), a residential sector located 600 m northeast of the Acropolis or Complex C-II-4 at Kaminaljuyu (Figure 1). It was characterized by buildings with talud-tablero architecture and dating to the Early Classic.

Recent findings of pyrite and slate disks

During the 2018/2019 season, the ZAK Project carried out a number of excavations 40 m northeast of Ballcourt B in the Parque Arqueológico Kaminaljuyu (Figure 1). The ballgame was a key ritual during the Classic period at Kaminaljuyu, as illustrated by the 13 ballcourts identified at the site (Arroyo and Paiz 2015). Ballcourt B was excavated by Smith (Arroyo and Paiz 2015; Parsons 1986), who cut a trench across the east–west axis of the court. This building had two construction episodes, with an element first cut into the original surface below the court superstructure, which consisted of a stone slab drainage likely used to divert rainwater that collected on the structure's surface. Excavations also revealed a stone monument in the form of a tenoned human head on the western side of this ballcourt.

The earthen platform excavated by Josué Álvarez of the ZAK Project near Ballcourt B uncovered seven intrusive pits, which had been dug into the surface of the platform to place a number of objects and human remains, perhaps as part of an activity connected to the nearby ballcourt (Figure 3). Table 1 includes a description of the finds contained inside the various intrusive pits. These included several human bones and teeth, all in a very poor state of preservation; nonetheless, it was possible to identify six skulls, four mandibles, and other indeterminate human bone fragments. A radiocarbon date of A.D. 415–538 (sample number PLD-34834, Sigma 1) was obtained from Pit 5, together with a *candelero* and sherds indicating a late Early Classic date for this deposit (Arroyo et al. 2020). The intrusive pits were not all dug at the same time, but they can be assigned to the Early Classic because of the pottery found within them. These pits reflect specific discrete events occurring separately during the Classic period.

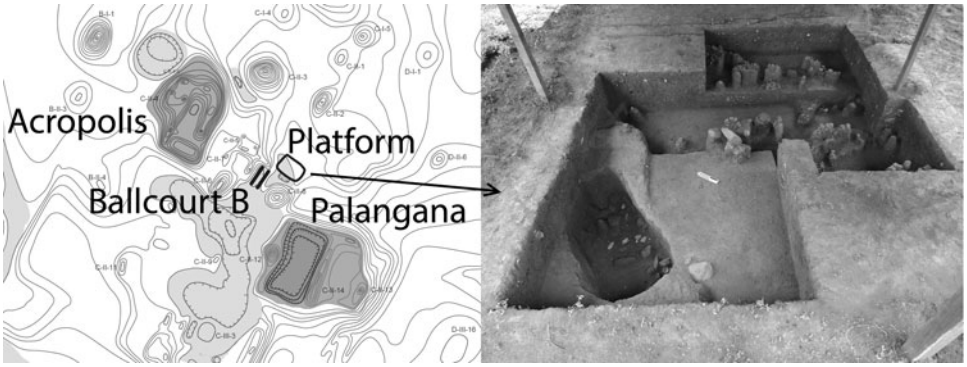


Figure 3. Section of partial excavations next to Ballcourt B at Kaminaljuyu, showing Pit 5. Photograph and diagram by the author (ZAK).

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Table 1. List of offerings found in intrusive pits next to Ballcourt B, Kaminaljuyu.

Intrusive pit number	Operation no.	Bones	Offerings
1	I30		1 ceramic ear spool; 1 slate disk fragment; 1 censer fragment; 1 green stone bead; 1 figurine head; 2 obsidian blade fragments
2	J29		1 ceramic ear spool; 1 Esperanza Flesh bowl; 1 Orange bowl; 4 green stone beads; 2 carved green zoomorphic beads; 1 *candelero*; 1 figurine head; 1 zoomorphic figurine head; 1 calcite fragment; 3 Molina Red bowls
3	J31	Secondary burial: 1 mandible, long bones	1 Amatle Bichrome bowl; 1 Esperanza Flesh ring base bowl with 1 Prisma miniature jar inside; 12 green stone beads; 1 basalt mano; 1 polished schist stone fragment; 2 slate disk fragments; 1 skull-shaped figurine head; 5 obsidian blades (7–10 cm)
4	K33	2 human mandibles	1 Amatle Bichrome ring base; 1 Molina Red bowl; 3 green stone beads; 15 obsidian blade fragments; 3 irregular chert blades; 1 obsidian blade; 1 chert blade
5	K34	3 human skulls, long bones, 1 human mandible, long bones, 3 teeth, other bones	1 ceramic ear spool; 1 Berlin bowl; 1 Esperanza Flesh bowl; group of 1 Orange slip ring base, 2 Amatle Bichrome ring base bowls, 1 Amatle bichrome bowl, and 1 Amatle bichrome jar that may have been a bundled offering; 1 censer fragment with a human face; 1 human figurine with a tumpline; 1 ceramic ear spool; 8 slate disk fragments; 1 unidentified material disk fragment; 50 green stone beads; 1 tubular jade bead; 2 jade celts; 2 green stone fragments; 1 double chamber *candelero*; 25 obsidian blade fragments with 2 complete blades
6	K35	3 skulls	1 Amatle Bichrome bowl; 1 Molina Red bowl; 1 Molina Red miniature bowl; 2 circular stones; 1 basalt mano; obsidian blades; 1 green stone bead
7	G35		1 Berlin tetrapod stuccoed bowl; 1 Llanto ring base bowl; 1 Molina Red bowl; 2 Llanto bowls; 1 ceramic ear spool; 9 obsidian blades

The practice of decapitation in association with the ballgame is a common theme in the archaeological record. Such rituals have been discussed by Taladoire (2017), and many scenes from various sites, such as El Tajín in Veracruz (Ladrón de Guevara 2010), Chichen Itza in Yucatan (Schele and Miller 1986), and pottery from the Pacific Coast of Guatemala, document these practices. Ethnohistorical sources like the Popol Vuh include a narrative on the decapitation of Junajpu on his victory over the Lords of Xibalba (the Underworld) while playing the ballgame. Maya hieroglyphic texts link the ballgame with the underworld and death (Zender 2004), perhaps connecting decapitation rituals, as part of the various sacrifices that took place, with what occurred on the ballcourt proper. Based on references to iconographic and ethnohistoric accounts linked to the ballgame and decapitation rituals, the intrusive pits in the earthen platform next to Ballcourt B at Kaminaljuyu may in fact be burials of decapitated heads resulting from events that occurred at the court. Unfortunately, the skulls recovered here are in a very poor state of preservation, and it was impossible for bioarchaeology experts to confirm that they were decapitated heads.

Excavations at Ballcourt B took place in 1941, and it is difficult, if not impossible, to compare excavations profiles from that time with those of 2018 and 2019. While not definitive, the earthen platform, with its intrusive pits, is proposed as a potential area connected to ballcourt activities. Excavations by Smith (1961) documented that Ballcourt B was used during the Early Classic period, and the intrusive deposits inside the earthen platform are contemporaneous with Smith's findings.

Several artifacts or offerings were associated with the decapitated heads placed in the pits. At least 11 slate disks with minute remains of pyrite were recovered in Pits 1, 3, and 5. Pit 5 had the most offerings, with eight slate disks, while Pits 1 and 3 had smaller slate fragments (Figure 4). Other artifacts in these intrusive pits included greenstone beads, obsidian blades, figurine fragments, ceramic vessels, and miscellaneous objects (see Table 1 for a complete listing).

The 11 slate disks recovered from the intrusive pits associated with Ballcourt B vary in diameter from 9.0 to 16.0 cm, and in width from 0.3 to 0.5 cm (Figures 5a and 5b show 9 of them, as the others were fragmented in many pieces). The disks have two to four holes, suggesting that they were sewn onto garments, possibly those worn by ballgame players. Pit 3 contained human bones and a mandible, while Pit 5 had three decapitated skulls, one mandible, and other human bones. Burying the disks with the decapitated heads and mandible suggests that they were objects that needed to accompany the human remains of these ballgame players. The use of reflective objects or mirrors as part of their costumes is interpreted here as a way of channeling through different realities. The objects included in the various pits belonged to the individuals whose bone remains were placed inside them. Some of these objects were worn as part of the clothing, customs, and objects owned by those buried in the intrusions.

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Figure 4. Disks and offerings from Pit 5 next to Ballcourt B. Photograph by Tojin Benito (ZAK).

Taube (2004) notes that mirrors were worn as pectoral adornments by Olmec ballplayers. For example, Tenochtitlan Monument I at San Lorenzo portrays a ballplayer employing a mirror pectoral atop a bound captive (Lunazzi 2016:129). While this monument dates to the Preclassic period, the use of reflective objects was already in practice and may have expanded in the Classic, illuminating the garments worn by ballgame players.

Contemporary rituals associated with K'iche dances celebrated during community festivals include capes adorned with small mirrors. These mirrors are integral to the costume of the dancers, not to reflect an image, but to shine (García Escobar 2009). The reflective stone disks at Kaminaljuyu may indicate that such disks were part of the paraphernalia used in rituals occurring before, during, or after the game took place. By wearing these bright and shining objects, the players were securing a passageway to another realm of the Maya world.

Description of the reflective objects recovered near Ballcourt B

The earthen platform excavated to the northeast of Ballcourt B had seven intrusive pits (Figure 6); three of them had remains of reflective objects or mirrors. These artifacts consist of slate disks that had decomposing pyrite remains on one side. It is difficult to confirm exactly the composition of what was placed on the surface of all the disks due to the oxidation of pyrite. Analysis by X-ray diffraction of two slate disk fragments from a pyrite surface recovered in Pit 1 was carried out at the Cementos Progreso laboratory in Guatemala City. The first fragment contained jarosite (60%) and quartz (36%), while the second was composed of quartz (60%), jarosite (6.4%), and palygorskite (32.6%). Jarosite appears as a byproduct of the oxidation of iron sulfides, especially pyrite, confirming the presence of this mineral on the slate surface. While slate disks with pyrite remains were not recovered from all the intrusive pits, the group of seven offerings shows a number of connections between them. For example, four out of the seven pits contained ceramic ear spools; three out of seven had slate disks that served as the backing for reflective objects (small pyrite remains were recovered adhered to their surface); five out of seven pits had greenstone or jade ornaments; and six out of seven deposits contained obsidian blades.

The contents of the seven pits may represent items used by the ballgame players. Some pits contain human remains, which may represent sections of these individuals with offerings that were part of the burial ritual. There is a preference for the use of ceramic ear spools, greenstone or jade beads, and slate disks with pyrite (Figure 7). All but one of the pits had obsidian blades, suggesting bloodletting ritual practice, perhaps prior to or after the ballgame encounter. Pit 5 contained the highest number of human remains, including three skulls, one mandible, and fragments of two long bones. This was also the pit with the highest number of offerings, indicating that the bone fragments of the individuals placed here were of more relevance than those from the other pits. Preliminary isotope analysis carried out by Lori Wright on a tooth recovered in Pit 5 suggests that the individual originated in the Motagua Valley or the Copan area (Lori Wright, personal communication 2020). It is possible that several of the human remains located inside the earthen platform represent foreign individuals. Future isotope analysis will help confirm this assumption. The tubular jade bead, 2 jade celts, and 52 greenstone beads and fragments that were part of the objects contained in the pit would also indicate a link to the Motagua region, where jade and other greenstone sources have been identified (Rochette 2009). Additional analysis is being undertaken by Wright, and more data will be available soon on the origins of some of the individuals located next to Ballcourt B at Kaminaljuyu.

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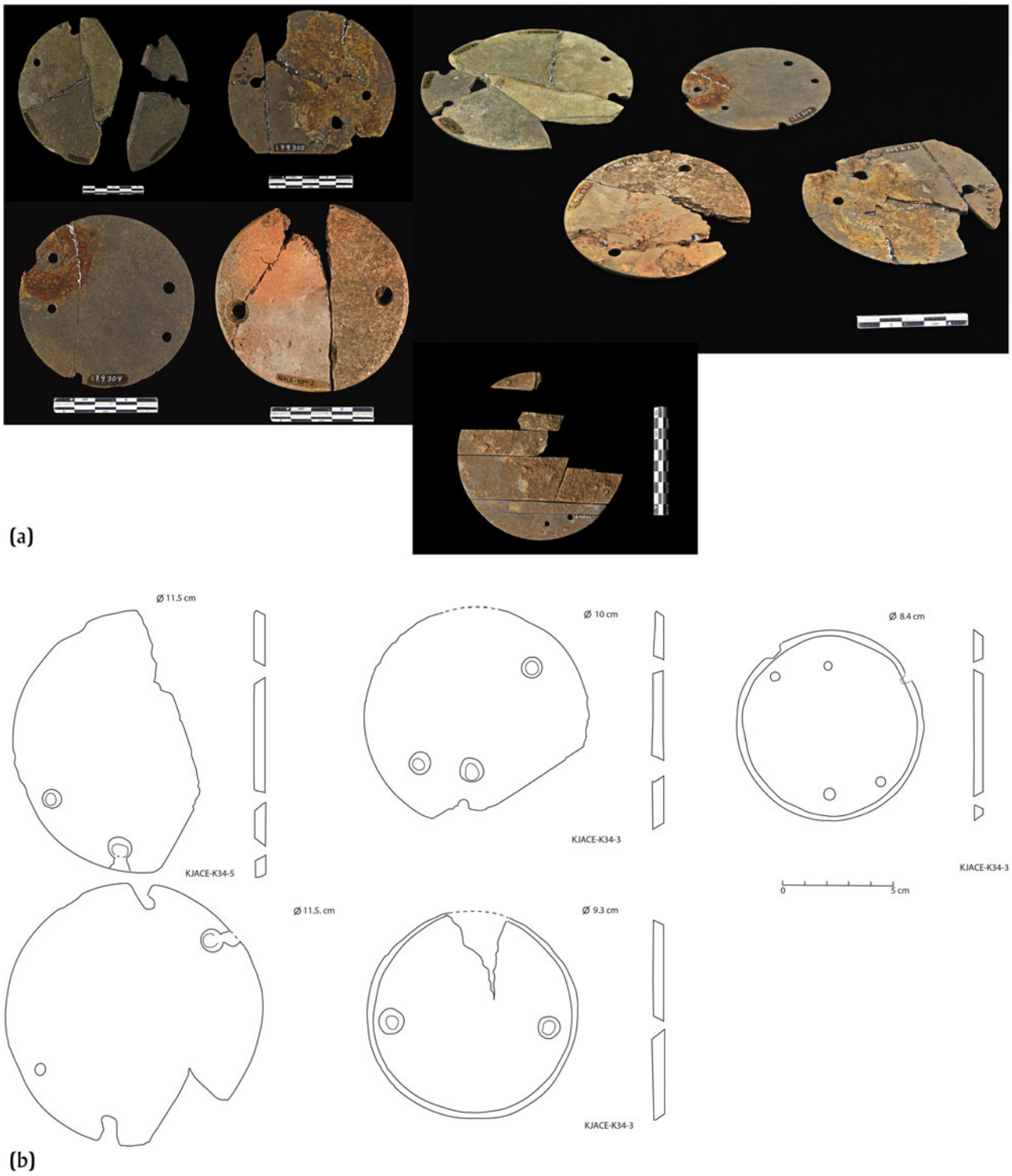


Figure 5. (a) Slate disks recovered from intrusive pits next to Ballcourt B; (b) cross-section illustrations of examples of slate disks recovered next to Ballcourt B. (a) Photographs by Tojin Benito (ZAK); (b) illustration by the author (ZAK).

Pyrite reflective objects and exchange in the Maya Highlands

Reflective-surface objects or mirrors were common during the Classic period in the northwest and northern highlands of Guatemala (Table 2). Nebaj, 107 km northwest of Kaminaljuyu, had the largest number of these artifacts, with over 200 examples (Figure 8); they were recovered in tombs and caches associated with Mounds 1 and 2 (Smith and Kidder 1951). The site of Nebaj was a primary site located in the northwestern Maya Highlands that had access to special resources such as pyrite, slate, and a number of imported artifacts, favored by its location near a network

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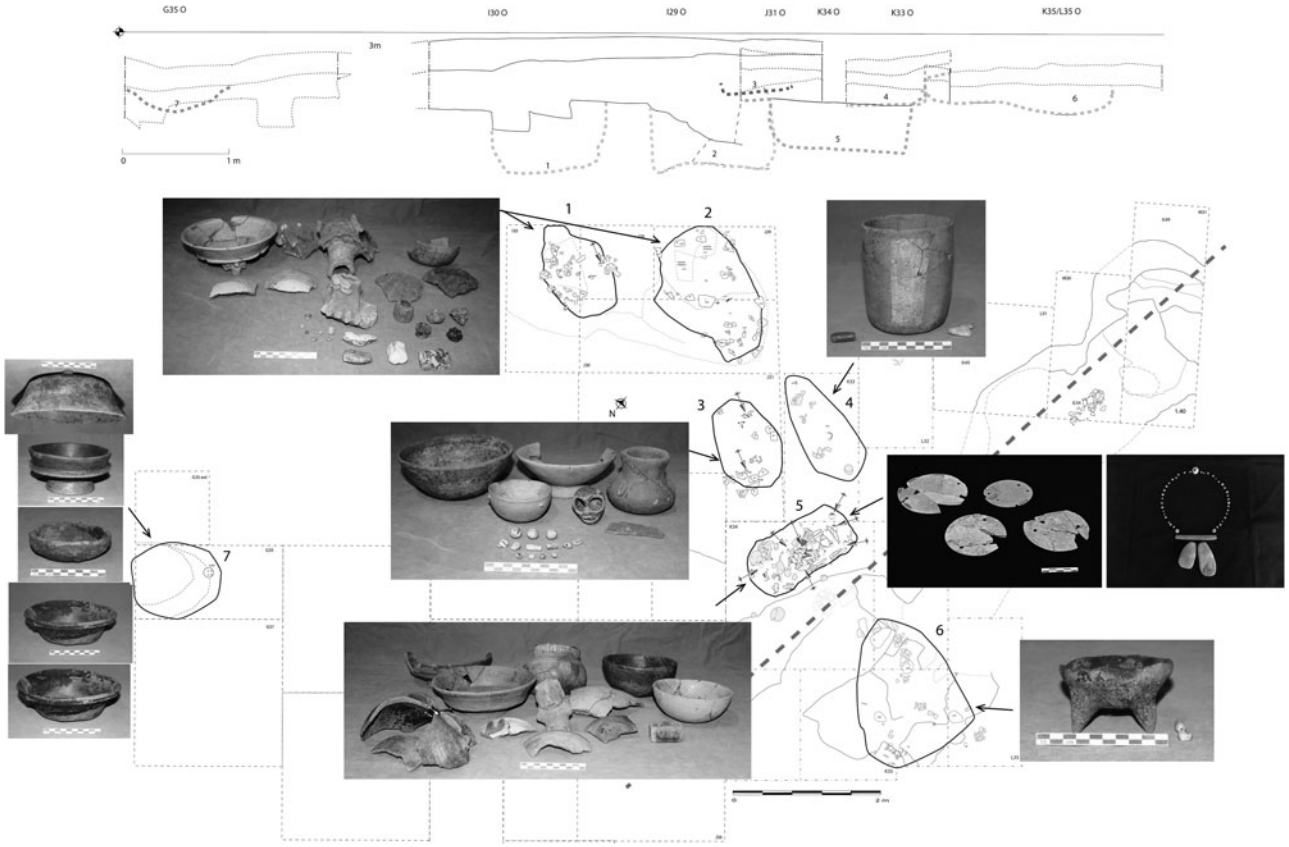


Figure 6. Profile cut and plan of intrusive pits with offerings inside them, Kaminaljuyu, Guatemala. A list of the contents of each pit is provided in Table 1. Prepared by Gloria Ajú (ZAK).

of rivers that connected the region to the southern Maya Lowlands and the eastern highlands (Figure 9). Smith and Kidder (1951:50) have suggested that Nebaj enjoyed "an economy sufficiently secure to permit many craftsmen to spend an enormous amount of time producing objects without any utilitarian value." No workshops for the production of pyrite or slate artifacts, however, have yet been identified at the site, perhaps because excavations have thus far been limited to larger buildings. Still, some of the Nebaj mirror offerings in the tombs appeared unfinished.

Pyrite plaques at Nebaj have been interpreted as personal adornments and not mirrors (Smith and Kidder 1951:50), based on their association with tomb burials. Like the Kaminaljuyu examples, the perforations on the opposite edges of the plaques suggest that they were attached to clothing rather than suspended as pendants. Those few examples of plaques that were decorated with stucco and painted could have been treasured possessions or symbols of wealth and power with ceremonial significance. Some plaques were recovered inside ceramic vessels placed as funerary offerings; these vessels may have been specifically created to hold them, as the plaques fit perfectly inside them.

Another site in the northwest Maya Highlands where pyrite objects have been recovered is Zaculeu in Huehuetenango (Figure 8), located 38 km southwest of Nebaj and 108 km southeast of Kaminaljuyu. Here, over 33 slate disks were recovered. At least three of them have decorated surfaces, and one disk from a tomb excavated below Structure 1 has 33 plaques mounted on one surface consisting of small polygonal pieces of iron pyrite. Most of the slate disks have two pairs of holes close to the edge on opposite sides, similar to examples from Kaminaljuyu Ballcourt B and Nebaj, suggesting that they were worn or carried (Woodbury and Trik 1953:232). There are also some plaques with holes in their centers. In contrast to the Kaminaljuyu examples, the disks recovered at Zaculeu are thinner, with diameters varying between 8 and 24 cm.

Four mosaic mirrors (Figure 8) were recovered in one grave at the site of Kixpek, Quiché, located 48 km southwest of Nebaj and 85 km southwest of Zaculeu. Three of the mosaic pyrite mirrors were circular in shape, while one was square (Mason 1927). They had been placed with a burial in a tomb chamber. The bases of the mirrors consisted of a porous pumice or tufa stone, which differs from most of the disks and plaques described from Kaminaljuyu, Nebaj, and Zaculeu, which are of slate or shale. As with previous examples, these plaques had drill holes for attachment to clothing, serving the double purpose of ornament and mirror. The reflecting surface was composed of a mosaic of many thin slabs of iron pyrite cut into polygons (the square example has 80 pieces, while the circular ones have up to 53). The thickness of the mosaics varies from 0.3 to 0.4 cm (Mason 1927), and diameters are 10–12 cm.

Excavations at Zacualpa, Quiché, located 52 km southeast of Nebaj, uncovered a circular ceramic disk as a support for

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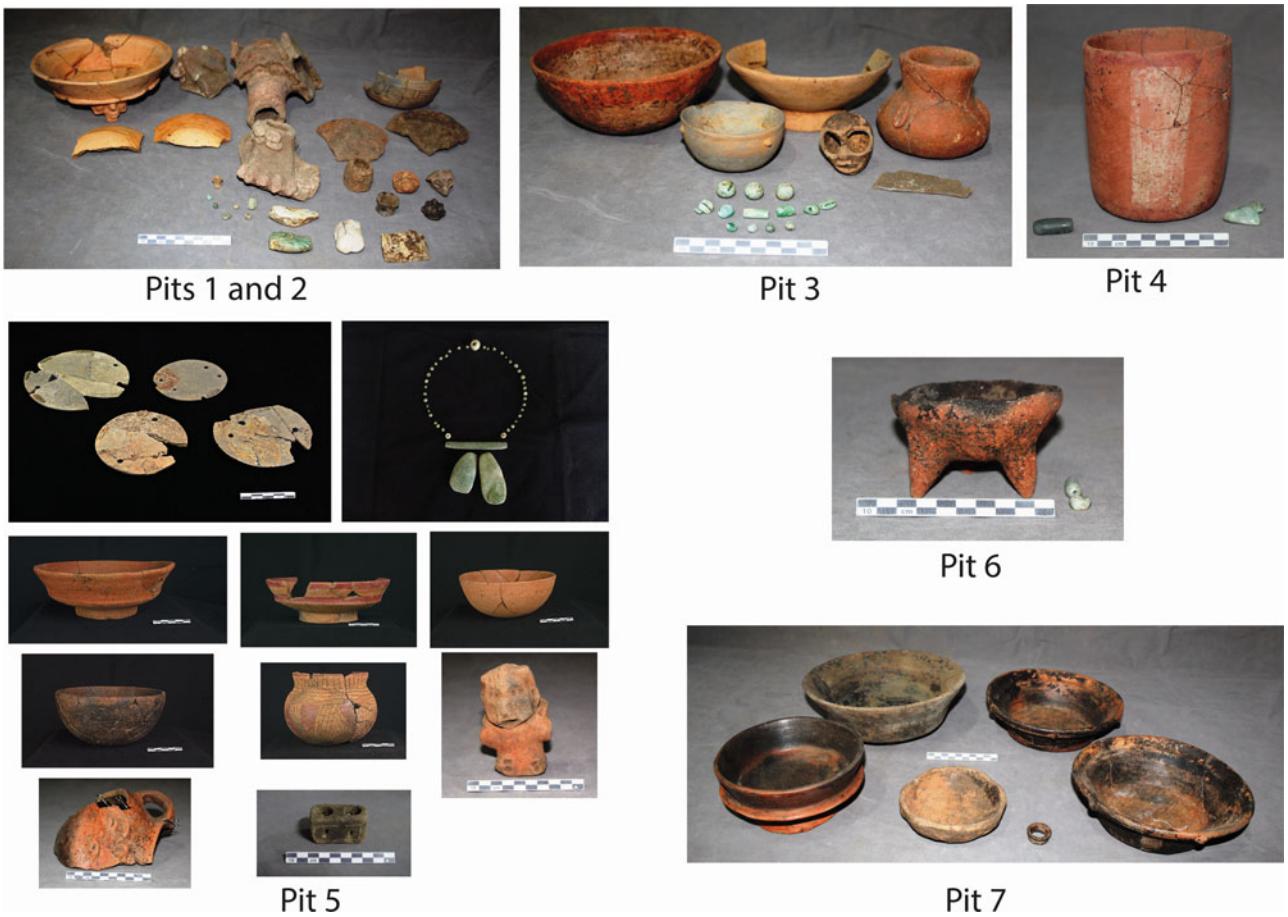


Figure 7. Groupings of offerings from intrusive pits near Ballcourt B. Prepared by Gloria Ajú (ZAK).

a mirror dating to the Late Classic, with a diameter of 10 cm and a thickness of 0.8 cm. It had two perforations for attachment and incrustations of iron pyrite pieces on one side (Wauchope 1975:43).

Additional findings of slate disks have been reported at La Lagunita, Quiché, located 15 km north of Zacualpa and 40 km south of Nebaj (Figure 9). Here, Ichon and Viel (1984) report finding a slate-disk pendant associated with a carved jade plaque below a floor in Structure A-6. An offering of slate disks was recovered in Mound 7 at La Lagunita, as part of the interment of two individuals deposited inside Sarcophagus 4 during the Early Classic. While the authors do not indicate that the slate disks had pyrite remains, it is possible the pyrite had decomposed. Cave C-48, excavated by the ancient inhabitants of La Lagunita underneath the plaza floor at the axis of Group A, was used for ritual activities and included over 300 vessels and other artifacts. Ichon (Ichon and Arnauld 1985) has proposed that the location and offerings placed inside this manmade cave represent a mythological place of origin. The offerings in this cave included pyrite-encrusted disks and jade ornaments dating to the Early Classic.

Additional pyrite plaques were uncovered at the site of Guaytan in San Agustín Acasaguastlán in El Progreso (Figures 8 and 9), located 137 km southeast of Nebaj. These were placed as offerings in Early Classic tombs excavated inside mounds. Guaytan had 142 mounds, with 14 of them containing tombs. Smith and Kidder (1943) documented 12 ballcourts, but the excavations that took place in 1943 focused only on tombs. Tomb II in Mound 24 had 11 individuals, and among the offerings, fragments of a pyrite mosaic plaque were recovered, together with 18 pottery vessels and obsidian blades. Tomb III, within the same structure, contained 37 badly decomposed skeletons. The

Table 2. Maya Highlands sites where mirrors were recovered.

Site name	Number of mirrors	Reference
Kaminaljuyu	40	Kidder et al. 1946
Lake Amatitlán	9	Mata Amado 2009
La Lagunita	6?	Ichon and Arnauld 1985
Nebaj	200+	Smith and Kidder 1943
Kixpec	4	Mason 1927
Zaculeu	8	Woodbury and Trik 1953
Quen Santo	3	Kidder et al. 1946
Zacualpa	1	Wauchope 1975
Guaytan	7	Smith and Kidder 1943

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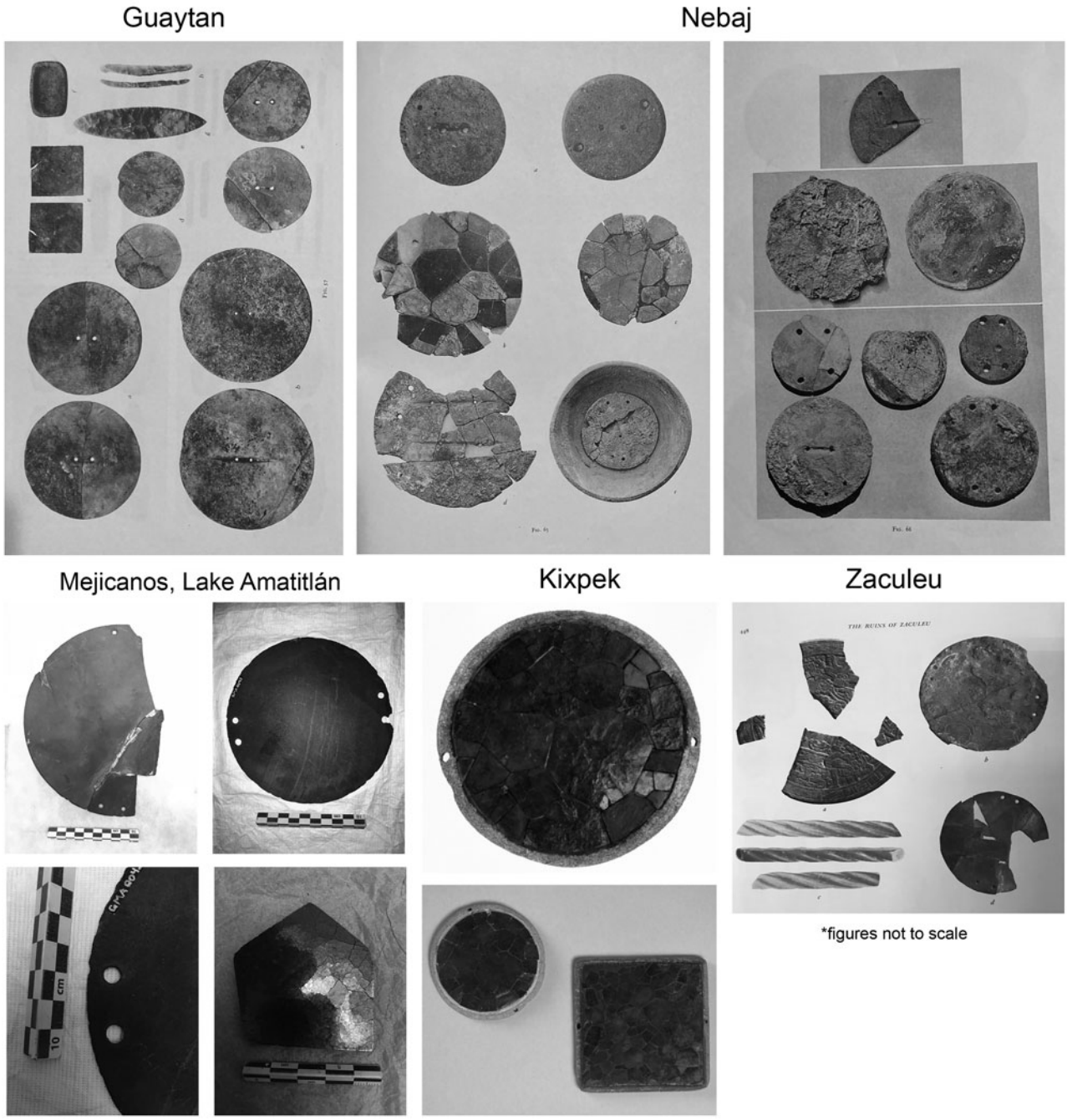


Figure 8. Photographs of disks and reflective objectives from various sites. Guaytan: Smith and Kidder 1943:Figure 57; Nebaj: Smith and Kidder 1951:Figures 65 and 66; Mejicanos, Lake Amatitlán, Kixpek: University of Pennsylvania Museum digital collections; Zaculeu: Woodbury and Trik 1953:Figure 282.

tomb was probably used several times. Included in the offerings were several backings for pyrite mosaic plaques, shells, shell and jade beads, and odd pieces of jade and obsidian lancets.

The plaques were thick disks or squares of stone, one side covered with mosaics of small, accurately cut, and fitted plates of pyrite. Diameters of circular specimens vary between 8.5 and 19.5 cm, while the square example was 8 × 8 cm. The thickness of the slate measured 0.5–0.8 cm in width. All but one example had two perforations at the center.

A site closer to Kaminaljuyu with pyrite mosaic mirrors is that of Mexicanos, on Lake Amatitlán, only 18 km south of Kaminaljuyu (Figures 8 and 9). Mata Amado (2009) reports finding pyrite mosaic fragments on the shore of the lake next to the Mexicanos site. A whole example was recovered, measuring 18 cm in diameter and 0.4 cm in width. In addition, four slate disks were also found in the deposit, measuring 14.5–22.0 cm in diameter and 0.25–0.30 cm in width. All of the disks have perforations or holes on the edges, suggesting that they were worn attached to clothing. As with

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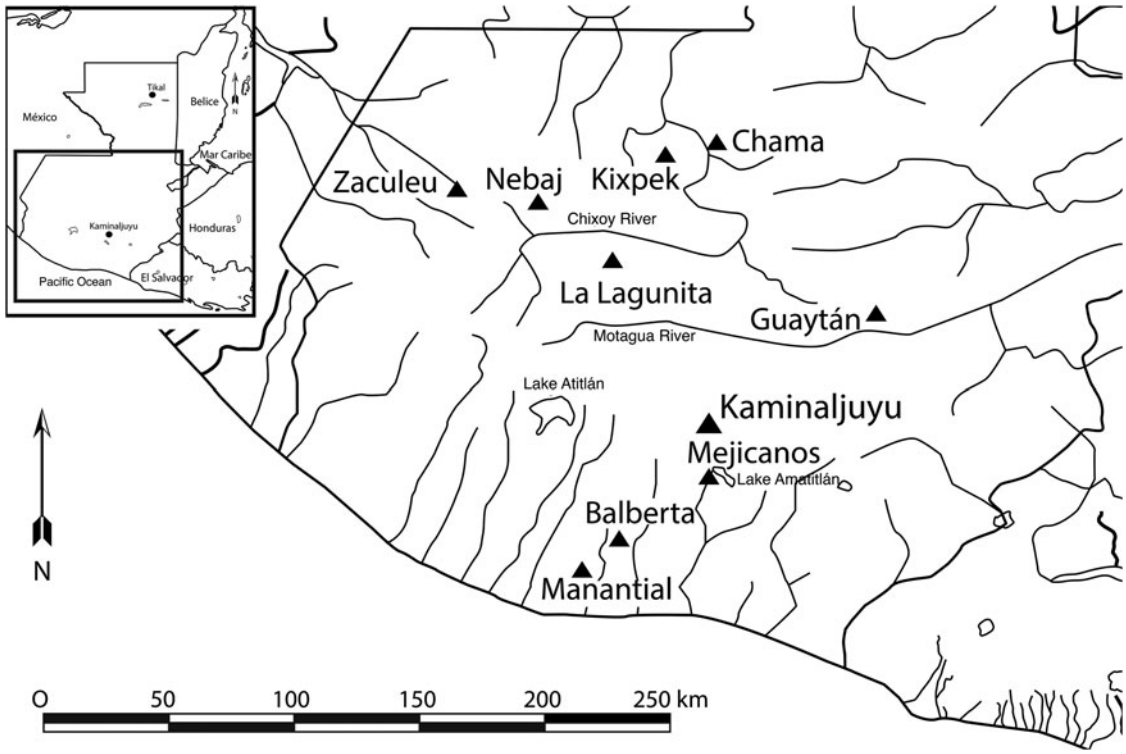


Figure 9. Map of northwest Maya highland sites in Guatemala that contain remains of mirrors. Prepared by Javier Estrada (ZAK).

most of the examples from Kaminaljuyu, the edges were beveled. Scanning electron microscope analysis indicates that the top layer consists of fine pyrite crystals, with a binding agent made with clay. The crystals, pyrite dust to human eyes, are believed to have been pressed into the clay while it was still soft. The object would have been fired, much like pottery in a kiln. The pyrite grains were then polished until a mirror-like luster was achieved (Nelson et al. 2009:4). It is unclear how much this pyrite composite surface would have reflected an image similar to a mirror. These examples indicate that their manufacture was a less time-consuming technique, one that resulted in a shiny surface, suggesting its use as a reflective object rather than a mirror.

Several of the examples listed here and recovered from various Maya Highland sites consist of slate disks with little pyrite remaining, suggesting potential examples of pyrite composite reflective objects. Larger disks with pyrite mosaics could have functioned as mirrors, while the smaller versions could have been composite pyrite reflective objects attached to costumes and textiles for ballgame encounters, dances, and special events. Further systematic analysis of the manufacturing techniques could confirm the type of mirrors and reflective objects and better interpret their functions. Results presented by Barrientos and collaborators (2020) describe similar techniques to those reported by Nelson and colleagues (2009), indicating common practices for the manufacture of this type of reflective object.

It is relevant to note that almost all the examples described above date to the Early Classic period. This chronology corresponds to the major peak of influence exerted by Teotihuacan, a site that also has mirrors, as documented in excavations and depicted in its iconography. Taube has suggested that mirrors were a cult object shared between Teotihuacanos and the Classic Maya (Taube 1992:187). The presence of mirrors in the tombs of Mounds A and B highlights a close relationship between Kaminaljuyu and Teotihuacan during the Classic period.

Mineral and stone sources and exchange

Mirrors and reflective disks reviewed here were made of pyrite and slate. Sources of pyrite have been identified in Guatemala, one of which is in the mountains of Huehuetenango, including Aguacatan in the northwestern highlands, Quetzaltenango, and in Chiquimula in the eastern region of Guatemala (Gallaga 2014:282; Roberts and Irving 1957). A slate source has been documented near San Juan Sacatepéquez (Luis Velásquez, personal communication 2021) a few kilometers from Kaminaljuyu. As described above, the largest number of slate-backed pyrite objects has been found at Nebaj, a Classic period site located 45 km south of the Huehuetenango pyrite source. The dynamic nature of riverine trade must have played a key role in the exchange of exotic reflective objects in the highlands and beyond. For example, the Chixoy and Xacbal rivers to the northwest, and the Polochic and Motagua rivers to the east could have served as potential trade routes for slate, pyrite, and other products. The Polochic and Motagua river routes may have been linked to additional pyrite and slate sources located in the southern Maya Mountains (Druecker 1978:56, 58; Graham 1987). The

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concentration of Maya Highlands sites with mirrors or reflective-surface objects suggests that the region was critical in the exploitation of mineral sources and the production and exchange of these exotic goods.

Summary

In Kaminaljuyu, some 40 slate plaques with pyrite remains have been recovered, suggesting that these artifacts were important objects. Some were recovered in excavations at Mounds A and B in the first half of the twentieth century, while recently, a number of them were excavated by the ZAK Project. The latest examples were recovered as intrusive offerings, together with human remains, inside an earthen platform located 40 m from Ballcourt B. Although it is not possible to state with certainty due to the poor state of conservation, some of the human remains appear to be decapitated heads. The slate plaques with pyrite may have been mirrors or reflective objects with special functions used by specific members of society.

Mirrors had various symbolic meanings and were also seen depicted on costumes that could have identified the wearers as ball players, as proposed here for examples recently excavated and interpreted as possible ballgame insignia. Ballgame players may have worn reflective disks sewn to their clothing to identify them as unique members of society. By carrying reflective objects, they could interact with distinct levels of the Maya universe through the ballgame rituals in which these artifacts served as intermediaries between the human or earthly world and the supernatural (Pereira 2008:134).

Research from other parts of Mesoamerica has identified mirrors as items that accompanied ruling elites in their transformation after death. These and other reflective objects were important symbols for warriors, as seen at other sites such as the Feathered Serpent pyramid at Teotihuacan (Sugiyama 2005). The offerings and human remains from the recent excavations at Kaminaljuyu may represent ball players as warriors, fighting darkness and light through the ballgame ritual.

Access to the sources of some materials used for manufacturing mirrors and reflective objects must have empowered elites responsible for the trade in such precious items. Elites at the Maya Highlands sites of Zaculeu, Nebaj, and Kaminaljuyu may have easily obtained special objects like mirrors or reflective objects because of their location near to mineral sources or access to exchange networks that included a variety of exotic products.

Evidence of reflective objects and mirrors in other parts of the Guatemalan Highlands, together with the location of pyrite and slate sources, suggests that the northwestern Maya Highlands was an area with critical regional players in the exchange of these exotic and unique goods. And if these goods were used for the ballgame ritual, the Maya Highlands must have played a key role in the development of this important ritual activity during the Classic period.

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