

**Continued Investigation of Caracol's Social Organization:
Report of the Spring 2002 Field Season at Caracol, Belize**

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The 2002 field season of the Caracol Archaeological Project took place from the onset of February through the end of March. The excavation crew consisted of a total of 20 individuals (see Table 1). The investigations focused on locales that could potentially shed new light on the upper echelon of Caracol's society as well as answer questions about untested eastern structures in the site epicenter. Accordingly, excavations focused on:

- Structure A13, a huge stand-alone platform dominating the eastern side of an elongated plaza north of the A Group aguada and immediately south of the A Group ballcourt.
- Structure B28, the structure defining the eastern side of the B Plaza and flanked to either side by platforms presumably supporting range buildings.
- The plaza in front of Structure B33, in an attempt to define earlier Preclassic remains to complement those recovered in 1995 and 1996 on the eastern side of the Northeast Acropolis.
- Structure F2, a badly looted eastern building in a major group some 500 m east of the A Group that had been partially trenched in 1991.

A further goal of the 2002 field season was to begin articulation with the IDB Tourism Development Project, directed by Dr. Jaime Awe, in terms of artifactual recording and reporting miscellaneous excavation undertaken while consolidation efforts were ongoing.

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The Problem: Defining the Upper Social Limits of Caracol's Society

It is difficult to fully define ancient Maya society without a full understanding of the complete range of variation that may be present. Archaeological research at Caracol has gone a long way towards defining the social variation present at the site, but there are still some parts of the range that are not firmly anchored. In particular, the physical remains of the site's uppermost elite, believed to be those represented on the carved monument texts, have remained elusive.

Eighteen field seasons at Caracol have yielded 255 burials and excavated most of the extent structural types at the site. The structures investigated have ranged from crudely built features (i.e., 2000 field season) to elaborate palaces (i.e., 2001 field season). Almost the entire range of these constructions can be associated with a wide variety of deposits. It is possible to argue that the Caracol ruler lived in the Northwest Quadrangle on Caana and to view this complex as an extended residential and administrative compound (A. Chase and D. Chase 2001). But, if our current models that equate rulers and individuals on carved monuments are correct, we do not know where these individuals are buried in death as none of the dated and presumed royal chambers that have been encountered have death dates that can be correlated directly with the lifespans of individuals on the carved stone monuments (A. Chase and D. Chase 1996a). If we cannot identify these individuals in death, then it proves very difficult to "adequately model ancient Mesoamerican society" (A. Chase and D. Chase 1992:16). The research carried out during the 2002 field season hoped to provide additional information on the named rulers and the upper echelon of Caracol society that could be compared and contrasted with other settlement data that had been collected in preceding field seasons.

Hieroglyphic Texts and Archaeological Remains: Other Sites

One goal of Maya archaeological researchers has been to link the individuals in the hieroglyphic texts with on-the-ground archaeological remains. When such linkages have been accomplished, the recovered human remains are generally found in positions of prominence, in impressive chambers, and with an extensive array of associated artifacts. This is true for both sites with limited hieroglyphic texts, such as Santa Rita Corozal (A. Chase 1992) and Altun Ha (Pendergast 1979), and for sites with extensive texts, such as Tikal (Coe 1990; Harrison 1999) and Palenque (Ruz 1953,

Schele and Mathews 1998). In other cases, it is difficult to make such associations, in spite of large number of texts and concentrated excavation efforts (but see Martin and Grube 2000). At Quirigua, no archaeologically recovered individuals can be associated with the known dynastic sequence (Sharer 1990). At Copan, even though multiple "founders" have now been located and tentative associations made (Sharer 1997; Traxler 2001; Traxler and Sharer 2003), none of the known tombs can be clearly associated with the king list. At Dos Pilas a tentative association was made for Ruler 3 (Demarest et al. 1991), but cannot be confirmed in the tomb texts. At Calakmul questions have been raised over whether or not the tomb of Jaguar Paw has been located (Carrasco et al. 1999). In spite of potential linkages (Burial 5; Coe 1959), more recent excavations at Piedras Negras have failed to recover tombs that are specifically those of certain rulers (Houston et al. 1998), although attempts have been made to link re-entered interments with these individuals (Fitzsimmons 1997; Houston and Escobedo 2003). At Uaxactun the central tombs have been seriated into a dynastic sequence (Valdes and Fahsen 1995); however, there is only limited evidence that this is actually appropriate.

Hieroglyphic Texts and Archaeological Remains: Caracol

Since the start of the Caracol Archaeological Project, we have been explicitly concerned with linking the site's epigraphic record (A. Chase et al. 1991; Beetz and Satterthwaite 1981; Houston 1987, 1991; Grube 1994) with the archaeological remains. To this end we have been systematically examining various epicentral structures and groups over the course of 18 years. While we have been successful in correlating historic statements of successful warfare with increased population and prosperity (A. Chase and D. Chase 1989, 1998, 2000), we have yet to make a viable linkage to the site's human remains. While epigraphic records have been found in a series of tombs, none of the recovered dates can be correlated with individuals from the hieroglyphic record (A. Chase and D. Chase 1996a). And, other individuals recovered in tombs from the main epicentral groups date from times that don't correlate directly with these texts (see D. Chase and A. Chase 2002, 2003).

In the A Group the majority of the recovered tombs date to an earlier horizon than that known from the site's hieroglyphic record. The two tombs in front of Structure A6 were both Early Classic in date (Anderson 1958; Satterthwaite 1954). No tombs were located in the cores of either Structure A6 or Structure A5. In Structure A4 the lower chamber was Early Classic in date and the upper chamber was looted so badly that it can only be generally dated to the end of the Early Classic or early Late Classic era; importantly, however, there were no painted texts in this chamber. The tomb in Structure A7 was quite impressive; especially with its stone "bier" bench (D. Chase 1998), but its remains date to earlier than the bulk of the hieroglyphic records and it too was not characterized by interior text painting. The tomb behind Structure A1 is also relatively early based on its plentiful redeposited ceramic material; again there is not evidence of painting. A painted text did occur in the Structure A3 tomb and dated the chamber to A.D. 695 (A. Chase and D. Chase 1987:15), relatively late, but still disjunctive with Caracol's hieroglyphic record. Excavation showed that the substructures for Structures A1 and A3 were both constructed much earlier than the extent hieroglyphic record. Thus, the excavated remains in the A Group do not appear to correlate with any of the epigraphically known Caracol rulers.

On Caana, seven tombs are known from Structure B19 and B20. In spite of 3 painted chambers (A. Chase and D. Chase 1987), there does not appear to be any possible equivalency with the individuals in these tombs and those in the dynastic record. Death dates, as decoded on these tomb walls, do not match the lifespans of Caracol rulers, as indicated in the hieroglyphic records. The two chambers recovered during the 2001 field season on the summit of Caana fall into a time for which the dynastic records are not fully known, but their limited contents and disturbed nature suggests that, while elite, they do not represent the extreme end of the social spectrum. In the B Plaza excavations into Structures B4, B5, and B6 revealed no archaeological materials that could be correlated with the texts. Thus, as in the A Plaza, the "rulers" of Caracol are again missing.

In point of fact, the downtown Caracol tomb sample does not appear to represent the extreme upper end of the social spectrum - those individuals named in the site's hieroglyphically recorded dynastic record. In order to fully understand why this is the case and what it means, several excavations remain to be undertaken, if only to rule out certain structures as being possibilities for the interment of named dynastic individuals.

The 2002 Investigations

The investigations undertaken during the 2002 field season sought to finish the excavation of an important eastern building, to further explore Caracol's ritual origins, and to test two areas within epicentral Caracol that could potentially be loci for interments that could be linked to the hieroglyphic record ([Figure 1](#)). The archaeological testing of all possible elite loci in epicentral Caracol for dating purposes relative to highest echelon elite interments is important before consideration can be given to other remote interment possibilities, such as that Caracol's rulers could have been buried elsewhere, such as perhaps in Naj Tunich cave where Brady (1989) has noted the existence of looted tombs and for which textual linkages to Caracol are known to exist (Grube 1994).

Residential groups at Caracol exhibit a strong eastern focus with associated mortuary ritual (A. Chase and D. Chase 1987, 1994, 1996b; D. Chase 1998; D. Chase and A. Chase 1998, 2002). This eastern mortuary focus is also replicated within the elite residential groups within the Caracol epicenter, such as in the Northeast Acropolis, the Central Acropolis, and Caana (A. Chase and D. Chase 2001; D. Chase and A. Chase 1996). Yet, as indicated above, the interments in these 3 residential groups can not be directly correlated with the dynastic or hieroglyphic records. Given the strong eastern mortuary focus within residential groups both within and outside the epicenter, however, it would surely prove useful to see if such a focus was extended to other non-residential epicentral plazas. With these considerations in mind, limited testing was undertaken in Structures B28 and A13.

Structure B28

Structure B28 forms a smallish eastern building or pyramid on the B Plaza. Lower level range constructions are attached at its northern and southern ends. In form, the arrangement superficially resembles Tulakatuhebe, a building complex located ca. 3.5 km southeast of the Caracol epicenter (A. Chase and D. Chase 1987), which was the focus of a relatively high status mortuary subcomplex based on data gathered from extensive looting. The top of epicentral Structure B28 initially appeared to be boulder strewn, similar to Structure B26, which was excavated during the 2001 field season and proved to be an unfinished construction effort. Unlike Structure B26, however, the crudely faced remains of a slightly raised platform or substructure could be discerned on the summit on Structure B28, and the facing was in fact recovered through excavation. Structure B28 also is associated with Terminal Classic Stela 18 (A.D. 810) and Altar 23 (A.D. 800), indicating that it had the possibility of housing mortuary remains relevant to Caracol's late dynastic association. Because of its association with late hieroglyphic texts and its central position on the eastern extent of the B Plaza, Structure B28 was considered to be an excellent candidate for gaining a direct link between the archaeological remains and the site's epigraphic record. Even without recovered mortuary remains, an interpretation of this structure's function is important to general considerations of the Caracol B Plaza.

Suboperation C27A was initially undertaken in March 1986 by Stephen Houston and consisted of a 1.5 m by 2.0 m test-pit placed about a large plain stone that was protruding from the ground near the base of Structure B28 and just south of its main E-W axis. The excavation was carried down to the level of a badly preserved plaster floor and revealed that the large plain stone was not a monument, but rather the lower cornerstone of a building cornice. Apart from a few sherds, 99 human bone fragments were recovered lying above the plaza floor in no particular anatomical order.

Suboperation C27B was undertaken in April 1989 and was laid out as a 2 m wide (N-S) by 7 m long (E-W) trench placed on an axial line to Structure B28. It was designed to encompass the newly discovered Altar 23. This excavation removed the humus above and surrounding the altar and determined that the altar was situated on the summit of a raised platform that ran north-south and blocked access to Structure B28. Only 2 sherds were recovered in this excavation.

Suboperation C27C was undertaken in February and March of 2002. It consisted of a 6.3 m long (E-W) by 2 m wide (N-S) trench that encompassed the articulation of the Structure B28 steps and the B Plaza ([Figures 2b, 3, and 4](#)). The excavation revealed that the latest version of Structure B28 had a projecting lower stair platform, as is found on Caana and Structure B5. The actual stairs to the substructure summit began ca. 4.25 m east of the bottom step for this projection. This projection was built directly on the latest plaza floor and rose some 2.35 m above it. A deeper probe behind the preserved lower stairs found both the intact upper plaza floor and an intact lower plaza floor. The excavation in front of the lower Structure B28 steps was carried down to bedrock and revealed a total of 3 plaza floors. No artifactual materials were recovered that securely date either the construction of these floors or the construction of the latest version of the Structure B28 stair projection. However, portions of a new stela and extensive disarticulated human remains were found overlaying and to the front of the B28 steps; some of this bone was burnt, as was the floor directly

in front of the lower step. These human remains contain the post-cranial bones of minimally 2 individuals. However, 17 human mandibles also were recovered. Either the individuals were warriors wearing mandible necklaces or there were many more individuals incorporated within this enigmatic deposit. No perforations were found in the mandibles, however, making the first alternative less likely. The human bone was strewn directly on the plaza floor and, in some cases, under the broken monument fragments. Clearly dating to the Terminal Classic era, the disarticulated human remains may share some similarities with the late Problematic Deposit 48 at Tikal, a disarticulated deposit of human bone found near the re-entered Burial 8 at Tikal that contained 24 mandibles (Coe 1990: 494-495).

Caracol Stela 25 (Figures 5 and 6) was revealed in basal excavations on axis to Structure 28 (Figure 3). The style of its text and its iconography indicate that it was carved late in the Classic Period. As recovered, the stela is incomplete. Four fragments of Stela 25 rested directly on the latest floor of the B Plaza in direct association with disarticulated human bone. Three of these fragments were weathered, but showed signs of carving; a fourth fragment was completely eroded. These fragments indicate that the original stela measured at least 36 cm in depth by 54 cm in width and had a height of over 1.52 meters. The sides of the stela fragments are particularly badly flaked, perhaps as a result of burning. Based on the positioning of the stela fragments, it is suspected that they rolled to their present position from somewhere higher, perhaps the original summit of the Structure B28 stair projection; however, no additional fragments were recovered within the slope excavation. The recoverable iconography shows a single individual facing to the viewer's left. This individual wears an elaborate circular earflare assemblage, a large beaded necklace, and a hat or helmet that is decorated with high plumes of feathers that also splay out to the viewer's left. Hieroglyphic text is positioned both above and to the front of the individual's headgear. These texts are quite worn, but the two highest glyphs are recognizable as *bacab* and "jog" (*u bah*). The middle glyph to the left of the headgear (containing a *kan* sign) may represent the name of the Caracol personage being portrayed. Stylistically, the sweep of the feathers and placement of the text is perhaps most similar to the portraiture seen on "Late Classic" Caracol Stela 8, which is dated to at or after A.D. 800.

Suboperation C27D consisted of an axial trench placed over the summit of Structure B28 and measuring 2 m north-south by 10.6 m east-west. The trench was positioned so as to bisect a small summit platform that measured 7.1 m east-west by ca. 16 m north-south (Figure 2a, 7, and 8). Vertically placed stone blocks outlined its eastern and western limits. The remains of a crude plaster floor abutted the eastern facing; the floors to the west of the western facing were completely eroded. Excavation showed that this summit platform rose ca. 55 cm above an earlier summit floor; dry core fill of both cut and uncut stone made up the fill of this summit platform. The earlier summit floor overlay crude blocks of dry core fill well past a depth of 2 m; excavation was halted when it became clear that further penetration would undermine the dry core fill. A similar penetrating excavation was made at the western part of the summit and continued until it became dangerous to dig. A construction wall comprised of undressed blocks was encountered in this excavation. Few diagnostic artifactual materials were recovered, although Pantano Impressed sherds were found deep within the core of Structure B28. This sherd material indicates that the bulk of the substructure supporting Structure B28 could have been constructed in the later part of the Late Classic Period.

Suboperation C27E consisted of a 2 m extension of Suboperation C27C to the south along the front of the lower stair (Figure 3). This investigation encompassed the stone that was investigated in Suboperation C27A and reopened that investigation. It succeeded in recovering more fragmentary human bone as well as a backfilled piece of a modern ceramic mug, but found no other Stela 25 fragments.

Structure B28 Summary. Excavations into Structure B28 found no special deposits, but did recover fragments of a new carved stela, presumably dating to the end of the Late Classic Period. The construction matrix for Structure B28 was not well bedded and consisted primarily of dry core fill composed of large undressed blocks. Because this matrix is inherently unstable, excavations could not proceed to the depths required to uncover earlier construction efforts. The artifactual materials that were recovered, however, indicate that the latest version of Structure B28 was constructed in the later part of the Late Classic Period. At the end of its functional use life, minimally the lower step of the building was burned; this burning also consumed the broken monument fragments at its base and portions of the disarticulated human bone that littered the central base of Structure B28.

All of the excavations undertaken on Structure B28 were completely backfilled at the end of the 2002 field season.

Structure A13

The second epicentral locus selected for limited investigation during 2002 was the summit of Structure A13 ([Figures 9 and 10](#)). Structure A13 was clearly a dynastic building, possibly associated with accession (Beetz and Satterthwaite 1981). It had 3 stelae set along the base of its long western stairway; most relate to a single largely unknown dynastic individual once called "Flaming Ahau" (Houston 1987). Earlier tests at the base of the Structure A13 stairway did not find good preservation. The goal of the 2002 field season was to determine if a superstructure in fact existed on the summit of Structure A13 and to gain information on its overall plan and form. As currently envisioned, deeper penetration may come in a future field season.

Suboperation C21A consisted of a 4 m (E-W) by 2 m (N-S) excavation placed at the base of Structure A13 on its main axis over the hole that was left from the removal of Caracol Stela 6 by Linton Satterthwaite. This investigation was carried out by Stephen Houston in 1986 and recovered parts of a poorly preserved plaster floor, poorly fashioned risers at the excavation's eastern extent, and recent trash that had been thrown into the cavity created by the removal of the stela.

Suboperation C161B began as an areal excavation measuring 3.04 m north-south by 6.80 m east-west. Once the humus was stripped over this entire area and the recovered stones were drawn ([Figure 11](#)), the excavation was subdivided again for a 2 m wide penetrating excavation along its southern side ([Figure 12](#)). This penetrating excavation proceeded with two deeper excavations, one along the western limit of the excavation exterior to the recovered line of stone representing a summit platform and one within the central part of the summit substructure. The westernmost probe recovered two earlier plaster floors and a core matrix composed of loose earth into which large flat stones were bedded. Excavation penetrated 2.6 m into this core before halting. The central excavation recovered five superimposed floors. Two of the lower floors were equivalent to floors found in the western probe. All of these floors were sealed beneath the core of the latest substructure as represented by the fill and facing shown in [Figure 11](#). This latest fill and facing also covered a circular pit that had been cut minimally through the bottom four floors ([Figure 12](#)). Located within this pit were two sets of superimposed caches vessels.

Special Deposit C16B-1 was placed within a pit with a diameter of some 65 cm dug some 1.5 m into earlier constructions within Structure A13 ([Figure 13](#)). Based on stratigraphy, the deposit appears to have been sealed only by the latest construction at this locus on the summit of Structure A13. Superimposed paired cache vessels were set within the pit ([Figure 14](#)). The upper cache vessel set consisted of lip-to-lip dishes ([Figure 15a](#)) placed 1.1 m below the present surface; the second lidded cache vessel was in the form of a barrel ([Figure 15b](#)) and had been placed at a lower level in the pit, some 1.4 m below the present surface. The upper cache set contained a jadeite bead, a pearl, a piece of decomposed pyrite from a mirror, and purposefully included animal bone. All the contents of this cache show indications have having been burnt *in situ*. The contents of the lower cache resembled the first in that they also contained a jadeite bead, a pearl, and animal bone. While the contents of the two cache vessels resemble the unimpressive contents of Late Preclassic caches from deep within Structure A6, both the vessel forms and the paired vessel set in a single deposit are similar to one of the caches recovered from behind Structure A1 that dated to the onset of the Late Classic Period.

Suboperation C161C was designated for an areal excavation that straddled a visible platform corner for a northern structure on the summit of Structure A13. The excavation was in the form of an "L" and measured 7.52 m by 4 m at its greatest extent and 5 m by 1.5 m at its shortest. Only the overlaying humus was stripped from the underlying stones within this excavation; these materials were then planned ([Figures 16 and 17](#)). No significant artifactual materials were recovered.

Suboperation C161D measured 3.5 m by 4 m and was set tangent to Suboperation C161C so as to be able to define the relationship between the northern and central platforms on Structure A13. Only the humus layer was again removed. Unfortunately, the stone scatter below the humus did not delineate clear architectural relationships ([Figures 16 and 17](#)). The only artifact recovered of note was a circular ceramic whistle that portrayed arms and male genitalia, but was missing its head.

Structure A13 Summary. The excavations undertaken on Structure A13 revealed that three small platforms - and no formally constructed buildings - surmounted this huge edifice, at least in its final form. These same investigations also indicated that there was a very complex construction history at this locus with numerous plaster floors. Based on the

presumed dating of the cache vessels found within the latest version of the middle platform, it would appear that the Structure A13 substructure gained its final form in the early part of the Late Classic Period - or at a time coeval with the three stela that were set in front of this building.

All excavations were backfilled at the end of the field season.

Northeast Acropolis Plaza

Another locus selected for excavation during 2002 was the plaza area immediately south of and tangent to the unexcavated palace Structure B33. The plaza area, rather than the structure was selected for investigations for several reasons. First, the unexcavated Structure B33 is palace-like in form and, therefore, not likely to have housed deposits. Second, Structure B34, the group's east-focused pyramid has already been excavated, revealing a series of burials and caches (D. Chase and A. Chase 2003). Perhaps the most interesting material recovered in this earlier excavation was deep below the plaza in front of Structure B34. A major Protoclassic interment was recovered (A. Chase and D. Chase n.d.) as well as a Late Preclassic building resembling early shrines known from the North Acropolis at Tikal (Coe 1990). Based on spatial proxemics, it was believed that the likelihood was good that similarly early remains lie under the plaza in the vicinity of the Structure B33 axis. Given the high status of the early Structure B34 remains, it was felt that an excavation through the hard Late Classic floor matrices marking the upper 2 m of plaza fill in front of Structure B33 would yield similarly unique remains.

Suboperation C117D consisted of a 2 m (E-W) by 4 m (N-S) excavation placed directly on axis, but in front of, Structure B33 ([Figure 18](#)). The materials under the surface mimicked the fill sequence for the latest plaza that had been recovered in front of Structure B34. Directly under the surface, which essentially represented the latest decomposed plaza floor, was an extensive layer of dry core fill composed of large unshaped boulders. These rocks rested on a densely packed dirt matrix that was largely devoid of stone, but was full of sherds, lithics, faunal bone, and other trash that dated to the later part of the Late Classic Period. As in the earlier eastern excavation, at a depth of just over 2 m below the present surface, an earlier plaza flooring was encountered. This surface abutted a plaster coating that overlay the bottom row of a set of two ripped-out steps at the northern end of the excavation. These steps had been constructed directly on an even earlier plaza floor. Beneath this second plaza floor a series of partial plaster floors were encountered. Four of these, all visible on the section ([Figure 18](#)) clearly represent earlier plaza surfaces. The uppermost of these four mid-level floors sealed a pit that cut through the three earlier floors on the southern limit of the excavation ([Figure 19](#)). Excavation within this pit recovered a cache immediately tangent to the southern excavation limit ([Figure 20](#)). Two meters below the bottom mid-level floor, bedrock was encountered. The final plaza flooring rested 20 cm above bedrock and articulated with the corner of an earlier Late Preclassic substructure, which rose to a height of 1 m above this floor and was preserved in the northeastern corner of the deeper excavation ([Figures 22](#) and [23](#)). In the fill immediately overlying this early construction, a jadeite bead and carved conch shell artifact were recovered Ð perhaps indicative of ritual termination.

The earlier building was not penetrated. The excavation was completely backfilled at the end of the field season.

Special Deposit C117D-1 consisted of lip-to-lip cache bowls ([Figure 15c](#)) placed within a specially dug pit that was sealed by a continuous plaster floor ([Figures 19](#) and [20](#)). Based on the stratigraphic sequencing known for the Northeast Acropolis, this cache was deposited well before the Protoclassic burial recovered in front of Structure B64 that can be dated to approximately A.D. 150. As recovered, the two cache bowls were set lip-to-lip and sealed an open-air hollow. A shallow dirt level within the lower vessel contained 9 pomacia shells, 1 shell bead, 1 jadeite bead, 1 miniature carved stingray spine in mica ([Figure 21](#)), and 1 miniature carved stingray spine in conch shell. In the Belize Valley caches containing pomacia shells are generally dated to the Late Preclassic (J. Awe, personal communication, 2002).

Structure F2

The fourth focus for the 2002 field season was the completion of the Structure F2 excavation. Structure F2 is the eastern building in the Northwest Group. It was savagely looted from its northern side into its center at some point prior to 1985. Structure L3, a similarly situated eastern building connected to the epicenter by causeway, yielded an elite tomb and a painted text dating to A.D. 613 (A. Chase and D. Chase 1987:41-43). Thus, given its prominence, there was a possibility that Structure F2 could contain similar epigraphic material. In 1991 the looted building was cleaned up and a

trench through its front medial axis was excavated to plaza level, recorded, and then backfilled. While two secondary burials were encountered in the building core and two cist burials were found in the plaza to the front of the building, no formal tombs or caches were encountered by the Caracol Project investigations. The looters also appear to have failed to locate deposits. In order to determine conclusively that there was no formal axial deposit on this important eastern structure, the rear medial axis was trenched during 2002 in order to almost fully complete the axial section ([Figure 24](#)). The lack of a tomb in this important eastern building is significant, especially when contrasted with the tomb recovered in the rear of Structure F4, the plaza's western building, that was excavated in 1986 and contained the remains of 24 redeposited individuals (D. Chase 1994; D. Chase and A. Chase 2003).

Suboperation C79B was a trench on axis to Structure F2. It measured 12.75 m east-west by 2.0 m north-south. The southern edge of the trench was tangent to the looter's excavation, which had penetrated the building from its northern side ([Figure 24](#)). The recovered stratigraphy revealed a very rich and complex history at this locus. The trench succeeded in recovering remains of the latest construction in the form of a doorjamb and patched floors. Painted stucco decoration found in the western collapse indicated that the building had once been elaborately decorated. Some 65 cm below the latest version of Structure F2 lay an earlier structure summit representing Structure F2-2nd. This version of Structure F2 had a step up into a rear room; its front room was covered by three sequent plaster surfaces. Two even earlier versions of Structure F2, at least as represented by elevated plaster floors, were found deep within the dry core fill. The remains of four sequent stairways were recovered in the western flank of the mound. Immediately west of the latest stairway and sealed only by the latest plaza floor was the burial of an elderly articulated individual, S. D. C79B-1. An even earlier burial, S.D. C79B-3, sealed by three plaster surfaces, lay further west within the plaza to the front of Structure F2. Two disarticulated interments of young adults, S.D. C79B-2 and S.D. C79B-4, were recovered deep within the building core. Because of the lack of ceramic markers, it is difficult to tightly date these interments (although they are surely Late Classic based on stratigraphy and accompanying fill material). Eventually, the excavation in the interior of Structure F2 had to be stopped because of the instability of the dry core fill that made up the bulk of the building core. The excavation was backfilled at the end of the 1991 field season.

Special Deposit C79B-1 consisted on an articulated supine individual placed within a cist below the base of the lowest step for Structure F2. The head of the individual was located in the south end of the cist and the legs were flexed at the north end. Large capstones covered the body, but the walls of the cist were not lined with stone ([Figure 26](#)). The individual was an older adult male who had had considerable ante-mortem tooth loss. No ceramic vessels accompanied the burial, but a shell disc and a bone needle were included with the body.

Special Deposit C79B-2 consisted of the disarticulated remains of minimally two individuals. Neither individual had complete skeletal remains. The bone was located deep in the core of Structure F2, 2.6 m below the summit of the mound and east of the recovered door jamb that appears on section. The remains were concentrated within a limited area in the dry core fill of the structure. The two individuals were identified as an adult male, based on the manubrium/sternum ratio, and an unsexed individual less than 19 years of age; several extra teeth were also recovered from this deposit.

Special Deposit C79B-3 was a cist burial covered with slabs that began 1 m east of the western excavation limit. A single supine individual with head to the south and legs slightly flexed at the knees was placed within the unlined cist ([Figure 27](#)). Only 5 teeth were recovered with the burial; most had been lost well before death. The older individual was probably male based on the mandible. No purposefully included artifactual materials were recovered with the interment.

Special Deposit C79B-4 was recovered in a concentrated area deep within the core of Structure F2, east of and below S.D. C79B-2. The burial consisted of the disarticulated remains of what was apparently a single individual. Based on the sacrum, the individual was tentatively identified as a female and the teeth provided an age of approximately 21 years at the time of death. An obsidian inlay found with the bones may have once graced a perishable artifact included with the interment.

Suboperation C79C was an extension of the axial trench during the 2002 field season. The excavation extended the axial trench in Structure F2 an additional 3.1 meters east, probing beyond the eastern limit of the looters' pit. The investigation was 2.5 m in width (N-S). In the course of carrying out this excavation, the rear facing for Structure F2-2nd was encountered and the dry core fill to the west of this facing was dug to a depth of over 4.1 m below present ground surface ([Figure 25](#)), ending at an early plaster floor. No deposits were encountered. The excavation was backfilled at the

conclusion of the field season.

Structure F2 Summary. The lack of any formal interments within the core of Structure F2 is surprising given the prominence of this eastern building. The non-conformity of this eastern building with Caracol's standard mortuary pattern is highly suggestive that the Northwest Group's main function was not residential in nature. Further research is needed to understand better how this structure and group articulated with the rest of the site.

Caana Structure B19 Text

Consolidation on Caana was ongoing in February and March of 2002. One of the foci was Structure B19 and the stabilization and reconstruction of the two lateral sets of rooms set to either side of the substructure's main stairway. The stabilization effort had revealed accidentally the edge of a stucco cornice that had been buried within the wall of the room blocking access to the northeast court. With the permission of the Department of Archaeology and the assent of IDB Tourism Development Project, this cornice was exposed and drawn ([Figures 28](#) and [29](#)). It constitutes the majority of the cornice for the eastern side of the eastern lateral B19 basal suite of rooms. Most interestingly, it is separated into two registers. The northernmost register is clearly modeled in the form of a caiman with a water symbol on its snout. The southern register is both lower and slight inset from the northern register and contains a framed panel of 5 glyph blocks of minimally 8 hieroglyphs. The first two glyph blocks include the 1 Ahau 8 Zac and the literally translated phrase "his second penis event." The third glyph block opens with the possessive *ya* and two modifiers followed by "K'an," Caracol's all-popular royal name. The fourth glyphic block contains titles and is followed by the Caracol Emblem in Glyph Block 5, which ends the text. Based on Caracol's known dynastic sequence, on Caana's stratigraphic sequence, and on the unknown K'an name included in the text, the date 1 Ahau 8 Zac probably refers to 9.16.1.6.0, although 9.13.8.11.0 (and possibly 9.18.14.1.0) cannot be ruled out conclusively. After being drawn, the IDB Tourism Development Project graciously agreed to incorporate this stucco text within its stabilization efforts.

Articulation with the IDB Tourism Development Project

The artifactual materials that are being recovered during the course of stabilizing efforts by the IDB Tourism Development Project are being processed by the Caracol Archaeological Project and are being collected within an extension of the CAP field system, using the modifier "CD" for "Caracol Development" within a newly established running series of Operations. The formal processing of the IDB artifactual materials was begun during the 2002 field season with the cataloguing and drawing of most of the recovered materials that were identified as "specials" by the stabilizers (including the carved bone on the title page from Structure B4 stabilization). While some coordination is possible when both the research and tourism projects are together in the field, as is evident in the recording of the new Caana stucco text (see above) and in the ability to photograph stucco materials as they are discovered in the field (see [Figure 30](#)), it is the drawings, photographs, and other records that permit a fuller picture both of finds made during the stabilization efforts and of the data necessary to help guide consolidation efforts. Towards these ends, there has been a sharing of drawings and photographs between the two conjoined projects. In accord with these goals, the records and vessels for two open tombs, which were excavated under the auspices of the IDB Tourism Development Project, were provided to the Caracol Archaeological Project at the end of the 2002 field season and are presented here.

S.D. CD5-1 is an open tomb that was encountered within Structure B145, an eastern construction south of Reservoir C ([Figure 31](#)). The tomb was open on its southern end and was excavated in May 2001 ([Figure 32](#)). It was colloquially referred to as "the caretakers' tomb." Disarticulated bone and two ceramic vessels ([Figure 34a](#) and [b](#)) occupied the northern extent of the chamber. Two other ceramic vessels ([Figure 34c](#) and [d](#)) were along the western wall. It is possible that the remains of an articulated individual with head to the south were associated with these latter two vessels. Neither the human remains nor information pertaining to them, however, was available for analysis. Still, it would appear that minimally 2 individuals had been placed within the chamber based on the two sets of mortuary vessels recovered in the chamber. The ceramic vessels date the use of the chamber to the middle of the Late Classic Period.

S.D. 13A-1 is an open tomb encountered within Structure 4H6, an eastern building east of the old "Caracol Camp" turnoff to the site (ca. 2 kilometers east of the epicenter). The chamber was excavated in December 2001 by IDB personnel. As found, the tomb had a small entranceway into it that was centered like a niche in the lower building step (see [Figure 33](#)). Large rubble blocks had collapsed into a circular chamber leaving a series of small air holes. The

remains of 3 disarticulated individuals - 2 adults and one of a younger age - were recovered. Five incisors were inlaid with jadeite (2) and pyrite (3). A pair of squarish jadeite beads was also recovered from the tomb. Two ceramic vessels ([Figure 34e](#) and [f](#)) associated with the chamber permit it to be dated to the Late Classic era.

Summary

The 2002 research at Caracol attempted to find human remains and hieroglyphic texts attributable to one polar end of the site's social matrix or to rule out certain areas as potentially containing such remains. While the human remains were elusive, new texts were found and recorded. Even though three strategically placed east-focused structures were investigated, no major burials were encountered – something that is surprising given Caracol's proclivity for east-structure focused mortuary deposits. In some cases, such as in Structure B28, it was impossible to excavated deeply enough to conclusively rule out the locus as having housed a royal burial. In other instances, such as in Structure A13, any royal interment would likely pre-date the dynastic record found on Caracol's carved monuments. The completion of the Structure F2 trench without recovering ritual deposits in the core of the building leaves the Northwest Group as something of an enigma in terms of its function. However, excavations at the Structure B28 locus recovered fragments of a new stela that dates to the end of the Late Classic Period and investigations in Structure A13 recovered a cache that dates to the onset of the Late Classic era. A deep excavation immediately south of Structure B33 in the Northeast Acropolis yielded both a Preclassic cache and building substructure; future research within this area has the potential to provide very early remains that should shed light on Caracol's early elite. The two new hieroglyphic texts associated with Structure B19 and Stela 25 provide tantalizing clues about Caracol's Late Classic dynastic history, but also re-emphasize how much is still missing. Making a formal archaeological link between the Caracol's hieroglyphic record and its archaeology is extremely important not only for understanding the site's full social matrix but also for contradicting current indications that such a linkage does not, in fact, exist. Without the ability to firmly establish this link, it may prove necessary to formulate alternative models for Late Classic Maya society at sites like Caracol and to reexamine the degree to which epigraphic statements and archaeological data can or should be correlated.

Acknowledgements. The major parts of Figures 2a, 2b, 3, 7, 11, 12, 17, 18, and 24 were drafted by Amy Morris. The IDB Tourism Development Project, directed by Jaime Awe, provided original drawings for the Structure B145 tomb and copies of notes and drawings relevant to the Structure 4H6 tomb, as well as the actual vessels for the drawings done by the CAP shown in Figure 34; a large copy of the new Structure B6 mask drawing was also graciously provided (not illustrated in the above report).

References

Anderson, A.H.

1958 "Recent Discoveries at Caracol Site, British Honduras." Proceedings of the 32nd International Congress of Americanists. Copenhagen.

Beetz, Carl P. and Linton Satterthwaite

1981 The Monuments and Inscriptions of Caracol, Belize. University Museum Monograph 45. University of Pennsylvania, Philadelphia.

Brady, James E.

1989 An Investigation of Maya Ritual Cave Use with Special Reference to Naj Tunich, Peten, Guatemala, Ph.D. dissertation, University of California, Los Angeles.

Carrasco Vargas, Ramon, Sylviane Boucher, Paula Alvarez Gonzalez, Vera Tiesler Blos, Valeria Garcia Vierna, Renata Garcia Moreno, and Jaview Vazquea Negrete

1999 "New Evidence on Jaguar Paw, A Ruler from Calakmul." Latin American Antiquity 10(1):47-58.

Chase, Arlen F.

1992 "Elites and the Changing Organization of Classic Maya Society." In D.Z. Chase and A.F. Chase, eds., Mesoamerican Elites: An Archaeological Assessment, pp. 30-49. University of Oklahoma Press, Norman.

Chase, Arlen F. and Diane Z. Chase

1987 Investigations at the Classic Maya City of Caracol, Belize: 1985-1987, Pre-Columbian Art Research Institute Monograph 3, San Francisco.

1992 "Mesoamerican Elites: Assumptions, Definitions, and Models." In D.Z. Chase and A.F. Chase, Eds., Mesoamerican Elites: An Archaeological Assessment, pp. 3-17. University of Oklahoma Press, Norman.

1994 "Maya Veneration of the Dead at Caracol, Belize." In V.M. Fields and M.G. Robertson, eds., Seventh Palenque Round Table, 1989, Vol. 9, pp. 53-60, Pre-Columbian Art Research Institute, San Francisco.

1996 a "The Organization and Composition of Classic Lowland Maya Society: The View from Caracol, Belize." In M.G. Robertson, M. Macri, and J. McHargue, Eds., Eighth Palenque Round Table, 1993, pp. 213-222, Pre-Columbian Art Research Institute, San Francisco.

1996 b "A Mighty Maya Nation: How Caracol Built an Empire by Cultivating its ÔMiddle Class." Archaeology 49(5):66-72.

1998 "Late Classic Maya Political Structure, Polity Size, and Warfare Arenas." In A. Ciudad Ruiz et al., Eds., Anatomia de una civilizacion: Aproximaciones Interdisciplinarias a la Cutura Maya, pp. 11-29, Sociedad Espanola de Estudios Mayas, Madrid.

2000 "Sixth Century Change and Variation in the Southern Maya Lowlands: Integration and Disbursement at Caracol, Belize." In Joel D. Gunn, Ed., The Years Without Summer: Tracing A.D. 536 and Its Aftermath, pp. 55-65, BAR International Series 872, Archaeopress, Oxford.

2001 "The Royal Court of Caracol, Belize: Its Palaces and People." In T. Inomata and S. Houston, Eds., Royal Courts of the Ancient Maya, Volume Two: Data and Case Studies, pp. 102-137, Westview Press, Boulder.

n.d. "Problems with the Protoclassic: Ceramic Seriation, Maya Diversity, Archaeological Context and Data from Caracol, Belize." Unpublished paper.

Chase, Arlen F., Nikolai Grube, and Diane Z. Chase

1991 "Three Terminal Classic Monuments from Caracol, Belize," Research Reports on Ancient Maya Writing, Number 36, Center for Maya Research, Washington, D.C.

Chase, Diane Z.

1994 "Human Osteology, Pathology, and Demography as Represented in the Burials of Caracol, Belize." In D.Z. Chase and A.F. Chase, Eds., Studies in the Archaeology of Caracol, Belize, pp. 123-138. Monograph 7. Pre-Columbian Art Research Institute, San Francisco.

1998 "Albergando a los Muertos en Caracol, Belice." Los Investigadores de la Cultura Maya 6(1):9-25, Universidad Autonoma de Campeche, Campeche.

Chase, Diane Z. and Arlen F. Chase

1996 "Maya Multiples: Individuals, Entries, and Tombs in Structure A34 of Caracol, Belize," Latin American Antiquity 7(1):61-79.

1998 "The Architectural Context of Caches, Burials, and Other Ritual Activities for the Classic Period Maya (as Reflected at Caracol, Belize)." In Stephen D. Houston, Ed., Function and Meaning in Classic Maya Architecture, pp. 299-332, Dumbarton Oaks, Washington, D.C.

2002 "Patrones de Entierramiento y Ciclos Residenciales en Caracol, Belice." Paper presented at the IV Mesa Redonda de Palenque, Palenque, Mexico, June 16, 2002.

2003 "Seculares, Sagrados, y Revisitados: La Antigua Profanacion, Perturbacion y Reconsagracion de los Enterramientos Mayas." In A. Ciudad et al., Eds., La Muerte en la Cultura Maya, SEEM, Madrid (July).

Coe, William R.

1959 Piedras Negras Archaeology: Artifacts, Caches, and Burials. The University Museum, University of Pennsylvania, Philadelphia.

1990 Excavations in the Great Plaza, North Terrace, and North Acropolis of Tikal (Group 5D 2). Tikal Report 14. The University Museum, University of Pennsylvania, Philadelphia.

Demarest, Arthur A., Hector Escobedo, Juan Antonio Valdes, Stephen Houston, Lori Wright, and Katherine Emery

1991 "Arqueologia, Epigrafia y el Descubrimiento de una Tumba Real en el Centro Ceremonial de Dos Pilas, Peten, Guatemala." U tz'ib 1(1):14-28.

Fitzsimmons, James L.

1998 "Classic Maya Mortuary Anniversaries at Piedras Negras, Guatemala." Ancient Mesoamerica 9(2):271-278.

Grube, Nikolai

1994 "Epigraphic Research at Caracol, Belize." In D.Z. Chase and A.F. Chase, Eds., Studies in the Archaeology of Caracol, Belize, pp. 83-122. Monograph 7. Pre-Columbian Art Research Institute, San Francisco.

Harrison, Peter D.

1999 Lords of Tikal: Rulers of an Ancient Maya City. Thames and Hudson, New York.

Houston, Stephen D.

1987 "Notes on Caracol Epigraphy and Its Significance." In A. Chase and D. Chase, Investigations at the Classic Maya City of Caracol, Belize: 1985-1987, Appendix 2, pp. 85-100. Monograph 3. Pre-Columbian Art Research Institute, San Francisco.

1991 "Appendix: Caracol Altar 21." In M.G. Robertson and V. Fields, Eds., Sixth Palenque Round Table, 1986, pp. 38-42. Pre-Columbian Art Research Institute, San Francisco.

Houston, Stephen D. and Hector Escobedo

2003 "Mensajes del "Mas Alla": La Muerte en Piedras Negras, Guatemala." In A. Ciudad et al., Eds., La Muerte en la Cultura Maya, SEEM, Madrid (July).

Houston, Stephen, Hector Escobedo, Mark Child, Charles Golden, Rene Munoz, and Monica Urquizu

1998 "Monumental Architecture at Piedras Negras, Guatemala: Time, History, and Meaning." Mayab 11:40-56.

Martin, Simon and Nikolai Grube

2000 Cronicle of the Maya Kings and Queens: Deciphering the Dynasties of the Ancient Maya, Thames and Hudson Ltd. London.

Pendergast, David

1979 Excavations at Altun Ha, Belize, 1964-1970. Volume 1. Royal Ontario Museum, Toronto.

Ruz Lhuiller, Alberto

1953 "The Mystery of the Temple of the Inscriptions." Archaeology 6(1):3-11.

Satterthwaite, Linton

1954 "Sculptured Monuments from Caracol, British Honduras." University Museum Bulletin 18:1-45.

Schele, Linda and Peter Mathews

1998 The Code of Kings: The Language of Seven Sacred Maya Temples and Tombs. Touchstone, New York.

Sharer, Robert J.

1990 Quirigua: A Classic Maya Center & Its Sculptures. Carolina Academic Press, Durham.

1997 "K'inich Yax K'uk Mo', the Foundation of the Copan Dynasty, and Mesoamerican Interaction." Unpublished paper presented in "A Tale of Two Cities: Copan and Teotihuacan." May 1997, Harvard University.

Traxler, Loa P.

2001 "The Royal Court of Early Classic Copan." In T. Inomata and S. Houston, Eds., Royal Courts of the Ancient Maya, Volume Two: Data and Case Studies, pp. 46-73. Westview Press, Boulder.

Traxler, Loa P. and Robert J. Sharer

2003 "Las Tumbas de los Primeros Reyes y Reinas de Copan." In A. Ciudad et al., Eds., La Muerte en la Cultura Maya, SEEM, Madrid (July).

Valdes, Juan Antonio and Federico Fahsen

1995 "The Reigning Dynasty of Uaxactun During the Early Classic: The Rulers and the Ruled." Ancient Mesoamerica 6(2):197-219.

TABLE 1:

Caracol Project Members: 2002 Field Season

Staff:

Arlen F. Chase C1

Diane Z. Chase C2

Amy Morris C111
Amy Murphy C118
Jorge Garcia C144
Mark Earl Jacobs C145
Justin Kiner C146
Charles George C149
Amanda Groff C150
Michael Huff C151
Ben Marshall C152
Belizean Labor:
Consuelo Tzib
Rosa Gladiz Melera
Darlen Guadalupe Santos
Carlos Ivan Mendez
Eric Manzanero
Ubildo Howe
Oscar Luis Gamez
Victor Manuel Carrillo
Marvin Alexander Chable

Figures

[Figure 1](#). Epicentral Caracol showing the locations of Structures A13, B28, B33, and F2, all areas of investigation during the 2002 field season.

[Figure 2a](#). Section through Structure B28: summit.

[Figure 2b](#). Section through Structure B28: base.

[Figure 3](#). Plan of excavations at the base of Structure B28 showing distribution of new stela Fragments and other large stones.

[Figure 4](#). Photograph of the basal excavation of Structure B28 showing large stones in front of the lower step.

[Figure 5](#). Photograph of the fragments of Caracol Stela 25 *in situ*.

[Figure 6](#). Drawing of the recovered fragments of Caracol Stela 25.

[Figure 7](#). Plan of stones within summit trench representing the upper platform of Structure B28.

[Figure 8](#). Photograph of the Structure B28 summit excavation showing the platform facing.

[Figure 9](#). Plan of the top of Structure A13 showing excavation locations and the existence of three summit platforms.

[Figure 10](#). Profile of Structure A13 showing the location of Suboperation C161B.

[Figure 11](#). Plan of central platform stones uncovered in Suboperation C161B.

[Figure 12](#). Section through central platform: Suboperation C161B.

[Figure 13](#). Detail of cache pit through the lower platform floors showing the plan of S.D. C161B-1.

[Figure 14](#). Photograph of S.D. C161B-1 *in situ*.

[Figure 15](#). Cache vessels recovered from S.D. C161B-1 (a and b) and S.D. C117D-1 (c).

[Figure 16](#). Photograph of summit excavation over the northern platform.

[Figure 17](#). Plan of areal excavation undertaken as Suboperation C161C and C161D.

[Figure 18](#). Section of Suboperation C117D.

[Figure 19](#). Detail of middle part of south excavation wall in Suboperation C117D showing cache pit.

[Figure 20](#). Plan of S.D. C117D-1.

[Figure 21](#). Photograph of carved mica stingray spine from S.D. C117D-1.

[Figure 22](#). Plan of Preclassic building platform at the bottom of Suboperation C117D.

[Figure 23](#). Photograph of the Preclassic structure at the bottom of Suboperation C117D.

[Figure 24](#). Section through Structure F2.

[Figure 25](#). Photograph showing rear penetration of Structure F2.

[Figure 26](#). Plan of S.D. 79B-1.

[Figure 27](#). Plan of S.D. 79B-3.

[Figure 28](#). Photograph of the new Structure B19 text *in situ*.

[Figure 29](#). Drawing of the Structure B19 cornice text.

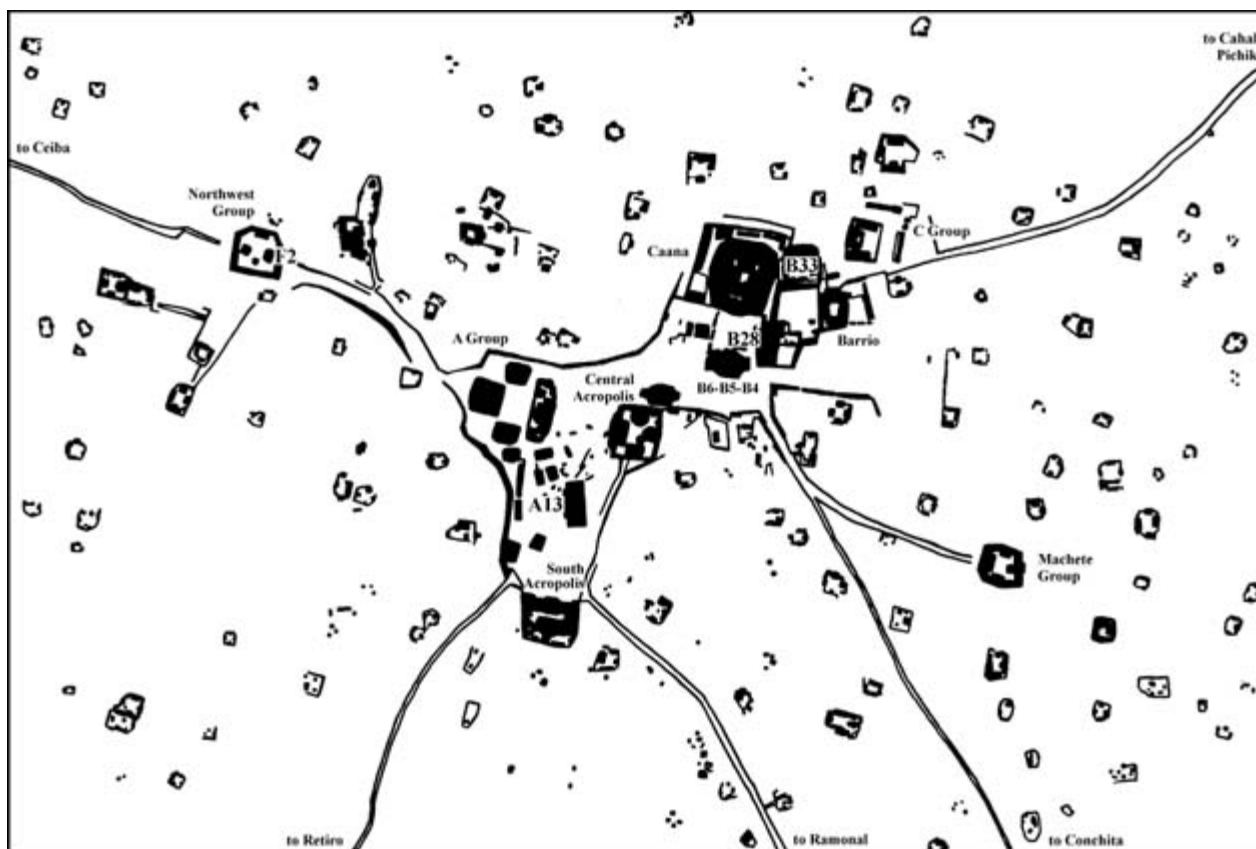
[Figure 30](#). Photograph of glyphic cartouche from upper east balustrade recovered by IDB Tourism Development Project.

[Figure 31](#). Profile of open tomb in Structure B145 excavated by the IDB Tourism Development Project.

[Figure 32](#). Plan of the tomb in Structure B145 excavated by the IDB Tourism Development Project.

[Figure 33](#). Photograph of the tomb in Structure 4H6 excavated by the IDB Tourism Development Project.

[Figure 34](#). Vessels recovered by the IDB Tourism Development Project: Structure B145 tomb (a, b, c, and d); Structure 4H6 tomb (e and f); Barrios stabilization (g).



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CARACOL, BELIZE

Epicenter & Surrounding Settlement

© Arlen F. Chase & Diane Z. Chase
Caracol Archaeological Project

Structure B28

excav. C27D



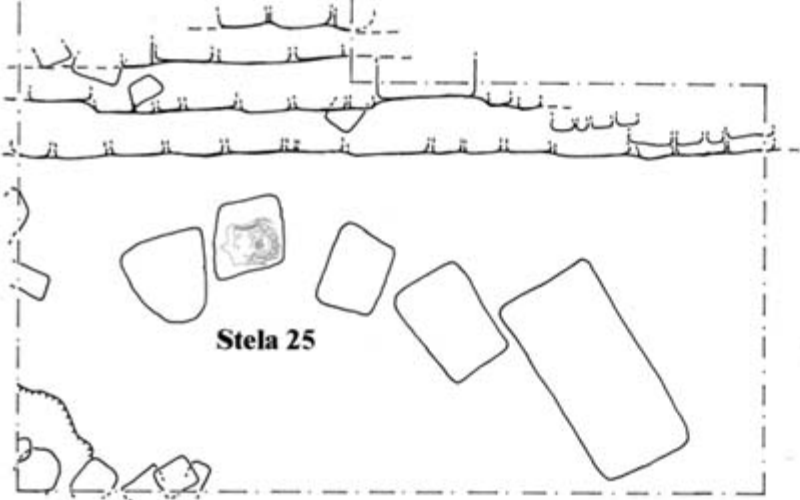
excav. C27C

Stela 25

Altar 23

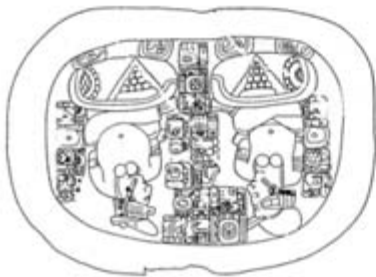
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excav. C27C



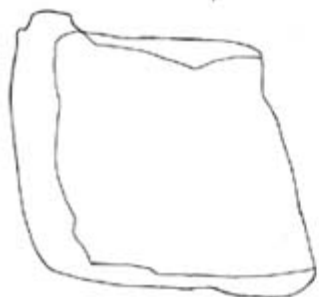
excav. C27E

Altar 23



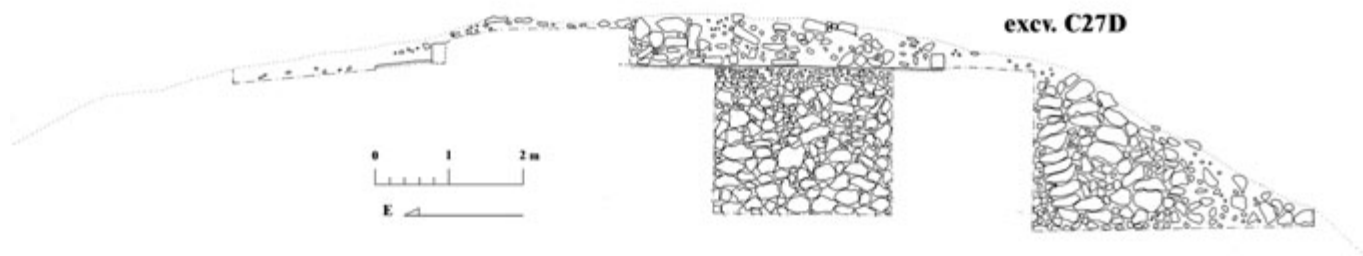






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Structure B28





Structure B28

excav. C27D

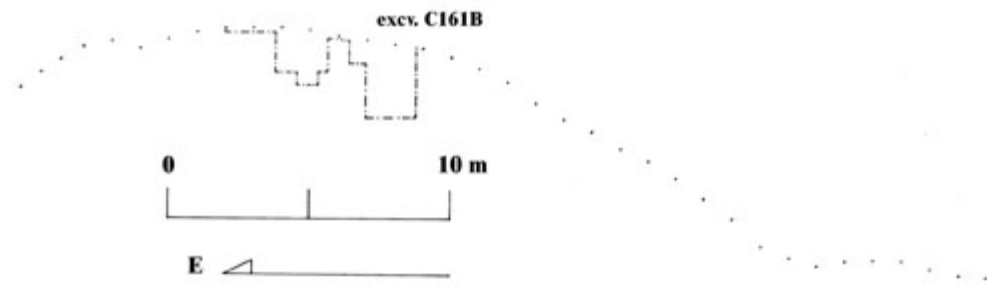




Structure A13



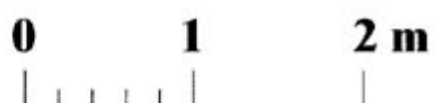
Structure A13



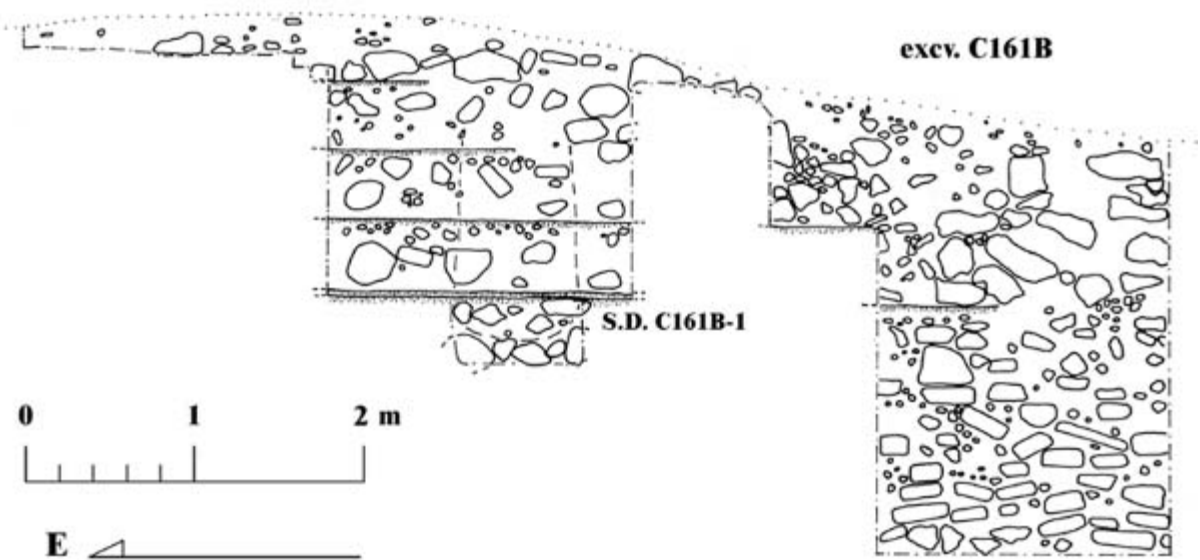


Structure A13

excav. C161B

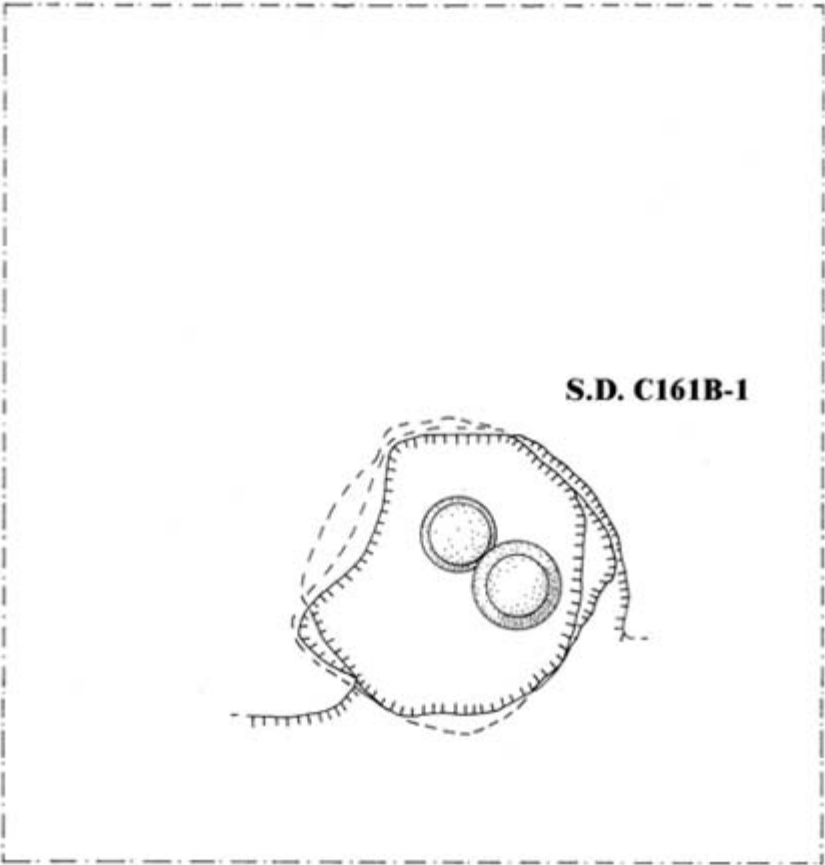


Structure A13



Structure A13

excv. 161B





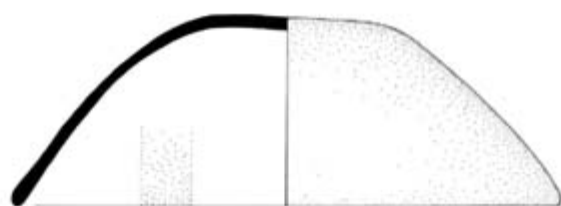


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b



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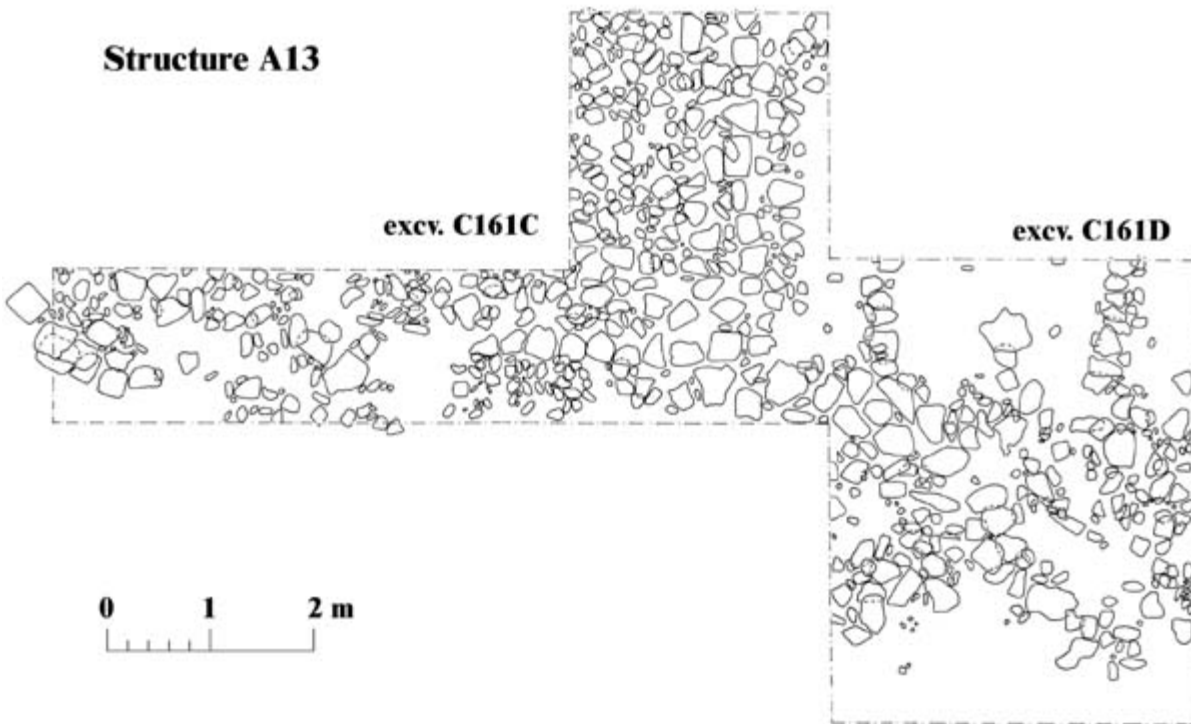


Structure A13

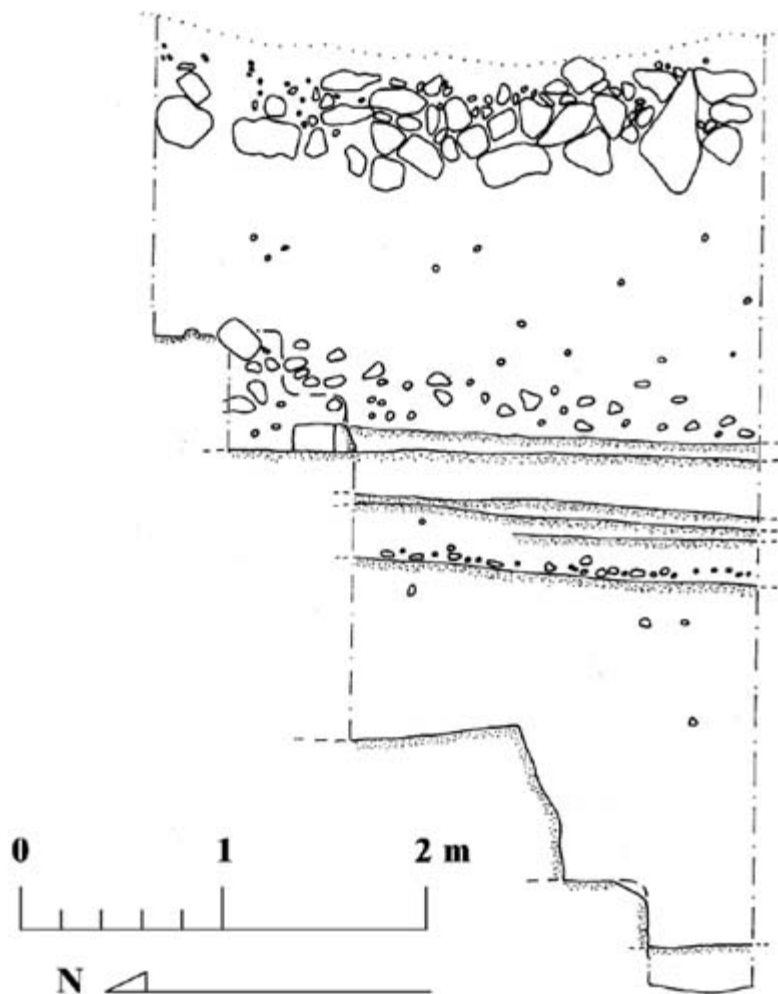
excv. C161C

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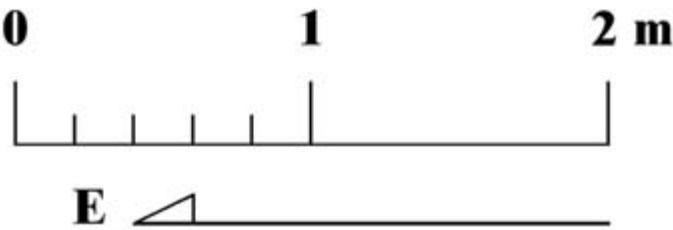
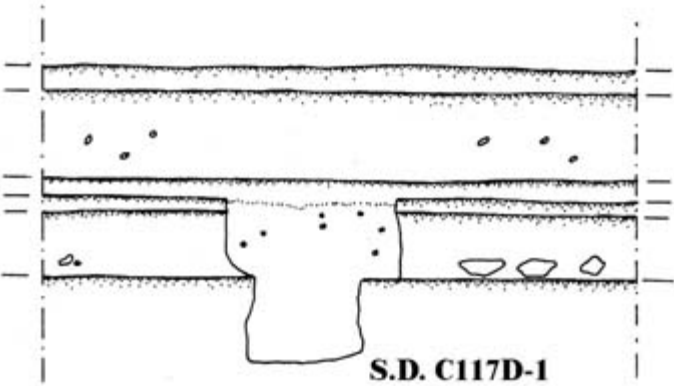
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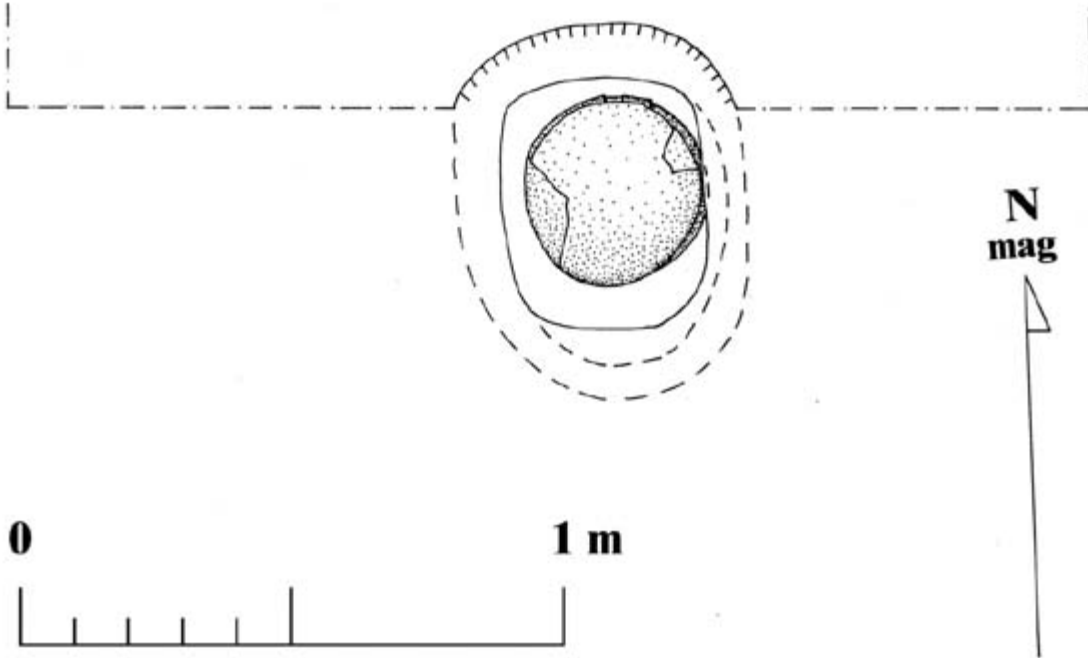
excav. C117D



excav. C117D

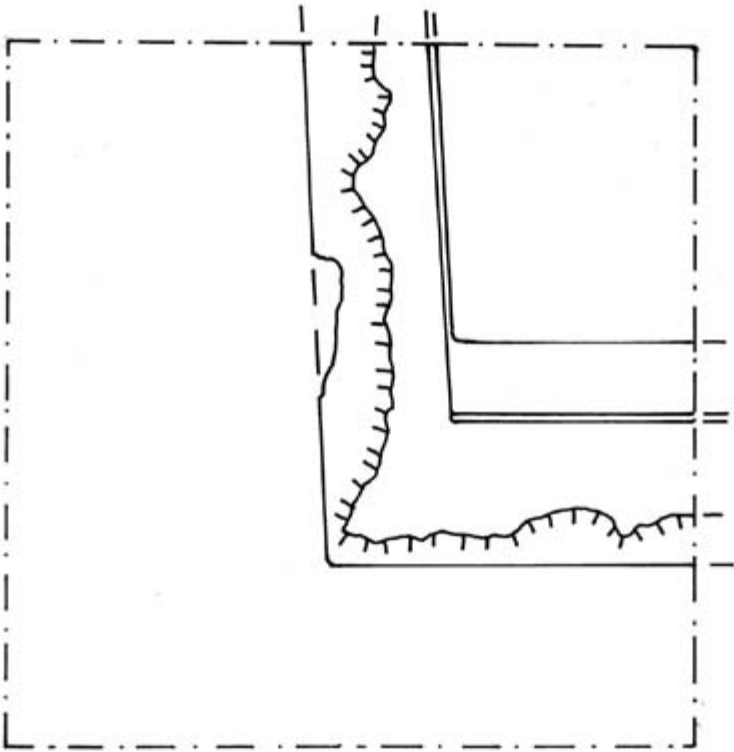


S.D. C117D-1



excv. 79D

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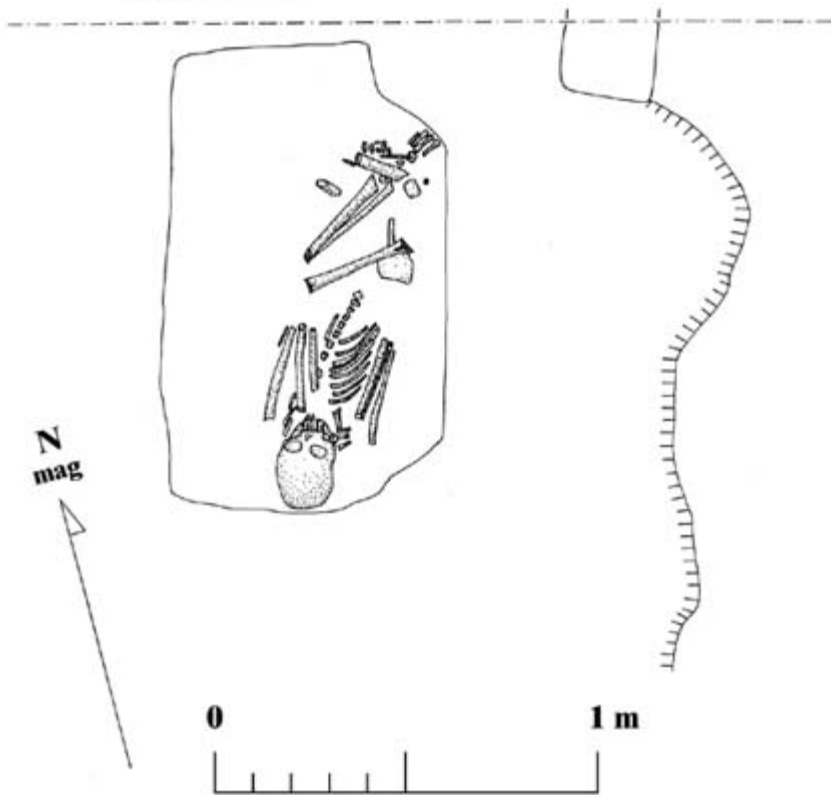


Structure F2



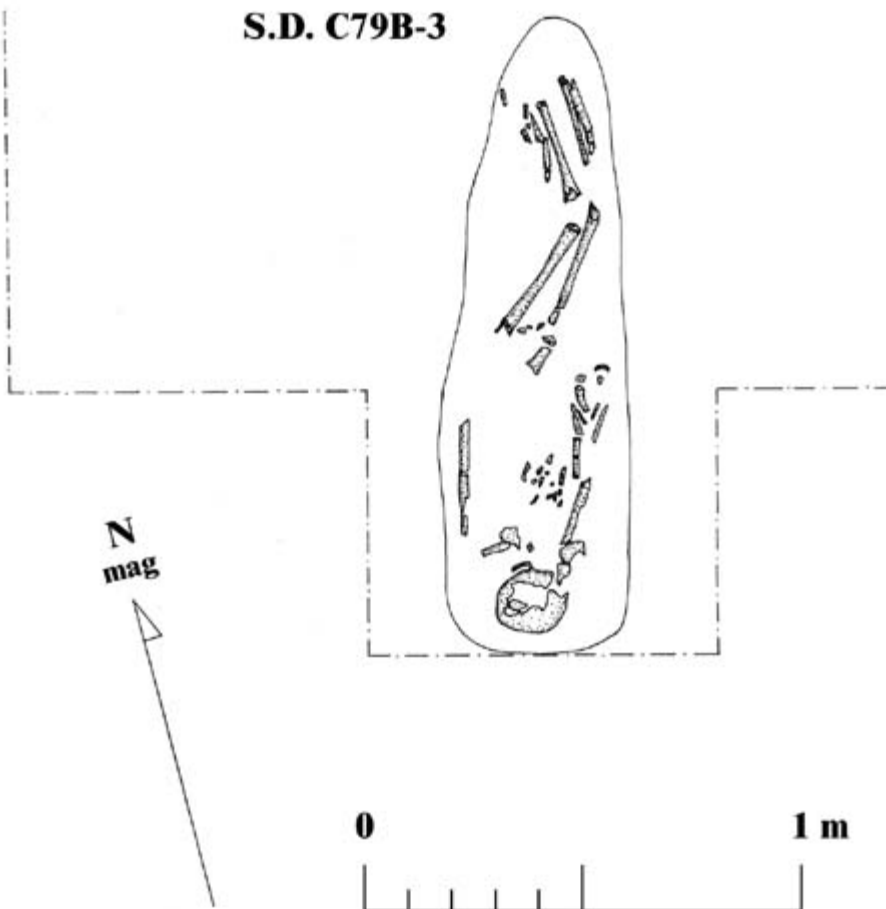
Structure F2

S.D. C79B-1



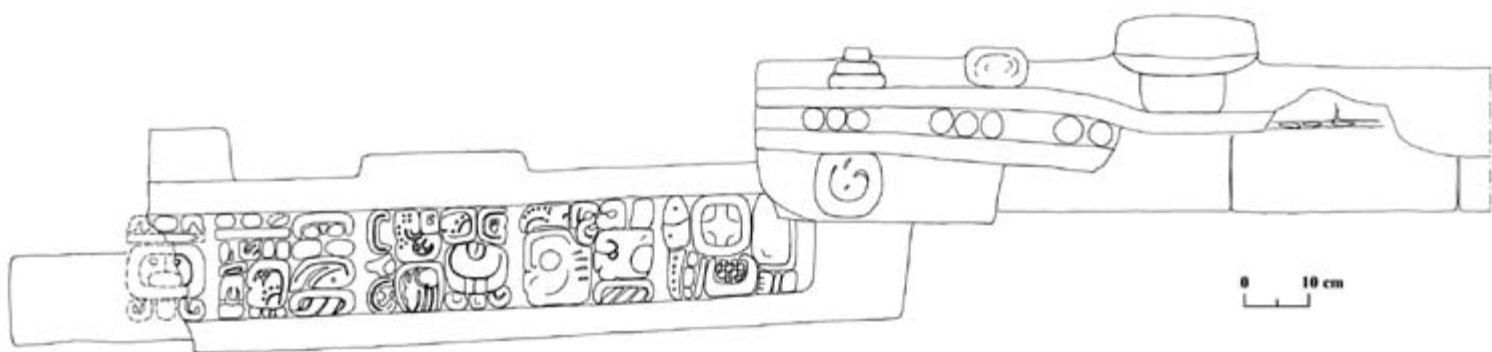
Structure F2

S.D. C79B-3



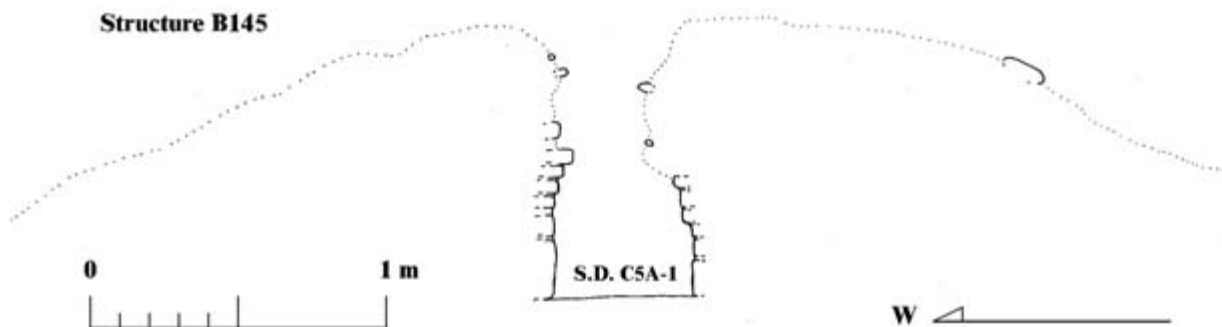






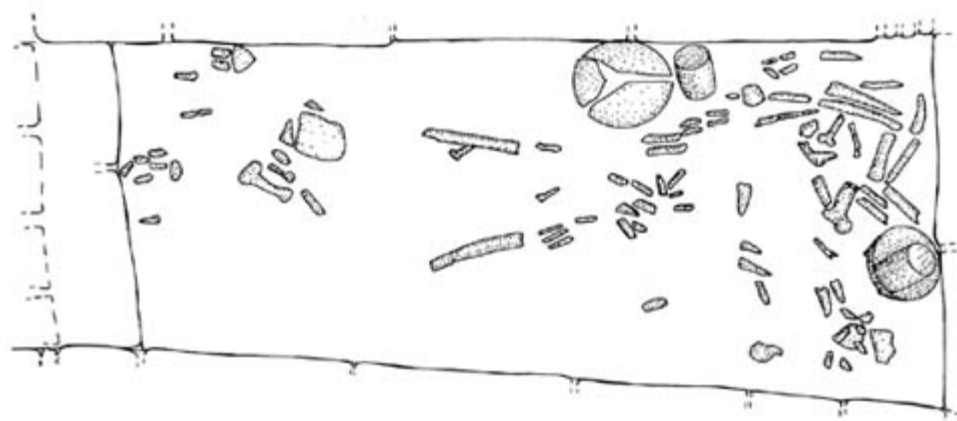


Structure B145



Structure B145

S.D. C5A-1

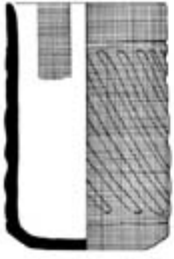


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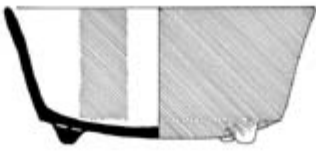


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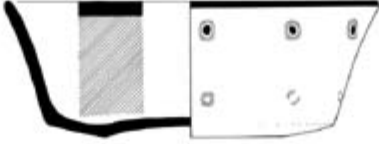
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f



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