The 26th annual report of the Blue Creek Archaeological Project

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Introduction

Remote sensing data collected in 2016 on behalf of the Northwest Belize LiDAR (Light Detection and Ranging) Consortium revealed the presence of numerous linear stone features occupying the uplands of northwestern Orange Walk district. Many of these features form polygons that enclose small plots of land, which in turn are occupied by ancient Maya residential structures. This arrangement mirrors contemporary Maya house lots, or solares, found throughout the Yucatan Peninsula. It has been proposed that these archeological and contemporary features may be functionally analogous. If true, this would demonstrate that Maya institutions of land tenure, which are well documented for Postclassic sites along the eastern coast of Quintana Roo, are of greater antiquity and geographical scope than previously thought.

In order to test this hypothesis, a series of investigations were conducted in an area with a high density of these landscape features, located approximately 2.75 km north-northwest of X’noha and 1.2 km west of the border with Mexico (Figure 1). An idealized house lot model consisting of rock walls demarcating an enclosed space, occupied by a structure, was used to identify potential research locations. Walled enclosures lacking interior residential structures are

Figure 1. Locations of AL17 operations.
also common. Operation AL17-01 involved the excavation of a trench bisecting one of the linear rock features for the purposes of obtaining chronological and construction technique data. Operations AL17-02 and AL17-03 were focused on investigating the interior spaces of these enclosures and occupation history of associated residential structures.

Methodology
Stratigraphic Excavations and Mapping
Both on-structure (AL17-02-A) and off-structure (AL17-03-A & B) stratigraphic excavations were conducted for the purpose of obtaining chronological data from the residential structures occupying house lot interiors. Excavated matrix was processed with a 1/8” mesh screen and all artifacts were collected. Structures occupying the interiors of these house lots were also surveyed using a Trimble Geo 7X1 handheld GNSS (Global Navigation Satellite System) system. Descriptions of these operations are provided in the following section.

Shovel Test Pit Program
As “empty” space comprises the majority of house lot interiors, multiple data collection methods were employed in an effort to identify activity areas and associated chronological data. Operation AL17-02-B consisted of 18 shovel test pits conducted at a 25 m interval in a grid pattern. Soil matrix was screened using 1/8” mesh, and all artifacts were collected. Results are provided in the following section.

Qualitative Phosphorus Survey
Common sources of pre-modern anthropogenic phosphorus (P) include human waste, organic refuse (e.g., plant and animal byproducts), burials, and ash from fires (Holliday and Gartner 2007:302). Of importance to archaeologists is that P is relatively immobile upon entering the soil system, thus providing a spatial indicator of past human activity. A qualitative spot test soil P survey of the AL17-02 house lot interior was conducted in an attempt to identify activity areas. Samples (n=130) were collected in a grid pattern at 10 m intervals at an average depth of 20 cm, though in some cases shallow bedrock necessitated the collection of material closer to the surface. Due to testing protocol, all samples were removed off-site and processed in the Maya Research Program field laboratory. Available P (Pav) was measured using the Luster Leaf Rapitest Soil2 P test kit. Soil was mixed with distilled water at a ratio of 1:5, stirred, and then left to settle for 24 hours due to the high clay content of the soils. After settling, the solution was extracted and placed within a container consisting of individual testing and reference chambers. The Rapitest powdered agent was then added to the testing chamber, the resulting solution mixed, and after ten minutes, the color was recorded using the reference chamber. Colors ranged from light blue for soils deficient in Pav to dark blue for those with a surplus. Detailed results of the soil P survey are presented below.

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1Trimble Geo 7X specifications: https://drive.google.com/file/d/0BxW3dqQ5gdnTRkx0STNzUTF3b0k/view
Operation AL17-01 – Linear Stone Feature

Excavations AL17-01-A, AL17-01-B, and AL17-01-C

Objectives of operation AL1-01 were to document the subsurface morphology of the linear stone feature, and to collect data on construction techniques and chronology. Work proceeded by placing a 1 m x 4 m trench across the feature (AL17-01-A). Two stratigraphic units were encountered, including a humic layer (10YR 2/1 Black) containing large amounts of chert that extended to a depth of 50 cm. What appeared to be a 90 cm wide wall (Figure 2) was encountered in the center of the trench; this feature was left intact. Excavation continued on both sides, where the humic layer transitioned to a mottled (7.5&R 5/6 Strong Brown & 5Y 7/1 Light Gray) clay loam gravel layer with a high density of chert cobbles and boulders. Few ceramics were recovered, though lithic debitage was abundant.

The trench was expanded by 2.5 m x 1 m to the east (AL17-01-B) in an effort to determine whether the lower gravel layer was natural or some sort of supporting structure for the wall. The latter may be the case, as the gravel layer only extended 70 cm to the east (Figure 3). The final suboperation (AL17-01-C) extended the entire trench by 1 m to the south and cross-sectioned the wall. Few ceramics were recovered from any of the suboperations, though lithic debitage was abundant in the first stratigraphic unit.

Figure 3. AL17-01-A:3; feature in background

Figure 2. AL17-01-B:2; profile of A:3.

Operation AL17-02 – House Lot 1

Excavation AL17-02-A

House Lot 1 contains a residential structure composed of multiple buildings sharing a large basal platform that occupies the slope of a small hill. In order to provide a level surface, the eastern edge of the basal platform has a significantly higher elevation than the western side, which is only slightly elevated above the natural landscape. A 2 m x 2 m test pit (AL17-02-A) was excavated into the interior patio, which penetrated the basal platform to bedrock. Three stratigraphic units were encountered (Figure 4), beginning with the surface level of mixed humic material and architectural collapse, underneath which was a badly deteriorated plaster floor 3 cm in thickness. The floor capped a thick layer of chert and limestone cobble fill that sat directly on bedrock. The bedrock exhibited irregular surface topography, but generally sloped from north to south (Figure 5). MRP Co-Director and Project Ceramicist Collen Hanratty attributed recovered ceramics to the Early Classic. Further excavation and artifact data are shown in Table 1.
Table 1. Excavation data for AL17-02-A.

<table>
<thead>
<tr>
<th>Lot#</th>
<th>Depth/cm</th>
<th>Matrix</th>
<th>Ceramics</th>
<th>Lithics</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL17-02-A:1</td>
<td>0-22</td>
<td>10YR 2/1 Black Silty Clay</td>
<td>1 Bulk Bag of Sherds</td>
<td>1 Bulk Bag of Debitage</td>
<td>1 Biface</td>
</tr>
<tr>
<td>Floor 1</td>
<td>22-25</td>
<td>2.5 7/1 Light Gray Plaster</td>
<td></td>
<td></td>
<td>2 Obsidian: 1 Proximal and 1 Distal Prismatic Blade Fragment</td>
</tr>
<tr>
<td>AL17-02-A:2</td>
<td>25-130</td>
<td>10YR 3/1 Very Dark Gray Silty Clay</td>
<td>1 Bulk Bag of Sherds</td>
<td>1 Bulk Bag of Debitage</td>
<td>5 Bifaces</td>
</tr>
</tbody>
</table>

Figure 4. AL17-02-A wall profiles. Datum southwest corner, 9 cm above ground surface.

Figure 5. AL17-02-A, looking north.
From the perspective of a cost-benefit analysis, the shovel test program was unproductive considering the labor investment. Only 31 pieces of chert debitage and 17 sherds were recovered, with 10 of the test pits producing no cultural material. With the exception of a single monochrome sherd decorated with a stamped design, all other ceramics were eroded. The paucity of artifacts is partly attributable to the shallow depth of bedrock (Figure 6), particularly in the western portion of the house lot along the slope. As would be expected, the soils were significantly deeper in the eastern downslope area. Most of the shovel tests in this area were not excavated to bedrock due to the presence of a layer of chert gravel that sits on top of the bedrock (Figure 7).

Figure 8 presents an artifact density map based on materials recovered from the shovel test survey. Unsurprisingly, the densest concentration was located off the back corner of the residential structure, a common location for ancient Maya middens. A moderately high concentration was detected along the downslope side of a small platform, while a similar concentration near the southeast corner of the house lot was not associated with structural remains.
Soil Phosphorus Survey

Again, in terms of cost-benefit analysis, the soil P survey was highly productive. Four people were able to collect 130 samples in one day, while laboratory processing was completed by a single person in 3 days. Figure 9 presents the survey results in the form of a density map of available P values. Similar to the shovel test data, there is an area of high Pav adjacent to the backside of the residential structure, likely representing a midden. Furthermore, multiple areas with high concentrations of Pav were detected to the north of the residential group. These results demonstrate the utility of soil P surveys, as this area, which was devoid of architectural remains and cultural landscape features, appears to have been a locus of activity for the ancient Maya. Unfortunately, the P values do not indicate what types of activities occurred in this area, though its distance from the residential group and associated midden may indicate that the high levels of Pav are attributable to agricultural activities, perhaps even intentional soil enrichment (i.e., fertilization). However, further investigation is required to test this hypothesis.

Figure 8. AL17-02-B artifact density map. Location of AL17-02-A test unit is also shown in the patio of the large residential group.
Operation AL17-03 – House Lot 2

Excavations AL17-03-A and AL17-03-B

Operation AL17-02 was completed quickly, and so it was decided that additional excavations would be conducted near a patio group in the adjacent house lot in order to obtain additional chronological data. The patio group consisted of three structures bounding a small patio that contained a depression. The operation proceeded by placing a 2 m x 2 m test pit (AL17-03-A) in the interior of a patio group (Figure 10). Three stratigraphic units were encountered (Figure 11), beginning with the surface level of mixed humic material and architectural collapse. This lot was terminated upon encountering a badly eroded plaster floor, which sat upon a thin layer of subfloor ballast composed of small limestone and chert gravel and cobbles. This ballast layer extended for 16 cm on average before giving way to a fill layer comprised primarily of chert gravel, cobbles, and boulders that sat upon the bedrock. The bedrock dropped in elevation from the northwest to southeast (Figure 12). A cut into the bedrock was discovered in the southeast corner, excavation of which showed it to be cultural in origin (Figures 13 and 14). Artifacts from this cut were collected as a separate lot, though it became clear after the fact that it was the same fill layer recorded above. Due to the depth, small area, and proximity of the cut to the excavation unit walls, it was not possible to reach bedrock. As

Figure 9. Density map showing qualitative available P values.
such, an 80 cm x 80 cm extension (AL17-03-B) was opened to the east (Figures 15 and 16). The first three lots were completely removed, but the bedrock was only partially exposed due to constant collapse of the loose chert fill into the excavation unit, thus making it unsafe. Even so, an approximately 72 cm east-west stretch of the bedrock was cleared. Nothing unusual or notable was recovered below the cut, and its function remains unclear. MRP Co-Director and Project Ceramicist Collen Hanratty attributed recovered ceramics to the Early Classic. Further excavation and artifact data are shown in Table 2.

Figure 10. Location of AL17-03-A and AL17-03-B.

Figure 11. AL17-03-A and AL17-03-B, south wall profile.
Figure 12. Plan of AL17-03-A and AL17-03-B. Depths given are from southwest corner datum, elevation 14 cm above ground surface.

Figure 13. AL17-03-A, bedrock with cut in southeast corner.
Figure 14. AL17-03-A, bedrock cut in southeast corner.

Figure 15. AL17-03-A and AL17-03-B, bedrock. Facing south.
Figure 16. AL17-03-A and AL17-03-B, bedrock. Facing west. Dashed line marks 90° cut in the bedrock.

Table 2. Excavation data for AL17-03-A and AL17-03-B.

<table>
<thead>
<tr>
<th>Lot#</th>
<th>Depth/cm</th>
<th>Munsell</th>
<th>Ceramics</th>
<th>Lithics</th>
<th>Other</th>
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<tr>
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<td>1 Bulk Bag of Sherds</td>
<td>1 Bulk Bag of Debitage</td>
<td>1 Biface</td>
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<tr>
<td>Floor 1</td>
<td>51-54</td>
<td>2.5 7/1 Light Gray</td>
<td></td>
<td></td>
<td>1 Obsidian Scraper</td>
</tr>
<tr>
<td>AL17-03-A:2</td>
<td>54-66</td>
<td>10YR 3/1 Very Dark Gray Silty Clay</td>
<td>1 Bulk Bag of Sherds</td>
<td>1 Bulk Bag of Debitage</td>
<td></td>
</tr>
<tr>
<td>AL17-03-A:3</td>
<td>66-108</td>
<td>10YR 3/1 Very Dark Gray Silty Clay</td>
<td>4 Bulk Bag of Sherds 2 Bags w/ single vessel sherd</td>
<td>1 Bulk Bag of Debitage 2 Bifaces</td>
<td>3 Carbon Samples</td>
</tr>
<tr>
<td>AL17-03-A:4</td>
<td>108-189</td>
<td>10YR 3/1 Very Dark Gray Silty Clay</td>
<td>1 Bulk Bag of Sherds</td>
<td>1 Bulk Bag of Debitage</td>
<td></td>
</tr>
<tr>
<td>AL17-03-B:1</td>
<td>18-40</td>
<td>10YR 2/1 Black Silty Clay</td>
<td>1 Bulk Bag of Sherds</td>
<td>1 Bulk Bag of Debitage</td>
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</tr>
<tr>
<td>Floor 1</td>
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<td>AL17-03-B:2</td>
<td>43-58</td>
<td>10YR 3/1 Very Dark Gray Silty Clay</td>
<td>1 Bulk Bag of Sherds</td>
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</tr>
<tr>
<td>AL17-03-B:3</td>
<td>58-100</td>
<td>10YR 3/1 Very Dark Gray Silty Clay</td>
<td>1 Bulk Bag of Sherds</td>
<td>1 Bulk Bag of Debitage</td>
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<td>AL17-03-B:4</td>
<td>100-192</td>
<td>10YR 3/1 Very Dark Gray Silty Clay</td>
<td>1 Bulk Bag of Sherds</td>
<td>1 Bulk Bag of Debitage</td>
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</table>
Discussion and Conclusions

The AL17 operations tested an extremely small sample of the proposed ancient Maya house lots, and so the following preliminary assessment is provided with caution. Excavation of the linear rock feature demonstrated its cultural origin, and suggested that surface remains represent the collapse of a more formal arrangement comprised of a wall of stacked stones resting on a chert cobble base. The presence of lithic debitage indicates the Maya were utilizing the walls as a source of lithic raw material, though production was low intensity and likely opportunistic. The paucity of ceramics suggests that these features will be difficult to date without the assistance of a chronometric method, such as 14C. Furthermore, operation AL17-01 demonstrated the excavation of these features to be labor intensive.

The ceramic analysis from the residential groups indicates an Early Classic (AD 250-600) occupation. However, the presence of a single layer of fill resting on bedrock and capped by a single floor suggests an occupation of relatively short duration. While hesitant to extrapolate these results to the broader area, it should be noted that the construction sequence at both residential groups was identical. The relationship between the structures and linear stone features has yet to definitively established, particularly in terms of chronology, yet their spatial arrangement would seem to indicate they are contemporaneous. If true, this has important implications for the development of these systems. Rather than developing gradually over hundreds of years, it is possible the hypothesized house lots, and by extension institution of land tenure, may have come into being over a short period during the Early Classic. Whether this hypothetical scenario was driven by centralized authority or the individual efforts of independent households remains to be determined.

References

Holliday, Vance T., and William G. Gartner