BRAP BEAT

Sifting at sunrise (J. Logee)

The BRAP 2019 Season

By Monique Vincent

The 2019 season is now officially over and all of the participants are safely back home. We spent our last week in the field taking final photographs, drawing balks, and finalizing paperwork and shipping manifests back at the lab. All of our equipment loaded onto a truck on Thursday, August 1, and rolled down the dirt road for the last time this summer.

We wanted to provide one final issue of the *BRAP Beat* with summaries from our various field staff and specialists on the results of our work this summer. We had an exceptionally good season thanks to our team and are excited to continue processing our results and sharing them over the coming months in different venues. The next big meeting for some of the BRAP team members will be at the 2019 Annual Meeting of the American Schools of Oriental Research (ASOR), which will be held in San Diego this November. We hope to see some of our readers there!

The Qasr

By Craig Tyson

This season we returned to the exterior of the north wall of the Qasr to continue excavations. The goal of the 2017 season was to excavate a probe up against this wall in order to locate and date the founding level of the Qasr, which has been a matter of some speculation. The 2019 season provided an opportunity to attain the goal set in 2017. When excavations began in the 2019 season, it was immediately apparent that the backfill from 2017 had been disturbed between Wall 11 and the Qasr. All of the backfill and some of the earth that had been left unexcavated in 2017 had been removed by looters in the years between seasons. This season we expanded the probe to 4.0 x 4.0 m.

Wall 11 and associated surfaces and pillar bases; earlier phase and mortar under the Qasr (K. Bramlett)

The latest Iron II phase is represented by Wall 6, which is at the north edge of the probe. This wall was associated with a beaten-earth surface that had a large Iron 2C pithos buried in it (see *BRAP Beat* 2.1). The pithos was complete but cracked. This was likely part of a domestic structure. An earlier Iron II phase is represented by Wall 11, which went deeper than Wall 6 and was associated with a cobbled floor, a separate beaten earth surface, and possible pillar bases. The complex appears to date to the early part of the Iron II.

In order to achieve our main objective of dating the Qasr, Walls 6 and 11 were removed. Both Wall 11 and the Qasr were constructed on top of a hard-packed layer of clay, which was itself laid over an uneven bedrock surface. A large stone mortar was set into the hard-packed clay surface under the Qasr, suggesting that it was part of an earlier Iron Age building over which the Qasr was then built.

The 2019 excavation at the Qasr gives us an idea of when the Qasr was built, which seems to be the early part of the Iron 2. It has also raised other questions about the precise stratigraphic relationship between the Qasr and the other Iron Age walls and features that we located. We will return to the Qasr in 2021 in order to open more squares and gain a fuller understanding of this fascinating building and its history.

The House

By Stephanie Selover

Excavation centered on a single large structure, now named House A, which was previously excavated in 2012 and 2017. These earlier excavations proved the building was in fact a domestic structure, with two phases of floors and walls. The house area was reopened this season with the goal of opening a larger horizontal exposure of the house, with the intention of learning more about domestic architecture at the site during the Iron Age.

Team House tracing surfaces (F. Ninow)

House A courtyard room with large bedrock boulder and doorways; western small rooms (K. Bramlett)

A total of seven rooms were excavated in House A this season, all excavations reaching an Iron Age II floor level. This was the Phase II floor found in both the 2012 and 2017 seasons. The architecture of House A, which is not completely known, consists of a number of well-constructed and well-preserved stone walls. Three doors between rooms were found preserved with intact door lintels, revealing that likely the entire first story of the house is preserved. Given the thickness of the walls, all two rows wide, and the presence of stone courses found preserved on top of the intact doorways, it is highly likely that this house was originally two stories high. The finds above the house floors included a large amount of pottery and bone, groundstone tools, beads, figurine fragments, spindle whorls, loom weights, fragments of bronze and iron objects, two complete bowls and a juglet, and many jar stoppers.

The house consists of an open-air, clay-lined entry courtyard in the northeast that leads south to a smaller clay-lined entry room. This entry room contains a possible tabun in the southeast corner and a doorway that leads south to a larger room. A small divisional wall in the southwestern corner of the entry room leads into a series of 4 small rooms toward the west. These rooms were roofed with earthen and plaster surfaces. These rooms contained pottery and a small mudbrick platform. The two long walls that make up this hallway of rooms continues at least four meters further west than we excavated this season, so likely further small, unexcavated rooms remain to be uncovered in future seasons.

The central courtyard was excavated this season with a hard-packed earthen floor. A later Hellenistic reuse of the courtyard disturbed the earlier Iron Age phase.

Previously, excavation areas were backfilled with over a meter of sifted earth to try and preserve excavated features after the season's end. This was unsuccessful and led to considerable disturbance of the archaeological record. At the end of this season we hired a team of local wall consolidators to add a modern mortar to the standing architecture of House A to hopefully preserve it for future excavation.

Wall consolidation team (M. Vincent)

The casemate room; the western face of the wall (K. Bramlett)

The Wall

By Dawn Acevedo

The goals for this season were to determine whether the large western fortification wall matched up with the apparent phasing of the large eastern fortification wall that was excavated down to bedrock during the 2017 season; to confirm that this is, in fact, a casemate fortification; and to determine the layout, function, phasing, and destruction details of the casemate room partially excavated in 2017. Excavation this season reached bedrock so that we are confident that all of these goals were accomplished this season.

The eastern fortification wall, as shown in 2017, was built on bedrock, most likely during the later Iron Age I period. After its construction, two superimposed surfaces to the west of the wall suggest that there was an occupation associated with this time period that made use of the eastern fortification wall. A foundation trench was then dug into the two western surfaces for the construction of the western fortification wall. The eastern wall was reconstructed from the seventh course upward to match the height of the new western wall, creating the casemate fortification. The entire fortification system is particularly large with a width of 7.2 m from western to eastern faces. Finds from the casemate room include jar stoppers, a faience bead, and pottery from the late Iron Age I/early Iron Age II. During Iron Age II, to the west, two walls running east-west were built against the western fortification wall. A beaten-earth surface was associated with numerous groundstones, indicating that this was a domestic structure.

Around Iron Age IIB/C, a renovation inside the casemate room added a partition wall, a new beaten-earth surface, and an upper mudbrick construction. This level included domestic occupation with mortars and pestles as well as 45 clay loom weights and a number of spindle whorls. The room was destroyed in fire, as found in the debris from this occupation. To the west of the casemate wall, another possible surface had pottery dating to Iron Age IIB. High amounts of boulder tumble above this surface implies that the upper courses of the east-west walls fell into this room and

Balk drawing on the last day (M. Vincent)

may be related to the same destruction noted inside the casemate room.

Later earth layers outside the casemate system produced pottery sherds dating to the Iron Age IIC. A series of towers were built on top of the casemate wall. These have yet to be excavated and therefore cannot be dated at this time. The towers fell at a later time and their boulder tumble covered the entire earlier fortification system.

Geospatial Survey

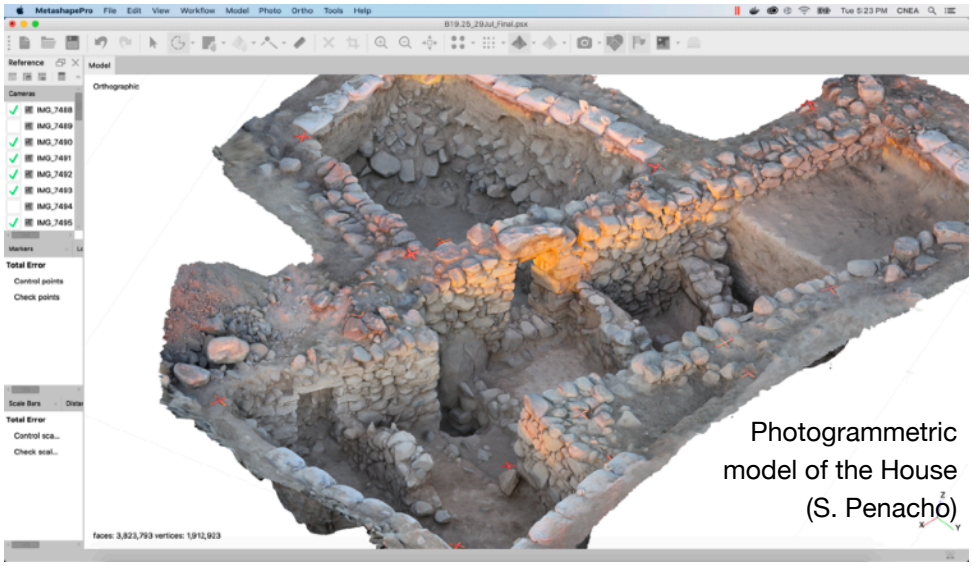
By Susan Penacho

Georeferencing the final photos at the Wall (M. Vincent)

GPS coordinates were taken within excavation areas for artifacts found *in situ*, locus elevations, and samples including soil, charcoal, lithic, and pottery for residue testing. As part of daily and final photography, we are in the process of creating photogrammetry models of each excavation area. These are then georeferenced for accuracy and can then be used in further study, for measurement, and the drawing of top plans and balks.

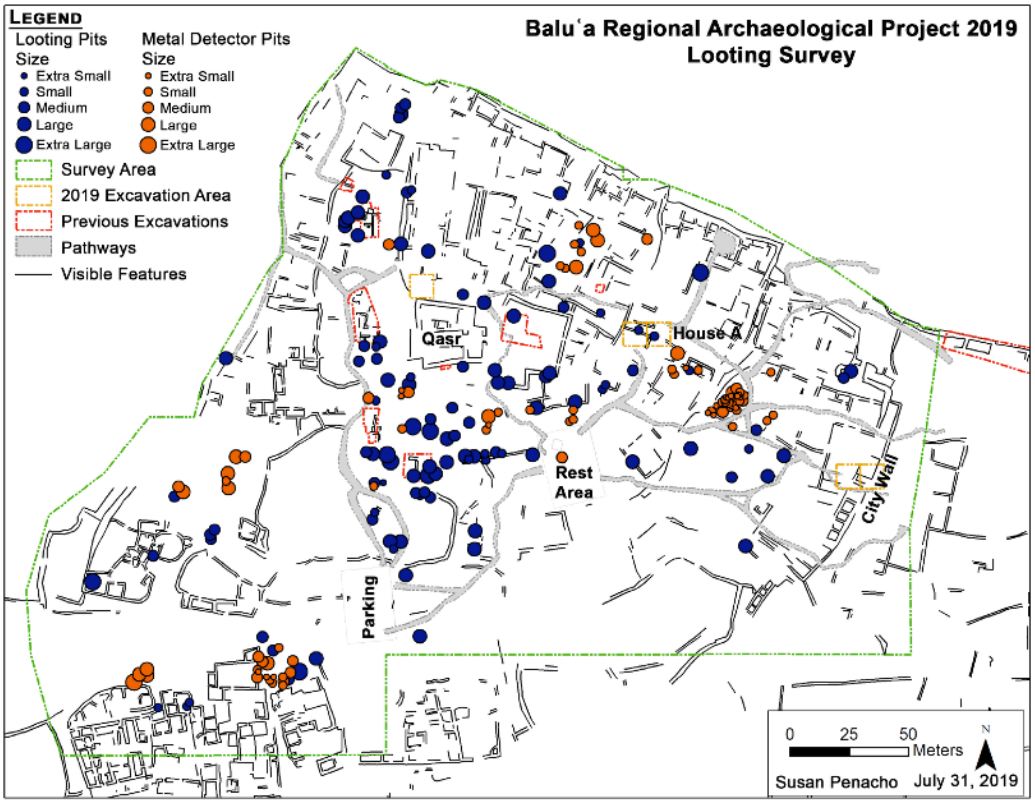
Three GPS surveys were begun during the season within the Iron Age City Walls: the mapping of the Pathways to Presentation paths created this season (see *BRAP Beat* 2.2), a re-survey of cisterns originally documented in 2005 and 2010, and a survey of looting pits.

The identified cisterns were resurveyed as part of the larger paleoenvironment study in order to better understand the water collection systems at Baluʿa. In 2005 and 2010 a handheld GPS unit was used to document cisterns primarily within the western portion of the site and outside the Iron Age city walls, though only four were noted within the main portion of the Iron Age city. Using the GPS unit this season, we surveyed those four cisterns within the Iron Age city and determined that the previous locations were inaccurate by around 3-5 meters. We also noted four additional cisterns within the Iron Age city, two located close to the eastern city wall. We believe that there are further cisterns within the Iron Age walls, but they are hidden beneath the large amount of rock on the site. A further study of the site's hydrology could help clear up possible cistern locations in future seasons.



Photogrammetric model of the House (S. Penacho)

The site of Baluʿa has been and continues to be disturbed by looters over the course of many years. In 2005 and 2010 the



team undertook a looting survey based in the southwest part of the site made up of better-preserved architecture from the Middle Islamic and the southern edge of the Iron Age city. This season a systematic GPS survey was undertaken to map identified disturbed areas within the Iron Age city walls. These disturbances fall into two categories, deep looting pits often dug along visible architectural features and small shallow pits possibly dug after the use of a metal detector. A total of 201 disturbances were noted: 113 looting pits and 88 metal detector pits. These were described based on relative size ranging from extra-small to extra-large. The metal detector pits are often clustered in open spaces such as in the eastern side of the site between the House and Wall excavations as well as near the parking area in the southwest. The greatest cluster of looting pits were found south of the Qasr around areas of previous excavations. These primarily fall in the large to extra-large category. During the season, there were two looting disturbances overnight within the House excavation area. We will continue to document this issue at Balu'a in future seasons in order to raise awareness to the ongoing problem.

Paleoenvironmental Research

By Adam Schneider

Another development of the 2019 season has been the launching of the new BRAP Paleoenvironmental Research Program (BRAP-PER). This new wing of the larger archaeological project aims to provide important new information about the past environmental context not only for the site of Balu'a itself and its immediate vicinity, but ultimately to establish the first detailed information about ancient environments and environmental change in the central Jordan region. There were two main objectives for BRAP-PER during the 2019 field season. The first of these was to conduct a preliminary paleoenvironmental survey of Khirbat al-Balu'a and its hinterland in order to assess what challenges, resources, and opportunities will collectively shape the future of the research program. In particular, this survey was aimed at developing research questions that could form the core of several future grant proposals that could potentially help to fund future scientific and archaeological fieldwork at Khirbat al-Balu'a. The second main objective of the 2019 field season was to complete important preliminary stages of an existing BRAP-PER project already in its early stages: a stable carbon, oxygen, and nitrogen isotope analysis of organic archaeological materials, which can provide

important new information about local diet, ecology, and climate in antiquity. Two tasks, in particular, were central to this effort: 1) to identify and collect candidate samples of animal bone and tooth enamel that are likely to yield viable stable isotope ratios during analysis; and 2) to reach agreement with a stable isotope lab that will process and analyze these samples in the near future. Both of these objectives were achieved during the course of the 2019 field season at Balu'a.

Archaeobotanical Report

By Geoffrey Hedges-Knyrim

Our botanical sampling goal at Balu'a for the 2019 season was to prioritize sampling of contexts likely to yield botanical remains for analysis. These contexts included, but were not limited to floors, occupational debris, and doorways. Soil samples from these contexts were immersed in water and any carbonized remains which floated to the surface were skimmed through a 250 micron mesh. A bilge pump allowed the recycling of water. Once the samples were done, the light fraction (anything that floated: carbonized remains, roots, and some shell) and heavy fraction (anything that sank: rocks, pottery, and bone) were left to dry in the shade. Once these were dry, the light and heavy fractions were bagged and ready for storage or shipment.

Although we did not have a microscope in the field for preliminary identification of botanical remains, some observations were possible. The samples from Balu'a were rich in carbonized remains and were dominated by cereals, including barley and wheat. Legumes were the second most abundant type of crop; these include lentil and common pea. Preliminary analysis at the University of Connecticut will help guide sampling and future research questions on plant remains at Balu'a. Besides subsistence reconstruction, isotopic analysis (δ13C) of the plant remains will help reconstruct crop water availability. When contrasted with the site-based paleoclimate record, the isotopic signal of the plant remains will determine whether the inhabitants of Balu'a were practicing dry farming or supplementing their crops with irrigation. Overall, the plant remains from Balu'a will help understand subsistence, economy, and paleoclimate at the site and in Iron Age Moab generally.

That's a Wrap!

Thank you for following along with our discoveries at Balu'a this summer! Keep tabs on our website, www.BRAPJordan.org, for updates on research and future excavation seasons. Please consider supporting our work by making a donation at lasierra.edu/givenow/ (use the "other" box and type in "Balua Project").