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The Tausert Temple Project: Report for the 2011 Season

By Pearce Paul Creasman

As readers of this journal may recall, The University of Arizona Egyptian Expedition (UAEE), directed by Richard H. Wilkinson, has conducted an archaeological investigation of the 19th Dynasty Pharaoh-Queen Tausert’s temple in Western Thebes since 2004.¹ Most of the UAEE’s work focused on the temple proper, but the existence of several other structures adjacent to the temple was evident, also. Both the UAEE and William Flinders Petrie (who examined the site briefly in 1896²) recorded a variety of possible features, spanning some 500 years. Of particular interest is the likely existence of several tombs west of the temple from a later date (Late Period) underneath the embankment of a present-day road (Fig. 1).

In 1896, Petrie recorded the existence of several tombs from a later date outside the Tausert temple proper (Fig. 2, next page).³ Yet, as Petrie focused on the Tausert components of the site, no complete investigation of these tombs was made. Furthering Petrie’s observations, the 2008–2010 excavations at the western edge of the temple by the UAEE revealed direct archaeological evidence of three possible tombs.⁴ Since these features were discovered late in UAEE’s field season and their relationship to the temple was unclear, the UAEE was only able to reveal the entrance of one such feature partially (Fig. 3, next page), which was noted in an earlier volume of this journal.⁵ Both the concern for the safety of the excavators and the fact that further disturbance of the embankment might endanger road stability contributed greatly to the decision to carry out a non-invasive survey of that area of interest, rather than an undertake an excavation at the time.

Consequently, a ground-penetrating radar survey was implemented in order to define the size and extent of any archaeological features present under the road embankment. Ultimately, the goal of the survey was to determine whether additional excavation between the road and the temple was warranted and, if so, how to plan going forward with it. Permission to conduct the survey was granted kindly by the Supreme Council of Antiquities on 9 August 2011. The survey was conducted from 11-21 August 2011, and most of September and October 2011 were spent processing the data offsite.
EVIDENCE

Near the base of the modern road embankment, the UAEE excavations at the northwest corner of Tausert’s temple revealed a mud brick wall extending away from the temple that appears to represent the entrance area of a tomb (Fig. 3). Additionally, the UAEE uncovered indirect evidence of two possible additional tombs at the western edge of Tausert’s temple complex (immediately south of the suspected tomb in Fig. 3). Large, similarly-sized mounds of rock chips above the strata of the temple are interpreted as the primary sign of tombs adjacent to the southwest and central-western parts of the temple, whereas multiple factors seem to indicate a tomb at the northernmost corner including: 1) the large volume of the rock chip mound and its location, 2) a mud brick wall with bricks that differ in size from those used in Tausert’s temple, 3) location and direction of the mud brick wall construction (outside of and away from the temple) and, 4) Late Period date of various items of material culture scattered around the area in which the mud brick wall is located. Here, the scattered remains of at least ten individuals, coffin fragments, and other objects from one or more burial assemblage/s provide further evidence of a possible tomb, its likely date, and of looting in antiquity. The area around the two southern rock chip mounds, however, yielded no indication of post-burial disturbance. For example, in a stratigraphic layer above the remains of the temple, the 2008 season found flakes from the nearby stone outcropping. When the edge of the first tomb came to light, we realized these flakes were the byproduct of tomb construction. If the southern chip mounds in fact indicate nearby tombs, there is a possibility that the tombs remain intact.

In order to establish the identity of these anthropogenic features, their purpose, and their condition, the decision was made to employ ground-penetrating radar (GPR) that could image the subsurface with high resolution. The topography of the site presents a physical challenge to both excavation and the use of GPR due to the modern road embankment which impedes upon the area of interest. This necessitated positioning the GPR grid and maneuvering the equipment along a very steep slope, which rose 5 meters above the excavation level and, in some locations, exceeded 30 degrees. Presumably, this embankment covers artifacts and features, as well as the original sedimentary formations seen below and around the temple compound.
METHODS

GPR uses echolocation to investigate the subsurface: features with contrasting electromagnetic properties that backscatter transmitted radar waves back to a recording receiver. With knowledge of the subsurface velocity (collected by on-site tests) and the total travel time to and from the contrasting target (recorded during data collection), the depth and shape of subsurface features can be imaged in three dimensions. On sites with significant variations in the topography (e.g., steep slopes or excavation pits, both of which are present at this site), however, it is necessary to use advanced mathematics and methods that are employed more commonly for geological and seismic analysis, but can be adapted to an archaeological setting. Essentially, a three-dimensional map of the existing surface is made by an extensive site survey and then used as a “baseline,” allowing interpretation of subsurface features from a “level” perspective. Therefore, the topography of the site was surveyed at a 2 m x 2 m sampling grid, using a stadia rod and survey level. These topographic data were then interpolated for each of the 3,438 transmitter and receiver locations (Fig. 4).

Prior to imaging, irrelevant signals and other sources of interference were removed via filtering and muting in accordance with standard geophysical practices, and as necessitated by the uniqueness of the survey area. For example, strong interference from the metal fence posts along the road was deleted from the data when found/possible, but with the consequence of degrading the image resolution and potential for accurate interpretation near the road.

INTERPRETATION

The main features of the road embankment/survey area are, first, the unevenly textured upper layer interpreted as recent debris associated with the road, and, second, the low-amplitude, finely-structured lower layer interpreted as the consolidated sedimentary material seen in and around the temple site (Fig. 5). In the lower portions of the slope near the present-day limits of the archaeological excavation, several ancient features can be seen (Figs. 6-7, next page). At 3.9 meters below the reference elevation (1.5 meters below current excavation levels), two strongly-reflective rectangular
features appear (Fig. 6-A & 7-A). Most likely, these rectangular features are associated with tombs or the foundations of Tausert’s temple. Both in cross section and in depth view, several other potentially anthropogenic structures can be seen close to the current extent of the archaeological excavation (Figs. 6 and 7 B-F). The subsurface area near the road is devoid of any obvious anthropogenic features, but high levels of interference have likely had an impact on it, including a buried active power line running parallel to the road.

**Fig. 6.** Profile view of the interior of the road embankment 1 meter from the baseline looking toward the road from the temple. The rectangular components of a feature are seen in the box labeled A. Other potentially anthropogenic features are labeled B-F.

**Fig. 7.** A depth slice at -3.5 meters. The rectangular features are seen in A. Other high-amplitude features include B through F. (D. Sassen).

**LIMITATIONS AND SUGGESTIONS FOR FUTURE INVESTIGATIONS**

The interpretation of the GPR data in this case is limited to resolving features of sufficient size and contrast in order to separate them from the background material. With decreasing size, features of less than the dominant wavelength of the signal (~1 meter) become increasingly difficult to differentiate from the background. Additionally, differentiating structural features from modern or ancient debris (evident on the surface of the survey area) becomes difficult if the electromagnetic properties of the materials used in construction of archaeological features are similar to those of the background materials and debris (e.g. mud brick). This occurs, for example, if prior excavation, looting, or construction activities have disturbed the structures in such a way that building material has become mixed with surrounding debris. Accumulation of small errors in data acquisition and image processing complicate these limits further. Therefore, features B though F (Figs. 6 & 7) should be considered only potential targets for further examination. Other features lacking the size or contrast to be seen with the GPR may exist within the road embankment and could be revealed by subsequent excavation, also.

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