



KERKENES PROJECT

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In 1926–28, Erich Schmidt and Hans Henning von der Osten from the Oriental Institute conducted the first surveys and excavations at the late Iron Age site of Kerkenes in central Turkey. In 1993, investigations of this important site were continued, and April through July of 2018 marked the project’s twenty-sixth year of renewed exploration (fig. 1). Wide-ranging financial sponsors of this work included the Merops Foundation, the National Science Foundation, and the National Endowment for the Humanities. During this season, the project completed over 12 ha of electrical resistance survey, revealing the buried walls and structures around the Water Gate and the Gözbaba Gate. We also undertook additional geophysical survey on the later Byzantine castle. Excavations were conducted in two different urban blocks in the northern part of the city, within Urban Blocks 7 and 8. Samples from these excavations and from prior years of excavation were prepared and exported in order to assist us in gaining a better understanding of daily life and production practices in the ancient city.

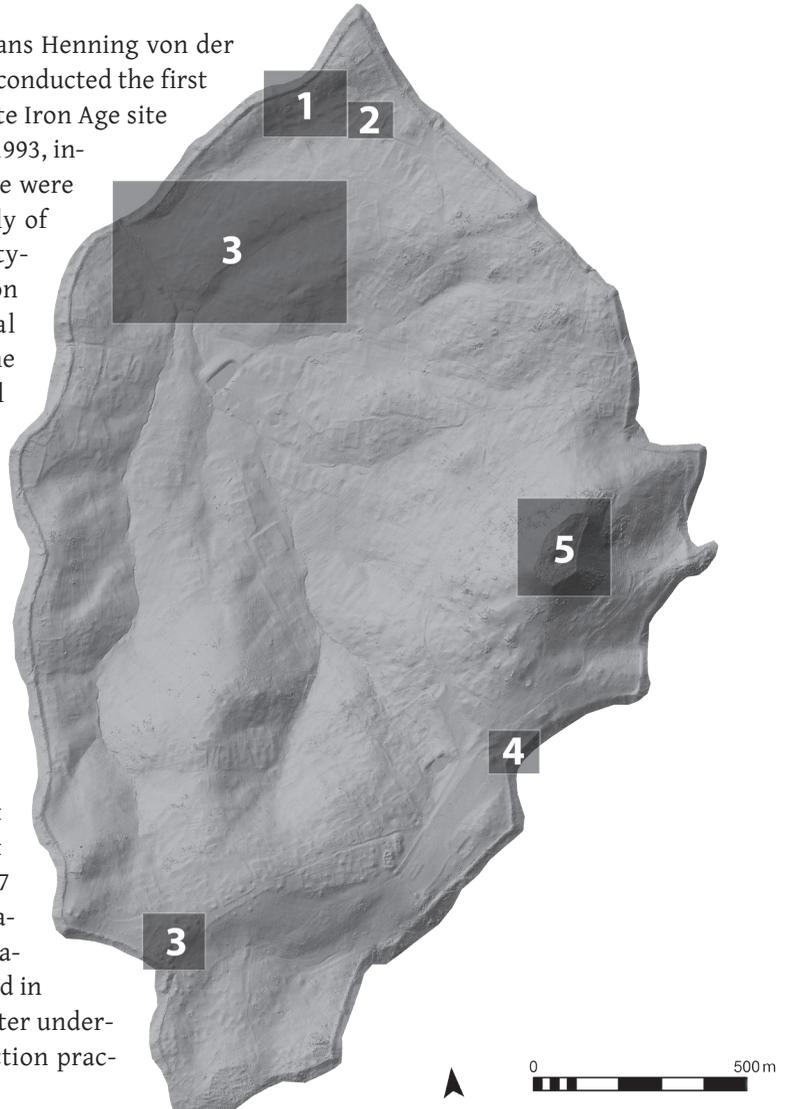
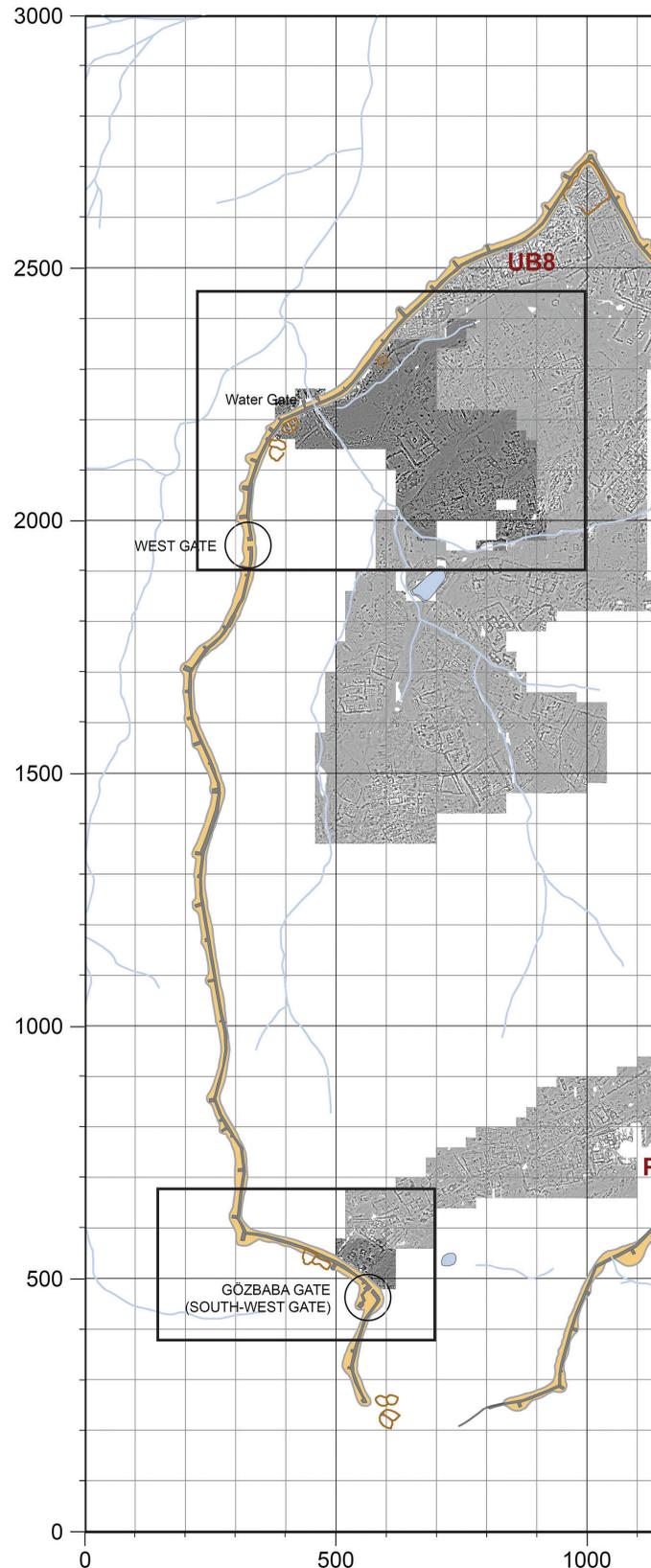


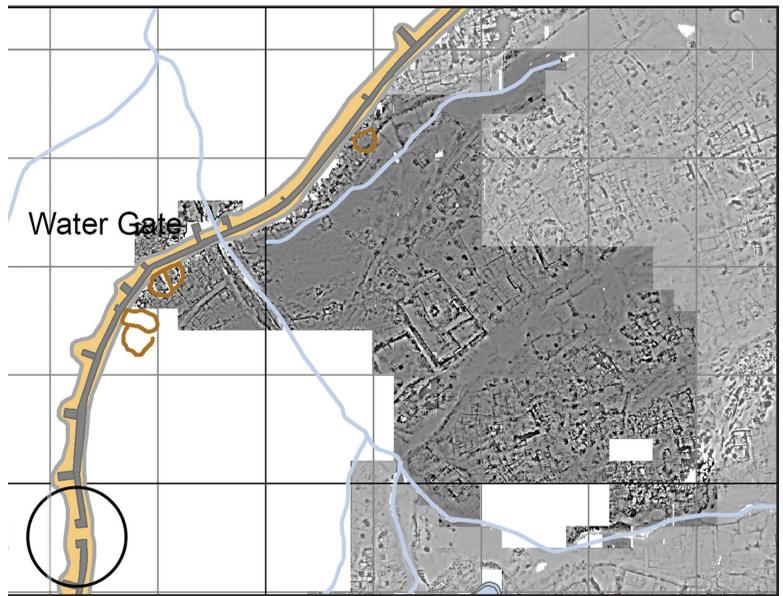
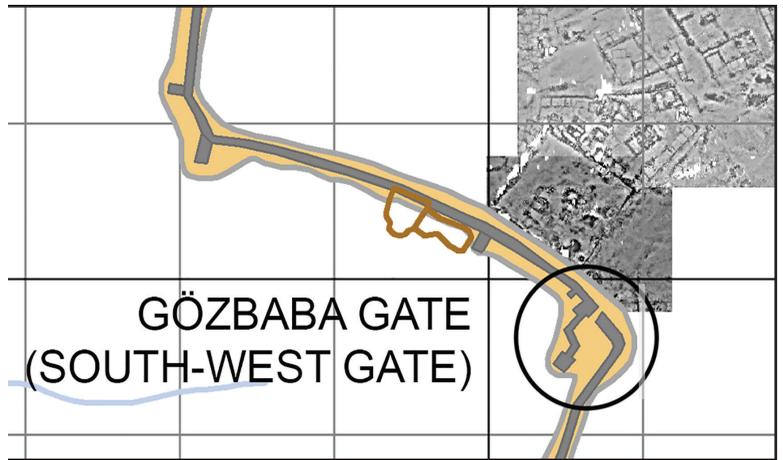
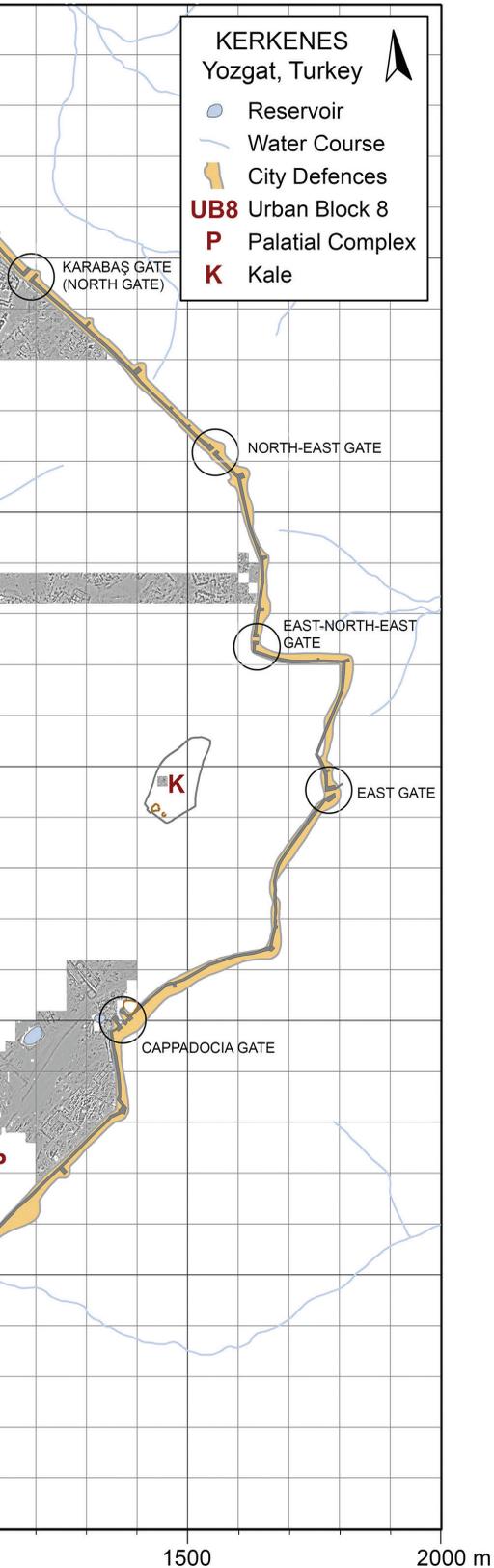
Figure 1. Map of the locations of work at Kerkenes in 2018: (1) Urban Block 8, (2) Urban Block 7, (3) the resistance-survey areas in 2018, (4) the Cappadocia Gate, and (5) the Byzantine Castle.

GEOPHYSICAL SURVEY

Our team completed twenty-five days of geophysics at Kerkenes between May 5 and June 5, ending when the ground became too dry for the resistance survey to continue. The resistance survey, working in two teams, surveyed a total area of 122,400 sq. m. (12.24 ha) (fig. 2). We undertook the survey in both the far southern area of the city, adjacent to the Gözbaba Gate (fig. 3), and in the north and west central area of the city, including inside and outside of the Water Gate (fig. 4). The area adjacent to the Gözbaba Gate was an area of particular interest, given the evidence from earlier excavations for larger-than-household-scale bread production in these urban blocks. It also completed the full survey of the immediate vicinity of the main street leading from the Cappadocia Gate to the Gözbaba Gate via the Palatial Complex. We plan to expand the survey in this area of the city in future seasons. The area inside and outside the Water Gate continued our multi-year survey in the north-central portion of the city. It is a revealing building-by-building plan of the northern half of the city. The project also undertook extensive groundtruthing of the surveyed data at the Water Gate in partnership with students from Abdullah Gül University's Department of Architecture.

Additional geophysical survey was undertaken, utilizing Electrical Resistance Tomography (ERT) methods, up on the later Byzantine Castle. Two long transects were surveyed in this manner along the length of the castle. The results provide us with a preliminary idea of the depth of the bedrock within this area of the city as well as an idea of how it undulates beneath the surface. The bedrock appears to be within 2 m of the surface of the ground and is largely level, other than a deep cut for a large cistern that was in use within the castle. These results indicate that the present-day elevation of the castle is not far off the raised area that would have existed in this part of the city during the Iron Age. We plan to expand this work in future seasons and to attempt to map the buildings within the castle.



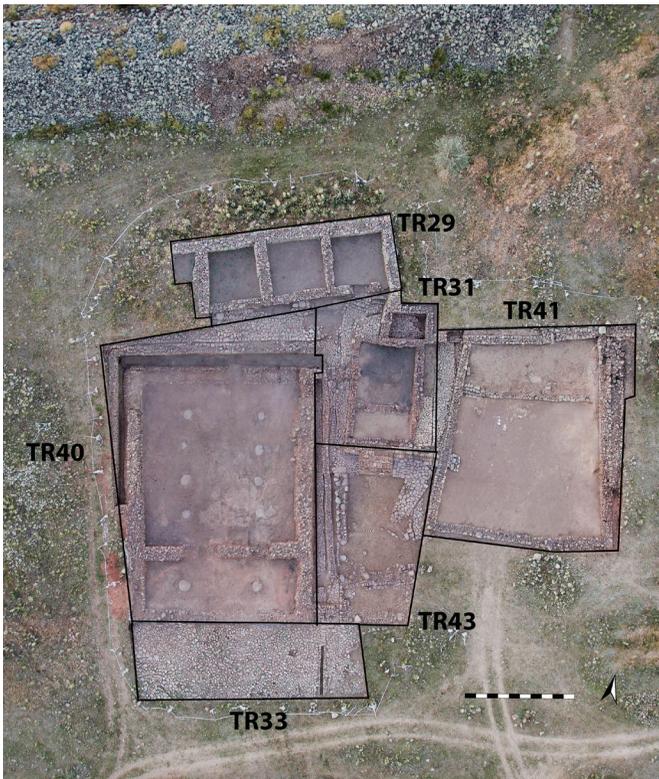


LEFT: Figure 2. Results of the 2018 electrical resistance survey within the city. TOP: Figure 3. Results of the electrical resistance survey near the Gözbaba Gate. BOTTOM: Figure 4. Results of the electrical resistance survey near the Water Gate.

EXCAVATION

We excavated at Kerkenes in May, June, and July. Work took place in three trenches: Trench 41 (TR41), Trench 43 (TR43) (figs. 5 and 6), and Trench 44 (TR44) (figs. 6 and 7). TR41 and TR43 are located within Urban Block 8, while TR44 is located 125 m away in Urban Block 7 (fig. 6). All three of the trenches are located in the northern portion of the city. Urban Block 8 is a large urban block among the circa 757 urban blocks at Kerkenes, covering a total estimated area of 6,000 sq. m. Urban Block 7, in contrast, is a small urban block, covering only a total area of 600 sq. m. By excavating sections of both urban blocks in the same manner and using the same methods, we will be able to make a preliminary comparison of the use of space in large and small urban blocks. Excavations within Urban Block 8 have so far uncovered a large contiguous area of 1,650 sq. m, a little over one quarter of the urban block, revealing a range of different activity areas that speak to how the ancient inhabitants of the city used this urban block.

TR41 is a large trench, 370 sq. m, on the eastern side of Urban Block 8. It lies directly to the east of a paved area alongside the main building in Trench 31 (TR31) and to the west of what appears to be the eastern urban block wall. The western edge of the trench extends just beyond a north-south wall that demarcates the eastern edge of the paved area in TR31. The entire space is an outside, unroofed space. The main area within the bounding walls of TR41 is separated into two distinct areas by an east-west terrace wall. The northern raised terrace area is smaller, 64 sq. m. It likely was raised to level off an area for activities around an outcrop of protruding bedrock. The southern, lower area is much larger, 185 sq. m, with the bedrock outcroppings in the north-central portion of this area at a much lower level. The east-west wall that bounds the southern end of this area may also have a terracing function. Future excavation to the south will clarify the nature of this wall.



Excavations in the northern terrace were completed in 2017, while the excavation of the southern area and the top of the southernmost wall were completed in 2018. Two staircases were uncovered in TR41. One staircase of four steps is at the westernmost end of the east–west terrace wall. It provided people access between the terrace and the southern area without having to climb the terrace wall. The second staircase, comprising two steps, is alongside the north–south wall at the midpoint of the southern area. It provided access over that wall and into the outside paved areas of TR31 and TR43. Two sandstone blocks, found along the north–south wall near the midpoint of the terrace, might have also functioned as a step. If so, it would have provided access from the terrace directly into the paved area on the other side of that wall.

Throughout both the terrace and the southern area, we found scattered evidence for badly eroded surfaces. These areas may have been left exposed for some time after the destruction of the city until surrounding structures and the top courses of the surrounding walls collapsed in on them. As in years past, the team collected extensive soil samples in a hexagonal lattice across both areas at the level of the original surfaces. These soil samples have been floated, and analysis of the recovered material may reveal more detail as to the range of activities that took place on these outside surfaces. While pieces of metal, pottery, and bone were recovered throughout the southern area, two notable finds were discovered in the southwestern corner of this area. These were an iron awl and a copper alloy arrowhead.

LEFT TO RIGHT: Figure 5. Aerial photograph of the excavation areas of Trenches 41, 43, 33, 40, 29, and 31. Figure 6. Aerial photograph of the excavation areas of both Urban Block 7 (foreground) and Urban Block 8. Figure 7. Aerial photograph of Trench 44.



TR43 is a trapezoidal trench that encompasses a roughly 16.4 m × 9.7 m, previously unexcavated gap between Trench 33 (TR33), Trench 40 (TR40), TR31, and TR41. TR43 includes a southern continuation of the slot area, the northern end of which we excavated last year within TR31. This slot is a narrow (ca. 1 m wide) paved area along the outside of the eastern wall of the large columned building in TR40 (fig. 8). Unlike the bin area to the west of that building, the slot area was closed on its northern end in TR31 by a short east–west cross wall. A drain ran down the length of the slot, and both the paving and the drain continued along the western side of TR43 until ending in an east–west cross-wall just short of the southern end of the trench. The drain continued under the wall before meeting up with the covered drain excavated within TR33 in 2014. We discovered modifications to the end of the slot during its use life, including the removal of a portion of the paving and the wall on the east side of the slot. These modifications, along with an apparent rectangular enclosure in the southern end of the trench, will be the focus of further investigations.

In northern end of TR43, to the east of the slot, we uncovered a large and impressive T-shaped sandstone staircase (fig. 9). It measured 7.6 m × 3 m and comprised multiple worked sandstone blocks arranged into a five-step staircase. A cut posthole found in the sandstone blocks

flanking the northern end of the central stair, and extending across most of the northern end of TR43, suggests that the stair might have originally been underneath a wooden porch. During the destruction of the city, this porch may have burned to the ground, exposing the sandstone steps to the extensive weathering of its constituent blocks that we found during excavation. This impressive staircase runs up to the southern wall of the main building in TR31. This suggests the presence of a doorway in this southern wall and that this building was of some importance. The preservation of the southern wall had left in doubt the presence of such a doorway when we originally excavated TR31. This is certainly the most impressive entrance feature, if it is one, so far found on any building within this urban block.



Stone paving abuts either side of the central stair and extends to cover the northern end of the trench. On the eastern side of TR43, the paving continues down into the middle of the trench, outlining an open area at the base of the steps. To the west, on the eastern side of the eastern wall of the slot, and to the east, along the eastern edge of the trench, drains flow downhill through this area. Both drains connect with drains encountered in previous years in the paved areas above them in TR31. Additional excavation in the southern end of TR43 may help better clarify how the drainage system for this area functioned.

We found one-third of the finds from TR43 in close proximity to the staircase. This includes a small number of ivory and bone inlays, as were found in TR40, as well as a small metal weight (fig. 10). The inlays may have come from inside of the building in TR31, may have been part of the porch that covered the staircase, or were from items under the porch. We discovered pottery and bone in particular concentrations near the foot of the staircase, and an iron sickle was found on the stone paving near the easternmost drain within TR43. We also found iron tool fragments within the extension to the slot in western portion of TR43.



OPPOSITE LEFT: Figure 8. The excavated slot area in Trench 43. ABOVE: Figure 9. The sandstone staircase and northern end of Trench 43.

Finally, we opened a third trench, TR44, covering 33.5 sq. m within Urban Block 7. This is a much smaller urban block, 125 m to the east of Urban Block 8. In 2011, geophysical survey identified a row of rooms built along the southwest edge of this urban block. We used the geophysical data to situate TR44 to reveal one of the interior rooms within this row (fig. 7), a room that the survey showed as possessing a floor with higher electric resistance values. Excavation of the room revealed a bedrock outcropping partially used for the floor of the room, and a good state of preservation of material within the room. This included a small almost complete jug, a glass bead (fig. 11), and a footed bowl. We also discovered a green rectangular stone stamp seal within the room (fig. 12). This is the first seal that we have found at Kerkenes, providing the first evidence of bureaucratic practices that we have so far only been able to assume took place within the city. Given the level of preservation within TR44, Urban Block 7 will no doubt see additional excavations in the future.

In each of the trenches, daily and final recording was undertaken using 3-D modeling and photogrammetry alongside traditional recording techniques. The use of 360-degree cameras, pioneered last year, saw widespread usage for daily 3-D models in 2018. We also began to build on these digital recording methodologies by undertaking a new augmented-reality software-development project in 2018. We field tested new software that we had designed to allow archaeologists to start to use augmented-reality headsets in order to make digital drawings and plans in the excavation areas (fig. 13). We want to continue to develop and perfect this methodology in future seasons.



TOP: Figure 10. A small metal weight from near the sandstone staircase in Trench 43. MIDDLE: Figure 11. A glass bead from Trench 44. BOTTOM: Figure 12. A green stone stamp seal from Trench 44.



CONSERVATION AND LABORATORY ANALYSIS

Conservation efforts continued in 2018, both on site and in the excavation depots. The team performed annual cleaning and maintenance in areas of earlier excavators' work at Kerkenes, including the Cappadocia Gate and the Palatial Complex. We also undertook repairs to fencing and to the signs throughout the 271 ha of the site. In the excavation depots, the project's conservators were active in cleaning and conserving new objects from the excavations. They also welcomed a conservation student trainee from Batman University, who undertook basic conservation tasks under our conservators' watchful eyes. The training of students from Turkey and abroad has always been a part of the Kerkenes Project, and we enjoyed expanding that this year into the realm of conservation.

Team specialists also were active in processing material from the excavations, working closely with the conservators on their long-term preservation. Continued flotation of soil samples collected within key contexts over the past two years was completed, and the team finished sorting almost the entire heavy fraction from the bin context in TR40. By their painstaking efforts, our team recovered additional fragments of ivory, bone, and metals linked to the finds in this important context. Coordination between experts working with the various types of material within the soil-sample grid in room 5 of TR31 continues to also yield important information beyond what was seen when it was first excavated. A few malted-barley seeds found in the light fraction, combined with the grindstones and pouring vessels recovered during excavation, may help our team to piece together some of the activities that once took place within this room.

Finally, work also continued on the larger-scale conservation plan for the Cappadocia Gate. Data from the continued monitoring of shifts in the freestanding walls, recovered by the team through photogrammetric analysis of drone photographs, was used together with an engineer's site visit this summer to check the feasibility of the current conservation plan. With the wooden structure that once supported the walls in antiquity, burned completely in the fire that consumed the city, few options remain to try and preserve the structure. Final plans are being drawn up for submission to the commission overseeing all such efforts.

FACILITIES AND INFRASTRUCTURE IMPROVEMENTS

Our team continues to make significant improvements to the facilities within the excavation compound in Şahmuratlı village. We completed the garage in 2018, which was needed to protect the project vehicles and to provide additional storage for tools and equipment. The roof of the new garage also proved to be an excellent water-collection device when it rained, and a newly installed rain-barrel system helped collect that rainwater for use by the project's flotation-machine setup. Water access has been an issue for not only the excavation compound but also the entire village throughout the years, and our growing system of rainwater barrels have helped to elevate our pressure on the limited water resources. However, during the 2018 season, the entire village saw upgrades to its water-management system provided by the Sorgun Regional Governor and his officials as part of a regional improvement initiative within rural villages. For the first time, the village has central water and sewer lines! These needed improvements not only will benefit the project for the three months that we are in the field, but, more importantly, they will benefit the village all year long.

Additional maintenance and repairs were carried out this season in the excavation compound and on the roads leading up to Kerkenes Dağı. Metin Kayhan, the Sorgun special administrative director, with the support of the Sorgun regional governor, undertook repairs on the extension of the road that leads up to the archaeological site. Meanwhile, the team made necessary repairs

to roofs and structures in the excavation compound. We also installed new shelving within the large workspace area in the upper depot, an area that the project's senior research specialists use for research and collaboration.

OUTREACH

Outreach continues to be a priority for the Kerkenes Project. During 2018 we completed work on the most recent Kerkenes News, a Turkish-English biannual publication detailing work during the preceding two-year period. We also presented the results of the 2017 excavations at the 40th International Symposium of Excavations, Surveys, and Archaeometry in Çanakkale. We hosted a lecture and a visit to the site by students and teachers from the Mehmet Akif Ersoy Ortaokulu, building on last year's outreach efforts in Sorgun (fig. 14). In addition, we participated in the science fair held at the middle school. Finally, we hosted visits from guests wanting to see the site. We gave special site tours in 2018 to the Yozgat governor, the Sorgun subgovernor, and a member of the Japanese Embassy.

BELOW: Figure 13. Field testing the field drawing software in the augmented-reality headset. OPPOSITE: Figure 14. Students and teachers from the Mehmet Akif Ersoy Ortaokulu trying the augmented-reality headset while visiting Kerkenes.



ACKNOWLEDGMENTS

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