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# The New Swedish Cyprus Expedition 2015 Excavations at Hala Sultan Tekke

Preliminary results. With a contribution by D. Kofel

## Abstract

In 2015 the sixth season of the renewed excavations at the Bronze Age city of Hala Sultan Tekke continued in the compound which was exposed in Area 6W in 2013–2014. Further evidence of textile processing was found. The results of another ground-penetrating radar (GPR) survey in 2014 indicated a new city quarter west of the former. Excavations were initiated there in 2015 and parts of the remains of a large compound were exposed. Two occupational phases, Strata 1 and 2, could be determined, both of which were destroyed in a conflagration. Further excavations were carried out in Area A, 550 m to the east of Area 6W and close to the mosque of Hala Sultan Tekke. In 2014 more than 80 circular anomalies were indicated by our geomagnetic survey supported by GPR. Twelve of them were excavated in 2015. Most of them turned out to be backfilled wells of which the fills mainly date from the 13th and 12th centuries BC (Late Cypriot IIC–IIIA). One of the excavated anomalies is interpreted as an offering pit. The preliminary date according to the pottery is roughly the 15th century BC (Late Cypriot IB).

*Keywords:* Cyprus, Late Bronze Age, prospecting, wells, tombs, offering pits

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\* DOC Fellow of the Austrian Academy of Sciences at the Department of Oriental Studies, University of Vienna, and the Institute for Oriental and European Archaeology, Department for Egypt and the Levant.

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## Introduction

Hala Sultan Tekke is a large Bronze Age city close to the famous homonymous mosque near the international airport of Larnaca on the south coast of Cyprus. The city flourished mainly in the later part of the Late Bronze Age around 1200 BC but recent excavations demonstrated that there is also evidence of a settlement which dates back to the transitional Middle/Late Cypriot period, *c.* 1600 BC.

The history of the excavations at Hala Sultan Tekke goes back to 1894 when J.L. Myres opened a number of trenches west of the Salt Lake without finding any cultural layers except for stray sherds. The “excavations” of the British Museum at Hala Sultan Tekke in 1897 and 1898 are described by Bailey.<sup>1</sup> The low scientific standard even considering the period in which they took place became quite instantly clear when studying Bailey’s report on the British Museum “excavations”.<sup>2</sup> It seems that the main objective of these digs was to find rich tombs in order to supply the British Museum with spectacular finds. Some rich tombs were excavated but most of the discovered tombs had already been looted.

The Cypriot Department of Antiquities has been engaged at Hala Sultan Tekke, particularly in 1968, when V. Karageorghis excavated two rich Late Bronze Age tombs to

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Among the team members are T. Bürge, who acted as assistant field director, M. Al-Bataineh, who functioned as the architect, surveyor, and draughtsperson and H. Ta’ani as technical archaeologist. Other participants were M. Ausiayevich, A. Beckman, Dr S. Chandrasekaran, A. Holmén, D. Kofel (palaeobotany), S. Lauscher, A. Lazarides, C. Lindengard, T. Ljunggren, M. Olsson, F. Palm, Dr L. Recht (Mycenaean pottery), M. Reimann, and J. Sjöholm. Dr A. Fischer, B. Stolle, and R. Árnadóttir participated part-time. Dr D. Reese provided essential information on the molluscs and the osteological material for which we are most grateful.

<sup>1</sup> Bailey 1976, 1–32.

<sup>2</sup> Cf. Fischer 2012, 74.

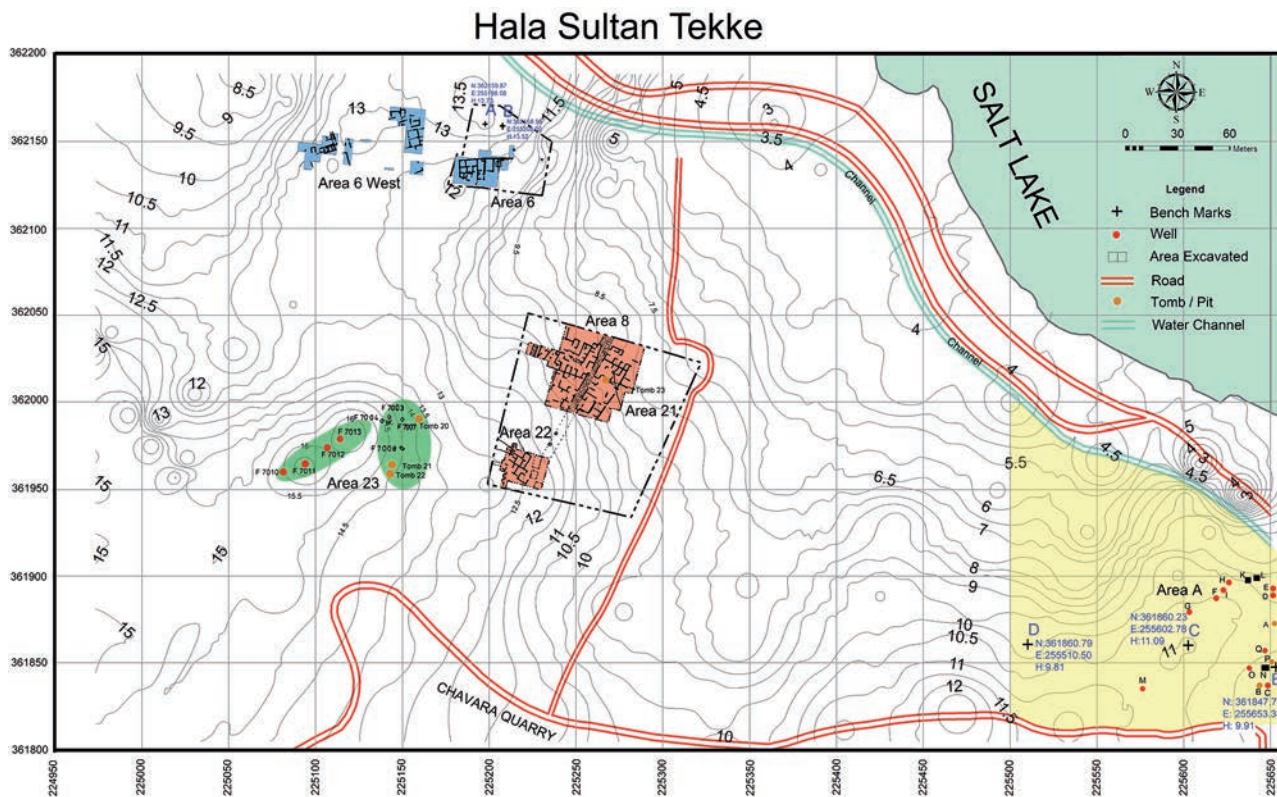


Fig. 1. Topographic map (from west to east): Area 6 West, Area 6, Area 8, and Area A. Areas excavated by the New Swedish Cyprus Expedition are marked blue (Areas 6, 6 West; 2010–2015) and yellow (Area A; 2013–2015), Areas 8, 21 and 22 are marked red and Area 23 is marked green (drawing by M. Al-Bataineh and T. Bürge).

the west of the mosque.<sup>3</sup> In the 1970s and 1980s additional tombs were (re)excavated by the Swedish mission directed by P. Åström (see references below).

Regular excavations in the settlement of Hala Sultan Tekke started at the beginning of the 1970s and continued intermittently for more than three decades until 2005. Selected results from the excavations in and around Area 8 were published as preliminary reports together with a number of specialized studies.<sup>4</sup> Excavations under the direction of P.M. Fischer from the University of Gothenburg began in 2010 and continued on an annual basis up to the present day.<sup>5</sup> The most recent excavations lasted from 4 May to 5 June 2015.

As in previous seasons, the main objectives of the project were the search for the oldest city of Hala Sultan Tekke, and the establishing of the total extent of the city. Complementary excavations took place in Trenches 16C and D of Area 6W,

where a domestic and industrial compound, which, *inter alia*, produced gold and silver jewellery, had been partly exposed in 2014.<sup>6</sup>

In 2014 a third georadar and magnetic survey of a 70 m × 50 m area was carried out. It resulted in the discovery of a large stone-built compound,<sup>7</sup> the eastern limits of which had already been exposed in 2013 and 2014<sup>8</sup> (Trenches 14B/C and 19B). In 2015, an area of 261.50 m<sup>2</sup> was opened up to the west of the trenches from 2013 and 2014 (Trenches 20A–D, 21C, 22C–D, and 23A, B, D; Figs. 1, 2).

In Area A, which is located roughly 550 m east of Area 6 and close to the mosque of Hala Sultan Tekke, more than 80 circular anomalies were indicated in the magnetic survey supported by GPR in 2014,<sup>9</sup> which covered an area of 1.1 hectares. The excavation of Tomb A, a well reused as the burial pit

<sup>3</sup> Karageorghis 1976.

<sup>4</sup> HST 1–12.

<sup>5</sup> Fischer 2011; 2012; Fischer & Bürge 2013; 2014; 2015.

<sup>6</sup> Fischer & Bürge 2015.

<sup>7</sup> Trinks 2015.

<sup>8</sup> Fischer & Bürge 2014; 2015.

<sup>9</sup> Trinks 2015.

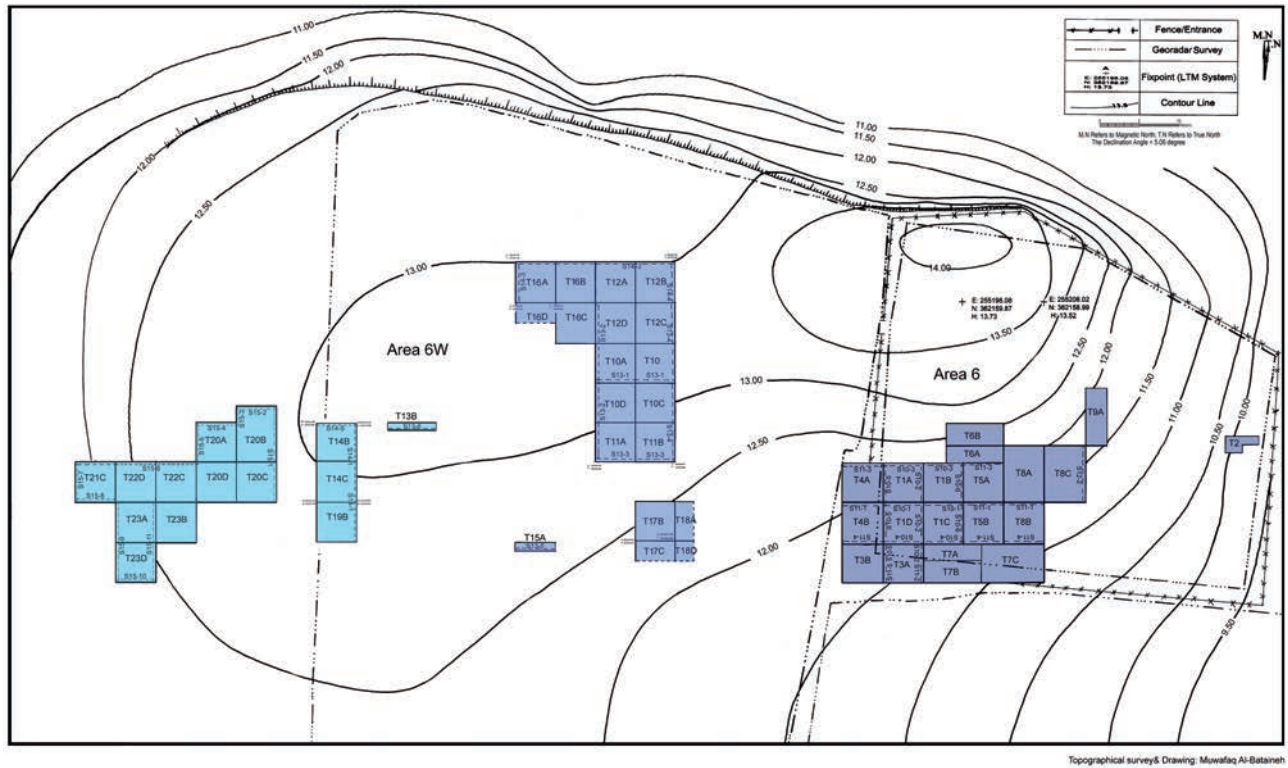


Fig. 2. Positions of trenches and sections: Area 6 West, 2015 season (light blue), Area 6 West, 2013–2015 seasons (medium blue) and Area 6, 2010–2012 seasons (dark blue) (drawing by M. Al-Bataineh).

of several individuals, which started in 2013, was completed. Tomb A is close to Pit B, an offering pit from the 13th century BC, and Wells C, D, and E, all of which were exposed in 2014.<sup>10</sup> In 2015 another twelve geophysical anomalies (F–Q) were investigated in Area A.

## Results of the excavations in Area 6W

### TRENCHES 16C, D, AND TT

The excavations of the small compound that was partly exposed in 2014 (Trenches 16A and B) were extended towards the south (Trenches 16C, D, and TT). This compound is north-west of the larger building, where the “Horned God Krater”, and 300 kg of remains from copper-working of tapped slag, furnace walls, fragments of tuyères, crucible fragments, copper/bronze fragments, and pieces of raw copper were found.<sup>11</sup>

There are again two strata of occupation in Trenches C and D. Trench 16C is a 5 m × 5 m trench south of Trench 16B. Trench 16D measures 5 m × 2.5 m with an extension in the south-western corner measuring 2 m × 2 m, viz. Trench 16TT.

### Stratum I (Fig. 3)

Rooms R39–42 had been partly exposed in the previous year. R39 contained an interesting stirrup jar of local production (L397-6).<sup>12</sup> R40, a room with a pillar-supported roof, contained, *inter alia*, three loom weights and a number of fragments of Plain White wheel-made and White Painted Geometric and Pictorial Style wares.<sup>13</sup> After further exposure in 2015 it became clear that the southern walls of R40 were not

<sup>10</sup> Fischer & Bürge 2015.

<sup>11</sup> Fischer & Bürge 2014, 80–83.

<sup>12</sup> Fischer & Bürge 2015, 33, fig. 7a:5, 34, fig. 8.

<sup>13</sup> For the terminology of WPGS (White Painted wheel-made Geometric Style) and WPPS (White Painted wheel-made Pictorial Style) see Fischer 2012. These two terms are substitutes for the ill-defined White Painted wheel-made III; see also P. Åström's comments quoted in Fischer 2012, 77.



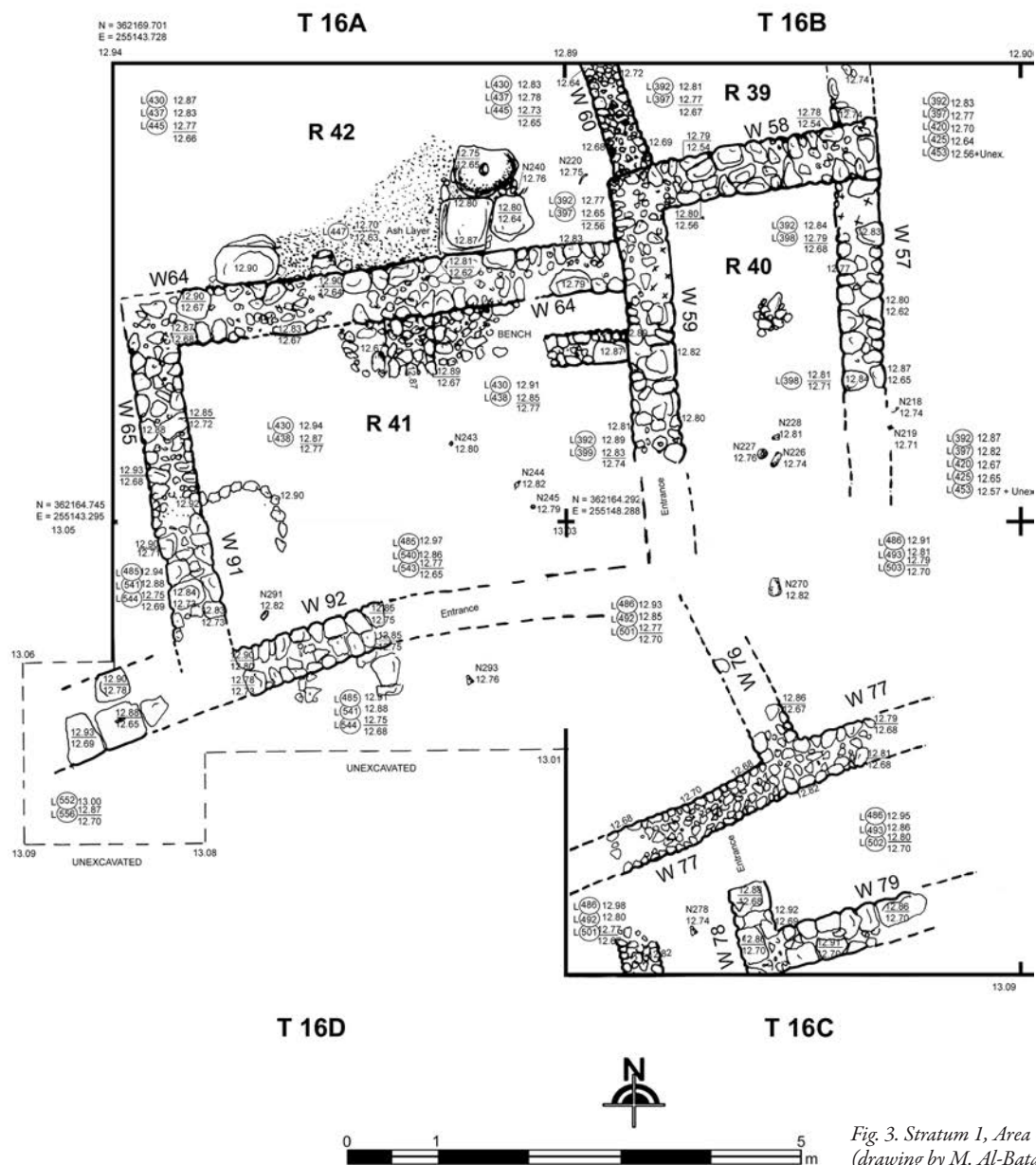


Fig. 3. Stratum 1, Area 6 West, Trench 16A–D (drawing by M. Al-Bataineh).

completely preserved due to their position close to the surface, which had been affected by ploughing.

The exposure of R41, which is west of R40 and south of R42, continued. R41 is limited by the walls W64, W59, W92, and W65 and measures approximately 5 m × 3 m. The eastern part of W92 and the southernmost part of W59 are not preserved. West of the spot where W65/91 and W92 are supposed to meet there are several regularly laid ashlar blocks. The function of these ashlar blocks could not be determined. A stone surface was exposed in the northern part of R41 from

where a grinder derived. Another stone structure, a possible wall or a bench, is west of W59. A circular stone-lined structure was built against W65/91 in the western part of the room. Finds from R41 include a stone pestle (N243), a bronze arrowhead (N244), a fishing net weight of lead (N291), and a spindle whorl of dark grey stone (N245). This space seems to be a combined domestic and working facility.

R42 is to the north of R41 and contained the remains of a large stone basin. This basin might have been (re)used as an olive press. Other finds from R42 are lead fishing net weights

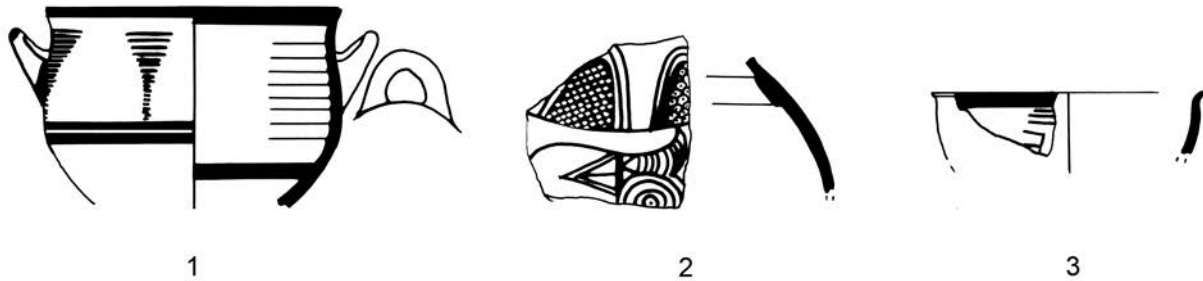


Fig 4. WPGS bowl (L501-1; no. 1) and jug (L541-1; no. 2) from Stratum 1 and Mycenaean cup (L511-1) from Stratum 2 (no. 3), Trench 16C, D (drawing by M. Al-Bataineh).

(N220, N240) and remains of two cooking pots. R42 is an open working space, maybe a courtyard.

The area south of R40 and R41 produced a possible basket handle (L486-1) of a closed vessel of White Painted wheel-made ware, a fragment of a Red Lustrous wheel-made jug (L492-1), a part of a White Painted wheel-made Geometric Style (WPGS) jug (L541-1; Fig. 4:2), a bowl (L544-1), and another almost complete bowl of the same ware (L501-1; Fig. 4:1), and two pestles (N270, N293). More than 25 kg of murex shells were discovered in the area south of R40 (L493, L503; Fig. 5). This area had certainly been an open space to judge by the presence of crushed murex shells.<sup>14</sup>

To the south there is another structure formed by two perpendicular walls, W76 and W77, which were reused from Stratum 2. W76 is only fragmentarily preserved and runs roughly NNW–SSE and W77 roughly WSW–ENE. A fragment of a platter of Red Lustrous wheel-made ware (L502-1) was found south of W77.

In the southernmost exposed area are the remains of two walls, W78 and W79. W78 runs NNW–SSE and is preserved to a length of 1 m. W79 forms a corner with W78, has a preserved length of 2.2 m and runs approximately WSW–ENE,



Fig. 5. Murex shells from Area 6 West, Stratum 1 (photograph by P.M. Fischer).

i.e. parallel to W77 described above. Another possible wall, of which less than a metre is preserved, runs parallel to W78, approximately 0.9 m to the west. The function of this structure is not clear. A stone loom weight (N278) was found west of W78. No anomalies were indicated by the georadar to the south, and it is evident that previously existing structures were entirely destroyed by farming.

<sup>14</sup> With reference to the unpleasant smell of these shells when exposed to air.

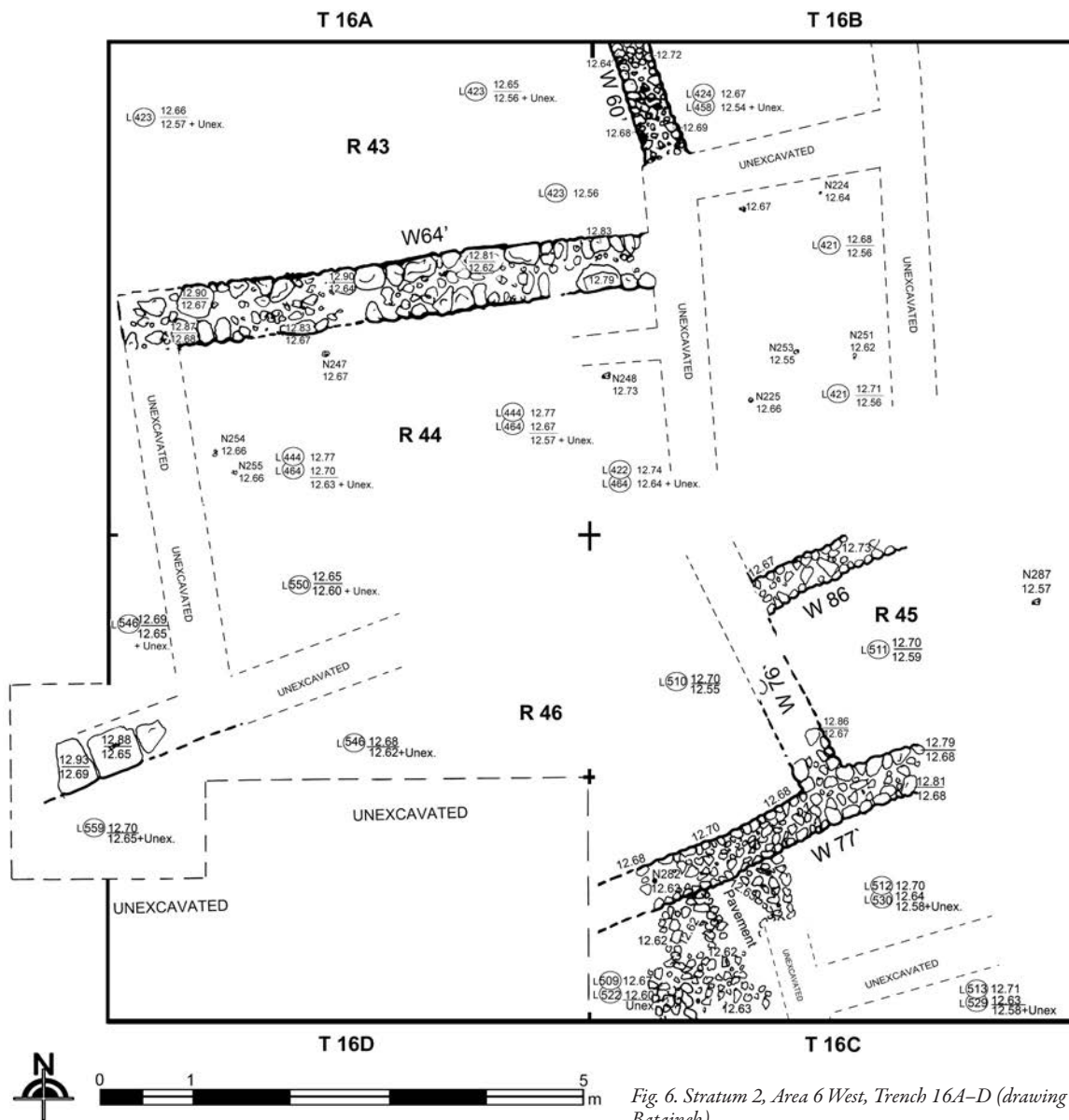


Fig. 6. Stratum 2, Area 6 West, Trench 16A–D (drawing by M. Al-Bataineh).

### Stratum 2 (Fig. 6)

There are two walls in the northern part of the compound, W60' and W64', which were originally built in this phase and, later on, reused in Stratum 1. R43, which was partly exposed in 2014, contained *inter alia* three cooking pots, a Plain White wheel-made bowl and several bowls and kraters of White Painted wheel-made ware. It seems to have been an outdoor area, perhaps a courtyard where food was prepared.

R44, which was partly exposed in 2014, is to the south. There is only one wall preserved: W64'. This is the walled

space from where a WPPS krater with a fish (L444-1), a stone pestle (N247), a fired clay loom weight (N248), a silver earring with a gold pendant and a sheet of silver which was attached to the item (N254), two gold earrings, and a melted lump of silver, in which another gold ring was embedded (N255), derive. As the eastern limits of this room are not clear, it remains doubtful how this space relates to the area to the east, from where a silver amulet (N224), a bead of a disc-shaped black stone (N225), a bronze ring (N253), a gold earring with an attached profiled gold plate with a possible representation of





Fig. 7. Aerial photograph of Area 6 West, Trenches 14, 19–23: A: “defence wall”; B: basin; C: well (photograph by P.M. Fischer and T. Bürge).

a bull (N251), a helmet shell (*Phalium*), a WPGS deep bowl (L421-1), and a fragment of a Mycenaean krater with the head of a horse (L421-2) derive.<sup>15</sup> This area was affected by building activities in the following Stratum 1.

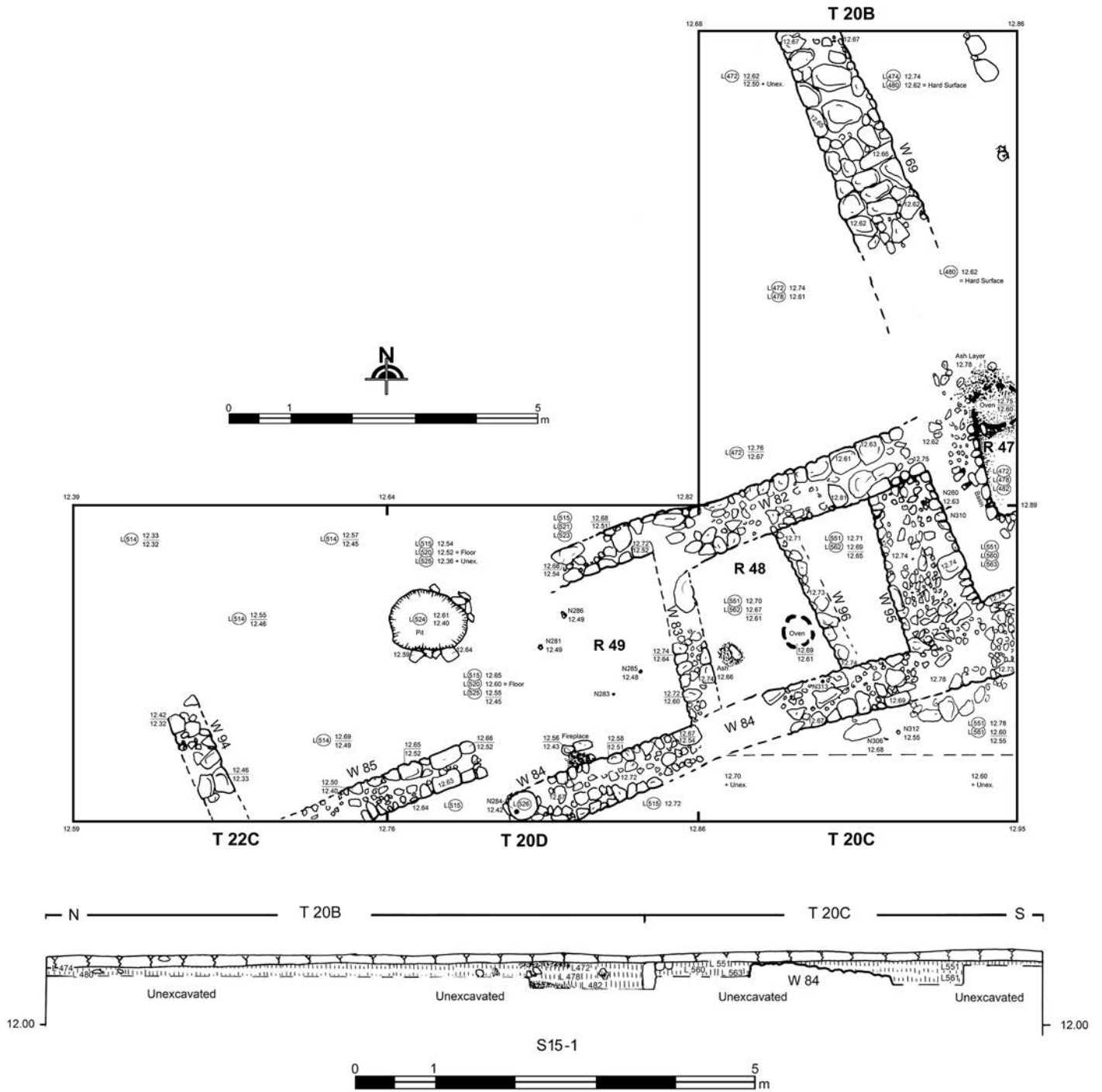
R45 to the south is limited by W86, W77', and W76', the latter of which is only fragmentarily preserved. The eastern boundary of the room is not preserved. This space contained a Mycenaean shallow cup (L511-1; Fig. 4:3), a krater of White Painted wheel-made ware (L511-2), and a stone loom weight (N287).

R46 to the west of R45 is bordered by W76' and W77'. A stone spindle whorl (N282) was discovered among the stones of W77'. It is tentatively ascribed to Stratum 2. The area south of W77' was partly stone paved. East of the pavement a cooking pot of Coarse ware (L530-1) was found.

#### TRENCHES 20A–D, 21C, 22C AND D, AND 23A, B, AND D

The area of the excavations in 2015 is 5 m west of Trenches 14B, 14C, and 19B from 2014. The structures in Trenches 14B, 14C, and 19B are difficult to subdivide stratigraphically since modern farming has disturbed the context to a depth of 20–30 cm below the surface. Stone structures of a large compound were indicated by the georadar survey in 2014. An area of 261.5 m<sup>2</sup> was opened up 5 m to the west of the trenches from 2014 (Fig. 7). There is a small ridge of stones between the area of excavations from 2014 and 2015, which represents the boundary between two fields. This ridge is beyond any doubt built of stone from Late Cypriot structures which were brought up to the surface during ploughing and collected there. The excavated area from 2015 demonstrated two occupational strata, Stratum 1 and the older Stratum 2.

<sup>15</sup> Fischer & Bürge 2015, 36–38.



*Fig. 8 (top). Stratum 1, Area 6 West, Trenches 20 B-D, 22C (drawing by M. Al-Bataineh).*

*Fig. 9 (above). Section 15-1, east section Trench 20B, C (drawing by M. Al-Bataineh).*

### Stratum 1 (Trenches 20B, C, D, 22C)

The exposed part of a compound of the most recent phase of occupation, Stratum 1, extends approximately 9 m × 22 m (Figs. 8, 9). There is a 1.3 m wide wall to the north, W69, which runs NNW–SSE. Its southern part is not preserved. This wall is almost twice as wide as all the other walls which belong to domestic and industrial facilities. It faces the harbour, and may represent a portion of the defence system, which would make it the first such structure ever discovered at Hala Sultan Tekke.<sup>16</sup>

In the space to the east, most likely an outside area, a complete wheel-made cooking pot of Coarse ware (L480-1; Fig. 10:1) was found next to the eastern section of Trench 20B. The space west of W69 is also an open space. It contained several ceramic finds: a complete shallow angular bowl (L472-8) and a cup (L472-9) of Plain White wheel-made ware, a WPGS deep bowl (L472-7), a WPPS krater with the depiction of a bird (L472-3), a cooking pot of Coarse ware (L472-1), and the upper part of a loom weight (L472-4). A fragment of a Mycenaean krater (L472-2; Fig. 10:2), a Base-ring II bowl (L472-5), and a White Slip II mature bowl (L472-6) are considered residual.

There are three walled spaces to the south: R47–R49. R47 is the easternmost of these spaces and is limited by the massive W95 and by W84. An oven and an ash spot are in the northern part of R47. There is a kind of “basin” (L482) in the centre (?) of the room. It was filled with dark brown ashy soil. The remaining part of the room (L551, L560, L563) contained the upper part of a Base-ring juglet (L563-1), a sling bullet of lead (N310), and a clay loom weight (N260).

R48, the next room to the west of R47, is bounded by W83, W82, W95/W96, and W84, on top of which a circular paste bead (N313) was discovered. The room measures 3 m × 2.3 m. A clay oven and an ash spot were exposed in this room. The exposure of R48 and the area to the south, where a stone pestle (N312) and an elongated lead object (N306) were found, will continue.

R49 is to the west of R48. It is limited by W82, W83, and W84. The western limit of this space is not preserved. North of W84 is a small stone-lined fireplace and a small “pit” is incorporated into the wall. It contained a limestone spindle whorl (N284) and a frying pan of Coarse ware (L526-1). In the north-western part of Trench 20D is a partly stone-lined pit with a diameter of 0.9–1.2 m (L524). In addition, this space contained several fragments of residual pottery, e.g. a White Slip I bowl (L520-1), a Mycenaean closed vessel with bichrome dark brown and white decoration (L520-2), a My-

cenaean shallow cup (L525-1), and the base of a Mycenaean miniature jar (L525-2). Additional finds from R49 include a globular white paste bead (N283), two stone biconical spindle whorls (N281, N285), and a clay loom weight (N286). North of R49 a basin of Plain ware was found (L523-1).

Two perpendicular walls are to the west W94 and W85. Their orientation is the same as that of the walls of the rooms described above, but their mutual relation is not clear and is further complicated by the limited preservation of these two walls. A Coarse ware cooking pot (L514-1) comes from the area north of W85 and east of W94.

### Stratum 2 (Trenches 20A, B, D, 21C, 22C, D, 23A, B, D)

At least six (partially) walled spaces (R50–55) and several open areas belong to Stratum 2 (Figs. 11, 12). R50 is a partially exposed walled space which is bounded by W89, W72, and W70. Its entrance to the south is 1.2 m wide. The area east of W70 has not been exposed yet, except for a test trench, 1 m × 3.3 m in size, next to W70 (L481, L483). Fragments of a spouted bowl (L481-3) and a deep bowl (L481-2) of White Painted wheel-made ware, a Base-ring II bowl (L483-1), and an alabaster jug (L481-1) come from the test trench.

R51 to the south could be entered via a doorway in W70. It is limited by W90, W72, W70, W73, and W88. It is 2.8 m × 4 m in area. There is another entrance from the north (see above) via R50. A stone loom weight (N273) was found in the area of the northern entrance. A circular ash spot (diameter approx. 0.4 m) was exposed in the north-western part of R50. In the centre of the room there is a stone-packed posthole. R50 contained a large variety of ceramic finds, some of them complete or almost complete: a handle of a Plain White wheel-made jar marked with a finger impression (L490-4), a handle of a pithos with a potmark (L498-1), three WPGS deep bowls (L479-6, -8, L507-1; Fig. 10:3), two WPGS shallow carinated bowls (L479-7, -9), two WPPS kraters with the depiction of a bird (L479-2, -3), and another krater of the same ware with geometric decoration (L490-5), a spouted juglet of White Painted wheel-made ware (L507-3), a small bowl of Coarse ware (L479-5), a Base-ring II bowl (L479-4), a Base-ring II jug (L507-2; Fig. 10:6), the front part of a Base-ring bovine figurine (L499-4), a Mycenaean jug (L499-3), and fragments of a White Slip I bowl (L490-3), a White Slip I closed vessel (L499-1), a White Slip II early bowl (L499-2), and a White Slip II late bowl (L490-2). Of special interest is a Mycenaean (LH IIIA2–B) conical rhyton with projecting knobs (L490-1; Fig. 10:7) which resembles a hedgehog. Other finds include a part of a basalt bowl (L479-1), a bronze earring (N277) next to the northern entrance, and four lead sling bullets (N264, N265, N266, N279; see some of them in Fig. 14), which were found just west of the entrance in W70.

<sup>16</sup> Åström's search for a “town wall” in the decades prior to the current excavations was not successful.



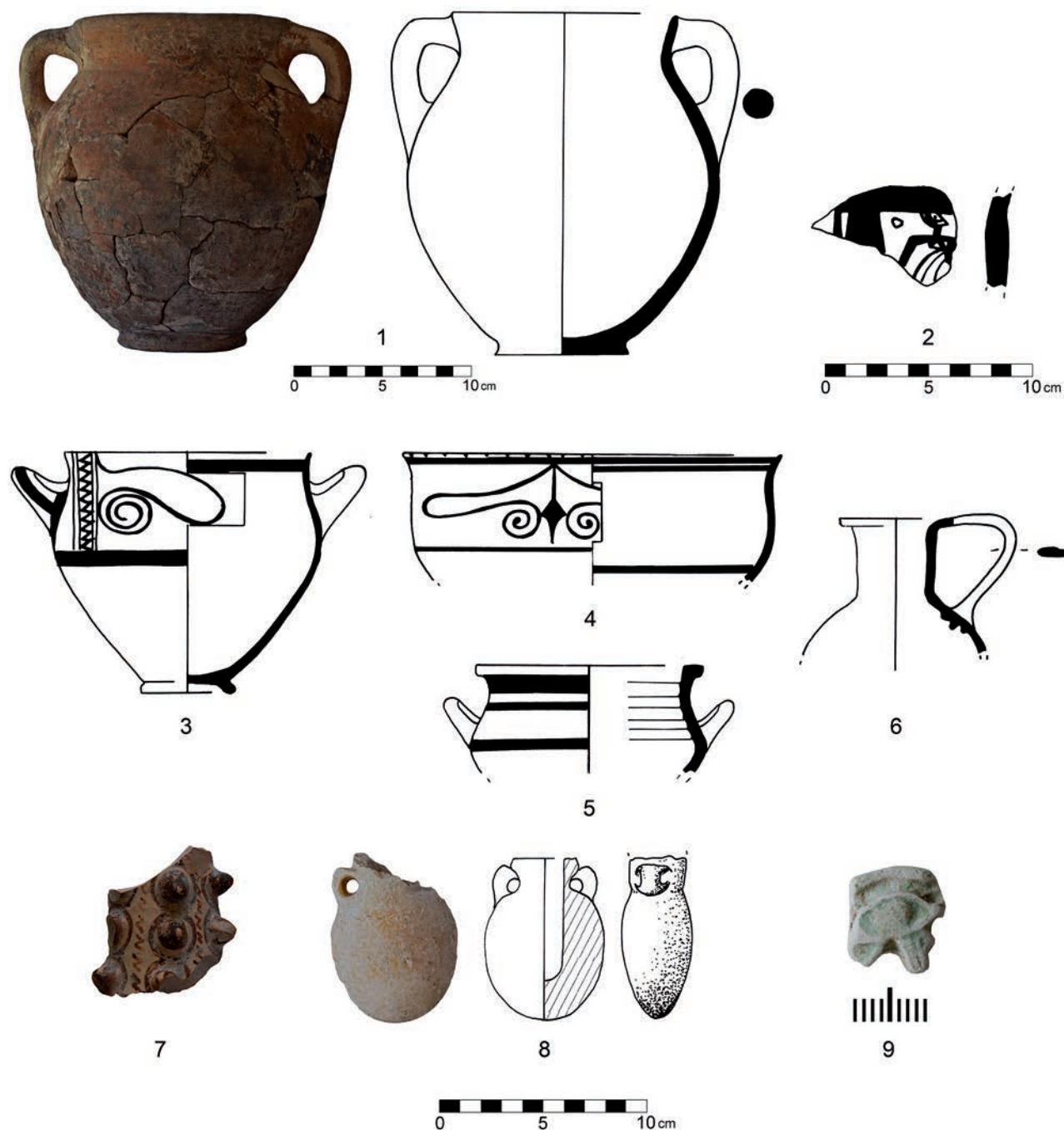


Fig. 10. Cooking pot of Coarse ware (L480-1; no. 1), and fragment of Mycenaean pictorial krater (L472-2; no. 2), from Stratum 1 and WPGS deep bowls (L507-1, L491-2; nos 3–4), White Painted wheel-made squat jar (L505-3; no. 5), Base-ring II jug (L507-2; no. 6), Mycenaean (LH IIIA2–B) conical rhyton (L490-1; no. 7), alabaster flask (N288; no. 8) and Egyptian faience amulet (N309; no. 9) from Stratum 2, Area 6 West, Trenches 20–23 (drawing by M. Al-Bataineh, photographs by P.M. Fischer and T. Bürge).



*Fig. 12 (below). Section 15-11, east section Trench 23A, D (drawing by M. Al-Bataineh).*

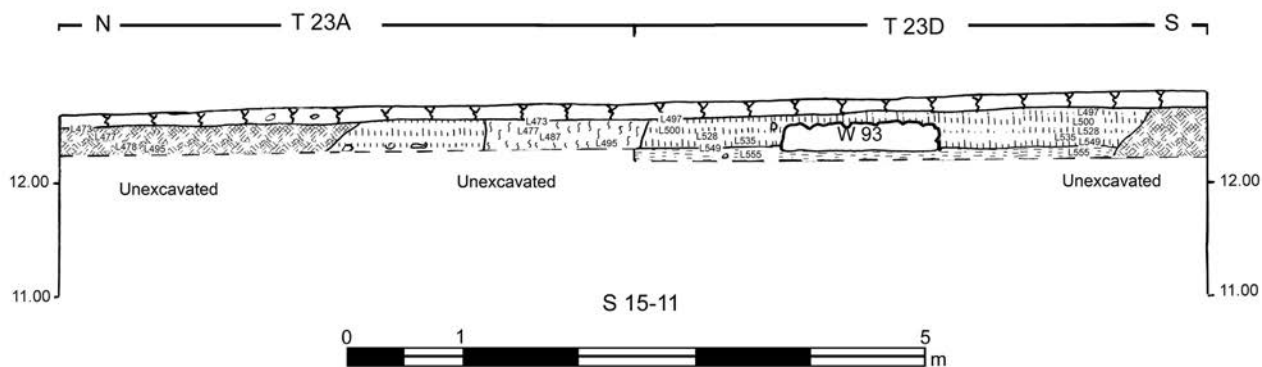




Fig. 13. Basin from Stratum 2, Area 6 West, Trenches 20D, 22C (photograph by P.M. Fischer).

R52 is the narrow walled space to the south of R51. It is limited by W73, which is preserved to a length of 8.5 m, by W88, which has a 0.8 m wide entrance, and another wall, W97. The southern limits of R52 could not be exposed because of the interfering W84 from Stratum 1 on top of it.<sup>17</sup> A layer of gravel (possible foundation) was found in the southern exposed part of the room. Finds from R52 include a fragment of a Mycenaean closed vessel with bichrome dark brown and white decoration (L531-1) and a handle of a Plain ware jug with a potmark (L537-1).

There is another space to the east of R52 bordered by W88 and W87, which could be reached through the doorway in W88. Only a small part of this space could be exposed because of the interfering W83 and W84 from Stratum 1. The excavated portion measures approximately 2.3 m × 0.5–0.8 m. The northern and southern parts of this space again contained much gravel (possible foundation). There are no finds of interest in this space.

To the west of R52 is a basin, R53, which is limited by W73, W97, and W98 (Fig. 13). The size of the basin is 2.1 m × 2.7 m. A clay loom weight (N290) was found built in the northern wall of the basin, a stone spindle whorl (N289) on the southern wall. A concentration of slag was exposed in the eastern part of the basin. The basin is clad by a layer of fine, white plaster. The basin contained a part of a vat in Plain ware (L538-1). The basin might have been used for the purple-dyeing of textiles.

The area north and west of R52 and R53 is an open area. An oven and an ash spot were found north of W73, and a stone-lined posthole was exposed against the same wall further to the east. A lentoid alabaster flask (N288; Fig. 10:8) was found just west of the basin R53. Other finds from this area include a Plain White wheel-made shallow carinated bowl (L518-3), two shallow bowls of White Painted wheel-made ware (L539-1, -2), a WPGS deep bowl (L539-4), a krater (L518-5) and a jug of the same ware (L518-2), a reused body sherd of a White Painted wheel-made vessel, possibly a lid or a spindle whorl (L539-3), a hand-made cooking pot of Coarse ware (L518-4), and a residual White Painted VI juglet (L518-1).

<sup>17</sup> According to the policy of the Department of Antiquities architectural remains should not be removed.



The next space to the west is R54, bounded by W74, W80, and W75. It extends 2 m by at least 3 m. Its southern part is not exposed yet. There are two semicircular ash spots, one against W74 in the north and one against W80 in the east. The room contained a White Painted wheel-made bowl with painted and incised decoration (L475-2), a WPGS rounded bowl (L519-1), a carinated bowl of White Painted ware, which imitates Base-ring wares (L475-4), a White-shaved juglet (L475-1), the neck of a bichrome painted Base-ring human figurine (L475-3), and a Mycenaean (?) stirrup jar (L475-5). The entire room was covered by a layer of ash.

The areas to the west and to the south of R54 are affected by modern farming. The area south of this structure, possibly an open space, was tentatively assigned to Stratum 2. It yielded a stone biconical spindle whorl (N300) and a lead sling bullet (N308). Only two minor sections of walls could be exposed: W81, which is to the west at the border of Trenches 21C and 22D, and W93 in Trench 23D. W81 runs approximately parallel to W75, at a distance of 3.3 m. Built into this wall are two large rectangular stones, each with two square recesses for door pivots. The width of this door is 0.9 m. The area between W75 and W81, R55, contained two fragments of WPGS kraters (L476-2, -3), a base of a “Canaanite” jar with a hole, reused as funnel (L476-1), and a stone loom weight (N259).

The area west of W81, Trench 21C, contained spots of ash and fireplaces: there is a fireplace, partly stone-lined, in the north-eastern corner of the trench, approximately 0.6 m in diameter. In the western half of the trench, extending approximately 0.8 m in diameter, there is a large ash spot. There are concentrations of medium-sized stones in the northern, south-western, southern, and central parts of the trench. Finds from this area include a bowl (L496-3), an amphoriskos (L496-2) and a squat jar (L505-3; *Fig. 10:5*) of White Painted wheel-made ware, a WPGS deep bowl (L491-2; *Fig. 10:4*) and two kraters of the same ware (L491-1, L496-1), and a cooking pot of Coarse ware (L505-4).

The southern limits of R55 are not clear (see above). The northern part of Trench 23A, which possibly still belongs to R55, was partly stone-paved. A stone weight was found in the northern part of the trench, a part of a limestone basin in the eastern part. Additional finds from this large area include a pithos handle with a potmark (L477-1), a wheel-made cooking pot of Coarse ware (L477-2), and three lead objects—a spherical object (N267), a sling bullet (N268) and two rings linked together (N269).

The stone-lined structure which appeared in the north-western corner of Trench 23A turned out to be a well with a diameter of 1.2 m (L494, L506, L508, L516). Several large worked stones fell down or were thrown down into the well. The most remarkable of these stones is a precisely executed, large, well head (L516-3), which proves that the structure is a



*Fig. 14. Sling bullets of lead from Stratum 2, Area 6 West (photograph by P.M. Fischer).*

well. Traces of wear from ropes are visible on one side. Other finds from this well include a WPGS deep bowl (L516-2), the front part of a White Painted zoomorphic figurine (L494-2), a fragment of a White Slip I bichrome bowl (L516-1), the handle of a White Slip II jug or juglet (L494-1), a part of a Base-ring II jug (L494-4), and the rim of a Mycenaean shallow cup (L494-3). For safety reasons, the excavations came to a halt at approximately 3.20 m below the surface, at a level of 9.20 masl.<sup>18</sup> It is not clear yet whether the well was dug in the period of Stratum 2 or Stratum 1. Therefore, the attribution of this well to Stratum 2 remains tentative.

There are interesting finds in the southern part of Trenches 23A and D: the western part is covered by gravel (L527, L534) extending almost diagonally from north-west to south-east. Finds from this area include a composite alabastron of White Painted wheel-made or Mycenaean ware (L527-2), the leg of an Aegean-type cooking pot (L534-1), a fragment of an alabaster (open?) vessel (L527-1), a clay loom weight (N274),

<sup>18</sup> Metres above sea level. All heights in the report are masl.

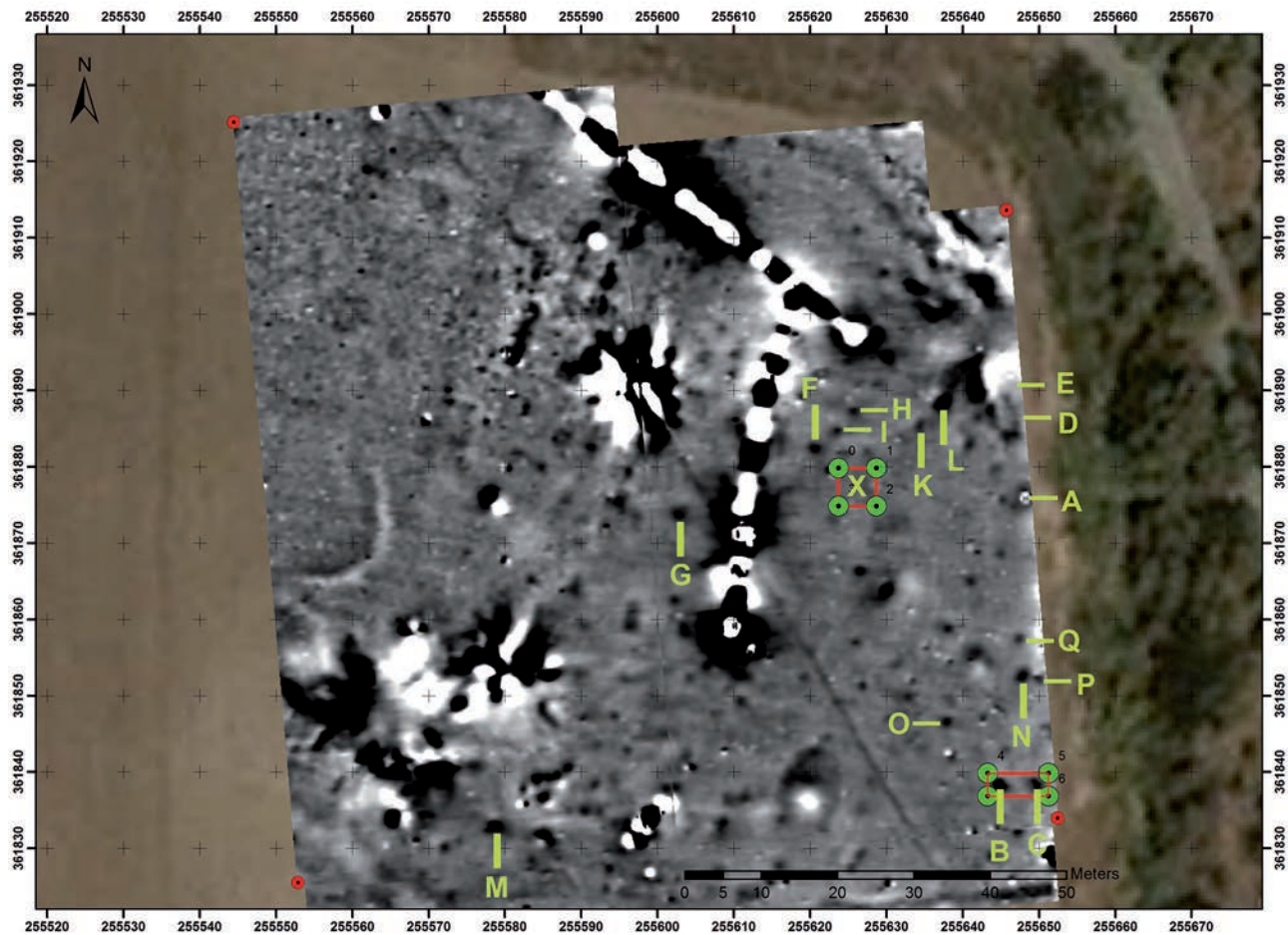


Fig. 15. Magnetogram (white/black range:  $-8/+16$  nT) of Area A with excavated features (by I. Trink and P.M. Fischer).

and a worked stone (N280). Other features are an oven with a diameter of 0.6 m close to the western section (L477'), a rectangular pit (L533, L553) extending at least  $2.2 \text{ m} \times 1.1 \text{ m}$  in the south-western corner, and a circular pit covered by stones (L542, L554) with a diameter of 1.1 m against the southern section of the trench. A semicircular lead object, possibly a spindle whorl (N275), was found on top of the rectangular pit.

The area east of the gravel (L528, L535, L549, L555) can be clearly distinguished from the remainder because of much harder soil. There is a wall running NNW–SSE, W93, at the eastern section of Trench 23D, which has to be further exposed. There are a number of hewn stones in the south-eastern part and a stone structure (dimensions  $0.8 \text{ m} \times 0.6 \text{ m}$ ) in the south-eastern corner. A multitude of finds derive from this area: a WPGS deep bowl (L535-5), a WPGS shallow bowl (L535-6), a wheel-made cooking pot of Coarse ware (L535-

4), a head of a Base-ring bovine figurine (L549-1), a fragment of a Mycenaean stirrup jar (L528-1; LH IIIA–B), a fragment of a light green Egyptian faience vessel with black decoration (L535-1), an Egyptian faience amulet of a female (L535-2), another Egyptian faience amulet with an eye (N309; Fig. 10:9), a stone spindle whorl (L535-3), two clay loom weights (N292, N303), two stone pestles (N296, N304), a bronze needle (N297), a pair of bronze tweezers (N294), an earring of bronze and/or silver (N276), two lead fishing net weights (N298, N305), and eleven lead sling bullets, of which most are ellipsoidal or, more rarely, truncated or cylindrical (N295, N299, N301, N302, N307A–F, N311; Fig. 14). A pit of trapezoidal shape (L548; dimensions  $1.5/2 \text{ m} \times 1.4 \text{ m}$ ) is in the northern half of the trench. A clay loom weight (N271) and a possible bronze arrowhead (N272) were found on top of the pit.

Future excavations will be undertaken in this area.



## Results of the excavations in Area A

Area A is immediately west of the mosque of Hala Sultan Tekke. Two tombs from the Late Cypriot period have been excavated there in the past.<sup>19</sup> Our surface survey in 2013 led to the discovery of some “pits” in the western section of the channel opposite the mosque, which was excavated in the 1950s. One of them, Tomb A, which is some 20 m to the north of Tomb 2, was excavated from 2013<sup>20</sup> to 2015.

Based on the results of the surface survey a georadar and geomagnetic survey was carried out in 2014<sup>21</sup> which resulted in more than 80 circular anomalies being identified (Fig. 15). In the same year, four of these anomalies in the south-eastern part of Area A were opened in order to check the geophysical results. They turned out to represent a rich offering pit (Pit B), and three wells (Wells C–E).<sup>22</sup> In addition to complementary excavations of Tomb A another eleven of these geophysical anomalies (F–Q) were investigated in 2015. The following anomalies turned out to be wells which were abandoned in the 13th and 12th centuries BC: Wells F, G, H, I, M, O, and Q, of which Well F will be presented in greater detail because of many interesting finds. K contained a platform of cement of maybe Ottoman date. L did not contain any finds of interest. The other two, N and P, are pits which will be presented in more detail because of much interesting pottery which dates from the 16th/15th centuries BC.

### TOMBA

This well had been reused for the burials of six individuals<sup>23</sup> who were buried or rather thrown into the well on several occasions. Skeleton 6, the first buried individual, is a young female around 20 years of age<sup>24</sup> with an artificially deformed cranium and a poor state of health. She was buried together with a rather large dog. Skeleton 5, one metre above the former, is also a female in her 20s. Skeleton 4, half a metre above Skeleton 5, is also a female around 40 years of age. Skeleton 3 is an 8–9-year-old child close to Skeleton 4. Skeleton 2, half a metre above the former, is an adult of undefinable sex around 20 years of age. The scanty remains of Skeleton 1, 0.7 m above the former, are a possible, roughly 20-year-old, female.

Most of the finds which were associated with the buried individuals are their personal belongings and include faience beads, silver jewellery including an earring and some plaques,

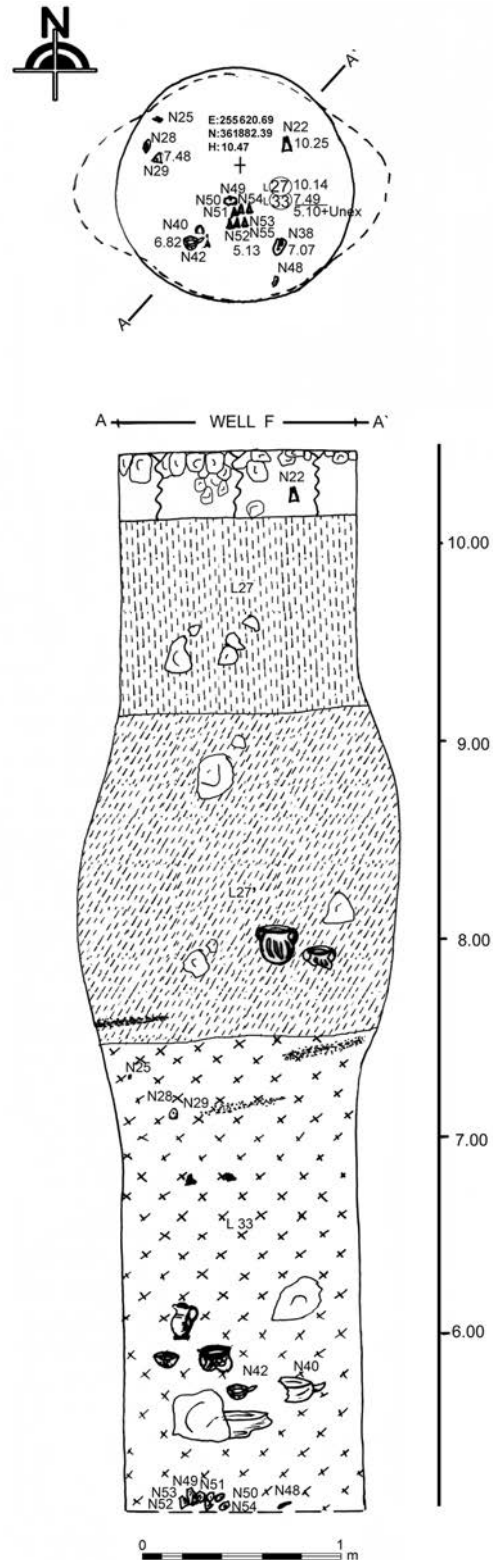


Fig. 16. Plan and section of Well F (drawing by M. Al-Bataineh).

<sup>19</sup> Tombs 1 and 2 in Karageorghis 1976, 70–89.

<sup>20</sup> Fischer & Satraki 2014.

<sup>21</sup> Trinks 2015.

<sup>22</sup> Fischer & Bürge 2015.

<sup>23</sup> The skeletons are numbered from “1” to “6”, where “1” is the most recent.

<sup>24</sup> Cf. Stolle in Fischer & Bürge 2015, 44.



Fig. 17. Collection of finds from Well F: White Slip II bowl (L33-1; no. 1), Base-ring bowls (L33-19, N42; nos 2, 3), Base-ring jug (L33-12; no. 4), bone shuttle (N48; no. 5) and Egyptian paste scarab (N25; no. 6) (photographs by P.M. Fischer and T. Bürge; drawing by M. Al-Bataineh).

and a bronze finger ring still attached to the finger phalange. There are only three more or less complete ceramic vessels—two White Painted Wheel-made Geometric Style deep bowls and a White Shaved juglet.

The time span between each of the burials is difficult to estimate, however the pottery offers some clues: there is a White Painted Wheel-made Geometric Style deep bowl and a White Shaved juglet just below the earliest burial (Skeleton 6), and another White Painted Wheel-made Geometric Style deep bowl between Skeletons 1 and 2, most likely belonging to the latter. These findings date the burials to the Late Cypriot IIIA period and mostly to its first half. The burials might have taken place within a relatively short period of up to some years.

For safety reasons the excavations of Tomb A which started at 10.18 masl were stopped at the level of 4.71 masl.

## WELL F

Well F is a circular feature of 1.3 m diameter (*Fig. 16*). Like other circular features, which were interpreted as wells in Area A, this too has clay-plastered walls. The uppermost locus below colluvial soil is L27 at 10.14 masl. A number of finds were discovered just below the surface. These include a White Slip II mature bowl (L27-2), a complete White Slip II late bowl (L27-1), a bowl of Plain White hand-made (?) ware (L27-3), a trefoil mouthed jug of the same ware (L27-4), two hand-made

cooking pots of Coarse ware (L27-5, -6), and a loom weight (N22). The well widens at roughly 9.10 masl but the nature of the fill did not change (L27').

While there are just a few pottery sherds and bones below the initial concentration of finds, the number of finds increased from a level of 7.49 masl (L33). The soil, which was intermingled with mudbricks, contained eight White Slip II bowls (L33-1 in *Fig. 17:1*, L33-2, -3, -5, -6, -9, -10, -18), a relatively large closed vessel of Red Lustrous wheel-made ware (L33-4), a jug of hand-made Bucchero ware (L33-7), a carinated bowl of White Painted wheel-made ware (L33-8), a vat (L33-11), a lamp (L33-17) and a strainer (L33-15) of Plain ware, the rim of a krater of Mycenaean ware with bichrome decoration (L33-16), and a bowl of Monochrome ware (L33-14). In addition, there were a number of Base-ring finds, mainly Base-ring I: three bowls (N42 in *Fig. 17:3*, L33-13, -19 in *Fig. 17:2*, L33-21), a trefoil-mouthed jug (L33-12; *Fig. 17:4*), and a juglet (L33-20). Other finds include a white paste scarab (19th Dynasty, N25; *Fig. 17:6*), nine loom weights (N28, N29, N38, N49, N50–N54; *Fig. 18*, central row), a bone shuttle (N48; *Fig. 17:5*), and a folded piece of bronze, most likely from a vessel (N40). It should be highlighted that the loom weights are of different shapes: circular, oval, and truncated pyramidal.

For safety reasons the excavations were halted at a depth of 5.00 masl.



*Fig. 18. Loom weights of fired clay from Area 6 West (upper row), Well F (central row), and Pit P (lower row; photograph by P.M. Fischer).*





Fig. 19. Pit N (photograph by T. Bürge).

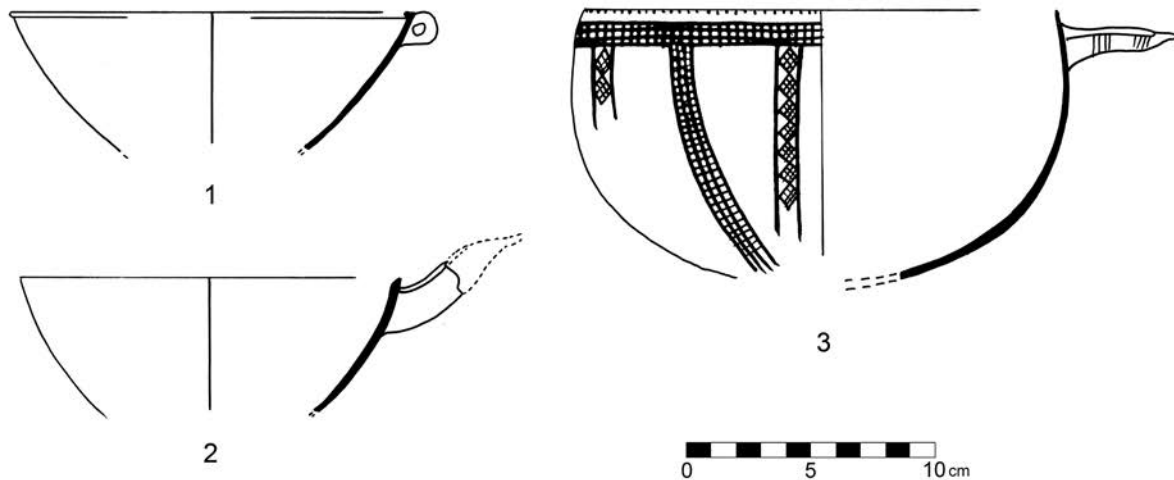


Fig. 20. Collection of finds from Pit N: Base-ring I bowls (L36-2, -3; nos 1, 2) and White Slip II bowl (L36-1, no. 3) (drawing by M. Al-Bataineh).

## PIT N

Pit N is a feature of rectangular/oval shape, measuring approximately 1.6 m × 2.2 m (top level: 9.62 masl; Fig. 19). It was clearly distinct from the surrounding virgin soil due to its light reddish-brown, compact fill. It contained a negligible amount of bones and shells, and a relatively small amount of pottery. The pottery fragments are almost exclusively of hand-made Plain, Black/Red Slip, hand-made Coarse, Monochrome, Base-ring I, and White Slip II early wares. Finds from this feature include a shallow bowl of Red-on-Black ware (L36-4),

two bowls of Base-ring I ware (L36-2, -3; Fig. 20:1, 2), and a bowl of early White Slip II ware (L36-1; Fig. 20:3). The bottom of the feature was reached after 1.05 m at a depth of 8.57 masl.

The function of this feature is not entirely clear. It differs from the other pits by its rectangular/oval shape and its shallowness, which definitely excludes a primary use as a well. A (looted) burial is unlikely due to the very small amount of bones. In general, the sherds were scattered in the pit, which means that they were deliberately broken before or in the process of deposition.



## PIT P

This feature has a circular shape with a diameter of approximately 1.2–1.4 m (top level: 9.62 masl; *Fig. 21*). The first locus below colluvial is L38 starting at 9.22 masl. The fill inside the feature has a similar reddish-brown colour and compact texture as Pit N (see above). A hand-made cooking pot of Coarse ware (L38-1), a loom weight (N24) and a bone shuttle (N26) were found in L38.

A concentration of finds of which many were complete started at 8.23 masl. These finds comprise four shallow bowls of Plain White wheel-made ware (N41, N45, L40-7, -8); a lamp of Plain ware (L40-9); a bowl of Monochrome ware (L40-11); four bowls (L40-2, -4 in *Fig. 22:3*, L40-5, -12), two juglets (N43 in *Fig. 22:4*, L40-13), a jug (L40-14) and a tankard (N44; *Fig. 22:5*) of Base-ring I ware; the rim of a krater of Bichrome wheel-made ware (L40-10), a fragment of a Proto-White Slip bowl (L40-1), a White Slip I bichrome bowl (L40-2; *Fig. 22:1*), and a White Slip I monochrome bowl (L40-6; *Fig. 22:2*). A flat, square inlay (?) of ivory (N39), and eight circular, oval or pyramidal loom weights (N30–37; *Fig. 18*, lower row) were also found in the fill. The bottom of the pit was reached at a level of 7.48 masl, i.e. with a total excavated depth of 2.14 m.

Pit P did not contain any human osteological material but numerous complete and even intact finds most of which fit into the Late Cypriot IB period. We suggest that Pit P functioned primarily for the deposition of offerings during a ritual which might have had a relation to the nearby Tomb 2.<sup>25</sup>

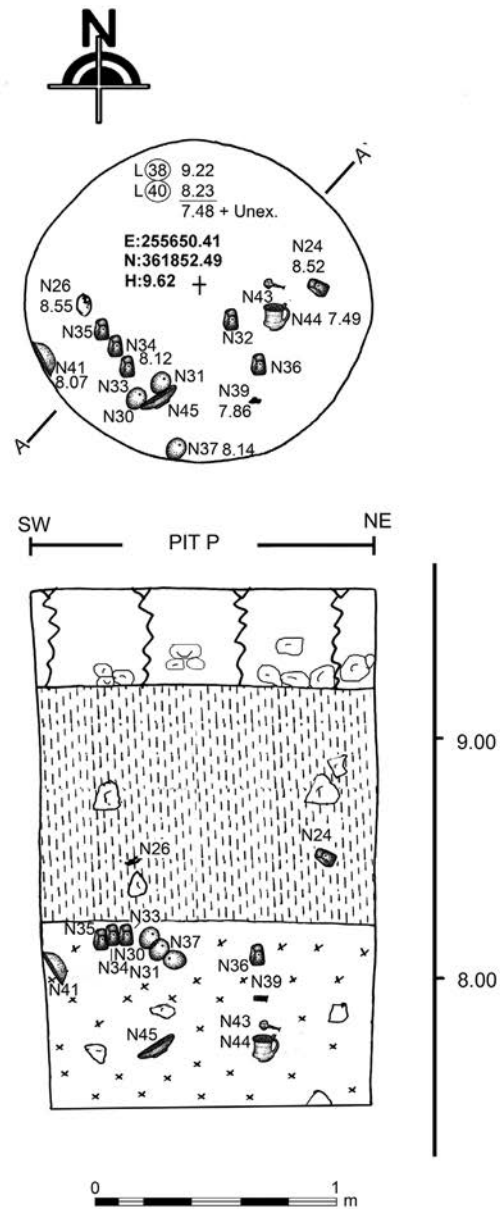
## Discussion and conclusions

### AREA 6W: ARCHITECTURAL REMAINS

Once again, geophysical prospecting, primarily by georadar, has shown a great potential for the discovery of new city quarters and the planning of the subsequent excavations at Hala Sultan Tekke. The pre-excavation information about the size and orientation of the buried architectural remains and also their distance from the ploughed surface are invaluable tools in planning and carrying out our field projects as efficiently as possible. After the georadar surveys in 2010 and 2012 the third survey in 2014 resulted in the discovery of another city quarter west of the area which had been excavated in 2013 and 2014. It should also be highlighted that all areas where georadar had been used turned out to contain structures of stone, and totally “empty” areas have not yet been found.<sup>26</sup>

<sup>25</sup> Tomb 2 which is closest to our Pit P also contained White Slip I amongst the oldest material. Karageorghis (1976, 89) dated the oldest burial phase towards the end of Late Cypriot I.

<sup>26</sup> With the exception of areas disturbed by ploughing.



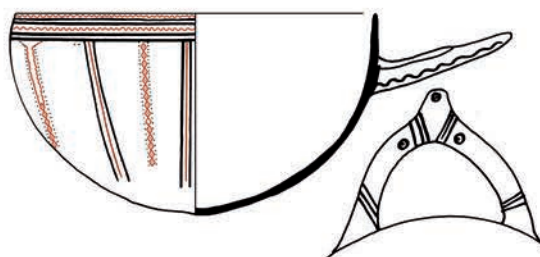
*Fig. 21. Plan and section of Pit P (drawing by M. Al-Bataineh).*

Complementary excavations were carried out in the area which was opened in 2013 and 2014. In Stratum 1, the most recent layer of occupation, further evidence of extensive textile production and dyeing was found. In addition to loom weights and spindle whorls there was a heap of crushed murex shells, approximately 25 kg, close to a basin where, in 2013, remains of purple colour was found.

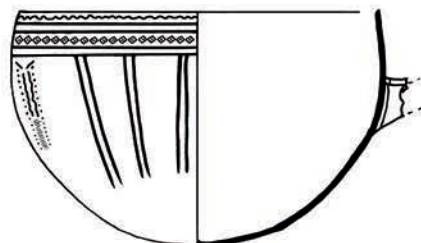
The main objective of the excavations in 2015 was the new city quarter inside the surveyed area of 70 m × 50 m which



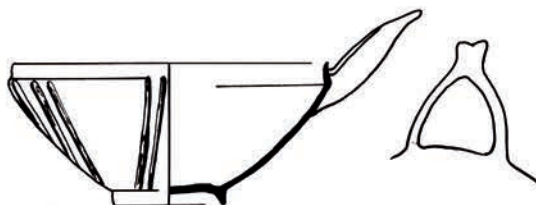
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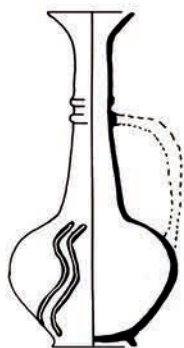
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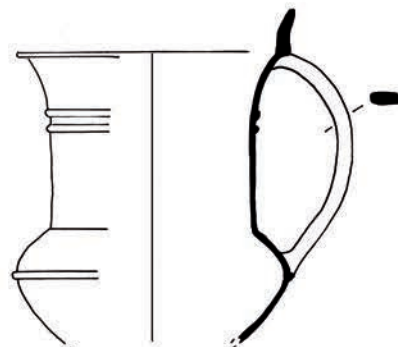
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4



5



was immediately fenced off after the promising georadar results. The georadar indicated a large stone-built compound with walls of varying widths which border several rooms. In 2015, an area of 261.5 m<sup>2</sup> was opened up. Once again, two strata of occupation were discovered: the most recent Stratum 1, and Stratum 2.

One of the most interesting structures from Stratum 1 is a wall which is twice as wide as any of the other walls which belong to domestic and industrial structures. Only a small portion of it has so far been exposed but this wall seems not to be connected to any building and may therefore represent part of a defence system which faces the ancient harbour (Salt Lake). This would make it the first evidence of a defensive wall ever discovered at Hala Sultan Tekke. Further exposure to the north and south is planned for 2016.

In general, the architectural remains of Phase 2 are better preserved in this area than those from Stratum 1. Stratum 2 yielded a 2.1 m × 2.7 m large basin built of a chalky, dense material. A suggested function of the basin is the dyeing of textiles. There is a concentration of sling bullets at two spots in Stratum 2: one is in the eastern part of Room 51, in the entrance to the room in W70, the other is to the south-west, in the open space west of W93. In addition, the ash layer, which covered large portions of Stratum 2, points to a catastrophic event, most likely a hostile attack.

## AREA A

A total of 17 features indicated by the geomagnetic survey or which were visible in the western section of the deep cut opposite the mosque were investigated between 2013 and 2015. Thirteen of these turned out to be wells, of which one, Tomb A, was reused for the burials of six humans and a dog in the 12th century BC according to the associated pottery. The other wells were backfilled in the 13th to 12th centuries. Well G also contained material which possibly dates to the early Iron Age.

In contrast, Pit N, which is certainly not a well, was backfilled in the 13th century according to the pottery. The function of this feature is not clear but it may have served as an offering pit. A chronological connection to Pit P, which is roughly 2 m to the east of Pit N and is also interpreted as an offering pit, is not possible since Pit P is characterized by the absence of wares later than White Slip I, whereas Pit N

mainly contained early White Slip II sherds. Both pits lack Mycenaean imports.

Pit P resembles to a large extent the offering Pit B from 2014 which also contained several complete vessels but no human osteological remains.<sup>27</sup> However, there is a chronological difference: whereas Pit B dates from the 13th century, Pit P can be dated to Late Cypriot IB, i.e. roughly the 15th century BC. We suggest that Pit P functioned primarily for the deposition of offerings during a ritual connected with the earliest burial of the nearby Tomb 2.

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## Preliminary archaeobotanical analysis

BY DOMINIKA KOFEL

## Introduction

Archaeobotanical analyses extend our knowledge of the living conditions of ancient societies. In the present study a brief overview and preliminary interpretation of the archaeobotanical material from the excavations at Hala Sultan Tekke in 2015 is presented.

## MATERIAL AND METHOD

In total, 26 soil samples were collected from Area 6W: 22 samples were collected from ash/burned layers, two from fill/debris above and below a floor level, one sample from the contents of a pot, and one was taken close to the concentration of *Murex* sp. in Stratum 1. Five came from Stratum 1 and 21 from Stratum 2.

A manual bucket flotation system was used. Each soil sample was dispersed in water and then gently stirred to release the botanical remains. Thereafter, the watery solution from the upper part of the bucket was poured through two sieves (0.5 mm and 0.25 mm mesh size). The next step was to pour fresh water onto the soil remains at the bottom of the bucket

Fig. 22. Collection of finds from Pit P: White Slip I bichrome bowl (L40-2; no. 1), White Slip I monochrome bowl (L40-6; no. 2), Base-ring I bowl (L40-4; no. 3), Base-ring I juglet (N43; no. 4) and Base-ring I tankard (N44; no. 5) (photographs by P.M. Fischer and T. Bürge; drawing by M. Al-Bataineh).

<sup>27</sup> Fischer & Bürge 2015, 45–46, 55.

Table 1. List of plants identified in Hala Sultan Tekke, 15 samples; f = fragment/s.

|  | AREA 6 W |       |       |       |        |       |      |       |       |        |        |         |       |       |       |       |       |       |        |       |        |
|--|----------|-------|-------|-------|--------|-------|------|-------|-------|--------|--------|---------|-------|-------|-------|-------|-------|-------|--------|-------|--------|
| Trench                                   | 16C      |       |       | 16D   |        | 20C   | 20D  | 21C   |       |        |        | 22C     |       |       | 22D   |       |       | 23A   |        |       | 23D    |
| Locus                                    | 502      | 503   | 511   | 544   | 556    | 562   | 538  | 491   | 505   | 505    | 517    | 518     | 519   | 539   | 475   | 476   | 476   | 508   |        |       | 500    |
| Heights                                  | 12.75    | 12.68 | 12.59 | 12.72 | 12.87  | 12.65 | 12.3 | 12.01 | 11.98 | 11.95  | 12.43  | 12.3    | 12.24 | 12.31 | 12.23 | 12.04 | 12.19 | 10.57 | 10.25  | 10.17 | 12.46  |
| Stratum                                  | 1        | 1     | 2     | 1     | 1      | 1     | 2    | 2     | 2     | 2      | 2      | 2       | 2     | 2     | 2     | 2     | 2     | 2     | 2      | 2     | 2      |
| Sample no.                               | 12       | 16    | 19    | 24    | 25     | 26    | 23   | 7     | 11    | 10     | 17     | 20      | 18    | 22    | 5     | 2     | 6     | 13    | 14     | 15    | 9      |
| Cereal grains                            |          |       |       |       |        |       |      |       |       |        |        |         |       |       |       |       |       |       |        |       |        |
| Cerealia, indet. (cereals)               | 2        | 1 f   | 1 f   |       |        |       | 1    |       | 1 f   | 2 f    | 2 10 f | 5       | 9 f   | 4 f   | 11 f  |       | 2     | 59 f  | 7 62 f | 3 7 f | 6 f    |
| Hordeum vulgare nudum (naked barley)     |          |       |       |       |        |       |      |       |       |        | 1      |         |       |       |       |       |       |       | 6      | 1     |        |
| Hordeum vulgare cf. nudum (naked barley) |          |       |       |       |        |       |      |       |       |        |        |         |       |       |       |       |       | 4     |        |       |        |
| Triticum dicoccum (emmer wheat)          |          |       |       |       |        |       |      |       |       |        |        |         |       |       |       |       |       | 1     | 5      | 1     |        |
| Triticum cf. monococcum (einkorn wheat)  |          |       |       |       |        |       |      |       |       |        |        |         |       |       |       |       |       |       |        | 1     |        |
| Triticum sp. (wheat)                     |          |       |       |       |        |       |      |       |       |        |        |         |       |       | 1     |       |       |       |        |       |        |
| Glume base indet. Cerealia               |          |       |       |       | 1      |       |      |       |       |        |        |         |       |       |       |       |       | 1     | 7      |       |        |
| Rachis cf. Hordeum                       |          |       |       |       |        |       |      |       |       |        |        |         |       |       |       |       |       | 8     | 1      | 1     |        |
| Other economic plants                    |          |       |       |       |        |       |      |       |       |        |        |         |       |       |       |       |       |       |        |       |        |
| Chrozophora tinctoria (dyer's croton)    |          |       |       |       |        |       |      |       |       |        |        | 3       |       |       |       |       |       |       |        |       |        |
| Ficus carica (common fig)                |          |       |       |       |        |       | 1    |       |       |        | 5      | 3       | 1     |       |       |       |       |       |        |       |        |
| Olea europaea (olive)                    | 6f       |       | 1f    | 1 9 f | 1 27 f | 1f    |      | 1f    |       | 5f     | 1 25 f | 14 67 f | 15f   |       | 2     |       | 1 f   |       |        |       | 3 f    |
| Prunus dulcis (almond)                   |          |       |       |       |        |       |      |       |       |        |        | 3 f     |       |       |       |       |       |       |        |       |        |
| Vitis vinifera (common grape vine)       | 3 15 f   |       |       |       |        |       | 7 f  |       |       | 1 17 f | 6 58 f | 30 39 f | 2     | 1     | 1 3 f |       | 1 f   | 4 f   |        |       | 1 12 f |
| Legumes                                  |          |       |       |       |        |       |      |       |       |        |        |         |       |       |       |       |       |       |        |       |        |
| Fabaceae, indet. (Leguminosae)           |          |       |       |       | 1      |       |      |       |       |        | 3      | 1       |       |       |       |       |       |       |        |       |        |



|  | AREA 6 W |       |       |       |       |       |      |       |       |       |       |      |       |       |       |       |       |       |       |       |       |
|--|----------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Trench   | 16C      |       |       | 16D   |       | 20C   | 20D  | 21C   |       |       |       | 22C  |       |       | 22D   |       |       | 23A   |       |       | 23D   |
| Locus  | 502      | 503   | 511   | 544   | 556   | 562   | 538  | 491   | 505   | 505   | 517   | 518  | 519   | 539   | 475   | 476   | 476   | 508   |       | 500   |       |
| Heights  | 12.75    | 12.68 | 12.59 | 12.72 | 12.87 | 12.65 | 12.3 | 12.01 | 11.98 | 11.95 | 12.43 | 12.3 | 12.24 | 12.31 | 12.23 | 12.04 | 12.19 | 10.57 | 10.25 | 10.17 | 12.46 |
| Stratum  | 1        | 1     | 2     | 1     | 1     | 1     | 2    | 2     | 2     | 2     | 2     | 2    | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     |
| Sample no.                                       | 12       | 16    | 19    | 24    | 25    | 26    | 23   | 7     | 11    | 10    | 17    | 20   | 18    | 22    | 5     | 2     | 6     | 13    | 14    | 15    | 9     |
| Grasses, weeds and herbs                         |          |       |       |       |       |       |      |       |       |       |       |      |       |       |       |       |       |       |       |       |       |
| Anthemis arvensis<br>(corn chamomile)            |          |       |       |       |       |       |      |       |       |       | 2     |      |       |       |       |       |       | 2     | 2     | 2     |       |
| Citrullus colocynthis<br>(colocynth)             |          |       |       |       |       |       |      |       |       |       | 1     |      |       |       |       |       |       |       |       |       |       |
| Echium vulgare<br>(Viper's Bugloss)              |          |       |       |       |       |       |      |       |       |       |       | 1    |       |       |       |       |       |       |       |       |       |
| Fumaria officinalis<br>(common fumitory)         |          |       |       |       |       |       |      |       |       |       |       | 1    |       |       |       |       |       |       |       |       |       |
| Mentha sp.<br>(mint)                             |          |       |       |       |       |       |      |       |       |       |       |      |       |       | 1     |       |       |       |       |       |       |
| cf. Plantago lanceolate<br>(narrowleaf plantain) |          |       |       |       |       |       |      |       |       |       |       |      |       |       | 1     |       |       |       |       |       |       |
| cf. Rumex acetosella<br>(red sorrel)             |          |       |       |       |       |       |      |       |       |       |       |      |       |       |       |       |       |       |       |       | 1     |
| cf. Stellaria sp.<br>(chickweed)                 |          |       |       |       |       |       |      |       |       |       |       |      |       |       |       |       | 1     |       |       |       |       |
| cf. Viola sp.<br>(violet)                        |          |       |       |       |       |       |      |       |       |       |       |      |       |       |       |       |       | 1     |       |       |       |
| Apiacea, indet.<br>(parsley family)              |          |       |       |       |       |       |      |       |       |       |       |      |       |       | 1     |       |       |       |       |       |       |
| Lamiaceae<br>(mint family)                       |          |       |       |       |       |       |      |       |       | 1 f   |       |      |       |       |       |       |       |       |       |       |       |
| Poaceae<br>(grasses family)                      |          |       |       |       |       |       |      |       |       |       | 2     | 2    |       | 1     |       |       |       |       | 1     | 1     |       |
| Indeterminate                                    |          |       |       |       |       |       |      |       |       |       | 8 f   | 1 f  | 1 f   | 2     |       | 2 f   |       | 6 f   | 12    | 2     |       |

and the operation was repeated until no more soil was left. Sieves retained both the heavy and the light residues after silts and other particles smaller than 0.25 mm were rinsed through. Residues were dried and the heavy elements were separated from the lighter ones. Thereafter, they were sorted using a low-powered stereo/binocular microscope at 1.5–4x magnification. The macroscopic remains were identified based on the shape, surface, and size. In order to make an accurate determination, identification keys and atlases were used as well

as reference collection and communication with a botanical expert.<sup>28</sup> Twenty-one soil samples (five from Stratum 1, and 16 from Stratum 2) offered material for archaeobotanical analysis. All the material was charred. The plant remains for each trench can be studied in *Table 1*.

<sup>28</sup> Many thanks to Dr Renata Stachowicz-Rybka, W. Szafer Institute of Botany, Polish Academy of Sciences.

## Plant remains

In addition to already identified plant remains from 2014<sup>29</sup> some new plants were identified (Table 1). Amongst these are *Hordeum vulgare nudum*, *Triticum dicoccum*, *Chrozophora tinctoria* (Fig. 23A), *Ficus carica*, *Anthemis arvensis* and *Echium vulgare* (Fig. 23B). Barley (*Hordeum vulgare* var. *nudum*; Fig. 23C) and emmer wheat (*Triticum dicoccum*; Fig. 23D) were the first and most commonly cultivated species in the Eastern Mediterranean.<sup>30</sup> They occurred in Cyprus by the 8th millennium BC.<sup>31</sup> Wheat due to its nutritive value, and content of starch and proteins has been the preferred stable food of traditional farming communities in Old World civilizations.<sup>32</sup> Barley, which is often considered a component of poor people's bread, can withstand drier conditions and poorer soils than wheat. It is also the main component in beer fermentation.<sup>33</sup>

*Euphorbiaceae* family plant *Chrozophora tinctoria* (dyer's croton; Fig. 23A) can be used as a source of red and blue dye colour.<sup>34</sup> Ethnographical studies in Turkey proved that mediator substances such as lime, salt, ash, and lemon salt were used during the dyeing process. They action between the dyeing substances and fibres, and can change the tones of the colour.<sup>35</sup> This dye is used today for colouring liqueurs, wine, pastries, linen, and Dutch cheeses.<sup>36</sup>

Fig (*Ficus carica*) is one of the classical fruit crops associated with the beginning of horticulture in the Mediterranean as early as the Early Bronze Age.<sup>37</sup> It is considered an important source of vitamins, minerals, carbohydrates, sugars, organic acids, and phenolic compounds.<sup>38</sup>

Flowers of *Anthemis arvensis* (corn chamomile) are widely spread across Europe.<sup>39</sup> It is a commonly used antioxidant and it is well-known as a medical drug<sup>40</sup> and used for decorative purposes.

*Echium vulgare* (viper's bugloss; Fig. 23B) is considered as a demulcent expectorant that relieves inflammatory pains, fevers, and nervous ailments.<sup>41</sup>

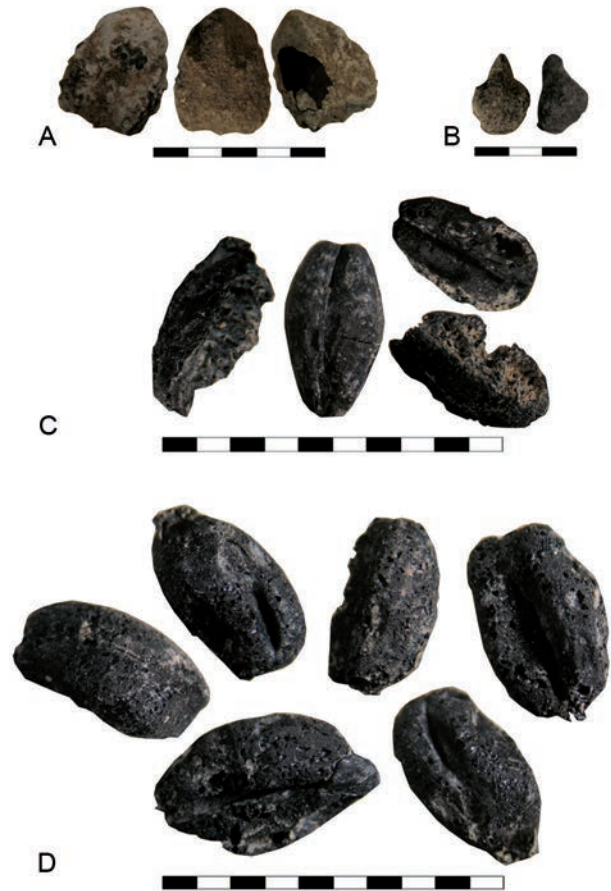


Fig. 23. Botanical remains from Area 6 West; A: three seeds of *Chrozophora tinctoria* (dyer's croton) from Trench 22C; B: seed of *Echium vulgare* (viper's bugloss) from Trench 22C; C: grains of *Hordeum* sp. (barley) from Trench 23A; D: grains of *Triticum* sp. (wheat) from Trench 23A (photograph by D. Kofel).

## Interpretations

The most diverse samples came from Stratum 2 in T21C, 22C, 22D, 23A, and 23D. Some samples will be discussed in greater detail.

The first was collected from an ash layer in L518 (T22C). Eleven different taxa could be identified. There are grasses, weeds, cereals, and economic plants that are both non-edible and edible plants. The dominating taxa are olives and grapes. There are also cereals, figs, and fragments of almonds, and the dyer's croton that might have been used for dyeing textiles. There was also a seed of viper's bugloss that is valued for its medical properties. Macrofossils of grasses and weeds occur. The context is not entirely clear but it seems to be a kind of a

<sup>29</sup> Kofel 2015.

<sup>30</sup> Zohary *et al.* 2012, 23.

<sup>31</sup> Zohary *et al.* 2012, 177.

<sup>32</sup> Zohary *et al.* 2012, 23.

<sup>33</sup> Zohary *et al.* 2012, 52.

<sup>34</sup> Ugulua *et al.* 2009, 411.

<sup>35</sup> Ugulua *et al.* 2009, 411.

<sup>36</sup> Uphof 1968, 128.

<sup>37</sup> Zohary *et al.* 2012, 126.

<sup>38</sup> Vinson *et al.* 2005, 44.

<sup>39</sup> Kornaś 1990, 19.

<sup>40</sup> Djeridane *et al.* 2006.

<sup>41</sup> Uphof 1968, 194.

rubbish or storage area in the vicinity of a kitchen where food was processed. The presence of weed and grasses taxa might indicate cleaning activities that were undertaken before the meal was prepared. The occurrence of dyer's croton might suggest that plants were left somewhere nearby for drying before dye extraction. This may also be valid for the viper's bugloss (drying before medicine production).

Another sample of 300 ml comes from the well in L508 (T23A). Although the sample is small it comprised the second highest number of macrofossils. There is wheat, barley, corn chamomile, and some indeterminate grasses. Also from L508 comes a representative of the *Viola* family. The presence of grain chaffs and rachides might indicate that the grains were burned in ears. Ears of grains together with occurrence of flowers and some grasses remind of small "bouquets" that were dropped into the well while burning. Another possibility is that they represent contaminants that fell into the well during backfilling. Nevertheless, in that case, the remains would not be found concentrated but rather would be scattered around the well. Additionally, the situation seems to be unusual for the site where grains were found mostly as impressions in clay.<sup>42</sup>

## Conclusions

There were five trenches from Stratum 2 which delivered the richest and the most diverse samples. In T22C (L518) the presence of both edible and inedible plants together with herbs and grasses might indicate a storage. The interpretation as storage area is based on the occurrence of cereals, olives, figs, almonds, and grapes. Moreover, two plant species might have been left for drying for later usage (dyer's croton and viper's bugloss). A waste area would be characterized by all the above-mentioned plants (food leftovers) and other non-edible species (grasses). Nevertheless, the ratio between those two groups directs our interpretation of the function towards storage place.

Another interesting context was the well in T23A (L508). It delivered three relatively small samples of many grains with chaff. Moreover, there were macrofossils of flowers. That together draws a picture of some small "bouquets" that were dropped, while burning, into the well. They were deposited on purpose rather than by accident.

To conclude, this year's plant macrofossil analyses suggest that dyeing processes, preparation of food, and storage of various species were undertaken in the area of the excavations in the most westerly part of the opened-up area.

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<sup>42</sup> Hjelmqvist 1976, 121, 120.



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