

TELL EL-RETABA, SEASON 2012

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Abstract: The sixth season of fieldwork of the Tell el-Retaba Archaeological Mission has brought a number of significant results. For the first time remains of a Hyksos settlement (beside the previously known cemetery) were uncovered. Exploration of a large, regularly planned building, divided into a number of standardized flats, brought new evidence for the reconstruction of the function and organization of a strongly fortified town, which existed on the site during the Twentieth Dynasty. Remains of a Third Intermediate Period settlement showed that after the New Kingdom there was a clear change in the settlement pattern in Tell el-Retaba.

Keywords: Tell el-Retaba, Hyksos, New Kingdom, Third Intermediate Period, fortress

During the sixth season of fieldwork of the Polish–Slovak Archaeological Mission in Tell el-Retaba excavations were carried out in three areas: Area 7

(on the western side of the asphalt road), Area 9 and Area 3 (both on the eastern side of the asphalt road [see map in *Fig. 1*]).

AREA 7

HYKSOS CEMETERY AND SETTLEMENT (PHASES G1–G3)

A Hyksos tomb was discovered in 2011 in Area 9, on the eastern side of the asphalt road (Rzepka, Hudec et al. 2014a: 93–97; 2014b: 39–43). The cemetery, to which this tomb belonged, extended for at least 80 m westwards. Three tombs belonging to this cemetery were discovered in 2012 [*Fig. 2*].

Burial [927] in tomb [920] was located in square Y105–X115 in the middle part

of Area 7. Petrie’s “wall 2” [893] stood on top of the northeastern side of this burial, but erosion of the wall made it possible to excavate the tomb almost in its entirety. The building of the wall did not disturb the tomb. The structure and burial were oriented southeast–northwest with the head of the deceased lying to the southeast. The tomb comprised a rectangular burial chamber (2.50 m by 1.30 m by 1.00 m) built of sandy mud bricks (42 cm by 16 cm by 10 cm) laid in stretcher bond. The vault

over this burial chamber was constructed of a single row of mud bricks [Fig. 3 top left]. It was held in place by backing stones, inserted in alternate rows. The bricks were held together by a coarse bonding material mixed of sand, silt and fine gravel, rather similar to the material used for the mud bricks. This material was also used as render on the inside walls of the chamber. This type of tomb architecture corresponds with Type 4.3 at Tell el Dab'a (Forstner-Müller 2008: 29).

The burial was of a woman of *maturus* II age (about 50–59 years) (for detailed anthropological analysis of all burials by Alena Šefčáková, see Rzepka, Hudec et al. 2014b: 46–52). Robbing of the grave in antiquity left the skeleton disturbed and not in anatomic position. Grave goods missed by the robbers included ceramic vessels clustered by the feet of the deceased in the northwest corner of the tomb. It is not clear whether this was the

original position of the vessels as one of the bowls was discovered in the mouth of the robbers' hole, below Petrie's "wall 2". The bones of several animals were recovered inside the chamber; they are interpreted as animal offerings intended presumably as food for the afterlife.

Burial [947] was placed in tomb [929], which was excavated in the southwestern part of Area 7. The tomb, oriented east–west, comprises a rectangular burial chamber [Fig. 3 right] corresponding with Type 4.3 of Tell el Dab'a (Forstner-Müller 2008: 29). It measured 3.20 m in length and 1.20 m in width. The vault was built of a single layer of mud bricks, again using backing stones in alternating rows. The bricks of the burial chamber and vault were held together by coarse bonding. The bones of a male who had died at the age *maturus* II/*senilis* (approximately 50 years) were found inside the burial chamber. Looting in antiquity had left the

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skeleton disturbed and mixed with animal bones.

Burial [922] was located in square Y115–X115 in the eastern part of Area 7. It contained the skeleton of a child between three and four years old. The skeleton was oriented from east to west [Fig. 3 bottom left]. The burial was a simple one, placed in a relatively deep but narrow oval pit [902]. Instead of a proper tomb construction

there were two rows of mud bricks stood on end and leaning against the south wall of the burial pit to shelter the body. This kind of structure corresponds to Type 2.2 at Tell el-Dab'a (Forstner-Müller 2008: 26). The brick size varied between 38 cm by 14 cm by 10 cm and 40 cm by 20 cm by 10 cm. The structure was only 0.70 m long and 0.55 m wide on the outside, its height reaching approximately 0.40 m.

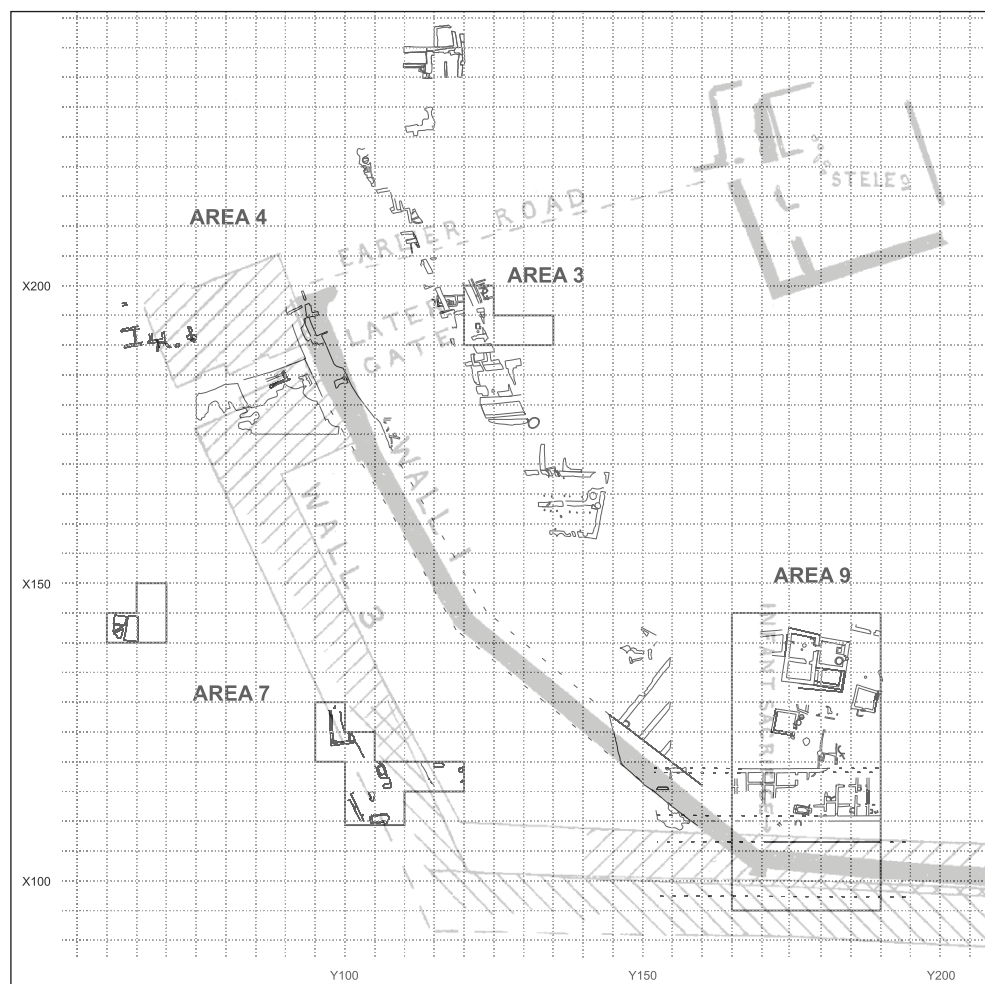


Fig. 1. Areas excavated in 2012
(Drawing Ł. Jarmużek, S. Rzepka)

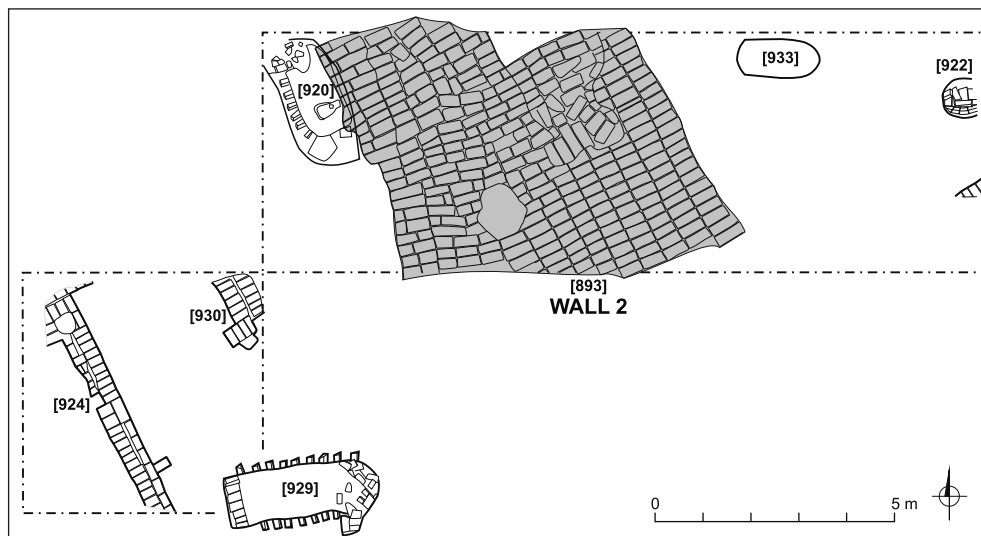


Fig. 2. Hyksos cemetery and settlement, partly covered by Ramesside "wall 2" [893]
(Drawing V. Dubcová, L. Hudáková, L. Hulková, L. Jarmužek)



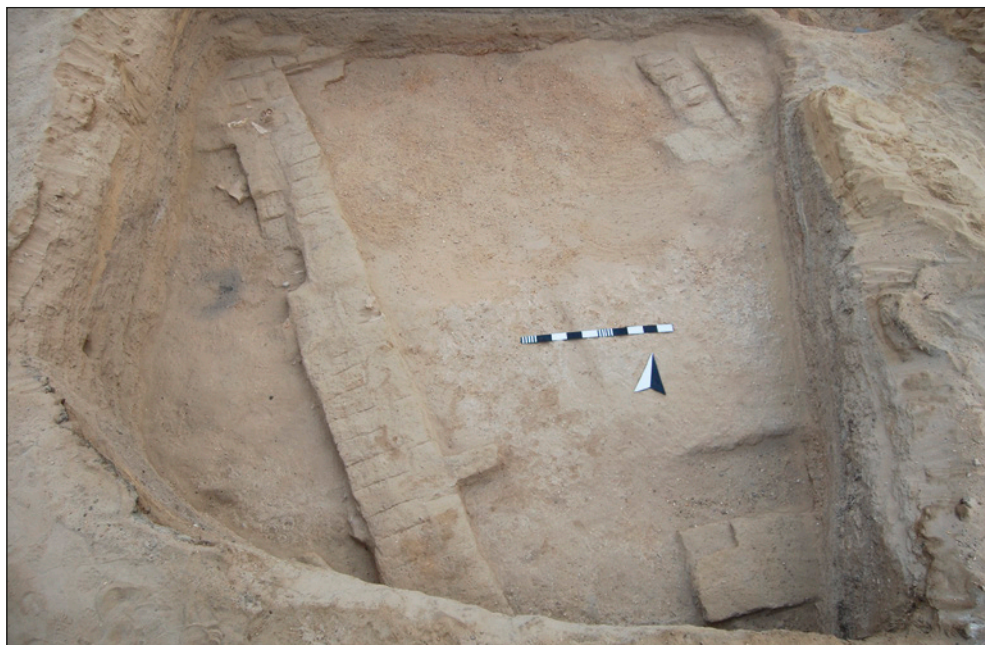
Fig. 3. Burials from the Hyksos cemetery: top left, tomb [920]; bottom left, infant burial [922]; right, tomb [929] (Photos L. Hudáková)

SETTLEMENT

Beside the above-described tombs some remains of a settlement architecture were discovered in Area 7. Near the Hyksos tomb [929] a wall [924], about 5.00 m long, constructed of two rows of yellowish mud bricks (33–40 cm by 17–20 cm by 8–10 cm) was discovered in the western margin of square Y100–X110 [see *Figs 2, 4*]. The wall ran in a NNW–SSE direction and only one course of bricks has been preserved, set directly on a pinkish bed of sand-gravel without recognizable foundations. The deposit westward of the wall [923] contained several animal bones; some bones were found also in the layer covering the mud bricks of the wall, especially in its northern part. In the northwestern corner of the square, the wall seems to turn

westward. Further on, it was connected to a group of mud bricks (another wall?) which disappeared into the northern trench wall of square Y100–X110. The bricks were made of the same material as [924]; they seem to continue in a SWW–NEE direction at a right angle to the wall [924].

A fragment of another wall [930], running parallel to the wall [924] and built of similar yellowish mud bricks, was found further to the east. As a rather limited area was so far excavated, it is not possible to determine, whether [924] and [930] belonged to one building. It is clear, however, that this structure (structures?) was older than the nearby Hyksos tomb [929]: the burial pit of this tomb was dug into a layer which covered the walls [924] and [930]. The layer was continued in



*Fig. 4. Hyksos settlement walls in square Y100–X110
(Photo L. Hudáková)*

square Y105–X115, where it was cut by the grave [920].

EIGHTEENTH DYNASTY

SETTLEMENT (PHASES F1–F4)

Remains of two houses built of characteristic black bricks were discovered in 2011 under the late Ramesside *midol* in Area 4: “Black House 1” [660] and “Black House 2” [617] (Rzepka, Hudec *et al.* 2014a: 89–93; 2014b: 55–64), dated by

pottery to the first half of the Eighteenth Dynasty. Another house of the same type was discovered in 2012 in Area 7. This “Black House 3” [911] consisted of at least two rooms, and is now partly covered by the later defence wall (Petrie’s “wall 2” [883] of Ramesses III date). The house was 6.85 m long from north to south and 4.00 m wide [Fig. 5]. The only installation discovered inside was a small mud brick oven [928] in the southwestern corner.

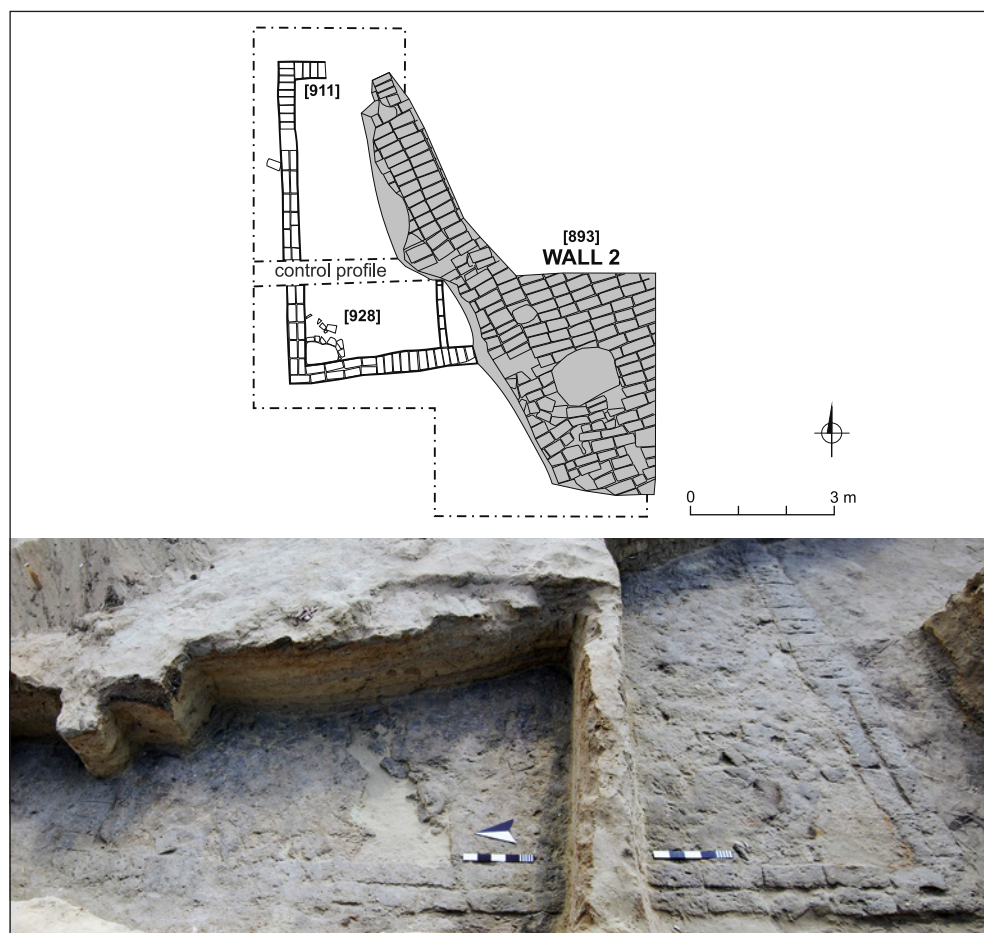


Fig. 5. “Black House 3” [911]: plan showing feature partly covered by Ramesside “wall 2” [893]; view from the west (Drawing V. Dubcová, L. Hudáková, L. Hulková; photo L. Hudáková)

There was a rather limited number of artifacts recovered from the Eighteenth Dynasty “Black Houses” and surrounding installations, but their diversity and character indicate the role and function of this part of the settlement. There are flint tools, various grinders, pounders, hammerstones and fragments of querns. A collection of circular clay objects with two depressions on each side (S1156, 1197, 1198, 1208) [Fig. 6 top] may have been used as a kind of loom weight (see Petrie and Duncan 1906: 34, Pl. XXXVIc, 47) or more probably net sinkers (Brunton 1948: Pl. LII, 18–19; von Pilgrim 1996: 276–278, Fig. 121,c). Quite interesting find is a dagger (knife?) S1214 [Fig. 6 bottom] discovered on the floor of the “Black House 3”. A similar object was found in 2011 in “Black House 1”. Both appear to be daggers with a cast hilt, from 28 cm to 33 cm long and about 5 cm wide. The tip of the hilt has an arch-shaped ridge and the shaft is concave and rather straight at the base, the blade is lanceolate. The hilt and the blade were probably cast together.

Similar daggers and knives are known from the Eighteenth Dynasty. The Tell el-Retaba finds belong to Susanne Petschel’s Type VII, that is, daggers with fan-, goblet-, T-shaped or cylindrical hilt-tip, attested in Egypt from the Second Intermediate Period to the Nineteenth Dynasty (Petschel 2011: 191–221).

There are also simpler and thinner daggers, without the protruding points on the lower part of the hilt, but with a more rounded blade than on the Retaba pieces. These are Petrie’s “symmetrical knives” or “dagger knives” (Petrie 1917: 26–27; Petschel 2011: 267–269). He found a few fragments of similar knives at Tell el-Retaba and attributed them to the Eighteenth Dynasty (Petrie and Duncan 1906: 33, Pl. XXXV B). Unlike elaborate daggers, which were found mostly in tombs, “dagger knives” occur rather in settlements. Their simpler, rounded, not so richly decorated form and smaller dimensions suggest their utilitarian rather than combat function.

[JH, LH, VD]

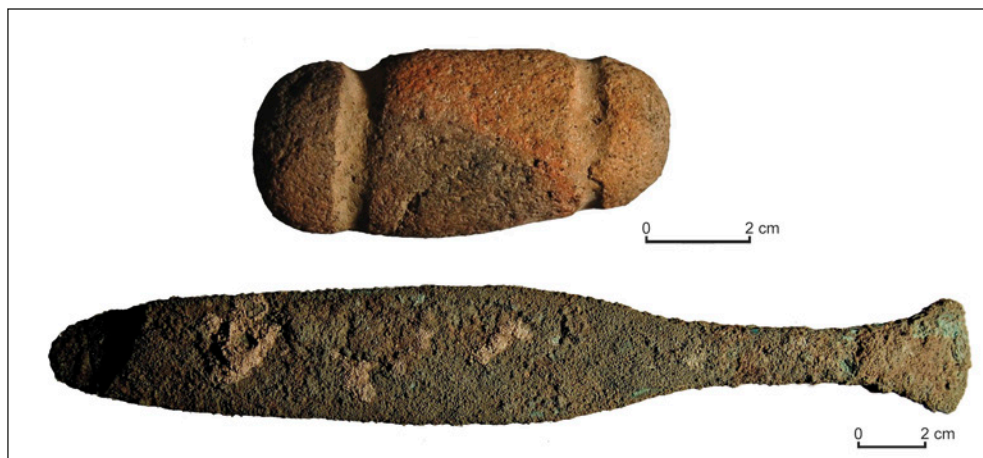


Fig. 6. Finds from “Black House 3”: top, terracotta net sinker(?) S1156; bottom, dagger S1214 (Photo L. Hudáková)

AREA 9

TWENTIETH DYNASTY
(PHASES D1–D4)

“Wall 3” (phase D3)

During the 2012 season a fragment of Petrie’s “wall 3” [983] was cleared in Area 9 [Fig. 7]. Petrie considered this the latest of the defense walls in Tell el-Retaba. It was definitely later than his “wall 2”, which was partly covered by “wall 3” on Petrie’s plan (Petrie and Duncan 1906: 30, Pl. XXXV). The dating of “wall 2” is secure: a foundation deposit found by Petrie contained objects inscribed with the name of Ramesses III (Petrie and Duncan 1906: Pl. XXXIV). The dating of “wall 3” was less evident. Also the functional relation between these walls was not obvious.

“Wall 3” is a massive structure, built of very large mud bricks, which measured 42 cm by 18 cm by 14 cm each. The southern face of the wall was almost completely destroyed, only a very short fragment of the original width (given by Petrie as 8.80 m) could be observed. The preserved fragment of the wall is about 1.00 m high, but most of it is the wall foundation; no more than two or three layers of bricks have been preserved above the foundation. A street 3.60 m wide ran along the inner face of the wall. On the northern side of this street there was a long building [834/838] (see below), which featured the same orientation as “wall 3” and was founded on the same level, hence was presumably contemporary. Pottery



Fig. 7. “Wall 3” [983] and street running along its inner face, looking southwest
(Photo L. Gidzińska)

found in building [834/838] proved that “wall 3” was constructed in the first half of the Twentieth Dynasty. Thus “wall 3” was contemporary with or only slightly later than “wall 2”.

Fortified town of Ramesses III (phases D2–D3)

Already in 2011 a fragment of large building [834/838] stretching E–W along “wall 3” was traced. The interior of this building was explored during the 2012 season [Fig. 8].

The structure is of significant dimensions: the excavated fragment extends (from east to west) approximately 37.60 m, but it must have been longer, as neither its western nor eastern limits have been reached; its width (N–S) was 8.80 m. The width of this building matched the thickness of “wall 3”, corroborating the stratigraphical evidence for the homogeneity and contemporaneity of the structures. A defense wall 17 cubits wide (8.80 m is almost exactly 17 cubits) was planned and a street 7 cubits wide (3.60 m \approx 7 cubits) was foreseen along its inner face, as well as a building 17 cubits wide on the northern side of the street.

Unfortunately, building [834/838] was rather poorly preserved and has not been fully excavated, thus all the interpretations concerning its function and spatial organization are still preliminary. Denudation in the western part of the excavated fragment has resulted in no floor levels being preserved and only some remains of foundations. In the eastern part, where the walls stand higher and floor levels have been preserved, significant damage was caused by a large modern trench, apparently made with a bulldozer, 14.00 m long and 4.00 m

wide, running from the southwest to the northeast.

In the better preserved parts of the building two occupation phases were recognizable, earlier (phase D3) and later (phase D2).

Earlier occupation phase (phase D3)

Originally the building was probably divided into a series of uniform units marked in Fig. 8 as I, II, III, etc. At least eight such units were noted in the part of the building that has been excavated so far. Each unit comprised six rooms: three narrow ones (1, 2 and 3) which were about 1.50 m wide and three broader ones (4, 5 and 6), the width of which ranged between 2.50–3.20 m. Each unit had an area of about 30 m². The fact that not a single unit is fully preserved makes the reconstruction of the original layout difficult, however the proposed scheme fits the ruins discovered so far.

Unit VII is the best preserved in this fragment of the building [834/838] which was excavated so far [Fig. 9]. The entrance must have been in the north wall of room VII.1 – this wall is not preserved, but the entrance can be presumed there by analogy with the room V.1. A doorway in the south wall of room VII.1 (antechamber) led to room VII.2, which served as a kitchen. There was a fireplace/kiln [1092] in the northwestern corner, filled with ashes. Nearby walls bore traces of fire. Three rounded structures found further to the south [1088, 1089, 1090] had mud walls about 3–5 cm thick. They were either bins or stands for storage vessels. A deposit of ashes was found between these structures. A thin mud-brick wall [1087] ran 0.40 m away from and parallel to the south wall of the room; it could have served as a kind of bin. A doorway in the west wall of the

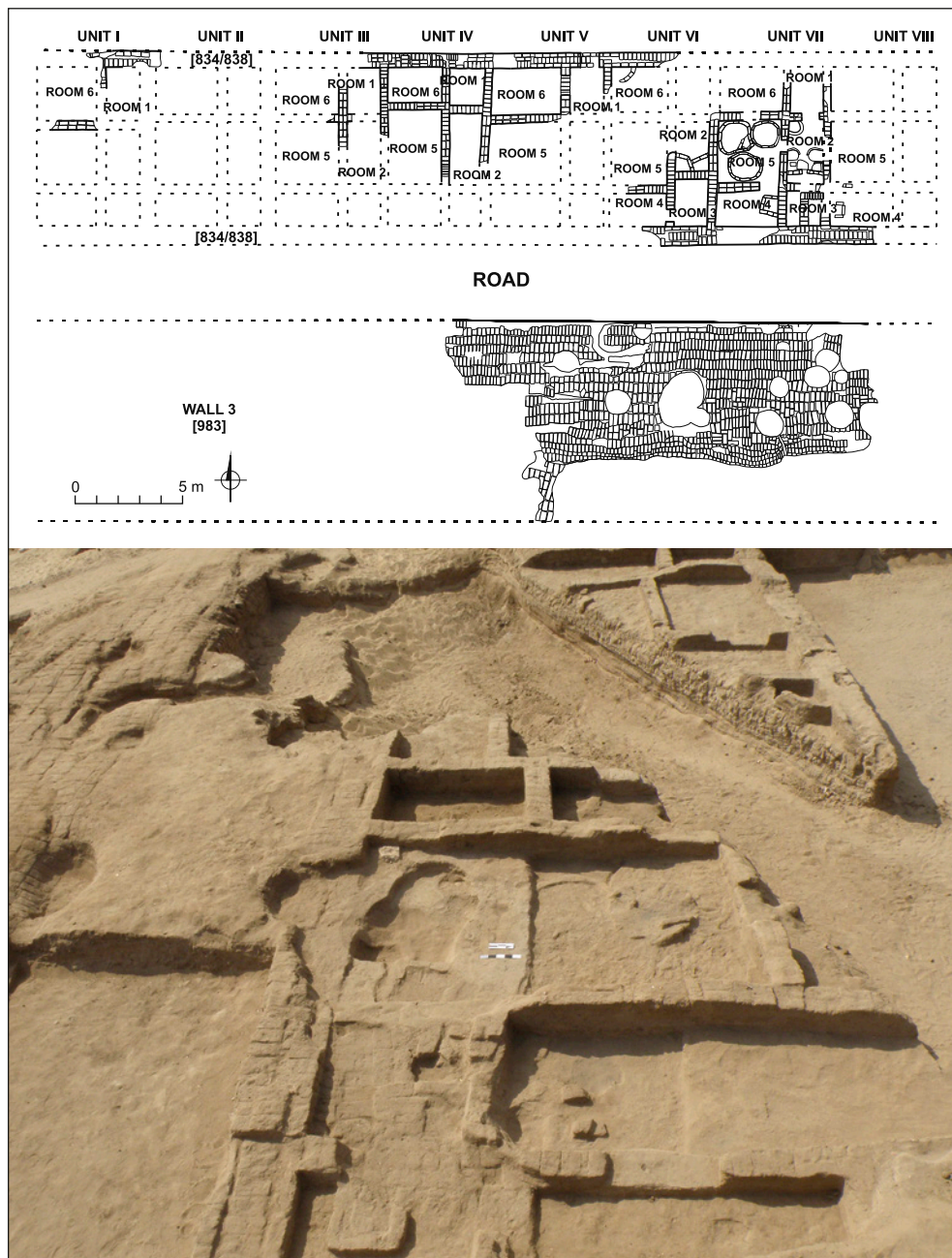


Fig. 8. Building [834/838]: plan and view looking west
(Drawing Ł. Jarmużek; photo L. Gidzińska)

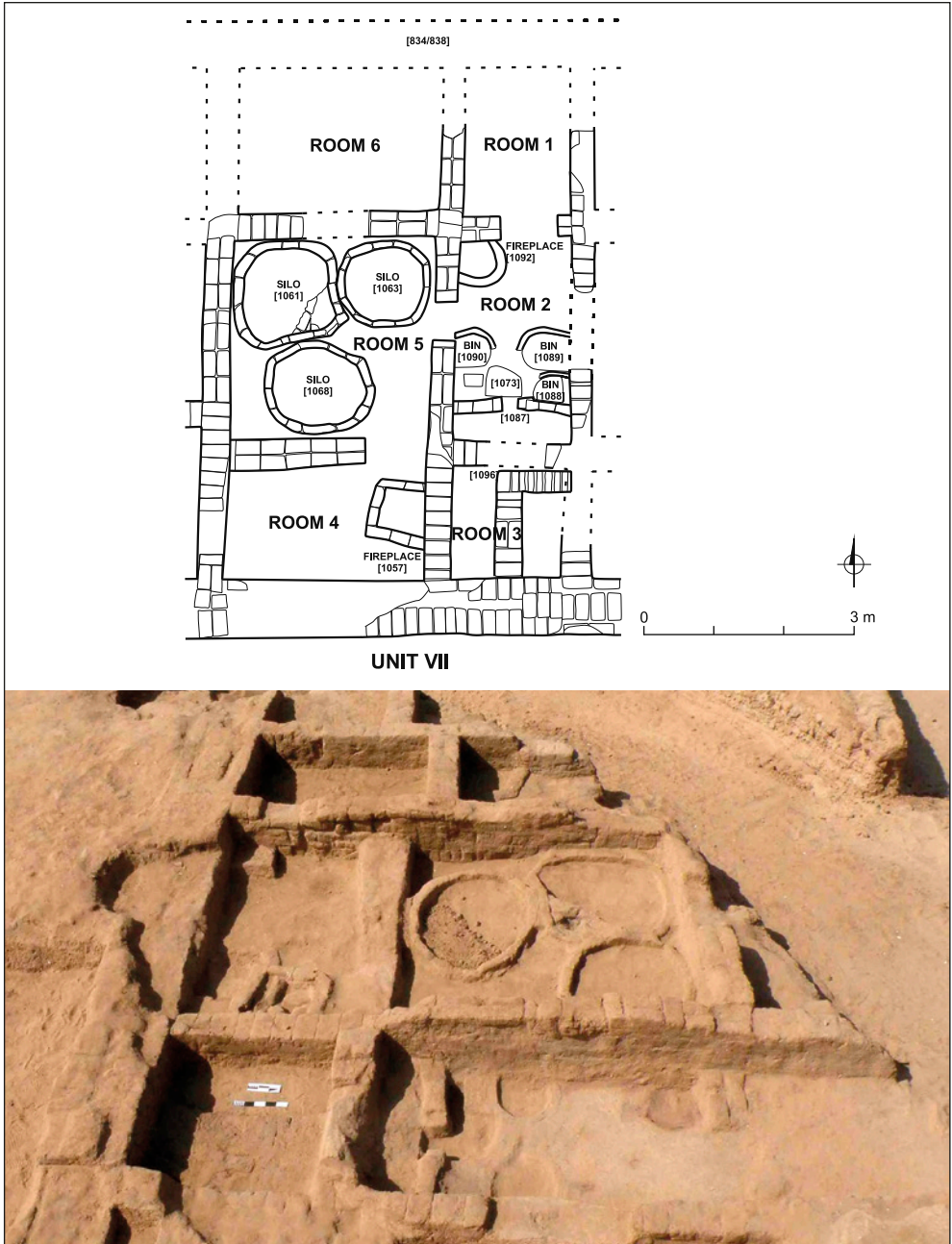


Fig. 9. Unit VII in building [834/838]: plan and view of the earlier occupation phase (Drawing Ł. Jarmużek; photo L. Gidzińska)

kitchen led to room VII.5, which was a magazine. It enclosed three mud-brick silos [1061, 1063, 1068], tightly fitted in between the walls of the room. Their diameter varied from 1.10 to 1.30 m. Room VII.4, to the south of the magazine, was equipped with a rectangular structure [1057], lined with mud bricks, attached to the east wall of the room. The structure was filled with ashes, bones, pottery and some fragments of mud bricks. It is either a fireplace (the floor of the room included ashes) or a platform for a quern(?). Room VII.3 probably served as a staircase. An L-shaped mud-brick feature [1096], filling the eastern half of this room, should be probably interpreted as remains of stairs leading to the roof or to an upper floor. The latter option seems to be much more probable, as in the ground floor most of the space was occupied by storage and

kitchen installations. In the ground floor there is no space for a living room and for bedrooms. Assuming the domestic function of the building [834/838] (the pottery and the small finds found inside clearly support this interpretation), the living room and the bedroom(s) must have been located on the upper floor.

Later occupation phase (phase D2)

In a later occupation phase a significant rearrangement took place inside building [834/838]. In general, it seems that the original six-room units were replaced by larger entities. Units VI, VII and VIII may have been merged into one big compound. New doorways were cut between rooms VI.3 and VII.4, VII.2 and VIII.5. A wall separating rooms VII.4 and VII.5 was removed, creating one large room. The size of this new, large compound is impossible



Fig. 10. Unit VII in building [834/838]: view of the later occupation phase
(Photo L. Gidzińska)

to determine, because the area to the west has been completely destroyed and the area to the east has not been excavated. The position of the main entrance is also unknown. The function of some rooms surely changed: the previous magazine with three large silos (room VII.5) now became part of a large room (room VII.4/VII.5, living room?) with a large round

fireplace [1042], lined with a single layer of bricks and found filled with ashes [Fig. 10]. A much smaller fireplace, lined with only three bricks [1041], was discovered in room VIII.4.

Small finds from floor levels of the second occupation phase have given us some idea of the kind of activities, which the inhabitants of the building had

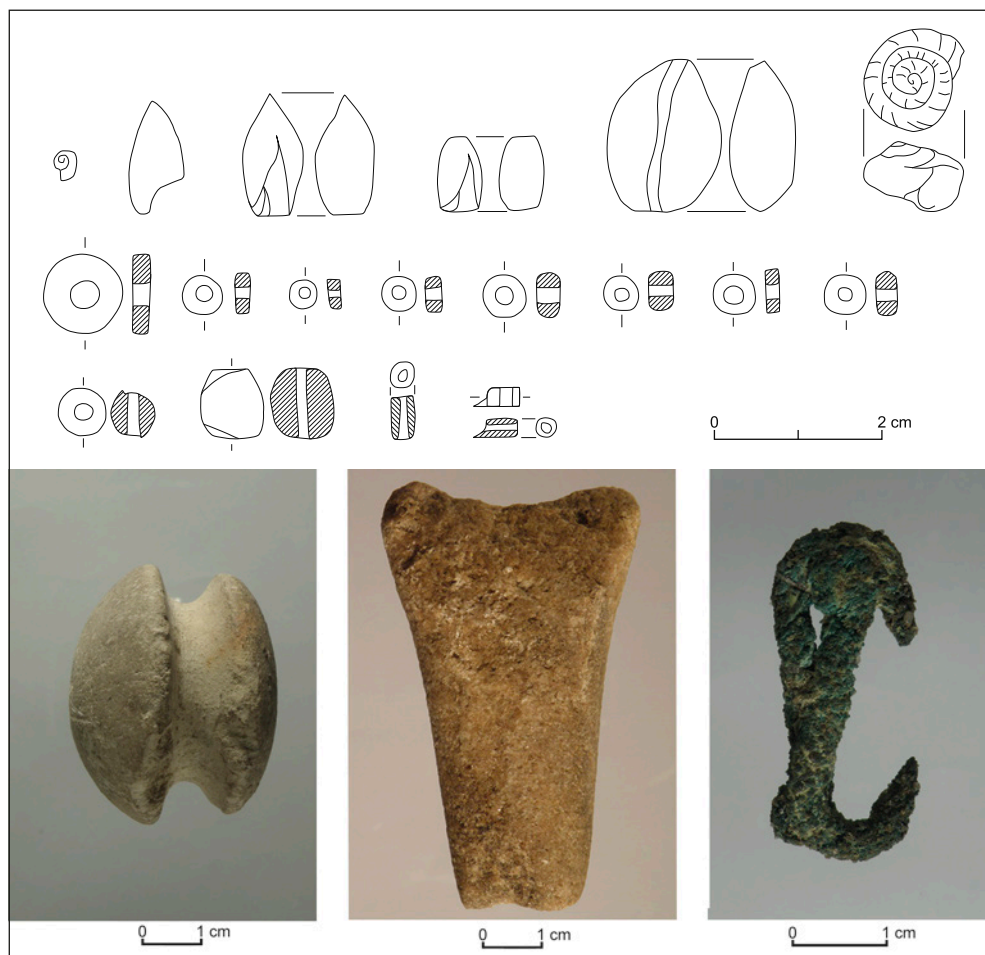


Fig. 11. Finds from Unit VII: top, beads S1414, made of shell, faience and glass; bottom left, limestone earplug S1294; bottom center, quartzite drill S1286; bottom right, bronze fishing hook S1423 (Drawing A. Rys, E. Jarmužek; photos L. Gidzińska)

engaged in. A significant part of these activities was linked with food acquisition and processing.

From the floor of room V.1 came a flint sickle blade (see Tillmann 2007: 70–73), which suggested that the fortress was not (or at least not entirely) supplied with grain from the Nile Valley, but that at least some fields were cropped and harvested by the inhabitants. Several grinders and fragments of querns were found in rooms VI.2, VII.6 and VII.2. Fishbones were quite common in some of the floor layers and a range of small finds also



Fig. 12. Limestone mortar S1278, found in place (Photo L. Gidzińska)

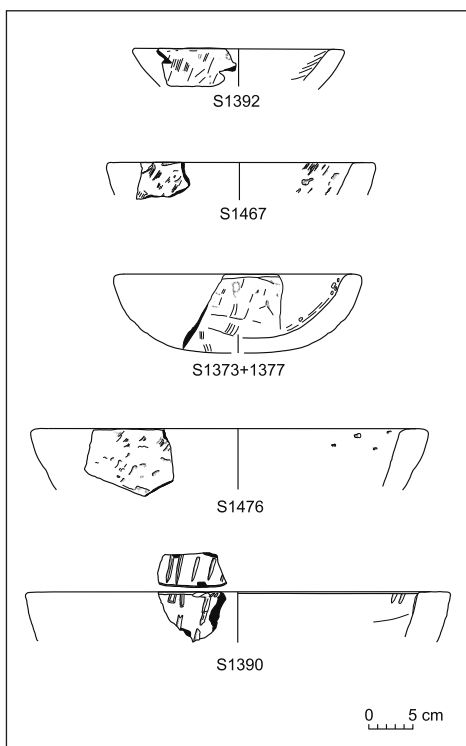


Fig. 13. Limestone bowls of different sizes from room 1 in building [991] (Drawing B. Jakubowska, A. Pawlikowska, P. Sójka, E. Jarmużek)

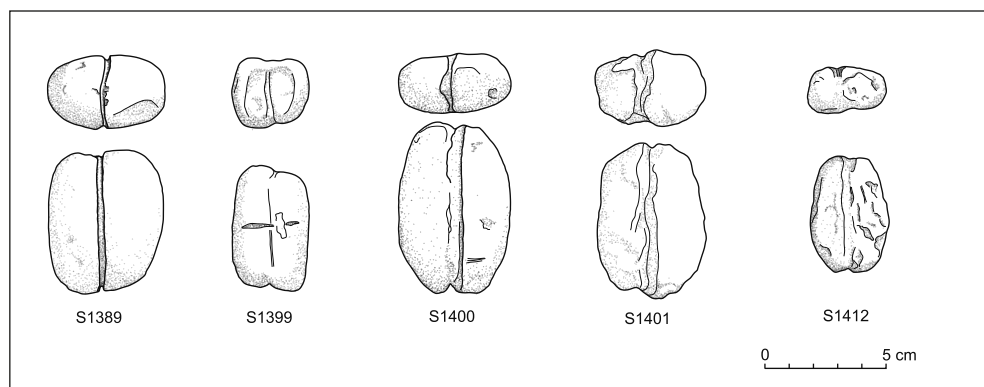


Fig. 14. Set of five loom weights from room 2 in building [991] (Drawing A. Pawlikowska, E. Jarmużek)

testifies to the importance of fishing as an occupation. Two corroded metal fishing hooks [*Fig. 11* bottom right] were found in room VI.4, along with a lead net sinker, apparently also linked to fishing. A large set of beads (about 50 in number) was found in the same room [*Fig. 11* top]. The local residents' occupations included crafts, as indicated by a quartzite drill S1286 found on the floor of room V.1 [*Fig. 11* bottom center]. The drill may have been used to produce stone vessels.¹

Coming from the same place was a small find of entirely different character, an earplug [*Fig. 11* bottom left] of a kind that became a fairly common form of personal adornment from the beginning of the New Kingdom (Freed 1982: 231–233, Nos 301–303). The Tell el-Retaba example is made of rather cheap material (limestone) and lacks any ornamentation.

THIRD INTERMEDIATE PERIOD SETTLEMENT (PHASES C1–C4)

A fragment of the Third Intermediate Period settlement was uncovered in the northern part of Area 9 [*Fig. 15*]. Several occupation phases could be recognized.

Phase C4

One of the earliest Third Intermediate Period structures is building [1082], which has not been fully excavated. Some of its walls served as a base for later construction (see below). The spatial layout of the building changed over time. It comprised two rooms initially, room 1 measuring approximately 3.00 m by 3.00 m. These two rooms were merged into one in the next phase, when the center wall between them was covered by a thick ash-rich layer,

which probably served as a walking level. At least one post replaced the center wall in order to support the roof. A posthole [1048] was found in the middle of the unearthed part of the room. About one meter to the west a fireplace [1044] was noticed. A silo [1049] to the west and a kiln [1094] to the north of building [1082] may have originated from the same period as the building.

Phase C3

Building [991] [*Fig. 15*] was built on the ruins of building [1082]. Some walls of the older structure were used for raising the new one. The south wall of building [991] abutted the south wall of the older building. Building [991] was about 9.00 m long and 5.40 m wide. The building comprised two rooms. The main entrance, 0.80 m wide, was placed in the east wall of room 1. The room was almost square, it measured 4.00 m by 3.75 m. There was a fireplace [1077] and a posthole [1053] in the middle of the room. Room 2 measured 4.00 m by 2.75 m. A doorway between the two rooms was 0.55 m wide; the door opened into room 2 (the door pivot is preserved). Many small artifacts were found on the floor, e.g., a set of five ovoid loom-weights [*Fig. 14*] made of limestone. These, together with a spindle whorl S1404 found in the same layer prove that textile production was taking place in room 2.

On the east side of building [991] there was an open space where a round kiln [1065] was found. It was preserved to a height of 20 cm. The kiln had thin walls made of fired clay, about 4 cm thick; its diameter was 1.00 m. It was filled with a layer of ashes and charcoal.

¹A set of comparable quartzite drill heads is known from Amarna, for example, see Seyfried 2012: 362, Cat. No. 142.

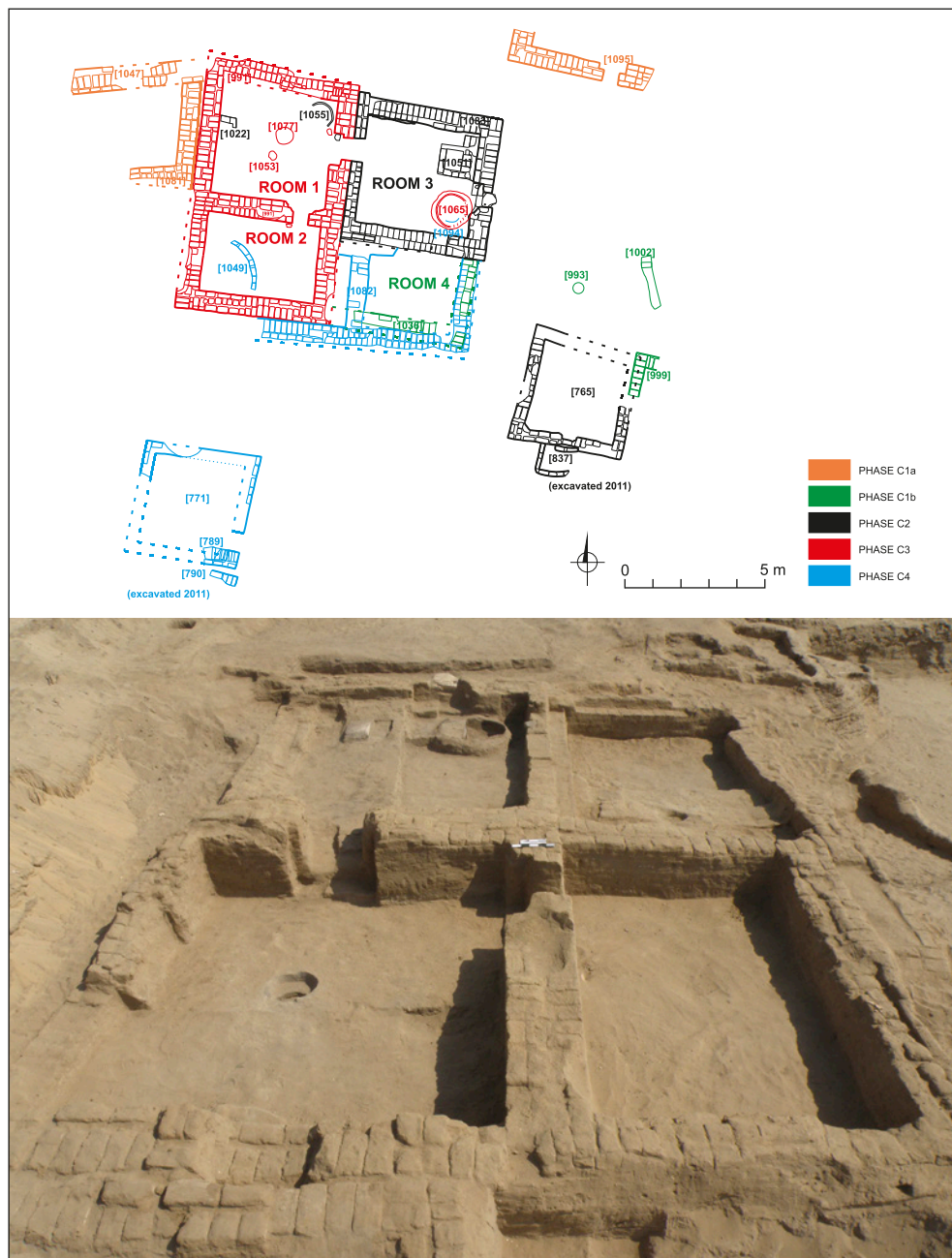


Fig. 15. Building [991]: plan of the Third Intermediate Period settlement and view looking east (Drawing Ł. Jarmużek; photo L. Gidzińska)

Phase C2

During the later phase of use, building [991] changed shape considerably. The doorway between the two rooms was blocked, so there was no access to room 2. Some of its walls had probably collapsed and it was used as a dump for rubbish, which included a large amount of animal bones.

A new room was constructed, room 3 [1083] [see *Fig. 15*], to replace room 2, which was no longer suitable for dwelling. It was added to the east wall of room 1. Room 3 measured 3.70 m by 3.90 m and was built in the same fashion as other rooms. The new, main entrance to the building was set in the east wall of the room; it was about 0.50 m wide. In the doorway there was a limestone block, which served as a threshold. In the northeastern corner of the room there was a mud-brick bench [1051]. Beside it a rectangular fireplace was constructed of mud bricks. A few grinders and fragments of stone vessels were found on the floor. A small, rounded depression (0.33 m in diameter) in the floor in the southwestern part of the room could have been used to hold vessels.

In this phase room 1 clearly served as a kitchen with food processing activities being indicated by the fireplace and the furnishings in the form of the quern, grinder and mortar. But the most characteristic set of objects was constituted by the limestone bowls of various sizes [*Fig. 13*]. The bowls were quite crude with chisel marks frequently apparent on the unsmoothed outer surface. The usually smoother inner surface can be attributed to prolonged usage.

Phase C1b

In the next phase, building [991/1083] was enlarged. Room 4 was added to the south of room 3 and to the east of room 2. The walls [1036] of the room were built directly on top of the ruins of building [1082]. The room measured 4.30 m by 2.40 m. The entrance was placed probably in the south wall of room 3. The doorway has not been preserved, but its location is marked by a threshold stone.

Two structures to the east of building [991] probably originated from the same period. Wall [999] was found at the edge of the excavation trench. It was probably the corner of a building. The wall was about 0.40 m thick. An ash-rich layer [1003] had accumulated on the inside of this wall. The other structure was a very poorly preserved fragment of wall [1002]. A thick and extensive ash-rich layer [993] was found on the western side of this feature. A limestone mortar was found in the middle of the layer, preserved completely and in its original location [*Fig. 12*]. It was produced from a reused limestone block with a fragment of the smoothed surface of the original block still visible on one side.

Phase C1a

Building [991/1083/1036] stopped being used in this phase. Broken brick rubble covered the floors in all of the rooms, initiating prolonged use of the area as a rubbish dump. Several ash-rich layers were observed, each one containing large quantities of bones, pottery sherds and small finds.

Recapitulation

Comparing the archaeological remains from the Third Intermediate Period with those datable to the Twentieth Dynasty one can observe significant changes in the settlement patterns. Inhabitants of the fortified town of Ramesses III lived in a large house [834/838], which was divided into small flats. The settlement of the Third

Intermediate Period consisted of small, one to three room houses, planned and executed with less care. It seems that the fortified town of Ramesses III was planned and built by the state, while the Third Intermediate settlement consisted of individual private houses, built by people who had rather limited resources at their disposal.

[SR, LJ]

AREA 3

Excavations on a small scale were carried out in this area to the south of the Eighteenth Dynasty house discovered in 2010 by SCA mission directed by Mustafa Nour el-Din (Rzepka, Nour el-Din et al. 2014). The aim was to collect pottery samples for dating the surrounding strata and to check whether under the Eighteenth

Dynasty strata older material is present. A small oven was excavated, contemporary with the above-mentioned house. A test trench proved that in this area occupation started with the Eighteenth Dynasty; underneath were culturally sterile layers of *gezira* sand.

[SR]

APPENDIX TELL EL-RETABA 2012. PRELIMINARY REPORT ON ARCHAEOBOTANICAL INVESTIGATIONS

Claire Malleson
Independent

During the 2012 season 34 samples were analysed for macro-botanical remains from three areas of excavation (for the 2009–2011 results, see Malleson 2012; 2013; 2014). Each of the samples was processed via bucket flotation using a 300 µm mesh to collect the (primarily charred) plant macrofossils. This material was dried and examined under a binocular microscope at 7–25x magnification, plant remains were identified based on morphology of the items, and recorded in an access database.

Table 1 lists the number of samples taken from the three areas of investigation, provides the raw data counts of identified items by period and area, and the density (IPL – number of identified plant items per litre of soil). Dating is based on information available in 2012. The focus of excavations was on Areas 7 and 9, the few samples from Area 3 are not discussed in detail here as they should be considered with the other samples from earlier seasons. These samples (Area 3) were not rich in charred plant remains.

Table 1. *Archaeobotanical samples from Tell el-Retaba 2012 season*

Area	Period	Number of samples	Total item count	Total sample volume	Density (Items per litre)
3	Eighteenth Dynasty	4	536	20	26.8
7	Eighteenth Dynasty–Hyksos	4	2297	16	143.56
9	Twentieth Dynasty	15	15733	70	224.76
9	Third Intermediate Period	11	28214	55	512.98

Table 2. *Archaeobotanical samples from Area 9, Tell el-Retaba 2012 season*

Phase	Period	Number of samples	Total item count	Total sample volume	Density (Items per litre)
D2	Twentieth Dynasty	11	13990	50	279.8
D3		4	1743	20	87.15
C1	Third Intermediate Period	4	6768	20	338.4
C2		4	1607	20	80.35
C3		2	12413	10	1241.3
C4		1	7426	5	1458.2
TOTAL		26	43947	125	351.58

Table 3. *Items per litre (density) of major taxa groups by phase, Area 9, Tell el-Retaba 2012 season*

Group	D2	D3	C1	C2	C3	C4
Cereal chaff	82.94	35.65	83.15	40.15	34.2	569.6
Cereal grains	8.74	2.25	12.25	4.5	2.5	55.4
Wild grasses	17.76	9	53.45	8.95	13.4	110
Wet-loving taxa	133.7	11.75	10.2	7.55	64.8	153.6
Legumes	5.18	13.3	11.95	3.5	74.5	19.2
Other wild taxa	1.66	1.05	1.05	0.1	40.5	12.6
Dung	4.38	1.65	2.4	1.3	1001.6	23.2
Edible taxa (e.g. lentil)			0.9	2.4	0.2	0.8
Fruits	0.02	0.65	3.4	0.15	0.1	5.2
Indeterminate	25.42	11.65	159.5	11.5	9.3	532.4
Oil plants			0.05			0.8
Woody taxa		0.2	0.1	0.25	0.2	2.4

AREA 9

Table 2 provides details of the Area 9 samples. Whilst phase C4 (early Third Intermediate Period) appears to have the highest density of remains, there was only one sample taken from this phase, and in fact only two samples from phase C3, which also had an exceptionally high density of items present. Overall the average density of items in Area 9 was 350. Table 3 shows the density of each major taxa group, by phase.

There is a great deal of variation between these samples. The materials being utilized as fuel differ over time, and it is possible to detect some changes in the local ecology/environment. Samples from phase D3 (earlier Twentieth Dynasty) derived from three ‘ashy patches’ and a floor surface in building [834/838]. The ashes here were a mix of cereal chaff items,

legume seeds, other weeds, wet-loving taxa and grasses. The later Twentieth Dynasty (phase D2) samples from ash patches and floors in building [834/838] were dominated by seeds of wet-loving taxa. The sample from phase C4, the early Third Intermediate Period, building [1082] contained an especially large amount of vesicular items (most often heavily damaged grains). Of the two samples from

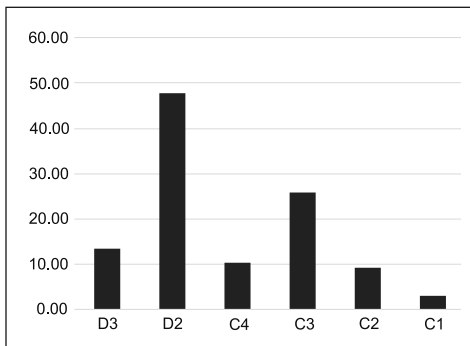


Fig. 17. Wet-loving species: % of overall assemblage for each phase (C. Malleson)

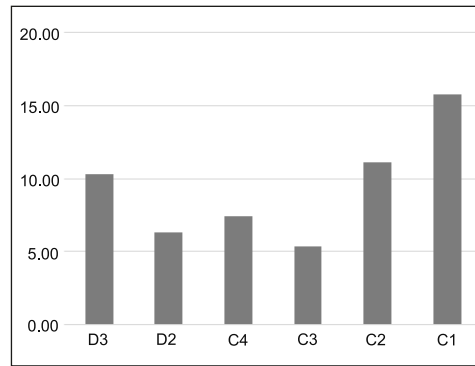


Fig. 18. Wild grasses: % of overall assemblage for each phase (C. Malleson)

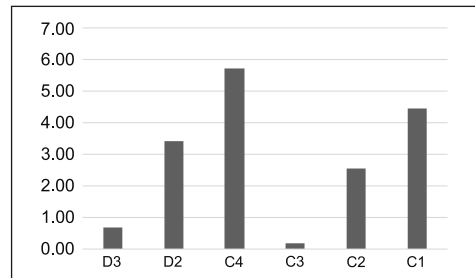


Fig. 19. Ratio of grass: legumes (C. Malleson)

Table 4. Percentage of assemblage of taxa groups by phase, Area 9, Tell el-Retaba 2012 season

Group	C1	C2	C3	C4	D2	D3
Legumes	3.53%	4.36%	29.84%	1.29%	1.85%	15.26%
Weeds	0.31%	0.12%	16.22%	0.85%	0.59%	1.20%
Dung	0.71%	1.62%	4.00%	1.56%	1.57%	1.89%

Table 5. Area 9, Tell el-Retaba 2012 season. Percentage of samples in which the most common species/items occur (more than 10 items)

Species	Total item count	%
Emmer wheat chaff (<i>Triticum turgidum</i> subsp. <i>dicoccum</i>)	10,284	100.00
Ryegrass (<i>Lolium</i> sp.)	2440	100.00
Clover (Trifoliae tribe)	1608	96.15
Spikerush (cf. <i>Eleocharis</i> sp.)	1720	92.31
Indeterminate vesicular items	6542	88.46
Dung fragments (primarily cattle)	10,458	76.92
Reeds (<i>Scirpus</i> sp.)	81	73.08
Emmer wheat grains (<i>T. turgidum</i> subsp. <i>dicoccum</i>)	300	73.08
Canary grass (<i>Phalaris</i> sp.)	90	69.23
Indeterminate seeds type 2	404	65.38
Indeterminate cereal grain	779	65.38
Annual fimbry (<i>Fimbristylis bisumbellata</i>)	6112	61.54
Sedge (cf. <i>Carex</i> sp.)	179	57.69
Wild grass (Poaceae)	254	57.69
Indeterminate item – possible termite faeces	667	53.85
Hulled barley grains (<i>Hordeum vulgare</i>)	38	46.15
Joined flatsedge (<i>Cyperus articulatus</i>)	557	46.15
Bullrush (<i>Scirpus</i> cf. <i>praelongatus</i>)	24	42.31
Carpet weed (<i>Glinus lotoides</i>)	436	34.62
Hulled barley chaff (<i>Hordeum vulgare</i>)	34	26.92
Ryegrass chaff (<i>Lolium</i> sp.)	48	26.92
Lentil (<i>Lens</i> sp.)	72	26.92
Indeterminate capitulum base	84	26.92
Grass 'B'. Possible wild sorghum (cf. <i>Sorghum halepense</i> / <i>arundinaceum</i>)	97	26.92
Deadnettle family (Lamiaceae)	10	23.08
Pea family (Viciae tribe)	10	23.08
Cereal culm base	195	23.08
Goosefoot (<i>Chenopodium</i> sp.)	12	19.23
Common fig (<i>Ficus carica</i>)	57	19.23
Tiger nuts (cf. <i>Cyperus esculentus</i> tuber)	101	19.23
Daisy family (Asteraceae)	132	19.23
Beet (<i>Beta Vulgaris</i>)	18	15.38
Acacia pod fragments	13	11.54
Root/Tuber	27	11.54
Legume pod fragment	54	11.54
Wild grass chaff	21	7.69
Grass 'A'. Possible wild sorghum (cf. <i>Sorghum halepense</i> / <i>arundinaceum</i>)	50	7.69
Hawksbeard (<i>Crepis</i> sp.)	76	7.69
Knotweed family (Polygonaceae)	32	3.85
Bugloss (cf. <i>Echium</i> sp. or <i>Buglossiodes</i> sp.)	217	3.85

phase C3 in building [991] one consisted almost entirely of dung, with large numbers of legume seeds and some wet-loving taxa. Phase C2 samples from building [991] were dominated by items of cereal chaff with some wild grasses, and the ones from the final phase (C1) in building [991] were also dominated by vesicular items, with cereal chaff and grasses.

Looking at each plant-type group it is possible to detect some general trends. *Fig. 17* shows that there appears to be a sudden increase in numbers of seeds from wet-loving plants in phase D2 (later Twentieth Dynasty), followed by a gradual decline. Discounting the sample from phase C4, there is a clear decrease over time and there is almost an inverse pattern of wild grasses [see *Fig. 18*]. This peak in numbers of wet-loving plants in the Twentieth Dynasty was also identified during the 2011 season samples from Area 9 (building [834/838]) (Malleson 2014) and there is increasing evidence for a wet-phase at the site during the late Twentieth Dynasty, with a gradual drying out through the Third Intermediate Period.

There appears to be a correlation between the quantity of legumes/‘weed’ seeds and dung. Again, looking at the quantities of the different types of materials, phase D3 and C3 both contained the highest percentages of dung, legumes and weeds [see *Table 4*]. The sample from phase C3 which consisted primarily of dung fragments also contained high numbers of legumes and weeds, but a remarkably low quantity of cereal chaff. *Fig. 19* shows that the ratio of grasses to legumes is especially low in phases D3 and C3: the wild grasses (*Lolium* sp., *Phalaris* sp. and a small-grained grass,

tentatively identified as wild sorghum) which are generally considered to have been ubiquitous crop weeds, were overwhelmed by the legumes in these two phases. This suggests that the animals may have been fed with clover-enriched fodder in both the Twentieth Dynasty and Third Intermediate Period.

As is the case for most of the Retaba samples, the most ubiquitous species were emmer wheat (chaff), ryegrass, clovers, spikerush, reeds, canary grass and annual fimbry [see *Table 5* for taxa list].

AREA 7

Table 6 shows the IPL (density of items) of each taxa group for the samples from Area 7. There was just one sample from the Eighteenth Dynasty, one from Eighteenth Dynasty–Hyksos period and two from the Hyksos period, so with just this

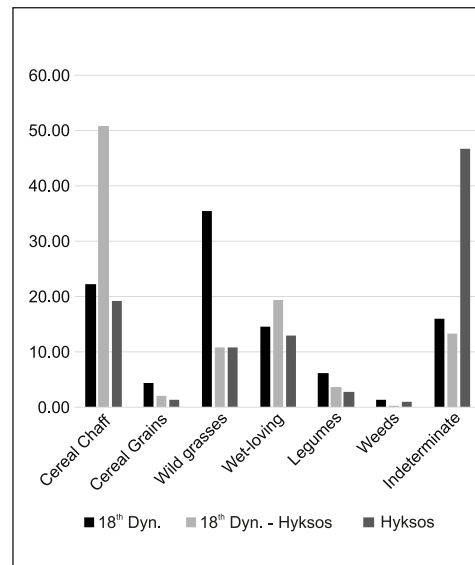


Fig. 20. Percentage of assemblage of selected taxa groups, Area 7, Tell el-Retaba 2012 season (C. Malleson)

small number of samples it is not really possible to draw any firm conclusions. The average overall IPL for this area was just 143 [see *Table 1*]. *Fig. 20* demonstrates the major differences between these four samples. The Eighteenth Dynasty sample was dominated by cereal chaff, the Eighteenth Dynasty–Hyksos period sample was dominated by wild grasses and the Hyksos period samples were dominated by indeterminate items. The most ubiquitous plant materials (overall) were the same as the rest of the site: emmer wheat (chaff), ryegrass, spikerush and hulled barley (grains), canary grass and clovers [see *Table 7* for species list].

Table 6. Items per litre (density) of major taxa groups by period, Area 7, Tell el-Retaba 2012 season

Group	18th Dynasty	18th Dyn. – Hyksos	Hyksos
Cereal chaff	65.8	41.6	12.83
Cereal grains	12.6	1.6	0.83
Wild grasses	105	8.8	7.17
Wet-loving taxa	43.2	15.8	8.67
Legumes	18	3	1.83
Other wild taxa	4	0.2	0.67
Dung	1	0.2	0.17
Fruits	0.2		3.5
Indeterminate	47	10.8	31.33
Woody taxa			0.17

Table 7. Percentage of samples in which the most common species/items occur (more than 10 items), Area 7, Tell el-Retaba 2012 season

Species	Total item count	%
Emmer wheat chaff (<i>Triticum turgidum</i> subsp. <i>dicoccum</i>)	604	100
Indeterminate vesicular fragments	198	100
Ryegrass (<i>Lolium</i> sp.)	239	100
Spikerush (cf. <i>Eleocharis</i> sp.)	284	100
Hulled barley grains (<i>Hordeum vulgare</i>)	11	75
Canary grass (<i>Phalaris</i> sp.)	12	75
Indeterminate cereal grain	26	75
Indeterminate item – possible termite faeces	29	75
Emmer wheat grains (<i>T. turgidum</i> subsp. <i>dicoccum</i>)	31	75
Clover (Trifolieae tribe)	69	75
Indeterminate seed type 2	249	75
Grass 'B'. Possible wild sorghum (cf. <i>Sorghum halepense</i> / <i>arundinaceum</i>)	328	75
<i>Cyperus</i> cf. <i>articulatus</i>	495	75
Wild grasses (Poaceae)	11	50
Reeds (cf. <i>Scirpus</i> sp.)	18	50
Trifolieae tribe <1 mm	39	50
Rose family (Rosaceae)	10	25
Daisy family (Asteraceae)	10	25
Grass 'A'. Possible wild sorghum (cf. <i>Sorghum halepense</i> / <i>arundinaceum</i>)	20	25
Annual fimbry (<i>Fimbristylis bisumbellata</i>)	30	25

CONCLUSIONS

It is not possible to draw any major conclusions about the Eighteenth Dynasty–Hyksos period at Retaba yet, the only pattern emerging from Area 4 excavations and Area 7 is the dominance of cereal chaff in the samples, more detailed analysis using more advanced statistical methods is required. Earlier observations (Malleson 2014) of a peak

in the presence of wet-loving plants, with a drop in the presence of wild grasses during the later Twentieth Dynasty is confirmed by the 2012 results. As we progress with excavations it will be possible to study fuel use in more detail, potentially determining if different fuels were preferred for different uses, for example, domestic ovens versus kilns.

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