

# Ryszard F. Mazurowski

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## tell Qaramel Excavations 2006

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# TELL QARAMEL

## EXCAVATIONS 2006

Ryszard F. Mazurowski

*The eighth season of excavations at Qaramel took place from 4 April to 18 May 2006. The Syro-Polish Archaeological Mission was a joint undertaking of the Polish Centre of Mediterranean Archaeology of the University of Warsaw and the Directorate General of Antiquities and Museums of Syria, partly financed by the University Warsaw Institute of Archaeology.<sup>1</sup>*

*Exploration continued of Early Aceramic layers, representing the Pre-Pottery Neolithic A (PPNA) horizon in traditional terminology and designated as Qaramelian on our site, as well as some older structures from the Proto-Neolithic, meaning Proto-Qaramelian. Field activities were concentrated on the southern slope and foot of the tell, around the two towers (squares J-7, J-8, K-7) and the 'shrine/common house' (K-3/4, L-3/4). New squares (L-4b,d / M-4a,c and L-5) were opened east of completed squares K-5b,d and K-3,4 / L-3,4, in an area where younger-occupation layers from the Bronze and Iron ages are less extensively represented (for a plan of the site, see Fig. 1 in Mazurowski 2007: 484). Well preserved levels of the Proto-Qaramelian and Qaramelian settlement are expected here, hopefully contributing to studies of aspects of spatial organization in Aceramic Neolithic villages.*

1 Expressions of gratitude are due Dr. Bassam Jammous, Director General of Antiquities and Museums in Syria, and Dr. Michel Al-Maqdissi, DGAM Excavations Department Director, Damascus, for their help, kindness and hospitality. The mission is indebted to the staff of the Regional Directorate of Antiquities and Museums in Aleppo and its Director, Dr. Nadim Fakesh, in particular.

Co-directors Ryszard F. Mazurowski (stone finds; photographic documentation) and Youssef Kanjou (processing of human bones) managed a team which included on the Polish side, archaeologists Marcin Białowarczuk (special-finds registrar; trench supervisor in squares J-7 and K-7), Aneta Czubińska, Joanna Gawrońska (registrar; trench supervisor in squares K-3/4, L-3/4, M-4 a,c) Artur Grabarek (trench supervisor in squares K-3/4, L-3/4, M-4 a,c), Piotr Karczmarek (flint objects; trench supervisor in square J-8 b,d), Renata Maskowicz (documentalist), Magdalena Nowakowska (trench supervisor in square L-5), Bartłomiej Paprocki (preliminary processing of animal and human bones). The Syrian side was represented by Muhammad Fakhrou and engineer Youssef Al-Dabti from the Regional DGAM in Aleppo.

## SQUARE J-8 B,D

Two settlement levels, both connected with the Early PPNA horizon, were uncovered in this square, which was the highest-lying of the trenches explored this year (for previous work, cf. Mazurowski 2007: 485 and Fig. 2).

## STRATUM VIII – LEVEL 12

The main house in this level (loc. 19) [Fig. 1, left] is semi-subterranean, oval in shape and made of big stones and mud mixed with small river pebbles. It was about 4 m in diameter (partly damaged by Early Bronze Age pits) with walls 0.50 m wide and preserved to a height of 0.40-0.50 m. The outer wall face was made of big, sometimes dressed flat stones. Inside it, there was a bench made of small and medium-sized pebbles, thickly plastered with red mud. The floor made of the same red mud was 3-5 cm thick. Some sickle-blades, flakes and blades were found on the floor.

The other structure (loc. 13) is distinctly smaller, oval (about 1.20 m in diameter) with red mud used for the wall, which was 0.20-0.30 m wide and about 0.20 m high, and was reinforced with small pebbles. Several flint artifacts and a large quantity of bones were recovered from this locus.

An irregular structure of hard white mud (loc. 16), 3-7 cm thick, was located to the south. Below the round and regular center, also of mud, there was an oval pit, about 0.40 m deep, featuring a conical bottom. It was filled with red soil and burned stones, as well as a few bones.

Two small oval hearths (nos 9 and 10) were discovered in the southern part. They measured 0.20-0.30 m in diameter and were 1-15 cm deep, containing a fill of grey ash and isolated burned bones.

## STRATUM VIII – LEVEL 13

An oval building (loc. 18) occupied the center of the square in the next level (also damaged by a large and deep Early Bronze Age pit) [Fig. 1, right]. Made of white mud and oval in shape, it was raised on a foundation of flat pebbles. The diameter was 2.50-3.00 m. A bench of small pebbles plastered with light red mud, about 0.35-0.40 m high, was added against the east wall inside the house. The wall, c. 0.30 m wide, was made of hard white mud, the same kind that was used for the floor, which was laid on a bedding of small pebbles. Nothing but a few blades and bones were found inside the house.

Of the six hearths situated around the house, no. 11 with a diameter of 0.80 m was the biggest. It was made of flat stones, laid in an oval shape, and covered with red mud. Some bones were found in its fill. The remaining hearths (nos 12, 13, 14 and 19) were also oval in shape but much smaller, from 0.20 to 0.40 m in diameter. They consisted of thin layers of gray ash (2-10 cm) with no artifacts. The sole exception is hearth no. 15 which contained grey ash, red soil, charcoal as well as some burned pebbles.

The five pits discovered among the hearths (nos 10, 11, 12, 13, 14) were not very big, from 0.10 to almost 0.80 m in diameter and 0.10-0.20 m deep (pit 12 was 0.40 m deep exceptionally). All were filled with red soil and grey ash. Finds included isolated flint artifacts and bones. A posthole north of loc. 18 was 0.15 m in diameter, 0.40 m deep and covered with red mud. The fill consisted of red soil, grey ash, charcoal and burned stones without any artifacts.

TELL QARAMEL  
SYRIA

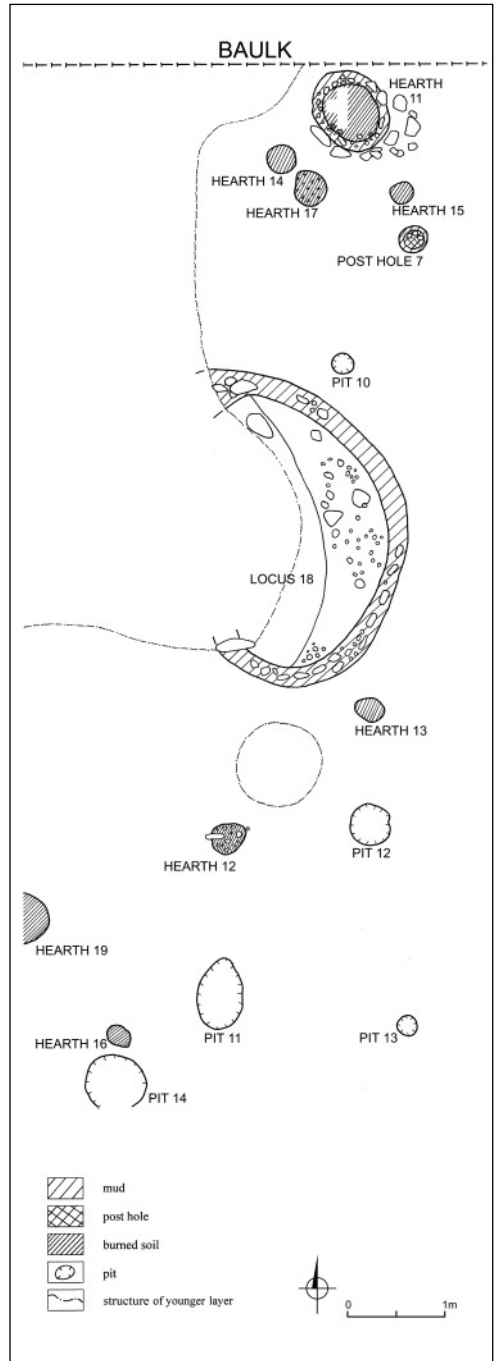
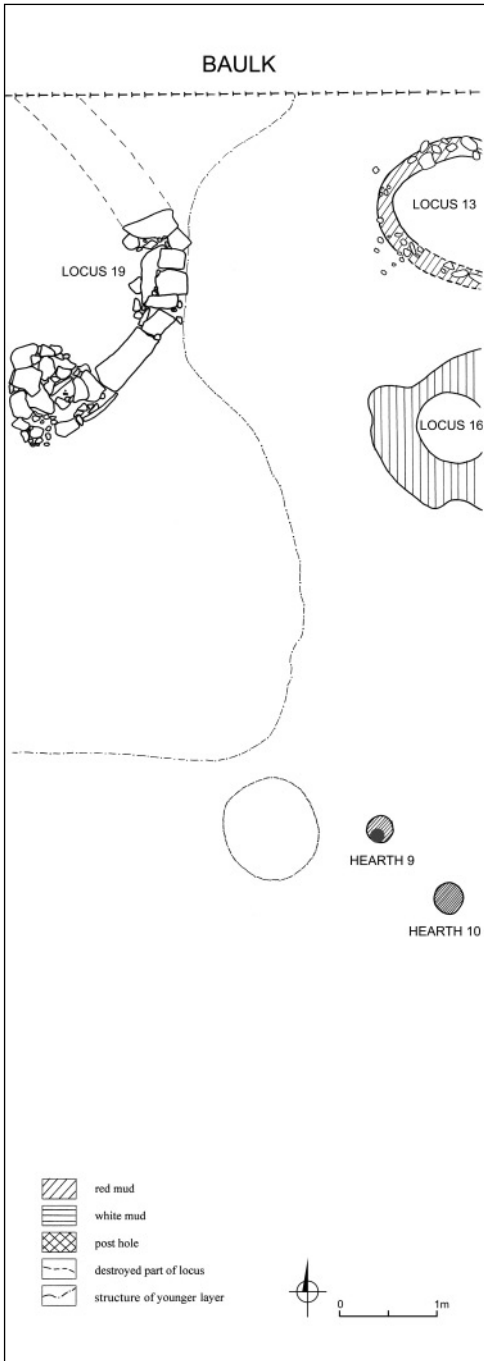


Fig. 1. Square J-8 b,d. Stratum VIII, levels 12 (left) and 13  
(Drawing P. Karczmarek)

## SQUARE J-7 / K-7

Exploration concentrated mostly in the western part of the square around the tower structures discovered previously. All levels investigated this season were connected with the PPNA stratum V (for last year's work, cf. Mazurowski 2007: 487-492 and Figs 3-7).

## TOWER 0 – LEVEL 10

Yet another tower (loc. 56 = Tower 0) was located directly below the walls of Tower I (loc. 24b) explored in the previous season (loc. 56) [Figs 2, 3]. The lowest parts of the stone foundation of the later tower could be seen next to the wall of loc. 56, indicating reuse of the older remains, especially in the southern part, under the next building.

This earlier tower was a round structure, c. 5 m in diameter. The walls, c. 1 m wide, were constructed of small pebbles set in red mud, but since only the lowermost parts have survived, it was impossible to say what the superstructure could have been like. The floor was made of tamped mud bedded on small pebbles [Fig. 4].

The internal divisions uncovered in this structure consisted of a crescent-shaped bench in the southwestern part, made of big flat stone slabs and tightly packed cobbles, once possibly plastered to judge by residual traces of the same kind of red mud that was used for the floor. An unusual hearth (loc. 57 and 57a) stood in front of the bench, in the central part of the room. In the older phase (loc. 57a), it was round, c. 1 m in diameter, and sunk into the floor. The inside wall and bottom were lined with a hard white lime mass with crushed limestone mixed in, which was subsequently plastered with mud. Rebuilt, the hearth (loc. 57) remained round, but was now smaller (c. 0.85 m in diameter)

and on floor level. A mud wall, still standing to a height of 0.15 m, encircled it. Atypically, the wall was made of red mud and faced on both sides with a thick layer of yellow mud plaster, which increased its thickness from 0.10 to 0.15 m. None of the previously discovered, similar hearths from different PPNA layers represented this kind of construction.

The location of this structure at the edge of the settlement, its different size and method of construction, as well as specific installations like the bench and hearth, and finally no traces of any typical home equipment suggest a special function for the locus as a refugial tower and perhaps some kind of cult or common house for public meetings. The four small hearths to the west of the structure could be connected with the cult function.

A layer of burned soil, charcoal and ashes around the structure is proof of a conflagration which brought down the building. A round pit by the southeastern part of the wall may have been used before the tower was rebuilt.

## LEVEL 11

The level also contained a round semi-subterranean house (loc. 55). Only the eastern part could be excavated in the trench, allowing the diameter to be projected as being about 4-5 m. Fragments surviving in the trench wall indicate that the destroyed walls of *pisé* were c. 0.50 m thick. A mud bench inside the structure was about a meter wide; taken together with the thickness of the wall, this left very little space inside for effective use. The "bench" may have actually been the floor level, and the hole in the middle of the house was covered and used as a storage space.

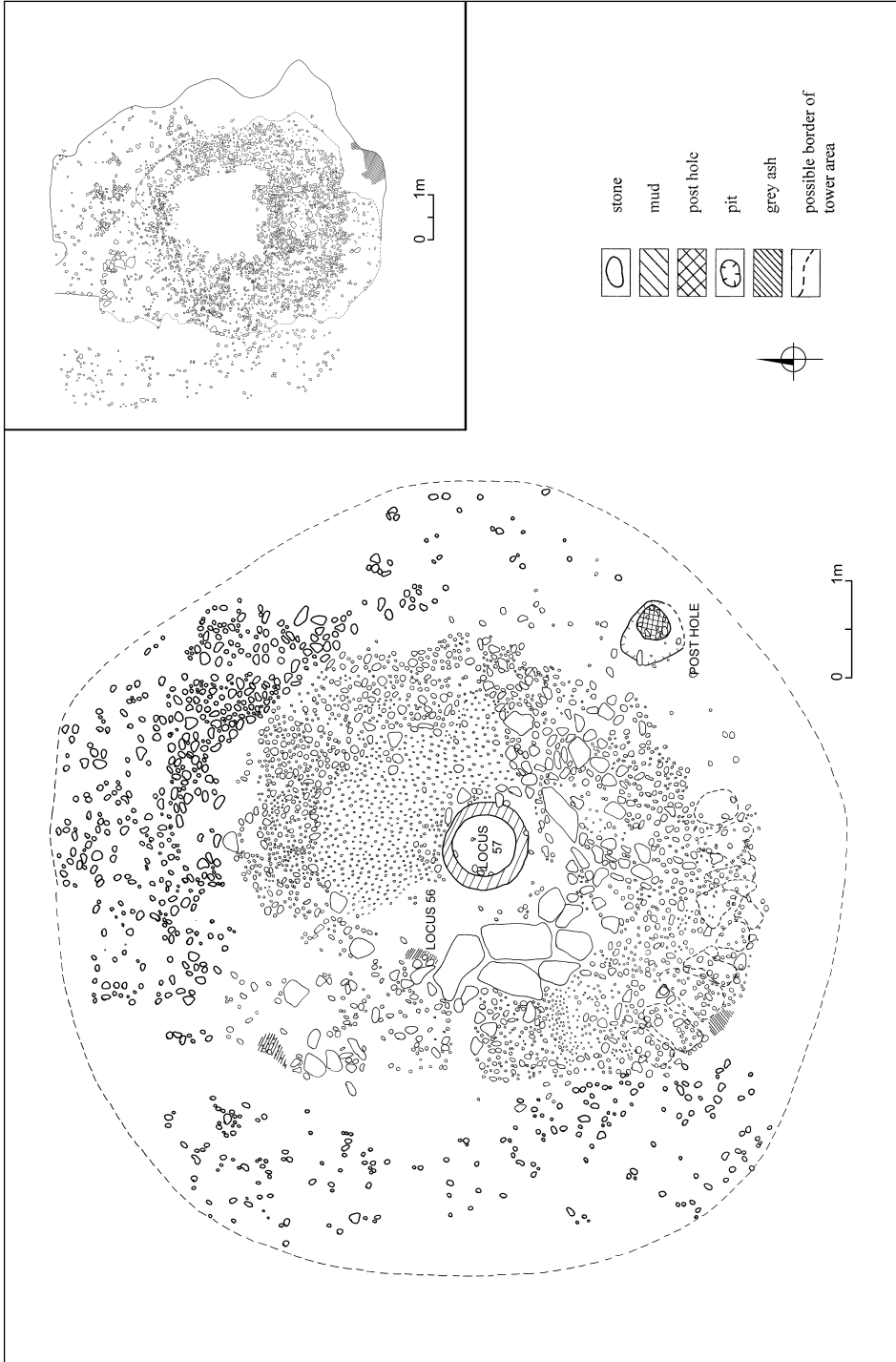


Fig. 2. Square J-7, K-7. Stratum V, level 10 – Tower 0 (loc. 56). Inset: foundations of Tower I (loc. 24b) in level 9 (Drawing P. Paprocki, A. Czubińska)



Fig. 3. Square J-7, K-7. Stratum V, level 10 – Tower 0 (loc. 56), loc. 58 and 54 at far right. View from the south (Photo R.F. Mazurowski)



Fig. 4. Square J-7, K-7. Stratum V, level 10 – Tower 0 (loc. 56). View from the north (Photo R.F. Mazurowski)

Directly underlying Tower 0 was a structure (loc. 60) which may constitute yet another, earlier phase of the building. Tower 0I, as it was designated provisionally, was round, c. 5 m in diameter. Its wall was made of pebbles set into red mud, but this time the lowest parts of walls were sunk 0.60 m into the ground. The fill contained only a large number of pebbles of different size mixed with dark loose soil and lumps of post-construction mud. No traces of a floor have been found so far, although a layer of big boulders could have been a kind of basement or perhaps yet another tower [Fig. 5]. Explorations of this structure will be continued.

A thick layer of ashes and charcoal around this tower (and around the nearby house loc. 55) also suggests a fire, which

must have consumed most of the PPNA village.

#### LEVEL 13

The structures uncovered so far in this level include an oval house (loc. 54), c. 4 by 3 m, located in the northeastern corner of the square [Fig. 6]. The walls of *pisé* were c. 0.30 m thick. Only a small fragment of what could be a mud floor was identified. Near the west wall there was a hearth (loc. 53), round in shape, c. 0.70 m in diameter, surrounded by a low mud wall and lined with a thin layer of mud plaster on the bottom as well. An analysis of the stratigraphy indicates that it was rather connected with a younger occupational level.

To the south a large courtyard of tamped mud was discovered. Dug in the



Fig. 5. Square J-7, K-7. Stratum V, level 11 – loc. 60 under Tower 0. View from the west (Photo R.F. Mazurowski)



centre of this courtyard was a large pit (loc. 58). It, too, was round, 2.50 m in diameter and 0.60 m deep, reaching

culturally sterile layers. It is impossible to determine its function until further excavations are carried out.



Fig. 6. Square K-7 b,c. Stratum V - level 13  
(Drawing B. Paprocki)

SQUARES K-3 B / K-4 B,D / L-3 A / L-4 A,C

This season level 8 of stratum V was explored (for previous work, cf. Mazurowski 2007: 491-496). It also seems to represent a very early PPNA horizon, perhaps even a transitional stadium from Proto-Neolithic to PPNA, as confirmed by large quantities of el-Khiam points found together with Qaramelian ones.

Three houses from an older occupational level were discovered. Locus 17a was situated below loc. 17, in the eastern part of the trench, half concealed in the trench wall. This semi-subterranean structure was round in shape and measured c. 4.50 m in diameter. The wall of stones covered with mud was c. 0.30 m wide and standing to a height of 0.20 m. There was a bench of mud-plastered pebbles against the wall,

c. 1 m wide and about 0.50 m high. Dark burned soil, gray ash and an abundance of animal bones made up the fill of the house.

An earlier phase of the building (loc. 29) [Fig. 7] was destroyed when loc. 17a was built. It, too, is partly concealed in the trench wall. It was also semi-subterranean, approximately 4 m in diameter, with the same kind of wall and the same fill. Only the mud bench was narrower, measuring c. 0.20 m in width.

A third structure located by the north trench wall was a semi subterranean structure (loc. 22a), underlying the house (loc. 22) from a younger occupational level. It was round, approximately 3 m in diameter, with a wall 0.40 m wide and preserved to a height of 0.40 m. A crescent-

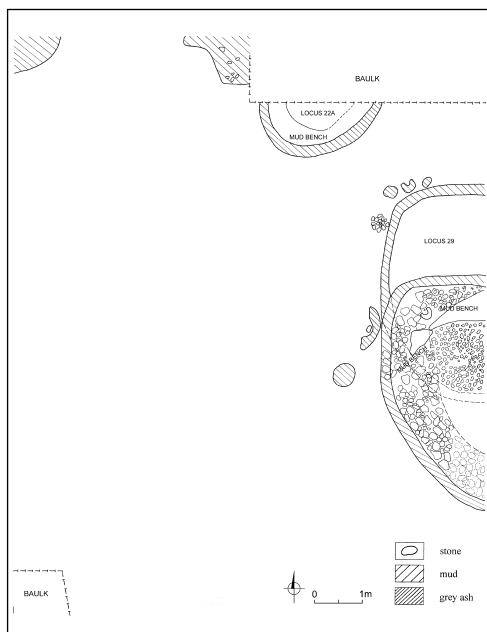


Fig. 7. Square K-3 b, K-4 b,d, L-3 a, L-4 a,c. Stratum V – level 8 (Drawing J. Gawrońska)

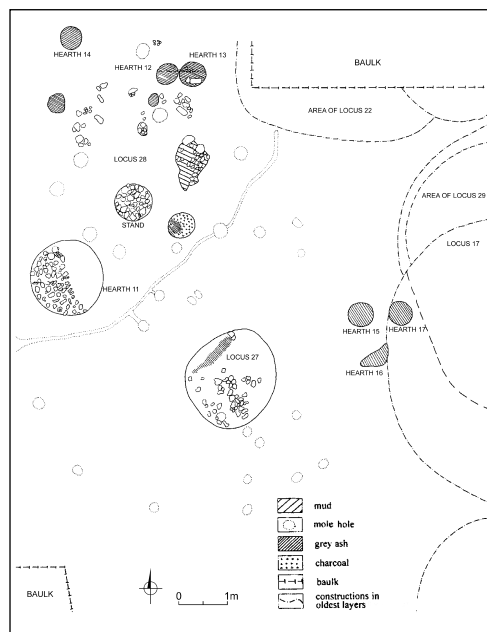


Fig. 8. Square K-3 b, K-4 b,d, L-3 a, L-4 a,c. Stratum VI – level 1 (Drawing J. Gawrońska)

shaped mud bench stood against the wall, approximately 0.60 m and 0.40 m high. The fill contained dark gray burned soil with charcoal and animal bones.

The next stratum appears to represent a transitional stage from Proto-Neolithic to PPNA or even the Proto-Neolithic. The first level explored here contained a house (loc. 28), pit (loc. 27) and seven hearths [Fig. 8]. The structure was a round shelter, c. 3 m in diameter, with a round stand of stones in the middle (c. 0.80 m in diameter) probably supporting the roof. Pit 33 was round, c. 0.60 m in diameter, and contained black burnt soil, grey ash and charcoal.

Located in the center of the trench (and southeast of the house) was a round pit (loc. 27), c. 2 m in diameter and 0.60 m deep. The fill consisted of burnt black soil, charcoal, burnt animal bones, pebbles and

red mud. Most of the bones belonged to the same animal, probably wild cattle, and were found in anatomical position. It seems that this feature was actually a hearth. Another hearth (no. 11) lay by the middle of the western trench wall. It was oval in shape, c. 1.50 m in diameter and c. 0.30 m deep, containing grey ashes, burnt black soil and stones together with animal bones, as well as abundant charcoal. Finally, there were much smaller hearths lying north of locus 28 (nos 12-14) and another three by the eastern trench wall (nos 15-17). These features were approximately 0.40-0.60 m in diameter and 0.10 m deep. They contained grey ash inside. Below hearths 16 and 17, an animal jaw was discovered.

The underlying structures from level 2 included three houses and one hearth. Locus 22b was located below locus 22a. It was a round (c. 3 m in diameter) semi-subterranean house, dug 0.40 m into culturally sterile soil, its walls made of mud. The fill contained animal bones, stones and grey ash together with lumps of charcoal. Locus 30 was a kind of round shelter (c. 3 m in diameter), surrounded by post holes which presumably carried the roof. Finally, another round (or oval?) semi-subterranean feature (loc. 31) was located below the later locus 29. [Fig. 9]. The fill contained grey ash together with burnt soil, charcoal, stones and animal bones. A post hole and stand were discovered to the south, probably supporting the roof. Another hearth (11a) underlay the later hearth 11. It was round, about 1 m in diameter and 0.10 m deep, filled with grey ash together with burnt soil, charcoal, stones and animal bones.

Level 3, which was found to lie directly on sterile soil, contained a house (loc. 32) and a pit (pit 34). Neither of these could be fully excavated in the present trench. Pit

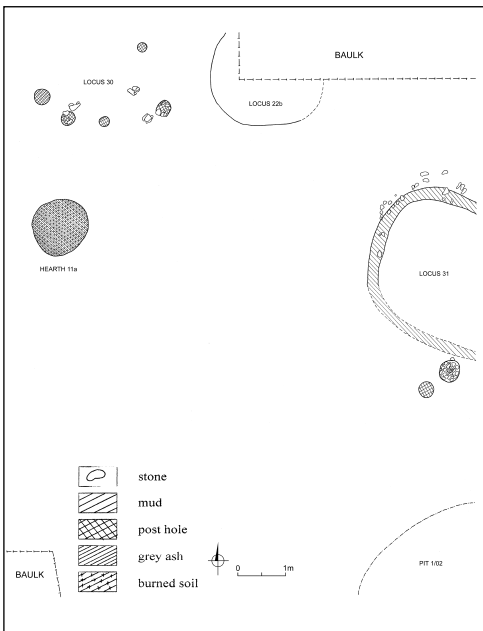


Fig. 9. Fig. 9. Square K-3 b, K-4 b,d, L-3 a, L-4 a,c. Stratum VI – level 2 (Drawing J. Gauronśka)

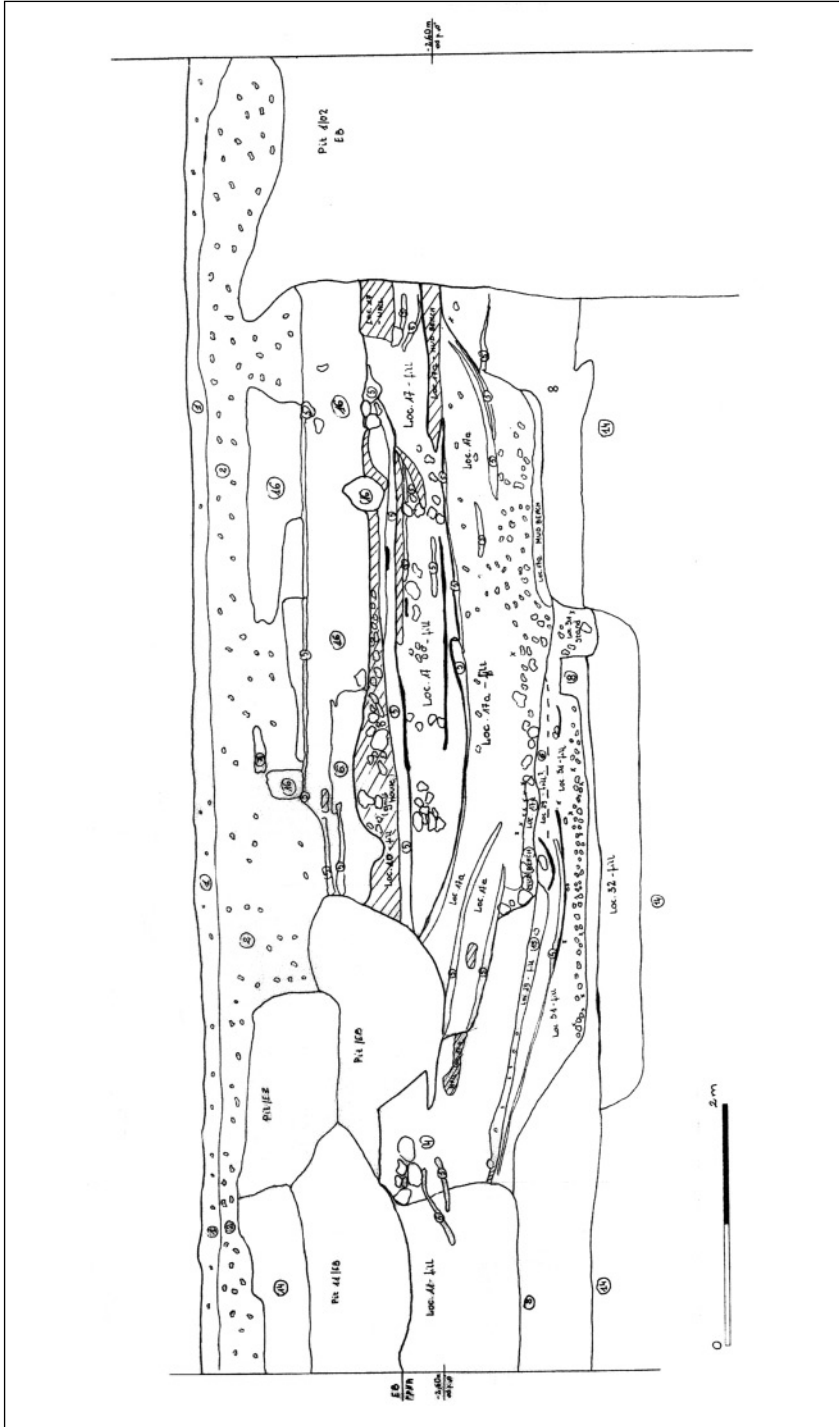


Fig. 10. Square K-3 b, K-4 b,d, L-3 a, L-4 a,c. Eastern trench wall section. 1 - top soil; 2 - brown soil with abundance of pebbles; 3 - white floor; 4 - beige (tauf) mud; 5 - grey ash; 6 - light beige (tauf) mud, burnt soil and light brown soil with pebbles; 7 - dark beige soil; 8 - red soil; 9 - light beige mud; 10 - light brown soil with pebbles; 11 - light red soil; 12 - beige soil with small pebbles; 13 - sterile soil; 14 - light red soil with pieces of limestone; 15 - grey soil with pebbles; 16 - layer with white floors (EB); 17 - animal bones (Drawing J. Gawronska)

34 was round (oval?) in shape, dug 0.70 m into sterile layers; it was c. 2.70 m in diameter. The fill contained animal bones and red and brown soil mixed with lumps of charcoal. Locus 32 in the eastern part of the square lay directly under loc. 31 and

was a round (oval?) subterranean feature, c. 4 m in diameter, dug into sterile soil. The walls were covered with mud. The fill contained pebbles, animal bones and red and brown soil together with grey ash and lumps of charcoal. [Figs 10, 11].

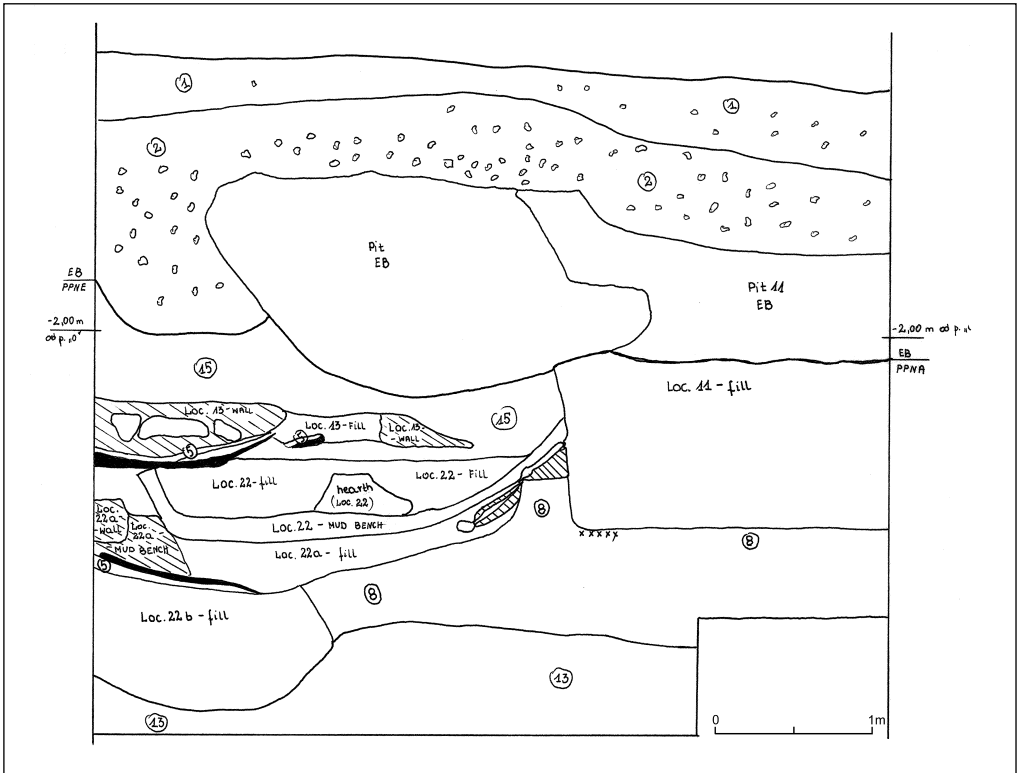


Fig. 11. Square K-3 b, K-4 b,d, L-3 a, L-4 a,c. Northern trench wall section. For legend, see Fig. 10 on previous page (Drawing J. Gawrońska)

### SQUARE L-4 B,D / M-4 A,C

The newly opened trench L-4 b,d / M-4 a,c is situated in the lowest-lying, southernmost part of the tell, east of trench K-4 b,d/L-4 a,c. Stratum I uncovered this season yielded Early Iron Age remains. Locus 1 [Fig. 12] was a large and severely damaged building, measuring c. 5.50 (N-S) by 7 m (E-W). It was divided into 3-4 or

more (?) rooms. The walls, which rose to a height of 0.50 m where preserved, and which were 0.60-0.70 m wide, were made of stones and mud, the floors of mud and pebbles (including a pavement of small pebbles in one chamber). A large mortar was discovered in the south wall and a door socket by one of the partition walls.

## SQUARE L-5

Early Iron age remains were featured also in the other newly opened trench on the lowest, southernmost part of the tell. An oval stand (loc. 1), c. 1.70 m in diameter, was constructed of a layer of stones sized 10-20 cm, with bigger stones set around the circumference. Only half the structure was excavated, the rest being concealed in the northern trench wall [Fig. 13]. A wall of big

stones with smaller stones as the core filling bordered the three loci (2, 3, 4) found in the eastern part of the square from the west. A pavement of small pebbles was found in loc. 2, while the next locus to the south had an irregular floor of big and medium-size pebbles. In the southernmost loc. 4, a limestone quern set among small pebbles was found undisturbed.

## FLINTS

The oldest settlement levels excavated this season in trench L-4 a,c, K-4 b,d, L-3 a, and K-3 b, identified as Proto-Qaramelian, yielded innumerable flint artifacts, all representing unipolar core techniques. Cores, much exhausted, were used for producing blades, occasionally also flakes. The most numerous categories include the following: oblique sickle-blades, usually truncated, 4-5 cm long, 1.0-1.5 cm wide, seldom with two edges lustrated; el-Khiam

points representing types with straight or slightly concave base and a pair of recesses, 3-4 cm long; borers and perforators, slender with long, thin sticks; and finally, retouched blades with partly retouched edges not exceeding 5 cm in length. Tools made on flakes – burins, end-scrapers and retouched flakes – are much more rare. Burins and end-scrapers exceed 5 cm in length and 3-5 cm in width. Retouched flakes are distinctly smaller and do not

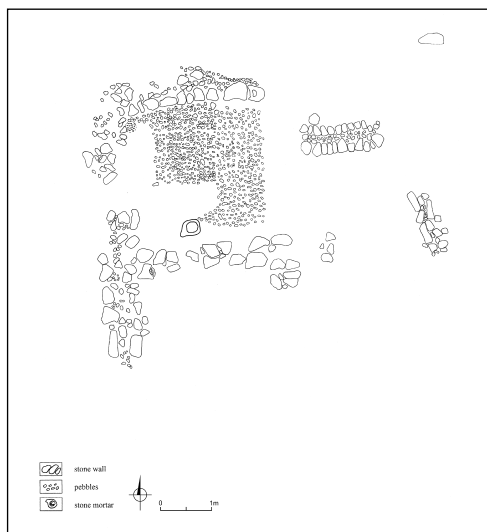


Fig. 12. Square L-4 b,d, M-4 a,c. Stratum I – level 1 (Drawing J. Gawrońska)



Fig. 13. Square L-5. Stratum I – level 2 (Drawing M. Nowakowska)

exceed 3 cm. From a technological point of view these tools, which originate from a Proto-Neolithic and transitional to Early PPNA horizon, resemble a local upper Paleolithic industry.

Flint finds from early PPNA levels in squares J-7 b,d, K-7 and J-8 b,d represented mostly a bipolar, single-striking-platform core technique. The cores represent primitive nary forms, used like single-platform cores during the last phase of exploitation. Blade production continues to be the major industry, and the tools inventory, as well as size of tools do not change distinctly. Sickle-blades, el-Khiam points, borers, perforators and retouched flakes are still the most numerous categories. Flaking tools are represented by burins, end-scrapers and retouched flakes. A new form of burin and end-scraper made on blades appears in these levels. The typical Qaramelian handle points occur in the Early

PPNA levels, too. Geometrics are in abundance, but only a few segments.

Secondary deposits of flint materials from Proto-Neolithic and Early PPNA layers were found in the newly opened squares L-4 b,d, M-4 a,c and L-5, where Iron Age and Bronze Age settlement remnants were excavated this season. Some finds can be classified as belonging to the Bronze Age. These are irregular massive blades and flakes which were retouched sporadically.

The frequency of brown flint, referred to as "chocolate" flint, in the raw material at Qaramel is over 92%. Grey obsidian appears in the Early Bronze and Early Iron Age chipped-stone industry collection (c. 0.5%); it is likely that it was brought to the site from Cappadocia. It is possible that at least some of the obsidian finds are in secondary position, having been moved from the youngest horizon of the PPNA settlement.

## GROUND AND PECKED STONE INDUSTRY

Only 96 finds representing the ground and pecked stone industry from the Early PPNA and Proto-Neolithic were recorded this year. The same regularity has been observed in previous seasons with the number dropping sharply when excavations reached the oldest occupational horizons. Characteristically, nearly all of the finds came from house fills or were reused in the construction of walls, benches or floor substructure.

Following R.F. Mazurowski's classification (1997), the finds were identified as: basalt *bolas* ball (IA1); 18 fragments of querns with trough-shaped section (IIB1a), mostly made of basalt and sporadically of limestone; complete quern with trough-shaped section and bowl-shaped depression in centre (IIB1b), made of limestone; semi-manufactured circular quern-like form with trough-shaped section (IIA1); 13

fragments of single (IIIA1) and double-pole (IIIA2) pestles made of chlorite



Fig. 14. Mortar of limestone  
(Photo R.F. Mazurowski)

pebbles (two with groove ornament); 16 fragments of unilateral or bilateral oval grinders of basalt, very often with traces of work also on the lateral edges (III E1a,b; III E2a,b); three limestone unilateral mortars with one bowl-shaped depression (IVA1); limestone bilateral mortar with 1/1 ratio of bowl-shaped depressions [*Fig. 14*]; five fragments of single- or double-pole mortar pounders (VD1/2), made of natural pebbles; six two-sided trapezoidal celts with oval transverse section (VIIA1a) made of chlorite; semi-processed triangular celt with oval transverse section (VIIA2a); large elongated polishing stone (IXA) of limestone; ovoid macehead of limestone (XC1) with natural hole; two slender pebbles with one pointed end and the other, broad end used as a grinder (XIB); needle (XIC1) of chlorite; fragment of awl (XIC2) of chlorite; two natural elongated pebbles with negatives of blows at the ends (XIIA1); two natural pebbles with lateral surfaces covered with scars after use (XIIF); natural pebble with parallel grooves on the surfaces (XIIG); two fragments of conical bowls with outturned rim (XIVA1), one

decorated; three fragments of hemispherical bowls with inturned or almost straight rim (XIVA2), one decorated; two oval shaft straighteners (XVA), made of chlorite pebbles; two (one decorated) rectangular shaft straighteners (XVC) made of chlorite; six short tubular circular beads, rectangular in transverse section, shorter than 1/3 of the diameter (XVIA2a), made of chlorite pebbles; complete barrel-shaped bead with ovoid transversal section (XVIA3a); complete barrel-shaped bead with subrectangular transversal section (XVIA3c); pendant of a natural pebble without any surface or edge processing (XVIB1).

Basalt and chlorite continue to be the predominant raw materials, the former used for heavy-duty tools, the latter for more precise tools, ornaments and bowls. Limestone and calcareous mudstone were also popular.

The number of decorated artifacts from the oldest layers also fell, but the objects – fragments of decorated pestles and shaft straighteners – resemble forms recovered earlier from younger layers.

## ANIMAL AND HUMAN BONES

Animal bones were located in PPNA layers, domestic areas, pits, fills of houses and sometimes also inside walls. The most commonly represented animals included wild cattle, sheep/goat, gazelle, donkey, and probably horse and onager. Different species of birds were also common. Rare in the collection were the bones of wild pig and boar, dog, cat and rodents. Shells of snails, turtles and mollusk were very unique.

Many animal bones bore evidence of human activity: cuts, grooves made with

flint tools, traces of hole boring. Tools made of animal bones were very rare, mainly whistles made of cattle phalanx and one perforator. Moreover, two long tubular cylindrical beads (XVIA1a) were found intact, made of the long bones of birds.

Human bones were very rare and none were identified with a burial. The most common evidence were pieces of skull. None bore any trace of other than natural activities. The bones have been stored for professional examination in the future.



## CONCLUSIONS

Summing up, the four towers from a very early stage of the PPNA appear to have been preceded by a structure (Tower 0I) apparently of the same nature but built of very massive stones. Regardless of what their function was exactly, the towers were undoubtedly monumental structures of such significance that they were rebuilt after each destructive conflagration. This process is significant and completely unknown from the early stages of the evolution of Neolithic civilization.

Exploration in trench L-4 / K-4, where sterile layers have been reached, have shown that the lowest-lying stratigraphic unit found here corresponds to the oldest layer from trench K-6 a,c, for which two radiocarbon dates have been obtained in the end of the 12th and early 11th millennium BC (non-calibrated). While there is little more data for précising the chronology, further excavations in this trench should help to clarify the issue of the dating of the oldest occupational deposits on Qaramel.

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