Seleukeia Gadara (Umm Qays, Jordan) – Economic Aspects of the Building Process and the Strategic Concept of a Hellenistic Fortification

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1. The Fortification

1.1 The Site

Gadara, the modern Umm Qays, is situated in the northwestern edge of Jordan, opposite the Golan Heights and overlooking Lake Tiberias, the Jordan Valley and Wadi al-Arab. After the battle of Paneion in 200 BC the former Ptolemaic settlement was taken over by the Seleucids under Antiochos III. who shortly after fortified the hilltop. The fortification can be dated by stratigraphy in the first half of the 2nd century BC.[1]

1.2 The Elements of the Fortification[2]

Only the southern flank and parts of eastern flank (fig. 1) are preserved whereas the northern and western part of the fortification was covered by the Roman extension of the settlement. The corners were marked by rectangular towers. Between these the southern flank was divided by two jogs with inserted gates, which were protected by pentagonal towers.

The gates next to the pentagonal towers and two more next to the north-eastern tower were spanned by segmental arches and could be locked with two aisled doors. In each pentagonal tower a sally part opened to the side opposite the gate. The towers were equipped with a high number of loopholes in two different sizes (fig. 2).

2. The Building Process

2.1 The Material

The building is made of a soft local limestone, which was cut immediately on the site. The material is easy to work but delicate for weathering. A harder limestone would have been available a little further outside the area, but would have generated higher costs for transport and have needed more time for processing.

The in-situ rock is available in geological layers and could easily be cut in ashlars. These had approximately homogeneous sizes[3] and could be assembled in a modular system: nearly every ashlar could be used as standing or lying stretcher or as header. In this way many ashlars could be prefabricated. Only very few ashlars had to be cut for their specific position (e. g. socle, change between two building elements, loop-holes, arches). The alignment of the ashlars, which resulted in an isodomic or pseudoisodomic masonry, was dependent on the thickness and the function of the particular section.

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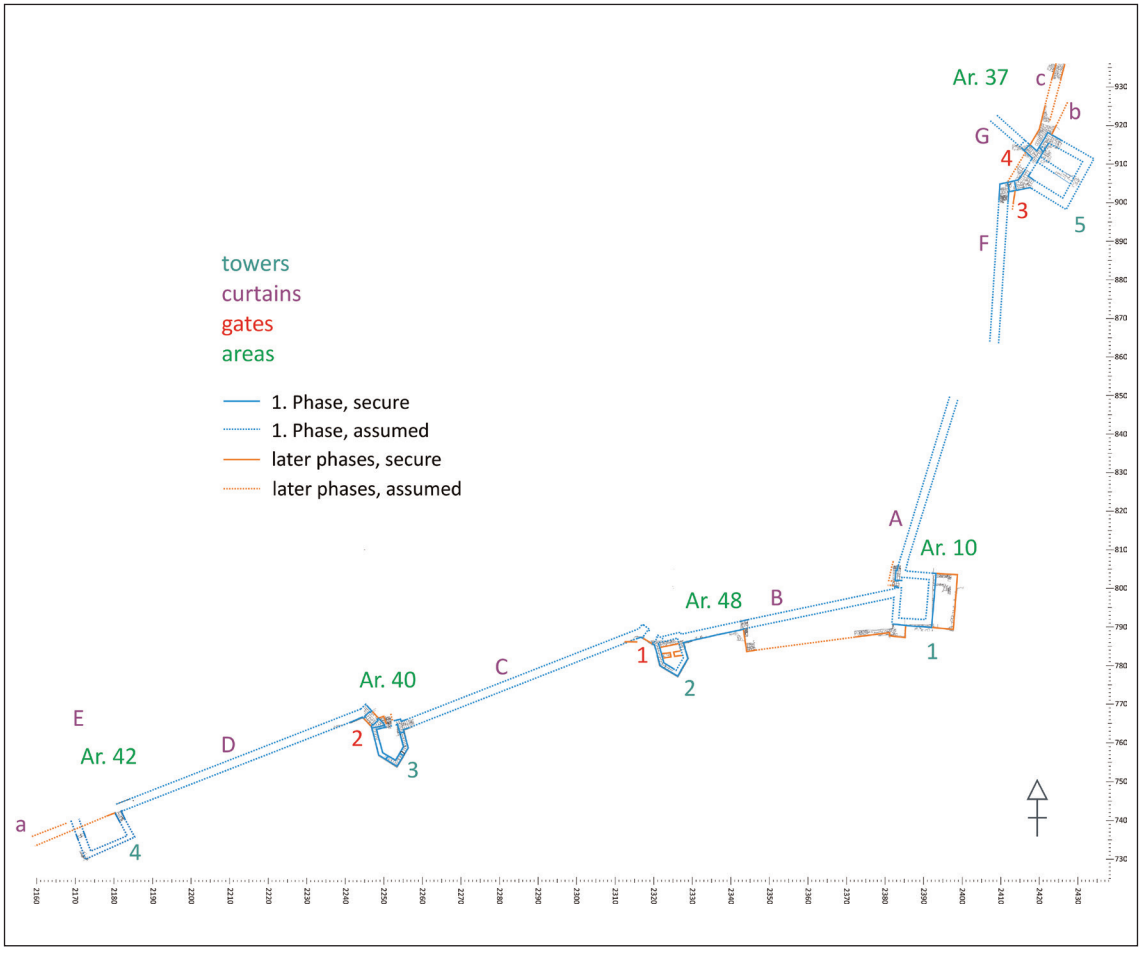

Fig. 1: Seleukeia Gadara (Umm Qays), southern and eastern flank of the hellenistic fortification.

2.2 The Assembly

Before assembly the ashlars were fitted on the sides, where an anathyrosis permitted very fine straight joints. After assembly the upper sides were cut as preparation for the next layer. They were set in a thin layer of gypsum mortar, which facilitated the setting of the ashlars and the bonding of the blocks. Several teams started simultaneously, divergences in the height of different units of the project were evened out by jogged ashlars. Every two to four layers a uniform level was established over a longer distance (fig. 3). By this it was possible to use machines like a "dikolos" to assemble the ashlars starting from the sections on higher ground level.[4] The construction of the towers was done by more specialised teams, which also were responsible for preparing the connection to the curtains.

There was no finishing work on the frontage after assembling the ashlars. The smooth exterior was the result of an effective way of cutting the stone and not following aes-

Fig. 2: Tower 3 with bricked up sally port.

thetic or representative requirements. Only the ashlars of the socle had bevelled edges what most probably followed the defensive needs.[5]

2.3 Compartment Walls as Method for Saving Material

Whereas the walls of the towers and the socles were massively made of regular ashlars, the curtains above the socle are "compartment walls". This means the façade is composed of a regular alternation of headers and stretchers. The alignment changes every layer. The headers from both sides meet in the middle of the wall. In the adjacent layers a header is inserted between the stretchers on the outside. By this, vertical internal walls are created in intervals of half of the length of an ashlar. The space in between these internal walls was filled with earth and rubble (fig. 4).

This technique of compartment walls was most probably developed in the Ptolemaic Empire and used for fortifications in Cyprus and Central Syria.[6] In these regions the building material was similar to the soft limestone in Gadara. The technique is especially suited for the requirements of fortifications, which required a particularly economic building technique because of their huge dimensions. By this, the amount of ashlars could be reduced by two for every seven ashlars and the smoothing of the ashlars could be restricted.

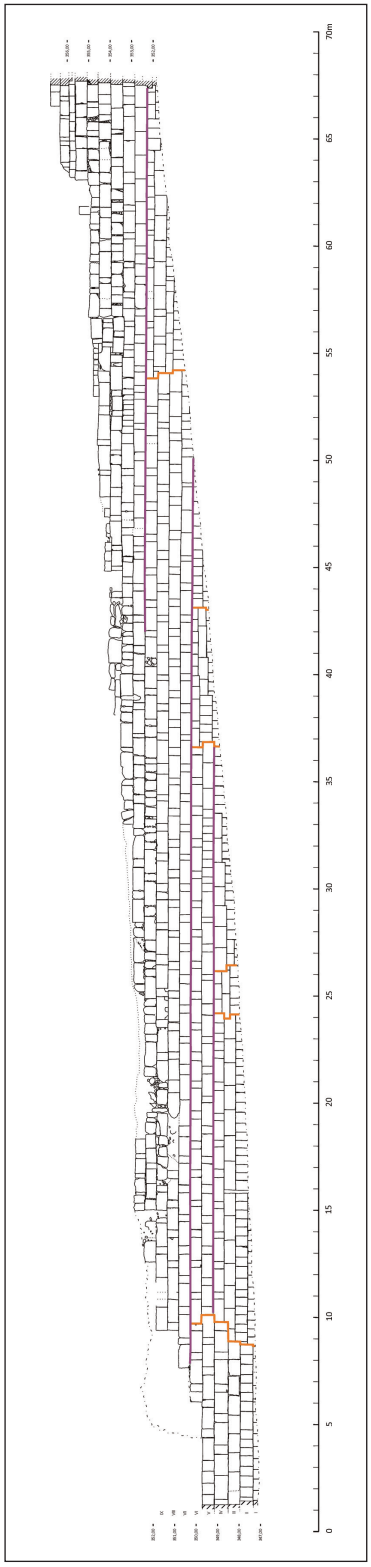

Fig. 3: Curtain C, construction joints and horizontal joints running through larger sections.

Fig. 4: Curtain C, view of a section of a compartment wall.

2.4 The Construction Time

In order to estimate the time needed by every team for a particular section of wall a group of four masons will be assumed, each of them cutting 3 to 4 ashlars daily. For a section of 13-metre curtain wall with an assumed height of 10 layers (5,5 m) 728 ashlars are needed. So every stonemason would have to process 188 ashlars, which would take about 59 days. In an analogous calculation the stonemasons would need approx. 42 days to process the stones for a pentagonal tower.

2.5 Conclusions

Like no other category of ancient buildings fortifications required an economic acquisition of building material, masonry work and assembling, due to the huge dimensions of the constructions and sometimes the time pressure, under which in case of immediate danger, the project needed to be finished.

In Gadara the following measures have been taken:

- The stones were cut directly on site what is cost effective and time saving.
- A modular system was used for the ashlar formats. In this way many ashlars could be prefabricated, which again saves time.
- Compartment masonry was used for the less endangered parts of the curtain walls.
- The ashlars have a simple shape for the predominant sections of the fortification and could thus also be manufactured by untrained workers.
- The work was divided into different sections so that parallel work could be carried out.
- The processing and smoothing of the stones took place in an economical way, so that the number of work steps was reduced.

3. The Strategic Concept

3.1 The Strategy of Active Defence

In the original planning the fortification showed many elements of an active defence: the towers situated in short distance of 56 to 67 m had many loopholes for different purposes and different types of weaponry. Whereas the loopholes in general got bigger in the 4th century BC following the development of artillery, the loopholes in Gadara were more suited for smaller artillery.

Possible artillery:

- pentagonal towers (8 × 12 m): torsion bolt shooter and small torsion stone throwers (5- or more likely 1 mina-shots), which were designed for use against people
- rectangular towers 1 and 4 (11 × 14 m; * × 13 m): torsion bolt shooters and small torsion stone throwers (5 mina-shots), which again were designed for use against people
- rectangular tower 5 (14 × 15 m): bigger torsion stone throwers (10 mina-shots), that could be used against people and catapults.

Narrow ports on the sidewalls of both pentagonal towers allowed sallies of military units in case of siege. The active strategy required a relatively high number of trained manpower. Following the calculation of McNicoll concerning the southern wall of Milet the manning of a tower required 15 and a curtain 20 persons plus a reserve of 50.[7] Assuming a total number of towers in Gadara of 11–13 there would have been needed 385–500 men for the total fortification.

3.2 Changes in the Strategic Concept

Shortly after or even during the erection of the fortification the strategic concept was changed and the sally ports were blocked. The inserted walls had loopholes. This means the defensive function of the towers persisted and archers were available at least in case of danger. But it seems that the additional openings were considered more a weak point than sallies a helpful instrument against enemies. This can be seen as a hint that necessary human resources for active defence were no longer available.

3.3 Conclusions

The strategic concept and the equipment with weaponry was not always following the "state of the art" in the poliorcetic and fortificatoric techniques but was dependent on the economic facilities of the attacking and defending forces:[8]

- Active defence might have been the only "way out" for a besieged city but required a high number of soldiers: obviously these were not available in Gadara for long term so that the sally ports were closed.
- If the attacking forces did not dispose of elaborate weaponry like siege towers but used ladders for surmounting the walls, the defensive weaponry had to be adjusted: the weaponry in Gadara was more oriented against people than against catapults.

Notes

[1] Jansen 2020, 117; Konrad 2013, 104–108. 115; Kenrick 2000.

[2] More detailed description: Hoffmann 2000, 180–210; Jansen 2016b; Jansen 2020.

[3] Sizes of the ashlars: 92–123 × 36–44 × 55–58 cm.

[4] A reconstruction of a "dikolos": Bessac 1997, fig. 8–6.

[5] Bevelled edges as a measure to prevent the levering out of stones: Bessac 1997, 31–32.

[6] Jansen 2020, 143–147.

[7] McNicoll 1997, 148.

[8] Jansen 2016a, 104.

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References

Bessac 1997
J.-C. Bessac, La construction des fortifications hellénistiques en pierre de Doura-Europos (Syrie) (Dissertation Lille 1997) (Microfiche).

Hoffmann 2000
A. Hoffmann (under cooperation with C. Bührig), Die Stadtmauern der hellenistisch-römischen Dekapolisstadt Gadara, AA 2000, 175–233.

Jansen 2016a
B. Jansen, Defensive Funktionen, in: Müth et al. 2016, 101–125.

Jansen 2016b
B. Jansen, Gadara, in: Müth et al. 2016, 273–277.

Jansen 2020
B. Jansen, Die hellenistische Befestigung von Seleukeia Gadara (Umm Qays) (Rahden/Westf. 2020).

Kenrick 2000
Ph. Kenrick, Fine Wares from the City Wall Section at Beit Nawashi (Area XLII), AA 2000, 235–262.

Konrad 2013
M. Konrad, Hellenistische und römische Feinkeramik aus Gadara: Stratifizierte Fundensembles und deren Evidenz für die Periodisierung des Platzes von der Seleukidenzeit bis zum Ersten Jüdischen Aufstand, in: A. Hoffmann – C. Bührig, Forschungen in Gadara/Umm Qays von 1987 bis 2000 (Rahden/Westf. 2013) 103–131.

McNicoll 1997
A. W. McNicoll, Revised and Supplemented by N. P. Milner, Hellenistic Fortifications from the Aegean to the Euphrates (Oxford 1997).

Müth et al. 2016
S. Müth – P. I. Schneider – M. Schnelle – P. de Staebler, Ancient Fortifications. A Compendium of Theory and Practise. Fokus Fortification Studies I (Oxford 2016).