19

Sabine Ladstätter
Felix Pirson
Thomas Schmidts
(Hrsg.)

Band 1

Häfen und Hafenstädte im östlichen Mittelmeerraum
Harbors and Harbor Cities in the Eastern Mediterranean

BYZAS

Veröffentlichungen des Deutschen Archäologischen Instituts Istanbul

Häfen und Hafenstädte im östlichen Mittelmeerraum von der Antike bis in byzantinische Zeit. Neue Entdeckungen und aktuelle Forschungsansätze

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Hrsg. von
Sabine Ladstätter – Felix Pirson – Thomas Schmidts

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Recent Researches and New Discoveries in the Harbours of Seleucia Pieria

Hatice PAMİR

Abstract

Seleucia Pieria is located on the northern corner of the Orontes Delta (modern Asi Deltası) in Samandag in the province of Hatay in southern Turkey. The topography of the north eastern Mediterranean gained a special importance in the Orontes Delta. The topographical features of the northern Levantine region are characterized by steep mountain ranges running parallel to the coastline, which provide very few means of access to the inland regions and the Orontes Delta is one of the few harbour areas there. The Amuq plain, which is located 25 km inland and connected to the coast by the Orontes River Valley (modern Asi Nehri), is strategically situated between the Upper Tigris and Euphrates river systems of eastern Turkey/northern Syria, Iraq, and the Mediterranean. As emphasized before by many scholars, the Amuq Plain is at the crossroads of overland routes[1]. The earliest well-known excavations conducted in the delta by L. Woolley in the 1930's unearthed a pre-Hellenistic harbour site of Al Mina; another important site in the delta is Sabuniye located to the north of the Orontes River valley. The recent discoveries at the site revealed that Sabuniye functioned as a trading post or harbour of Alalakh and Kunulua in Amuq Plain from the late Bronze through the Iron Age I. Later Al Mina was the harbour of Kunulua until the end of the 4th century B.C.[2] and lost its harbour function after Seleucia Pieria was established. Seleucia Pieria had two harbours, one of which – the so-called inner harbour – was situated in the lowlands to the southwest of the city while the other one – the so-called exterior harbour – is situated on the coast including two piers or breakwaters. This paper is based on the results of archaeological surveys of the ancient city of Seleuceia Pieria carried out between 1997–2000 and 2002–2006.

Özet

Seleucia Pieria Türkiye'nin güneyindeki Hatay ilinde Samandağ yakınlarında Orontes/Asi Nehri'nin deltasının kuzey köşesindedir. Asi Deltası Akdeniz'in kuzeydoğusundaki genel topoğrafyada özel bir öneme sahiptir. Doğu Akdeniz'de kıyıya koşut

1 H. Pamir, The Orontes Delta Survey, in: K. A. Yener (ed.), The Amuq Valley Regional Projects 1, Surveys in the Plain of Antioch and Orontes Delta, Turkey, 1995–2002 (Chicago 2005) 67.

2 H. Pamir, Al Mina and Sabuniye in the Orontes Delta. The Sites, in: G. R. Tsetskhladze (ed.), Greek Colonisation: an Account of Greek Colonies and other Settlements overseas (Leiden 2006) 535–543; H. Pamir, Sabuniye. A Late Bronze-Iron Age Settlement on the Northeastern Mediterranean Coast, in: K. A. Yener (ed.), Across the Border. Late Bronze-Iron Age Relations between Syria and Anatolia, AncNearEastSt Supplement 42 (Leuven 2013) 173–195.

uzanan dik dağlar topoğrafyanın en önemli özelliğidir. Bu dağlar yüzünden kıyıdan iç bölgelere geçiş için pek fırsat yoktur ve Asi Deltası bu yöredeki çok az limandan biridir. Amik Ovası 25 km kadar içeridedir ve kıyıya Asi Nehri vadisiyle bağlanır. Yukarı Dicle/Fırat nehir sistemleriyle Türkiye-Suriye-Irak yöresi ile Akdeniz arasında önemli stratejik bir konumdadır. Birçok araştırmacının ifade ettiği gibi Amik Ovası kara yollarının kavşağında bulunmaktadır.

L. Woolley tarafından deltada 1930lu yıllarda yürütülen meşhur kazılarda Helenistik dönem öncesi limanı Al Mina ortaya çıkmıştı. Deltadaki bir başka önemli mevki Asi vadisinin kuzeyindeki Sabuniye'dir. Burada yapılan çalışmalarda Sabuniye'nin Geç Tunç devrinden itibaren I. Demir Çağı sonlarına değin Amik Ovası'ndaki Alalakh ve Kunulua yerleşimlerinin ticari noktası veya limanı olduğunu ortaya çıkardı. M.O. 4. yy'ın sonuna kadar Sabuniye Kunulua şehrinin limanı kalmaya devam etti. Seleucia Pieria kurulunca bu liman işlevini kaybetti. Seleucia Pieria'da iki liman olduğu belirtilmektedir. »İç liman« şehrin güneybatısındaki alçak kısımda, »dış liman« ise kıyıda bulunuyordu ve bu ikincisinin iki dalgakıranı vardı. Bu yazı Seleucia Pieria'da 1997–2000 ve 2002–2006 dönemlerinde sürdürülmüş arkeolojik araştırmaların sonuçlarına dayanmaktadır.

Seleucia Pieria was founded in 300 B.C. by Seleucus I. Nicator as the capital city of his kingdom extending from Samarkand to the East and Sardes to the West[3]. Lying along the delta flats and on the lower foothills of Musa Mountain, Seleucia Pieria was widely accepted as an important harbour in the Eastern Mediterranean during the Hellenistic and Roman periods, and, especially in Roman times, it became a rich and prosperous trade centre in the Eastern Mediterranean along with Antioch on the Orontes (modern Antakya) (**Fig. 1**).

Between 1937 and 1939, brief excavations were made in Seleucia by a committee under the leadership of Princeton University[4]. The first descriptions of the harbours of Seleucia Pieria appeared in travelers' accounts. The 18th century traveler R. Pococke visited the city in the 1740's and described in detail the inner harbour, the exterior harbour piers and provided a sketch plan of the city[5]. Other travelers

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3 For the history of the city foundation and Seleucus' policy of it see H. Pamir, Seleuceia Pieria (Diss. Ankara University 2001); G. Downey, A History of Antioch in Syria: From Seleucus to the Arab Conquest (Princeton 1961) 58 f.

4 R. Stillwell, Outline of the Campaigns, in: R. Stillwell (ed.), Antioch on the Orontes III. The Excavations 1937–1939 (Princeton 1941)1–8. 31–34.

5 R. Pococke, A Description of the East and some other Countries II, 1 (London 1745) 182–184 pl. 25, in his description: »In the plain near the south west corner of the city there was a fine basin (I) which was walled round; the design of it was to receive the shipping; from it the passage, or channel (K) leads to the sea. To the north of this channel there is flat spot of ground, about a half a mile square at (L), to which there is a gentle ascent, where at the south west point of the hill was a tower (M). On this spot also there is another strong tower (N), from which a wall was built over the sea cliffs to the north as far as the famous channel (O), cut in the rock, which I shall have occasion to mention; this together with the wall, enclosed the harbour, and joined it to the suburb below. This tower seems to have been designed as a defence to the harbour, as well as the tower (M). On the south side also of the entrance there was another tower (P), built on the rock which beneath was hollowed into a room twenty-four feet (7.31 m) long, and ten feet (3.048 m) wide, near this there is a pier (Q), which runs into the sea, and is eighteen paces (16.38 m) wide, and about sixty-seven (60.97 m) long; it is built of very large stones, some of which are twenty feet (6.096 m) long, five (4.55 m) deep, and six feet (1.828 m) wide; the stones have been joined together by iron clamps, the marks of which are still to be seen. A little way to the north of this there is such another pier (R), fifteen paces (13.65 m) and a hundred and twenty long; and the bottom being kept clean and open between these piers it is probable the shipping lay there in summer, as in the winter they were doubtless laid up in the basin: The south side of this basin, the entrance to it were built strong for defence, and a wall carried from the basin (S), about a half furlong to the south, defended by towers for greater security.«

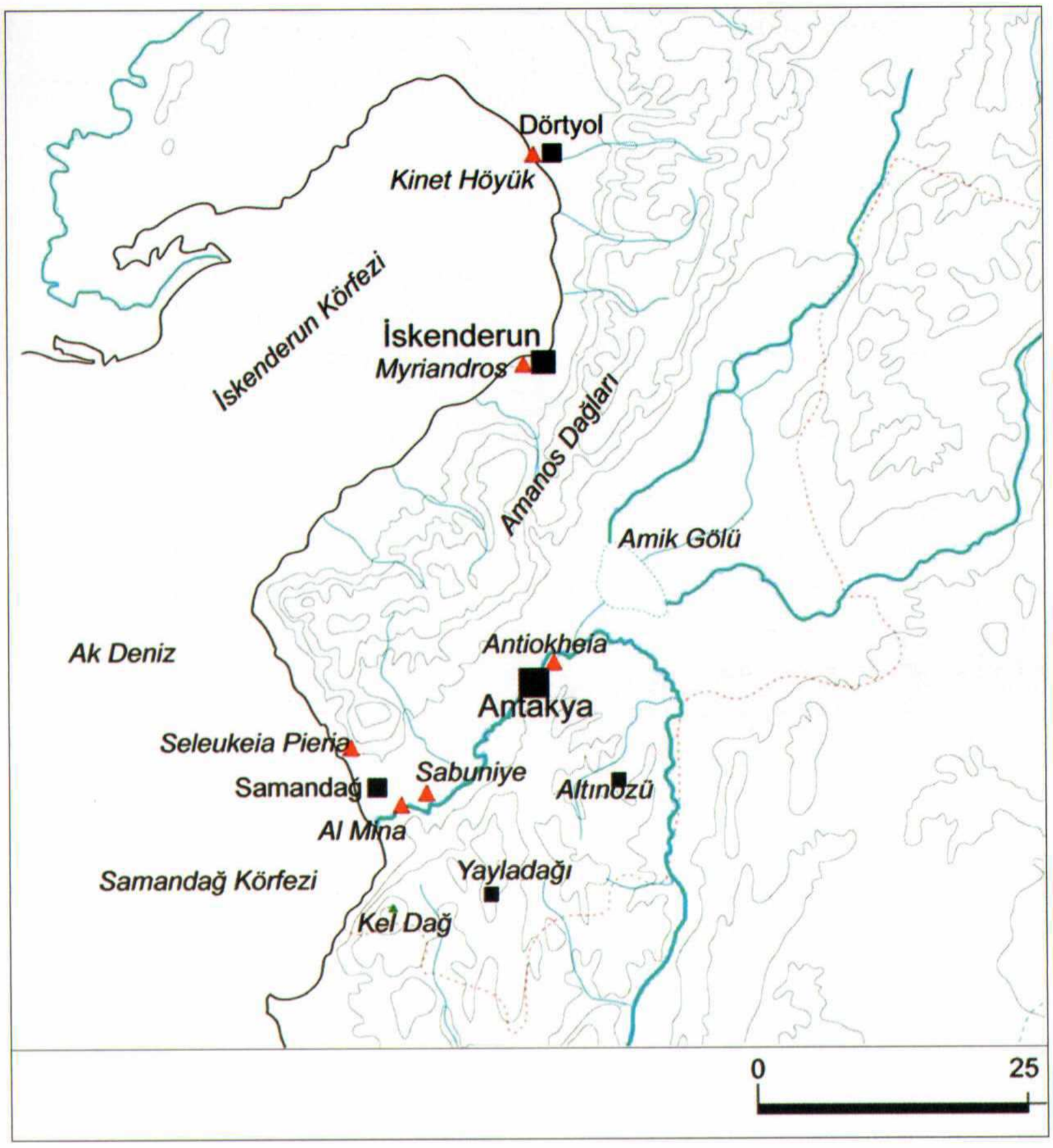

Fig. 1
Map of Hatay region and the sites (ODAP Archive)

K. Baedeker[6], A. Drummond[7], F. Neale[8] and W. Barttlet[9] described the harbours as magnificent and added that the swampy inner harbour is connected to the sea with a channel, the mouth of the channel is blocked with sand, the harbour's columns can be seen clearly and small vessels continue to dock there (**Figs. 2. 3**). V. Chapot described the inner and outer harbour in his detailed work on the ancient city[10]. In the early 19th century, the British Empire made surveys to determine the reusability of Seleucia Pieria which was an important stop along the trade network connecting the Mediterranean to the Gulf of Basra, which was already planned by Alexander the Great but achieved only by Seleucid kings. General Chesney, who arrived at Seleucia Pieria in 1835 to find a route from the Asi River Delta to the Euphrates and from there, to the eastern provinces (India), described its harbour as once renowned and magnificently large[11]. Captain W. Allen, who visited

6 K. Baedeker, Palestine and Syria with Routes through Mesopotamia and Babylonia and the Island of Cyprus (Leipzig 1912) 358.

7 A. Drummond, Travels through Different Cities of Germany, Italy, Greece and Several Parts of Asia as far as the Banks of the Euphrates: In a Series of Letters (London 1754) 225.

8 F. A. Neale, Eight Years in Syria and Palestine from 1842–1850, I (London 1851) 74.

9 W. H. Bartlett – T. Allom, Syria, The Holy Land, Asia Minor & C. Illustrated II (London 1851) 17.

10 V. Chapot, Antiquités de la Syrie du Nord, BCH 26, 1902, 161–208.

11 F. R. Chesney, Narrative of the Euphrates Expedition Carried on by Order of the British Government during the Years 1835, 1836 and 1837 (London 1868) 171.

Fig. 2
Drawing of Seleucia Pieria exterior harbor (W. Bartlett 1851, pl. 17)

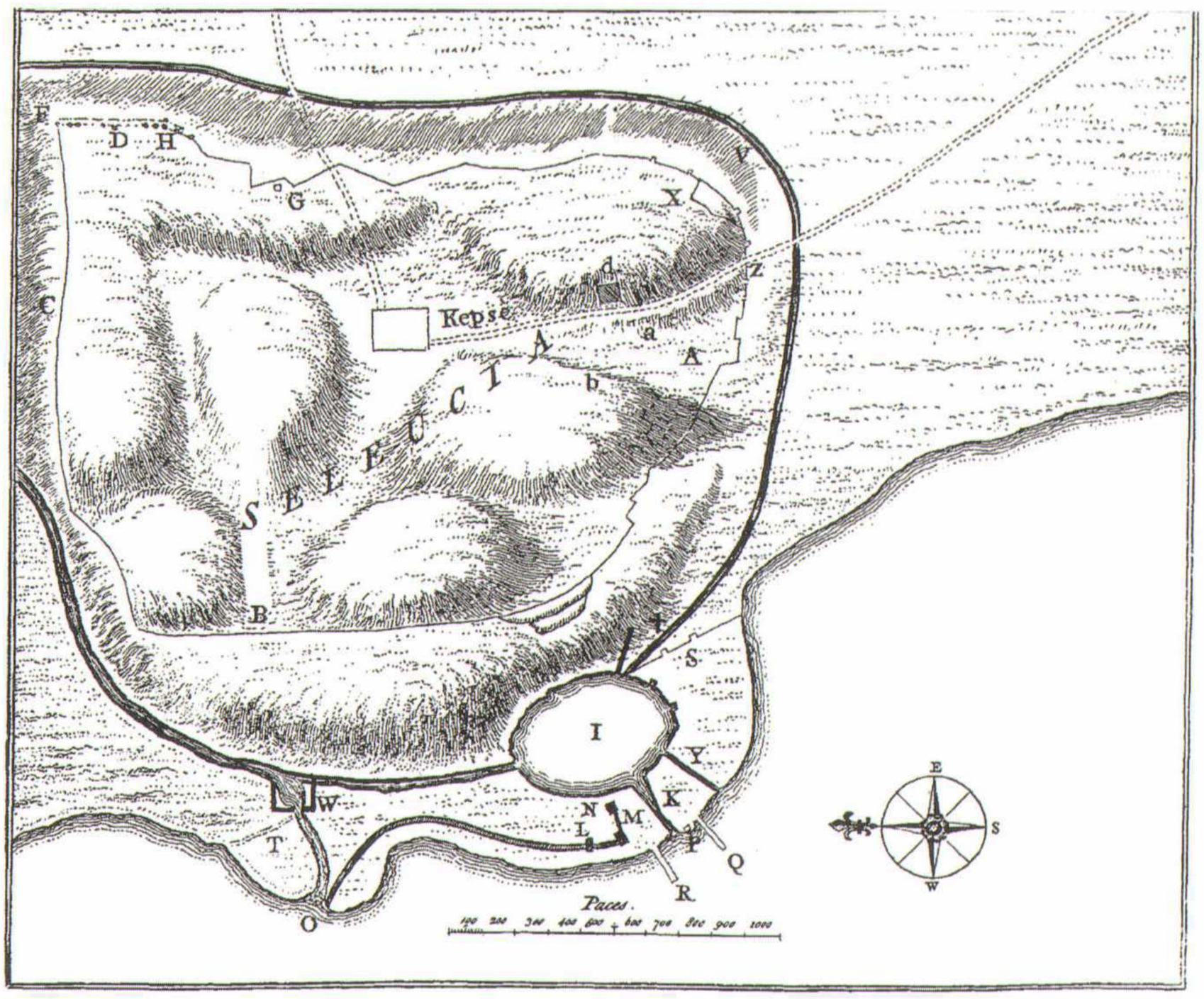

Fig. 3
Sketch plan of Seleucia Pieria (R. Pococke 1745, pl. 25)

the region for the same purpose, surveyed the harbour of Seleucia Pieria in detail and described the pool-shaped inner harbour and the exterior harbour with piers protruding to the sea on the beach as the most exquisite ones of their kind. He stated that the exterior harbour could be salvageable with some work but the inner harbour was full of silt and therefore unusable[12].

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12 W. Allen, The Ancient Harbour of Seleukeia in Pieria, Journal of the Royal Geographic Society 23, 1853, 157–163.

Fig. 4 Seleucia Pieria topographical view on google earth map (© Digital Globe)

Particular attention should be paid to the scientific descriptions of the harbours of the ancient city published by K. Lehmann-Hartleben[13] and then by D. J. Blackman[14]. The other remarkable geomorphologic research was carried out by O. Erol and P. A. Pirazzoli on the transformation of the shore line of the Delta and its effects on the harbours[15].

This paper is based on the results of archaeological surveys at the ancient city of Seleuceia Pieria carried out between 1997–2000 and 2002–2006.

Seleucia Pieria has two harbours, one of which is situated on flat ground to the southwest of the city – the so-called inner harbour – while the other one is situated on the coast and includes two piers or breakwaters, the so-called exterior harbour (**Figs. 4. 5**). The inner harbour of Seleucia Pieria, once a traveller attraction, is now land for agriculture and orchards. The point which travellers said was connected to the exterior harbour and the sea through a channel, and at the same time connected the inner harbour to the sea, has completely silted up.

The inner harbour of the city was formed where there is a natural lagoon fed by waters from the hills along the shore[16] (**Fig. 6**). Değirmendere River which runs from the north used to flow here and reach the sea. This lagoon was probably in a good position to offer shelter for boats before the founding of the city of Seleucia Pieria. Based on Polybius'

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13 K. Lehmann-Hartleben, Die antiken Hafenanlagen des Mittelmeers, Klio Beih. 14 (Leipzig 1923).

14 D. J. Blackman, Ancient Harbours in the Mediterranean 2, IntJNautA 11, 1982, 185–211.

15 O. Erol – P. A. Pirazzoli, Seleucia Pieria. An Ancient Harbour Submitted to Two Uplifts, IntJNautA 21, 1992, 320–328.

16 O. Erol, Asi Nehri Deltasının Jeomorfolojisi ve Dördüncü Zaman Deniz-Akarsu Şekilleri (Ankara 1963) 22; RE II A (1923) 1184–1200 s. v. Seleukia (Pieria) (E. Hönigmann).

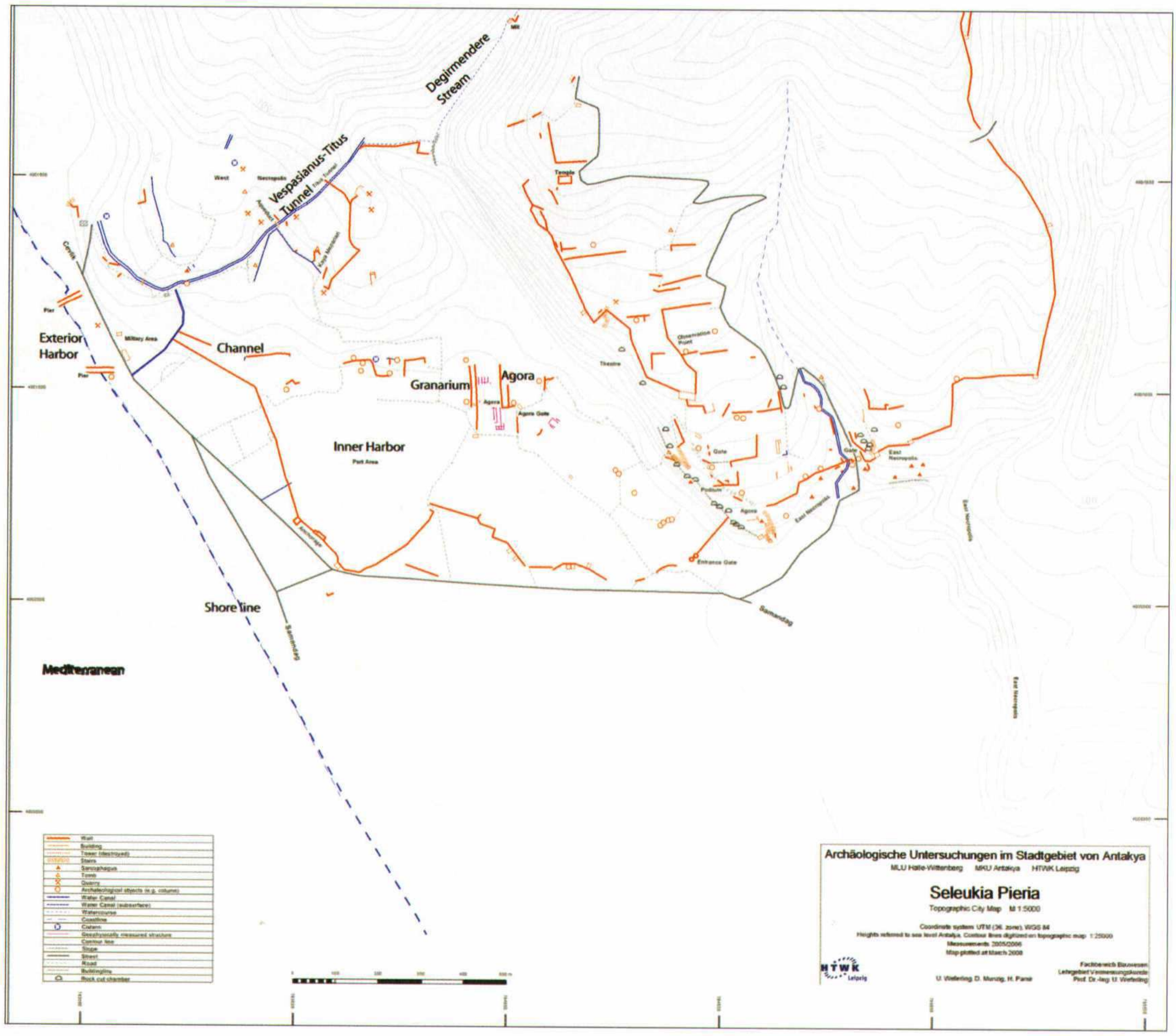

Fig. 5 Ancient city topographical plan (U. Weferling, D. Munzig, H. Pamir)

Fig. 6 Top view of inner the harbour (ODAP Archive)

Fig. 7 Southeast wall of the inner harbour (ODAP Archive)

definition[17], K. Lehmann-Hartleben defines the first phase of the inner harbour as an *emporion*[18]. Today the harbour, which is located in the southwest plains of the city with its northern, eastern and southern sides closed and reaching to the southwest with a long channel becoming narrow in the west, resembles a closed teapot reaching out to the sea[19]. The inner harbour is approx. 400 m long from the north to the south, 600 m wide from the east to the west and 250 m away from the shoreline.

The west and southeast sides of the present level of the inner harbour basin are 6 m deeper than the surface where the lower city is located. It is surrounded by walls on the southeast, south, west and northwestern sides, while the north and east sides are left in natural condition or surrounded by fortified terraces which gradually increase (**Figs. 7. 8**). The southern walls of the inner harbour are quite strong whereas the remaining walls are either non-existent or very weak (**Fig. 9**). The Değirmendere River which flows to the inner harbour lies to the north of the inner harbour. In the second half of the 1st century A.D., its bed was changed by a complex structure, the so-called Vespasianus-Titus Tunnel, including a curtain wall, rock cut tunnel and channel, which stopped its flow to the harbour[20].

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17 Pol. 5, 59.

18 Lehmann-Hartleben op. cit. (n. 13) 40.

19 He compares its form to the retort bottle: Allen op. cit. (n. 12) 157.

20 Pamir op. cit. (n. 3) 192–201; Pamir op. cit. (n. 1) 74 f.

Fig. 8 Natural topography on the east side and harbour basin (ODAP Archive)

Fig. 9 South wall of the harbour (ODAP Archive)

The southwest-west of the inner harbour is surrounded by two walls coming from the east-southeast and from the north; these run parallel to the coast and extend against each other at the entrance to the harbour. Both walls are part of the fortifications, and are the strongest and thickest parts of the city walls. At the entrance to the harbour there seem to be breakwaters (**Figs. 10. 11**). Approx. 13 m south of the wall coming from the east, on the

Fig. 10 North pier of the harbour (ODAP Archive)

Fig. 11 View to the north pier from the harbour basin (ODAP Archive)

Fig. 12 Dried stream bed on the west (ODAP Archive)

seaside of the modern road, remains of a poorly preserved 7 m long ashlar masonry wall near the sea have been discovered. V. Chapot pointed out that there were two additional walls from the harbour wall to the sea and that these were breakwater walls protecting the harbour entrance. He wrote, »the existence of a dried riverbed passing between two walls is the best indicator for this«[21]. The small streambed there today is quite difficult to define due to the presence of modern hotel building. However, a slight depression in the soil is still visible, but R. Pococke still observed a breakwater and a channel between the sea and harbour in that area[22] (**Fig. 12**).

A channel extending to the northwest of the inner harbour is now completely dried up and filled in, its floor filled with pebbles and eroded soil from the slopes. Furthermore, its elevation is higher than the basin of the inner harbour. The channel which runs to the sea has a length of 457 m and an average width of 60 m. On the west side of this channel the partial remains of harbour walls can be seen. In the north, this channel passes through the small stream bed (**Fig. 13**) fed by the waters of the Vespasianus-Titus Tunnel, but now it is dried up. Just to the north of the small stream, Çevlik Military Outposts and other modern buildings were constructed in the 1950's. Due to this modern construction, the ground in this area was raised and knowledge about the harbour entrance was lost. However, in the military zone, the tower carved into the rock and the second tower just to the northwest, which the travellers reported, have been designated as the towers protecting the harbour entrance (**Fig. 14**)[23]. It is unclear whether the inner harbour channel is connected to the exterior harbour or not.

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21 Chapot op. cit. (n. 10) 204–208.

22 See n. 5; according to Pococke's description of the basin (K) the channel connects the harbour to the sea. Because of a modern road over the riverbed and modern housing, this connection is not visible any more.

23 See n. 5–12.

Fig. 13
Stream bed connected to the tunnel on the north (ODAP Archive)

Fig. 14
Rock cut tower to the north next to the exterior harbour (ODAP Archive)

The east of the inner harbour is surrounded by harbour walls; on the east and north sides some structural remains adjacent to the harbour have been discovered. This area, defined as the agora based on various architectural remains to the east of the inner harbour, was excavated in the 1930's; portals of shop rows have been identified (**Figs. 15. 16**). The results of the archaeological and geophysical surveys carried out in that area and the location of the place led to its identification as the harbour agora. Geomagnetic data reveal negative linear anomalies as well as a massive positive anomaly in the centre, indicating a space of approx. 5 × 7 m with a central pit. Some parallel walls extend to the north and

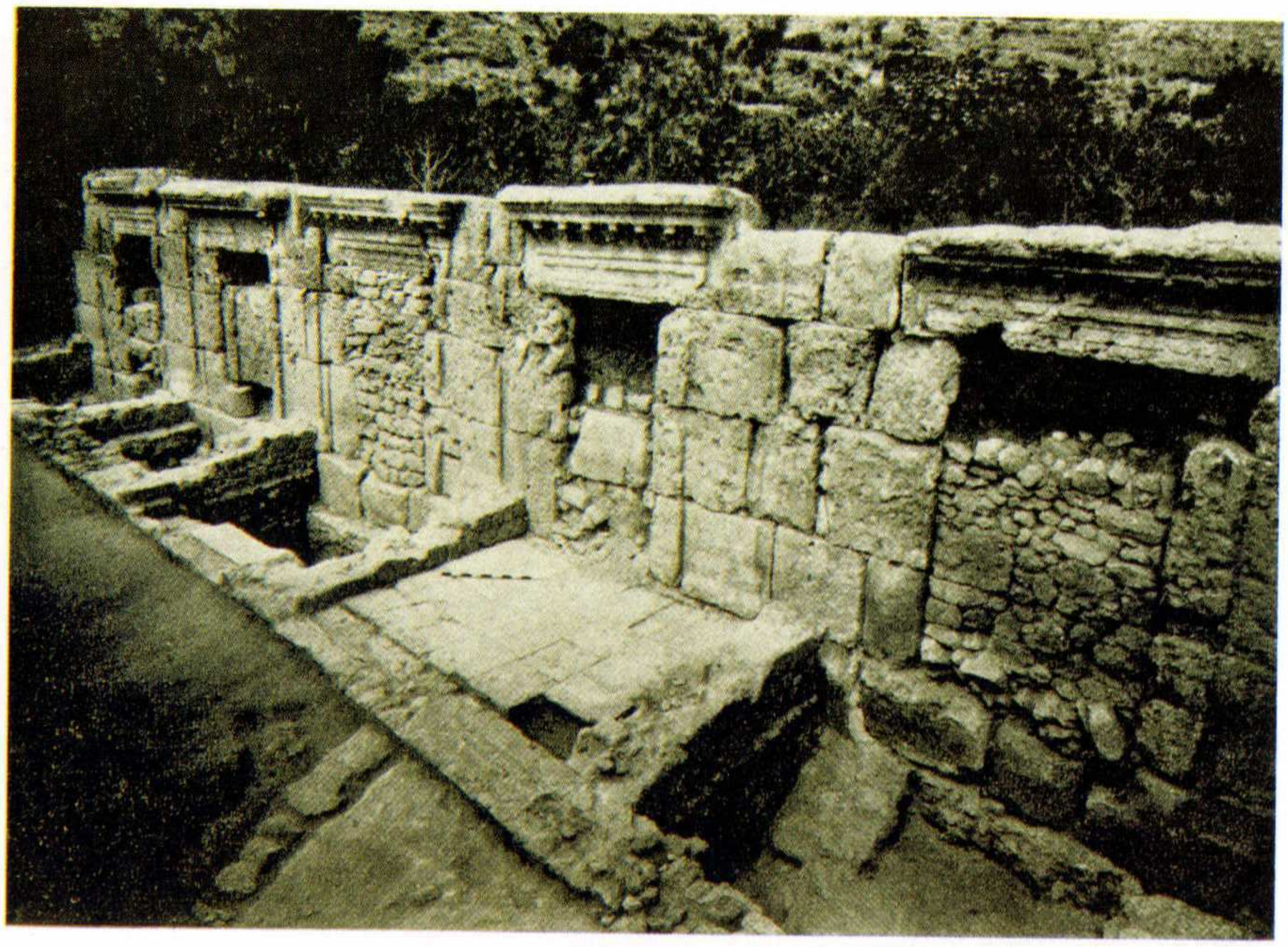

Fig. 15
Portals and shops from the 1937 excavation (Stillwel 1941, fig. 2)

Fig. 16
Architectural remains of the agora and resused postaments (ODAP Archive)

west of this central structure. GPR applied to the western part of the stretch detected a section of a large building complex consisting of several regular spaces at depths between 0.3 m and 2.4 m (**Fig. 17**)[24].

Warehouses were identified and documented next to the east side of the inner harbour, at a depth of 2 m lower than the agora's present level. In addition, a *granarium* structure consisting of twelve adjacent parallel rooms and two warehouses on a level 2 m higher than the inner harbour basin level, which is now filled in and turned to land, have been identified (**Fig. 18**). The rooms are at least 3.30 m wide and 9.45 m long and extend parallel

24 G. Brands – C. Meyer, Antioch on the Orontes and Seleucia Pieria 2004: Preliminary Results of the Geophysical Survey, Arkeometri Sonuçları Toplantısı 21 (Ankara 2006) 151.

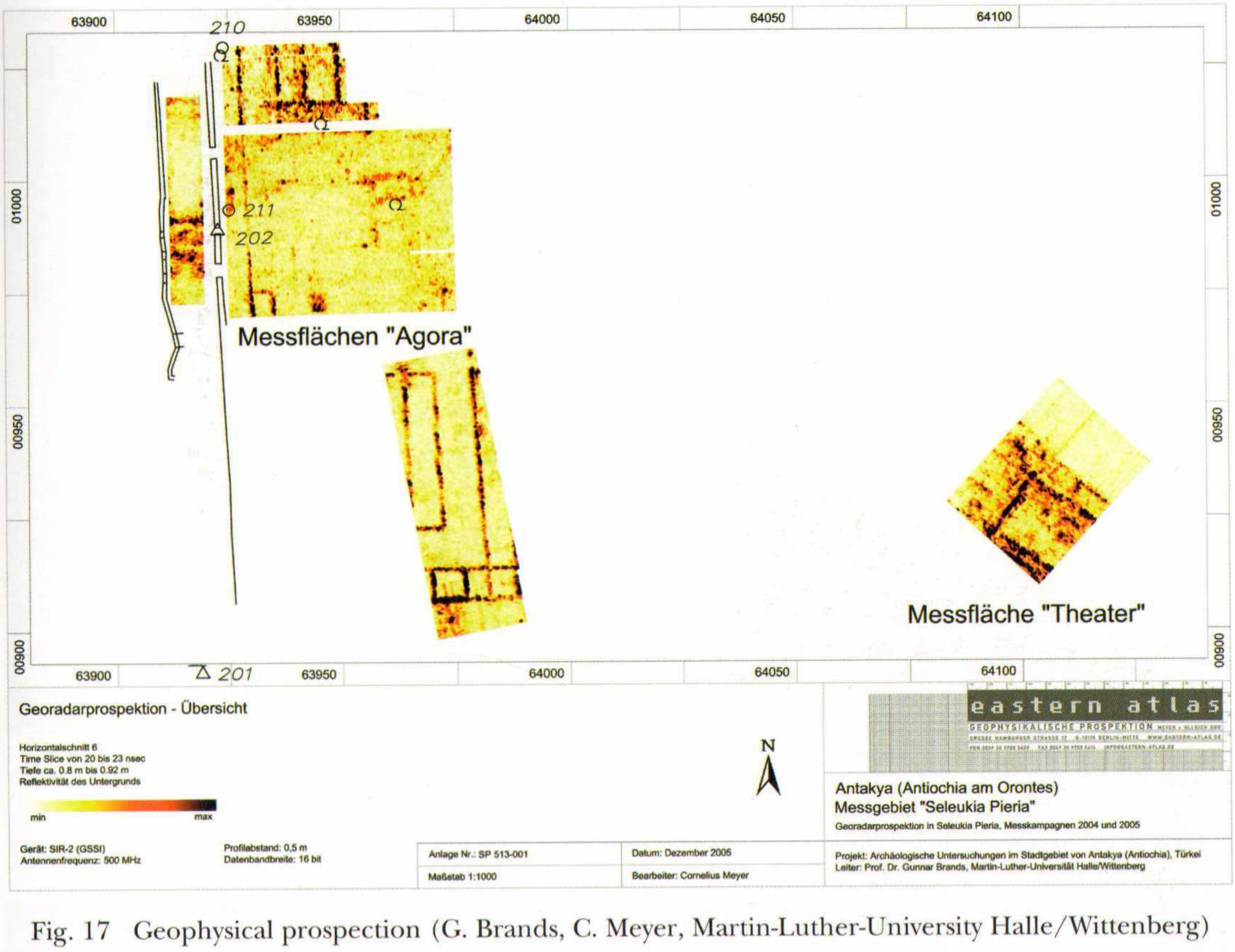

Fig. 17 Geophysical prospection (G. Brands, C. Meyer, Martin-Luther-University Halle/Wittenberg)

in a SE-NW direction. The back wall of the rooms adjoins the retaining wall of the agora. In the back wall of the rooms a chimney like opening built in *opus quadratum* from ashlar blocks opend up in form of a ramp (**Figs. 18. 19**). Openings of this kind usually served for pouring grain into the rooms (**Figs. 20. 21**). This indicates that the structure had a connection at its upper surface, and an opening from the agora side. On top of the wall where the agora adjoins this area, ashlar blocks lie along this row of parallel rooms (**Fig. 18**). The facades of barrel-vaulted roofs, and long and narrow adjoining structures face the harbour[25]. These structures are thought to be harbour warehouses, where products such as wheat were stored before being loaded onto ships[26]. This *granarium* has windows with ramps to the upper section as well as upper lids. Furthermore, another warehouse with a barrel-vaulted roof has been identified on the northeast terrace of the harbour, a *horrea* or type of warehouse (**Fig. 22**). The *granarium*'s rooms parallel to each other whose side walls are believed to be buried underground, with only the rear walls visible, are covered with barrel vaults. Only one room to the north of the whole structure is completely preserved. It shows the plan and the structure of the other rooms. Its walls are built out of *opus mixtum* with stone, cement and tiles and are covered with a barrel vault.

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25 H. Pamir – G. Brands, Asi Deltası ve Asi Vadisi Arkeoloji Projesi Antiocheia, Seleuceia Pieria ve Sabuniye Yüzey Araştırmaları 2004 Yılı Çalışmaları, AST 23, 2, 2006, 96 fig. 10; Pamir op. cit. (n. 3) 109–113.

26 G. Rickman, Roman Granaries and Storage Buildings (Cambridge 1971) 123–137. 148.

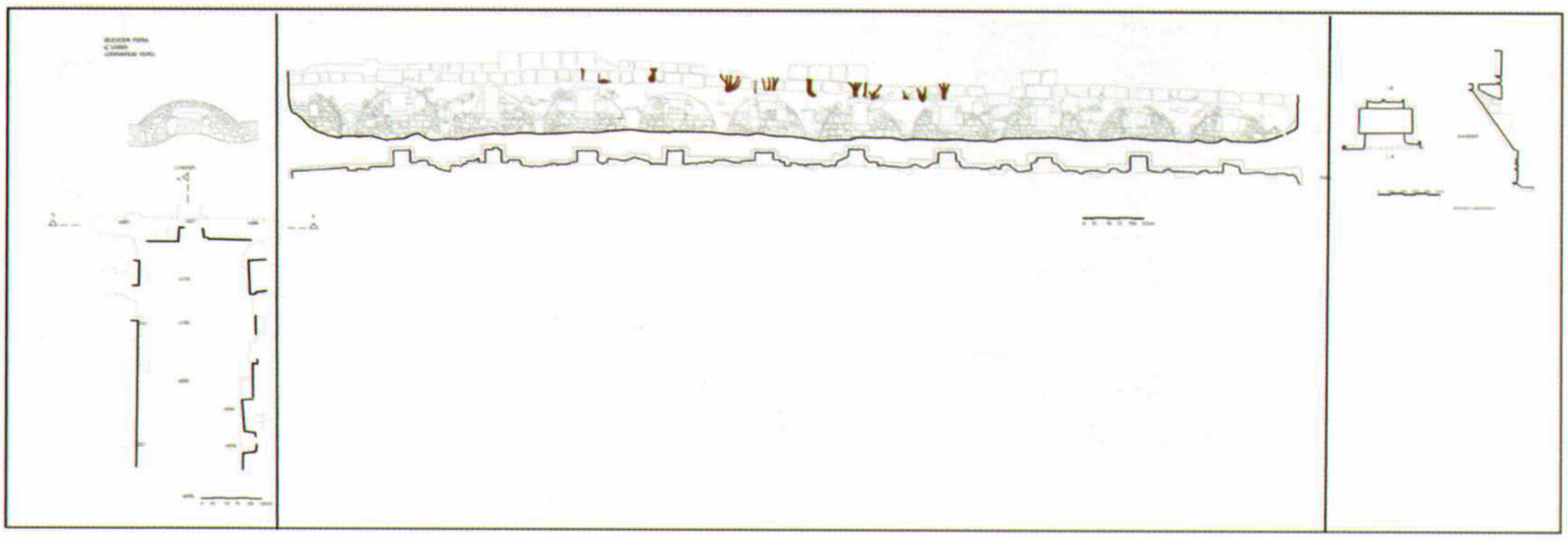

Fig. 18
Section drawing of the *granarium* (ODAP Archive)

Fig. 19
Looking at the rear wall of the *granarium* from inside (ODAP Archive)

Just outside the southern wall of the inner harbour a sedimentary deposit about 6 m high lies south of the harbour entrance. The sedimentary bulk consists of sand, some artifacts such as marble architectural fragments or sherds (**Fig. 23**). The sedimentary bulk must be related to rescue digging by the Roman army to the keep the harbour mouth clear from silting up under Diocletian's rule in A.D. 305, as recorded by Libanius[27]. Five hundred soldiers were employed in deepening the mouth of the harbour at Seleucia[28]. This sedimentary bulk and Libanius' records indicate that the harbour was still in use in the early 4th century and the harbour entrance was not closed.

The inner harbour entrance silted up at the latest after the 4th century, when the connection with the sea was maintained from the south; landfill started to occur and this entrance to the harbour was blocked with a poorly built wall, using gravel, concrete and reused blocks, turning it into a kind of pool (**Fig. 24**). This must have occurred at

27 Lib. or. 20, 18; 11, 158–162; 19, 45–46.

28 Downey op. cit. (n. 3) 330.

Fig. 20 Window openings on the back wall (ODAP Archive)

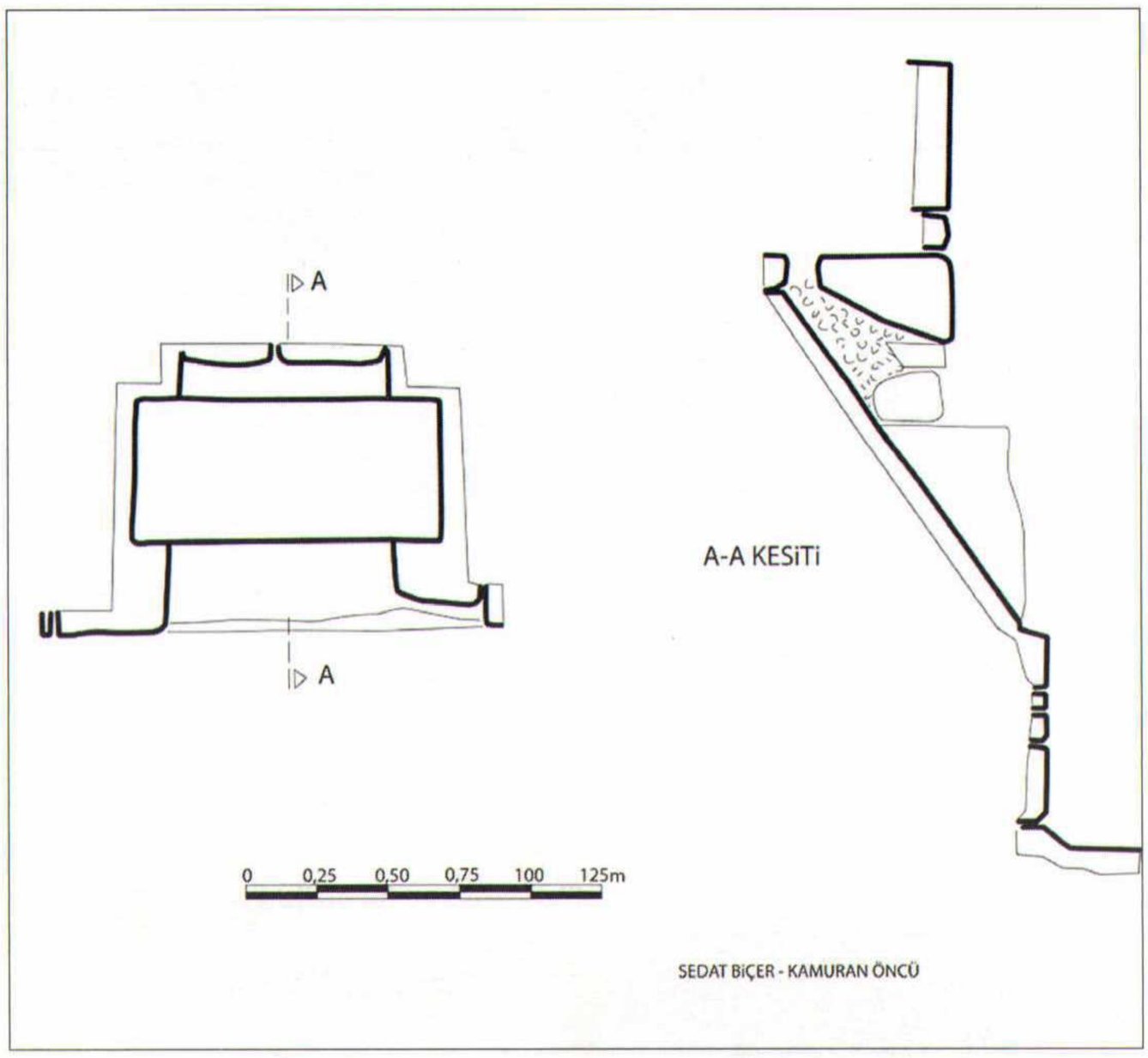

Fig. 21 Section drawing of openings (S. Biçer, K. Öncü)

Fig. 22 Ware house on the east terrace of the harbor (ODAP Archive)

Fig. 24
Wall at the entrance (ODAP Archive)

Fig. 23 Sedimentary bulk (ODAP Archive)

roughly the same time as the construction of the exterior harbour in A.D. 346 by Constantius[29]. The channel on the west of the harbour connecting it to the Vespasianus-Titus Tunnel could be used to protect the inner harbour from sudden flooding and to control the supply of fresh water. When the entrance of the inner harbour was closed, the channel also connected the inner harbour to the exterior harbour.

The exterior harbour, starting from the side of the modern Çevlik-Mağaracık road at the west end of the city, reaches the sea through the beach. With its two piers, it is still well-preserved, but a large portion of it has been turned to land by the sand (**Figs. 3. 25. 26**). A military outpost behind it covers up the harbour connection. The southern pier is better preserved than the northern one.

The southern breakwater/pier, approx. 123 m long, begins at the modern road and continues to the north with a 30° angle to the sea. Approx. 63 m further, a second 30° angle diverts it to the north, protecting and closing the harbour against sea currents from the east. It continues out to sea like at that angle for approx. 60 m, then terminates. The width of the breakwater varies between 12 and 12.50 m. Its construction with masonry

29 Lib. or. 2, 263–264; Downey op. cit. (n. 3) 361.

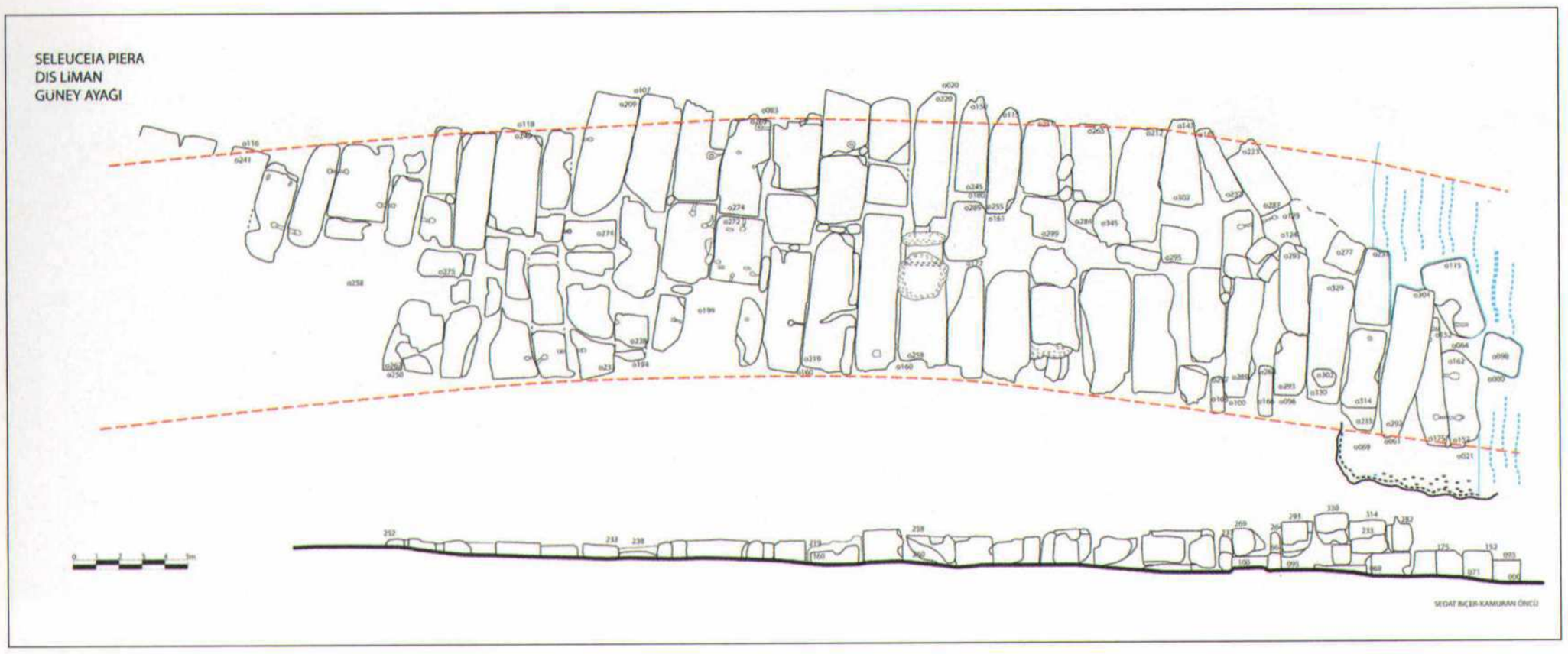

Fig. 25 Drawing of the southern pier of the exterior harbor (S. Biçer, K. Öncü)

Fig. 26 Looking at the southern pier from the north (ODAP Archive)

demonstrates that bigger blocks were placed crossways on the inner and outer surface, while between two blocks, smaller blocks were used (**Fig. 25**). After a few courses, this pattern changes into two smaller blocks on the inner and outer surface, with a larger block placed transversally in between; the blocks were fastened with iron clamps (**Fig. 26**), creating multiple resistance points.

The starting point of the northern breakwater is 177 m away from the south breakwater, just to the side of the modern road. It shallowly reaches on to the sea. The northern breakwater continues 80 m into the sea, with a 15° angle to the south for the first 45 m, then it makes a 30° angle to the south again and after a further 25 m ends in ruins (**Fig. 27**). The masonry technique and materials used are the same as for the southern breakwater but are less well preserved.

Fig. 27 Northern pier of the exterior harbour (ODAP Archive)

Fig. 28 General view of the exterior harbour from the east (ODAP Archive)

Behind the exterior harbour, the two towers within the outpost perimeter must have been used in connection with harbour facilities. The rock-cut tower just behind and in the middle of the piers would have functioned in relation to the harbour (**Fig. 14**). These towers used to protect the exterior harbour as well as the northern entrance of the inner harbour. R. Pococke tells of a large, cellar-like cavity inside the tower carved into the rock, while V. Chapot relates that inside or at the entrance of the rock chamber there is a vault supported on columns, probably used by harbour watchmen as a harbour custom building or perhaps as some sort of lighthouse.

Conclusion

The fact that a natural lagoon facing the sea existed right next to a rocky acropolis must have been one of the biggest advantages Seleucia Pieria enjoyed in terms of selection of a location for the capital city founded by Seleucus I Nicator himself. Polybius[30] tells of an *emporion* on flatlands surrounded by strong walls in Seleucia Pieria and of suburbs of the city. According to Livy, the Seleucid Navy, defeated in a battle near Cyprus, retreated to Seleucia and some ships were taken there for repair[31]. According to the Goroub Papyrus (dated to 246/245 B.C.)[32] the capacity of the harbour was five ships that could be docked end to end. Taking the size of the harbour into consideration, this suggests that not the entire harbour was used as docks.

It is clear that the inner harbour was used for military and commercial purposes and that it housed ship repair facilities. Indeed, the west side of the inner harbour was surrounded by piers and harbour walls which were part of the city walls. The pseudo-isodomic wall surrounding the inner harbour, and the disorderly placed ashlar masonry wall built from large blocks fixed by metal clamps which delineates the border of the inner harbour from the west, are the best sources of information. These two piers/breakwaters are also part of the city walls and they date back to the foundation of the city in 300 B.C.; they continued in use throughout the Roman period[33]. Siltation problems occurring in all harbours constructed in lagoons appeared likewise in the harbour of Seleucia Pieria[34]. The factors that caused the inner harbour to turn to land could include the following:

- Silting[35] brought by Değirmendere/Kapısuyu River which runs from the north of the ancient city to the inner harbour. This river must have caused floods and damaged the harbour from time to time.
- Erosion of the slopes in the east and north of the lagoon and subsequent accumulation of silt in the lagoon[36].
- Carriage and accumulation of materials by Orontes/Asi River from the southwest to the northeast where Seleucia Pieria is located. This is caused by the fact that the direction of winds and waves from the Asi Delta is southwest to northeast[37].

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30 Pol. 5, 59.

31 Liv. 33, 41.

32 M. Holleaux, Etudes d'Epigraphie et d'Histoire Grecques III (Paris 1942) 285, 15–20.

33 Blackman op. cit. (n. 14) 105: The main breakwater in harbour construction technique used since the 6th cent. B.C. was the built breakwater with ashlar blocks. Mortar was used with ashlar blocks during the Roman period.

34 Pamir (n. 3) 27.

35 Erol op. cit. (n. 16) 24–26; F. S. Ozaner, Vespasianus-Titus Tüneli ve Yol Açtığı Çevre Değişiklikleri, AST 10, 1994, 205–226.

36 Ozaner op. cit. (n. 35) 203.

37 Ozaner op. cit. (n. 35) 209. According to statistical surveys conducted in the course of observations of the watercourse over the last 15 years, for the purpose of gaining information regarding the size of debris carried by the Asi River, 445 years of precipitation corresponds to an area which is 10 km long, 0.3 m wide and 5.5 m thick. Dams on Asi River have naturally reduced the amount of sediment the river carries. This amount must have been much greater in antiquity. The amount according to data of the last 15 years played an important role in blocking the harbour.

- Coastal changes in the Asi Delta due to tectonic movements. The first tectonic movement, which took place approx. 2500 years ago, raised the coast 1.7 m, whereas the second movement 1400 years ago raised it 0.7–0.8 m, resulting in an elevation of the shoreline approx. 2.5 m between just before the founding of Seleucia Pieria and the loss of its significance. Moreover, tsunami waves caused by the great earthquake of 526 A.D. are said to have put the harbour out of function[38].

The shoaling of harbours was one of the most significant problems ancient harbour engineering faced. Engineers devised various solutions to this problem. One of them was to place jetties against waves and sand movements[39]. Another was to control the stream coming to the harbour, and to make it flow through the harbour[40]. In harbours with single entrances people tried to clean silt by using pressurized water. This method involves the stopping of the water flow of a stream with dams. The water is accumulated until it is capable of creating a strong wave. Then dam shutters are opened at certain intervals and the sudden force of water cleans the harbour. Seleucia Pieria can be regarded as the best example of this method[41]. The Vespasianus-Titus Tunnel which was quite complex for its time must have been made to carry pressurized water into the harbour by the use of pools and a channel opening to the northwest of the inner harbour. At the same time, a second entrance to the harbour must have been created with the channel here. The deadline for the implementation of this plan is written on the inscription dedicated to the deified Vespasian and Titus at the entrance of the tunnel. However, according to several writings on the tunnel walls, the construction continued in the 2nd century A.D.[42].

The Diocletianic era (284–305 A.D.) document reveals that despite all efforts, shoaling could not be prevented, the harbour was plagued by the same problem and rectification attempts continued. Under the command of Eugenius, a military unit consisting of 500 retired soldiers worked on deepening the entrance to the harbour of Seleucia. The work, however, could not be completed due to the unwillingness and mutiny among the soldiers, prompting the inhabitants of Seleucia to kill them, only to be punished by the emperor[43]. The date of this rebellion is 303 A.D.[44]. Sedimentary bulk mixed artifacts on a small hill just on the side of the Hellenistic wall to the southeast of the inner harbour

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38 P. A. Pirazzoli – J. Laborel – J. F. Saliege – O. Erol – İ. Kayan – A. Person, Holocene Raised Shorelines on the Hatay Coasts (Turkey). Palaeoecological and Tectonic Implications, Marine Geology 96, 1991, 296–310; Erol – Pirozzoli op. cit. (n. 15): It is similar to the situation of the harbour of Ugarit in terms of losing functionality due to tectonic movements and tsunami waves; E. Guidoboni – A. Comastri – G. Traina, Catalogue of Ancient Earthquakes in the Mediterranean Area up to the 10th Century (Rome 1994) 297. 314–346. Ancient sources and data verify that the greatest earthquake detected in Seleucia Pieria happened on 20/29 May 526 at noon.

39 Blackman op. cit. (n. 14) 199. As in Sidon or the harbour of Ephesos, an attempt was made to prevent sand from accumulating in the harbour by closing the entrance with jetties.

40 Blackman op. cit. (n. 14) 199 f. This was also practiced in the harbours of Tyre and Mahdia in the East Mediterranean.

41 Blackman op. cit. (n. 14) 202.

42 Pamir op. cit. (n. 3) 200; Pamir op. cit. (n. 1).

43 Lib. or. 20, 18–19.

44 Downey op. cit. (n. 3) 330.

show that efforts for deepening the harbour entrance took place here[45]. Therefore, we can state that at least the entrance in the west of the harbour was still open in A.D. 303, and the channel in the north was used as a second entrance to clean the harbour of slime with dams, water reservoirs and pressurized water.

In the 4th century A.D., the almost inoperable state of the inner harbour resulted in the construction of a new one. In A.D. 346 when Emperor Constantius visited Seleucia, he saw the new harbour constructed at the seaside and commented that this harbour would be very useful for commercial and military undertakings[46].

For the Roman policy of hegemony in the Eastern Mediterranean, the harbour of Seleucia played an important role in Rome's financial and military activities in the east. Twenty-seven days away from Rome by sea, the harbour of Seleucia Pieria[47] became an important Roman commercial and military base in the Eastern Mediterranean along with Alexandria[48]. In the early 2nd century A.D., the harbour of Seleucia Pieria played an important role in supply operations during the Roman military campaign against the Parthians led by Trajan and continued after his death by Hadrian[49]. It was the most prominent harbour where military resupplies, grain shipments to Italy and passenger transportation took place in the north-western Levant during the Roman period. To protect maritime transportation, a coast guard force/imperial guard fleet called *Classis Syriaca* was created. According to inscriptions on six grave steles and twenty-two marble stelae from the necropolis of Seleucia Pieria, the deceased individuals were mariners of *Classis Syriaca* from Ravenna and Missena[50]. These epitaphs, which date between 129–212 A.D., indicate that the Missena navy was temporarily based in Seleucia[51]. The *granarium* and *horrea* located in the south of the inner harbour clearly show the potential of the harbour[52]. The fact that a lighthouse, shipyard structures, harbour avenue and moorings have not been found yet does not mean that these structures did not exist.

Seleucia Pieria continued as a harbour city of Antioch, which was growing and increasing in prosperity during the Roman period; it connected Antioch to Rome and Mediterranean world. Only after the cessation of trade activities due to the devastation of Antioch

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45 Erol op. cit. (n. 16) 24: In his geomorphological survey Erol states that this hill, called Kiremitli Tepe, is an artificial hill containing alluvia and sea sand, in addition to being the highest point there. Although it faces the danger of disappearance today, it still is a source of information.

46 Lib. or. 2, 263–264; Downey op. cit. (n. 3) 361.

47 Cic. Att. 11, 20, 1. Brundisium. This was delivered by a freedman of C. Trebonius Seleuekia on 15th August 47, from Cicero to Attikus on 14th August; the journey had lasted for 27 days.

48 M. Grant, The Ancient Mediterranean (London 1969) 278–301; J. W. H. G. Liebeschuetz, Antioch: City and Imperial Administration in the Later Roman Empire (Oxford 1972) 75.

49 D. van Berchem, Le port de Séleucie de Piérie et l'infrastructure logistique des guerres parthiques, BJb 185, 1985, 62.

50 L. Jalabert – R. Mouterde, Inscriptions Grecques et Latines de la Syrie III, 2 (Paris 1953) 1153–1182; H. Seyrig, Le Cimetière des Marins à Séleucie de Piérie, in: R. Dussaud, Mélanges syriens offerts à Monsieur René Dussaud (Paris 1939) 451–453; Chapot op. cit. (n. 10) 180 f.

51 Seyrig op. cit. (n. 50) 458.

52 J. H. Rose, The Mediterranean in the Ancient World (Cambridge 1934) 121–150. Grain to be sent to Rome from the Eastern Mediterranean used to be directed from Seleucia Pieria. This explains the fact that the navy was stationed at this harbour.

and Seleucia by the great earthquake of the 6th century A.D. did the harbour of Seleucia lose its importance. The fact that small vessels still docked at the exterier harbour of Seleucia in the mid-19th century, and the existence of surveys by R. Chesney – who visited the region in order to research ways to improve this harbour –, show that the harbour of Seleucia is still usable at that time.