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WAS HISARLIK AN INTERREGIONAL CITY WITH IMPORTANT HARBOR IN THE LATE BRONZE AGE?

Nicolas Assur Corfù

Abstract:

During the last two decades a number of publications emerged concluding that Hisarlik in Western Turkey is the Troy of Homer. In this paper we discuss the scientific evidence available to support or dismiss the notion that Late Bronze Age Hisarlik was a large settlement with a harbor. The basic investigations in this respect have previously been published, but the findings have received little attention and have not been fully integrated into any thorough analysis. In the present study based on those earlier investigations it is revealed that the plains around Hisarlik and the so-called lower city were marshland in the Bronze Age. Malaria will be considered as a new aspect of the question. Our new evaluation of the scientific results suggests that it is unlikely that Late Bronze Age Hisarlik was a large settlement with a harbor.

Keywords: Hisarlik, Troy, natural science, harbor, malaria, marsh.

Introduction

The topic of Troy brings to mind many associations. One of them is the link with the hill Hisarlik (39° 57' 27" N, 26° 14' 18" E) in Western Turkey, approximately 26 km south-southwest of the modern town of Çanakkale. The suggestion of a connection between Homeric Troy and the region of Hisarlik predates H. Schliemann's investigations in 1870-1890¹ and can be traced back to the 18th century AD.² Recently, the Troy-Hisarlik link has received a lot of attention in the literature, but no consensus has been reached regarding its merit.³ An exhaustive review of the literature is beyond the scope of this paper and we refer to Aukenthaler's work for a summary.⁴

1 ULF 2004, 85.

2 MORRITT 2010, especially 4.

3 LATACZ 2001; TROIA, AUSSTELLUNGSKAT.; ASLAN, BIEG 2003; ULF 2004; KORFMANN 2006; LATACZ ET AL. 2008; SCHROTT 2008; KOLB 2010; ULF 2010; ULF, ROLLINGER 2011; CROWE 2011.

4 AUKENTHALER 2011.

Opinions regarding the geographical location of the Homeric Troy greatly diverge. A first group of scholars is convinced that Hisarlik is the Homeric Troy⁵ whereas a second group challenges this assignment.⁶ Additional groups consider Karatepe⁷ in Cilicia or Pergamon⁸ in western Turkey the location of the Troy of Homer. At this point the discussion appears deadlocked and a fresh approach based on new arguments is needed. Very generally, i.e. in terms of method, the discussion of Troy can be grouped into four distinct topics: First, the Iliad, Homer's great literary work and the origin of the discussion; second, the historical content of the Iliad; third, the geographical location of a city named Troy; and fourth, the question whether Hisarlik was a large settlement with a harbor. The existence of such a settlement is necessary if some historic event such as that involving Troy is to be remembered.

The present paper deals exclusively with the fourth and final question and aims to evaluate whether Hisarlik was a large city with a large harbor in the Late Bronze Age and to establish a scientific base for considering or dismissing Hisarlik as a site of historic relevance. Here, a city is a large settlement of an importance extending beyond local.⁹ Addressing the question from a scientific point of view is straight forward since all the necessary investigations have previously been carried out and published.¹⁰ However, those studies gained little attention and no relevant conclusions have been drawn from them. Here we will employ these impartial observations to draw some important conclusions regarding the historic relevance of Hisarlik.

Since the citadel hill of Hisarlik is too small for hosting an important town,¹¹ the so-called lower city south of the acropolis has been proposed as the site of a large settlement. According to Korfmann a defensive wall enclosed 270'000 sqm¹² and according to Blum, 5'000 to 10'000 people were living in this lower city.¹³ Hence, the existence of a lower city has been considered a fact¹⁴ although it has hardly been excavated on a larger scale.¹⁵ Furthermore, no real buildings originating from the Late Bronze Age (Troy VI-VII) could actually be detected in this

5 LATA CZ 2001; TROIA, AUSSTELLUNGSKAT.; ASLAN, BIEG 2003; KORFMANN 2006; LATA CZ ET AL. 2008; PERNICKA ET AL. 2014.

6 ULF 2004; KOLB 2010; ULF 2010.

7 SCHROTT 2008. Challenged by several authors: ULF, ROLLINGER 2011.

8 CROWE 2011.

9 Recently Osborne dealt with the ongoing discussion about a definition of the term 'city' for antiquity (OSBORNE 2005). Important are 'a whole range of economic, social, and political activities' and the accessibility of the settlement (OSBORNE 2005, 13).

10 JABLONKA ET AL. 1994; RIEHL 1994; RIEHL 1999a; RIEHL 1999b; KAYAN ET AL. 2003; ÇAKIRLAR 2009; KAYAN 2014.

11 JABLONKA in: KORFMANN 2006, 167.

12 KORFMANN in: TROIA, AUSSTELLUNGSKAT. 2001, 70, fig. 73.

13 BLUM in: KORFMANN 2006, 157.

14 JABLONKA in: KORFMANN 2006, 167–80; KORFMANN in: Stuttgart 2001, 64–76, 381, Abb. 425; JABLONKA ET AL. 1994, 52, Plan 1.

15 JABLONKA in: KORFMANN 2006, 176, Abb. 8; JABLONKA ET AL. 1994, 52, Plan 1.

location up to date.¹⁶ In addition to the citadel and the lower city, many other settlements have been found in the region of Hisarlik.¹⁷ However, most other sites are rather small compared to the citadel of Hisarlik which remains with 22'100 sqm the largest and therefore most important settlement of the Late Bronze Age found in the region to date.¹⁸ Nevertheless, Karaağaç Tepe, Kumtepe, and Bozköy-Hanay Tepe at distances of 12, 4, 14 km from the citadel, respectively, are respectably sized, about half the dimension of Hisarlik.¹⁹

In the following discussion part of the lower city and the surrounding area of Hisarlik will be analyzed by scientific methods in an attempt to gain new insights.

Troia VI: The so-called defensive trench of the „lower city“

A ditch in the lower city south of the citadel of Hisarlik has been investigated and interpreted to represent a so-called defensive trench.²⁰ Traces of a fire are said to have been found in it.²¹

The flora

First we will consider the flora retrieved from the vegetal remains and the pollen in the area of the ditch. Air-borne pollen from the entire area was ‘archived’ in the sediment. Investigations have produced the following results:²²

The palaeobotanical investigation of the sediment of Layer VI shows that there must have been open spaces, and that the ditch was filled with water, in which reeds grew.²³ Grapevines (2%) and fig-trees (5%) were the only cultivated plants; no traces of cereals and cultivated legumes (pulses) have been found. Evidence of segetalflora (arable weeds) is also absent. A high proportion of riverbank plant species were present. Many salt-avoiding and somewhat fewer salt-tolerating plant species could be identified. Those salt-tolerating species found are known to mostly grow in low-salt or salt-free soil. In terms of quantity of plant matter a higher proportion of salt-tolerating plants has been found and only a small proportion of salt-avoiding plants. Plant species specifically indicative of a salty environment were not present. The majority were water plants capable of surviving dry phases. A good supply of nutrients is evident. Most of the plants

16 BLINDOW ET AL. 2014, 686–9: investigated by geophysical prospection and a few sondages.

17 JABLONKA in: ASLAN, BIEG 2003, 198–202, Tab. 3, Abb. 34.

18 JABLONKA in: ASLAN, BIEG 2003, 198–202, Tab. 4, Abb. 35.

19 JABLONKA in: ASLAN, BIEG 2003, 198–202, Tab. 3 and 4.

20 The complete so-called defensive trench could not yet be verified, especially the two parts that join the citadel wall: BLINDOW ET AL. 2014, 687–8.

21 JABLONKA ET AL. 1994.

22 RIEHL 1994, 69–71.

23 JABLONKA ET AL. 1994, 60.

were species which could survive the winter under the water surface. The anatomical structure of more than half of the living plants was adapted to marshy conditions, but also species which could thrive in moderately moist soil existed.²⁴ In general, there was a good supply of water. The presence of species of nitrogenous plants is indicative of standing water. At times, the water had a brackish (i.e. fresh water mixed with sea water) character.²⁵

Investigations in other areas of the lower city have been announced,²⁶ but to date the analysis of only very few samples containing “almost no archaeobotanical remains” are published.²⁷ Nevertheless, the additional sample analyses available confirm water plants and species characteristic of open vegetation. “The ditch must have been moist for at least part of the year”.²⁸ A second ditch 80–100 m further south²⁹ has been uncovered that contained *Chara oogonia* in abundance. These algae need to be continuously submerged.³⁰

Additional archaeobotanical data is available in the literature for samples collected from buildings of the citadel of the Late Bronze Age.³¹ In a building of area E8 close to the citadel wall as well as in neighboring buildings, high portions of wild plants growing in wet soil have been identified. In addition Characeae, a family of algae, have been detected in these samples.³²

A review of the methods applied in general in all of these studies is given in a more recent paper.³³ And finally, another recent paper describes for Troy VI the presence of a trash layer in the middle of the lower city, in area K13,³⁴ indicating an open and uninhabited area in this location.

We conclude from these results that the area around the so-called defensive trenches was without doubt open and marshy. Periods of sea water intrusion are evident as expected given the proximity of the well-established coastline existing 4500–5000 years ago (see fig. 1).

24 RIEHL 1994, 70.

25 RIEHL 1994, 70–71; ÇAKIRLAR 2009, 69.

26 RIEHL 1994, 71.

27 RIEHL 1999b, 11.

28 RIEHL 1999b, 33.

29 RIEHL 1999b, 11.

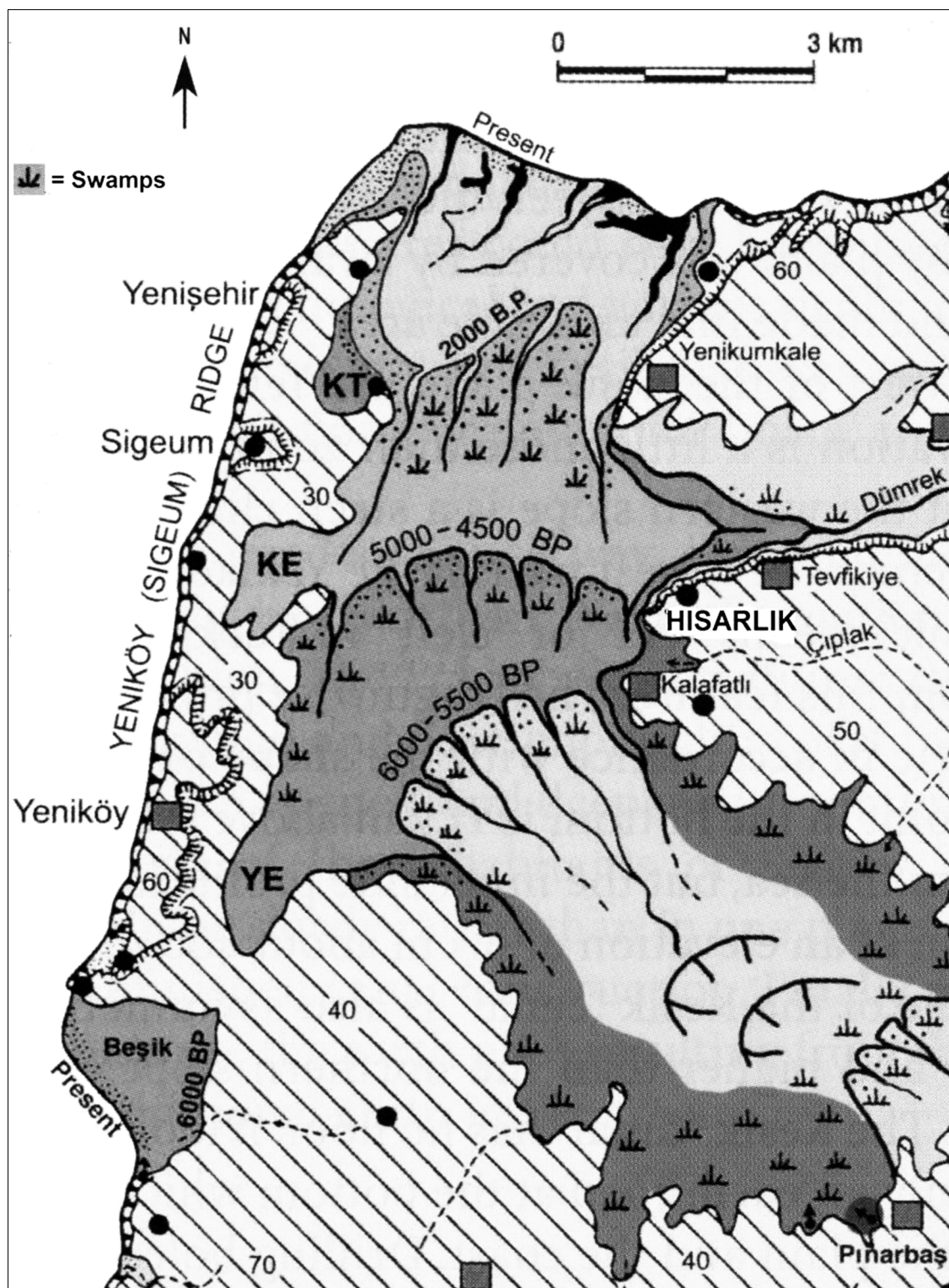
30 RIEHL 1999b, 33.

31 RIEHL 1999a, 373. For the lower city RIEHL 1994 is explicitly mentioned (RIEHL 1999a, 377).

32 RIEHL 1999a, 377–81.

33 RIEHL, MARINOVA 2014. The samples of Late Bronze Age layers were mainly from floors and from spots in connection with burials: RIEHL, MARINOVA 2014, 604.

34 PAVÜK 2014, 419.



Geomorphological development of the Karamenderes plain, “Troian Bay” in grey (except Beşik, based on Kayan 2003, 397, Fig. 7. YE: Yeniköy-plain; KE: Kesik-plain; KT: Kumtepe-plain, dotted area with grass-like symbol = swamps, in grey degree: development of silting up processes through the millenia, BP: before present (bp), hatched areas: plateaus 40–80 m over sea level).

Indications of Fire?

We will now consider the traces of fire in the ditches, which have been interpreted to indicate damage by fire north of the ditch in the Late Bronze Age (level VI). Earlier investigations revealed the following results:³⁵

Blackened bones³⁶ were found in the ditch, as well as small pieces of burnt mud brick and slag. Larger pieces of charcoal were completely lacking. The plant remains, which included a high proportion of aqueous flora, were only minimally charred. This may be indicative of the presence of mud banks.³⁷ The botanical finds were charred, with the exception of a few mineralized remnants. The sediment, however, showed no sign of charring, except for a few charred seeds, and this argues against a fire destruction layer.³⁸ The charring must have taken place at a slow, regular rate. Rough mechanical disturbance can certainly be excluded.³⁹

Taken these results together, we postulate that anaerobic (low or no presence of oxygen) dissolution of plant matter is the main cause of the charring observed in the ditches. This process is known to leave black residues behind and to give the impression of charring through fire. Plant matter sinks in the marsh to produce natural coal. In the case of fire, moreover, only those remains which are exposed to air can be charred, i.e. remains which are not underwater. Black grains are formed under anaerobic conditions. Also the blackened bones are likely the result of the same process of anaerobic decomposition of organic material adhering to them. Coal explored today was generated on a geological time scale out of plants sunken in swampland in an anaerobic process called coalification or diagenesis of coal not yet fully understood. Normally this process is a long-term chemical reaction but it can also take place relatively quickly and is then called syndiagenesis. Marshy conditions of this nature have been detected in the black or dark grey sediments found all over the “Troian Bay” (see fig. 1),⁴⁰ the delta of the river Karamenderes stretching from the hill Hisarlik southwest, west, and northwest all the way to the coastline of today (see fig. 1). These sediments are rich in organic material.⁴¹ Hence, charring by fire is not necessary to observe charred-looking organic matter.

However, the presence of slag indicates very high temperatures as the melting of stone requires over 1000°C. Also the partially calcinated bones suggest high

35 RIEHL 1994, 68–9.

36 Some partly calcinated, i.e. the organic part of bones (Collagen) is thermally decomposed. The process needs around 600°C and the products are white fractions of bones and white powder.

37 JABLONKA ET AL. 1994, 60.

38 RIEHL 1994, 69.

39 RIEHL 1994, 69.

40 KAYAN in: KORFMANN 2006, 325–7.

41 KAYAN ET AL. 2003, 390.

temperatures of about 600°C.⁴² Under such hot conditions, on the other hand, there would have been nothing left of the plant remains other than the mineral content of the plants, which would not have been recognizable as such. Therefore it is reasonable to assume that the stones and bones as well as the mud brick fragments must have fallen into the ditch over the course of time, since rough mechanical disturbance has been ruled out above.⁴³ In summary we find so far:

First, no positive evidence of fire has been found around the ditch in the so-called lower city of Troy VI which was located in an open, marshy area.

Second, the ditch initially thought to have been a defensive structure was actually much more likely an attempt at draining the area below the hill in the south, an effort which was ultimately unsuccessful.

The Trojan Bay at river Karamenderes

We now turn to the Trojan Bay, including both the plain of the delta of the Karamenderes River and its silt deposits southwest, west, and northwest of the hill of Hisarlik and the areas formerly covered by the sea up to the present-day coastline (see Fig. 1). First we will characterize the makeup of the Trojan Bay on the basis of the published scientific evidence available, and then we will consider the possible existence of a harbor in the Late Bronze Age.

The area between Hisarlik and the Sea

Earlier investigations produced the following results:⁴⁴

The nature of the soil was investigated by means of 285 drill samples reaching down to the 6000 and 7000 year old layers in the areas south, north, and west of Hisarlik.⁴⁵

Some 4500 years ago, Hisarlik was situated directly on the coast (Fig. 1)⁴⁶. The Karamenderes formed an extended delta marsh as the sea level dropped by as much as 2 m during the Bronze Age. Throughout the entire period of habitation at Hisarlik the sea level was lower than it is today.⁴⁷ During the phase of silting and the formation of the delta during the past 6000 years the sea in the "Trojan Bay" was very shallow and not navigable.⁴⁸ This conclusion is supported by recent

42 This indicates bones which have had their organic structure (collagen) broken down through heat. This normally creates chalk-like white fragments.

43 RIEHL 1994, 69.

44 KAYAN ET AL. 2003, 379–401.

45 KAYAN ET AL. 2003, 381–2: down to 20.5m in depth.

46 See also RIEHL 1999b, Map 3–5.

47 KAYAN ET AL. 2003, 383, Fig. 2.

48 KAYAN ET AL. 2003, 379; KAYAN in: KORFMANN 2006, 325–7.

studies of the manmade piles of mollusk shells, which had been gathered as food and which are typically collected by hand in shallow coastal and lagoon waters.⁴⁹ The stacks of shell demonstrate an extensive use of this source of nourishment over the entire settlement period at Hisarlik. However, it is also evident that the mollusk consumption slowly declined over time from the Bronze Age to the Byzantine Period, as silting continued and as the coastline shifted to the north.⁵⁰ In line with shallow waters is a study attempting a reconstruction of the terrain of the "Trojan Bay" which indicates marshland north and west of the site Hisarlik in the Late Bronze Age.⁵¹ Still in the 19th century AD extended wetland has been recorded in the delta.⁵²

In conclusion: The delta of the Karamenderes was marshy and the shallow sea extended as far as the present coastline north of Hisarlik. During the past 6000 years the sea withdrew further and further to the north.

Possible locations for a harbor

We will now consider possible sites of harbors, since this is a necessary element of a large settlement and a center of commerce and trade.

Previous investigations have revealed the following results:⁵³ The Yeniköy Plain (Fig. 1, YE) is only separated from the Beşik Plain in the southwest by a ridge approximately 10 m high. A waterway cutting through the ridge and connecting the two plains never existed during the period of interest. The apparent channel in this location is manmade and must be dated later. Both plains (Yeniköy and Beşik) are the result of silting which took place 3500–5000 years ago.⁵⁴ The bay at Beşik was a very shallow coastal strip, a lagoon.⁵⁵ The Kesik Plain (Fig. 1, KE), an extension of the Yeniköy Plain to the north, still had a marine character with a very low water level up until about 3500 years ago, whereupon it also quickly silted up and became a marsh.⁵⁶ A recent study concludes that the "Trojan Bay" was never used as a harbor during the entire Bronze Age.⁵⁷ A big harbor would also have meant long distance trade⁵⁸ and import of foreign goods like pottery. However, recent analytical measurements concerning the resources of pot-

49 ÇAKIRLAR 2009, 59.

50 ÇAKIRLAR 2009, 59; what is evident considering the slow movement of the coastline towards north: fig. 1.

51 RIEHL 1999b, 48; ASLAN, BIEG 2003, 202–5, Abb. 37.

52 ASLAN, BIEG 2003, 205.

53 KAYAN ET AL. 2003, 379–401.

54 KAYAN ET AL. 2003, 395–7; ÇAKIRLAR 2009, 69.

55 ÇAKIRLAR 2009, 69.

56 KAYAN ET AL. 2003, 397–9; KAYAN 2009, 105–6, 124–5; ÇAKIRLAR 2009, 69.

57 KAYAN ET AL. 2003, 390, 400–1.

58 KORFMANN, in: TROIA, AUSSTELLUNGSKAT., 355–68.

tery from Troy VI to Troy VIIb have revealed a predominantly local production⁵⁹ and a continuity in use of resources⁶⁰ for pottery, and hence of continuity in population from the Late Bronze Age to the Early Iron Age with little foreign influence.⁶¹

We summarize this new evidence: Yeniköy and Kesik silted up as a result of delta formation during a period some 4000–5000 years ago and represented a marshy area. Therefore neither of these bays could have been used as a harbor in the Late Bronze Age. The Beşik bay also silted up, starting about 5000 years ago. It is evident that the entire "Trojan Bay" has increasingly filled up with silt over the last 6000 years and that the coastline has shifted to the north. The "Trojan Bay" was actually a lagoon and mostly swamp stretching over several kilometers during this time. The area shows no indication of any places suitable for construction of a larger harbor.⁶² The same holds for the Beşik bay.⁶³ Moreover, a rocky plateau separates the Beşik bay from the Trojan Bay and the hill of Hisarlik. Therefore, if the Beşik bay had ever served as harbor the corresponding harbor town would likely have been built on the plateau right east of the bay (fig. 1) rather than on the distant hill of Hisarlik. Both locations have about the same elevation above sea level (fig. 1).

Towards a new understanding

During roughly the past 6000 years, the entire area between the present-day coastline and the hill Hisarlik was an area of very shallow sea and swamp. There was also marsh in the area where the lower city is thought to have been located. However, there is no evidence supporting the presence of a densely populated lower city during the Late Bronze Age. The incidence of a devastating fire having totally erased the lower city can be ruled out.

Wetland in these latitudes is always linked to the presence of malaria, a factor which has previously not been fully taken into consideration in the discussion of Hisarlik.⁶⁴ However, in one study it has been noted that the marshy "Trojan Bay" was generally avoided for settlements in the Late Bronze Age. Exceptions appear to have been Kumtepe, Beşik-Yassitepe in the Beşik plain, and some smaller settlements in the region.⁶⁵ It should be noted, that species of malaria-carrying mosquitos exist which breed in brackish water.⁶⁶ Malaria was widespread in Central

59 HNILA 2012, 23,30, GRAVE ET AL. 2013, 1761–2; RIGTER 2013, 7, 29, 34, 53–4, 220–2.

60 The same clay-bed were used for centuries: RIGTER 2013, 53.

61 GRAVE ET AL. 2013; ASLAN ET AL. 2014.

62 KAYAN ET AL. 2003, 390, 400–1; KAYAN 2014, 720–5.

63 ÇAKIRLAR 2009, 79; KAYAN 2014, 721.

64 Only S. Riehl mentioned malaria once as a possible problem: RIEHL 1999b, 48.

65 JABLONKA in: ASLAN, BIEG 2003, 198–202, Tab. 3, Abb. 34.

66 <http://www.muecken.org/anopheles-gambiae> [April 2015].

Europe up to the 19th century AD, even during cooler periods such as the 16th and 17th centuries AD.⁶⁷ And malaria-infested areas were always avoided as locations for establishing large settlements. Malaria is clearly an important factor speaking against the foundation of a capital city near wetland in general and against a supra-regional city at Hisarlik in particular. Unfortunately malaria is not provable on the bones of skeletons.⁶⁸ In the citadel of Hisarlik people were probably aware of the risk of malaria as they tried to drain the marsh south of the citadel with two ditches.

Hisarlik could not have been an important harbor, as the sea surrounding the site over a stretch of many kilometers was far too shallow for navigating ships during the Bronze Age. The Beşik Bay can be ruled out as a harbor, since Troy would have been founded on the nearby plateau east of the bay and not at the rather distant site of Hisarlik, which is separated from the Beşik Bay by the plateau and by swampland. In addition, it is evident that the Beşik Bay has turned to marsh in the course of the last 5000 years.

We summarize: Arguments against a large settlement at Hisarlik are: 1. Shallow sea, 2. Marsh, 3. Malaria, and 4. The lack of a harbor. In contrast, Late Bronze Age Troy of Homer should have been a large settlement with a big harbor.

Hisarlik was not a town or even a big city with a harbor in the Late Bronze Age. Instead, it was a place with no direct access to the sea. On the upside, the marshland and unnavigable sea to the west of Hisarlik provided complete protection from attacks from this direction. The impressive walls of Hisarlik demonstrate a great need for safety. However, the protected area of the Late Bronze Age city and its buildings are rather small, certainly in comparison to the size of the walls. Hence, the fortification indicates some local importance such as that of the central settlement of a group of villages in the vicinity but the small size of the protected area argues against a city of supra-regional significance.⁶⁹

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67 <http://wiki.bildungsserver.de/klimawandel/indey.php/Malaria> [April 2015].

68 Private communication of J. Kremo, Basel.

69 For a critical proof-reading of the manuscript I thank R. C. Ackermann, Basel, Berne and Th. Wytttenbach, Santa Barbara CA very much.

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