


NOSTOI  
INDIGENOUS CULTURE, MIGRATION +  
INTEGRATION IN THE AEGEAN ISLANDS + WESTERN  
ANATOLIA DURING THE LATE BRONZE + EARLY IRON  
AGES

NOSTOI: INDIGENOUS CULTURE, MIGRATION + INTEGRATION IN THE AEGEAN ISLANDS +  
WESTERN ANATOLIA DURING THE LATE BRONZE + EARLY IRON AGES

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EDITED BY

Nicholas Chr. Stampolidis – Çiğdem Maner – Konstantinos Kopanias





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**The Aegean-Type Sword Found at Hattuša and  
the Written Sources about the Exchange of  
Technology at the Late Bronze Age**

PART 5  
CHAPTER 35

KONSTANTINOS GIANNAKOS

**Abstract**

Technology and its “products” unearthed from archaeologists, are irrefutable witnesses of the technological level of each era and place. Evaluation of archaeological finds and advanced technology of each era, when compared to the ancient literature, could infer conclusions regarding the nature of international relations. Metallurgy, construction technology, production and exchange of precious and rare metals, silver and iron, constituted “cutting-edge technology” for the LBA. The world of the eastern Mediterranean and the Aegean Sea during the LBA was not formed by “isolated” states, but continuous movement and exchanges of various kinds were taking place. Thus, the investigation of the contacts, wars, alliances or trade relations, as recorded in literature, archaeological finds, for documented by witnessing the cross-traffic/infusion of technological know-how, helps us in deriving rational conclusions about the real facts of each era. The present study performs a synthesis of the archaeological evidence and the textual documentation in regard with the technological level in constructions and metal production in order to infer conclusions for possible relations and exchanges between Minoan Crete and/or Mycenaean Greeks-*Δαναοί/Ἀχαιοί*, as Homer calls them, and Cyprus, Egypt, and the Land of Hatti.

## Introduction

The findings of weapons and panoplies in the graves of Mycenaean in Crete led the archaeologists to call them “warriors’ graves.” The people of these graves may represent a local community which extended its authority by adopting new methods of battle. As always in history, the “products” of cutting-edge technology offered predominance and superiority of weaponry to their “owners” in battles. Minoans and Mycenaean produced and used tremendous weapons both in war and in hunting. They did not trade their weaponry, they seldom made presents of their swords, and those found far away could not be explained by trading.<sup>1</sup>

### 15th-14th century: Mycenaean and Hatti, Egyptian Archives

A bronze sword was unearthed at Hattuša, bearing an Akkadian inscription:<sup>2</sup> “As Duthaliya the Great King shattered the Assuwa-Country he dedicated these swords to the Storm God, his Lord.” Probably it was dedicated to Hattuša, by Tudhaliya II, after his victory<sup>3</sup> over Assuwa Confederation, where *the Lands of [L]ugga*,<sup>4</sup> *Karakisa*, *Wilusiya*, and *Taruisa* were included. The sword is probably of Mycenaean origin, type B,<sup>5</sup> dating to the LHII period.

Two more swords of Mycenaean-type were found at Izmir (classified as Mycenaean type B, “one good example”),<sup>6</sup> and at Kastamonu/Kaštama, probably manufactured in Anatolia.<sup>7</sup> Bronze alloys of both swords have not been analyzed and the percentage of tin is unknown.<sup>8</sup> Taruisa/Tarwiza and Tudhaliya II are also mentioned in an inscription on a silver bowl of LBA.<sup>9</sup> At Hattuša, a ceramic bowl of Hittite manufacture was found, dated to the late-15th/early-14th century, with a drawing, depicting a warrior bearing a boar’s tusk helmet with horn, crest, and flowing ribbons, “all to some extent reminiscent of Aegean representations,” since “Hittite helmets are different, what we have here may

1 Sandars 1963, 127-8.

2 Ünal et al. 1991, 46-52.

3 Garstang and Gurney 1959, 121, 13-23; Bryce 2005, 125.

4 *Lugga=Lukka*: Bryce 2005, 125, 425 n.15; Garstang and Gurney 1959, 106; Huxley 1960, 33: “[*Ard*]ugga”; Freu and Mazoyer 2007, 80: “*Lukka*” not “*Arduqqa*.”

5 Hansen 1994, 213. *contra* Cline 1996, 138-40.

6 Sandars 1961, 17-29 pl.19:7.

7 Ünal 1999, 207-26.

8 Papadimitriou 2008, 282-6: for 1600-1150 BC, in Greece, the alloys contained tin 8-11%, for cold hammering, and 12-15% for hot forging.

9 Hawkins 1997, 8.

be the Hittite picture of a Mycenaean warrior.”<sup>10</sup> Moreover at Masat Höyük,<sup>11</sup> several Mycenaean findings have been unearthed. Wiener<sup>12</sup> mentions that fragments of wall paintings of Mycenaean technique have also been discovered in Büyükkale at Hattuša.

The *Indictment of Madduwata*,<sup>13</sup> dated to the late-15th century BC, describes events that occurred under Tudhaliya’s II reign, who supported militarily Madduwatta, a vassal ruler of Hittites, against Attarissiya, *the ruler of Ahhiya*.<sup>14</sup> Attarissiya had 100 chariots with him. But when Attarissiya performed raids *against Alašiya/Cyprus*, Madduwatta joined him.<sup>15</sup> The verb used in connection with raids is the iterative form of “to attack,” which is best rendered as “make raids” and “the text does not speak of conquest, and raids cannot be expected to leave tangible traces.” Three points should be emphasized: the battle between Attarissiya and Hittites took place possibly at southwestern Anatolia, Attarissiya made raids to Cyprus and the description of one officer’s death of each side “somehow recalls Homeric battles.”<sup>16</sup>

The recorded relations of Egypt with Aegean appear from the 20th century BC until Tutankhamun that is ca. 2000-1330 BC. Minoan finds imply that Cretan artists/artisans were working at Avaris/Tell-el-Dab<sup>a</sup>. Impressive coloured wall paintings with acrobats in palm-groves, bull-leapers framed by half-rosettes, maze patterns and griffins appear during Ahmose’s reign, as in the Cretan Minoan Palaces, implying that one of his wives was of Cretan origin.<sup>17</sup> “The use of crushed Murex shells found within the plaster paste of Thera and Tell el-Dab<sup>a</sup>, the techniques of plaster preparation and of painting, the technique of impressed grid lines for the creation of repetitive patterns are not Egyptian,

10 Güterbock 1997a, 206, 210; Niemeier 1998, 42.

11 Özgüç T. 1978, 65.

12 Wiener 2007, 14 n. 92.

13 Beckman 1999, 153-60; Güterbock, 1997b, 199-200; Bryce 2005, 380-2.

14 In a Linear B Knossos tablet C914, it was read “Ahavija”: “a-ka-wi-ja-de”=“Αχαιφ(α δε”. Knossos destruction is dated around 1375 BC, roughly contemporaneous to Arnwanda I, adopted son and successor of Tudhaliya II: a word *Ahhiya(wa)* was found in Hittitic tablets and another –contemporaneous– *Ahawija* in Linear B. In modern Greek, “Kato Ahayia” is maintained.

15 Beckman 1999, 160.

16 Güterbock 1997b, 200.

17 Bietak (et al. 2007, 86) proposed “a political marriage as an explanation of Minoan royal emblems at Avaris,” like “the huge emblematic griffin, similar to the Knossos’s Throne Room’s griffin”; Redford 2006, 192; Cline 1998/2004, 239; Strange 1980, 51; Shaw, 2003, 208.

but definitely Minoan.”<sup>18</sup> Ahmose’s axe and Aahotep’s dagger were decorated with Aegean symbolic information, through the Minoan griffin.<sup>19</sup>

Gifts from T/Danaja—on the 42nd year of Thutmose III—are listed: “...chief] of Tanaya: Silver: a jug of Keftiu workmanship along with vessels of iron,”<sup>20</sup> indicating possibly advanced iron-technology in Mycenaean Crete (?) (consequently T/Danaja) at that era. Iron, as an extremely precious metal, had already been used in Crete since the first half of 17th c. BC, as the findings at Anemospilia—near Archanes—confirm: an iron-plated ring at Archanes is dated to 17th century BC. Furthermore, iron has also been encountered in later royal burials in Minoan Crete.<sup>21</sup> *Iron in this early stage was an extremely rare commodity, being difficult to work*<sup>22</sup> and consequently its use constituted cutting-edge technology. There are also references for iron-gifts to the Pharaoh in Amarna tablets.<sup>23</sup> After the rebuttal of the old theory about the Hittite monopoly<sup>24</sup> of iron during the 2nd millennium BC, it could be inferred that iron was initially introduced and spread as a strange and luxurious metal, and afterwards, as a possible consequence of the real shortage of tin and even copper. In Tutankhamun’s tomb, several iron objects were found.<sup>25</sup>

The famous list of Amenhotep III at Kom-el-Hetan mentions Keftiu, T/Danaja and the very well known Aegean places: Amnisos, Knossos, Kydonia, Mycenae, Thebes, Ilion,<sup>26</sup> etc. Amenhotep’s close relations with Achaean rulers are evident

18 Bietak et al. 2007, 68.

19 Bietak 1995, 28 n. 53. Warren (1995, 13) mentions that Aahotep’s dagger and Ahmose’s axe: “...are decorated with Aegean symbolic information while the axe motifs combine Egyptian conquest of the Hyksos through the medium of an Aegeanizing motif, the Minoan form of griffin.” Mumford (2001, 362) refers to “an Aegean-derived niello dagger from Queen Ahhotep’s tomb.”

20 Redford (2003, 96 n. 226) transliterates “iron” and in n.226 refers to the rarity of such a manufacture. Breasted (1906, 217) transliterates iron and in n. c writes “By ɔ”. Strange (1980, 96) transliterates “iron.” In n.b, for “bi3” he quotes Harris and Graefe, who doubt if “bi3” in this case could be iron, although it evidently must be some metal. Cline (2009, 110, 114) and Panagiotopoulos (2009, 394) transliterate “iron (or copper ?)”. Kelder (2010, 36 n. 105), referring also to written communication with M. Raven, comments: “it appears that the reading ‘iron’ for ‘bia’ is now widely preferred.”

21 Sakellarakis and Sakellarakis 2002, 136-56; Varoufakis 2005, 47-60.

22 Kelder 2010, 36,105; Lucas 1948, 274; Ogden 2000, 167.

23 Lucas 1948, 268-75; Moran 1992, EA22, EA25; Ogden 2000, 166-8.

24 Sandars 2001, 219-21. Muhly (2006, 24-5) agrees that there was no Hittite monopoly.

25 Coleman and Manassa 2007, 77, 240 n. 148, refer that the iron dagger found in the tomb was not made from meteoric iron; Lucas 1948, 272; Muhly 2006, 22-5; Ogden 2000, 168.

26 Karetsoy et al. 2000, 246. Also Strange (1980, 22 n. 9) with citations to older publications and Cline (2004, 238) too; Cline (2009, 115): “Ilios?”; Macqueen (2001, 162-3 n. 30) believe that this transliteration is by no means certain and that presumably, for the

from remnants of his Palace at Malkata and his faience plaques at Mycenae.<sup>27</sup> Akhenaten performed two wars against Hittites in Syria before his sixth and at his fifteenth regnal years, as a talatat revealed, permitting Schulman to write: “a fact that allows speculations for a possible ‘alliance’ with Mycenaeans,”<sup>28</sup> probably Mycenaean mercenaries.

Heavily armed northern mercenaries appear in Egyptian documents and the incursions of pirates, *Denen, Lukka, and Sherden*, had become so serious *by the reign of Amenhotep III*, that the Egyptians constructed coastal forts and patrolled the mouths of Nile.<sup>29</sup> This event during Amenhotep’s III era reminds us in a way of Homer since *Odysseus, leading his army, and Menelaus, leading his army too, had visited and/or raided Egypt, separately, and not jointly in group, as the later Sea Peoples.*<sup>30</sup>

#### Material Evidence from Cyprus and Ancient Greek Literature

The evidence from Hittite archives describes “repeated” raids of Attarissiya (the ruler of Aḥḥiya) against Cyprus *from Lycia*. Leaving aside the opinion that “the text does not speak of conquest, and raids cannot be expected to leave tangible traces,” we could examine the evidence from Cyprus which –in fact– suffered a number of destructions around 1400 BC,<sup>31</sup> in the era of Attarissiya: *Enkomi* was destroyed in ca. 1425 BC, and it was rebuilt and destroyed again in 1375 BC *Kourion* was destroyed by fire and Phlamoudi, Nitovikla, and Nikolidhes were abandoned in a roughly contemporaneous era. Whatever the cause of the Cypriote destructions, they occurred at a period which immediately preceded a notable influx of Mycenaean influence, possibly even temporary control of the island, roughly around the date of Knossos’ destruction on ca. 1375.<sup>32</sup> Furthermore, either Alassa-Paleotaverna or Kalavassos-Ayios Dhimitrios, both situated on mountainous areas, must have become the political and

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Egyptians, wrj was part of either kftiw or tny. Kozloff 2012, 211: “possibly Troy.” Latacz (2004, 131) suggests Waleja-Elis. Kelder (2010, 38 n. 111) refers to Goedicke’s transliteration “Aulis.” Cline and Stannish (2011, 9) consider that the transliteration Ilios should probably be disregarded and it is either Eleia in Crete or Aulis.

27 Karetsou et al. 2000, 249; Philips 2007, 479-90: detailed description of the plaques..

28 Schulman 1988, 54-7; and some others: Coleman and Manassa 2007, 198-9.

29 Redford 1992, 242; 2006, 196; Shaw 2003, 322; Coleman and Manassa 2007, 203; Cline 2004, 239-41.

30 Hom. Od. 4, 120-37, 225-30, 350-5; Giannakos 2012, 68.

31 Doxey 1987, 306.

32 This is supported by Popham (1970, 85) and the latest generation of archaeologists (e.g. Hatzaki), working at Knossos seems to agree on an early LMIIIA2 date, see Driessen and Langohr 2007, 179; for opposing opinions, see Giannakos 2012, 161 n. 716.

administrative centre of Alashiya/Cyprus during the 14th–13th centuries BC, replacing Enkomi, on the coastland.<sup>33</sup> The above archaeological data could be compatible with raids around 1400 BC and withdrawal on the mountainous areas of the island. Approximately fifty years later, the king of Cyprus wrote to Pharaoh Akhenaton:<sup>34</sup> “Men of Lukki, year by year, seize villages in my own country,” implying that the raids were going on. All the aforementioned remind us of the case of Atreides in Homer and in ancient literature: Kinyres, the King of Pafos at Cyprus, gave –as a hospitality gift– to Agamemnon a thorax.<sup>35</sup> Atreides considered as guest-gifts/ξένια even the commodities acquired “by violence and looting” from Cyprus and its sheashores.<sup>36</sup> Menelaus was wandering in many places for eight years, among them Cyprus, and Egypt where he gathered riches,<sup>37</sup> apparently not peacefully. Consequently, Greek literature also echoes raids to Cyprus by Atreides.

We conclude that “Attarissiya” is the transcription of the name “Atreides– Ἀτρείδης” in Hittite,<sup>38</sup> which further implies a working hypothesis: the redating of the Trojan War at the era of Attarissiya, approximately at 1400 BC. A supporting argument could also be the ascertainment that the story of Troy was first sung in hexameters, some time between 1450 to 1050 BC.<sup>39</sup>

### Evidence for Silver’s Technology:

#### Is Technology of Silver giving a Clue about Hittites?

We know that *in Hatti* nine silver mines existed inside the Halys river bent.<sup>40</sup> Up to 18,000 tablets are dealing with the multidimensional silver and tin trade in Anatolia, between Neša/Kaneš and Assur, during the period of the Old Assyrian Colonies in Anatolia. Mining of silver ores at the Black Sea region is also mentioned.<sup>41</sup> Hattuša and Hatti are sometimes written simply with the Sumerogram for silver.<sup>42</sup> Pharaoh Ramesses II connects Hatti with silver.<sup>43</sup> The king of Arzawa? requests “silver”

33 Knapp 2008, 152, 302-7: about Alashiya and Cyprus.

34 EA 38: Moran 1992, 111.

35 Hom. Il. 11, 18-23.

36 Strabo, *Geographica* 1, 2, 32, 32-40.

37 Hom. Od. 4, 81-91.

38 It had already been proposed by Barnett and by Brandestein (cf. Page 1988, 30-1).

39 Latacz 2004, 267-274; Ruijgh 2011, 283, 287, 257-8; Nagy 2011, 211-7, 141-6, 273-310.

40 Yakar 1976, 116, 121; *contra* De Jesus 1978, 100-1.

41 Yener 1986, 469-70; 2000, 46, 54.

42 Watkins 1986, 13, 53; Bryce 2006, 139.

43 Breasted 1906, 135, 138, n.g: “This may point to the more plentiful use of silver in Asia Minor where it was produced.”

from Hattusili III?<sup>44</sup> Šuppiliuma I sends Pharaoh only silver objects,<sup>45</sup> as greeting gifts. The first “equation” that appears is apparently that Hatti was connected semantically with Silver - Ἄργυρος.

Hittites called themselves *people of the Land of Hatti*,<sup>46</sup> identified by the region, where they lived. The Hittitic texts were written in Akkadian and in Nešitic,<sup>47</sup> the language of Neša/Kanesh, the official language, spoken by the ruling class. There are also remnants of the *language of Hatti-Hattian*, in few surviving texts, of religious/cultic character.<sup>48</sup> The main three languages in Hittite kingdom were: Nešitic, Luwian, Palaic. Five more languages (thus nine in total) were identified in the archives. Palaic was spoken to the North, Luwian to the West and Southwest and Nešitic with Hattian in central and eastern Anatolia, by groups of people with the corresponding names. *Hatti was a multilingual and multiracial Land*.<sup>49</sup> Across the west and southwest seashore of Anatolia the Language of Minoans and Mycenaeans should have also been spoken, as the material evidence points out.<sup>50</sup>

Homer uses different names for the Mycenaean Greeks: “Achaioi,” “Danaoi,” “Argives” etc., though they were speaking a common Greek language, in different local dialects. We should investigate Homeric epics, to determine possible names of “Hittites.” The Homeric Catalogue of Ships is perhaps the most ancient part of Iliad, dated possibly at the Trojan War’s era. Homer describes the Trojan allies and in three cases uses the term “τηλόθεν/ from-very-far.”<sup>51</sup> We note: a very distant Land/“τηλόθεν” from Troy, “Ἀλύβη-(H)Alybe” of Halyzones “the birthplace of silver” is

44 Hoffner 2009, 352-4.

45 Beckmann 1999, 279.

46 Bryce 2005, 18-9, 396 n.45: The term “Hittite” occurs in Bible (*hittî, hittîm*) for a small population group in North Syria and it was adopted by scholars due to its phonetic resemblance to the “Land of Hatti” in texts of the LBA.

47 Melchert 2003, 15: “The name Hittite for this Language is by now too well established to be changed in favor of the more correct Nešite;” Hawkins 2003, 129; Watkins 2008, 6; Bryce 2005, 17, 387: “from the large number of texts written in this language it is clear that it became the official language of the kingdom,” reflecting “not a fossilized chancellery language but a living, spoken language.”

48 Bryce 2005, 12; Melchert 2003, 16.

49 Bryce 2005, 389, 11, 16-20, 52-5, 387-8; Watkins 1986, 45; Melchert 2003, 9 map 40.

50 For Minoan/Mycenaean Greek dialect: Niemeier (1998, 31) mentions the finds of Korfmann at Troy VI, with numerous objects of Mycenaean origin; Mee 1998, 138-41, for Mycenaean objects at Iasos, Miletus, Ephesus, Kolophon, Klazomenai, etc.; Vermeule 1986, 85 n. 297, 206, 279; Watkins 1986, 5, at late Troy VI; Wiener 2007, 14, for LHIII A2-IIIB finds.

51 Hom. Il., 2, 848-57, 862-3, 886-7.

present, Phrygians<sup>52</sup> are present, two of the three main Hittite kingdom's linguistic groups, Paphlagonians and Lycians are present plus one lesser group, the Carians. Ancient authors had already mentioned "the inside Halys river bent Halyzones,"<sup>53</sup> connecting them with Halybes.<sup>54</sup> What about the third main language the Nešitic? There is no trace. But we note a second "equation": Halybe and Halyzones are connected semantically with the birthplace of Silver. It is therefore logical to equate the two first terms of the two "equations" to silver: Halybe equals Hatti.

In such a case, the Hittitic main territory inside Halys river bent and all the linguistic/racial groups of the vassal kingdoms to the Hittite Great King are described by Homer as allies of Troy.

At this point we should note that all the above are not compatible with the evidence from Greece: The presence of silver in eastern EMI Crete is surprising.<sup>55</sup> There was intensive exploitation, working and production of silver from Laurion's mines from Late Neolithic to LBA.<sup>56</sup> A cupellation workshop, from the late 4th millennium BC (ProtoHelladic I - PHI) was excavated and hundreds of litharge fragments were recovered at Lambrika, Koropi in Attiki, with evidence of the process of silver separation from argentiferous lead.<sup>57</sup> Specified quantities of metal may have been used as a medium of exchange in the pre-coinage societies.<sup>58</sup>

Structural "Engineering:" Ancient Sources, Technology and Know-How  
The Walls of Troy were built by two gods, Apollo and Poseidon, and one mortal, the king of Aegina Aiakos who had close relations to Cretans, the colonists of Troy, according to the tradition. The Walls of Tiryns were constructed by *the Cyclopes* for *Akrisios*. Cyclopes, the smith-deities, were part of the pre-Olympian trinity "Titans, Cyclopes, Hekatonheires," in prehistoric Greece,<sup>59</sup> and they were also the bearers of technology in the ancient Hellenic mythology. However we believe that,

52 Bryce 2005, 354-5: "Phrygians appeared after the fall of Hittite kingdom, or slightly later than Trojan War, possibly connected to Mushki of the Hittitic texts."

53 "Αλυς-(X)άλυς, or possibly (X)άλυ(φ)ς. Strabo, *Geographica*, 12, 3, 24, 1-24; 12, 3, 19, 1-16; 12, 3, 20, 1-10; Hesychius 2998-9.

54 Huxley 1960, 34-5; Page 1988, 163; both proposed that Ἀλύβη and Ἀλιζώνες could refer to Hittites. Χάλυβες="Steel-people."

55 Muhly 2008, 73.

56 Tzahili 2008, 10-1; Muhly 1997, 28; Stos-Gale et al. 1995, 130; Stos-Gale and Gale 1982, 472, 484-5.

57 Kakavogianni et al. 2006, 78-9.

58 Michailidou 2005, 20; Michailidou 2008, 212-6.

59 "Intellect, Technology and Natural Forces", the "equilateral triangle" of the "manifested deity"; Tassios 2005, 8; 2008, 3, 31; 2001, 529-32.

in this myth, Cyclopes “gastroheirs-belly-hands” represent labor-force “invited” to build the walls, following Strabo: “Cyclopes who came by invitation from Lycia and gained their living from their handicraft.”<sup>60</sup> Minyan, Minoan, and Mycenaean Greeks had advanced cutting-edge technology and “engineering” know-how, from the beginning of the early MH (it begins ca. 2200/2100 BC) or even earlier. Almost every settlement, since neolithic times, used 2-meter thick fortification walls from the mid-third millenium already, in Lerna (ca. 2500 BC), Syros (ca. 2200 BC), Aegina (ca. 2100 BC).<sup>61</sup> The bearing capacity of a stone wall increases with the width. This is a technical know-how gained from experience, or trial-and-error method.

The ashlar wall technology was very popular in all houses at Akrotiri and Crete during LMIA.<sup>62</sup> It was very normal to develop—one thousand years later—3m thick walls at Tiryns and 5m or 7m in Mycenae even later.<sup>63</sup> This procedure of gradual development of a wall’s bearing capacity, by increasing its thickness, is very simple know-how for “engineers”: they had to move apart a little the external masonry sides and increase the “filling” inside in order to undertake higher loads. However, a really intuitive engineer’s spirit is needed, in order to design and construct a structure to bridge great openings such as the three-dimensional corbelled vault used for tholos tombs. In this case a really original know-how and very high technological level of knowledge and skill is demanded. *Mycenaean “Engineers” utilized very succesfully the coursed ashlar in the construction of large bee-hive tholos tombs with the corbelling technique*<sup>64</sup> and adobe structures presenting strength in today’s terms of 3-5N/mm<sup>2</sup>, much higher than the strength of modern bricks of low quality (~3N/mm<sup>2</sup>).<sup>65</sup> The corbelled vault tholos at Fourni Crete belong to EMII (~2900-2300 BC),<sup>66</sup> the know-how expanded at Messinia *where the first tholos tombs belong at late-MH*.<sup>67</sup> Smaller tholoi in Georgiko and Koryfasio are refered.<sup>68</sup> At Kakovatos, the tholos tombs are dated to MH or early-LHI. Some of the tholos tombs at Mycenae have been constructed even before 1520 BC, for the Kings and their close families.<sup>69</sup>

60 Gastroheirs-Γαστερόχειρες. Strabo, Geographica 8, 6, 11, 1-4; (Pseudo)Apollodorus, *Bibliotheca* 1, 2, 24, 7-1, 2, 25, 6.

61 Palyvou 2005, 94.

62 Palyvou 1999, 611.

63 Tassios 2008, 30; Palyvou 2005, 94.

64 Palyvou 2008, 117.

65 Palyvou et al. 2001, for Akrotiri.

66 Dated by Sakellarakis: Dickinson 2003, 49.

67 Treuil et al. 1996, 357.

68 Tassios 2008, 29.

69 Mylonas, 1983, 168: the tholoi “Daimons’s,” “Atreus’s Treasure,” and “Klytemnestra’s.”

The structural analysis of the “Atreus Treasure,” with the Finite Element Method, estimates maximum tensile and compression stresses of approximately  $0,74\text{N/mm}^2$  and  $0,17\text{N/mm}^2$ , implying linearly elastic behavior with no damage expected.<sup>70</sup> Similar results were derived from the structural analysis of the tholos tomb of Thorikos Attiki, which are “emphasizing some of the intuitive choices made by the Mycenaean architects in those remarkable monuments.”<sup>71</sup>

For the dating of “Atreus Treasure,” finds of LHIIIA1-LHIIIA2 are mentioned at the grave’s “dromos,” sherds of bothros deposit of the grave of LHIIIA1, which testify that it was reused.<sup>72</sup> This provides a *terminus ante quem*.

Mycenaean and Minyan had also constructed Flood Control and Land-reclamation works, at many sites in mainland Greece,<sup>73</sup> with most characteristic the “drainage” of Kopais lake, where Spyropoulos unearthed sherds of MH period, from the Mycenaean dams still existing today.<sup>74</sup> Furthermore, Mycenaean flood protection works, with deviation of Alfeios river, existed at ancient Olympia.<sup>75</sup> For sewage and sanitary installations, systems of water traps and odor traps in palaces and town houses were unearthed such as in Akrotiri, similar to the ones used in modern houses.<sup>76</sup> This technique was “re-used,” at the end of the 19th century CE. It is proposed in this paper, that the legend for the construction of the walls of Troy by Aiaikos and two gods of the Greek twelve-gods, seems to be derived from a “memory” or tradition suggesting that the contemporaneous neighbors of Mycenaean Greeks could justify their high-level know-how and advanced technological level and also indicating a “restricted cycle” of individuals possessing it, as implied by the support and participation of the Gods in construction.

In tablet Kbo 3.57, Hittite King Hantili boasts that he fortified the cities and Hattuša. Some researchers support that it was Hanitli I, 1590-1560 BC, and speak about a *flow of technology from east to west*<sup>77</sup> since the *postern gates in the “Poternenmauer” in Boğazköy, date to the 16th. century BC and the corbelled vaults occur only in the Argolid in LHIIIB!* Apparently there is a misunderstanding, since besides the aforementioned datings:

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70 Askouni et al. 2008.

71 Cremasco and Laffineur 1999, 139. The tomb is dated between MH-LH: Treuil et al. 1996, 354-7. This implies an average date 1550 BC.

72 Cavanagh and Mee 1999, 94.

73 Tassios 2006a; 2006b; 2008; Knauss 2002; Palyvou 2008.

74 Iakovides 1997, 39; Tassios 2008, 12: “This advanced technology and the first phase of the works were developed since the middle of the 2nd millennium BC.”

75 Tassios 2008, 12-7; Knauss 2002.

76 Palyvou 1997, 387-9.

77 Maner 2012, 60, 64; Seeher 2006, 14-5, 37, 39.

1. The Hittite king of the tablet is Hantili II, ca. 1450 BC, since at that era Kaska people attacked and sacked Hattuša and Nerik, the latter remaining under their sovereignty till Hattušili III, two centuries later;<sup>78</sup>

2. The first bee-hive tholoi, dated to the mid/late-third millennium BC, appeared before the formation of the kingdom of Hatti (begins ca. 1650 BC);

3. In *Civil Engineering* the three-dimensional bee-hive tholos *bearing huge earth weight*, with perfect fitting of the stone-blocks (a sheet of paper does not intrude in the stone-blocks' joints) is much more complicated to be designed, constructed and remain for millennia, than the two-dimensional arc of the postern gates or the "tunnels" inside the walls, *bearing only their own "dead-load,"* with the rough, bunglesome fitting of the stone-blocks;

4. In Kiapha-Thiti, Attiki, the fortifications, dated LH I-II (begins ca. 1620/1580 BC)<sup>79</sup> "contain features like 'sally ports' and a ramp;"<sup>80</sup>

5. The two-dimensional arcs, inside the body of the walls of Tiryns with the creation of empty space inside the mass of the walls, appear for the first time as "engineer's conception," in Phylakopi of Melos, at the Late Neolithic or EBA;<sup>81</sup> and

6. Phylakopi, Ayia Irini in Kea and Crete had LBI fortifications or structures, which could be considered as relevant to the development of Mycenaean fortifications.<sup>82</sup>

### Concluding Remarks

The cutting-edge technology and know-how is of decisive importance since, in all eras, both are possessed by the "Great Powers" each-time and they are combined with excessive wealth and military superiority. Excessive wealth and internal peace are needed for the financing of an overseas naval expedition even of smaller magnitude, including all the available forces of Greece, mainland, islands and Crete.<sup>83</sup> Mycenaeans possessed high-level cutting-edge technology and know-how, for: metal and weapons production and the design and construction of very complicated and intuitive structures, as well as conspicuous wealth evidenced in monumental graves, from the 16th century BC. Around 1400 BC, Mycenaeans had the ability to conduct raids: by land in SW Anatolia, with battles against a Hittite army; also by sea to

78 Bryce 2009, 298; 2005, 113, 420 n. 75, Schuler also; Freu et al. 2010, 163-4, Onofrio Caruba also; Collins 2007, 42.

79 Giannakos 2012, 12.

80 Hope-Simpson and Hagel 2006, 27.

81 Tsountas 1928, 15, 30-4; Hope-Simpson and Hagel 2006, 111.

82 Hope-Simpson and Hagel 2006, 26-7.

83 Bryce 2005, 358; Latacz 2004, 219: *of n86 ships according to the poet Homer.*

Cyprus, and possibly against the seashores of Egypt too, so that Pharaoh patrolled and fortified the Nile mouths. As a working hypothesis, we propose that the Trojan War should be dated much earlier, to the era of *Attarissiya-Atreides*, that is around 1400 BC. We could also infer that the Hittitic main territory inside the Halys river bent and all the linguistic/racial groups of the vassal kingdoms to the Hittite Great King are described by Homer as allies of Troy. A first linguistic approach implies that the bards sang for the first time a type of overseas campaign against Troy some time between 1450-1050 BC. A further investigation should be performed in order to examine this perspective, of an early date of the Trojan War, more thoroughly.

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