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The Aegean type Sword found at Hattušas, Silver as rare metal and the written Sources, Contribute to the dating of Trojan War?

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1. Introduction

During the late 15th ce. BC - early 14th ce. BC, Hittite and Egyptian material evidence refer to well known names from ancient sources: T/Danaja/Danaoi, Ahhiyawa etc. In this paper, the cutting-edge know-how of high level technology for production of bronze, silver and iron and the construction of high originality and intuition in engineering are examined in relation to archaeological finds. Moreover, this paper attempts to relate the aforementioned data to the possible dating of the Trojan War.

2. 15th-14th ce. BC Asia Minor: Mycenaean Warlike Technology and Activities

2.1. Material Evidence

A Type B bronze sword was found at Hattuša(s)¹ probably of Mycenaean Greek origin² dating to the period of Tudḫaliya II, with an Akkadian inscription:

*"As Duthaliya the Great King
shattered the Aššuwa-Country he
dedicated these swords to the Storm
Cod, his Lord".*

commemorating Tudḫaliya's victory over Aššuwa, described in his Annals³, mentioning **Wilusiya/𐎶𐎵𐎶𐎶, Taruisa/Τρωία**. Taruisa is referred once more -in an inscription of LBA- on a silver bowl⁴, recording the conquest of Tarwiza/Τρωία by a King called Tudḫaliya (II):

*"..... When Tudḫaliya Labarna
smote the Land of Tarwiza.....".*

Two more bronze swords of Mycenaean type were found in Asia Minor: one at Izmir and one at Kastamonu⁵. The sword found at Izmir was classified by Sandars⁶ as Mycenaean type B' and in fact "*a good example*".

The sword found near Kastamonu⁷ at Paphlagonia, in a cave -embedded in ice and icicles-, must have been manufactured in Asia Minor. Perhaps, this belonged to a booty taken by Kaskeans, as described in the prayers of the Hittite royal couple Arnuwanda I and his wife Ašmunikal, daughter of Tudḫaliya II⁸:

*".....they plundered the land...In
the land of Nerik, in Hursama, in the
country of Kastama....in these
countries, the Kashkeans sacked
them....."*

Although the bronze alloys have not been analyzed and the percentage of tin is unknown, Ünal guesses that, for the Kastamonu sword, the percentage of tin should be exceedingly high due to its preservation in ice.

A Mycenaean bronze spearhead was found at Niğde. It had been cast in a two-piece-mould, its edges then sharpened by forging and finally was abraded; it reflects a very high standard of technology⁹. There are Luwian hieroglyphic incised signs, indicating that it was produced during the second half of the 2nd Millennium BC. Similar Greek spearheads and arrowheads have been found in "Chambergrave 77" at Mycenae (cf. note 5), in "Grave 6" at Volos and at a location near a Mycenaean grave in Athens,

¹ Ünal et al., 1991; Hansen, 1994; Cline, 1996; Neve, 1993.

² Some scholars disagree.

³ Garstang & Gurney, 1959, p.121, lines 13-23.

⁴ Hawkins, 1997.

⁵ Details in Giannakos, 2015; 2012.

⁶ Sandars, 1961, p. 27, pl.19:7.

⁷ Ünal, 1999, p.207-226.

⁸ Pritchard, 1969/1992, p.399.

⁹ Bilgi, 1989, p.29-30.

indicating that it was imported from Greece during 14th-13th centuries BC.

2.2. Metallurgy of Mycenaean Weapons

Varoufakis¹⁰ in an analysis of Minoan copper from Kythira cites their conciseness in different metals (silver, cobalt, zinc, bismuth, sulphur) and remarks that, in case of shortage or excessive price of tin, the smiths added lead to give to the alloy higher "castability". Papadimitriou¹¹ in a very detailed work, gives the percentage of metals and the forming techniques -of the era 1600-1150 BC- for the swords' alloys containing tin from 8-11%, for cold hammering and when the tin percentage is equal to 12-15%, with hot forging in different temperatures. Naue II swords¹² of 13th-12th ce. BC have also been analyzed; they contain 86-90% copper and 12,6-7,3% tin.

There is no reference of metallurgical analysis of the swords at Hattuša, Smyrne/Izmir, Kastamonu and Niğde's spearhead.

2.3- Mycenaean(?) finds at Asia Minor

At Hattuša, in a level of the late-15th to 14th-century¹³, contemporary approximately to Tudḫaliya's II reign, a ceramic bowl of Hittite manufacture with an incised drawing inside was found, depicting an Aegean(?) warrior bearing a boar's tusk helmet with horn, crest and flowing ribbons dated around 1400 BC.

Fragments of wall paintings of Mycenaean technique¹⁴ have been also discovered in Büyükkale at Hattuša¹⁵. Imported Mycenaean pottery IIB¹⁶ in Maşat Hoyük -mostly of kitchen type ware- were presented. The palace of the older third level at Maşat Hoyük was destroyed by the Kaška peoples at about 1400 BC during the reign of Tudḫaliya II. The

Mycenaean pottery was found on the floors, with Hittite pottery and seals, of a later phase (first half of 13th ce.BC or a little later).

2.4. Hittite Texts for Tudḫaliya's II¹⁷ era

1. *Indictment of Madduwatta*¹⁸, belonging to Arnuwanda I, adopted son and successor of Tudḫaliya I/II, notes that under Tudḫaliya I/II's reign, Madduwatta(s) followed Attarissiya¹⁹, the man of Ahhiya²⁰, brother of the king of Ahḫiyawa, in (repeated)²¹ raids against Alasiya/Cyprus:

"[When Attarissiya and] the ruler [of Piggaya] were raiding the land of Alasiya, I often raided it too.... "

According to ancient literature *Ἀτρείδης/εῖς-Atreids* made raids against Cyprus. We have proposed²² that Attarissiya could be the transliteration of the Personal Name *Ἀτρείδης*.

2. The text "*Offenses of Seha River Land*"²³, dated to the period of reigns from Muwatalli II to Tudḫaliya IV, describes:

*"5. [Tarḫunaradus] started hostilities [against me] and relied on the King of Ahḫiyawa"*²⁴

This more recent translation is consistent with the picture of a king of Ahḫiyawa supporting "*anti-Hittite activities conducted in western Anatolia by local agents or deputies*" not necessarily physically present. The text is dated approximately one to two centuries later than Tudḫaliya I/II, but it could contribute to the understanding of a possible

¹⁰ Varoufakis, 2006.

¹¹ Papadimitriou, 2008, p.282-286.

¹² Kouli et al., 2006, p.96,89.

¹³ Güterbock, 1984/1997, p.206,210, Niemeier, 1998, p.42, Giannakos, 2015; 2012.

¹⁴ Wiener, 2007, p.14, n.92, cites Niemeier, 2006, at Concordia University.

¹⁵ Büyükkale (Great Fortress) is the royal residence, the Palace at Hattuša, Seeher, 2006, p.115.

¹⁶ Özgüç, 1978, p.66, 62-63, p.127-128. Özgüç, 1980, p.308-309.

¹⁷ For the reigns of Hittite Kings Appendix 1.

¹⁸ Beckman, 1995/1999, p.153-160, full text.

¹⁹ *Ἀτρεύς* according to Forrer, Bryce, 2005, p.368, agree, contra Güterbock, 1984/1997, p.207; *Atreid/Ἀτρείδης* cf Giannakos 2012.

²⁰ For *Ahhiya*, Giannakos, 2015; 2012. C914 Knossos tablet (1400-1375BC) writes "*Akhaiwijaṇ-de*" = "*Ἀχαιῖα δε*", Ventris&Chadwick, 1956, p.78.

²¹ See Giannakos, 2015; 2012.

²² Giannakos, 2015; 2012.

²³ KUBXXIII13: The full text in Garstang&Gurney, 1959, p.120, assigned to the reign of Tudḫaliya IV. See also Bryce, 2005, p.304. Güterbock, 1984/1997, p.207-208, n.22, assigns it to the reign of Muwatalli II or Hattusili III, the same Easton, 1985, p.194 and Singer, 1983, p.207.

²⁴ Güterbock, 1984/1997, p.208. Contrary to Sommer's translation that the king of Ahḫiyawa had been himself present on the Anatolian mainland.

involvement of the Ahhiyawan king in Asia Minor -through his representatives/agents local-rulers-, in the Late Bronze Age.

3. A Letter of the king of Ahhiyawa²⁵ to the Hittite king:

".....so that my great grandfather, Kaqamuna, ...and had previously married his daughter. Tudhaliya, your great grandfather, defeated the King of Aššuwā,...."

During the reign of King Tudhaliya I/II, the great grandfather of the (author) King of Ahhiyawa owned the islands²⁶, after a dynastic marriage. The name of the Ahhiyawan King, was: (A)Ka-ga-mu-na-aš. Two slightly different versions are²⁷: "8' ...]a-ka-ga-mu-na-aš-za-kán", describing the name as "Akagamunas"²⁸ and²⁹ "[Mr.³⁰X⁶]-a²kagamuna".

Starke³⁰ proposed that "Ka-ga-mu-na-aš" is Kadmos and R. Janko³¹ that, if it is to be equated with a Greek name, it is "Agamemnon/Ἀγαμέμνων".

Besides an "Attarissiya(s)/Ἀτρείδης", -the son of Atreus-, is there an "Ἀγαμέμνων" too, during (or even before) Tudhaliya' I/II's era?

4. The Alaksandu of Wilusa/Ἰλίου treaty³²: "when Tudhaliya came [...] against the land of Arzawa, **he did not enter [the land of Wilusa....]**"; this is an extract of a text belonging to an official Treaty mentioning that Tudhaliya did not enter to Troy, and maintained friendly relations to it, despite Wilusa's "defect from Hatti". Moreover, there is no reference at all for Ahhiyawa, fact implying most likely that by ~1280 BC, the latest, Ahhiyawa was not considered as serious power by the Hittite Kings.

2.5. Rare Metal Silver and "Halyzones" in the Trojan War

The Ships' Catalogue in the Iliad, dated probably much earlier than Homer's era at the era of the Trojan War, describes the allies (ἐπίκουρους) of Troy³³: "But of the **Halizones** Odios and Epistrophus were captains **from afar, from (H)Alybe**, where is the birth-place of silver"; I use (H)Alybe instead of Alybe since A is aspirated, and it was pronounced as "HA".

"Ἀλύβη/(H)Alybe" of Halyzones (most probably the region inside the Halys river bent, since the name Halyzones means in Greek "they who are encircled by Halys (river)") is referred as being "the birthplace of silver". All the three main linguistic/racial groups of the Hittite kingdom were present as allies of Troy³⁴: Palaians/Paphlagones, Lycians/Luwians, and Nesumnili/Land of Neša/Hatti (inside Halys river) probably as "ἀργύρου γενέθλη".

Yakar³⁵ presented a map of the Hittite kingdom with 9 silver mines inside the Halys river bent. Yener³⁶ wrote that the major objective of the trade during the Assyrian Colony period³⁷, was to obtain silver and gold from Asia Minor, between Neša/Kaneš and Assur. Furthermore, Hattuša (the capital) and Hatti (the Land) are sometimes written with the Sumerogram for silver³⁸:

URU KÚ.BABBAR-sa-= Hattuša=City-of-Silver

KÚRURU KÚ.BABBAR-ti-= Hatti= Land-of-Silver

Moreover, Pharaoh Ramesses II, for the battle of Kadesh connects Hatti with **silver**³⁹:

³³ TLG, Ilias, b.2, l.856-857, and l.848-855, 862-863, 886-887, translation Murray, 1924.

³⁴ Analysis in Giannakos, 2012; 2015. Watkins, 2008, p.6,45; Bryce, 2005, p.17-19, 396, note 45, 387, Hawkins, 2003, p.129; Melchert, 2003, p.12,13,16; Melchert, 2008, p.40.

³⁵ Yakar, 1976, p.116,121. De Jesus, 1978, p.100-101, doubts.

³⁶ Yener, 1986, p.469-470.

³⁷ 1950-1850BC, Yener, supra. Yener, 2000, p.54, 46, for silver in Arslantepe.

³⁸ Watkins, 1986, p.53, note 13.

³⁹ Lichtheim, 2006, vol.II, p.64. Breasted, 1906/2001, p.135, note c, note g, 138.

²⁵ Hoffner, 2009, p.290-292, full text.

²⁶ Apparently Lazpas /Lesbos et alii.

²⁷ Freu&Mazoyer, 03/2011, p.105.

²⁸ Freu, 1998, p.109.

²⁹ Sommer, 1932, as cited by www.hittites.info.

³⁰ Latacz, 2004, p.243-245.

³¹ Wiener, 2007, p.16-17 & notes104,113 and Melchert regards it even less possible.

³² Beckman, 1995/1999, p.87-93. Dated approximately at 1280 BC.

**“He had left no silver in his land.
He had stripped it of all its
possessions and had given them to
all the foreign countries in order to
bring them with him to fight.”**

A King of Arzawa(?)⁴⁰ writes to Hattušili III(?) asking also "silver" (and not gold) because "there is no silver here with me". Šuppiluliuma I writes to Pharaoh, asking gifts from gold, silver and lapis lazuli but he is sending to Pharaoh *only silver objects*⁴¹.

However, in Greece, there was intensive exploitation, working and production of silver from Laurion and Cyclades mines from Late Neolithic, EBA, MBA to LBA for silver and lead⁴². Homer's "ἀργύρου γῆ εστὶ γενέθλη" does not comply to this evidence, but it is compatible to the practice, since Assyrian Colony period, that Anatolian Plateau, around Neša/Kaneš, provided silver to Asia Minor, Middle-East and Egypt. This was probably an oral "common tradition", at the west coast of Asia Minor, due to the silver production in Asia Minor.

Bachvarova⁴³ (citing Latacz, 2004) mentions that the story of Troy was first composed between 1450-1050 BC and Iliad's final version was a blend of two narratives "one from the Trojan" (or even more accurately from the Western Asia Minor's inhabitants, *according to my view*) "and one from the Greek side".

This could explain the phrase "ἀργύρου γῆ γενέθλη" from the narrative which has been transferred by the inhabitants of Asia Minor (especially of the Troad's people) and not from the tradition of the inhabitants of mainland and insular Greece. *Bards/ᾄοιδοί* were singing the Epic(s) in the "Palaces" of both sides of the Aegean Sea, consequently, they could not narrate/sing false facts, but events which had taken place, even in "a poetic version".

⁴⁰ Hoffner, 2009, p.352-354, §116.KBo2.11.

⁴¹ Beckmann, 1995, p.279, §39-43. Giannakos, 2012; 2015.

⁴² Kakavogianni et al., 2006, p.78-83, 2008, p.45-57. Stos-Gale et al., 1995, p.130. Giannakos, 2015; 2012.

⁴³ Bachvarova, 2008, p.103. For Trojan War's earlier dating: cf. also Vermeule, 1986, p.85, 206, 279, note 297; Morris, 1989, p.521; Cline, 1996, 1997.

3. Material Evidence from Egypt dated at 16th-14th ce. BC

The relations between Crete and Egypt begin at the Old Kingdom or Predynastic era and the number of finds of imported Egyptian objects or their imitations in Crete is impressive⁴⁴. Egypt's contact with Aegean culture was not restricted to isolated waves of invasion, but it was the result of cultural and perhaps commercial contacts⁴⁵. In Egyptian written sources, there are a lot of references to Cretans/Keftiu, T/Danaja/Danaoi⁴⁶, Arzawa/Assuwa and possibly Troy, for exchange of know-how and gifts of high technology, during the reigns of Pharaohs from Ahmose, up to Ramesses III. The most characteristic case is the "Aegean list" at Amenhotep III's statue at Kom-el-Hetan⁴⁷.

3.1. 15th ce. BC: Iron Technology in Tanaja/Danaoi and Keftiu/Cretans?

Pharaoh Tuthmose III mentions⁴⁸:

*"[Benevolence of the chief] of
Tanaya: Silver: a jug of Keftiu
workmanship along with vessels of
iron⁴⁹..... with silver handle(s) 4,
making 56 dbn, 3 kdt"*

⁴⁴ Hood, 2000, p.21; Warren, 2000, p.25-26 for finds dated to Amenemhat II (~1900BC) or III (~1800BC).

⁴⁵ Dothan T.&M., 1992, p.30-31.

⁴⁶ Cline, 1994/2009. Wachsmann, 1987. Strange, 1980. Details in, Giannakos, 2015; 2012.

⁴⁷ Karetsou et alii, 2000, p.246, the colored photo of the statue's base. Cline, 1995, pl.6, Wachsmann, 1987, pl.LXVIII.

⁴⁸ Redford, 2003, p.96; Breasted, 1906, vol.2, p.217.

⁴⁹ Redford, 2003, p.96, transliterates "iron" and in note 226 refers to several articles (Harris, Ogden, Aufrere) about the rarity of such a manufacture. Breasted, 1906, vol.2, p.217, transliterates also "iron" and in note c writes "By ?". Strange, 1980, p.96, transliterates "iron" and he comments that "the Keftiu work was highly appreciated may be inferred from the fact that a work from Keftiu was given together with bowls made of iron, at this early stage a priceless metal". In note b, for "bis" he quotes Harris and Graefe, who doubt if "bis" in this case could be "iron", although it evidently must be some metal. Cline, 1994/2009, p.110,114 and Panagiotopoulos, 2006/2009, p.394, transliterates "iron (or copper (?))".

The "Keftiu workmanship" in metallic objects is referred also later in Pylos tablets⁵⁰, referring "*ti-ri-po-de ai-ke-u ke-re-si-jo we-ke*" = "two tripod cauldrons of Cretan workmanship, of ai-ke-u type". "*It is most tempting to identify Tanaya with the plain of Argos, and more specifically the kingdom of Mycenae*" and "*the Keftiuans are lumped in with Ashuwa/Ionia and Tanaja/Mycenae*"⁵¹.

The aforementioned Thutmose III's description, dated at the 15th ce. BC could point to Keftiu/Crete -during Tanaja sovereignty- as an iron-producing country at a very early stage in iron-metallurgy before 1200 BC. The iron may have come from Tanaja itself and it spread so rapidly after the collapse of the Hittite empire, due to the breakdown of the international trade with copper and tin⁵². As long as these metals were easily available, the highly developed bronze technology compared to the still infant iron technology prevented the effective use of iron. Egypt, having still access to copper and tin entered the Iron Age much later. After the rebuttal of the old theory about the Hittite monopoly⁵³ of iron during the 2nd mil. BC, we could infer that *iron* was initially introduced and spread as strange and luxurious metal and afterwards as possible consequence of the real shortage of tin and even copper. The precocious iron technology produced goods not superior to bronze until the success of a type of carbonation (case-hardening), that led to the production of an alloy similar to steel⁵⁴.

Iron seal rings have been found also at Dendra and Pylos containing nickel ranging from 2-11%, derived from meteorites or from nickel-bearing ores, as in Larymna, Euboea and Skyros⁵⁵. Iron seal rings at the Archaeological Museum of Athens are dated from 15th-13th ce. BC. Iron -according to tablets from Akkad- was six times more valuable than silver⁵⁶.

We should emphasize that the iron -as extremely precious metal- had already been in use in Crete since the first half of 17th ce. BC⁵⁷ as the finds from a human sacrifice at Anemospilia depict, where the priest wore a silver ring which was iron-plated; iron has been encountered also in later Royal burials, in Minoan Crete. In Tutankhamun's tomb⁵⁸, an iron dagger and a miniature headrest amulet were found, equally valuable to gold. During the eighteenth dynasty in ancient Egypt, *iron objects had been offered to Pharaoh from Tinay (Danaoi), Palestine and Syria*; besides the aforementioned findings there are references in Amarna tablets also⁵⁹. The smiths must have carburized the wrought iron by holding the iron artefact in a charcoal fire at temperatures from 720°C to 910°C, since the steel has at least 0,15% carbon (carbonized) throughout the entire body of the artefact.

These references imply an existing know-how and production technology for iron objects, in Minoan and Mycenaean Greece.

3.2. Amenhotep III and Akhenaten

3.2.1. Egypt and Tanaja/Danaoi

In the burial monument of Amenhotep III⁶⁰, at Kom-el-Hetan, Knossos, Phaistos, Kydonia, Lyktos, Mycenae, *ἑλίων/Troy*, Thebes, Amyklai/Sparta, Nauplion, etc., are referred. Objects from the period bearing the cartouche of Pharaoh Amenhotep III were unearthed in Greece: i.e. one scarab from Knossos and one from Kydonia, faience tiles⁶¹, a blue ape etc. at Mycenae, a scarab with the cartouche of his queen Tiji at Phaistos etc⁶². Pharaoh Amenhotep III's close relations to the Aegean and his

⁵⁰ Ventris & Chadwick, 1956, p.336. Michailidou, 2006, p.747.

⁵¹ Redford, 2003, p.96-98, 250-252.

⁵² Strange, 1980, p.137-139, note 271.

⁵³ Sandars, 1978/2001, p.219-221. Muhly, 2006, p.24-25, also for no Hittite monopoly.

⁵⁴ Muhly, 2006, p.21, similar aspect.

⁵⁵ Varoufakis, 1999, p.31.

⁵⁶ Varoufakis, 2005, p.48.

⁵⁷ Sakellarakis G.&E., 1991/2002, p.136-156.

⁵⁸ Muhly, 2006, p.22-25. Ogden, 2000, p.168.

⁵⁹ Detailed description in Lucas, 1948, p.268-275, specifically p.273. See also Ogden, 2000, p.166-168.

⁶⁰ Karetsou et alii, 2000, p.246 where the colored photo of the statue's base, is cited. A colored photo is also cited in Cline, 1995, pl.6, and a drawing of its inscriptions is cited in Wachsmann, 1987, pl. LXVIII. Giannakos, 2015; 2012.

⁶¹ Detailed analysis in Philips, 2007.

⁶² Colored photos in Cline, 1995, pls.6, 7; Karetsou et alii, 2000, p.251.

particular sympathy to Achaean rulers is evident from remnants of his Palace at Malkata⁶³.

Mycenaean pottery ranging from LHIIA to within LHIIIB has been found at over fifty sites in the Nile valley from the Delta, Saqqara to Argo island, above the Third Cataract, at a time when Mycenaeans were economic and military leaders in the Aegean⁶⁴. Petrie, in Akhetaten, unearthed Mycenaean pottery in the royal palace and the rubbish heaps –in a place reserved for official appearances of the Pharaoh and his followers at the center of the royal administration– and found 1329 Mycenaean shreds⁶⁵ and over 80 Late Cypriot shreds, dated from the life span of the city, from LHIIIA2 after the year 4 or 5 of Akhenaten's reign and a few shreds from LHIIIB not later than the year 3 of Tutankhamun. In the tomb of Aper-El, at Saqqara, Mycenaean pottery of LHIIIA2⁶⁶ –identical to pottery from Tel-el-Amarna– came to light.

The Amarna period marks the advent of Mycenaean world in the Egyptian archaeological record, after which Mycenaean pottery is found throughout Egypt until the end of 12th ce. BC, but after Tutankhamun's death in post-1351/1327 BC Egypt, T/Danaja disappeared from records, obviously weakened by then⁶⁷.

3.2.2. Amarna Period: were Danuna and Lukki forerunners of the Sea Peoples?

The discussion about Trojan War comprises a section about the Sea Peoples and the extensive destructions all over Mycenaean Greece, Asia Minor, the Levant and the

references by Pharaoh Merenptah (~1220 BC) and Pharaoh Ramesses III (~1175 BC). The first apparition of Lukka, Sherden, Meshwesh and Danuna(?), "peoples/tribes" was not among the "Sea Peoples"; they are mentioned during Amenhotep III's reign⁶⁸: "...*Amenophis III and Ramesses II encountered the individual groups, the breakup of the Mycenaean age forced communities to come together on a temporary basis*". Giv'eon⁶⁹, believes that the references of Amenophis III at the Karnak and Taharqa temples: *[ḥꜥ]w nbw[t]* (HaouNebout/Aegean world), *constitute an enumeration of certain enemies of Egypt towards North*. Danuna could confirm the confrontation to groups from Aegean world.

Homer's heroes -called "Δαναοί", Menelaus and Odysseus- had "visited" Egypt either as friends or as raiders during the era around Trojan War.

Moreover, the king of Alasiya (Cyprus) wrote to Pharaoh Akhenaten⁷⁰:

"(7-12) Indeed men of Lukki, year by year, seize villages in my own country....."

The disappearance of Minoan navy after the fall of Knossos (ca.1375BC) led Lycians to piracy and⁷¹ *"before Amenhotep III was dead, he had to arrange for the protection of Delta coast itself against their depredations...."*. Ancient Greek authors -writing for turmoil of the far past- refer to "Karian pirates" and this possibly implies⁷² that these "Karians" are the Lukka.

During approximately the same period, Attarisiya(s) with his allies -Asia Minor's local-rulers- were raiding against Alašiya (and Lukka), according to the Hittite archives; from Asia Minor and Lycia, "Danaos" Attarisiya(s) could recruit soldiers.

⁶³ Karetsou et alii, supra, p.246–249. Nikolakaki–Kentrou, 2000, p.47-51.

⁶⁴ Hankey & Aston, 1998, p.69.

⁶⁵ Today 1500-2000 shreds, belonging to -at least- 600 pots, cf. Kelder, 2010, p.68-69.

⁶⁶ Hankey&Aston, 1998, p.68, 69. Zivie, 1989, p.40.

⁶⁷ Kelder, 2010, p.70,141-146, list of Mycenaean pottery at Tel-el-Amarna. Wachsmann 1987, 125. Cline (2009, 37-41, 113-116; Strange 1980, 27-32, with references; Giv'eon 1971, 17): "Ramses II's references" (1304/1279-1237/1213 BC) "to the Aegean were usurped/copied from earlier lists"; Cline (2007, 198): "the lack of new lists reflects continuing trade" but "the nationality of sailors/merchants had changed".

⁶⁸ Redford, 1992, p.246, note 19. Shaw, 2000, p.322, refers also Danuna, Lukka during Akhenaten's reign.

⁶⁹ Giv'eon, 1971, p.20-21.

⁷⁰ Moran, 1987/1992, p.111,EA38.

⁷¹ Burn, 1930, p.108.

⁷² Sandars, 1978/2001, p.139-140.

the basis of substantial amount of Mycenaean pottery recovered there". The destruction of Troy VIIa is dated at the end of LHIIIC or early Geometric period thus "it does not come into consideration as the Homeric Troy"⁸⁹. Troy VIg ended at 1400 BC and Troy VIg up to before 1375/1350 BC⁹⁰. In House VIg there were 23 vases -locally produced in Troy⁹¹ "within a generation or two around 1400 BC"⁹² - on the floor, "scattered in the course of some **vigorous housecleaning** dated at LHII".

"**The vigorous housecleaning** may have been done by outsiders, (by the Greeks?) whether or not irritated on a matter of horses, and the level, LHII-IIIa1 looks to be, at a superficial glance, **at no distant date from the troubles that overwhelmed Knossos** and brought to an end the great productive and inventive age of early Greece"⁹³ during Tudhaliya I/II's era.

The distribution of Mycenaean pottery over time including Troy VIIb at LHIIIC is⁹⁴: 14%-LHIIa, 10%-LHIIb, 9%-LHIIIA1, 40%-LHIIIA2, 20%-LHIIIB, 7%-LHIIIC.

We could imply that "something happened" -approximately at LHIIIA1- and very close after it, in LHIIIA2, the percentage was launched to 40% and maintained to 20% in the LHIIIB. Trojans had been led in a "tightening" of commercial or cultural relations and being influenced by Mycenaean standards, prototypes and way of life, during the phases Troy VIg/VIIg, beginning from LHIIb/LHIIIA1 up to LHIIIB but not during LHIIIC.

We propose to examine the case of a "Trojan War" around 1400 BC or earlier, after which "Aeneas", a new king pro-Greek, replaced Priam's Royal "Coat of Arms" in Troy.

6. Idomeneus and Chariot tablets of Knossos

At Aulis -just before the departure for Troy- Agamemnon gathered an Assembly of six Kings "the elders, the excellent chieftains of the Pan-Achaean"⁹⁵: First Nestor, second "wa-na-ka-*Ἰνᾶκτα*" Idomeneus, two Ajaxes, Diomedes and Odysseus. King Minos's son was Deucalion, whose son was Idomeneus⁹⁶, meaning that Idomeneus was grandson of Minos. This passage could imply that Mycenaean Idomeneus was grandson of King Minos⁹⁷, and this places him two "generations" after the change of domination in Crete from Minoans to Mycenaeans⁹⁸.

In the Iliad⁹⁹, Idomeneus is referred 73 times, Achilles 367, Agamemnon 164, Menelaus 134, Odysseus 123, Nestor 79, Diomedes 82, both Ajaxes cumulatively 192. Idomeneus, Nestor and Diomedes are referred almost equally.

One Leucus, lover of the wife of Idomeneus, usurped his throne, killed her and her daughter Cleisithyra and seduced ten cities from allegiance to Idomeneus. After Idomeneus' return to Crete from Troy, he fought Leucus for gaining back ten cities around Lyctus, possessed by Leucus¹⁰⁰. Leucus banished Idomeneus from Crete and Idomeneus emigrated to the Sallentine region of Calabria¹⁰¹. All the above could be a memory of battles in Crete, after the Trojan War, that resulted in the Knossos palace's destruction and the shift of power to Kydonia later than ~1400BC (or the latest at 1340/1320 BC).

Knossos tablets are dated¹⁰² at the beginning of the 14th ce. BC till the latest at LMIIIA2¹⁰³. After this period (~1390-1370BC), Knossos

⁸⁹ Korfmann, 1986, p.25.

⁹⁰ Latacz, 2004, p.11.

⁹¹ Mountjoy, 1997, p.267 and Mommsen/Hertel/Mountjoy, 2001, p.203.

⁹² Vermeule, supra, citing Blegen. Blegen, 1963, p.115-144, believed the vases were originated "from Greek mainland and other Aegean centers".

⁹³ Vermeule, 1983, p.142-143, p.88, Hercules' sack of Troy. Cline, 1997, p.199; Mountjoy, (1998, p.34), (1997, p.277-292), same aspect.

⁹⁴ Mee, 1978, p.147.

⁹⁵ TLG, Ilias, b.2, l.402-409.

⁹⁶ TLG, Odyssea, b.19, l.178-185.

⁹⁷ See Sherratt, 2001, p.228.

⁹⁸ McGillivray, 2009, p.167, the change of power from Minoans to Mycenaeans at 1465/3 BC.

⁹⁹ TLG, search machine.

¹⁰⁰ TLG, Heraclides Ponticus, *Fragmenta*, 171, lines9-18.

¹⁰¹ Graves, supra, 169.l. Ancient authors write about his grave in Crete.

¹⁰² "Modern Archaeologists e.g. Hatzaki", according to Driessen & Langohr, 2007, p.179. Driessen, 2008, p.71; Ruijch, 1976, p.173. Page, 1988a, p.204. Doxey, 2007, dates 1375BC.

¹⁰³ Appendix 2 for dating of the periods.

ceased to have an operational palace and workshops and a wa-na-ka/ᾠναξ may no longer have been present at Knossos after LMIIIA2 or he was demoted and perhaps became dependent on Kydonia¹⁰⁴ (or the latest after 1340/1320 BC, depending on different archaeologists' datings¹⁰⁵). There is evidence for presence of public authority in LMII-III A1 (before 1395BC) at Knossos but not afterwards¹⁰⁶. Up to this chronology the heartland of the Mycenaean kingdom was around Knossos "as suggested by later stories about Idomeneus"¹⁰⁷.

Several hundreds of tablets, dealing with chariots, were also unearthed¹⁰⁸. These tablets record "complete" chariots with wheels, chariot-frames without wheels and chariot frames¹⁰⁹. Up¹¹⁰ to 250 complete martial chariots are described and more than 350¹¹¹ of "dismantled" type. The "dismantled" ideogram is connected to production or repair works¹¹² or even of "chariot very much incomplete and perhaps ruined"¹¹³.

All the above could lead to the implication that before the era of the Knossos destruction (~1390-1370 B.C.) a great number of chariots, possibly even 350+, were for repair at the workshops (250 ready for operations), probably due to battles.

7. Technological level of Constructions and Prosperity Period, Destructions in Palaces

As a civil engineer I support that a really intuitive engineer's spirit is needed to design and construct a structure to bridge great openings: the corbelled vault used for tholos tombs. In this case, a really original know-how and very high cutting-edge technological level in knowledge and skill is demanded¹¹⁴. Corbelled vault tholos tombs¹¹⁵ found at Fourni Crete are dated in EMII¹¹⁶. The first tholos tombs in Messenia are dated at the late MH¹¹⁷. Smaller tholoi¹¹⁸ in Georgiko¹¹⁹, Koryfasio¹²⁰ and Kakovatos¹²¹ are dated at MH or early-LH I¹²². Mycenae grew in significance in MHIII-LHI periods¹²³ whence an exclusive concentration of wealth in the Mycenaean Shaft Graves is recorded¹²⁴. In Argolid, at the LHII, the monumental tholos tombs were adopted and six of the nine tholoi at Mycenae are dated at the LHIIA period¹²⁵, contemporary¹²⁶ to the last of the shaft graves in Grave Circle A (LHI/LHIIA). The tholos tombs¹²⁷ have been constructed even before 1520 B.C., for Mycenaean Kings and their close families in parallel with chamber tombs for civilians, poor and rich¹²⁸.

¹⁰⁴ Driessen&Langohr, 2007, p.179-180. Sherratt, 2001, p.232, dates in LHIIIB.

¹⁰⁵ Cf. Giannakos 2012.

¹⁰⁶ Driessen, 1995, p.244: "In LMIIIA2-IIIB Knossos there is only evidence for cult practices".

¹⁰⁷ Driessen, 2001, p.101. Sherratt, supra, p.228.

¹⁰⁸ Driessen, 1996, p.484,485,495,496, note11 refers that where the Chariot Tablets were found, LMII (~1465-1445BC) shreds and later shreds were collected.

¹⁰⁹ Lejeune, 1968, p.11,12.

¹¹⁰ Ruijch, 1976, p.179. Driessen, 1996, p.493,492 refers a Knossian chariot force of 250 chariots and at least 500 horses. Ventris&Chadwick, 1956, p.365, more than 127. Driessen, 1996, p.485. Ruijch, 1976, p.198.

¹¹¹ Driessen, 1996, p.487. Lejeune, 1968, p.47. Ventris&Chadwick, 1956, "at least 237 not assembled". Driessen, 1996, p.485, minimum 310 chariots. Driessen, p.487, 342+ chariots. Tsikritsis in a personal contact mentioned that he counted ~500, for one presentation of him in a Cretological Conference.

¹¹² Lejeune, 1968, p.24, §b. Ruijch, 1976, p.182.

¹¹³ Ruijch, 1976, p.188. Driessen, 1996, p.486.

¹¹⁴ Giannakos, 2015; 2012.

¹¹⁵ Dickinson, 2003, p.306.

¹¹⁶ Dickinson, 2003, p.49: Dated by Sakellarakis, to EMII. Treuil et al, 1996, p.237, date a cyclic grave with dromos at Fourni Crete early MM.

¹¹⁷ Treuil et al., 1996, p.357. Acheson, 1999, p.99, stating that members of the elite Mycenaean class were buried since late MH period.

¹¹⁸ Tassios, 2008, p.29, 2009.

¹¹⁹ Tassios, supra.

¹²⁰ Tassios, supra. Shelmerdine, 2001, p.121, refers that Koryfasio was occupied in MH, but few potshreds are datable to MHIII and LHI.

¹²¹ Nikolentzos, 2003, p.620,626: "Kakovatos was a station of amber's imports in early Mycenaean world". Ruiperez&Melena, p.179.

¹²² Bennet&Galanakis, 2005, p.145,146: "by LHII 50 tholoi in Messenia, Triphylia, Elis".

¹²³ Voutsaki, 2005, p.138,139.

¹²⁴ Voutsaki, 2001, p.204.

¹²⁵ French&Shelton, 2005, p.181.

¹²⁶ The Cyclopean, the Epau Fournos and the Aegisthos tholoi, French&Shelton, 2005, p.180,181.

¹²⁷ Mylonas, 1983, p.168.

¹²⁸ See French&Shelton, 2005, p.181,182, Voutsaki, 2005, p.135.

Pylos -in LHIIIA- developed the network of taxation and workshop centers supporting it¹²⁹. This was the peak period for the deposition of wealth in tombs, with the highest number of rich tholoi, where, as in Shaft and Chamber Graves, during LHII/LHIIIA-B¹³⁰, large number of prestige items of very high quality and even some unique pieces were found. In Thebes, for the production from MH/LHI till LHIIIA1 and the early-LHIIIB1, there is evidence for local manufacture of glass, jewelry, gold jewelry and inlays at the kiln and the workshop of the House of Kadmos¹³¹.

A series of destructions of the main palatial centers are described¹³² in the period from 1400–1050/1030 BC. During the period of the Trojan War's conventional dating(s), 1300 or 1275-till-1190 BC, when the Mycenaeans should have campaigned for “ten years” massively against Troy (with “1186 ships”), their Palaces at home suffered a number of consecutive destructions¹³³:

*LHIIIA1/1400–1375 BC*¹³⁴: destructions with no total abandonment of the sites¹³⁵, at Mycenae the Ramp House, in Lakonia Mansion 2, at Pylos the Palace.

LHIIIA2/1375–1300 BC: at Mycenae the Pillar Basement and possibly the Palace, many Houses¹³⁶ outside the citadel, House of Kadmos¹³⁷ and a complex building¹³⁸ destroyed by fire, at Thebes, buildings at Tiryns, the center of Iolkos¹³⁹, the palace at Pylos.

LHIIIB1/1300–1225 BC: In Mycenae's citadel: the Cult Centre, the Great Stair and many East Wing Buildings¹⁴⁰, outside the citadel also: the Panayia Houses I and II (by earthquake?). At Tiryns two destruction phases with bodies buried under a wall, at Thebes: Megaron A¹⁴¹, Treasury Room¹⁴², Arsenal, Loukou plot, Lianga-Christodoulou complex, Koropouli workshop¹⁴³.

LHIIIB2/EarlyLHIIIC/1225–1190BC: Widespread destructions and abandonments ~1200BC mark the collapse of the palatial system in all palaces.

The above analysis describes a turbulent period of turmoil quite unstable with gradually increasing magnitude of destructions and implies that approximately from 1350 BC onwards the Mycenaean palaces were facing a gradual degradation of power. Moreover, by LHIIIB, valuable goods have virtually disappeared from all sites and seems to concentrate almost exclusively at Mycenae¹⁴⁴. The aforementioned evidence could imply much less wealth during LHIIIB together with internal(?) dangers also. The period of international campaigns of power demonstration is more rational to be during the MHIII - LHIIIA periods and not by ca. 1340/1320 BC (LHIIIB(+)) and later.

8. Summary and Conclusions

There is -relatively- "abundant" evidence from Tudhaliya II's reign (~1425/1420-1400/1390 BC) of Mycenaean's technology martial objects and depictions. This era was the heyday of Mycenaean prosperity achievements and wealth. Their technological level and know-

¹²⁹ Shelmerdine, 2001, p.128.

¹³⁰ Voutsaki, 2005, p.199.

¹³¹ Dakouri-Hild, 2005, p.209-210.

¹³² Middleton, 2010, p. 14-17

¹³³ Middleton, 2010, p.14-15.

¹³⁴ Appendix 2.

¹³⁵ Middleton, 2010, p.14, citing Mountjoy 1993.

¹³⁶ Petsa's House, the Second Cyclopean Terrace House, the House of Wine Merchant and the House of Lead (Atreus Ridge).

¹³⁷ Dakouri-Hild, 2001, p.95,96-101, dates the Kadmos's House construction in LHII and *a terminus post quem* in LHIIIA. Keramopoulos, LHIIIA1, Mylonas, LHIIIA2-B. Mountjoy LHIIIA2 or early LHIIIB, Dakouri-Hild, p.101, agrees.

¹³⁸ Adrimi-Sismani, 2007, p.164.

¹³⁹ Adrimi-Sismani, 2007, p.175,168 cites Tsountas identifying Kastro Volos as Iolkos of “Ships’

Catalogue” and Theocharis identifying Iolkos's Palace destroyed by a powerful fire at 15th ce.BC.

¹⁴⁰ The House of Columns and the Artisan's Quarters.

¹⁴¹ 1292±34BC, Adrimi-Sismani, p.166-167.

¹⁴² Aravantinos, 2005, p.255,257 refers finds -from 1550-1300BC- and relates Treasury Room to Homeric *θάλαμος*.

¹⁴³ Oliver, 2001, p.156: the majority of Pylos's, Mycenae's and Thebe's tablets, are dated to LHIIIB. Voutsaki, 2001, p.196, findings in destruction layers at Mycenae.

¹⁴⁴ Voutsaki, supra, p.203.

how were extremely high and of cutting-edge both in construction works and production of metallic objects: bronze, silver and iron even since 17th ce. BC. The Hittite texts refer *Ahhiyawan* military activities in Anatolia, Lukka and Cyprus, as the Egyptian sources also refer relevantly, facts compatible to what the ancient literature describes for the period around the Trojan War. Evidence from Egyptian archives refers to "*T/Danaja*" and to well-known cities as Mycenae, Knossos, Phaistos, Ilion etc., from the 42nd year of Thutmose III to almost Tutankhamun's death (ca. 1465/1463-1350/1329 BC). After this period the Mycenaean palatial centers enter in a *turbulent period of turmoil quite unstable with gradually increasing magnitude of destructions*, not compatible to a huge (of a number larger than 1000 ships) military expedition to Troy. Hittite texts, dated at Tudhaliya I/II's era, refer probably an Attariššiya = Atreid/Ἀτρείδης and an Akagamu-na-as = Agamemnon/Ἀγαμέμνων and raids against Cyprus/Alašiya, since descriptions in the Egyptian records refer to raids against Egypt by Danuna/Δαναοί; this evidence is compatible to the descriptions in the Iliad and in the ancient Greek Literature. One of the most prominent Achaean leaders, Idomeneus of Knossos is not possible to had reigned after 1375BC (or the latest 1340/1320 BC) -as *terminus ante quem*- and a great number of "*dismantled*" or "*ruined*" chariots are listed in Knossos tablets, shortly after 1400 BC.

Is it -possibly- pointing to internal conflicts just after the return from Troy?

Troy VI during the f/g Phases present an "*extended housecleaning*" (ca. 1400±50 BC, according to Troy's excavator C.W. Blegen).

Does this "extended housecleaning" depict a possible refurbishment of the Houses -cleaning, filling with broken Mycenaean pottery and levelling implying a continuity of life in Troy- after a change of the older Troy's Royal Dynasty by a new one which was "supported" by Mycenaean invaders, who intruded in the city with the help of the pro-Greek faction/side of

the Trojans, mainly after "Wilusa's defect from Hatti" long-before the reign of Tudhaliya I/II?

Is it possible that Trojan War is more ancient than conventional dating up to now and possibly dated between 1425 and 1390/1370 BC?

If the story of Troy was first composed between 1450-1050 BC and Iliad's final version was a blend of two narratives one from the western Troy's and Asia Minor's inhabitants and one from the mainland and insular Greece's inhabitants, *is it possible that the Tradition maintains a "core of real events" from the period between the early-15th century and the conquest of Troy on ca. 1400(+) BC?*

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APPENDIX 1

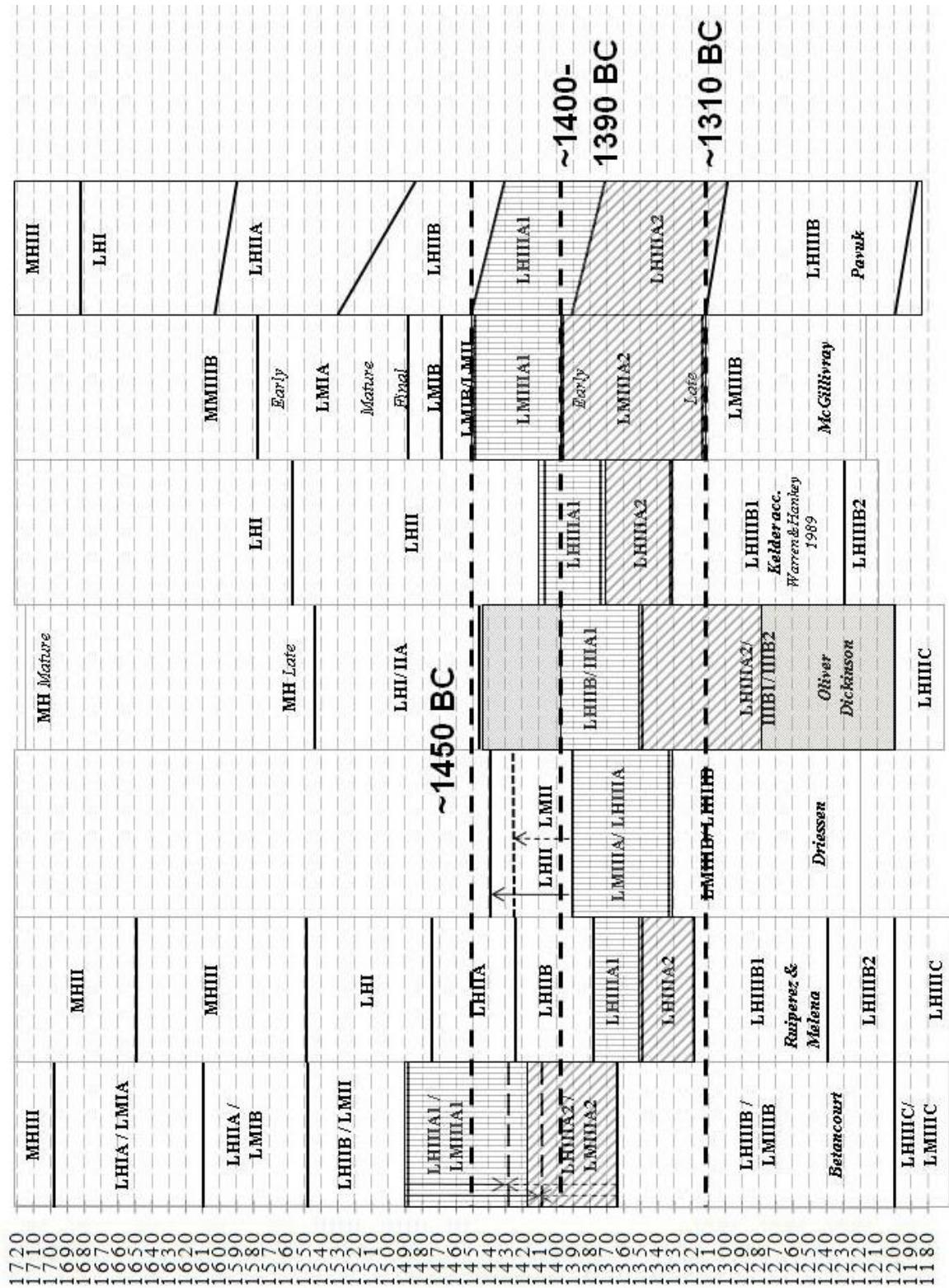
Chronologies of reigns in Hittite Empire and Egypt¹⁴⁵

Redford, 2006		Shaw, 2000 Kitchen, 1982		Hyksos reign		Hyksos		Hyksos		Hyksos	
1670	Labarna I 1680-1650	Huziyya I 1670-1650	Salitis (Sheshy) 1666-1663	Apophis 1604-1569	Khyan c. 1600	Apophis 1575-1550	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528
1650	Labarna I 1650-1620	Labarna I 1650-1620	Bnon(?) 1663-1655	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1630	Hattusili I 1650-1620	Hattusili I 1650-1620	Y'a'qob-el 1655-1644	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1610	Mursili I 1620-1590	Mursili I 1620-1590	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1590	Mursili I 1620-1590	Mursili I 1620-1590	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1570	Hantili I 1590-1560	Hantili I 1590-1560	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1550	Zidanta I 1560-1530	Zidanta I 1560-1530	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1530	Amunhotep III 1560-1530	Amunhotep III 1560-1530	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1510	Huziyya I 1550-1530	Huziyya I 1550-1530	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1490	Telipinu 1525-1500	Telipinu 1525-1500	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1470	Aluwarna 1500-1470	Aluwarna 1500-1470	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1450	Tahurwaili 1485-1470	Tahurwaili 1485-1470	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1430	Hantili II 1470-1465	Hantili II 1470-1465	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1410	Zidanta II 1465-1440	Zidanta II 1465-1440	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1390	Huziyya II 1440-1425	Huziyya II 1440-1425	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1370	Muwatali I 1425-1390	Muwatali I 1425-1390	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1350	Suppilulium I 1350-1322	Suppilulium I 1350-1322	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1330	Amunhotep III 1350-1322	Amunhotep III 1350-1322	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1310	Mursili II 1322-1295	Mursili II 1322-1295	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1290	Muwatali II 1295-1272	Muwatali II 1295-1272	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1270	Uthi-Teshub 1272-1267	Uthi-Teshub 1272-1267	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1250	Hattusili III 1267-1237	Hattusili III 1267-1237	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1230	Tudhaliya IV 1237-1228	Tudhaliya IV 1237-1228	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1210	Kurita 1228-1227	Kurita 1228-1227	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1190	Tudhaliya IV 1227-1209	Tudhaliya IV 1227-1209	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	
1170	Amunhotep III 1209-1207	Amunhotep III 1209-1207	Khayan 1644-1604	Amunhotep III 1390-1352	Apophis c. 1555	Amunhotep III 1390-1352	Tuthmosis III 1490-1436	Am enophis I 1550-1528	Tuthmosis III 1490-1436	Am enophis I 1550-1528	

¹⁴⁵ For Hatti: Bryce, 2009, p.798, Bryce, 2005, p.xv, Freu & Mazoyer, 2007/2011, vol.1, p.25-26.

For Egypt: Redford, 2006, p.114&157, Shaw, 2000, p.484-485 combined -in the same column- to Kitchen, 1982, p.238-239, and Gardiner, 1961/1964, p.443-445.

APPENDIX 2
Chronologies of periods¹⁴⁶



¹⁴⁶ Betancourt, 1987, p.48, Ruiperez & Melena, 1996, p.13, Driessen, 2008, p.69, Dickinson, 1994/2003, p.19, Kelder, 2010, p.137-138, following Warren & Hankey, 1989, see p.91, n.224, McGillivray, 2009, p.154, Pavúk, 2007, p.475.