EVIDENCE FOR THE INFLUENCE OF MYCENAEAN BUILDING AND DEFENSIVE TECHNOLOGY IN TROY VI, AROUND 1400 BC

Translation of the -*presented in the 3rd Intl. Conf. 2024****- article*****:***

ΜΑΡΤΥΡΙΕΣ ΓΙΑ ΕΠΙΡΡΟΕΣ ΜΥΚΗΝΑΪΚΗΣ ΟΙΚΟΔΟΜΙΚΗΣ ΚΑΙ ΑΜΥΝΤΙΚΗΣ ΤΕΧΝΟΛΟΓΙΑΣ ΣΤΗΝ ΤΡΟΙΑ VI, ΠΕΡΙ ΤΟ 1400 π.Χ.

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Abstract. In each period of Troy VI [Early (1740/1730-1500 BC), Middle (1500-1400 BC), Late (1400-1190/1180 BC)] new or strengthened fortifications of the acropolis were built. The, visible today, Walls belong to the Late VI, were built between 1425(-)/1410-1400/1390 BC[2] in a new position, horizontally, outside the older fortification (of the Early-Middle periods), and only a part of the Middle VI has been preserved in the visible Walls (Section 5). Around 1400/1390 BC, Bastions were built to protect all the Gates (VIV, VIU, VIT, VIS). As professor Klinkott, Architect of Korfmann's excavation team, argues, this defensive design is more akin to Mycenaean architecture and bears no resemblance to Syrian, Mesopotamian and, especially, Hittite examples. The Towers, still preserved today, considered as "characteristic of the Hittite defensive Architecture", were added much later (1250-1190/1180 BC).

I have suggested that the Fall of Troy is reflected in that particular layer, which Blegen called a "deposit (of Mycenaean pottery produced *one-to-two generations ca.1400BC*), which had resulted from *an extensive* '*housecleaning*', *at Troy VIf-end* when the fragments were accumulated, since *at the VIg-beginning they* were de-posited (to their new position)". I have argued that this layer shows *a non-total de-struction of the city, with enthronement of a pro-Achaean dynasty by the winners*.

Defensive Technology with Bastions and Towers appears already in Greece from Lerna (2650-2100BC), Syros (2300-2100BC), Aegina (2200-2050BC) to Mycenae and Tiryns (1400/1400(-)BC). This article presents archaeological evidence and the opinions of the excavators of Troy about the influences of Mycenaean Defensive and Building Technology in Troy (1425(-)/1410-

[1] American Society of Civil Engineers.

[2] *Interpretation of signs in chronologies BC*. Plus (+): [1600(+)→'before 1600']; minus (-): [1600(-)→ →'after 1600']; plus/minus (±): [1400(±)→'around 1400']; dash (-): [(25-50)→'between 25-50']; slash (/): [1425/1400→'1425 or 1400']; both: the 'wavy dash'/'~', *and*, 'ca.': approximately. Abbreviations: 'o.c.'='as above'; 'ca.'=approximately; 'av.'='in average'.

The original article in Greek at: https://edabyt.gr/3o-sunedrio-arxaias-ellinikis-texnologias/

1400/1390BC). Specifically, the Bastions protecting the Gates, the earthquake-resistant/antiseismic construction of the Walls and Houses of the acropolis, etc., combined with the impressive increase in the amount of luxury items of daily life after 1400BC within the citadel of Troy constitute archaeological evidence compatible with the adoption of Mycenaean technologies and lifestyle by a pro-Achaean dynasty in Troy. It is noted that during the period after 1570-1550BC until ca.1400 BC the Hittite Kingdom had weakened and was significantly limited only in the interior of Asia Minor around Hattusa, therefore it could not then affect the western Asia Minor and the defense system of Troy.

Key-words: Technology: *Mycenaean*, *Defensive*, *Building*˙ Troy VI.

1 Prolegomena

Troy became famous and prominent in world literature and the Arts, influencing students, researchers, writers and scientists thanks to the Iliad and the Odyssey, the Epics in *hexameter* attributed to Homer (second half of the 8th century BC).

However, during the last forty years, scholars -specialists in Greek and Indo-European linguistics- have erected a logical structure, widely accepted among themselves, but much less known among representatives of the general discipline of Greek philology. Το οικοδόμημα αυτό ανάγει την εμφάνιση *του εξαμέτρου στίχου* μεταξύ των Ελλήνων, περίπου οκτακόσια χρόνια πριν τον Όμηρο (16ο/15ο αιώνα π.Χ.). This structure dates the appearance of *hexameter verse* among the Greeks back approximately eight-hundred years before Homer (16th/15th century BC)[3]. It is characteristic that several verses of the Iliad are dated earlier than the 8th century BC; the most illustrative example is one of the verses which is dated earlier than *the historical Mycenaean era of Linear B*, in the 16th/15th century BC[4]:

"*Μηριόνης τ' ἀτάλαντος Ἐνυαλίῳ ἀνδρειφόντῃ·*"

"*and Meriones the "equal in weight"*(=peer) [TLG-LSJ] *of Enyalius*(=Ares)*, slayer of men;*", [translation by the author],

which refers to Meriones, second-in-command of the Cretan troops, under King/(F)Ἄναξ Idomeneus. It is probable that, the Iliad and Odyssey may have woven together preexisting tales and traditions of the Trojan War and precedent raids, or reinterpreted conflicting versions of the oral tradition, **"***through which some social groups invigorated memories of past events***"**.[5] Moreover, it has been recognized that the Epics reflect many chronological layers of the Pre-Palatial, Palatial, Post-Palatial, Geometric and Archaic periods, until their finalization during the Alexandrian period.[6]

In the Iliad, the god Poseidon -the brother of Zeus-, in front of the goddess Hera -the wife of the supreme god-, declares that Zeus "hated Priam's generation" and, thus, the pro-Achaean[7] "*Aeneas shal be King/FἌναξ in Troy*, *during his lifetime/'βίη*', *as his 'sons-of-his-sons' too"*. The Iliad transfer memories, most likely, of enthronement of a new pro-Mycenaean

[3] Latacz 2004, **260**; Ruijgh (1995, 3-4, 85-88) and (2011, 283); Wiener 2007.

[4] Ruijgh 1995, 85. TLG("Bibliography")-Hom.*Il*. B/2:652, rendered in modern Greek by the author.

[5] Maran 2019, 353.

[6] Giannakos (2024, 32-33); Wiener (2007, 6-7).

[7] Giannakos o.c.. Hom.*Il*. Y/20:300-308, rendering: footnote 4.

dynasty by the Achaeans, after the Fall (of Troy); this dynasty reigned for several generations and probably adopted Mycenaean standards of life ("Verseilles effect").[8]

If a historical core is included in the Epics, as I argue, then the Fall, transferred to us by Homer, can probably be traced to the fortifications of Troy.

2 Introduction: Troy – Urbanization Phases, Datings

At Troy, all the areas with undisturbed layers were unearthed by Schlieman, Dörpfeld, Blegen and Korfmann, who had the -*one of a kind*- privilege to be unique in History to witness an unrepeatable image. "By its nature, each excavation "destroys" undisturbed layers. After the excavation nothing can return to its original state, and no one will witness again this first image".[9]

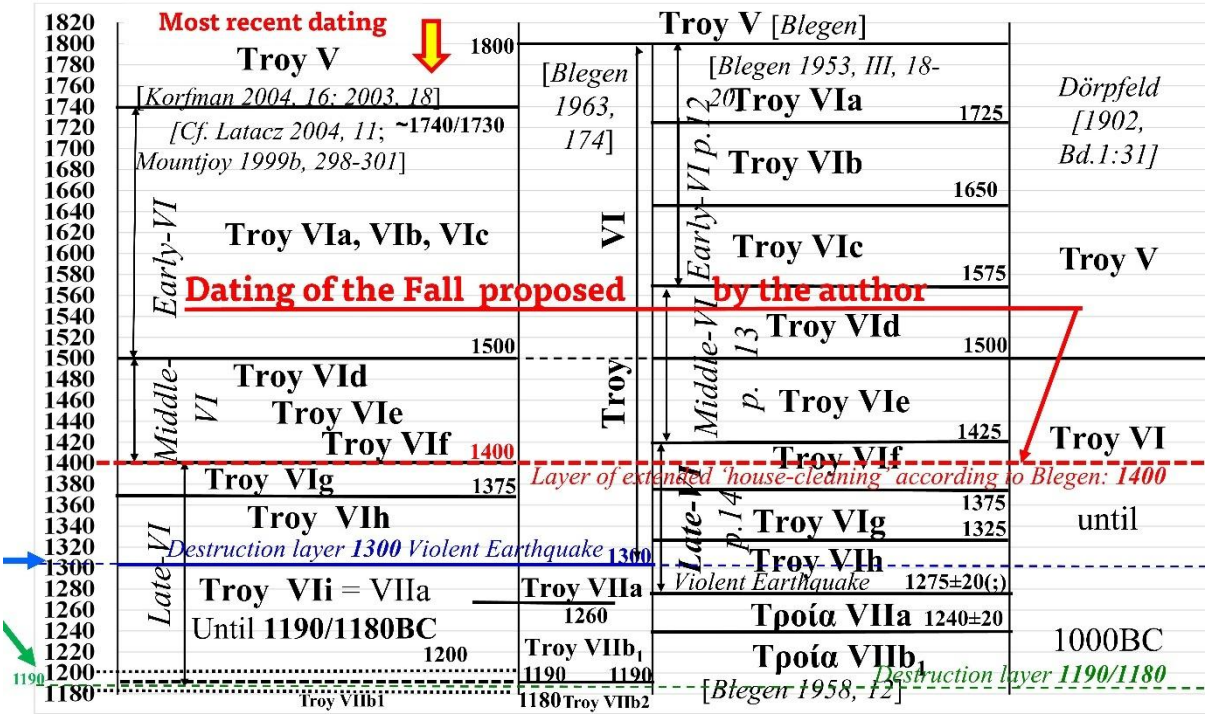

Figure 1. Periods and sub-phases of Troy VI, datings (Giannakos 2024, Fig. 1 updated).

During Schliemann's first excavations (1870-1873/1878-1882), seven layers -settlements- were distinguished. During the subsequent excavations by Schliemann-Dörpfeld (1890), nine layers -settlements- were finally classified instead of seven,[10] distinguished by their Latin numbering I-II-III-IV-V-VI-VII-VIII-IX; this classification remains and is used till today. The oldest Troy I is the deepest layer and rising upwards towards the surface the newer successive layers are located until the newest Troy IX. It is the settlement VI, among these nine settlements, which is contemporary to Mycenaean Greece and corresponds to Troy of the Homeric Epics.[11]

[8] Wiener (1984, **17**), 1989, and (2013, 150).

[9] Professor Doumas, 12-11-2019, 'House of Cyprus', Athens, panel of presentation of the book *Alassa* by Sophocles Hadjisavvas.

[10] Tolman-Scoggin 2013/1903, **33-36**.

[11] Γιαννακός 2016b, 209-210.

Blegen classified three subperiods of Troy VI, Early 1800-1575BC, Middle 1575-1425BC, Late 1425-1300/1275(±20(?))BC; this classification remains valid until today, but with different dates: *Early 1740/1730-1500BC*, *Middle 1500-1400BC*, *Late 1400-1190/1180BC*. These have been subdivided in sub-phases, which are distinguished with letters as subscripts of VI: from the deepest VIa-VIb-,…,-VIi/'former-VIIa' (upper, newest). Dörpfeld had already proposed on 1935AD, to extend Troy VI in the beginning of VII, renaming VIIa to VIi,[12] and this is accepted today.

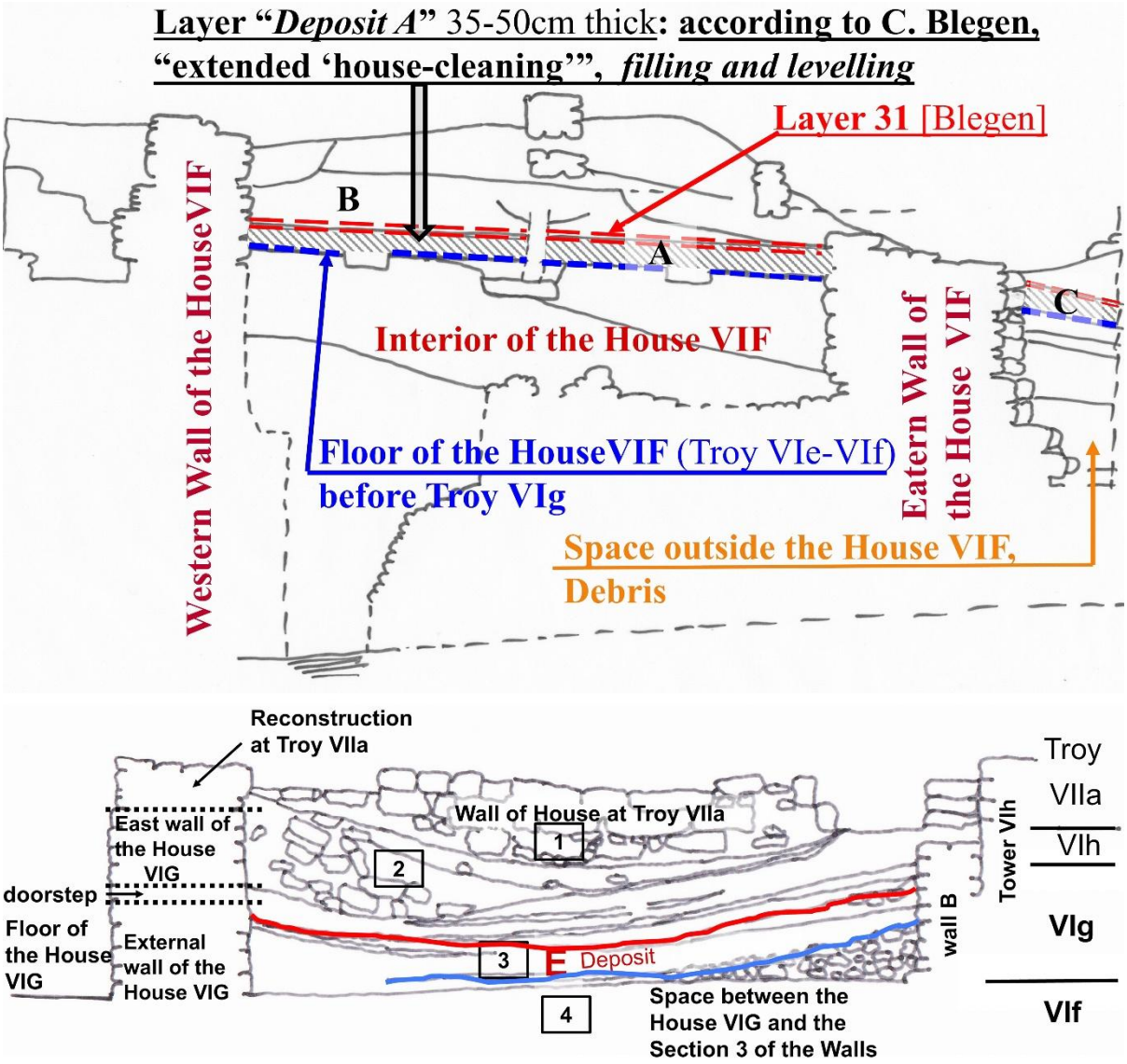

Figure 2. *"Extended, vigorous house-cleaning» according to Blegen*: (**i**) *House VIF* (see. Fig. 4-6) "Deposit A" and "C [**upper illustration**]. (**ii**) *House VIG*: "Deposit E" [**lower illustration**]. [The plans were drawn by the author based on Blegen 1953, 2:Figs. 482, 476].

Fig. 1 depicts the sub-phases of Troy VI, the "layer of extensive, vigorous, 'housecleaning'" according to Blegen (*VIf-end/VIg-beginning*→1400BC) and **the two layers of destruction**

[12] Blegen 1963, 144.

[*VIh-end*→1300[13]/1275[14], *VIIa/VIi-end*→1260(+)/1240BC[15]]; Korfmann-Mountjoy re-dated the VIIa/VIi-end at 1190/1180 BC.[16] *The Fall of Troy, according to prevailing assumptions, took place at VIIa/VIi-end, or, at VIh-end*.

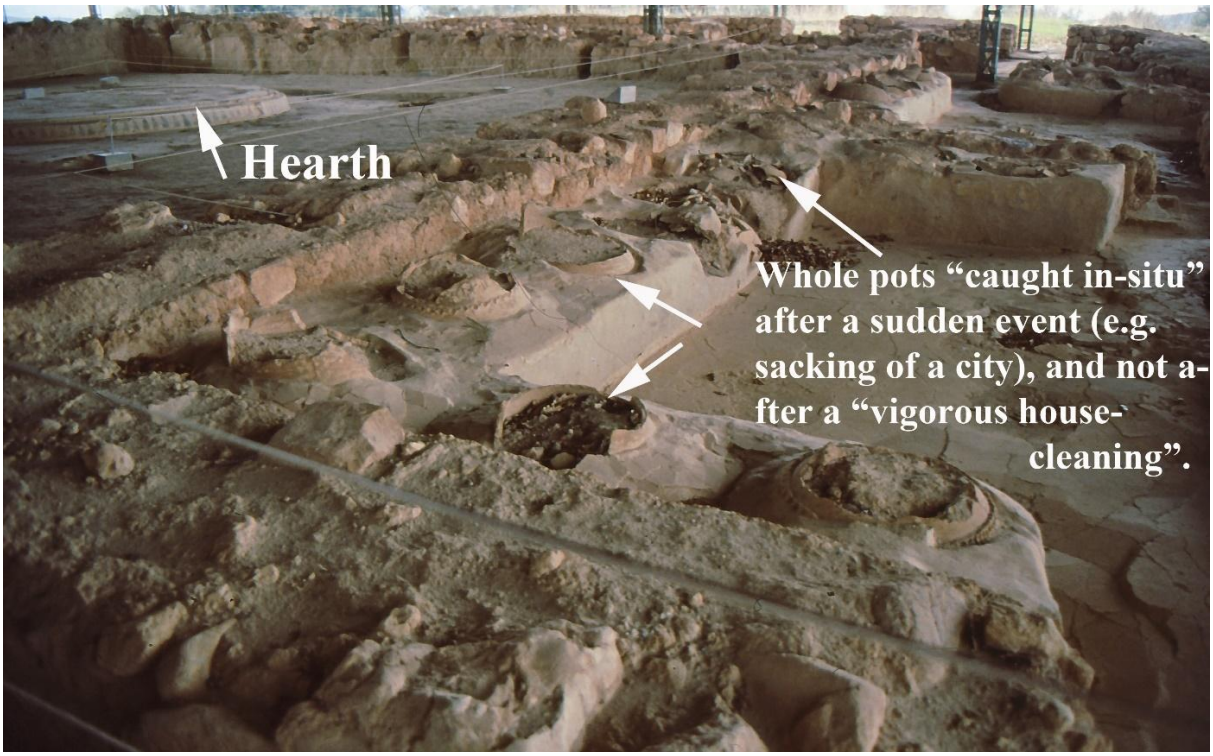

Figure 3. Example of the Fall and complete destruction of the Palace of Pylos: entire pots were caught "*in-situ*" and were unearthed intact by excavators, in the location they were embedded at the time of the destruction [author's photo]; after the disaster life did not continue and no "house-cleaning" and leveling followed.

Based on archaeological evidence, I proposed that:[17]

The Fall of Troy -*transferred to us by Homer* (Hom.*Od*. Θ/8:492-495)- is identified in a 'third layer' of a noncomplete destruction, the "*vigorous* 'house-cleaning'" according to Blegen (Fig. 2), *a deposit* of sherds of Mycenaean ceramics which "were produced one-to-two generations around 1400 BC", were accumulated as rubble at VIf-end (1400BC) and were deposited as debris at VIg-beginning (1400/1400(-)BC)".[18] This deposit consists of "a set of Mycenaean pottery of the period "LHIIB-'beginning-LHIIIA1'", without any find of the LHIIIA2 period",[19] that is, it dates before-1390/1380BC (**§5**). "This is not a deposit in conventional terms, where whole pots are caught in situ *as a result of a sudden event*", e.g. a Fall (Fig. 3: example of

[13] O.c., 142.

[14] Mountjoy (1999a, 256, 290 n.15): «*Blegen* (1953, 1:18, 1:20)».

[15] Blegen (1963, 153, 160-163: 1260(+)BC) and (1958, 1:12: 1240π.Χ.); Mountjoy 1999b, 297.

[16] Korfmann (2004, 16) and (2003, 18); Mountjoy 1999b, 298-301; Latacz 2004, 31.

[17] Giannakos (2015b, 759-760), (2016a, 65-66, 70-71), (2019b, 10-12) and (2024a, 33-34).

[18] Blegen 1953, 1:278-***279*****, 1:*301-302***; 1:110-111, 1:200, 1:228-229, 1:241, 1:263**;** «*Τροία VIg*»: 1:**254**, 1:266-**269**, 1:**321**.

[19] O.c., 1:268, 1:279.

Pylos), "but a deposit of (early)-VIg, widely scattered, result of "house-cleaning" and leveling", according to Mountjoy.[20] After the Fall, life continued under a new, pro-Mycenaean dynasty, since, according to Mellink,[21] "the Fall must have included looting and captivity, but not the great blaze envisioned by Agamemnon".

The present article examines the dates of the construction-phases of the Fortifications of Troy, *their defensive Technology*, the patterns of life in the 'citadel'/'Pergamon' of Troy (Hom.*Il*. 5:460) and makes comparisons with the Levant and Greece.

3 Poliorcetics during the 2nd Millennium BC

Whereas battle narratives are relatively rare, sieges (*lawītum*) were quite common in Mesopotamia and are discussed in some detail in the Mari archive [22] [1776-1759BC, Fig. 20, Levante), allowing us a fairly good understanding of Mesopotamian siegecraft. Fortifications of cities existed from at least 6000BC, with a thick brick wall and a three-meter-wide moat.[23] Siegecraft undoubtedly began when wall building began (Hamblin 2006, 185, 215-216). Among the machines and means used during the sieges were: siege ramp out of earth against the Walls, Siege Towers, Battering Rams and Siege Poles[24], Breaching, Undermining through tunnels, use of Siege Ladders for the mounting on the Walls.[25] In depictions on seals, battering rams (*yāššabum*) and siege towers (*dimtum*) are depicted: during an assault against a city of the southern Mesopotamia on a seal of the *middle-3rd millennium BC*, on a seal from Nabada Syria (2400-2250BC) and on wall-paintings at Beni Hasan in Egypt (1900π.Χ.),[26] where a battering ram in a siege turtle are depicted, but also in texts of Ebla[27] (2300/1500π.Χ., footnote 224). The siege turtle [28] was a kind of a “shack”, which protected the ram and its handlers from the fire of the besiegers, with a roof and side walls of fireproof wood. Easton (2010, 51-52)[29] accepts references to rams and towers only at the Beni Hasan and in the texts of Mari. Recently, however, a walled city conquest with huge round siege towers has been presented, from the tomb of the provincial governor Inti (Egypt, 6th Dynasty, 23rd century cal BC).[30]

The Hittite King Hattusili I (1650–1620BC) besieged the riverside city of Urshu (Fig.26), an ally of Ebla, east of Kaneš in Northern Syria.[31] The defenders “broke the battering ram”. Then,

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[20] 1997, **277-278**, **292**, 286-287. Vermeule 1986, **87-88**.

[21] 1986a, 100. Hom.*Il*. B/2:414-415.

[22] WAM:25–38; AW:1:69–71; RLA:1:471–2; MK:145–7; MM:33–4.

[23] EA:4:473.

[24] Τάσιος-Γιαννακός/Tassios-Giannakos 2018, 105-112.

[25] Burke 2008, 38-40.

[26] AW:159, color photo; Easton 2010, 51-52.

[27] Hamblin 2006, 219; Nadali 2009, 39-52: pictures of rams, towers; Steinkeller 1987, 14; Kupper 1997, 121–32; Burke o.c.. Sasson 1969, 33-34. Rey (2012, 139-140) and (2016, 39-40).

[28] Τάσιος-Γιαννακός/Tassios-Giannakos 2018, 107-112.

[29] Hamblin 2006, 221-236; Sasson o.c..

[30] Lull et al. 2018, 17.

[31] Barjamovic 2011, 200-201.

the King gave the order “to make a new battering ram, in the Hurrian manner/technology from (trees of) the mountains of Hassu, and to heap up earth”, in order to built a ramp for assaults against the Walls, “*and block off all the roads so that no one can enter or go out from Urshu. Eighty chariots and eight armies surrounded the city”*.[32] *Historical archives record long sieges, corresponding to the ten-year siege of Troy: nine years of Harsama by King Inar of Kaneš* (1650(+)BC),[33] four and a half years of Sanahuitta[34] two years of Ζάλπα,[35] by Hattusili I (Hamblin 2006, 300).

Mellink is apparently right that "rams and siege engines were already known War Technologies in Asia Minor during the Old Hittite period" (1650-1400BC[36]), and, as we saw previously, by the mid-3rd millennium BC in Mesopotamia and Egypt, so, “obviously, *by the early-15th-13th centuries BC were also available* (or had been autonomously developed by)) *the Achaeans*”.[37] The story about the Trojan horse was thus explained as a siege machine by Pausanias (1:23:8) and Pliny the Elder (VII:202, p.88, 227), and modern scholars too.[38]

However, *the Trojan Horse* is described as a trick of deception in the Epics,[39] rather than a siege engine, and its story is very similar to the trick of the general Thot-or-Thoti of Pharaoh Thutmose III (1504/1470-1450/1425BC[40]), who, during the siege of Joppa (Fig. 26), sent[41] “*two hundred baskets sealed with Pharaoh’s seals, which contained gifts/tribute*”, to the wife of the Prince of Joppa “*however, the baskets contained two hundred armed Egyptian soldiers. Five hundred soldiers carried the baskets, along with the (supposedly) captured Thot and his family*; the defenders of Joppa opened the gates to let the baskets in and thus the city was captured”. The story has been maintained in the Harris Papyrus, of the Seti I/Ramses II era [1316/1294-1304/1279-1237/1213BC][42] (Easton 2010, 54), consequently, it remained vivid ~200 years later.

4 (Re-)Construction Phases of the Fortifications of Troy VI

4.1 Walls

Paragr. §4[43] rely exclusively on the works by the chief excavators of Troy (§2), Schliemann, Dörpfeld, Blegen and Korfmann, as well as Klinkott, emeritus professor of Architecture at the

[32] Bryce 2005, 47, 72-73. Gurney 1990, 178-179. Hamblin 2006, 298-300.

[33] Bryce 2005, 34, translation by Balkan.

[34] Bryce 1983, 50-52.

[35] CS:1:182-183.

[36] Bryce 2005, xv.

[37] Mellink 1986a, 99-100.

[38] Rose 2005, 208 n.50; Lorimer 1950, 522; Page 1963, 296 n.119; West 2003/1997, 487-488.

[39] Strauss 2006, 253-266.

[40] Γιαννακός 2016b, 72, 33; Giannakos (2019b, “76”) and (2020, 115-116): ‘maximums/minimums’.

[41] Wilson 1969, 22-23.

[42] Footnote 40.

[43] Giannakos 2024, 14-21.

University of Karlsruhe and member of the Korfmann's group, who "documented in full the Troy VI-VII citadel".[44]

Dörpfeld (1902, 1:103, 124, 113) "discovered the fortifications"[45] and classified one stage of '*Troy V*' plus four stages of '*VI*', which are: Sections 5, 7 ('*1st stage*'); Sections 2, 3 and Gate VIS, *"so that the castle-area expanded by a considerable extend" outside of the earlier fortification* ('*2nd*'); Section 4, *which also extended outwards the fortified area* ('*3rd*'), and, the attachment of the Towers VIh, VIi ('*4th*').

Blegen[46] characterized 'essentially correct' the classification of Dörpfeld, however, "the fortification which Dörpfeld had attributed to Troy V belongs to Early-VI"; this "has not been demolished all at once", <u>*as expected after a devastating Fall and looting*</u>, "but piece-by-piece, during successive ((re-)construction) stages" (*sub-phases VIf-VIg, below*).

Klinkott (2004, 33, 79-81) considers "Dörpfeld's and Blegen's observations *on the fortifications of Troy* as a solid foundation for our research."

Finally, ***the 5 -in total- stages*** of construction/reconstruction of the Walls of ***Troy VI*** are:

1) The older Wall, 1,00-1,30m thick,[47] which is dated well-back at Early VI,[48] in the 17th century BC.[49] Its remnants were found (Figs. 4-5) behind the, *visible today*, Walls at a variating distance:[50]

- *Beneath Houses*: VIG, Pillar and VIA (there, in contact with the Section 5 located in front of it [Giannakos 2024, Figs. 3]).[51]
- *Inside Sections of the Walls*: a part of Section 7 and, probably, a part of Section 6, which was founded on burnt debris of Troy V.[52]
- *At Gate VIU* and the, dated to Early VI,[53] *Gate VIZ* (Fig. 9-left).

The trace of the oldest Wall is traced from these remnants (Figs.).

2) The second stage of the fortification of Troy VI, was probably implemented in two successive phases (Fig. 4) *at a short distance, chronologically, from each other:*

2α) *Section 5* (Fig. 4-left), *av. 2,70m thick*, is "the last surviving piece of the older fortification",[54] and "presents three reconstruction stages",[55] which resulted most likely by attacks against the, adjacent to it, "Scaean(s)"(=left/western[56]) Gate VIU (§4.2.3(α-δ)). It was "founded on a layer that contained a good deal of pottery of Early and possibly Middle VI. It

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[44] Easton 2010, 53.

[45] Blegen 1963, 30.

[46] 1953, 1:81, 109, 116, 112.

[47] Dörpfeld 1902, 1:104, 124.

[48] Blegen 1953, 1:111-112, 1:104, 1:81.

[49] Klinkott 2004, 79.

[50] Dörpfeld 1902, 1:103-104, Fig. 31.

[51] Blegen (1953, 1:111-112, 1:190-191: 'early-VIe', 1:131, 1:219-220˙ 2:461-465) and (1963, 116).

[52] O.c., 1:106-107.

[53] O.c., 1:113; Klinkott 2004, 69, 59, 79-81.

[54] Blegen 1953, 1:109**, 102**.

[55] Klinkott 2004, 69-70.

[56] TLG-LSJ.

cannot have been erected before late-"Early VI"' (1550-1500BC), "but its north end points to an early-VIe dating (*1500/1500(-)BC*), perhaps slightly earlier than the Wall R" .[57]

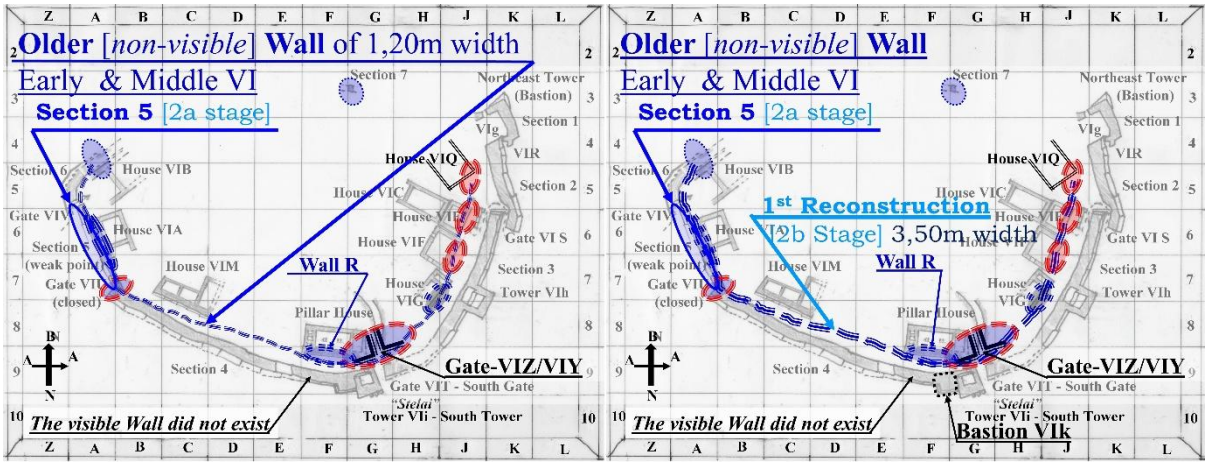

Figure 4. *Remnants of the Walls of Early* (blue ellipse, blue shading), *Middle Troy VI* (red ellipses; the blue shading: in Early VI too) *and the Wall of 1,20m width* (triple dashed line). The 2a Stage (**left**); the 2b Stage (**right**). [Designs by the author]..

2β) The *First Reconstruction* (*terminology according to Klinkott*[58]) includes an increase of the width (1,20→3,50μ) of the Wall[59] of Early VI, on the same outline (Fig. 4-right). "Dörpfeld and Blegen[60] found its traces at some Houses (Pillar [Wall R], VIG, VIF, VIQ), at the Gate VIU(f-h), and behind 'Section VI19-20'/'Bastion VIk' (Klinkott 2004, 79, 68). This *Reconstruction* of the 3,50m width, dated at 1500-ca.1490BC,[61] is "twice as strong" [62] compared to 2,70m of Section 5 (next to the "Scaean"/western Gate VIU); the construction of Section 5 constituted obviously the first effort to strengthen the fortification, just before the general increase of the Wall-thickness to 3,50m.

3) The *Second Renovation* (Fig. 5-upper), ~5m thick,[63] dated at 1425(-)/(~1410)BC,[64] *was materialized after the demolition of a part of the earlier Wall* (around its eastern Gate (Fig. 25-lower)) and includes the construction of the new Eastern Gate VIS -without its overlapping wall (Fig. 8)-, some walls behind the Gate VIU and the Sections 2-3, [65] which were erected outside the earlier Wall, that was demolished[66] because "perhaps was weakest";[67] however, the weakness of a fortification is discovered ***only after an enemy has breached it***.

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[57] Blegen 1953, 1:111, 1:191, 1:200, 1:219-220, 1:254. Giannakos 2024, Fig. 3-upper.

[58] *As §4.1.3-4.1.4-4.1.5.too.*

[59] Klinkott 2004, 70; Blegen 1953, 1:194.

[60] O.c., 1:**111**-2, 1:**194**, 1:81; Dörpfeld 1902, 1:124.

[61] Klinkott 2004, 75-76, 79: *early-15th century*. Blegen 1953, 1:111: *early-VIe*. Dörpfeld 1902, 1:123.

[62] Klinkott 2004, 68. Relation between horizontal Moments of Inertia=(1*3,50^3)/(1*2,70^3)=**2,20**.

[63] O.c., 61-62, 70-71; Dörpfeld 1902, 1:124. Blegen 1953, 1:84-85, Sections, **2**→4,50m, **3**→4,75m.

[64] Klinkott 2004, 42-44, 79-80: *VIf-beginning*; Blegen 1953, 1:111: *VIf*, *not far from 1400*.

[65] O.c., 79.

[66] Blegen 1953, 1:112, 1:81.

[67] O.c., 1:109-110.

Moreover, “at the side of the South Gate VIY of that era (Middle VI) [Fig. 9-left], *the Pillar House* touched *the earlier Wall*;[68] it *was clearly a military installation, arsenal-or-barracks*”,

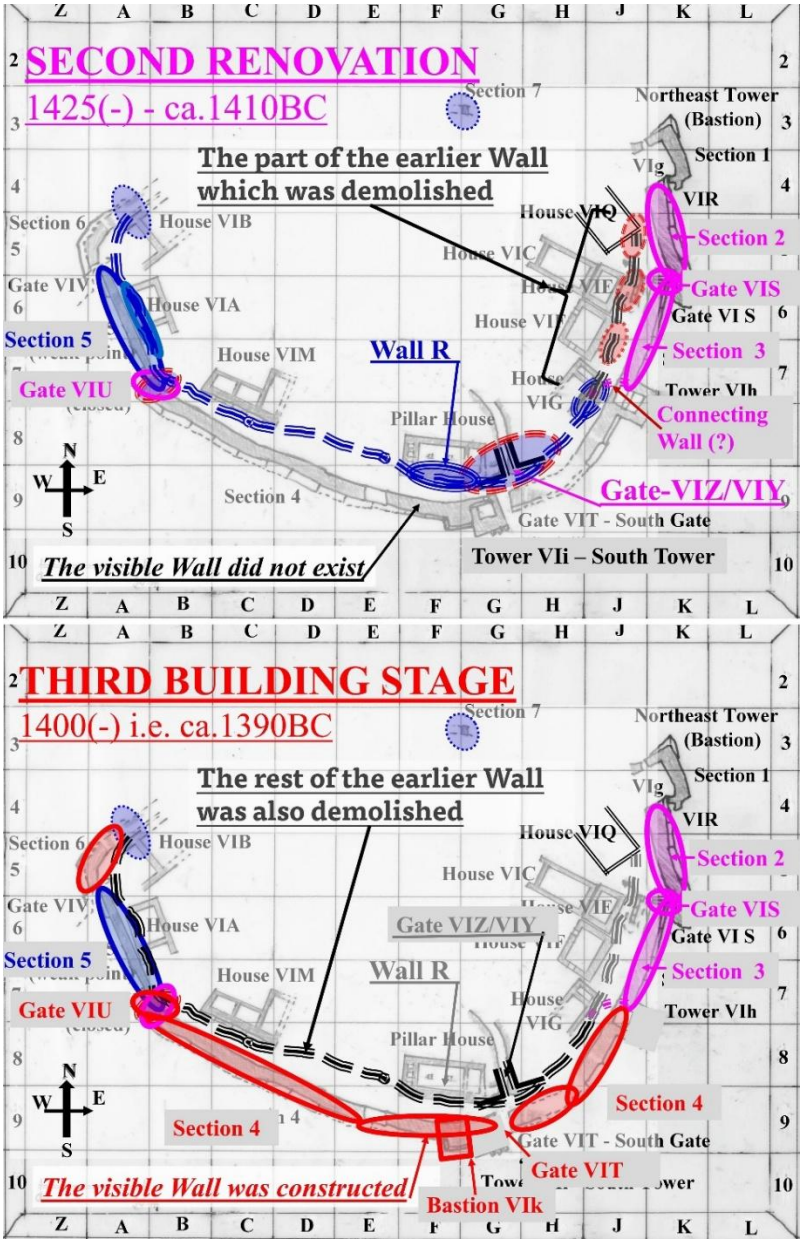

Figure 5. *The Second Renovation* (pink ellipses), with dim grey triple dashed line the demolished part; A probable -connecting the 2 fortifications- Wall is depicted [**upper**]. The 3rd Building Stage (red ellipses); for the Gate *VIU*, see §4.2 [**lower**]. Cf. Becks 2006, Abb. 2-3.

which served the defense of the city, ***only*** “during Troy VIf:[69] seventeen terracotta-pellets/sling-bullets were unearthed there”.[70] Afterwards, “its use was changed to (more) domestic and it functioned as spinnery-or-workshop (Troy VIg) and dwelling house (Troy VIh)”.[71] *These finds point towards ‘a siege’/sieges during-Troy VIf*.

[68] Blegen 1963, pl. 50: photo *of the Pillar House* in contact to the Wall.

[69] O.c., 1:187, 1:**228**-229, 1:**232-233**.

[70] O.c., 2:305, *photos of the pellets*: Blegen 1963, fig.1, 230, too.

[71] Blegen 1963, **133**.

4) The *Third Building stage* (Fig. 5-lower), 5m width,[72] followed (~1390BC)[73] the demolition of the rest of the earlier Wall and the "vigorous house-cleaning" (*1400BC*, *VIf-end/VIg-beginning*). It includes the construction of Sections 4, 6 (which were also built outwards in ground-plan), the Bastion VIk of 4,65m[74] width, and *successive reconstructions in the Western Gate/"Opening" VIU* (§4.2.3γ: 'VIU-VIUf-h'/'VIU-VIUi-k'). The reconstructions and the demolition of the earliest Wall *show* ***a new breach of the fortification by enemies****, av.~20-30 years after the previous one.*[75]

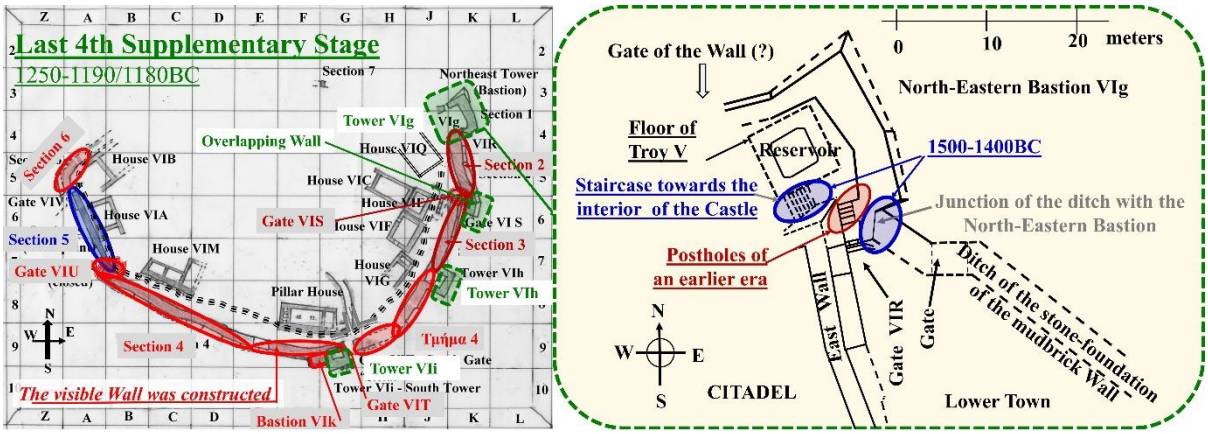

Figure 6. *The Fourth Supplementary stage*, (parallelograms with green dashed line) [**left**]. Detail of the Basion/Tower VIg [**right**]. [Design of the author based on Latacz (2004, 31, Fig. 6)· cf. Becks 2006, Abb. 2-3].

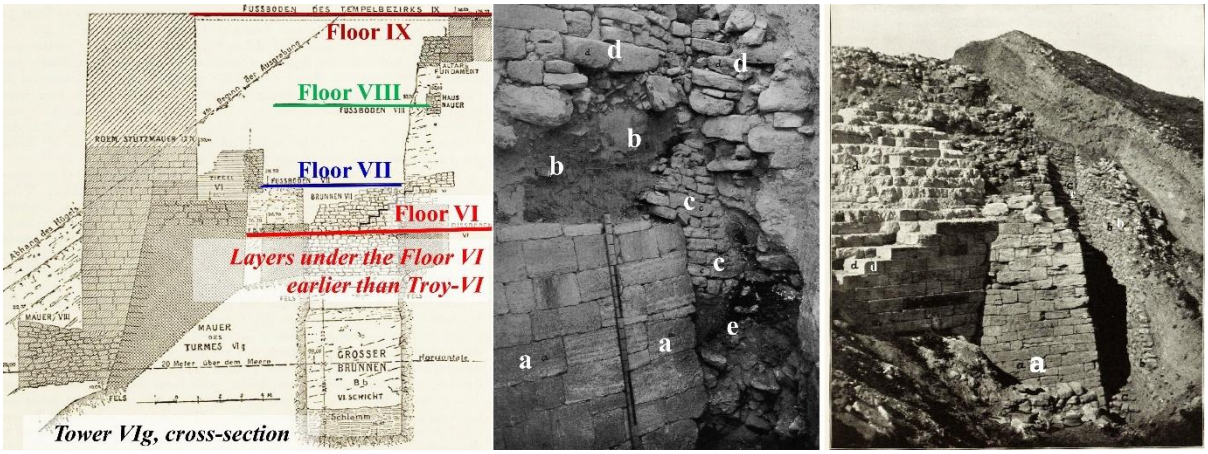

Figure 7. Tower VIg: Cross-section presenting the Floors of the phases of Troy [SOURCE: Dörpfeld 1902, 146, Fig. 53] (**left**). Layers of Troy VI depicted with a on the photo (**right**). The ashlar stone-masonry with (a) and the bricks with (b) belong to Troy VI, the wall (c) is a continuation of (a) and stands on loose rubble (e), *which, obviously, belong to earlier stages*; (d) belongs to Troy VIII (***middle***). [SOURCE: Dörpfeld 1902, beilage 14, 104, 116 (middle), beilage 22, 144 (right)].

[72] Klinkott 2004, 61, 70-71. Blegen (1963, 123) and (1953, 1:106). Dörpfeld 1902, 1:124.

[73] O.c., 124: *early-Vig*; Klinkott (2004, 80): *early-14th century*.

[74] Klinkott 2004, 79; Blegen 1953, 1:93.

[75] Giannakos 2024a, 33-34: proposed relation to the ancient Literature.

5) The *Fourth Supplementary stage* (1250-1190BC) includes the attachment of the Towers VIi, VIh and the overlapping-wall of the Gate VIS [76] (Fig. 6-left). The Tower/Bastion VIg was dated with great discrepancies: "after Section 2",[77] "with Section 4, earlier than Towers VIh-VIi",[78] or at 1250-1190BC[79]. Potsherds dated to Middle VI (1500-1400BC) were found at the junction between the Bastion/Tower VIg and the ditch of the stone foundation of the mudbrick wall of the lower town[80] (Fig. 6-right); *these finds warrant the dating of the construction of the mudbrick wall at its joint with the Bastion VIg*. The (internal) stair leading to the interior of the castle is contemporary to the mudbrick wall, some postholes between the two staircases are dated even earlier,[81] and an inner floor(=bearing-structure, not its covering-material/tiles) of Troy VI overlies "older foundation layers"[82] (Fig. 7). *An earlier defensive structure existed, obviously, at this area.*

4.2 Gates

The Gates are the vulnerable points in fortifications, where the attacks are directed; they must be secured sufficiently[83] *via the defensive designs and the available Technologies of each era*. Moreover, their reshaping(s) are easier than the redesign of the curtainwall.

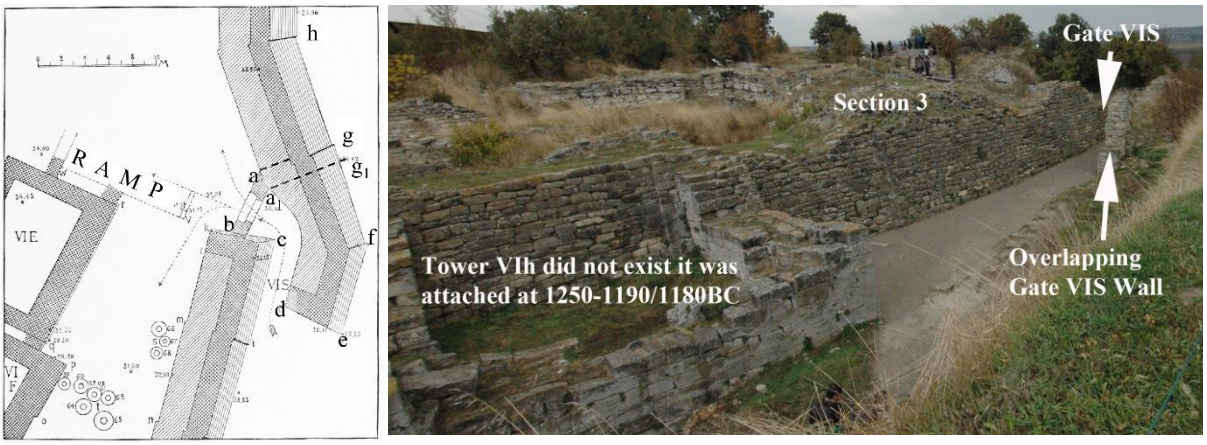

Figure 8. Eastern Gate VIS, *before* (when Section 2 was ending at a_1g_1) and *after* the construction of the overlapping Wall-section (a_1-g_1-*f*-*e*-*d*-a_1) [**left**] [Dörpfeld 1902, 1:127, fig. 40]. Photo shot by the author (**right**).

1) The *Eastern Gate VIS*, originally (1425(-)-(~1410)BC) had only the sections *b*-*c* and a_1-g_1, which functioned as *rudimentary Bastions* with minimum side protection; this protection was improved in ~1250-1190BC, when the overlapping Wall a_1-g_1-*f*-*e*-*d*-a_1-*a* was built beyond ag/a_1g_1[84] (Fig. 8). Then, the defenders could shoot easily *against both sides of the attackers*.

[76] Klinkott 2004, 80-81, 68. Becks 2006, Abb. 2-3.

[77] Blegen 1963, 119.

[78] Dörpfeld 1902, 1:139, 115.

[79] Klinkott o.c..

[80] Latacz 2004, 30-31, 11.

[81] O.c.. Korfmann 1999, 17-19, by Aslan 1999, 42; Dörpfeld 1902, 144-150; Blegen 1953, 1:82.

[82] Klinkott 2004, 37; Dörpfeld 1902, 1:144-6.

[83] O.c., 77; Rey 2016, 38.

[84] Dörpfeld 1902, 1:124-128; Klinkott 2004, 42.

2) The *South Gate VIZ-VIY-VIT* presents four reconstruction stages (Fig. 9-left):

2α) *Gate VIZ* at Early VI;

2β) *Gate VIY*, of Middle VI, which was reoriented, shifted a little to the west and twisted, and replaced Gate VIZ, at 1500-ca.1400BC;

2γ) *Gate VIT*, which replace *VIY*, "*when the castle was enlarged to the south*"[85] in a new outline (early-VIg/'~1390BC'): the Bastion VIk and the -functioning like a Bastion- Section 4 protected VIT, securing shots against both sides of the attackers (Fig. 9-right).

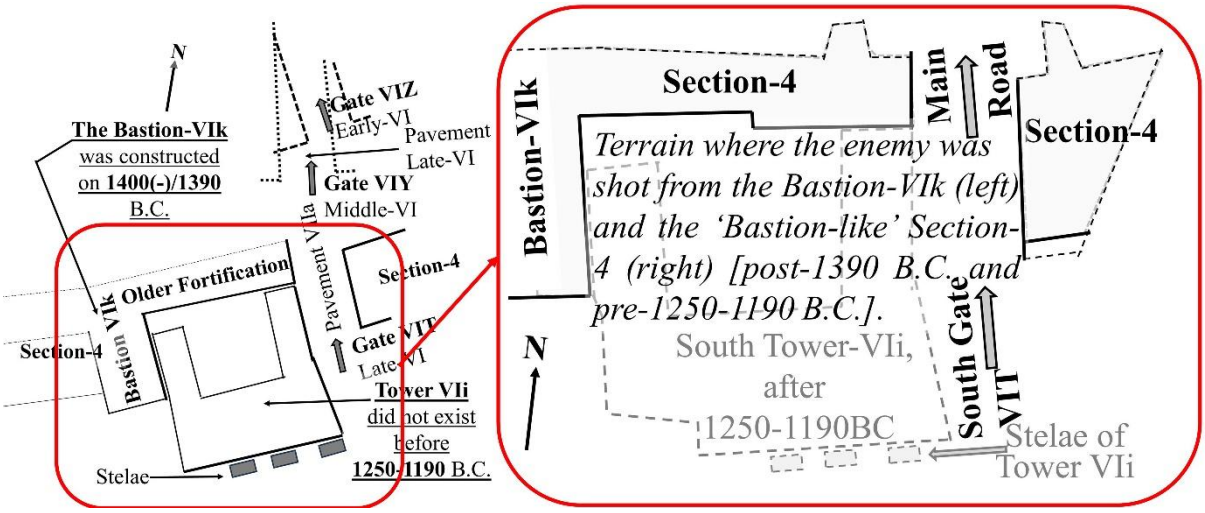

Figure 9. *South Gate VIZ-VIY-VIT* (**left**). Detail of the Gate VIT between 1390-1250/1190BC (**right**). [Designs by the author based on Blegen 1953, 2:fig. 452; see. Becks 2006, 157, Abb. 2].

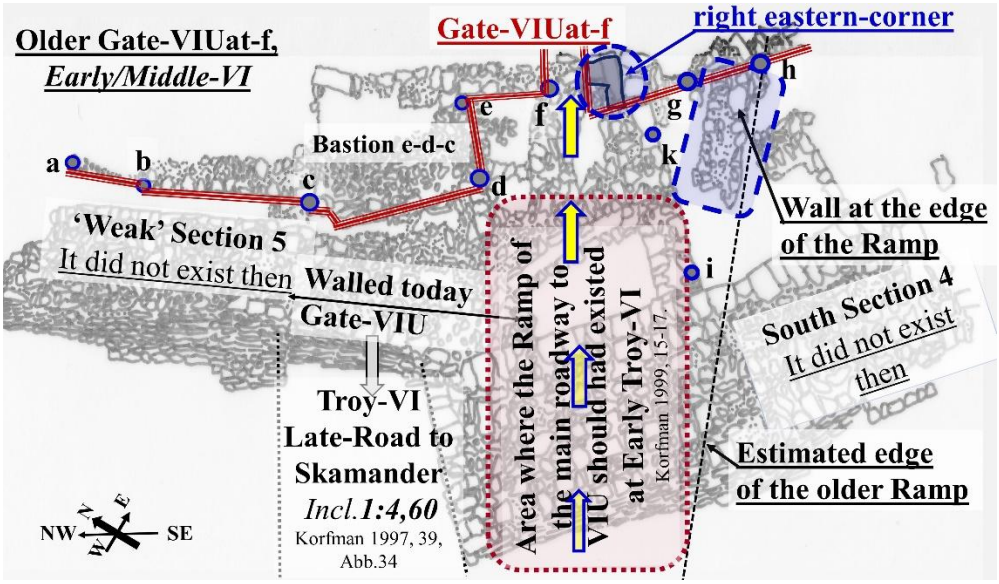

Figure 10. The *Western Gate VIU-at-f*, with opening-width for the passage of a chariot or carriage. [For the Figs 10-13, *see Bibliography*].

[85] Klinkott 2004, 59-61, 80; Blegen 1963, 117.

2δ) The attachment[86] of the *Tower VIi* for better protection, at 1250-1190BC,[87] which embodied the -preexisting since ca.1390BC- *Bastion VIk*.

Between ca.1390-1250/1190BC, the Gate VIT, ***without any Tower***, *was protected by two Bastions one on either side*.

3) The "*very important*" *Western Gate VIU*, of 3,60-4,0m opening, *it was the widest of the Gates* (*0,40-0,80m wider than the Gate VIT*); "the remains of three gates one on top of the other" were revealed there (Klinkott 2004, 66, 63: 3,60μ):[88]

3α) *Gate VIU-at-f* (Fig. 10) *had the opening-width for the passage of a chariot or carriage, existed during the Early and Middle VI, and belonged to an earlier Wall a-b-c-d-e-f-g-h, ≤1m thick, which predated Section 5*. At *e*, this wall jumped 1m out of flight against the enemy side towards *d* and, with *c-d*, formed the Bastion *e-d-c* ca.4,50m wide, which protected *the Gate*. Today, only a joint in the masonry, the "*right eastern corner*" of this Gate, is preserved.[89] "A ramp of 1:4,60 inclination has been unearthed, which belonged to a road towards Skamander river through a Gate of the lower town";[90] this ramp *belongs to the Third Building Stage* (*3β-3γ*, below), since, "immediately outside the later 'Gate'/'Opening' VIU (Square A7, Figs. 4-6), layers of *Early VI* were also unearthed", *namely contemporaneous to the Wall a-b-c-d-e-f-g-h*, "whose presence leads us to conclude that the earliest route to the citadel/castle" -before the construction of the road with inclination 1:4,60- "must be sought (Fig. 10-11) further to the **S**outh-**E**ast/**SE** (of VIU)" (Korfmann 1999, 15-17).

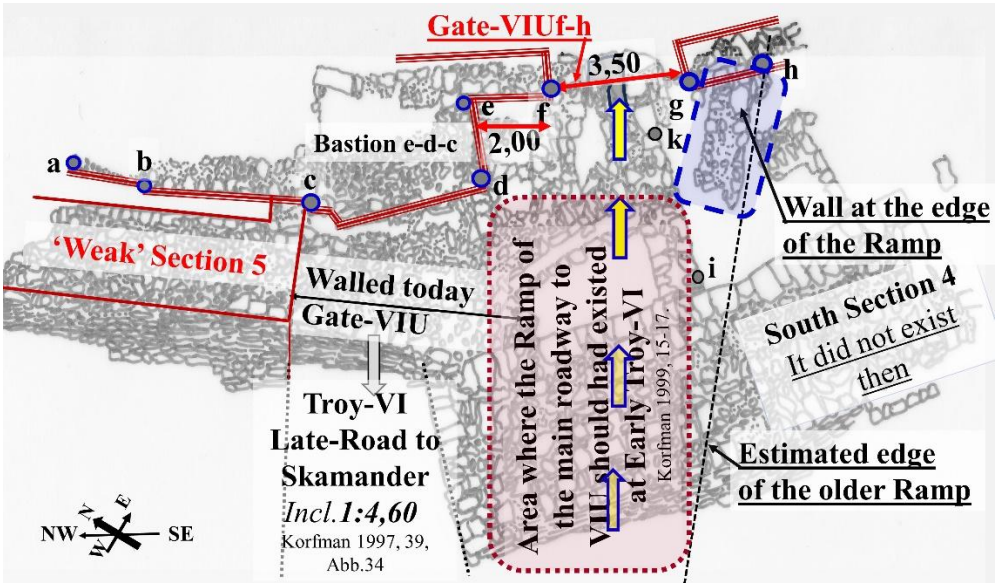

Figure 11. The *Western Gate VIUf-h*, (was built) higher and on the axis of the *earliest ramp* (dark red parallelogram with dotted line), NW of the later Road (inclination 1:4,60).

3β) The *Gate VIU-at-f was later closed*, and a new wider *Gate* (VIUf-h) was opened, *at the same place but at a higher elevation*, bordered by two 1,20m wide wall-strips, at *VIUf*, *VIUh* (Fig. 11). This *Gate* had 3,50m opening -the widest of all the Gates of Troy VI, *consequently,*

[86] Blegen o.c..

[87] O.c..

[88] Klinkott 2004, 66, 63: **3,60m**, 64: *very important*. Blegen (1953, 1:101): **3,80m**, 333. Korfmann 1997, 38. Dörpfeld (1902, 1:135): **4,00m**.

[89] Klinkott 2004, 66.

[90] O.c., 64-65; Korfmann (1997, 39, Ab.34, 38) and (1998, 37).

it was Troy's main Gate- , was located 2-3m away from the, *Tower-like*, *Bastion e-d-c* and on the axis of the *earliest ramp*; this ramp presented now an increased longitudinal inclination after the rising of the Gate's elevation: this made the access more difficult for the enemy as a counter-balance for the widening the Gate. However, *the VIUi-k* "*allowed the most unhindered passage of vehicles*".[91]

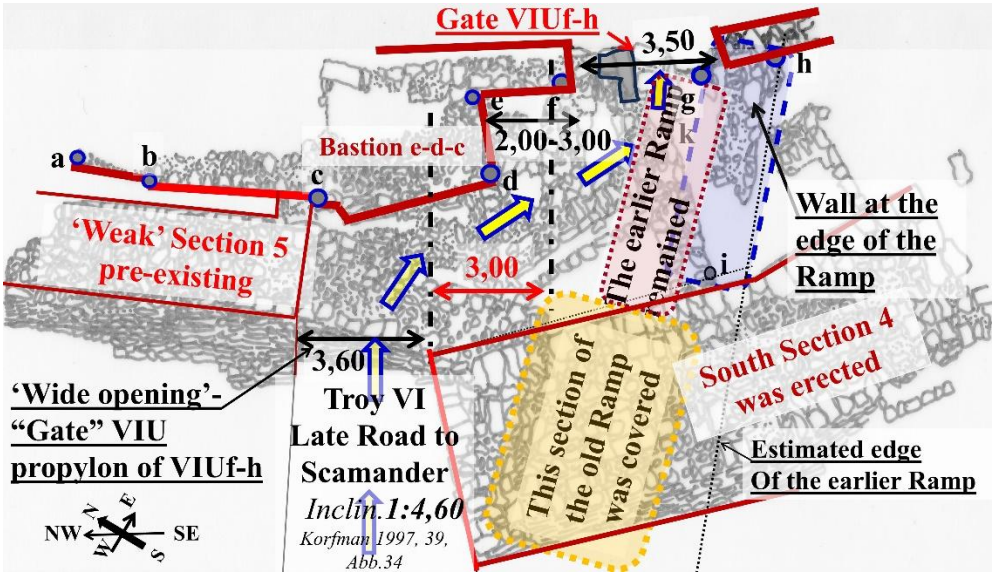

Figure 12. At ca.1390π.X., the wide 'Western opening/"Western-Gate" VIU (~1390π.X.), ~3,60m width (the dimension with red color); it was located ~3m (*the dimension with red*) *to the* ***NW*** of the Gate VIUf-h and functioned as its Propylon-"Vortor". The *earliest ramp* was partially covered by earth (orange parallelogram with dotted line) in order for Section 4 to be built on it; a part of the ramp had remained in function (dark red parallelogram with dotted line). *It constituted a first attempt to create a winding path with more steep inclination*.

3γ) The 'wide opening'/"Gate" *VIU was created* ***with the construction*** (~1390BC) ***of Section 4***, as "***a wide external opening*** *in the new much thicker Wall, moved 3m to the* ***N****orth-****W****est/****NW*** (Fig. 12). It was not on the axis of the older Gate VIUf-h, *which initially had remained in function*. "The *Wall a-b-c-d-e-f-g-h still had to be maintained in this area*". The "'opening'/'Gate' VIU' served as a Propylon(='*Vortor*')" of *VIUf-h*; "*an 'annoying-for-the-traffic' corner at VIUd still remained in the very narrow space between the two fortifications"*[92] (*a-b-c-d-e-f-g-h, Section 4*). *After the construction of the* (*functioning as a Bastion) Section 4 over a part of the earlier ramp 'that had been covered by earth*'",[93] the "*access to the citadel," via the VIUf-h, "was very difficult,* ***if it was possible at all due to elevation differences***" (Fig. 14-left). "*The access to the citadel was less important than the better defensive design of the Gate"*.[94]

However, "***the Gate VIUf-h*** **was walled up**, a little later ('after-the'/'waiting-for-the' campaign of Tudḫaliya(?) (**§9)**), while *a new access-road was created*, leading around the

[91] Klinkott 2004, 63-65/66.

[92] O.c., 65-66, 77. Blegen 1953, 1:109, 1:165.

[93] O.c., 65-66.

[94] O.c., 77.

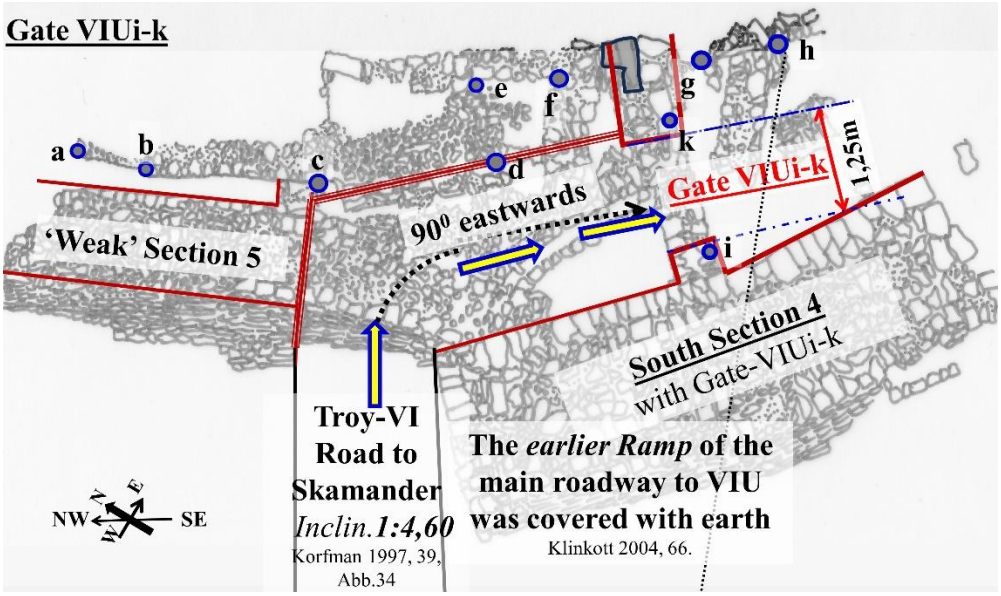

Figure 13. The *Western* Gate VIUi-k was re-oriented 90^0 eastwards (more difficult winding road), with an inclination 45,00%-59,30%.

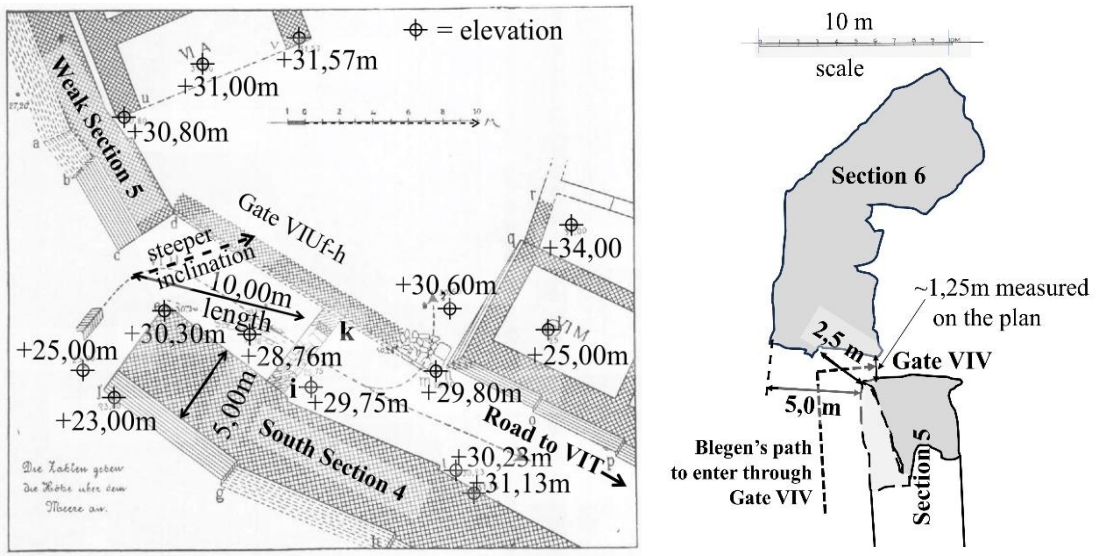

Figure 14. The *Western Gate VIUi-k* with elevations in relation to the sea-level (Dörpfeld 1902, 1:136, fig. 46) [**left**]: inclinations 45,00%-59,30% prohibitive for vehicles. *Towards the Gate VIUf-h, the inclination was even more steep* [SOUECE: Dörpfeld 1902, 1:136, fig.46]. The Gate VIV [**Right**]. [Designed by the author, based on Blegen 1953, 2: fig. 504].

'dressed end'[95] of Section 4 with an almost 90° turn to the east towards the Gate VIUi-k"[96] of 1,25m opening (Fig. 13, 14-left). *The VIUi-k* "*was no longer an option for wagon-traffic*".[97] "A Gate-lock was added at the Gate VIUi-k", not *at the opening VIU*, "*during Dörpfeld's Third Renovation*"[98] [ca.1390BC]: (*this implies that*) *the VIUi-k was created* '*almost-simultaneously-with*'/'*immediately-after*' *the Dipylon* "*Propylon-VIU*"-"*Gate-VIUf-h*" (§4.1.3-4)**.**

[95] Blegen 1953, 1:101.

[96] Klinkott 2004, 65-66.

[97] O.c.. Blegen (1963, 123) and (1953, 1:101-102).

[98] Klinkott 2004, 77, 67.

The absolute floor elevations at the doorstep of Gate VIU [+25,00m], of the soil at Houses VIM [+30,60m], VIA [+30,80m] and behind the *Gate VIUi-k* [+29,75m] (Fig. 14-left), "presented too steep inclinations of: 4,50-4,75(+)m in a length of 8-10m"[99] (45,00%-59,30%), prohibitive for vehicles, while "this was a great advantage for the defense".[100] Moreover, the later ramp to the Skamander, of 1:4,60 (21,74%) inclination, presented also a very steep inclination.

3δ) Finally, the *Dipylon 'VIU-VIUi-k' was walled-up* after 1190/1180BC,[101] (Fig. 17-right), as it took place in the *VIUf-h* at 1400/(~1390)BC,[102] during the apogee of the Mycenaean power. Dörpfeld[103] believed that the Gate VIU was walled up "to improve the defense, due to war, which resulted in the destruction of Troy VI".

4) The *Gate/'postern-Gate' VIV* of "barely 1,50m"[104] opening and 2,50m width (Fig. 14-right) "is rather narrow for a gateway of any importance",[105] with apotropaic pillar/stele.[106] Section 6, as a Bastion, extends 5m westwards beyond Section 5; a roadway, along Section 5, turned 90^0 eastwards through its opening, since the attackers were shot from both Sections 5-6.[107]

5) "*Scaean(s) Gates*": Homer locates the Greek Camp and Ship-Station "*ἐπὶ πλατεῖ Ἑλλησπόντῳ*"(="*by the wide Hellespont*"),[108] the opposite of today's 'narrow Hellespont'. From there, the Achaeans attacked Troy, traversing the Skamander valley. The Trojans,[109] on foot or on chariots, <u>*all the time*</u>, exited to the "*Ilieion pedion*"/*Skamander-valley* and returned to Troy through the "Scaeans Gates",[110] which were adjacent to a "*weak Section of the Walls and a Tower*",[111] from where they watched the battles.[112] "Scaean" means west, at-left. The *western Gate VIUf-h*, before 1400-'ca.1390'BC, was the widest (Gate) of the fortification.

The Iliad maintains, obviously, *recollections of "the most unhindered passage of vehicles," through the pre-1400 "Scaean" Gate VIUf-h* (*Troy VIf*) *belonging to the 3,50m thick Wall a-b-c-d-e-f-g-h, which (Gate) was protected by the 'Tower-like' Bastion e-d-c and was located next to the "weak Section 5"* (*2,70m<3,50m*).

5 Absolute Chronologies of the Periods LHIIIA1-LHIIIA2

The absolute chronologies of the periods LHIIIA1-LHIIIA2 are of great importance for the correlation of the sub-phases of Troy VI with the Mycenaean Palace period. However,

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[99] O.c., 65, 67.

[100] O.c., 67, 72; Blegen 1963, 123.

[101] Klinkot 2004, 78-81, 64.

[102] Cf. Blegen 1953, 1:101-102.

[103] 1902, 1:137-138.

[104] Blegen 1953, 1:104.

[105] Klinkott 2004, 70-71.

[106] O.c..

[107] Blegen 1963, 123-124.

[108] Hom.*Il*. H/7:84-86, 17:429-433, 15:431-435, translation by the author. Giannakos (2024a, 20-21): maps, geological research, analysis, bibliography. Γιαννακός 2024b, 18-20.

[109] Hom.*Il*. Λ/11:160, Υ/20:427, translation by the author. Giannakos 2024a, 20-21.

[110] Hom.*Il*. Γ/3:259-64, 11:165-185, 16:710-715, translation by the author.

[111] Loader 1998, 86-87: Bastion-Tower are interchangeable terms.

[112] Hom.*Il*. Z/6:431-9, 3:146-155, translation by the author. Blegen 1963, 14-15.

considerable controversy has arisen because the ^{14}C radio-dating differs from archaeologists' datings.[113] Thus, two chronologies were derived, high and low: "*the **high dating** reflects the results **of the most recent studies**, mainly through radio-dating*, while the low dating is based on the traditional method through correlation and synchronisms with Egypt and, to a lesser extent, with Mesopotamia".[114]

LHIIIA1 is dated to ~1440-1390BC (high) or 1390-1370/1360BC (low), and LHIIIA2, is dated to 1390-1300 or 1370/1360-1300BC, respectively,[115] while, o*n average, **in the high dating**, LHIIIA1→~1440/1425-1390/1380BC and LHIIIA2→1390/1380-1300BC*.

6 Mycenaean Technology in Troy VI

Evaluating the archaeological finds, we conclude:

1.- *Defensive design of the Fortification*: the Gates of Troy "were constructed initially without flanking protection; later (~1390π.X.), Bastions flanked the Gates":[116] the Bastion VIk protected the Gate VIT, Section 4 protected the 'VIU-VIUf-h'**/**'VIU-VIUi-k', Section 6 protected the VIV and rudimentary Bastions protected the VIS (1425-(ca.1410)BC).

O **Blegen**[117] underlines that "it is not a coincidence that Section 4", *which functioned as a Bastion*, "makes its appearance with the fortresses of Mycenae and Tiryns". Dörpfeld (1902, 1:107-181), who "*discovered the fortification Walls in association with much Mycenaean pottery*",[118] characterized Troy VI as "Mycenaean castle". After the re-excavations by Korfmann, Klinkott (2004, 77) points out: "*the design* (of the fortifications) *has no resemblance either to Hittite, Syrian or Mesopotamian comparative examples* (see §9-10) *and corresponds more to the Mycenaean West*".

Furthermore, the existence/influence of Mycenaean Technology in other fields as well is ascertained:

2.- *Anti-seismic Techniques of undertaking the tensile stresses in a stonemasonry*:

(i) *Use of Wooden Beams in Stonemasonry*. *The Houses VIE* (which was constructed after 1425/(ca.1410)BC)[119] *and VIF* (which had been constructed at Troy VIe, but has been significantly renovated after 1425/(ca.1410)BC,[120] as the layer of rejected debris between the House VIF and Section 3 proves), *are located within the Citadel, where the Royal Family and élite of Troy resided*.[121] "On the internal and external surfaces of the walls -south, west and north- of the two Houses, we can see horizontal cavities, where large wooden beams were

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[113] Shelmerdine 2008a, 3-6.

[114] O.c..

[115] O.c.. *Also*: Manning 2012, 23: 1420/10-1390/70-1330/15; Betancourt (1987, 48): *radio-dating*, ~1490-1430/10-1365BC; Cullen 2001, 332: *LHIIIA1*→1425/1390-1390/1370 (high), 1390(+)-1370/1360 (low), LHIIIA2→1390/1370-1340/1330 (high), 1370/1360-1340/1330 (low); Pavúk (2007, 475), Simpson-Hagel (2006, 22). Giannakos 2019b, Annex-3.

[116] Klinkott 2004, 75.

[117] 1953, 1:112.

[118] Blegen 1963, 30.

[119] Blegen 1953, 1:110

[120] O.c., & 1:320, 1:194, 1:200, 2:Fig. 482.

[121] Cf. Maran 2023, 40-42: *there was a restriction of access for citizens within the Walls in Mycenae*.

placed as an anti-seismic framework", in order to absorb the tensile stresses, a technique "similar to the Mycenaean (technique) in Palaces and Castles (e.g. Mycenae, Pylos)".[122]

This method of anti-seismic reinforcement, with wooden beams for the undertaking of the seismic tensile stresses, constituted a precocious and efficient stratagem to undertake tensile-stresses, since the tensile-strength of stone-masonry is almost zero and the reinforcement (with wood or metal in later times) is mandatory to avoid failure.[123] (This method) with the ashlar masonry had already appeared at Vassiliki of Ierapetra at Crete during the Pre-Palatial era, and at the first Palace at Phaistos during the Proto-Minoan era.[124] At Akrotiri of Thera they had become very popular at the latest habitation phase *before the eruption of the volcano (1613±13[125] or 1570/1530(+)BC[126])*, and had been widely applied as in Crete too.[127] During the late-**M**iddle-**H**elladic they spread in Peloponnese, due to the influence or active presence of Minoan builders, and became finally part of a Mycenaean style.[128]

(ii) *Undulating Joints along the Wall* (1425(-)-'ca.1390'BC).

Oblong vertical load-bearing elements (Walls) undertake a very large percentage of the horizontal seismic loading, due to their great stiffness in the direction of their length. They resist the loading-force with their internal shear resistances along the direction of their length. The existence of curved stone-blocks (*consequently, of the undulating joints too*) *in a stonemasonry increases the shear resistance in differential movement to the direction of their length.* Of course, the occurrence of differential settlements could activate a small (relative) sliding of the stoneblocks. However, curved surfaces of the stoneblocks may occur during their extraction, due to the rock-quality and its degree of processing difficulty, which depends on whether it is sedimentary, metamorphic or igneous. The level surface of the stone-blocks (and of the joints too) increases the compressive strength of the wall, while the curved surface increases the parasitic tensile-stresses and decreases the compressive strength. The shaping of the stone-blocks with perpendicular faces is more favorable for the undertaking of the earth thrusts.[129]

In Troy VI '*joints of undulating form*' *along the Wall* appear at the lower parts of 'Section 3'/'VI:7-8'[130] and the Tower VIg (Fig. 15).

Joints of undulating form along the Wall exist *at the North-Eastern Bastion of Mycenae* (Fig. 16-lower), extending to its full height. At the sidewalls of the Dromos of the Treasury of Atreus (Fig. 16-upper) were applied only to the four visible rows in the lower area of the wall, while in the eight overlying rows, the stone-blocks are again arranged in horizontal layers.

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[122] Blegen 1963, 134; Dörpfeld 1902, 1:110.

[123] Giannakos 2019b, 51-52, Fig. 8a-b.

[124] O.c.. Παλυβού/Palyvou 2005, 14-15. Tsakanika-Theochari 2009, 138. Γιαννακός/Giannakos 2016b, 298.

[125] Friedrich-Heinemeier 2009, 59; Warburton 2009a, 298.

[126] Pearson et al. 2018, 4; Manning et al., 2020, 9; Warren 2009, 182, 195.

[127] Shaw 2009, 63-64. Palyvou 1999, 611.

[128] Wright 2006, 17.

[129] I thank Professor T.P. Tassios, for the discussion with the author on the topic of joints; any errors in the text are solely mine.

[130] Klinkott 2004, Tafeln-Übersichtsplan: 'VI:7-8'='Τμήμα 3'.

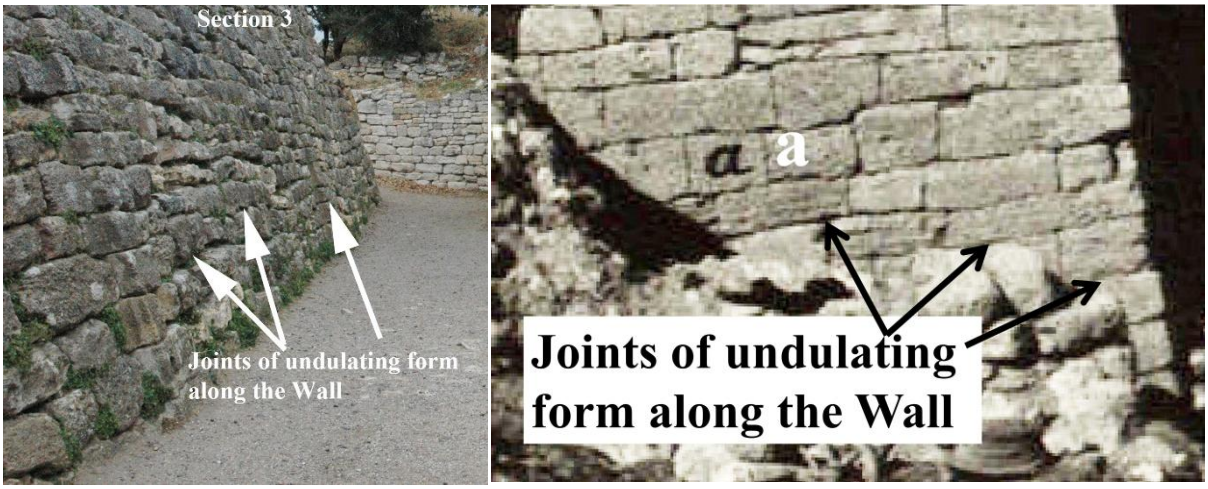

Figure 15. Troy VI, joints in stonemasonry of undulating form along the Wall: Section 3 (Fig. 8-right) [***left***]. The foot of Tower VIg; (a) belongs to Troy VI (Fig. 7-right) [***right***].

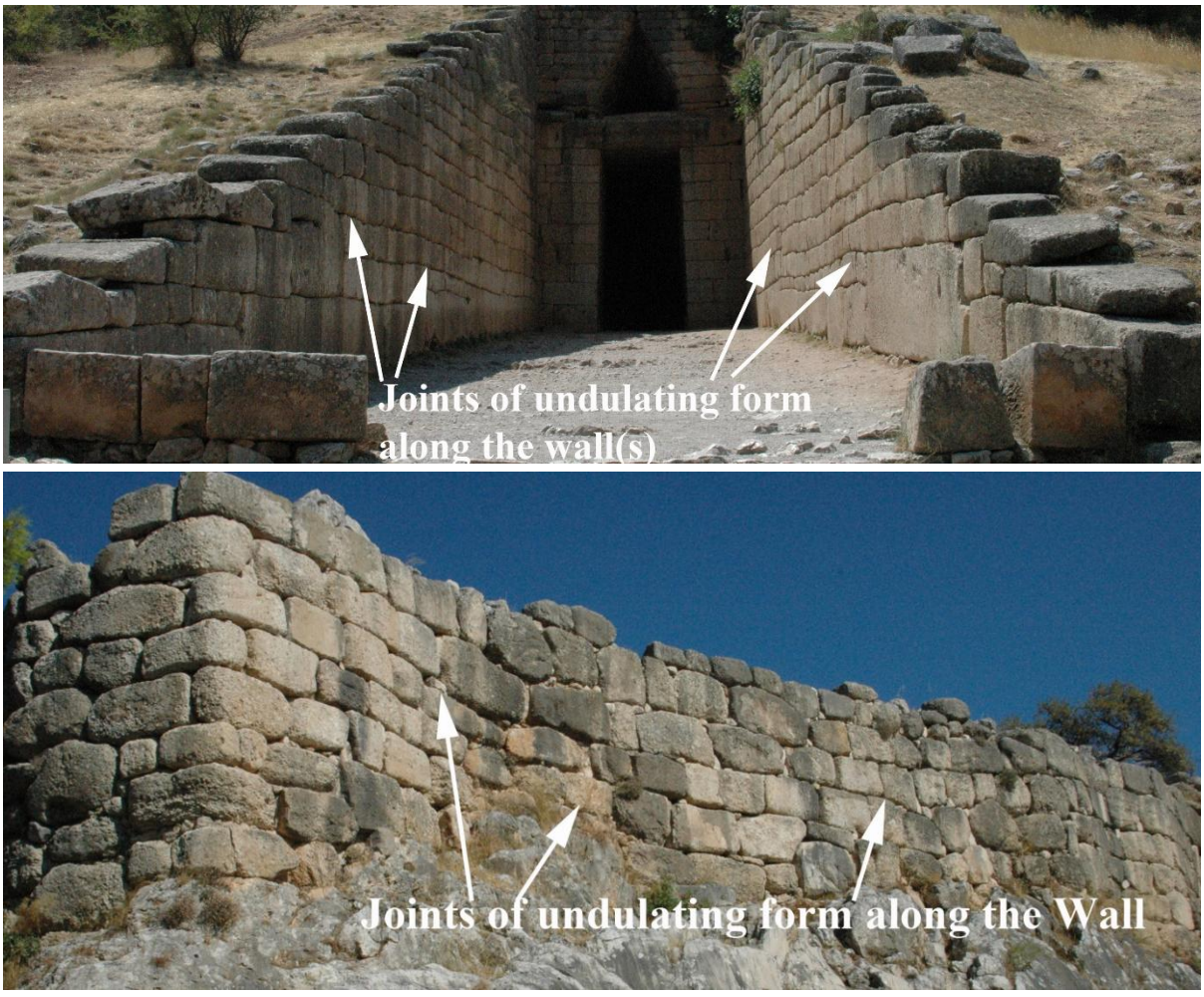

Figure 16. Joints of undulating form along the stonemasonry: the Dromos of the Atreus' Treasure (upper). North-Eastern Bastion of Mycenae (lower). [Photos of the author].

The dating of the construction of the “Treasury of Atreus”, or “Tomb of Agamemnon” ,[131] is difficult to be determined with precision.[132] Recent views vary between LHIIIA1[133] and early-LHIIIA2.[134] Its construction is dated from "finds of the LHIIIA1-LHIIIA2 periods on its Dromos, as well as deposits of LHIIIA1 pottery fragments, in a bothros crossed by the Dromos".[135] One unique LHIIIB ceramic sherd "appears to be a later intrusion from a renovation of the Tomb".[136] Tholos tombs were no longer constructed in LHIIIB.[137] *In the foundations of the walls of the Dromos*, Wace (1926, 111) states that, in undisturbed layers, sherds of LHIIIA pottery have been found. In any case Evans found *earlier fragments of stone vessels*, similar to LMI Cretan ones (1600-‘ca.1440’BC), which Wace considers that they may have been brought down from the slopes on either side of the Dromos. The northern Wall of Mycenae is dated at LHIIIA1.[138]

Therefore, the *Mycenaean craftsman* either deliberately shaped the curved surface of the joints or the nature of the rock led him to the curved form, because he could quarry the stone-blocks only in such a way. However, *the joints of undulating form, in long lengths and in consecutive series of stoneblocks, leads us to the conclusion that their formation was probably intentional*.

Of course, a question arises: *before the Mycenaeans, have the fortifications of Troy presented joints of undulating form*?

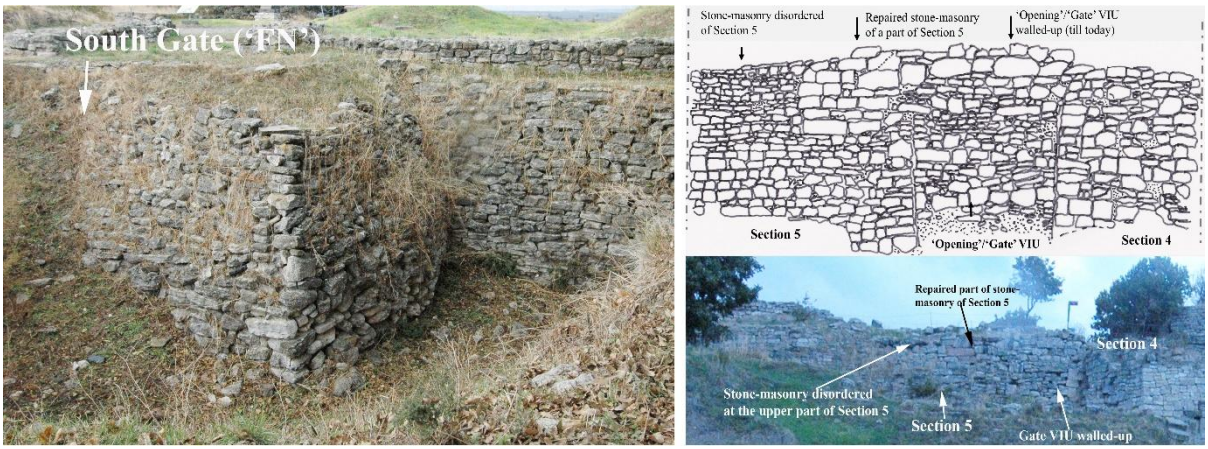

Figure 17. Fortification of Troy I (Fig. 25-lower: Gate FN) [**left**]. Section 5 (**right**). [Design by the author based on Klinkott (2004, Taf.23); author's photos].

In the Wall of Troy I (3.000-2.500(+)BC, [Blegen 1964, 174]) there are no joints of undulating form, but only straight ones, as far as they can result from the treatment of the rock (Fig. 17-left).

[131] Mylonas 1957, 85.

[132] French 1963, 46, n.29. Pelon 1976, 409.

[133] French 2002, 69.

[134] Cavanagh-Mee 1999, 1:94.

[135] O.c., 1:93-95.

[136] Footnote 132.

[137] Footnote 133.

[138] Mylonas 1957, 33; Dickinson 1994, 160-161. French 2002, 52, Fig. 16.

In Section 5 (1500/ca.1490BC) no wavy joints undulating form are observed along the Wall (Fig. 17-right). It should be noted that the entire length of the upper part of Section 5 is disordered and has probably been repeatedly repaired; in its earlier lower part, the joints are straight.

Klinkott[139] *also argues that the joints of undulating form in the lower areas of Sections 2, 3 and Tower VIg are a characteristic anti-seismic technique found in the lower part of the side walls of the Dromos of the Treasury of Atreus. The wavy form prevents displacements in case of dynamic strain in an earthquake (§9, Maner 2023).*

Rey, in the "corrected version" (2012) of his PhD thesis at the University of Paris 1, Panthéon-Sorbonne, “Poliorcétique au Proche-Orient à l’ Âge du Bronze”(="Poliorcetics of the Near East in the Bronze Age"), has also included the fortifications of the area: there are no joints of undulating form along the Walls, in drawings, photographs and reconstructions of the Walls (p.24, 28, 31, 110).

Therefore, there is strong evidence that the joints of undulating form along the Wall constitute an influence of Mycenaean techniques.

3) The "finishing of the floors with quicklime(="Gebrannter Kalk"=calcium oxide powder (CaO))", which, "like the Mycenaean pottery" technique[140], "was probably imported from Greece (or another area), *is similar to the technique for floors in the architecture of Mycenaean Palaces*".[141]

4) *Hearths*: in House VIA a thick layer of ash from a hearth was found approximately at the middle of the Hall/Αίθουσα, similar to what has been found in the Megara of Tiryns and Mycenae.[142] It must be emphasized that "Hearths are the representative core of the residences of the Mycenaean rulers, at least from the Middle-Helladic/Proto-Helladic era"[143], or much earlier (Dimini/Iolkos, 3700-3550 BC).[144]

5) *Mycenaean-style ceramic objects of daily luxury* increase greatly[145], by ca.1400BC, in the Houses within the Walls, that is, of the (Houses of the) Ruling Dynasty and the highest officials[146], which indicates that, *after-1400BC, the Royal Dynasty and the élite of Troy were greatly influenced by the Mycenaean way-of-life in their daily luxurious living* (e.g. ‘Versailles effect’[147]). *It is highlighted that, "not a single object of any kind, which could be characterized as Hittite, has been identified in Troy VI"*[148]*,* while the biconvex seal -mentioned by many (scholars)- "with a hieroglyphic script generally used by the Hittites", is dated to Troy $VIIb_2$[149]

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[139] 2004, 44. Maner 2023.

[140] Footnote 295.

[141] Blegen 1963, 134; Dörpfeld, 1902, 1:111. Tournavitou 2023, 12; Blegen-Rawson 1966, 40, 43, 47, 55, 174.

[142] Dörpfeld, 1902, 1:152.

[143] Thaler 2007, 293, 307-310; Wright 2006, 41.

[144] Giannakos 2019b, 11, 37-38. Τσούντας 2000/1908, 50. Lawrence 1996/1983, 8-9.

[145] Mee (1978, 146-147) and (2008, 371); Blegen 1953, 1:39.

[146] Footnote 120: restriction of access to the area inside the Walls in Mycenae.

[147] Footnote 8.

[148] Blegen 1964, 11.

[149] Easton-Hawkins 1996, 115-118; Latacz 2004, 49; Bryce 2005, 361-362.

(after-1150BC), *when all the Mycenaean Palaces and the Hittite Kingdom had already collapsed (ca.1200-1190BC) and they were no longer influential.*

7 Design of Fortifications in Greece from the Neolithic until the Mycenaean era

In Greece, fortifications are perhaps the earliest collective, large-scale projects.[150] The first defensive precincts are found at Sesklo (5800-5300BC), Dimini (4800-4500BC),[151] and Strofila Andros, 4.000Cal/late-5th millennium BC.[152] Fortifications at Dimini[153] are dated at the last phase of Neolithic period. At Saliagos, between Paros-Antiparos, there is a fortification with a circular structure (probably a bastion), as the fortification of Proto-Helladic-II/PH-II (2700-2200BC) Lerna.[154]

Figure 18. Zaggani Attiki: Fortification (**upper-left**); Detail of the Gate with Bastion (**upper-right**) [from (Σταϊχάουερ/Steinhaouer 2001, 30-32), with his approval]. *Fortifications with Towers and Bastions* (footnote 111): Lerna (**lower-left**), Kastri Syros (**lower-middle**) Aegina Kolona (**lower-right**) [from (Παλυβού 2005, 16), with her approval; Τσούντας 1899, Fig. 32].

In Zagani of Mesogaia Attica (Fig. 18-upper), the Gate of the PEII fortification is configured with a winding entrance corridor protected by a bastion and the opposite curved part of the Wall, in the form of a bastion, for shots from both sides against the attackers; the Wall had built between the end of Final-Neolithic/FN (4600-4400BC[155]) and Proto-Helladic-I (3100(+)-

[150] Παλυβού/Palyvou 2005, 16; Γιαννακός/Giannakos 2016b, 285-286.

[151] Müth et al. 2016, 4: «Iakovides 1977, E161–E163, fig. 29, 163f».

[152] Lull et al. 2018, 13. Χρήστου/Christou 2022.

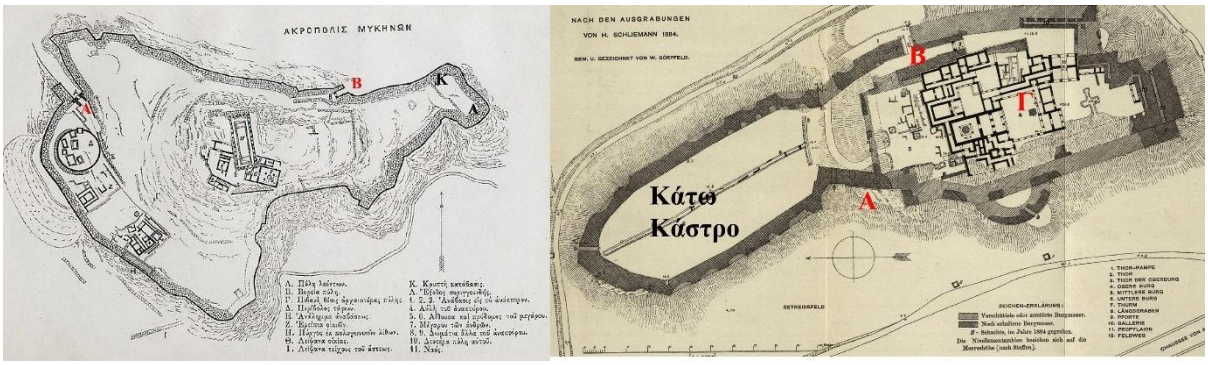
[153] Mylonas 1966, 45: Tsounta's excavations.

[154] Evans-Renfrew 1968, 9-10, 22-25, 81; Scoufopoulos 2001, 24-25.

[155] Tsirtsoni 2016b: radiochronology.

2700BC) and was strengthened the PH-II.[156] In Lerna III (2450/2350-2200/2150BC[157] or PH-I[158]/PH-II[159]) a fortification with Towers and Bastions were unearthed[160] (Fig. 18-lower-left) « *which is a precursor to the fortifications in Mycenae, Tiryns and Midea*».[161]

At Kiafa-Thiti at the southern foothills of Hymettus, two Towers with internal staircases are incorporated into the LHI-II fortification (~1580-1400BC) and protect the entrance ramp; "these fortifications give an idea of the possible nature of the earliest Mycenaean fortifications in Mycenae and Tiryns and constitute the forerunners of the more magnificent later Mycenaean constructions".[162]



Εικόνα 19. *Mycenae*: with red (A) the Lions' Gate, with (B) the postern gate; both of them with Bastions (**left**), [from Τσούντας 1893, Table 1]. *Tiryns*: with red (A) the area of the Gate ('pforte') with Bastions**;** (B) the Gate with winding access-road and a protrusion of the Wall like a Bastion. The path (after B) towards the upper castle (Γ) was bilaterally protected [from Schliemann 1886, Table/Tafel 1] (**right**).

Between, the fortifications in Zagani and Lerna on the one hand, and in Kiafa-Thiti on the other, the following (fortifications) intervene chronologically (Fig. 18-lower):

(**α**) in Panormos Naxos and Kastri Syros[163] ~2200BC[164] (early-PH[165]), (**β**) in Aegina ~2100BC[166] (MH[167]), (**γ**) in Aghia Irini Keas[168] and in Phylakopi Melos, until the walls in Phylakopi of the 2nd millennium BC.[169]

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[156] Στaϊνχάουερ/Steinhaouer (2001, 32) and (2009, 217).

[157] Wiencke 2000, 656, 14-16 Figs, early-IIIC (begins at 2450/2350BC) until late-IIIC.

[158] Dickinson 1994, 118: Lerna III.

[159] Mylonas o.c.; Scoufopoulos 2001, 19-20: early-PHII-beginning. Caskey-Caskey 1960b, 162: PHII.

[160] Caskey 1957, 128, Wall with Towers.

[161] Scoufopoulos o.c.; Caskey 1960a, 289.

[162] Simpson-Hagel 2006, 66-67.

[163] Τσούντας 1899, 118, Figs 32, 38: «near Apollonia» Sifnos, fortification with Towers.

[164] Tassios 2008, 30.

[165] Mylonas 1966, 45.

[166] Tassios o.c.. Wolters 1925, 47: Wall with Towers.

[167] Mylonas 1966, 45. Wolters 1927, 188. Simpson-Hagel 2006: *PH-LHI*.

[168] Caskey 1962, 277-278, 267.

[169] Τσούντας/Tsountas 1928, 30-34, 15. Simpson-Hagel 2006, 111. Whitelaw 2005, 49-51: dating of the Wall, 'cells', *at Phylakopi*.

The fortifications include double walls, often 2 meters thick with sloping outer surfaces and transverse to the wall ties, rectangular or semi-circular towers with ramparts, bastions and ditches, gates with complex protection systems and postern-gates.[170] A Wall of the ***M**iddle-**H**elladic period* was found in Mycenae, during which (MH) a clear increase in wealth[171] is observed; it had a wall-thickness<1.60-3.55m (thickness of the Wall in Malthi)[172] and it influenced the later Mycenaean fortifications.[173]

Ascertainment: Fortifications with Bastions and Towers appear as early as the late-4th/early-3rd millennium BC, they continue in the 2nd millennium and are precursors of the later Mycenaean fortifications. During the LHIIIA1, shortly before the addition of Bastions to the Walls of Troy VI (and about two centuries before the addition of Towers), Bastions flanked the Gates of Tiryns (Fig. 19-right) and Mycenae (Fig. 19-left), following *the centuries-old military fortification technique of Helladic/Greek territory*.[174]

8 Transfer of Technology: *from the East to Greece or from Greece to Troy VI and the East*?

Following the social evolutionary schemes of Morgan (1877), Lubbock (1892), and Childe (1930, 1939, 1944), the theory of Orientalism (*ex-orient-lux*) argues that the decisive inventions of copper smelting, which 'triggered' the development of civilization, emerged only hapax in "the East", to a Near Eastern/Levantine "mother civilization" (Fig. 20). *From there they were transported to the rest of the world*, *to Greece also*, by "*carriers of know-how and culture*", i.e. "*itinerant metal-smiths*", who *formed* "*islet-colonies*" *of foreign-craftsmen* and constituted the agents of technological and social change and development of civilization (Amzallag 2009, 504-512).

However, mining of copper-ore was *a seasonal activity* carried out by one-group/groups of participants *seasonally occupied*, *which consisted of fluctuating number of members*, from occasion-to-occasion and from year-to-year.[175] Consequently, *the strict specialization of "itinerant miners/smiths" was neither an organizational/socio-economic choice nor a technological one-way*.[176] The specialized knowledge required for copper production could have been gained as a continuation of pre-existing traditions for the mining-and-production of quartz/flint and obsidian;[177] he exploitation of obsidian appeared in Melos at the beginning of the **E**arly-**N**eolithic-**EN** (6500/6300BC).[178] The copper-smelting, the next evolutionary step

[170] Footnote 150. Note of the author: *Postern-gates=for sudden attacks against the enemies*.

[171] French 2012, 672. Simpson-Hagel 2006, 64: *in eastern Attiki too*.

[172] Rowe 1954, 253; Wright (2006, 11) and (2008, 237).

[173] Simpson-Hagel 2006, 27. French-Shelton 2005, 178: according to Μυλωνά/Mylonas (1961, 157) is dated later; Mylonas does not present any material-evidence (supporting his argument).

[174] Γιαννακός/Giannakos 2016b, 287.

[175] Kienlin-Stöllner 2009a, 73**;** Bartelheim 2009, 40-41**;** Krause 2009, 49.

[176] Giannakos 2024a, 30.

[177] Roberts 2011, 142-143.

[178] Renfrew 1973, 180-184: *photos of mines*. Giannakos 2024a, 30: chronologies EN.

after obsidian exploitation, appeared in Greece[179] by the “late-6th”-“early-5th” millennium BC,[180] “several hundreds of years” earlier than the Levant”.[181]

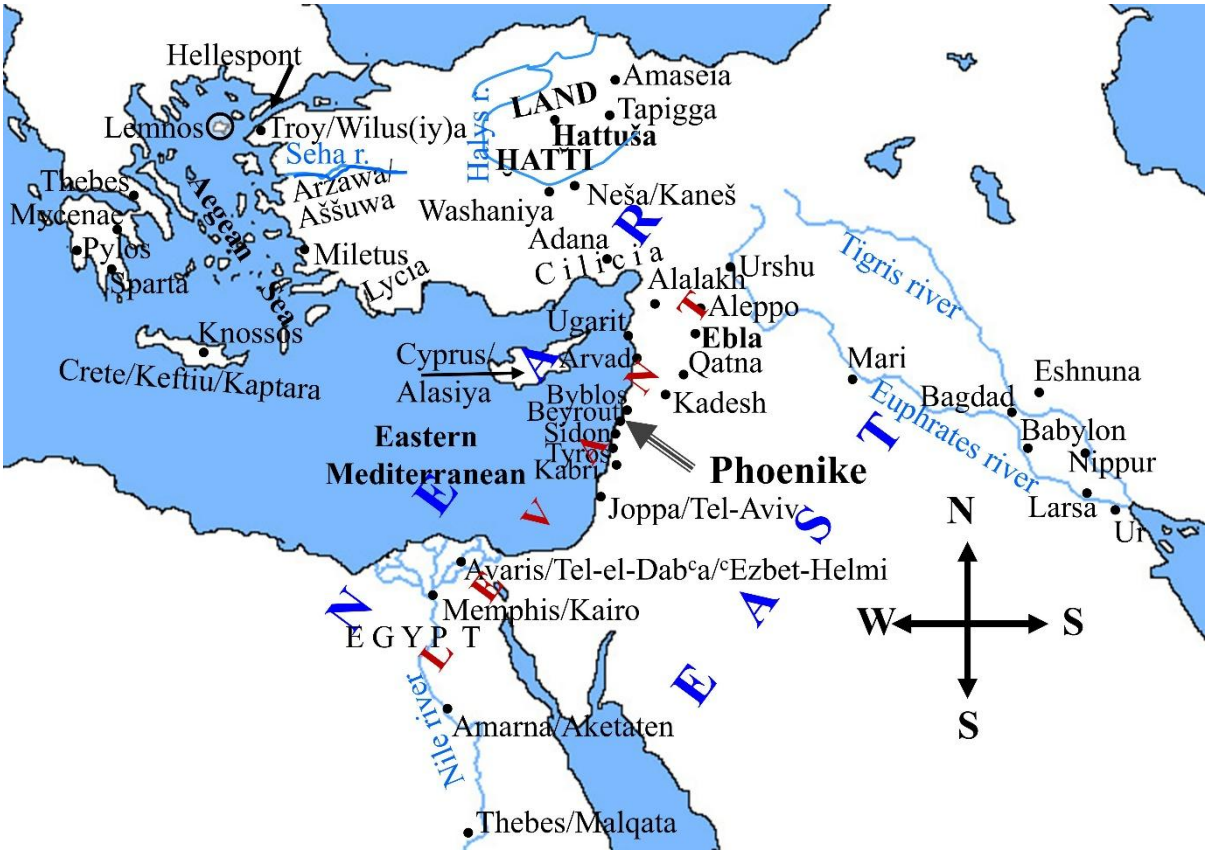

Figure 20. The Aegean Sea, the eastern Mediterranean and the Levant. [*Levant*, *Phoenike*, *Near East*, see Britannica 2023a; 2023b; 2023c. Map drawn by the author**;** see Giannakos (2024a, 23, Fig. 23), Γιαννακός/Giannakos (2016b, 36, Fig. 3), Wikipedia-“*Urshu*”].

Furthermore:

(α) During the Copper-Age, the zone from the Carpathian Mountains and the Balkans until the Iranian highlands, may have been a center of development of innovations in the copper-production. The co-production of know-how and innovations, among the interconnected societies in different regions, very quickly *led to (pioneering) adaptations and original improvements by the receiving societies*.[182]

(β) The classical diffusionist position of the followers of the theory of diffusion from the East, due to the primacy of the Middle East and the Levant in relation to areas of Europe, *seems incapable of accounting for the current archaeological evidence*.[183]

(γ) The autochthonous, independent, parallel development of know-how in remote communities *should be the first alternative to be investigated by the scholars*.[184]

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[179] Renfrew 1970, 31, 29-38. Phelps *et al*. 1979, 179-180, 183.

[180] Giannakos 2024a, 29-32: *findings*, *bibliography*.

[181] Hauptmann 2020, 14-17. O.c..

[182] Maran 2021, 213-214

[183] Dickinson 2014, 1861-1862, 1864.

[184] Tassios 2008, 28-32.

However, Morris[185] supports that there was a flow of Technology *exclusively from Phoenike towards the West and Greece*, and presents the following arguments:

1. Phoenician craftsmen transferred Technology at metal-rich areas of Greece: Thasos, Euboea, Boeotia, Lakonia, Crete, Rhodes, (even at) Laurion, "as *the traditions*, about Daidalos, Kadmos, Tyrian Hiram and King Solomon maintain",[186] *despite the absence of archaeological findings*.

2. *In Religion*, "the Greek 'god-craftsman'/'god-Architect' Daedalus/Daidalos[187] and the god-Metallurgist-Engineer Hephaestos originate from Kothar-va-Hussus**-or-**Hasis of Ugarit, because, the texts of Ugarit are chronologically earlier than the final concept of Hephaestos in the Knossos tablets and in Homer".[188] Penglase[189] supports that "the Greek myths are based on the Mesopotamian ones".

3. The place-name *da-da-re-jo*(=*Δαιδαλειόν-δε=Daidaleion-de*), *of the Knossos-tablets*, "should not be taken into account, because the placenames fail to illuminate the historicity of Δαίδαλος/Daidalos/Daedalus".[190] (**!**)

4. "Achilles' shield", as described by Homer, "has never protected a Mycenaean warrior, because its materials, bronze/tin/gold-and-silver, claim poetic attention."[191]

However**, archaeological findings, scientific arguments about ancient Technology and results of experiments in a University laboratory, completely refute the above claims, which are based on the Tradition and the Mythology with the argumentation that "archaeological evidence fails to illuminate the historicity"(!)** *of a 'craftsman-god'/'architect-god'*:

i) Professor T.P. Tassios,[192] commenting on Morris' and Penglase's claims, in addition to the above (§8γ), argues that, anthropologically speaking, Technology is a universality by definition, while Technology and Science cannot be treated by a "*meticulous accumulation of speculations*," by the scholars. To demonstrate that there are "occasional epistemological flaws" in their claims, *he lists numerous original projects of advanced Mycenaean cutting-edge Technology*.

ii) The Levantines called themselves either kn'n(=Can'-ani) from their Land,[193] or by their city's name (Tyrians, Sidonians). "Phoenicians"-"Phoenike" appear after-1200BC, according to (professor) Aubet, [194] an expert in Phoenicians. In Knossos tablets the term '*po-ni-ki-jo*[=*pho(i/e)nikio=φοινίκιγιο*] was read, which means dates (*fruits of Palm-trees/Phoenices-trees*), some other plant-product, or shell-paint [phoeniceos/*φοινίκεος*(=*πορφυρούς/red*), (*TLG-LSJ*)], without any relation to "Phoenicians-people", who had not yet appeared in History.[195] Therefore, it was not possible for "Phoenicians-people" to transfer anywhere any Technology before-1200BC, much less to Greece, which possessed the relevant know-how

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[185] 1992, 130-1, 30-35, 73-100.

[186] Morris 1992, 39.

[187] O.c., 14-16, 142/245/263: she refers to Hyginus.*Fab*. 274§15/39-40.

[188] O.c., **95**, 75-8.

[189] 1997, 73, 78-80, 219.

[190] Morris 1992, 75.

[191] O.c., 11-2**;** Hom.*Il*. Σ/18:474-82.

[192] Tassios 2008, 27-32. Giannakos 2015a.

[193] *ca-na-na-um*/*ca-na-na*.

[194] 1997, 8-12.

[195] Sarpaki 2001, **222-5**. Melena (1975, **81-3**) and (1983, 93). Murray-Warren 1976, 47-54.

of metal smelting by the "late-6th"-"early-5th" millennium BC, "*several* '*hundreds-of-years*' *earlier than the Levant*".[196]

iii) Between the religious traditions of Greece and Ugarit, which one is earlier? This can result from the *dating of tablets*, *of sacred religious places* (*inside Palaces*) and *of theonyms* (*linguistically*). The Ugarit tablets have recently been re-dated to 1185BC, most likely, or (less-probably) to 1350BC.[197] The Knossos tablets (late-15th century BC[198]) mention Daedalus and Hephaestus:[199]

α) *Daedalus/Daidalos/Δαίδαλος is included in a list of gods*.[200] *He had already been a venerated hero-god in the Mycenaean era*.[201] Daedalus' sanctuary was located inside the Knossos Palace,[202] which was signified by the substantive adjective (in accusative of singular, with "-δε" suffix) *da-da-**re-jo**-de=Δαιδάλ**ειό**ν-δε*, [203] "not surprisingly, given the close mythological connections of Daedalus with the Palace",[204] connections that transfer till today the deification of Daedalus and <u>*are irrelevant to his historicity*</u>*, as is the case with all the ancient gods, after all*. The ***-e-jo/-ειος/-eios*** ending *in da-da-**re-jo**-de/Δαιδάλ**ειον**-δε/Daidal**eion**-de* does not correspond to any type of the Greek language,[205] is frequent in Knossos which is nearer to the Minoan civilization,[206] and is related to the "pre-Hellenic *-e-ja/-ειᾰ/-eiă ending* [207] *in the pre-Hellenic language*".[208] Palatial ceremonies at Knossos were performed "at the Court of the Palace, a ritual arena for Court-based ritual activities,"[209] devoted, obviously, to relevant to the Palace gods, *as Daedalus/Daidalos*.[210] "The Court remained *the ceremonial core of the community* (at Knossos) for almost two millennia, by the **F**inal-**N**eolithic-IV"[211] (3300-3100/3000π.Χ.).[212]

β) *Ἥφαιστος/*Ἄφαιστος/*Ephaestus* (unaspirated/tenuis H-or-A/E) originates from the theonym Ἄφᾱ-Apha,[213] and after a post-Mycenaean turn Ἀ>Ἁ, it sounded aspirated.[214] Ἄφᾱ was used as (divine) toponym/placename like Ἀθήνη/Athēnē (cf. **Ἄφᾱ**-ία/**Afā**-ia) and e-

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[196] Footnote 180-181.

[197] Smith-Pitard (2009, 7-8): revised Smith (1994, 1: 1400-1350/1380-1350BC).

[198] Driessen (2008, 76, table3.2, tablets: RCT→LHIIIA1, NEP→early-LHIIIA2), 2000 and 1990.

[199] Melena 2014, 94.

[200] Duhoux 2008, 257-261.

[201] Ruijgh 1967, 263. Killen 1983, 70**;** Alberti 2019, 708**;** Del-Freo 2019a, 142.

[202] Hiller 2011, 196**;** Ruijgh o.c., Del-Freo o.c..

[203] Hiller o.c..

[204] O.c..

[205] Ruijgh 1967, 258.

[206] O.c., 262.

[207] O.c., 248-249.

[208] O.c., 261, 260-262. Francheschietti 2019, 726 n.8.

[209] Tomkins 2012, 65-6. Maran 2019, 358: "*Palaces focused on the Court*»**;** Wright 2008, 249-250.

[210] Cf. Hiller 2011, 196, 205.

[211] Tomkins 2012, **65**, 34, 64-68, 41, 43, 46.

[212] Schoep *et al*. 2012, xi. Tsirtsoni 2016b: *radio-chronology*. Giannakos 2024a, 30.

[213] Ruijgh 1967, **230 n.103**, 157 n.309, 54 n.39. Palaima 2017, 773: theonym *a-pa-i-ti-jo*.

[214] O.c..

ra/Ἥρᾱ/Herā.[215] *a-ta-na*=(Ἀθῆνα/Athens),[216] e-ra(=Ἥρᾱ)[217] and ***a-pa**-i-ti-jo/**ʰĀpha**istios/*[(x)]**Ἀ-φα**ίστιος[218] are pre--Hellenic[219] **toponyms/placenames**, "a legacy of the EBA pattern of settlement *before the arrival of the Greeks*",[220] which is indicated by a discontinuity in culture during **P**roto-**H**elladic-**I**.[221] **EBA** was dated at 3600/3200-2090/2000 by Warren-Hankey (1989, 169), as I recently presented,[222] however, *a (more) recent radiochronology* places it at 3400-3100BC.[223] Combining the two datings 3400-3100BC (for EBA) and 3300-3100/3000BC (for Knossos) *we arrive at the following maxima/minima*: *3400/3300-3100/3000BC*.

Consequently, *the **pre-Hellenic** theonyms/placenames date back to pre-3100/3000BC, namely, predate the Ugarit tablets by ~1500-2000 years*.

However, the Ugaritic theonyms may originate from Ebla (*after-2350-or-2250BC*)**:** [224] chthonic[225] god (of Ebla) [d]Gú-šar/Gaṯaru,[226] is identified as the Ugaritan kṯr/kṯrt/kšr/kšl=ka-ša-ru/ka-ša-lu [227] =Kôṯaru-wa-Ḫasīsu, means 'skilful' (Archi 2018, 1-3), 'proper', [228] 'he who repairs'[229] and "had Sumerian Enki and Hephaestus as ***functional equivalent deities***" *and not **"deities"** derived from him*.[230]

It is ascertained that, Daedalus and Hephaestus are chronologically traced back to a pre-Hellenic era, much earlier than Kothar/Kôṯaru of Ugarit, *and also earlier than [d]Gú-šar/Gaṯaru of Ebla*. *Consequently,* "*their myths **do not originate** from the Levant*».

Somebody could argue that, "there are different opinions on the readings of Linear B theonyms," however, the previous analyses are based on publications, *the classic ones* (Ventris-Chadwick, Lejeune, Ruijgh) *and the more recent* (collective volumes Carlier et al. 2012, Duhoux-'Morpurgo-Davies' 2008-2011-2014, Nosch-Enegren. 2017, 'Del-Freo'-Perna 2019), *as well as on publications on the Levant*.

iv) As far as the "Shield of Achilles" is concerned, professors Paipetis(†)-Kostopoulos performed lab-experiments in the University of Patras, throwing a spear-tip against shields of five metal plates/laminates 1,5mm thick: a shield of bronze laminates and a "shield of Achilles" (bronze-tin-gold-tin-bronze). "The "Achilles' shield" had an elliptical cross-section with semi-axes of 300 and 120mm, and a weight of 16,75kg". The results of the experiments are

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[215] O.c., 108 n.50, 260 n.132.

[216] Garcia-Ramon 2011, 241, 235. Hiller 2011, 205.

[217] Ruijgh 1967, 89 n.75, 228 n.89, 131. Contrary: Garcia-Ramon 2011, 234.

[218] Ruijgh 1967, 24 n.13. Civitillo 2012, 188.

[219] Chadwick 1976, 87.

[220] Ventris-Chadwick 1956, 14**;** Buck (1926, 26), Blegen (1928, 152).

[221] Hiller 2011, 204.

[222] Giannakos 2024a, 28.

[223] Tsirtsoni 2016b**;** o.c., 30.

[224] Archi 2015, 16-18, 120: 2350BC. Astour (2002, 63-64): refutes Pettinato (1976, 46-48: 2500).

[225] Pardee 2002, 278.

[226] Pardee 2000, 1:237-241.

[227] Smith 1985, 58, 125-126. Archi 1979-1980, 170**;** Albright 1940, 296-297**;** Goetze 1958, 28**;** Hasselbach-Andee 2005, 54: *s/*š, merges the sounds *θ, and, *s/*ś.

[228] Gelb 1980, 23**;** AHw:461-462.

[229] CAD:284-286.

[230] Pardee 2002, **280-1**, 174-9. Oxford-Dictionary-Online: equivalent=equal.

impressive: the tip of the spear completely penetrated the bronze shield (Fig. 21) creating a

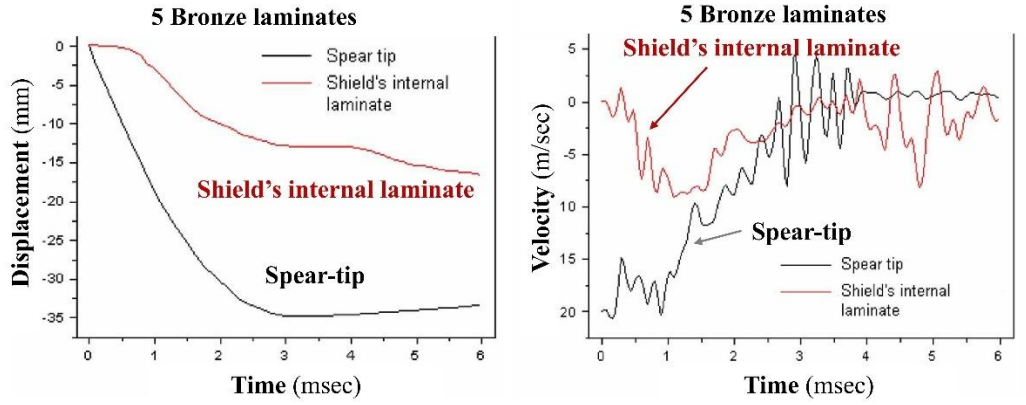

Figure 21. Experiments in the University of Patras: throws of spear-tip against *a shield of five bronze laminates*. *Displacements-time diagram* (***left***): the displacements of the tip (**black**) are much larger and *overpass permanently*, by a lot, the displacements of the inner laminate of the shield (**red**); *this depicts that the tip pierces and penetrates all the five laminates*. *Velocity-time diagram* (***right***): the velocity of the tip, by the ~2,5msec and after, pulsates with the inside of the lamina, in a parallel development, because it is pinned and penetrates all five laminates and pulsates (connected) with them.

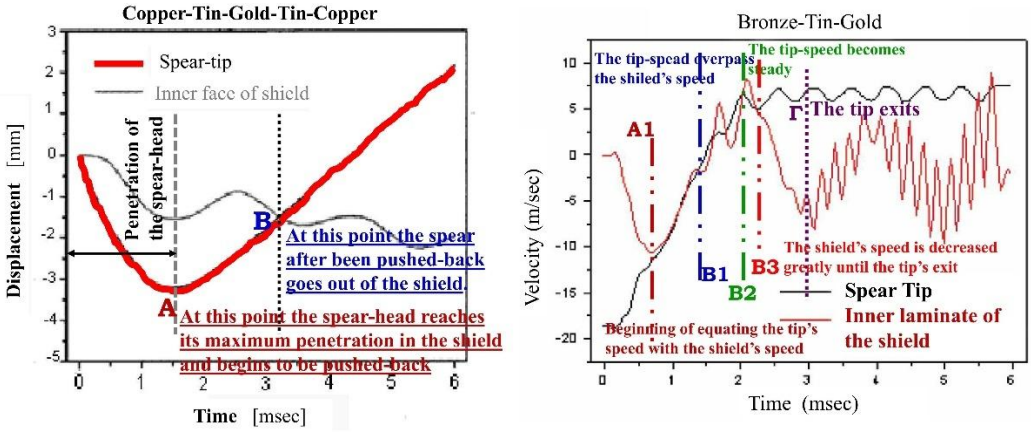

Figure 22. Experiments in the University of Patras: throws of spear-tip against "*a shield of Achilles"*. *Displacements-time diagram* (***left***): the displacements of the tip (**red**) are larger of the (displacements) of the shield (**black**); but ~1,5msec later (A) the tip begins to be pushed back and after the instant at ~3msec (B) it is led to exit backwards. *Velocity-time diagram* (***right***): after ~0,7msec (A1) the velocities of the tip and the shield are equal (partial piercing, simultaneous movement (together)); at the instant at ~1,5msec (B1) the velocity of the tip (**black**) slightly exceeds the speed of the shield (**red**); at ~1,7msec the velocity of the shield and the velocity of the tip vary considerably up to ~2,1msec (B2), *at which point the tip begins to pulsate around a constant value fully differentiated by the shield speed*, which shortly after B2 *changes direction, decreases spectacularly and after* (B3) moves independently of the tip until the exit of the tip at ~3msec (Γ): *afterwards it pulsates freely*. [See Tassios 2008, 4-6. The Figs 21-22, were kindly provided to the author by Prof. V. Kostopoulos; the author highlighted the stages with colors and comments].

significant hole, while in the "shield of Achilles" (Fig. 22) it had penetrated only the two outer layers (bronze, tin) and, once it had reached the central golden-laminate*, it was pushed-back*

"*outside the shield*".[231]

Two questions arise: was the shield of the experiment a 'non-functional burden' for Achilles? Are the Homeric descriptions compatible with the archaeological findings?

Linear B tablets describe "anonymous 'infantry soldiers'(=*pe-di-je-we*) and **élite heroes-warriors** of the military aristocracy, who were fighting duels riding on chariots 'like the (Medieval) knights'",[232] relying on their bravery and great strength. Homer describes:

(α) the unique **shield** of **Achilles**, the most pre-eminent *among the* ***élite*** **warrior-heroes**, the 'ultimate war-machine', *with whom no one could compare in strength*.

(β) Heavy shields of *élite hero-warriors*[233] with many layers of hide(=*raw ox-hide*), which as a material is not preserved over time, however, connecting/fastening materials of (the materials of) such shields were found in graves.[234]

(γ) Heavy 'Tower-shield' (depicted on: 'lion-hunting dagger', 'warriors' rhyton' of Tomb IV of Cycle A of Mycenae (1600-1500BC), at Akrotiri Santorini, etc.), belonging to the "great Ajax Telamonios"[235] -second in strength and bravery *élite* hero-warrior;[236] the shield consisted of a bronze plate lined internally with seven layers of hide. *In a similar* (*lab-*)*experiment*, the spear-tip stopped and bent at the seventh layer of hide of the "shield of Ajax", *just as described in the Iliad*.[237]

It is underlined also that,

(δ) the armor/panoply of the Tomb of the Dendra (1425/1415-1390BC) is **heavy**, weighs 15-18kg in its current state, while its experimental reconstructions weigh 23-30kg.[238]

The findings and the experiments prove that Homer describes existing, effective and applied in practice Mycenaean Technologies of Metallurgy and Shield-making, which were based on a deep knowledge of the properties of materials, and not because some precious "materials (of the shield) attracted his (Homer's) *attention as a poet".*

v) "*Frescoes of elaborate Aegean Technology*", at the era of the apogee of the power of the Mycenaean States (16th-14th century BC), were found in Halls/Αίθουσες in the ***sacred interior Palaces of the***: ***Levant*** (Alallah, Qatna, Kabri, Mari), ***Capital-cities of Egypt*** (Amarna/Aketaten, Thebes/Luxor/Malqata, Avaris/Tell-el-Da-bᶜa) ***and*** (the capital) ***of Ḫatti*** (Ḫattuša).[239] These are Minoan-Mycenaean images of ritual, symbolic and divine-religious significance, completely similar to corresponding images inside the Minoan-Mycenaean Palaces. In Ugarit similarities (entrance system with staircase, square hall with central pillar)

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[231] Paipetis-Kostopoulos (2003, 122) and (2008, 183-191**, 187**). Tassios 2008, 4-6.

[232] Lejeune 1968, 41, 51-§f.

[233] Hom.*Il*. O/15:479: ***Τεύκρος/Teucer***, M/12:296-29: ***Σαρπηδών/Sarpedon***· *Od*. χ/22:12: ***Λαέρτης-Laertes***.

[234] Myres 1939, 38. Stocker-Davis 2017, 593, **597-n.42**. D'Amato-Salimbeti 2024 and 2011, 19-20. Hood-'de-Jong' 1952, Pl. 52b.

[235] Hom.*Il*. M/12:364, H/7:211-223.

[236] Dixon-Kennedy 1998, 20.

[237] **Paipetis-Kostopoulos** 2008, 191, 197, 195: *photo of bent tip*. Hom.*Il*. H/7:244-248/258-259.

[238] Wardle 1988**;** Μπάκας/Bakas-Κατσίκης/Katsikis 2024. It is exhibited at the Archaeological Museum of Nafplio (near Mycenae).

[239] Müller-Karpe 2003, 392-393: color photos; Neve 1992, Abb.75**;** Brysbaert 2008, 101-108.

lead to the conclusion that inhabitants from the Aegean built houses there and spread architectural concepts of space and structural systems otherwise unknown to the local community.[240]

Mycenaean (ϝ)Ἄναξ/King had craftsmen-artists in his Palace, who were considered "Royal commodities",[241] *were living under restrictions and they were not permitted to travel*.[242] The Levantine *élites and the ministries of the Levant* had accepted the supremacy of Cretan Technology, and respectively configured the religious local tradition for the Palaces of their gods: Ugaritic-tablets refer that the goddess Anat invited the god Kothar-va-Hussus/Hasis from (Mycenaean) Crete (*where his throne and Palace were located, while he inherited Egypt*)[243] to the Levant[244] to create/build the Palace of god Baal.[245] Imitating their gods, many Levantine Kings applied to their (ally) Mycenaean (ϝ)Ἄναξ/King to permit his Palace craftsmen to work in their Palaces (in the Levant). Herennius Philo,[246] of Byblos (64-148AD[247]), identified Kothar-va-Hussus/Hasis-**or**-Χρυσὼρ(=Chrysor)/Χουσὼρ(=Chousor), as the inventor of iron and connected him with *Hephaestus/Ἥφαιστο* and *Zeus-meilichios/Ζεύς-μειλίχιος*. We recall that Zeus had been raised in Idaion Antron/cave of Crete (from where Anat invited a 'god-engineer'/'god-skillful-craftsman') and mastered the "φλεγέθοντες"(=combustive/burning) thunders [Hes.*Theog.* 846]. The god-Metallurgist Hephaestus (smelted[=*produced-smelting-metal-in-a-kiln*], created and) gifted the coper/bronze "automaton"/robot Τάλω/Talos to Minos (pseudo-Apoll.*Bibliotheca*. 1:140-143). *After the rebuttal of the old theory about the Hittite monopoly of iron during the second millennium BC,* "it is inferred that Keftiu/Crete possessed the know-how for the, difficult to process, iron."[248]

The Levantine and Egyptian *élites* highly appreciated and imported, by 1500(+)BC[249] as *terminus-ante-quem*, the *Cretan/Minoan-Mycenaean Technology*, fact *that equates to a flow of Technology from Greece to the Levant*,[250] *and this answers to the question of the title of this paragraph*.

9 The Hittites between 1650-1240BC - Fortifications' Technology

The Iliad does not mention the Power in Asia Minor, the Hittites, who did not call themselves Hittites, but *"*(simply) *the people of the 'Land-of-Ḫatti'".* They identified themselves by the region in which they lived**:**[251] *the capital Ḫattuša and the "heart/homeland" of the "Land-of-*

[240] Giannakos 2024a, 24-27, presentation of findings per Palace. Palyvou 2007, 444-445.

[241] Muhly 2005a, 685-686, 690**;** Michailidou-Voutsa, 2005**;** Michailidou 2005**;** Wright 2008, 249.

[242] Zaccagnini 1983, 247.

[243] Giannakos o.c.**;** Strange 1980, 83-86.

[244] O.c.; von-Ruden 2017, 239-240.

[245] Smith 1994, xxiii.

[246] TLG-*Fragmenta*: 2:87-94.

[247] Kokkinos 2012.

[248] Giannakos/Γιαννακός (2016a, 58) and (2016b, 83-85). Sandars 2001, 219-21**;** Muhly 2005b, 24-5**;** Lucas 1948, 270-272**;** Ogden 2000, 167.

[249] Alberti 2012, 119-20. Giannakos (2012, 50-5) and (2015b, 752).

[250] Giannakos 2016a, 60. Brysbaert 2008, 101-108, 155-165.

[251] Bryce 2005, 19, 16. Seeher 2006, 173. Akurgal 2001, 4. Γιαννακός/Giannakos 2016b, 166.

Ḫatti" were located "beyond Halys" river (Fig. 20). However, *among the* "*ἐπίκουροι*"/*epikouroi*(=*allies*) of Troy the (people) "Ἁλιζώνες/Halyzones"(="*surrounded-by-Halys*")[252] are mentioned, <u>*without been distinguished among the epikouroi/allies*</u>; the Halyzones came *from* "'τηλόθεν'/afar ***Ἀλύβη/Halybe*** '***the birth-place of silver***'" (Hom.*Il.* B/2:815/856-857), which was located "**beyond Halys** river".[253] In Hittite tablets, *Ḫattuša and Ḫatti are attributed by the Sumerogram*[254] *of* ***silver*** (*[URU]KÚ. BABBAR-sa-*, *[URU]KÚ. BABBAR-ti-*);[255] the king of Arzawa and some Pharaohs[256] associated ***Ḫatti*** with ***silver***.[257]

The Iliad transfers, *obviously*, *a recollection of this Ḫatti-silver identification*.

<u>*But was "the Land-of-Ḫatti" ever limited "beyond Halys" (river)*</u>?

Ḫattušili I (1650–1620BC) extended (Ḫatti) to Syria in the southeast, as well as in Arzawa and Troy in the west. Mursili I (1620–1590π.Χ.) *conquered Babylon and abolished the Babylonian State*. However, from the reign of Hantili I ('1590–1560'**-or-**'1585-1570'BC) a period of decline began.[258]

During the reign of Ammuna ('1560(-)-1525(+)'**-or-**'~1570-1550'BC[259]), the "Land-of-Ḫatti" had shrunk "beyond Halys", inside a smaller area than that the enclosed one by the river (Fig. 23-upper-left)[260] and Arzawa became independent,[261] having A(m)pasa-Ephesus as its "capital", until 1320/1316BC.[262]

Telipinu/**Telepenu**(s)[263] ('1525-1500'**-ή-'**1500-1480'**-ή-'**1480-1460'π.Χ.[264]), who *recovered the entire area within Halys* (bent) *and extended southward too*[265] *but not westward* (Fig. 23-up-per-right), *sounds very closely to "**Τελεπόν**τη(αο)/Telepontes(ao)/Τήλεφο/Telephus of Mysia*" of the ancient Greek Literature (*Τελεπεν/Telepen→Τελεπον/Telepon*, turn of short-vowel *ε→ο*). **Telephus** *resisted -initially- the Achaeans*, but later, *led Agamemnon-Achilles*

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[252] Giannakos (2016, 63-65) and (2019b, 42), with lexicographic references.

[253] Str.Geogr.*Geographica* 12:3:24:1-10.

[254] Sumerogram is called the use of a *Sumerian cuneiform character/symbol* to represent a meaning/term (e.g. silver) in a text of another language (e.g. of the "Land of Ḫatti").

[255] Watkins 1986, 53 n.13. Bryce 2006, 139.

[256] Ramses B and Akhenaten [or Tutankhamun, or Smenkare of the Amarna period (1384/1360-1360/1335BC), see Γιαννακός/Giannakos 2016, 339].

[257] Breasted 2001/1906, 138 n.g**;** Hoffner 2009, 352-354**;** Beckman 1999, 279**;** Giannakos 2015b, 754-755.

[258] Bryce 2005, 68-102.

[259] Giannakos 2019b, 56: 'maxima/minima'.

[260] Bryce 2005, 102-103, 123-124; Goedegebuure 2006, §20-21.

[261] O.c., 102, 104-106. O.c. §24-27. Freu-Mazoyer 2:94-95.

[262] Bryce 2005, 192-197. Freu-Mazoyer 2:76 and 1:127.

[263] Kimball-Slocum 2018.

[264] 'Footnote 36'**-**'Latacz 2004, 63'**-'**Miller 2013, xii'.

[265] Bryce 2005, 104.

to Troy and the beginning of its siege.[266] After Telepenu*, intra-dynastic conflicts and decline followed*.[267]

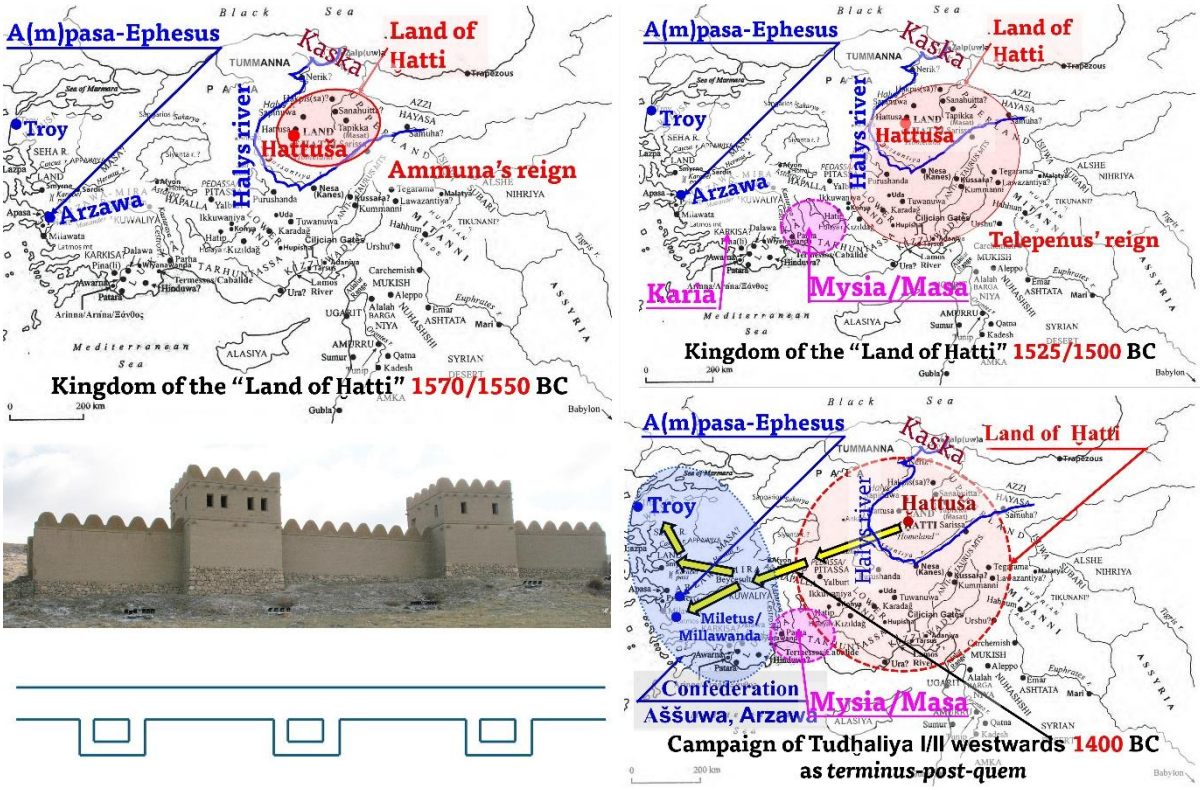

Figure 23. The "Land of Ḫatti": 1570-1550BC (**upper-left**), 1525/1500BC (**upper-right**) and, before the westward campaign of Tudḫaliya I/II (**lower-right**). Reconstructed section of the Wall at the archaeological site of Ḫattuša and ground-plan (**lower-left**): very low base of stonemasonry and overlying structure of mudbricks; the Towers were built-in at regular intervals (see Neve 1993, 622, Abb. 1, 627, Abb. 5). [Maps, photo, ground-plan by the author. Adjacent to Karia Maša(=Μυσία/Mysia(?)) was placed on the map according to Garstang-Gurney (1959, book-cover's map, 107-109), Gardiner (1960, 57), Götze (1960, 47-48). **Maša** has been transliterated as **MˀSˀ**/**Mesa** in Egyptian records **(**Breasted 2001/1901, 136, n.c.: *it is Mysia*), and, thus, it was identified, most likely, to the -well-known to the 1st millennium BC Greeks- Μυσία/*Mysia* (*ε/e*: short vowel, *u/y*: short/long vowel), in the story of *Telepontes-Telephus* of the ancient Greek Literature].

Hantili II *liberated from the Kaska/Kaskeans and walled* (Fig. 23-lower-right) *the capital Ḫattuša (~1450BC)*.[268] *Weak and shrunken "Land-of-Ḫatti"*[269] *was located "τηλόθεν"*(=*afar*) [*beyond Halys* river] *and had not Technologically influenced Troy*. *"Mu[ttalli]/Muwattalli I*[270](1400(+)-**or-**1420(+)**-or-**1425(+)BC) sounds very closely to "'*Μότυλος*(=*Motylos)/Μούτι-*

[266] Γιαννακός/Giannakos 2019a.

[267] Bryce 2005, 105-114.

[268] O.c., (113, 420 n.75) and (2009, 298). Freu-Mazoyer 2:163-164. Von-Schuler 1965, 24-25, 48. Carruba 1988, 200-206. Collins 2007, 42.

[269] Hom.*Il*. B/2:856-857. Giannakos 2016, 64.

[270] Carruba 1990, **541;** Miller 2013, **127**. Bryce 2005, 421 n.82.

λος(=*Moutylos*)',[271] who *welcomed Paris and Helen in Karia/Kar(a)kisa*"[272] (Fig. 23-upper-right), during their sail to Troy which triggered the Trojan War.[273]

The ancient Greek Literature transfer, most likely, '*dubbed-in-Greek*' *the names of* (some) *Kings of the "Land-of-Ḫatti"*, of the era when *Ḫatti had been restricted "beyond Halys" (river)* -namely *between 1525/1480-'~1400'BC- and associates these Kings with the Trojan War of the Iliad, which led to the Fall.*

The next King Tudḫaliya I/II ('1400-1375'**-or-**'1420-1390'**-or-**'1425-1400'BC[274]) ***at the end of his Reign***[275] [**1400-and-after**[-or-**1390**-or-**1375**]**BC**], campaigned against Arzawa and "Aššuwa Confederation"; "*Wilus(-ij-)a/(ϝ)"Ιλιον/(ϝ)Ilion*/*Troy* participated in the Aššuwa Confederation, ***having defected*** (from Ḫatti)"[276] (Fig. 23-lower-right), apparently under a pro-Mycenaean Dynasty after the Fall. "However, (Wilusa/Wilusija) was in peace with Ḫatti and was, regularly, sending messengers, *thus Tudḫaliya did not enter Troy*"[277] (§4.2.3c).

A new period of decline followed (~1370(+)-1350 BC).

Suppiluliuma I (1350-1321BC), *expanded again towards the western coast of Asia Minor*. Mursili II (1321-1295BC) *conquered Arzawa* and, in 1318/1316BC, Millawanda/Miletus, *the bridgehead of Aḫḫiyawa*(=Mycenaean Greece) *in Asia Minor*, *without any reaction from Aḫḫiyawa's King*.[278] *Muwattalli II* (1295-1272BC) returned (the sovereignty of) Millawanda-Miletus to Aḫḫiyawa, in exchange *for the signing of the "Treaty of Alaksandu(s)"*, *(which was) a Treaty of vassalage of Troy to Hatti*; based on this (Treaty), Muwattalli was able to bring his vassal-rulers/"allies" -after-that- *da-r-da-ni-ja*/*Dardanians*/*Trojans* (descendants/'sons-of-the-sons' of 'Aeneas') at the battle of Kadesh (~1275(+)BC) against Ramesses II.[279]

Urhi-Teshub, (1272-1267BC), son of Muwattalli II, was dethroned by his uncle Ḫattušili, thus intra-dynastic turmoil was triggered. Ḫattušili III (1267/1265-1240/1237BC) apologizes to his (relative(?))[280] King of Aḫḫiyawa, for "my youthful deeds", *in his (written) request* towards the Mycenaean King to prevent attacks of *his* (*Aḫḫiyawa's*) "*representative*" Piyamaradu, against allies/vassals of Ḫattušili in Asia Minor.[281]

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[271] TLG-*Morphology-Lexika*/*Lemma*: «*Μούτιλος/Moutilos*, also *Μότυλος/Motylos*».

[272] St.Byz.*Ethnika.epitome* 554:5-6: Σαμυλία(=Samylia); Ael.Hdn.Gr.*De.pros.cath*. 3.1:289:line42.

[273] Giannakos (2016a, 69-70) and (2019b, 20).

[274] 'Footnote 36'**-**'Miller 2013, xii'**-'**Bryce 2009, 798'.

[275] AHT:69. Giannakos 2019b, 20, 16-19.

[276] Garstang-Gurney 1959, 13-23, '*Chronicles of Toudḫaliya IV)*', 120-121**;** Beckman 1999, 87-93: '*Treaty of Alaksandu*', **§2-3**; Bryce 2005, 125**;** Giannakos (2015b, 750) and (2019b, 14-19).

[277] Beckman, o.c.**;** Giannakos 2019b, 19-21.

[278] O.c., *and* 21(/n.42)-24.

[279] O.c., *and* 44, 62.

[280] Giannakos (o.c., n.44-46) and (2024a, 27): *Queen Henti*=(χ)Ἐνδη(ίς)/(h)Ἔντη/(χ)e-(n)t-i(ς)/(h)e-(n)t-i(s) [in Linear B].

[281] O.c. 2019b, 24-25.

In the period '14th-end'-13th century, *long before the 'LHIIIB-end'*(=1200BC), *Mycenaean Palaces* (*Mycenae, Tiryns, Thebes, Agios Basilios of Laconia*) *had gone down in flames*.[282] Mycenaean (ϝ)Ἄναξ/King had imposed a suffocating control over the *Mycenaean élites*, causing probably internal revolutionary movements.[283] ***After-1340/1320BC***, when Ḫatti's influence reached the western shores of Asia Minor, the King of Aḫḫiyawa did not even visit personally his footholds in Asia Minor, did not conduct military operations there,[284] *and, therefore, did not conquer Troy at 1300BC*. *Furthermore, ceramic everyday luxuries* ***of 'Mycenaean style'/'Mycenaean influence')*** *declined by 50% after-1300BC*.[285]

In 1272BC, Ḫatti entered a prolonged period of trouble,[286] while, after-1240BC, Aḫḫiyawa was erased from the list of Great Powers -in Ḫatti's archives; in 1190/1180BC, all the Palaces (in Aḫḫiyawa and Ḫatti) had collapsed. Therefore, a campaign of "28 Lesser-rulers in a military hierarchy under the Mycenaean (ϝ)Ἄναξ/King"[287] was impossible, while, *after-1200BC, in Troy the objects of* ***'Mycenaean style'/'Mycenaean influence'*** *almost disappeared*.

However: *a Fall of Troy at ca.1400BC is compatible with the image of the -restricted "inside Halys' curve"- Ḫatti ('~1570'-1400BC), which did not influence the defensive Technology of Troy VI*; *moreover, "no Hittite object was found in Troy VI"* (footnote 148).

Çigdem Maner (2023, 206), based on Klinkott (2004), supports that:

The Walls of Troy VI are of a completely different technique from Ḫattuša, while its Towers are not arranged at regular distances. Towers were built in Troy I but only ***Tower VIh*** (of Troy VIh-VIi) *could be attributed to Hittite influence.*

The sawtooth offsets of the Walls, in ground-plan, are influenced by patterns of earlier fortifications in Asia Minor.

The fortifications of Troy are an indigenous technique in northwest Asia Minor, ***influenced by the Mycenaean fortification-architecture, with which it has much more in common*** *than with the Hittite architecture*.

However:

Blegen has ascertained "a discontinuity of Troy VI with the preceding periods (I-II-,….,-V), ***as evidenced by the architecture and the Walls***";[288]

the "*sawtooth offsets*" are "*clearly Mycenaean*";[289]

the Walls, visible today, were built in ~1390BC, *with Gates protected by Bastions, as in Greece. The* ***Towers*** *(****the Tower VIh too****) are not embodied into the Wall, but are later external additions, therefore, not a Hittite influence*.

[282] Maran 2022, 231. Shelton 2022, 44.

[283] Steinmann 2023, 75-77.

[284] Giannakos 2019b, 42-51, 14-21: με βιβλιογραφικές παραπομπές.

[285] Footnote 145.

[286] Giannakos 2019b, 23-27.

[287] O.c., 13.

[288] Blegen 1953, 1:5-6.

[289] Wright 2005, 196.

10 Mesopotamian Defensive Fortifications

Two categories of Gates/Entrances can be distinguished (Fig. 24): the simple Gate, with a straight (1) or "winding" access road (2), and the complex type of single (3), double (4) and triple Gate (5), with chambers/cells comprising two, four, six piers. Complex Gates are independent, autonomous fortified units with straight entrances, flanked on both sides by structures that protect them laterally.[290] The Gates (and the fortifications) of Troy VI do not follow Mesopotamian specifications.

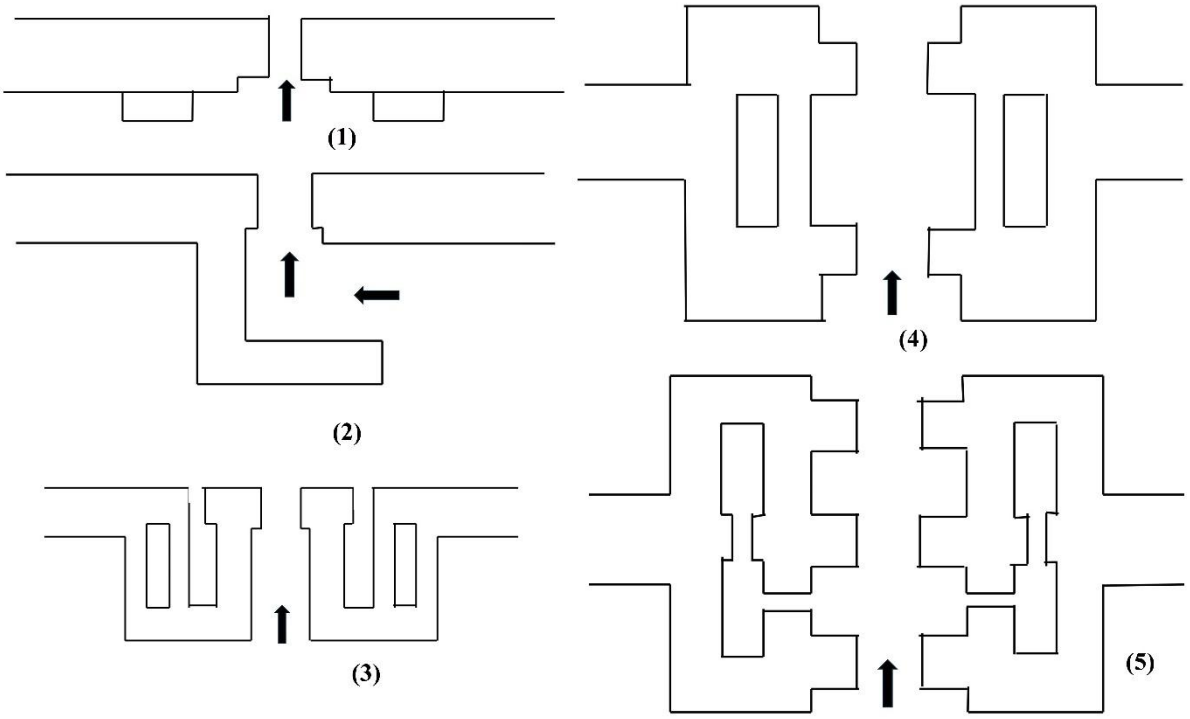

Figure 24. Types of Gates in Bronze Age Mesopotamian Fortifications: simple Gate with straight access road (upper-left, (1)); simple Gate with winding access road (middle-left, (2)); complex simple Gate with "chambers/cells" (lower-left, (3)); compound double Gate with "chambers/cells" (upper-right, (4)); complex triple Gate with "chambers/cells" (lower-right, (5)) [author's drawings, based on Rey (2012, 112), (2016, 38)].

11 Synopsis - Conclusions

The design of defensive fortifications in Greece included Towers and Bastions since the early-3rd millennium; the tradition of Wall-construction has been continuous until the Mycenaean fortifications.

Troy I-II (3.000-2.200BC)[291] had Towers in the fortifications (Fig. 25). However, *the beginning of Troy VI* is a "new era in the history of the habitation of the area of Troy. There is a clear discontinuity, a break, in the old local tradition of the Early Bronze Age, in the architecture and in the Walls." The Walls of early-Troy VI (1740/1730-1500BC), 1,00-1,30m thick, were designed without Towers or Bastions, unlike Troy I-II; the horizontal Moment of Inertia varies

[290] Rey (2012, 112-121) and (2016, 38-40).

[291] Blegen 1963, 174.

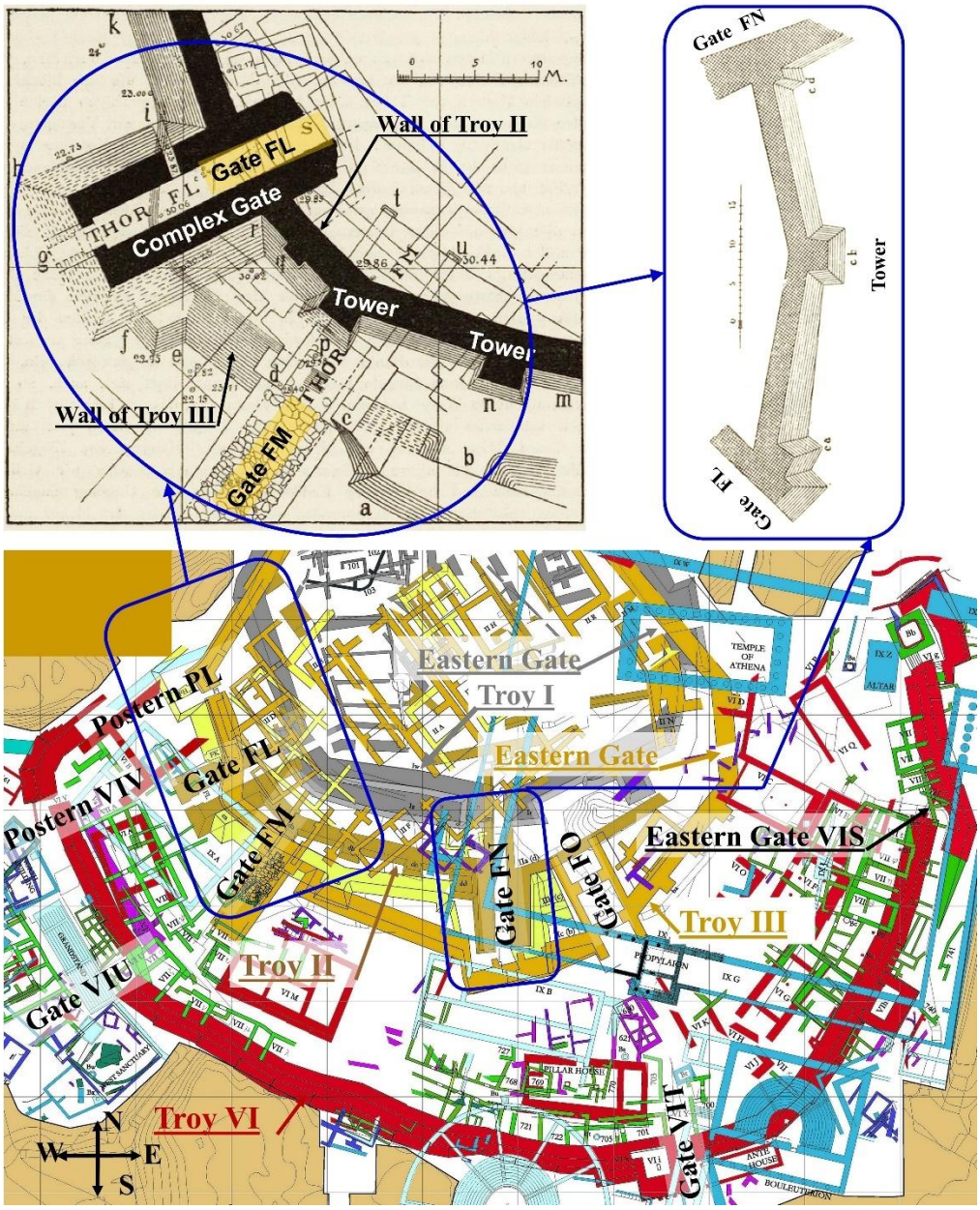

Figure 25. Troy, ground-plan: Troy I (gray color), Troy II (dark khaki), Troy III (light khaki) -some parts of III existed from Troy II-2nd period; Troy VI, Wall of 1390BC-and- after (dark red). The Gates are maintained in the same directions diachronically: west, south and east (Troy I-II/III) [**lower**], consequently, in the 'earliest fortification' of VI-Early/Middle too. [Based on a map of E.H. Riorden, with her permission; support by K., Barry, and C., Hunsaker, *Troia Projekt*, financial support: INSTAP, Institute for Aegean Prehistory]. Detail of the blue parallelogram, Troy I-II-III (3rd millennium); in the 1st-2nd period of Troy II the fortification had Towers (**upper-left**). Wall with Towers between the Gates FL and FN [1st-and-2nd-period of Troy II] (**upper-right**) [SOURCE: Dörpfeld 1902, 1:61-2, 64; see Blegen 1963, Fig. 8]. For “postern” (gates) see footnote 170.

between 12.5%- 27%[292] of the Walls in Greece. In ~1500-1490BC, the thickness increased to 2,70 and 3,50m; the Trojans were shooting against the left side with the shield of the

[292] =[(1,00/2,00)^3] until [(1,30/2,00)^3].

attackers from the Bastion (*e-d-c*) of the Scaean Gate VIUf-h (Fig. 10-11).In Mycenae, the Wall (early-LHIIIA1/~1440-1390BC) reaches a thickness of 6-10m;[293] there are Bastions for bilateral shootings (Fig. 19-right) and an uphill access road.

The pre-1425BC main Gate VIU was located axially on the access roads, which, in ~1390(-)BC, become "winding" with increased slopes. At ~1425/1410BC the Gate VIS had rudimentary bastions. At ~1390BC, the new Walls, *~5,00m thick*, were built *without Towers, but with Bastions at the Gates VIV, VIU, VIT*.

Troy, at 1400(+)/'~1390'BC, was not influenced by the defensive Technology of the -restricted "beyond Halys river"- Ḫatti, nor by Mesopotamian specifications.

Archaeological findings indicate that *Members of the Royal Dynasty and the élite of Troy*, 'before-and-after-the-Fall' (1400BC), built Hearths in Houses/'Megara',[294] used *Mycenaean ceramic objects of everyday luxury*, "which were produced locally (Troy VId-VIe-VIf) by LHII"[295] ('1620-1450'**-or-**'1500-1390'BC), ***adopted Mycenaean way of life, defensive design and know-how as well as Mycenaean building and anti-seismic Technologies***. *Those concerning the defense of Troy and the Houses within the Walls require decisions to be (approved and) adopted by the highest level of the city's hierarchy*.

These are compatible with my proposition that,[296] *the Mycenaean (ϝ)Ἄναξ/King, primus-inter-pares and (thus) different from the Kings of the Levant/Near-East, after the Fall of Troy* (~1400BC)*, integrated, through raids(?) and alliances, 'a network' of littoral Cities-States governed by his representatives local rulers in the Aegean Sea,* ***Troy****, Asia Minor, Cyprus, and the Levant; thus he controlled the commercial routes, increasing the Mycenaean influence "overseas" and the* '*accumulation of wealth*' *in Mycenae*.[297] Mycenae "*was chosen -deliberately by certain social groups- as the new capital at the onset of the Shaft Grave*[298] *period instead/'at the expense' of Argos*".[299]

Ancient Literature transfers compatible recollections:

During the Siege (of Troy), Menelaos-Odysseus were hosted in the House/Megaron ("*μεγάροισι*") of Antenor inside the Citadel/"Pergamos" of Troy; *the two sons of Antenor were second-in-command under Aeneas in "Dardanians"*, who (*Aeneas*) *succeeded Priam*.[300]

Lescheo(s) from Aeolian Mytilene,[301] contemporarily or slightly later than Homer [Lescheos' apogee: 730-or-650BC], connects the *demolition of the Walls of Troy with the Fall of the city*:

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[293] Mylonas 1957, 23.

[294] Dörpfeld 1902, 1:**152**-**155**.

[295] Mountjoy (2006, 241-243) and (1997, 259-267).

[296] Giannakos (2016a, 60), (2019β, 41-42) and (2024a, 27, **33-34**: proposition for relating *the Trojan campaigns of the Greeks* to archaeological findings).

[297] Voutsaki 2005, 135-139**;** Wiener 2007, 10-11. Fitzsimons 2007, 98-102.

[298] Μπιλίτου/Bilitou 2012, 7.

[299] Maran 2019, 354.

[300] Giannakos 2024a, 33. Hom.*Il*. Β/2:819-823, Γ/3:203-207.

[301] O.c., 32-33: contrasting poetic traditions, Aeolian-Ionian, for the Fall (of Troy), 17.

"*the Trojans demolished the Walls*, *to accommodate the Trojan Horse (and be pulled on inside the city)*";[302] the Trojan Horse caused the Fall.

Βιβλιογραφία

1.-FIGURES

Figures 10-13: *The ground-plans of the Gate VIU*, *which were used as the "substrate" in Figs. 10-13*, *were drawn by the author based on Klinkott (2004, Taf. 21-22)*. The detail of the "right east corner" of the *VIU-at-f* (in blue circle with dotted line), and the wall "at the edge of the ramp/'*Rampenwange*'" (in blue parallelogram with dashed line), were drawn after the photo (Abb. 31), which was shot and presented by Klinkott (2004, 44). The *earlier ramp* with the road on it (in the parallelogram with dotted line of dark red), was drawn based on (1999, 15-17); this *earlier ramp* was later partly-covered by earth and the Section 4 was constructed on its covered part. The photo (Abb. 36) of Korfmann (1997, 40) *presents this earliest road today, under the Section 4, as it was unearthed by Klinkott***.**

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