We present here a first edition of the inscription TÜRKMEN-KARAHÖYÜK 1 (henceforth TKH 1) found by the Türkmen-Karahöyük Intensive Survey Project (TISP), a sub-project of the Konya Regional Archaeological Survey Project (KRASP), in June 2019 (fig. 1; for photographs, see Osborne et al. 2020, this volume). Our main objective here is the reading and translation of TKH 1 with special focus on the palaeography and its use for dating the text. The palaeography places the text in the eighth century BC. Since the inscription was written in the name of K/Hartapu, son of Mursili, this dating has consequences for the other Hartapu inscriptions, as edited most recently in Hawkins 2000: 433–42. As we argue below, against current opinion, KIZILDAĞ 4 might in fact be eighth century as well.

The inscription is currently located in the Konya Archaeological Museum. For the archaeological context of the discovery and its implications for the history and urban character of Türkmen-Karahöyük, see Osborne et al. 2020, this volume. The siltstone or mudstone block on which TKH 1 was inscribed measures roughly 95cm by 45cm. The top and the right side are flat, while the left side and bottom are broken. Unlike the bottom, where damaged signs are present along a fresh break, the left side was apparently broken in antiquity, since the broken area is worn and slightly rounded. The inscription starts top right.

The inscription preserves three lines in decreasing height (line 1: ca 21cm; line 2: ca 16cm; line 3: ca 12cm), although the original height of line 3 is difficult to determine. In lines 1 and 2 the bottom signs are either resting on or close to the row dividers. After restoration of the final visible sign of the inscription in line 3, SOL, it is obvious that not a single other sign of line 3 would originally have rested on a bottom row divider. This is unexpected given the placement of the signs in lines 1 and 2. Moreover, part of a sign is visible below and to the left of wa/i at the beginning of line 3, right side. We should therefore take into account at least enough space to accommodate a single row of signs below the break.

Similarly, it is difficult to say whether lines 1 and 2 continued on the far left, although the blank spaces, the lack of any sign traces to the left of mu(wa)-tá (line 1) and ara/i-nî (line 2) and the fact that the second row divider ends before the left edge suggest that nothing may have been lost, and the inscription could be complete as is. In the remainder of this article we operate under this assumption.
Still, the inscription gives the impression of being unfinished. Starting on the right, the signs in line 1 have been carved in high relief up to the country name mu-sà-ka(ABOUT), with the remainder of the text being incised. Looking at KIZILDAĞ 1, with the king seated on his throne incised and the caption identifying him in relief, one could theoretically envision the official titulature and genealogy in relief and the further narrative left incised. The signs in this first part of line 1 are also taller than in the rest of the inscription: the MAGNUS.REX combination fills the entire height of (the already higher) line 1 as compared to the same combination in line 2 under the wings of the sun disk. Yet this contrast of relief versus incision within a single inscription is unique among both Late Bronze Age and Iron Age hieroglyphic inscriptions. One might also have expected the even more official-looking name and titles in line 2 with the aedicula to have been executed in high relief as well. But this scenario cannot apply anyhow since the process of carving out the background of signs clearly continued beyond the titles and genealogy to include the ox head (mu) of mu-sà-ka(ABOUT) as well, but was then discontinued for unknown reasons. Another sign of the unfinished state of the inscription is the differing depth of the relief (compare, for example, the signs ka+ra/i-ta- versus the surrounding signs) among the signs in the first part. Moreover, the carving-out is rough and unpolished.

A final observation concerns the varying density of the signs in a line. The signs in the initial high-relief part are more crowded than the rest of the inscription. It is conceivable that this is due to the technique of executing the inscription. If the signs were incised in a first stage with the carving-out around the incised signs following in stage two, then this would automatically result in a higher density and a more crowded arrangement of the signs.

Transliteration, translation and commentary

§1 When Great King Kartapu, Hero, son of Mursili, conquered the country of Muška.

Alternatively: Great King Kartapu, Hero, son of Mursili, who conquered the country of Muška.

§2 the enemy descended upon (his) territory (lit. came down into the land),

§3 (but) the Storm God of Heaven (and) all the gods delivered (its) 13 kings (to) His Majesty, Great King Hartapu.

§4 In a single year he placed the 13 kings, the(ir) weapons (= troops?), and wild beasts?? under (the authority of) ten strong-walled fortresses.

§5 And th[ey (?)] are there (as) His Majesty’s Chiefs (?)-of-the ...

General remarks

The writing is highly logographic, a feature that is shared with the other Hartapu inscriptions that mention more than Hartapu’s name (KIZILDAĞ 2, 3, 4; KARADAĞ 1; BURUNKAYA). With the exception of §1, nouns are not marked for case. As a result, all syntactic relations have been inferred based on our understanding of the most likely candidates for subject- and objecthood, and any other roles nouns may assume in the clause, such as the recipient or beneficiary of an action, or modifier or head noun. Even the SÜDBURG inscription (editio princeps Hawkins 1995), well known for its overall logographic writing and the ensuing syntactic ambiguities, contains more case endings.

An additional problem is the lack of sentence connectives, which are otherwise so ubiquitous in the Hieroglyphic Luwian corpus. Only in §5, at the end of the inscription, do we find a-wa/-i-. The only remaining means to establish clause boundaries is to identify the verb, assuming that the verb is in the usual clause-final position or, more rarely, in clause-initial position. Clearly identifiable verbs are mu(wa)-tā in §1 and DARE-tā in §3, with the expected past-tense ending -ta. The other words we identify as verbs do not have endings but are accompanied by INFRA/SUB ‘down/under’. Because the sentence initial cluster a-wa/-i- (§5) immediately follows SUB PONERE (§4), SUB PONERE certainly is a verb, ‘put under’. The adverb INFRA-tā-a, ‘down’, (§2) combines well with a verb of motion, hence we take PES as the verb ‘come’.

INFRA-tā-a | PES.a and | SUB PONERE are the only expressions that are marked by the crampon (*386, in transliteration represented as |). This usage does not comply with any of its known uses in either the second or
the first millennium. In the first millennium, the crampon is a word divider, in many inscriptions occurring before almost every word. In the second millennium, on the other hand, it still has the value VIR₂, `man, person`, and is used as a determinative for words denoting persons if it is not a logogram itself (for a full overview of the development of the use of the crampon, see Hawkins 2010).

**Specific remarks**

§1 ka+r̥/i-t̥-pu-sa: the spelling of the Great King’s name with a clear ka- sign (ka+r̥/i-t̥-pu-sa) is puzzling vis-à-vis the writing with hā in §3. We know that the Late Bronze Age laryngeal /h/ in the Anatolian Iron Age languages in some positions developed into dorsal stops (see Hawkins, Morpurgo Davies 1993: 60 for late Luwian; Melchert 1994: 305f. [avoid ‘f.’ - please add precise page range] for Lycian; Melchert 2004 for Lydian; Adiego Lajara 2007: 260 for Carian; Schürr 2019 for a general discussion), but having the two renderings together in a single inscription is surprising. It seems inescapable to see both Kartapu and Hartapu in TKH 1 as referring to the same person. If Hartapu was an old name that over time changed its pronunciation according to the development just mentioned, one might think of the writing with /h/ as ‘etymological’ or ‘archaic’ in the aedicula under the winged sun-disk. Whatever the explanation, if the two names indeed belong to the same individual, the writing with initial /k/ would point to an Iron Age date. Even if one were to invoke a scribal or stone mason’s error for the Kartapu variant, such a mistake would only be plausible in the Iron Age when the phonological development had taken place.

[add first name] Schürr (forthcoming) argues for Hartapu as an Anatolian name in general (pace Oreshko 2017: 59–62), and provides further arguments for Hartapu as a Luwian name, even though he does not commit himself fully to a Luwian analysis. Because the Luwian change h > k is only attested in the eighth century or later (Hawkins, Morpurgo Davies 1993: 60), this implies that TKH 1 is an eighth-century text as well.

§1 sa (*415): the sign sa, which only occurs in the relief section of the inscription, shows the archaic shape. In the Iron Age inscriptions of Anatolia this shape otherwise only occurs in the Hartapu inscriptions KIZILDAĞ 1, 2, 3, 4, BURUNKAYA and KARADAĞ 1 and 2, in the Wissusarma inscriptions TOPADA (Wissusarma of Tabal), SUVASA (servants of Wissusarma), KAYSERİ (servant of Wissusarma) and GEMEREK (where it competes with the linear form and also with forms that otherwise resemble several in TOPADA: Hawkins, Akdoğan 2011: 314), and in ÇİNEKOY (Waraika of Hiyawa).

The 12th- to 11th-century Malatya inscriptions mainly show late sa, and so do the early Karkamish inscriptions. The same applies to the 11th- to 10th-century inscriptions from Palästin (ALEPPO 6 and 7, ARSUZ 1 and 2). The use of late sa continues until suddenly, in a few eighth-century Karkamish inscriptions, archaic sa shows up again (KARKAMIŞ A5a, KARKAMIŞ bowl [Yariri], CEKKE [Kamani] and KARKAMIS A21+20b [Pisiri?]!).

In Karkamish and Cilicia, then, the use of archaic sa is an eighth-century phenomenon. Because this might be the case for the rest of Anatolia as well, the presence of archaic sa in the Anatolian inscriptions cannot be taken as evidence for an early date.

§1 FILIUS/INFANS (*45): the shape of the FILIUS/INFANS sign with the lower part of the ‘wrist’ curving sharply back to the right seems specific to TKH 1. The only inscriptions with a similar but decidedly more moderate curve are SULTANHAN (mid- to late eighth century), SUVASA, ASSUR letters e and f, and compare also BABYLON 1, BOR (mid-eighth century), EĞREK (mid-eighth century), KULULU 2 (mid-eighth century) and TOPADA. Except for the Babylon inscription and the Assur letters, whose origins cannot be determined, all date to the eighth century and come from south-central Anatolia (but note that D’Alfonso 2019 proposes a tenth- to early ninth-century date for TOPADA, and then presumably for SUVASA as well). For BABYLON 1, David Hawkins (2000: 392) gives a ‘late tenth-early ninth century’ date but on ‘sculptural stylistic grounds only’.

§1 URBS-li-si-sa: nominative singular of the genitival adjective of URBS-li-. It is remarkable that K/Hartapu’s father Mursili is not further qualified by a title. In the other Hartapu inscriptions the name Mursili is always accompanied by MAGNUS.REX HEROS (KIZILDAĞ 3, 4 and BURUNKAYA). Throughout the Hieroglyphic Luwian corpus, if an author has a title himself, his father also has one. Exceptions to this rule occur in HAMA 1–3 and 6–7, where king Uradami, son of king Urhilina, never provides a title for his father.

As noted by one of the reviewers, the use of the inflected genitival adjective -assi- to express patronyms is a relatively late phenomenon. Thus far the oldest texts in which this type of patronym is found are KARKAMIŞ A2+3 §1 (late tenth to early ninth century), MARAŞ 4 §1 and TELL AHMAR 1 §1 (both ninth century).

§1 mu-sà-ka(REGIO): the sign sequence mu-sà-ka(REGIO) is clear and prompts us to reconsider the reading of KIZILDAĞ 4 §2c. Initially, [add first name] Meriggi (1965: 314) read ma-sà-ka’-na(REGIO) there, linking it to mu-sà-ka-za(URBS) in KARKAMIŞ A6 §6,
usually interpreted as referring to the Muški or Phrygians (see Hawkins 2000: 124, 126). Later, he changed his reading to mu'- (Meriggi 1975: 271). In his edition of the KIZILDAĞ group of inscriptions, however, Hawkins (1995: 106) considered the latter reading by Meriggi ‘incorrectly changed’ and reverted to mu-. In a next stage and inspired by the country or region of ma-sas in SÜDBURG §§1b and 4b, Poetto (1998) proposed to recognise the same country in KIZILDAĞ 4. He reinterpreted the ka sign as ‘the protome of an eagle’. This then resulted in a new reading ma-sà-(REGIO) ara/i-na, followed by Hawkins (2000: 438) and now generally accepted.

The ka sign (fig. 2a) that Poetto reinterpreted as an eagle’s protome and hence read as ara/i is essentially the same sign as the ka in relief in TKH 1 (fig. 2b), although with a less elongated protrusion at the upper-left side of the sign. This protrusion does not represent feathers of the eagle’s head (so Poetto 1998: 470), but seems to be an ear; compare the protrusion at the upper-left side of the missed ka in TKH 1 (for further discussion of ka, see below).

We prefer the reading mu (*107) over ma in KIZILDAĞ 4 §2c. While the overall shape of ma and mu may be similar both in second-millennium and in the later first-millennium texts, the internal structure of the signs is always quite different. The sign ma must have the curl inside, representing the ram’s horn, while the mu sign may have the four internal strokes, though this is not a necessary feature, especially not in the second millennium. Not only is the curl absent from the sign in KIZILDAĞ 4 §2c, we are also convinced the four strokes are present (fig. 3).

Given the close parallelism between TKH 1 and KIZILDAĞ 4, and the apparent uncertainties surrounding the sign readings in the latter inscription that have now been resolved, we return to Meriggi’s 1975 reading of these signs as mu-sà-ka-na (REGIO) in KIZILDAĞ 4 §2c, minus the question mark. For a discussion of the historical consequences of this reading, see further below.

The more natural rendering of the ox head in both TKH 1 and KIZILDAĞ 4 instead of the highly abstracted forms of mu and u is a feature these inscriptions share with older texts. In both inscriptions the animal head has a clearly visible mouth, but only TKH 1 clearly shows the ear, eye and horn. The less naturalistic form in KIZILDAĞ 4 is more similar to mu in YALBURT and EMİRGAZİ.

§ 1 ka (*434): as just discussed, the sign ka in relief is a clear animal head with elongated ear with a line in the middle, a neck and an ‘eye’, with a vertical line through the middle of the eye (fig. 2b). This shape is both very different from the Empire form, which is far more abstract (see fig. 4a), and from the other attestations of ka in Iron Age Anatolia, which have neither a neck nor an ‘eye’, but regularly show one or two verticals at the base of the ear (for example KULULU 2 §4; fig. 4b). And while early Iron Age inscriptions from Malatya and Karkamış often show the neck, there never seems to be an ‘eye’. The only ka that can be compared is the attestation in KARKAMIŞ A25b (Kamani, mid-eighth century; fig. 4c). The incised ka of TKH 1 §1 (in mu-sà-ka) with the horizontal line in the head is unique.

§1 REL (*329): for a general development of the REL sign (although not explicitly used as such), see Hawkins, Morpurgo Davies 1993: 55. The shape of the REL sign found here (fig. 5a), with a rounded top instead of the more common pointed spade-like shape with sloping sides, can be seen also in BABYLON 1, ANDAVAL (late ninth to early eighth century; fig. 5b), KULULU 1 (mid-eighth century) and KULULU lead strip 1 (mid- to late eighth century) and KULULU fragment 1 (mid- to late eighth century), KARABURUN (eighth century; fig. 5c), ERKILET 1 and 2 (late eighth century), GEMEREK (eighth century) and AKSARAY (end of the eighth century). A marked difference, however, is that the top is not drawn as a single lined semicircle but as the contour of the sign in relief, as it were. In this sense, the sign is shaped more like REL with rounded top in KIZILDAĞ 4 §2c (fig. 5d). REL in KIZILDAĞ 4 itself is again more similar to Empire REL (for example YALBURT; fig. 5e) with respect to the circle at the bottom of the handle and to REL in KARAKUYU line 2 with both the circle at the bottom and the rounded top (fig. 5f).

Leaving aside BABYLON 1, all are dated to the eighth century, and most to the mid- to late eighth century. Only ANDAVAL is earlier, [add first name] Balatò (2012: 160) puts the inscription ‘between the ninth-early eighth century’ based on ‘iconographical and palaeographic considerations’. For BABYLON 1, Hawkins (2000: 392) gives a ‘late tenth-early ninth century’ date but on ‘sculptural stylistic grounds only’.

The absence of a case ending on REL allows for two readings. Either REL is the conjunction ‘when’ or it is the subject, in which case we should translate ‘who conquered Muška-land’ as in KARADAĞ 1 §2 (REGIO OMNIS: REL-sa (*273)FORTIS-tà; ‘who conquered all the lands’). If we take REL as the relative pronoun ‘who’, it needs to serve as the subject of a relative clause with its antecedent in the preceding discourse. There are now two options, the first one of which is more likely: (1) the relative clause is postponed or (2) it is embedded, leading to the following translations:

(1) MAGNUS.REX ka+ra/i-tà-pu-sa HEROS URBS-li-si-sa FILIUS mu-sà-ka (REGIO) REL mu(wa)-tà; ‘Great King Kartapu, Hero, son of Mursili, who conquered
the land of Muška’

(2) MAGNUS.REX ka-ra/i-ta-ru-sa HEROS URBS- 
li-si-sa FILIUS mu-sa-ka (REGIO) REL mu(wa)-ta ara/i-
Á TERRA INFRA-ta-a | PES.a; ‘Great King Kartapu, 
Hero, son of Mursili, who conquered the land of Muška, 
came down . . .

The syntax is highly unusual, with an embedded 
relative clause instead of the usual preposed or 
less common postposed position. Additionally, Kartapu as 
the subject of ‘come down’ leads to less coherent discourse 
than option (1) or REL ‘when’ (see immediately below).

REL as ‘when’ introducing the first clause of the 
sentence is syntactically as likely as REL ‘who’ in 
a postposed relative clause. For another case of REL ‘when’ 
at the beginning of an inscription, see SÝDBURG §1.

Translating REL as ‘when’ leads to a historically more 
marked event, the enemy attack in the back, a topos that is 
well known from Hittite historical narratives.

§1: mu(wa)-tá: The verb mu(wa)-, ‘attack, conquer’ vel 
sim. (see ACLT s.v.), seems to be attested relatively rarely 
and is restricted to south-central Anatolia (second-millen- 
nium YALBURT and KÖYLÜTÖLU, and first-millen- 
nium KAYSERİ, SULTANHAN, KARADAĞ 1 and 
kıZILDAĞ 4); the one attestation listed in JISR EL 
HADID fragment 1 (Hawkins 2000: 379 FORTIS(-) 
wa/i-ní-sa TERRA INFRA-ta-a | PES.a; ‘Great King Kartapu, 
Hero, son of Mursili, who conquered the land of Muška, 
came down . . .’).

The difference in shape between the regular 
mu sign of 
mu(-sà-ka) and mu(wa) is no doubt intentional. Strictly 
taken, the standard mu sign is differentiated from u, a plain 
ax head, by the four strokes in the head showing it to be a 
ligature with the sign mi, resulting in the sound value 
mu (u x mi > mu). These four strokes are eminently visible in 
the country name in TKH 1, but are clearly missing from 
the verb form mu(wa)-tá, ‘he conquered’. In KIZILDAĞ 
4 the contrast between the two sign shapes is evident in 
the orientation of the ox head. In both inscriptions the mu 
ax head in the geographical name looks straight and 
neutral – or even friendly looking in TKH 1 – but the head 
of the bovine in the verb is tilted downwards in both TKH 
1 and KIZILDAĞ 4, sticking out its tongue, and the animal 
has a decidedly aggressive countenance in TKH 1. This is 
not an innocent ox but a charging bull, appropriate for 
what the author of the inscription wishes to express, which 
is conquest.

Recently, [add first name] Oreshko suggested trans- 
lating muwa- not as ‘conquer’ but as ‘hold sway over, rule 
over’ (2017: 53–55). His argument is partially based on 
the reading of ara/i-na as /aɾin/, ‘forever’, in KIZILDAĞ 
4 §2c (but note that arin means ‘for a time’; see Melchert 
2018: 236) and the unlikelihood that an accusative of 
extent like arin combines with a telic verb such as 
‘conquer’. However, since we now reject the reading ara/i-
na in favour of Meriggi’s original proposal, this aspect of 
Oreshko’s argument no longer holds.

More importantly, a crucial element of Oreshko’s argumen- 
tation seems to be that one would expect a reference 
to the king’s own polity: ‘It seems strange that the king 
preferred to mention some conquest, “forgetting” to 
disclose the name of his own land’ (2016: 51) and ‘What 
one expects is not the name of the land Harpatu (sic) ever 
managed to conquer, but that of the land he now rules over’ 
(2016: 53). Thus REL mu-sa-ka-na (REGIO) mu(wa)-tá 
in KIZILDAĞ 4 §2c needs to express ‘rule over Muška’, 
with Muška as Hartapu’s core land – but note that Oreshko 
of course still reads mu-sá(SÝDBURG). This should then also 
apply to TKH 1. But this lack of disclosure is standard for 
Great Kings in both the Bronze and the Iron Age.

Regarding the latter, if the polity of a Great King is 
included in the titulature, it never accompanies 
MAGNUS.REX: one only finds a geographical name in 
connection with subordinate titles such as REX (for 
example KARKAMIŠ A4b §1) or HEROS (GÜRÜN §1b). 
The area that the only other Great King from Tabal, 
Wassusarma, controls is never made explicit (see 
TODAPA, SÜVASA B and C; also see SULTANHAN and 
KAYSERİ). As a result, we do not even know the Luwian 
name of the kingdom of Wassusarma and his father 
Tuwatti (D’Alfonso 2012). We also do not know what 
country or city King Sipi governed (KARABURUN), and 
if it were not for BOR, we would not know from indige- 
nous sources that Warpalawa (Assyrian Urballa) ruled the 
kingship of Tuwatti. In other words, there is a clear 
tendency not to mention the area one governs. Instead, if 
a region is mentioned, it is because special events 
involving the region are commemorated in the inscription, 
and not because someone is simply Great King or king 
over that region.

It is not clear whether Oreshko completely rejects the 
meaning ‘to conquer’, but we maintain that this meaning 
still fits all cases in Hieroglyphic and Cuneiform Luwian 
where muwa- co-occurs with the reflexive mi/-. This is the 
equivalent of Hittite *xâ tarḫ-; see Hawkins 1992: 262 
[add to bibliography]. For example, the sequence of (a) 
the gods running before the king in the attack, (b) muwa-
the hostile troops and (c) destruction of the hostile city in 
YALBURT Block 12–13 shows that muwa- cannot mean 
anything else than ‘conquer’, especially given that we now 
need to translate (VIR2) li-ôn-ard-i-sa as ‘troops, army, 
infantry’ (Melchert 2018):
The Stormgod, my Lord, ran before me. I conquered/overwhelmed*ruled the (enemy) troops, (and) destroy(ed) the city Pinali. But also without the reflexive, muwa- may denote a hostile or violent action. In SULTANHAN §32 (similarly KAYSERI §11) the muwa- deed is flanked by violent actions (only in SULTANHAN §44 does muwa- seem to mean 'to strengthen').

The Moongod of Harran shall put his hooves on him. Indeed, after that Kubaba of Karkamishly shall conquer/overwhelm*rule him. May the attaha-gods devour him.

For this reading and interpretation, see Yakubovich 2002: 207.

In this context, the meaning 'to rule, control' would be very unexpected. Instead, the sequence of events mirrors the events in YALBURT discussed above: (a) attack, (b) conquest and (c) destruction. Finally, the interpretation above of the bull's head as aggressive fits mu(wa)- 'conquer' better than 'rule over.'

The translation of §2 is then 'The enemy came down (here) from enemy territory' or 'he came down (here) to enemy territory'. The latter option would mean that this site and its surrounding land would be the enemy territory if we take argan(m)ī as an adjective. This is extremely unlikely, hence we opt for our first solution. The translation should then be 'came down (here) from/to enemy territory'. Since we analyse INFRA-ā as 'come down toward the deictic center', that is toward Türkmen Karahöyük, the sentence either means 'he came down (here) from enemy territory' or 'he came down (here) to enemy territory'. The latter option would mean that this site and its surrounding land would be the enemy territory if we take argan(m)ī- as an adjective. This is extremely unlikely, hence we opt for our first solution. The option 'he came down (here) from enemy territory' is not problematic when read out of context, but from a discourse perspective one expects the 13 kings to be delivered to Hartapu before his return home while still in enemy territory, not after.

Another theoretical possibility would be to link argan(m)ī-
came down (here) into the Aranean country’. The form ara/i-ni would be a dative-locative of the adjective in -iya-: *ariniyi > arini. Alternatively, it could again represent the stem without case ending, thus arani. For the absence of a posterior determinative URBS, compare similar adjectival formations in REX ha+ra/i-na-wa/i-ni-sa, ‘the Haranean King’, KARABURUN §12, or pa+ra/i-za5-ta-si/sa6-x-wa/i-mu-ta-s, ‘the Parz(a)n(tassean)’, TOPADA §7. The first three clauses would then translate as ‘When Kartapu … conquered the Muska, he came down (here) into the Aranean country. The Stormgod of Heaven (and) all the gods delivered (its) 13 kings (to) His Majesty, Great King Hartapu’. We would have to introduce a new large polity to the north of the territory controlled by Türkmên-Karahöyük that consisted of at least 13 kingdoms and centred on Alana, an obscure border town of Hittite period Tarḫuntašša. As a capital of a Neo-Hittite kingdom it would have been located on or close to the border of Hartapu’s kingdom. This seems hardly likely, and therefore we take ara/i-ni as ‘enemy’.

§2 INFRA (SUB) (*56): the INFRA sign in INFRA-tá-a, ‘down’, betrays its origins: it represents an extended arm with an exaggerated curved thumb pointing downwards (fig. 7a). Given that TKH 1 clearly exhibits Empire-like sign forms (see ara/i- / AVIS2 above or OMNIS2 below), a comparison with Empire *41 (CAPERE, tá) is warranted. First millennium monumental forms of CAPERE always show drooped fingers, which are also always longer than the thumb. Empire *41, however, does not show the drooping of the fingers (see Herbordt 2005: 400): the position of the fingers is similar to our sign. What made us decide against CAPERE in TKH 1 is both the curvature of the thumb and the fact that the thumb is much longer than the fingers. Similar hand-shaped SUB/INFRA-s occur on numerous Hittite period seals, where they are read as ká, in the 13th-century inscriptions EMİRGAZİ, YALBURT and SÜDBURG, in inscriptions from Suhi II (tenth-century KARKAMIŠ A1a) and from Katuwa (tenth-to ninth-century KARKAMIŠ A13d; fig. 7b). Similarly shaped CUM (*58), cousin of INFRA/SUB, occurs in inscriptions from IZGIN (11th tenth century), Suhi II (tenth-century KARKAMIŠ A1b), Katuwa (tenth- to ninth-century KARKAMIŠ A13d, A11b [fig. 7c], A2) and Yariri (ninth- to eighth-century KARKAMIŠ A6, A15b). As usual, TOPADA presents its own version (fig. 7e). Closest in shape to INFRA in TKH 1 is KARKAMIŠ A6, with the ‘cuffed’ wrist and open-ended arm (fig. 7d). The other inscriptions of south-central Anatolia show only the cursive form (*57; see fig. 7f).

§2 INFRA-tá-a PES.a: the spelling INFRA-tá-a is attested in MALPINAR §28. The writing of the verb of motion as PES followed by a is not easily explained. There are no verbal endings on -a, so the a should be part of the stem. It could represent the final syllable of the stem – compare DEUS-ni – but to our knowledge there is no verb with final syllable -a. Alternatively, a could be the first syllable. This convention is also used for IUDEX+/la = Labarna (in YALBURT, EMİRGAZİ), MONS+tu = Tuðhaliya (YALBURT, EMİRGAZİ), POST+a = āppan (YALBURT) and AVIS (DEUS)ku = Kubaba (GÜLBENKIAN seal). If this is the correct analysis, PES.a should represent awi-, ‘come’, and INFRA-tá-a PES.a = zanta awi- means ‘come down’.

While the combination of PES ‘come’ with INFRA ‘down’ is well attested (ALEPPO 2 §15, AKSARAY §2, SULTANHAN §14, KARABURÇLU line 4), in each case ‘come down’ occurs in the context of benefits descending from heaven. Going to a country, on the other hand, is expressed with verbs that are marked with the logogram PES2, for example the verb pa-, ‘go’. Assuming that pa- and awi- function like Hittite pai-, ‘go’, and inwa-, ‘come’, respectively, PES.a = awi- represents motion towards the deictic centre, in this case Türkmen Karahöyük, with the subject coming from somewhere else.

§3 13 REX: large numbers of Tabalian kings are regularly mentioned in Assyrian sources. For example, in his 22nd year (837 BC), Shalmaneser III received tribute from 20 kings of Tabal (RIMA 3 A.0.102.16, lines 170–72). It is perhaps significant that TOPADA lists three allies for Wassusarma and nine enemies, a total of 13 kings if one includes Wassusarma.

§3 ха+ra/i-tá-pú: the use of OMNIS2 (*430) as a syllable with the value пú (acrophonically derived from punati, ‘all, every’) is otherwise only attested in KIZILDAĞ 3 in the name ха+ra/i-tá-pú-sa and perhaps in SUVASA inscription A in the place name тi-pú-wa/i(URBS), if that name is not to be read as PES.OMNIS2-wa/i(URBS) (D’Alfonso 2017: 54).

The logogram OMNIS3, ‘all’, itself is only attested in Empire inscriptions, the KIZILDAĞ-KARADAĞ group and perhaps in TOPADA §22 (OMNIS2-P4-ži/a; see D’Alfonso 2019: 138, 143 for this tentative reading).

§3 DARE-ta₆: the syllabic use of CRUS (*82) as ta₆ otherwise only occurs in TELL AHMAR 1 (late tenth to early ninth century) in (a*314)ha-ta₆-sa₆-ta₆-i-ti (§12) and ta₆-ni-mi-i-sa (§ 17), and in a passage describing a
similar *topos as TKH 1 §3, employing the same verb DARE-ta.

TELL AHMAR 1 §3:
[*a-]wa/i-mu |DAR[E]-[a][a] *a-mi-[a-n[a] |(*314*)|ka-pi-
lak-lam-i-na
(This Celestial Storm God heard me,) and he delivered my enemy to me.

The delivery of the enemy by the gods finds exact parallels in Hittite annalistic literature; see, for example, LÚ.KÚR Ḫayašan ‘U BELI-YA karā pašt, ‘Go, at last! The Stormgod, my lord, has already given you that Ḫayašan enemy’ (KBo 4.4 ii 56–57 [NH]), with Hittite pašt-, ‘give’, the cognate of Luwian piya-(DARE).

§4 LEO*: as one of the reviewers notes, the reading of this sign as LEO (*97) = hvisara/hwitara, ‘wild beasts’, is uncertain. While the open mouth resembles *97, the eye is missing. Overall, the sign is less angular than all other instances of LEO; compare, for example, ÅLEPPO 2 §5, TELL AHMAR 6 §31 and BOHÇA §5. ‘Wild beasts’ seem hardly appropriate in the context if one assumes that they are part of the conquered armies of the 13 defeated kings. However, if the wild beasts are the result of hunting expeditions they could represent Hartapu’s prowess as hunter (compare Hawkins 2006), a theme that is explicitly addressed in KIZILDAĞ 4 §3: (TERRA)ta-sā-R[EL+ra/í] OMNIS2 MAGNUS.REX VIR li,-wa/i-ni CERVUS4.IACULUM-tā (DEUS)TONITRUS!. CAELUM, ‘A Great King, a (real) man, he regularly hunted all the land(s) (with the help of) the Storm God of Heaven’ (combining Melchert’s interpretation of this passage [2018: 237] with several of Poetto’s readings [1998: 471]).

§4 MAGNUS.SCALPRUM+ra/i: because of the phonetic complement -ra/i- the lexeme behind MAGNUS.SCALPRUM should have an /i/ in the final stem syllable. Of the words written with SCALPRUM, only two qualify: kuttassar(i)-, ‘orthostat (designed to bear inscriptions)’, and iriya(i)-, ‘portrait’ (Van den Hout 2002: 173, 185–86). With CASTRUM.FORTIS, ‘strong fortress’, immediately following, kuttassar(i)-, ‘orthostat’, is the most logical choice.

The only possible functions for MAGNUS.SCALPRUM+ra/i are as an adjective in locative case, a locative proper or a genitive, leading to the following three translations, respectively: (1) strong ‘orthostated’ fortresses = ten strong-walled fortresses; (2) strong fortresses in the orthostat(s); (3) strong fortresses of the orthostat(s). Only the first option makes sense.

§4 10 CASTRUM.FORTIS: there are many fortresses attested on the Konya plain (see Massa et al. 2020, this volume). It is quite tempting to understand our passage in reference to ten of those fortresses.

§4 SUB PONERE: the hand ign could be read either as CAPERE or as PONERE. INFRA CAPERE occurs in MARAŞ 4 §4, 12, ARSUZ 1 and 2 §10 and KIRŞEHİR §10. Given the position of the hand in TKH 1, which is unlike the CAPERE hands in the attestations just cited, a reading PONERE, ‘put under (someone’s authority), submit’, as in BOROWSKI 3 §6, might be easier.

The verb ‘place, put’ requires an animate agent. The 13 kings, the gods (from the preceding sentence) and Hartapu all qualify, but since the gods have delivered the 13 kings to Hartapu, the kings have most likely been stripped of their agency, and within a historical narrative divine action is usually restricted to running before the king in battle, delivering the enemy and more generally being good to and protective of the king. Hartapu is therefore the only logical subject. The object consists certainly of the weapons (= troops?) and wild beasts, but did Hartapu take the weapons of the 13 kings or are the 13 kings led to the fortresses in submission? While it cannot be excluded that 13 REX is a genitive, it perhaps makes more sense to place both people and their possessions under someone’s authority than just stuff. Thus, we translate ‘and in a single year he placed the 13 kings, the gods (from the preceding sentence) and Hartapu all qualify, but since the gods have delivered the 13 kings to Hartapu, the kings have most likely been stripped of their agency, and within a historical narrative divine action is usually restricted to running before the king in battle, delivering the enemy and more generally being good to and protective of the king. Hartapu is therefore the only logical subject. The object consists certainly of the weapons (= troops?) and wild beasts(?) (under the authority of) ten strong-walled fortresses’.

§5 wa/i (*439): the sign *439 = wa/i consists of a vertical with a hook on top and rectangular side elements (shape 3Aa-r; D’Alfonso, Payne 2016: 110). This particular form is unique among the 1,969 occurrences of post- and Neo-Hittite wa/i in that it combines the archaic rectangular shape of the side elements with an eighth-century hook on top of the central element. The sign shape closest to our form, 3Aa-s, with square side elements, only occurs in eighth-century texts and is attested in inscriptions from Karkamish, Mazuvari, Gurgum, Kummuh, Amuq, Tuvana and Tabal (D’Alfonso, Payne 2016). Because of the presence of a sign element that is firmly and exclusively connected with the eighth century, wa/i in TKH 1...
§5: the understanding of the final paragraph of the inscription is seriously hampered by three signs of unknown or uncertain reading and the fact that the bottom of the line is broken off. The signs in question are *326, *520 and the sign immediately preceding the Sun deity at the end. *326 can either be tū or SCRIBA (in its traditional reading), or SELLA under the new reading (van den Hout forthcoming), indicating a high official related to the ruling dynasty. Because the top of a sign is visible below and to the left of a-wa/i-, tū as the third-person dative clitic is excluded. *326 should therefore be taken as SELLA and goes with *520.

*520 is attested only in KARAHOYUK §15 (see Hawkins 2000: 24, 290, 294; followed by van Quickelbergh 2013: 254, 256) and seems to denote a countable (1 *520) commodity of some kind, for which Hawkins suggests a cereal.

The third dubious sign could be pa+ra/i, which together with the preceding a- could result in apari, rhotacised form of apadi, ‘there’. The possibility of a personal name, a-pa+ra/i-(DEUS)SOL = Aparitiwati, seems unlikely because of a lack of names starting with Apari- (for the alleged name *Apari-ura in KULULU lead strip fragment 1 i 2, see Hawkins 2000: 511; 2004: 364). Although SCRIBA/SELLA might suggest a so-called ‘scribal signature’ or, better, an addition to the text mentioning the person commissioning the inscription, the absence of a clear personal name renders this unlikely. Also, the role of *520 would be unclear.

The presence of (DEUS)SOL is incontestable, but it is exceptional to find the Sun deity unaccompanied by other deities. In most Hieroglyphic Luwian inscriptions any deity mentioned alone would be the Storm God; compare KIZILDAĞ 4 §3. This brings us to (DEUS)SOL as representing tiwadāmi-. This adjective, an -āmi- derivation of tiwad-, ‘sun’, with literal meaning ‘pertaining to the sun’, is only used as a non-religious title for high-ranking or ruling officials who are regents (Azatiwada, KARATEPE 1), ‘first servants’ (Sastura, CEKKE 2) or major domos (Ruwa, KULULU 4). [add first name] Hutter (2001: 176–78 already) suggests a connection between tiwadāmi- and Hittite ʿUTU-ŠI, ‘Majesty’. We therefore translate tiwadāmi- as ‘pertaining to His Majesty, His Majesty’s’ (see further Goedegebuure forthcoming [add to bibliography] - or should be ‘in preparation’, as in bibliography?).

The adjective tiwadāmi/i- is mainly used as modifier of CAPUT, ‘(noble) man’, but also occurs as an independent epithet; compare KULULU 4 §1 with tiwadāma/i-, likewise in clause final position: EGO-wa/i-mi ru-wa/i-sa₄ IUDEX-nt-sa ā-sa-ḥa SOL-wa/i+ ra/i-mi-sa₅, ‘I was Ruwa, Ruler, i.e., His Majesty’s’ (also see HİSARCIK 1 §1 and BOYBEYPINARI 2 IIIB 1 §5).

The sign that should follow a-wa/i- is limited to representing third-person enclitic pronouns (thus sa, tā, tu) or sentence particles (tu or tā). Given the curved top of the sign, tu (and the other signs representing /tu/), tā and tā are excluded. Although one cannot be certain, it seems that the curvature of the sign fits tā better than sa, which might require a more bent curve. Since tā would extend further to the left than sa, it would explain that *520 is placed to the left of SELLA, together forming a title. Taken together, this would mean that a-wa/i-tā represents awa+wada, with -ada referring to the 13 kings, either as nominative or accusative, while SELLA *520 would be something like ‘Chief(s)-of-the-Grain (???)’. With all due caution, given the fact that many of the steps of the argument outlined above depend on each other, we suggest reading and translating as follows, with apari as a nominal predicate ‘be there’ in reference to the fortresses of the previous clause: a-wa/i-[(d’)] SELLA *520 a-pa’+ ra’-[i-’] (DEUS)SO[I- o’], ‘And the[y] (are) there (as) His Majesty’s Chiefs-of-the Grain (???)’.

Under this interpretation, the 13 conquered kings or local rulers, who might originally have been vassal kings of Great King Hartapu, were distributed among the ten fortresses, stripped of their commanding roles and installed as subordinates in a non-military function, though still in some supervisory position.

**Date of the inscription**

The palaeography of TKH 1 strongly suggests an eighth-century date. The following signs were used for this determination (each sign has been discussed in depth above).

* sa (*415): in its archaic form, sa belongs to the Hittite and immediately post-Hittite periods, then reappears in several eighth-century inscriptions from Karkamish and Cilicia after a hiatus of at least three centuries. The archaic shape of sa in TKH 1 (and the other Hartapu inscriptions) cannot be used to argue for an earlier date. Instead, it could signal an eighth-century date.

FILIUS/INFANS (*45): its shape seems specific for TKH. Similar forms are only attested in mid- to late eighth-century inscriptions from south-central Anatolia (except older BABYLON 1 and the ASSUR letters), though note that [add first name] D’Alfonso (2019) proposes a tenth- to early ninth-century date for TOPADA.

ka (*434): within Anatolia its shape seems specific for TKH 1. The only ka that can be compared is the attestation in KARKAMIŞ A25b (Kamani, mid-eighth century).

REL (*329): REL with rounded chisel is mostly attested in the mid- to late eighth century in south-central Anatolia (except older BABYLON 1).

wa/i (*439): though the rectangular side elements are typical for older inscriptions, the hook at the top of the
middle element conclusively points at an eighth-century or later date.

Phonological evidence likewise supports an Iron Age date for the inscription. The development of /k/ < /h/ in the name Kartapu is only an Iron Age phenomenon. Assuming we have read §5 correctly, support for an eighth-century date is provided by the presence of rhotacism in apari < apadi. Though rhotacism needs to be further investigated, we maintain that d/r rhotacism is essentially a phenomenon that starts in the late ninth century in general and in the eighth century in Anatolia (Goedegebuure 2010: 76–78). We do not expect to find rhotacism in tenth- or ninth-century Tabal (in TOPADA as redated by D’Alfonso 2019), then for it to disappear from there in the mid-eighth century during the reign of Tuwati (KULULU 1, no rhotacism). Other texts that date with certainty to the reign of Tuwati start showing d rhotacism (ÇİFTLİK, KIRŞEHİR (+) YASSIHÖYÜK). The co-occurrence of texts with and without rhotacism during the time of Tuwati suggests that in Tabal proper the phenomenon started in the mid-eighth century. The earliest texts from Tuwana, which date to the ninth to the very early eighth century (ANDAVAL, NIĞDE 1) and are therefore older than the Tuwati texts, do not show rhotacism.

The use of the genitival adjective -assi- in the nominative to express patronyms is first attested in a late tenth- to early ninth-century text [which text? add reference?] and therefore supports a later Iron Age date.

Yet other features of the inscription pattern with Hittite period inscriptions: the highly logographic writing, the lack of the sentence initial chain with the exception of §5, the use of the aedicula, the shape of ara/i (*132), the use of the logogram OMNIS₂, the archaic aspects of the sign wa/i (*439) and the more natural rendering of the ox head mu (*107). Several of these features are shared with the other Hartapu inscriptions and the TOPADA-SUVIDA-GÖSTESIN cluster.

To sum up, both palaeography and language point at an eighth-century date for TKH 1, perhaps even at the mid-to late eighth century. At the same time, the inscription contains archaic features, which either point to archaisation or perhaps to a local scribal tradition that more than other Anatolian Hieroglyphic traditions adhered to the style established during the Hittite Empire. Only the recovery of more inscriptions from the Konya plain will allow us decide in favour of one option or the other.

**Historical assessment and consequences for the date of the other Hartapu inscriptions**

The other Hartapu inscriptions (KIZILDAĞ-KARADAĞ, BURUNKAYA) are dated to either the Hittite period under the assumption that his father Mursili is Mursili III = Urhi-Tessub (see Oreshko 2017: 49 n. 11 for a list of the substantial number of scholars supporting such a date) or not long after the fall of the Empire in the 12th or 11th century (Hawkins 2000: 434, 439; Oreshko 2017: 48–50, with references to further literature). An Empire period date for KIZILDAĞ 4 can no longer be upheld given the mention of the land Muska, that is the Phrygians instead of the land of Masa (see above). While a reference to Masa could be reconciled with such a high date (but see already Oreshko’s arguments against such a high dating), a Phrygian state simply did not exist in Hittite times.

The eighth-century date of TKH 1 now leads to a quandary. Do we accept two different Hartapus, both sons of a Mursili, who both conquered the Phrygians, one ruling in the immediately post-Hittite period and the other in the eighth century? Of all his conquests, Hartapu of KIZILDAĞ 4 only highlights the conquest of Muska (§ (DEUS)TONITRUS.CAELUM DEUS-na OMNIS₂ (BONUS)wa/i-sà-ti REGIO OMNIS₂ || (*273)mu(wa)-tà § REL mu-sà-ka-na(REGIO) mu(wa)-tà-‘, ‘(Hartapu) conquered all the lands through the goodness of the Storm God of Heaven (and) all the gods. Indeed, he conquered the country of Muska’; with REL as ‘indeed’ as suggested by Yakubovich 2008: 11 n. 14), which means that the Muska must have been quite important during the reign of Hartapu of KIZILDAĞ 4. But do we accept a powerful Phrygian polity already in the 12th or 11th century bordering on the Konya plain, when there is archaeological evidence of a rising political and economic power at Gordion only in the early ninth century (Voigt 2009: 325)?

Several of the Hartapu inscriptions are certainly late. The existence of an eighth-century Hartapu in TKH 1 now fully supports that the throne relief and inscription of KIZILDAĞ 1 are not only contemporaneous (see Oreshko 2017: 48) but also date to the eighth century (Osborne forthcoming). The rhotacism attested in tu-pi-ra/i, ‘he will smite/he smote’, in BURUNKAYA is also fully consistent with an eighth-century date. The remaining Hartapu inscriptions now need to be reassessed, most crucially KIZILDAĞ 4 with its mention of the conquest of the Phrygians and the similarities in general with TKH 1. The issue that needs to be resolved is whether TKH 1 used much older KIZILDAĞ 4 as a model, explaining its archaic features (which forces the existence of an early Phrygian kingdom), or if TKH 1 and KIZILDAĞ 4 are closer in time or even contemporaneous.

While KIZILDAĞ 4 undeniably looks immediately post-Empire or early Iron Age, there are some clues that connect it with the late aspects of TKH 1 and a few eighth-century Karkamish inscriptions. (1) The sign sa in its archaic use is not attested in the early texts from Malatya and Karkamish, but shows up again in inscriptions there from the late ninth to eighth century. Its presence in KIZILDAĞ 4 is therefore not evidence for an early date.
The same applies to the shape of FILIUS without upper ‘crampon’. Discussing the sign FILIUS in general, one reviewer notes that the absence of the upper ‘crampon’ in FILIUS, while the usual shape in second-millennium texts, is only a late phenomenon in first-millennium texts: it is omitted from archaising KARKAMIŠ A 21b+a §11, TOPADA §1 and KIZILDAĞ 3. We would like to add that the appearance of this version of FILIUS in KIZILDAĞ 4 is therefore either pre-11th century or it points to an eighth-century date. What separates the shape of FILIUS in KIZILDAĞ 4 from the Empire inscriptions is the placement of the ‘crampon’ vis-à-vis the hand-shaped sign element. In second-millennium texts the ‘crampon’ is always attached to the hand, while almost all early post-Empire texts already show the ‘crampon’ separated from the hand (for example GÜRÜN, DARENDE, KARKAMIŠ A4b and perhaps KÖTÜKALE; but with ‘crampon’ attached: KARKAMIŠ A14b). In our view, the separated ‘crampon’ combined with the omission of the upper ‘crampon’ from KIZILDAĞ 4 should be considered archaising and not archaic. (3) The particular shape of ka in TKH 1, so different from Empire ka, is otherwise only found in KIZILDAĞ 4, and again in an eighth-century inscription from Karkamish (KARKAMIŠ A25b). (4) And finally, the rounded top of REL in KIZILDAĞ 4 is mainly a late phenomenon, though the circle at the bottom is mainly second millennium. This too could imply that REL is archaising and not archaic.

This list of three potentially archaising sign uses (sa, FILIUS, REL) and one eighth-century use (ka) does not provide enough support for a down-dating of KIZILDAĞ 4, but the fact that both KIZILDAĞ 4 and TKH 1 belong to a Hartapu, son of Mursili, who conquered the Phrygians, should give us pause and makes it imperative that all sign forms of KIZILDAĞ 4 are reassessed against the complete Anatolian Hieroglyphic corpus.

Our eighth-century Hartapu is not known from other eighth-century sources, either indigenous or Assyrian. This might mean that Hartapu was simply beyond the purview of the Assyrians, being too far west and not a tributary king. Indigenous sources are often not historical in nature, so we would not expect any references to Hartapu unless the author of such an inscription was his servant or an antagonist of his. In Phrygia, Mida [Midas?] ruled during the second half of the eighth century. Given the latter’s continuing importance and international stature it does not seem likely that an Anatolian Great King would have conquered his territory at any time. On the other hand, the conquest of Phrygia in TKH 1 does not necessarily point at a full defeat but might refer to raids into Phrygian territory, allowing Hartapu as contemporaneous with Mida. Propaganda with exaggeration should never be excluded. But if we assume that a Great King Hartapu should have been mentioned in Assyrian sources, as for example Wassusarma (Assyrian Wassurme) or Warpalawa (Assyrian Urballa), then another explanation offers itself: Hartapu ruled in the first half of the eighth century. The eighth-century Assyrian references to Tabal only start with Tiglathpileser III, so an early eighth-century date would explain Hartapu’s total absence from Assyrian sources. It would also resolve the issue identified above, that it might be difficult to claim that Hartapu conquered parts of Phrygia during the reign of Mida. He would simply have operated before the reign of Mida.

While raiding or conquering Phrygian territory, Hartapu’s country was attacked by 13 kings. It is tempting to understand these kings as representing a coalition of subordinate Tabalian states to the east of Hartapu’s country. They were quite unsuccessful: not only were they defeated, they were also stripped of their royal power and absorbed into Hartapu’s society in a much lower position. This defeat, or another one, of Tabalian kings is probably celebrated in the BURUNKAYA inscription, which unfortunately is broken exactly where the defeated country or countries are mentioned. Only […] REGI[O]/URBS tupa/ra/i is preserved at the end (for the reading URBS or REGIO, see Oreshko 2016: 10).

Irrespective of the outcome of future debates about the date of the remaining Hartapu inscriptions and a more precise date for TKH 1, out of nowhere we now have an eighth-century Great King Hartapu, son of Mursili, ruler of a previously untested Iron Age kingdom with its capital at Türkmen Karahöyük.

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Abbreviations
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RIMA 3 = Kirk Grayson, A. 1996: Assyrian Rulers of the Early First Millennium BC II (858–745 BC) (Royal Inscriptions of Mesopotamia, Assyrian Period 3). Toronto, University of Toronto Press


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Fig. 1. TÜRKMEN-KARAHÖYÜK 1 (drawing by Fadime Arslan and James Osborne).

Fig. 2. (a) ka in KIZILDAĞ 4 §2c (photograph Cüneyt Süer 2011); (b) ka(+ra/i) in TKH 1 §1. [b is below print quality - please resupply at 600dpi at 81mm wide]

Fig. 3. (a) mu in KIZILDAĞ 4 §2c; (b) outlined mu in KIZILDAĞ 4 §2c (photographs Cüneyt Süer 2011).
Fig. 4. (a) ka in YALBURT Block 9 (photograph Cüneyt Süer 2011; Hittite Monuments); (b) ka in KULULU 2 §4 (photograph Cüneyt Süer 2011; Hittite Monuments); (c) ka in KARKAMIŠ A25b §3 (photograph Tayfun Bilgin; Hittite Monuments).

Fig. 5. (a) REL in TKH 1 §1; (b) REL in ANDAVAL §3 (photograph Bora Bilgin 2017; Hittite Monuments); (c) REL in KARABURUN §11 (photograph Bora Bilgin 2009; Hittite Monuments); (d) REL in KIZILDAĞ 4 §2c (photograph Cüneyt Süer 2011); (e) REL in YALBURT Block 4 (photograph Horst Ehringhaus 2005; Hittite Monuments); (f) REL in KARAKUYU line 2 (photograph Tayfun Bilgin 2006; Hittite Monuments).

Fig. 6. (a) ara/i in TKH 1 §2 (specular enhancement); (b) ara/i in SUVASA inscription D (photograph Tayfun Bilgin 2009; Hittite Monuments); (c) ara/i in YALBURT Block 14 (photograph Cüneyt Süer 2011; Hittite Monuments); (d) ara/i in TOPADA §8 (photograph Ingeborg Simon; CC BY-SA 3.0, 2015).
Fig. 7. (a) INFRA in TKH 1 §2 (specular enhancement); (b) INFRA in KARKAMIŞ A13d §3 (photograph Tayfun Bilgin 2014; Hittite Monuments); (c) CUM in KARKAMIŞ A11b §4 (photograph Tayfun Bilgin 2006; Hittite Monuments); (d) CUM in KARKAMIŞ A6 §13 (photograph Tayfun Bilgin 2014; Hittite Monuments); (e) INFRA in TOPADA §23 (photograph Ertuğrul Anıl 2019; Hittite Monuments); (f) INFRA in SULTANHAN §14 (photograph Tayfun Bilgin 2006; Hittite Monuments).