Abhandlung

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The Decipherment of Linear Elamite Writing

https://doi.org/10.1515/za-2022-0003

Abstract: Linear Elamite writing was used in southern Iran in the late 3rd/early 2nd millennium BCE (ca. 2300–1880 BCE). First discovered during the French excavations at Susa from 1903 onwards, it has so far resisted decipherment. The publication of eight inscribed silver beakers in 2018 provided the materials and the starting point for a new attempt; its results are presented in this paper. A full description and analysis of Linear Elamite of writing, employed for recording the Elamite language, is given here for the first time, together with a discussion of Elamite phonology and the biscriptualism that characterizes this language in its earliest documented phase.

Dedicated to Françoise Grillot and François Vallat, and to the memory of Vincent Scheil, Ferdinand Bork, Carl Frank, Walther Hinz, Piero Meriggi, and Marie-Joseph Steve, great pioneers who paved the way.

> "Provided sufficient text is available, a phonetic writing can and ultimately must be deciphered if the underlying language is known" (Gelb 1975, 96).

1 Introduction

In 1903, French excavators working in the Acropolis mound of Susa found inscriptions attesting to a new writing system (Scheil 1905), which for a long time was assimilated to that of the so-called 'Proto-Elamite' tablets, as a lapidary version of it (see, e. g., de Mecquenem 1956, 200; and Gelb [2]1963, 89: "a more developed form of Proto-Elamite writing") until, in the early sixties, it was interpreted as an independent script and renamed *elamische Strichschrift* (Hinz 1962[1]) or, in English, *Linear Elamite* (Hinz 1975; henceforth abbreviated as LE when used adjectivally, while PE stands for Proto-Elamite). Used in southern Iran between ca. 2300 and 1880 BCE (for the locations of the sites mentioned in this study, see Fig. 1), despite several decipherment attempts, Linear Elamite remained substantially undeciphered until recently (see Fig. 2).[2] Here is a summary of the results obtained in previous studies and proven correct by our decipherment (for the numbers that identify the various glyphs, see Fig. 3a).

Bork (1905, 328; 1924), studying inscription A,[3] correctly identified the phonemic values *ši* (glyph 83), *še* (glyphs 87 f.), *na* (169), and *k* (70, read by Bork as "(*a*)*k*"). Moreover, he came very close to establishing the correct readings of the glyphs 137 f. ("*en*" = *ni*), 201 ("*šu*" = *su*), and 2 f. ("*ke*" = *ki*).

Frank (1912, 20; 1923) came close to identifying two additional values — *n* and *š* — attributing the reading "*in*"

Article note: Abbreviations are those of the Reallexikon der Assyriologie und Vorderasiatischen Archäologie (https://rla.badw.de/reallexikon/abkuerzungslisten.html; note especially EKI = König 1965; and ElW = Hinz/Koch 1987), to which the siglum TZ, for the texts from Choga Zanbil published by Steve (1967), must be added.

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[The order reflects the moment when each author got engaged in the project: F. Desset and K. Tabibzadeh: end of 2018; M. Kervran: end of 2019; G. P. Basello: beginning of 2020; G. Marchesi: beginning of 2021.]

1 Note that Bork (1924) already used the term *Strichschrift* to refer to this writing.

2 On Linear Elamite, see, most recently, Desset (2012, 92–127; 2018a). See also Hinz 1962; 1969; 1971; 1975; Meriggi 1971; Vallat 1986; André/Salvini 1989; Salvini 1998; and Steve 2000.

3 LE inscriptions are traditionally identified by individual letters of the alphabet. It was Scheil (1905) who started to label the inscriptions with Latin letters following the alphabetical order and this practice has continued to this day.

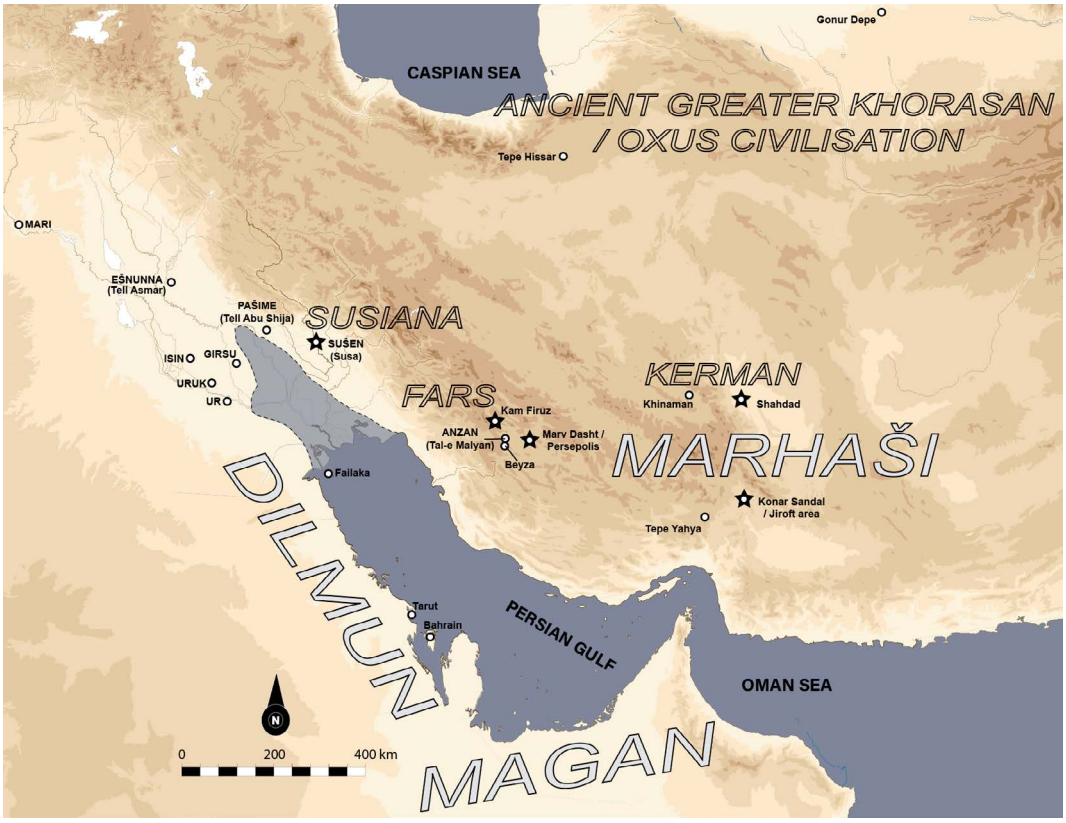


Fig. 1: General map of the archaeological sites mentioned in the text (F. Desset).
Sites where LE inscriptions were found are marked with a black star.

to glyphs 28–30 and "*aš*" to glyph 185. He also proposed to read glyphs 12 and 124 as "*ir*" and "*sa*", respectively (here read as *ra* and *s*).

Hinz (1962, 21; 1969, 44, fig. 19) identified glyphs 190 f. as *pi* (read "*piš*" by Bork 1924) and glyph 9 as *hu* in the writing of the PN Šin-pishůk. He proposed to read glyphs 39 f., 57, 236, and 281 as "*hal*" (= *ha*). In 1962, he rightly proposed to read glyph 180 as *ru*, before changing this identification to "*ha*" in 1969.

Meriggi (1971, 193–203. 219 f.) attributed the phonemic values *za* to glyph 50 and *pu* to glyph 135. He suggested that glyphs 71 f. and 76 may represent the class-marker of the 3rd person sing. "*ri*" (actually, glyphs 71 and 76 = ri_2 are to be distinguished from glyph 72 = *r*) and came close to establishing the correct readings of glyphs 185 ("*uš*" = *š*) and 182 ("*uz*" = *zu*).

Corsini (1986, 26–35) correctly identified glyph 93 as *k* (already read "*ka*" by Frank 1912; our k_2) and glyph 182 as *zu*.

Mäder [e. a.] (2018, table 21), proposed that glyph 139 could be read as either "(*i*)*h*" or "(*i*)*š*". Here it is read as *h*.

All in all, before 2018, 12 signs were properly identified: *hu*, *k*, k_2, *na*, *pi*, *pu*, ri_2, *ru*, *še*, *ši*, *za* and *zu*.

In 2018, F. Desset published a group of 8 silver beakers inscribed with LE inscriptions (texts X, Y, Z, F′, H′, I′, J′, and K′)[4] from the Houshang Mahboubian (7 arti-

4 Previously called *gunagi* vessels (Desset 2018b), these artifacts are here more cautiously referred to as beakers. In fact, it is not certain that all these vessels were actually termed *gunagi* (especially with regard to the spouted beakers with LE inscriptions Y and Z). This term can only be applied with certitude to the copper and silver beakers bearing the cuneiform inscriptions nos. 4, 6, and 7 (see below, section 2.2 and Table 2), all explicitly said to be written on *gunagi* vessels. In this connection, it should also be noted that the term itself, *gunagi*, never existed (at least not in this form). In fact, *gunagi* stems from GU.NA.GI_4, which is not a word but a fossilized syllabic spelling of the Sumerian term /gunangi/, used as a logogram for a derivative Akkadian word (see Dossin 1927, nos. 99: 4; 100: 16; 102: 9; etc.; note that GI_4 is not used as a syllabogram in the Akkadian syllabary of Susa; see Salonen 1962, 164). On the basis of the phonological and morphological transformational rules of the loans from Sumerian to Akkadian, this Sumerian loanword in Akkadian can be reconstructed as **kunakkûm*, assuming that the borrowing occurred before the generalized sound change that affected Sumerian toward the end of the 3rd millennium BCE and that caused the transformation of voiceless stops into voiced stops in many phonological environments (see Jagersma 2010, 36–38). However, the lack of syllabic writings for the hypothesized Akkadian term makes its reconstruction not entirely

facts) and Martin Schøyen (1) collections (Desset 2018b).[5] They may come from a Šimaški/Sukkalmaḫ-related royal graveyard located in the Kam-Firuz area (Fars), some 40 km north of Tal-i Malyan, the ancient city of Anšan. While we regret that the exact provenance of these artifacts is unknown, for heuristic purposes we think that each alleged ancient artifact has to be studied and analyzed before discharging it as a forgery. In what follows, our concern is to read and understand the texts. While the evaluation of whether the understanding of an unprovenanced text in an undeciphered writing system can validate the genuineness of its physical carrier represents a relevant methodological issue for an epistemological reflection, the chemical and metallographic analyses that were performed on 13 samples from some beakers of the Mahboubian Collection (Faieta [e. a.] 2018, 144, table 1) provided the following conclusion: "everything (gradually forming patinas betraying the interaction with the archaeological layer/burial soil, alloys with pure silver and low percentages of pure copper, free from common modern contaminants like tin, nickel, zinc, etc., and quite specific indicators of manufacturing processes) points to ancient artefacts and not to ingenious modern forgeries" (Faieta [e. a.] 2018, 147).

Since the names of the Sukkalmaḫ rulers Eparti II and Šilhaha, as well as that of the god Napireša, could be recognized in these texts, this group of inscriptions became the key for the decipherment of Linear Elamite, enabling Tabibzadeh/Desset (2019) and Kervran (2019) to decipher initially independently and concurrently more than 30 new signs.

While the door was unlocked in 2018 and opened in 2019, it is time now to enter the room fully and propose the near-complete decipherment of Linear Elamite. Editions of all the known LE inscriptions will follow in a separate work (Desset [e. a.], forthcoming), which will soon appear as a volume in the open-access series OrientLab Series Maior of the University of Bologna (www.orientlab.net/pubs/). However, two texts are preliminarily edited here: M in section 3.2 and F // G // H (Puzur-Sušinak; 22nd century BCE) in section 6.

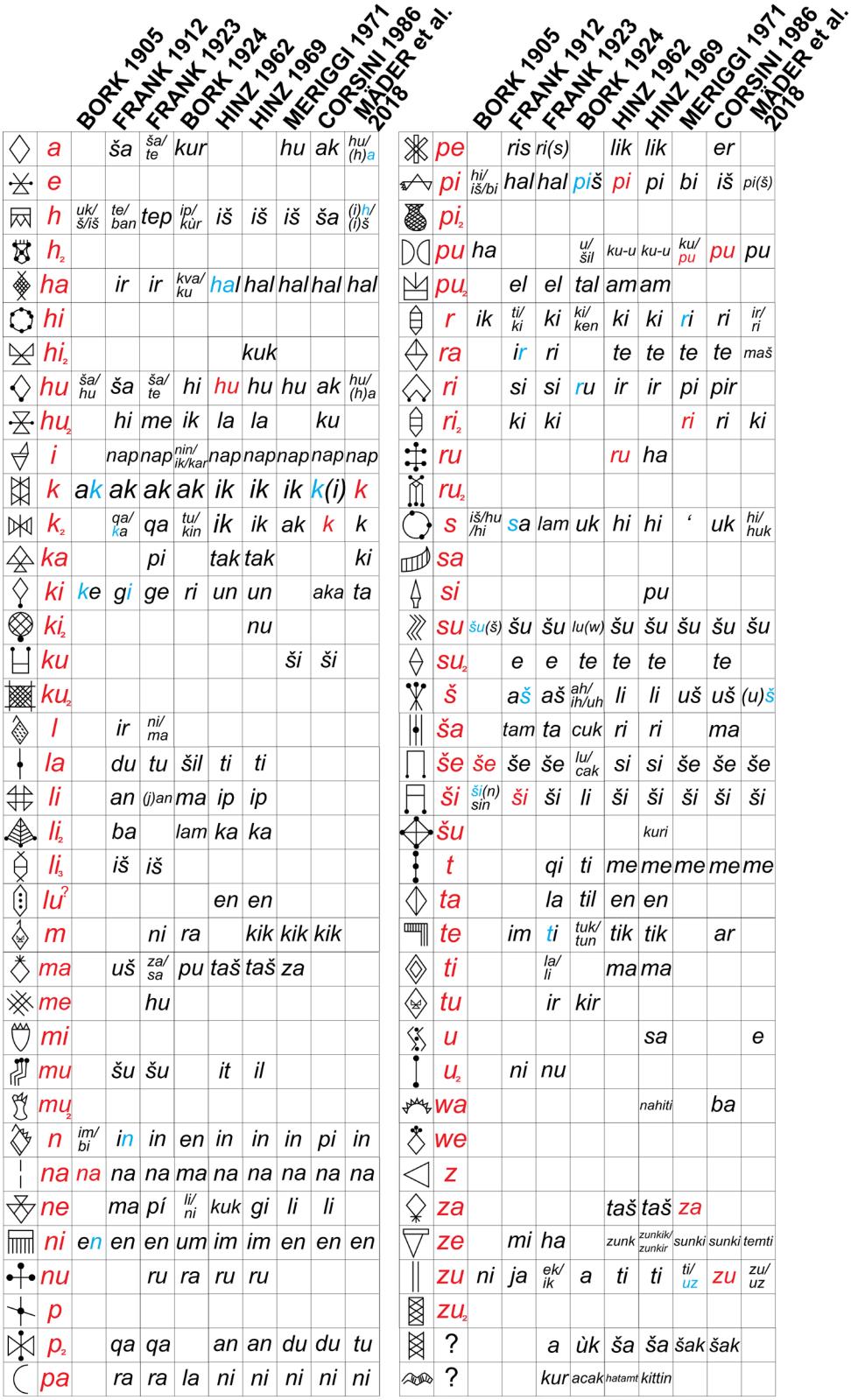
Before getting to the heart of the matter, several editorial choices must be stated. As the decipherment of Linear Elamite proved the absence of distinction between voiced and voiceless consonants in this writing system (at least for the plosives, but probably also for other types of consonants such as the sibilants) and as the voiceless series is more "neutral" and traditionally preferred in the field of Elamite studies (see, among others, Paper 1955, 21; Reiner 1969, 71 f.; Zadok 1984, 3; Bavant 2014, 242 f.; Krebernik [4]2021, 195), the voiceless plosives *k*, *p*, and *t* are favored instead of *g*, *b*, and *d* in the transliteration of LE texts and the transcription of Elamite words (cf., however, section 4.1 below, *sub* 6).

We follow Steve 1992 for the transliteration of cuneiform Elamite, but a preference is accorded to the voiceless plosives *k*, *p*, and *t* in accordance with the dictates of LE writing (thus, for example, we transliterate ka_3, pa_2, ta_2 instead of *ga*, *ba*, *da*). Also note that *ḫ* signs in Elamite texts are transliterated as *hV*(*C*) or (*C*)*Vh*, as is customary in the field of Elamite studies, but as *ḫV*(*C*) or (*C*)*Vḫ* when they occur in Akkadian or Sumerian texts.

The transliteration of LE signs (usually in italics with hyphens, such as hu_2-pu_2-*š*-*ša*-*n* in F // G // H: 2) is based on the system presented in Fig. 6/Table 4, while the transcription of the Elamite words is based on the system presented in Fig. 10/Table 6. Since the exact vocalic values of the LE signs *hu*, hu_2, *lu*[?], *nu*, *ru*, ru_2, and *šu* cannot yet be established (see below, section 4.1.2), they are provisionally transcribed /hů/, /lů[?]/, /nů/, /rů/, and /šů/, to be respectively understood as /ho/ or /hu/, /lo[?]/ or /lu[?]/, and so forth. For instance, the toponym hu_2-pu_2-*š*-*ša*-*n*, transcribed as Hůpošan, was perhaps read as either /hop(o)šan/ or /hup(o)šan/.

certain. As far as its Sumerian counterpart is concerned, the following syllabic spellings are attested: gu-na-an-gi_4 (TCL 5, 6055 i 5), gu-na-gi_4 (Nisaba 15, 340: 7; 504: 2), gu_4-na-an-gi_4 (AAICAB 1/1, pl. 34, 1911-225: 5), ku-na-an-gi_4 (BIN 5, 1: 14; UTI 5, Um. 3488: 11. rev. 6; YOS 4, 246: 53. 152). Such spelling variants and the fact that it is written syllabically point to a foreign origin for the word in question (*pace* Hinz and Koch, who considered "gu-na-gi_4" to be an Elamite word [ElW 513]; note that there are no occurrences of it in texts written in the Elamite language). Its etymon in the unknown lender language X can be reconstructed as **kunanki* ([kunanki] being the original pronunciation of /gunangi/ in 3rd millennium Sumerian), probably to be connected with the word *kun*, which occurs in the cuneiform text no. 5: 5 and whose referent is a copper alloy vessel that could be described as a squatter and smaller version of the three above-mentioned vessels referred to as GU.NA.GI_4. In this perspective, **kunanki* — analyzed as *kun-anki* — may then denote a "tall (*anki*) *kun*-vessel". Be that as it may, the terms *kun* and **kunanki*, both belonging to an unknown language in origin, as well as Akkadian **kunakkûm*, seem to refer to metal (copper alloy or silver alloy) beakers with a circular short base, a slightly convex lower wall, a carinated transition to the upper wall, slightly constricted/concave or straight and, finally, a simple or carinated rim bent outward and then inward to form a flat surface (see Desset 2018b, 119 f., fig. 15). Such beakers can also have a riveted handle or repoussé and chased/engraved decoration (as well as, maybe, a spout). Based on archaeological contexts and textual information, they were mainly produced and used in Western Iran and Mesopotamia between 2050 and 1850 BCE.

5 That publication also included inscription L′, from the art market. This text, however, proved to be meaningless and is probably to be regarded as a fake. For this reason, it is not considered here.



	BORK 1905	FRANK 1912	FRANK 1923	BORK 1924	HINZ 1962	HINZ 1969	MERIGGI 1971	CORSINI 1986	MÄDER et al. 2018
a		ša	ša/te	kur			hu	ak	hu/(h)a
e									
h	uk/šiš	te/ban	tep	ip/kùr	iš	iš	iš	ša	(i)h/(i)š
h$_2$									
ha		ir	ir	kva/ku	hal	hal	hal	hal	hal
hi									
hi$_2$						kuk			
hu	ša/hu	ša	ša/te	hi	hu	hu	hu	ak	hu/(h)a
hu$_2$		hi	me	ik	la	la		ku	
i		nap	nap	nin/ik/kar	nap	nap	nap	nap	nap
k	ak	ak	ak	ak	ik	ik	ik	k(i)	k
k$_2$		qa/ka	qa	tu/kin	ik	ik	ak	k	k
ka			pi		tak	tak			ki
ki	ke	gi	ge	ri	un	un		aka	ta
ki$_2$						nu			
ku							ši	ši	
ku$_2$									
l		ir	ni/ma						
la		du	tu	šil	ti	ti			
li		an	(j)an	ma	ip	ip			
li$_2$		ba		lam	ka	ka			
li$_3$		iš	iš						
lu?					en	en			
m			ni	ra		kik	kik	kik	
ma		uš	za/sa	pu	taš	taš	za		
me			hu						
mi									
mu		šu	šu		it	il			
mu$_2$									
n	im/bi	in	in	en	in	in	in	pi	in
na	na	na	na	ma	na	na	na	na	na
ne		ma	pí	li/ni	kuk	gi	li	li	
ni	en	en	en	um	im	im	en	en	en
nu			ru	ra	ru	ru			
p									
p$_2$		qa	qa		an	an	du	du	tu
pa		ra	ra	la	ni	ni	ni	ni	ni

	BORK 1905	FRANK 1912	FRANK 1923	BORK 1924	HINZ 1962	HINZ 1969	MERIGGI 1971	CORSINI 1986	MÄDER et al. 2018
pe		ris	ri(s)		lik	lik		er	
pi	hi/iš/bi	hal	hal	piš	pi	pi	bi	iš	pi(š)
pi$_2$									
pu	ha			u/šil	ku-u	ku-u	ku/pu	pu	pu
pu$_2$		el	el	tal	am	am			
r	ik	ti/ki	ki	ki/ken	ki	ki	ri	ri	ir/ri
ra		ir	ri		te	te	te	te	maš
ri		si	si	ru	ir	ir	pi	pir	
ri$_2$		ki	ki				ri	ri	ki
ru					ru	ha			
ru$_2$									
s	iš/hu/hi	sa	lam	uk	hi	hi	‘	uk	hi/huk
sa									
si						pu			
su	šu(š)	šu	šu	lu(w)	šu	šu	šu	šu	šu
su$_2$		e	e	te	te	te		te	
š		aš	aš	ah/ih/uh	li	li	uš	uš	(u)š
ša		tam	ta	cuk	ri	ri		ma	
še	še	še	še	lu/cak	si	si	še	še	še
ši	ši(n)/sin	ši	ši	li	ši	ši	ši	ši	ši
šu						kuri			
t			qi	ti	me	me	me	me	me
ta			la	til	en	en			
te		im	ti	tuk/tun	tik	tik		ar	
ti			la/li		ma	ma			
tu			ir	kir					
u						sa			e
u$_2$		ni	nu						
wa						nahiti		ba	
we									
z									
za					taš	taš	za		
ze		mi	ha		zunk	zunkik/zunkir	sunki	sunki	temti
zu	ni	ja	ek/ik	a	ti	ti	ti/uz	zu	zu/uz
zu$_2$									
?			a	ùk	ša	ša	šak	šak	
?			kur	acak	hatamt	kittin			

Fig. 2: Previous decipherment attempts, from Bork 1905 to Mäder [e. a.] 2018.
Important steps in the decipherment are marked in blue, correct identifications in red.

On the contrary, the vocalic distinction between /e/ and /i/ was completely established throughout the syllabary of Linear Elamite, but cuneiform writing did not distinguish between /he/ and /hi/, /ke/ and /ki/, /le/ and /li/, /re/ and /ri/, /se/ and /si/, and /ze/ and /zi/ (see below, section 4.1.1). For this reason, Elamite words that are only attested in cuneiform texts and that include the above-mentioned syllables cannot yet be transcribed with precision as regards the quality of the vowels (/e/ or /i/) involved. This uncertainty is represented in transcription by the symbol *ɪ* (= dotless *i*). Thus, for instance, Kıntatu means that this personal name was read either /kentatu/ or /kintatu/.

Geminate consonants are avoided in the transcriptions of Elamite words or names (Bavant 2014, 242 f.); thus, we transcribe Itatu (not Itattu), Pala-išan (not Palaiššan), Nahůnte (not Nahhůnte), etc.

Defectively-written names are normalized in transcription with their full forms (even though the defective forms might sometimes reflect more precisely the current pronunciations of the names in question in a given period; see below sections 3.4 and 3.5); thus: Insušinak (not Insušnak), Hatamti (not Hatati), etc. On the other hand, the name of the goddess Narůte/Narůnte is given as Narůte — Narůnte being a later by-form that is explainable as a result of secondary nasalization of the dental phoneme /t/.

Italics in the translation indicate that the rendering is uncertain.

All dates are given according to the so-called 'Middle Chronology' (Sallaberger/Schrakamp 2015).

2 Decipherment of Linear Elamite

2.1 The Corpus of LE Texts

As of today, about 40 LE texts are known (see below, Table 1), originating from Susa, Fars (Persepolis? and Kam-Firuz), and Kerman province (Shahdad and Konar Sandal). These 40 LE texts can be divided into seven distinct groups:

1) Susian texts not associated with Puzur-Sušinak[6] (all or most of them predating Puzur-Sušinak):
   - O (tablet; probably older than the other texts of this group)
   - J, K, and L (clay cones)
   - M, N, and R (tablets)
   - T (stone inscription)
2) Puzur-Sušinak inscriptions from Susa (ca. 2150–2100 BCE) — ordered chronologically:
   - P
   - I (coterminous with an Akkadian inscription of Puzur-Sušinak; see, provisionally,[7] Gelb/Kienast 1990, 335 f., Elam 10)
   - A (coterminous with an Akkadian inscription of Puzur-Sušinak; see, provisionally, Gelb/Kienast 1990, 328 f., Elam 4)
   - B (coterminous with an Akkadian inscription of Puzur-Sušinak; see, provisionally, André/Salvini 1989, 54–58. pls. I-III; Gelb/Kienast 1990, 337 f., Elam 13) and D
   - C (coterminous with an Akkadian inscription of Puzur-Sušinak; see, provisionally, Gelb/Kienast 1990, 337, Elam 12)
   - E
   - F, G, and H (duplicates)
   - U
3) Marv Dasht silver vessel inscription (ca. 2100–2000 BCE):
   - Q
4) Kam-Firuz (Mahboubian Collection) silver beaker inscriptions (Šimaški and early Sukkalmaḫ periods; ca. 2000–1880 BCE) — ordered chronologically:
   - Y and Z (Itatu I)
   - H′, X, and J′ (Eparti II and Šilhaha)
   - F′ (Eparti II and Zemt-Akone [/Temti-Agun] I)
   - I′ (Eparti II and an undetermined ruler [probably Pala-išan])
   - K′ (Pala-išan)
5) South-eastern Iran/Kerman (Shahdad and Konar Sandal South) inscriptions (mid-3rd to early 2nd millennium BCE):
   - S (Shahdad)
   - B′, C′, D′, and E′ (Konar Sandal South)
6) Metal vessel inscriptions (South-eastern Iran; late 3rd to early 2nd millennium BCE?):
   - M′
   - A′ and O′ (Lapu)
   - N′
   - W
7) Seal inscriptions (early 2nd millennium BCE):
   - V
   - G′

6 This is the correct reading of the name previously read "Kutik-Inšušinak" or "Puzur-Inšušinak"; see below, section 2.3.

7 New editions of the cuneiform inscriptions of Puzur-Sušinak that are coterminous with LE texts will be provided by Desset [e. a.], forthcoming.

Tab. 1: List of the 40 LE inscriptions known in 2021. R→L means from right to left, L→R from left to right, T→B from top to bottom, B→T from bottom to top. Figures in the field "text length" refer to the number of preserved signs in each text; "frag." means that the inscription is fragmentary and its actual length unknown.

Text	Material	Description (and dimensions in cm)	Found in regular excavations?	Provenance (date of discovery)	Collection (and inventory number)	Dating	Text length	Writing direction	Publications	Group
A	Lime/sandstone	Slab (H 21; L 71; W 85)	Yes	Susa (Acropolis, temple of Insušinak; 1903)	Louvre (Sb 17)	2150–2100	50	R→L	Scheil 1905, pl. 2; Hinz 1969, pl. 7; Meriggi 1971, pl. 1	2
B	Lime/sandstone	Fragmentary votive boulder (H 56.5; W 62.5)	Yes	Susa (Acropolis, near temple of Insušinak; 1903?)	Louvre (Sb 6)	2150–2100	33 (frag.)	L→R	Scheil 1905, pl. 2; Hinz 1969, pl. 8; Meriggi 1971, pl. 1; André/Salvini 1989, pl. 3b	2
C	Alabaster	Fragmentary statue (H 14; L 9.2; W 6.6)	Yes	Susa (before 1905?)	Louvre (Sb 87)	2150–2100	43 (frag.)	R→L	Scheil 1908, pl. 4; Hinz 1969, pls. 9 f.; Meriggi 1971, pl. 1	2
D	Lime/sandstone	Fragmentary votive boulder (H 51.9; L 66; W 55)	Yes	Susa (1908)	Louvre (Sb 172/6733)	2150–2100	52 (frag.)	R→L (?)	Scheil 1908, pl. 4; Hinz 1969, pl. 12; Meriggi 1971, pl. 1	2
E	Lime/sandstone	Basin/door-socket (?) (H 23.7; L 29.5; W 6.2)	Yes	Susa	Louvre (Sb 140B)	2150–2100	34	T→B	Scheil 1908, pl. 4; Hinz 1969, pl. 11; Meriggi 1971, pl. 1	2
F	Lime/sandstone	Slab (H 21.5; L 63.5; W 22)	Yes	Susa	Louvre (Sb 155)	2150–2100	46 (frag.)	R→L	Scheil 1908, pl. 5; Hinz 1969, pl. 13; Meriggi 1971, pl. 2; André/Salvini 1989, fig. 5	2
G	Lime/sandstone	Slab (H 13.7; L 57; W 21.3)	Yes	Susa	Louvre (Sb 139)	2150–2100	43 (frag.)	R→L	Scheil 1908, pl. 5; Hinz 1969, pl. 13; Meriggi 1971, pl. 2; André/Salvini 1989, fig. 6	2
H	Lime/sandstone	Slab (H 15.8; L 49; W 12)	Yes	Susa	Louvre (Sb 140A)	2150–2100	64 (frag.)	R→L	Scheil 1908, pl. 5; Hinz 1969, pl. 13; Meriggi 1971, pl. 2; André/Salvini 1989, fig. 7	2
I	Lime/sandstone	Goddess statue (H 106; L 45; W 46)	Yes	Susa (head: 1904; body: 1907, Acropolis, trench 93)	Louvre (Sb 54 + 6617)	2150–2100	38 (frag.)	B→T R→L	Scheil 1913, 18; Hinz 1969, pl. 14; Meriggi 1971, pl. 3	2
J	Clay	Fragmentary cone (H 5.4; Base diam 5.6)	Yes	Susa (Acropolis)	Louvre (Sb 17829)	2nd half of 3rd mill.	17 (frag.)	R→L	Scheil 1935, XI; Hinz 1969, fig. 11; Meriggi 1971, pl. 3	1

Tab. 1 (continued)

Text	Material	Description (and dimensions in cm)	Found in regular excavations?	Provenance (date of discovery)	Collection (and inventory number)	Dating	Text length	Writing direction	Publications	Group
K	Clay	Fragmentary cone (H 7.3; L 6; W 3.8)	Yes	Susa (Acropolis)	Louvre (Sb 17830)	ca. 2500 (?)	40 (frag.)	R→L?	Scheil 1935, XI; Hinz 1969, fig. 12; Meriggi 1971, pl. 3	1
L	Clay	Fragmentary cone (H 6.1; L 5.9; W 4.2)	Yes	Susa (Acropolis)	Louvre (Sb 17831)	2nd half of 3rd mill.	11 (frag.)	?	Scheil 1935, XII; Hinz 1969, fig. 13; Meriggi 1971, pl. 3	1
M	Clay	Lenticular tablet (H 7.6 L 4.2;)	Yes	Susa (Acropolis)	Louvre (Sb 17832)	2nd half of 3rd mill.	18 (frag.)	L→R (?)	Scheil 1935, XII; Hinz 1969, fig. 14; Meriggi 1971, pl. 3	1
N	Clay	Tablet (H 6.5; L 3.8)	Yes	Susa (Acropolis)	Louvre (Sb 17833)	2nd half of 3rd mill.	19 (frag.)	?	Scheil 1935, XIII; Hinz 1969, fig. 15; Meriggi 1971, pl. 3	1
O	Clay	Tablet (H 11.5; L 7.5; W 3.8)	Yes	Susa (Donjon)	Louvre (Sb 9382)	1st half of 3rd mill. (?)	43 (?)	?	Scheil 1935, XIII; Hinz 1969, pl. 15; Meriggi 1971, pl. 3	1
P	Gypsum	? (H 8; L 11)	Yes	Susa (Acropolis, *Chantier* 1; 1931)	Louvre (Sb 17822)	2150–2100	7 (frag.)	R→L	de Mecquenem 1956, 200; Hinz 1969, fig. 17; Meriggi 1971, pl. 3	2
Q	Silver alloy	Vessel (H 19; base diam 11; rim diam 9; weight 605 gr.)	No	Persepolis (?) (1966)	Tehran, National Museum of Iran	2100–2000	44	R→L	Hinz 1969, pl. 6; Meriggi 1971, pl. 4	3
R	Clay	Tablet (H 4.2; L 2.5)	Yes	Susa	Louvre (Sb 9383)	ca. 2500 (?)	12	?	Hinz 1969, pl. 16; Meriggi 1971, pl. 3	1
S	Clay	Ceramic vessel (H 32; base diam. 13; rim diam. 21.5)	Yes	Shahdad ("Cemetery A", grave 30) (1969–1970)	Tehran, National Museum of Iran (exc. no. 193)	late 3rd/ early 2nd mill.	5	R→L	Hinz 1971, pl. 1; Hiebert/Lamberg-Karlovsky 1992, fig. 4	5
T	Lime/ sandstone	? (H 15.7; L 9.5; W 14.5)	Yes	Susa	Louvre (Sb 18261)	2nd half of 3rd mill.	3 (frag.)	?	André/Salvini 1989, 59, fig. 3 and pl. 4b	1
U	Sandstone	Slab/door-socket (?) (H 14.5; L 30; W 28.5)	Yes	Susa	Louvre (Sb 18338)	2150–2100	20 (frag.)	R→L	André/Salvini 1989, 61, fig. 4 and pl. 5	2
V	Steatite	Gulf type round stamp seal (diam 2.5)	No	? (Persian Gulf)	Ligabue Collection	early 2nd millennium	3	R→L (for the imprint)	Winkelmann 1999, 25, figs. 1–2	7
W	Silver alloy	Vessel (H 13.4; base diam 14; rim diam 17)	No	? (Kerman)	Los Angeles County Museum of Art (LACMA)	early 2nd millennium (?)	127	R→L	Mäder [e. a.] 2018, 101, figs. 8–14	6

Tab. 1 (continued)

Text	Material	Description (and dimensions in cm)	Found in regular excavations?	Provenance (date of discovery)	Collection (and inventory number)	Dating	Text length	Writing direction	Publications	Group
X	Silver alloy	Vessel (H 14; base diam 6.5; carin. diam 10.5; rim diam 8)	No	Kam-Firuz	Mahboubian Collection	ca. 1950	56	R→L	Mahboubian 2004, 50 f.; Desset 2018b, 113, fig. 7	4
Y	Silver alloy	Vessel (H 16.5; base diam 7; carin. diam 12.5; rim diam 8)	No	Kam-Firuz	Mahboubian Collection	ca. 2000 for Y1, later for Y2	134	Y1: L→R Y2: R→L	Mahboubian 2004, 52 f.; Desset 2018b, 113, fig. 8	4
Z	Silver alloy	Vessel (H 20)	No	Kam-Firuz	Mahboubian Collection	ca. 1970	158	R→L	Mahboubian 2004, 54–55; Desset 2018b, 114, fig. 9	4
A′	Silver alloy	Vessel (H 10.3)	No	? (Kerman)	? (New York?)	late 3rd mill.	123	R→L	Phoenix Ancient Art catalog 2007/1, item no. 47; Mäder [e. a.] 2018, 100, figs. 1–7	6
B′	Clay	Tablet (H 10; L 18; W 2.2)	Yes	Konar Sandal (trench XV)	Jiroft Museum	ca. 2300–2100	6	?	Madjidzadeh 2011, fig. 5a; Desset 2014, pl. 1	5
C′	Clay	Tablet (H 8.5; L 13.5; W 2.2)	Yes	Konar Sandal (trench XV)	Jiroft Museum	ca. 2300–2100	7	R→L (?)	Madjidzadeh 2011, fig. 7b; Desset 2014, pl. 1	5
D′	Clay	Tablet (H 7; L 11.5; W 1.8)	No	Konar Sandal (trench XV)	Jiroft Museum	ca. 2300–2100	9	R→L (?)	Madjidzadeh 2011, fig. 3b; Desset 2014, pl. 1	5
E′	Clay	Tablet/brick? (W 3.5)	Yes	Konar Sandal South	Kerman Museum	ca. 2500 (?)	6 (frag.)	?	Madjidzadeh 2011, fig. 8b; Desset 2014, pl. 1	5
F′	Silver alloy	Vessel (H 12.5, fragmentary; rim diam 8)	No	? (Kam-Firuz?)	Schøyen Collection (MS 3205)	ca. 1900	55 (frag.)	R→L	Vallat 2011, pls. 74 f.	4
G′	Gold	Round stamp seal (diameter 2.4)	No	? (Central Asia?)	?	early 2nd mill.	6	?	Christie's London, 14/04/2011, Antiquities including property from the collection of Baron Edouard Jean Empain, lot no. 321	7
H′	Silver alloy	Vessel fragment	No	Kam-Firuz	Mahboubian Collection	ca. 1950	55 (frag.)	R→L	Desset 2018b, 115, fig. 10	4
I′	Silver alloy	Vessel fragment	No	Kam-Firuz	Mahboubian Collection	ca. 1880	75 (frag.)	R→L	Desset 2018b, 117, fig. 11	4

Tab. 1 (continued)

Text	Material	Description (and dimensions in cm)	Found in regular excavations?	Provenance (date of discovery)	Collection (and inventory number)	Dating	Text length	Writing direction	Publications	Group
J′	Silver alloy	Vessel (H 16; base diam 6; carin. diam 12; rim diam 8)	No	Kam-Firuz	Mahboubian Collection	ca. 1950	81 (frag.)	L→R	Desset 2018b, 117, fig. 12	4
K′	Silver alloy	Vessel (H 13.5; base diam 6.5; carin. diam 10.5; rim diam 7.5)	No	Kam-Firuz	Mahboubian Collection	ca. 1880	111	R→L	Desset 2018b, 118, fig. 13	4
L′	Silver alloy	Vessel	No	?					Desset 2018b, 118, fig. 14	**FAKE**
M′	Copper alloy	Vessel (H 8.7; base diam 8)	No	? (Kerman)	Private collection (London)	late 3rd mill.	47	R→L	Desset [e. a.] forthcoming	6
N′	Silver alloy	Vessel (H 9.9; base diam 8.7)	No	? (Kerman)	Private collection (London)	ca. 2000 (?)	144	R→L	Desset [e. a.] forthcoming	6
O′	Silver alloy	Vessel (H 8.5; base diam 11.3)	No	? (Kerman)	Private collection (London)	late 3rd mill.	159	R→L	Desset [e. a.] forthcoming	6

The distribution of each glyph (see Figs. 3a–b[8]) across these texts is as follows:

1: A, B, D, E, F, G, H, I, J, K, L, M, N, Q, R, T, U, W, X, Y, A′, C′, F′, J′, M′, N′, O′
2: A, D, G, H, L, U, W, N′, O′
3: X, Y, Z, A′, H′, I′, J′, K′
4: A′
5: Y
6: E, G, H, I, K, W, X, Y, Z, A′, F′, H′, I′, J′, K′, M′, N′, O′
7: A′, O′
8: A, U
9: Z, A′, M′, N′, O′
10: V
11: D′
12: D, S
13: D, F, G, H, Q, A′, F′, H′, O′
14: Y, Z
15: H
16: H, H′
17: F
18: H, Y, Z
19: A′
20: D, I, K, Q, S, X, Y, Z, F′, H′, I′, J′, K′, M′
21: D′
22: Y, Z
23: Q
24: Z
25: Y
26: Z, H′
27: Z
28: A, B, G, H
29: D, F, G, H, U
30: Q
31: C
32: D′
33: D, I
34: F, J
35: B, I
36: Q, Y, Z, A′
37: D
38: C
39: G, W, X, Z, J′, N′, O′
40: A, C, Z, A′
41: Z
42: Y
43: E′
44: I
45: W, A′, N′, O′
46: X, Y, F′, H′, K′
47: R, A′
48: D, F, H, Q, Z, M′
49: V, F′, G′
50: I, Q, Y, A′, O′
51: Y
52: G, M
53: K
54: D
55: F, X, Z
56: D′
57: B
58: K
59: K
60: Z

8 The glyphs recorded in L′ were suppressed (see above, section 1). For this reason, some glyph numbers were modified compared to the previously published list of Desset (2018b, 110, fig. 4).

61: K
62: X, D
63: Y, Z, F′, H′, K′
64: X, J′
65: Y, A′, O′
66: Z, I′
67: B
68: D, K
69: A
70: A, C, E, F, G, H, J
71: Q, W, Z, H′, K′
72: A, B, C, E, F, G, H, I, J, K, N, P, Q, S, U, W, X, Y, Z, A′, F′, H′, I′, J′, K′, M′, N′, O′
73: K
74: F, H
75: C′, D′, G′
76: K, N, Y, F′
77: W, A′, N, O′
78: G, H, A′, M′, O′
79: K
80: D, F, G, L
81: W, N′, O′
82: N
83: A, B, C, D, F, G, H, I, K, P, R, U, V, W, X, B′, G′, H′, J′, K′, M′, N′, O′
84: G, Z, I′, M′, O′
85: Y
86: W, Y, N′
87: A, C, I
88: B
89: C, E, W, O′
90: K
91: Y
92: A, C, D, H, M, N, Q, W, N′, O′
93: A′
94: B
95: B, D, I
96: X, Y, Z, J′
97: C, D, F, H, K, Q, Y, Z, A′, M′
98: A, E, J′
99: M, Y, Z, A′, I′, N′, O′
100: Y
101: Y
102: F, G, H, X, Y, A′, B′, H′, J′, K′, O′
103: J, Q, W, Z, F′, K′
104: H, I, N, X, Y, Z, H′, J′, K′
105: G, H, Y, Z, A′, J′, M′, O′
106: D, F, F′, I′
107: N
108: K
109: W
110: S
111: W
112: W
113: W
114: I, M′, N′
115: A, B, D, F, G, H, Q, W, A′, N′, O′
116: N
117: B′
118: C′
119: X, J′
120: Y, Z
121: W
122: L
123: W
124: A, D, E, G, H, U, Y, Z, F′, K′
125: B, F
126: W, A′, O′
127: L, A′, O′
128: R
129: Z, H′, I′, J′, K′
130: Q
131: W
132: A, C, F, G, H, I, K, A′, D′, H′
133: B, E, G, J, U, W, X, Y, C′, J′
134: I, M
135: A, E, F, I, P, W, X, A′, M′, O′
136: D, F, Q, Z, F′
137: A, B, C, E, Q, Z, F′, H′
138: I, T, X, Y, I′, J′, K′
139: A, B, E, X, Y, Z, J′
140: K, Q
141: F, H, N′
142: W
143: W
144: W
145: W
146: D′
147: K
148: W
149: X, I′, J′
150: W
151: J
152: H
153: A, B, Y
154: F, J′
155: N
156: K
157: W, N′
158: A, B, C, D, F, G, H, I′
159: Q
160: Y, Z
161: Z
162: Y
163: Y
164: D
165: D, K′
166: W
167: X
168: Y
169: A, B, D, E, F, I, Q, U, W, X, Y, Z, A′, F′, H′, I′, J′, K′, M′, N′, O′
170: D, F, G, Q, X, Y, Z, A′, C′, F′, H′, I′, J′, K′, N′, O′
171: F, I, M, W, Y, Z, A′, D′, K′, M′, N′, O′
172: A, B, C, D, E, F, G, H, I, J, K, Q, U, W, X, Y, Z, F′, I′, J′, K′, M′, N′, O′
173: J
174: T
175: Z
176: Q, Z, H′, I′
177: X, Y, F′, K′
178: A′, B′, M′, N′, O′
179: I, J′
180: D, Y, Z
181: K, A′, N′, O′
182: A, E, K, M, P, C′
183: A, B, F, H, Q, R, X, Y, Z, A′, F′, H′, I′, J′, K′, M′, N′, O′
184: K
185: A, D, F, G, H, J, Q, U, X, Z, H′, K′
186: D′
187: H
188: Y
189: A, D, F, H, I, M, Y, Z, A′, O′
190: A, C, U
191: B, H
192: G
193: H
194: X, J′
195: Z, F′
196: D
197: Z
198: G
199: I
200: Q
201: A, D, E, F, I, K, P, U, A′, O′
202: B, F, H, I
203: C, E, Q
204: D
205: K
206: K, M
207: Y
208: B′
209: W, A′, M′, N′, O′
210: I, M, Q
211: X, Y, Z, J′
212: A, D
213: N
214: Q, Y, Z, J′
215: X
216: W
217: D
218: Y
219: K
220: E′
221: E′
222: A′, O′
223: A′
224: M′
225: A′, O′
226: A′
227: W, A′, N′, O′
228: F′
229: F′
230: F′, H′, I′, K′
231: W, X, F′, H′, J′, K′, N′

232: F′, K′
233: X, F′
234: F′, I′, K′
235: F′
236: F′, H′, I′
237: F′
238: X
239: X
240: Z, H′
241: Z
242: Z
243: Z
244: Y
245: Y
246: Y
247: Y
248: Y
249: Y, I′, K′
250: Y
251: Y
252: Y
253: Y
254: Y
255: Y, J′
256: Y
257: G′
258: G′
259: H′, I′, K′
260: H′, K′
261: I′
262: H′
263: H′, I′, K′
264: H′
265: I′, K′
266: H′, I′, K′
267: H′
268: I′, J′
269: H′, I′, K′
270: Y
271: I′
272: J′
273: J′
274: J′
275: J′
276: J′
277: W
278: K′
279: K′
280: K′
281: K′
282: K′
283: K′
284: K′
285: K′
286: K′
287: K′
288: K′
289: K′
290: K′
291: K′
292: I′
293: I′
294: N′
295: M
296: O′
297: O′
298: A′
299: A′
300: A′, M′, N′, O′
301: A′
302: A′, O′
303: A′, M′, O′
304: A′, M′, O′
305: A′
306: W, A′, N′, O′
307: M′
308: M′
309: M′
310: M′
311: M′
312: M′
313: M′
314: M′
315: N′
316: N′
317: W, N′
318: N′
319: N′
320: N′
321: N′
322: W
323: O′, N′
324: N′
325: N′
326: N′
327: W, N′
328: N′
329: N′
330: N′
331: W
332: W
333: W
334: W
335: W
336: W
337: W
338: W
339: W
340: A′, O′
341: O′
342: O′
343: O′
344: O′
345: O′
346: M
347: C
348: M′

Dividing sign: B, C, D, E, F, G, H, I, J, Q, S, U, Y, Z, A′, C′, D′, F′, I′, K′, M′, O′

Fig. 3a: LE glyph list according to numbers (F. Desset).

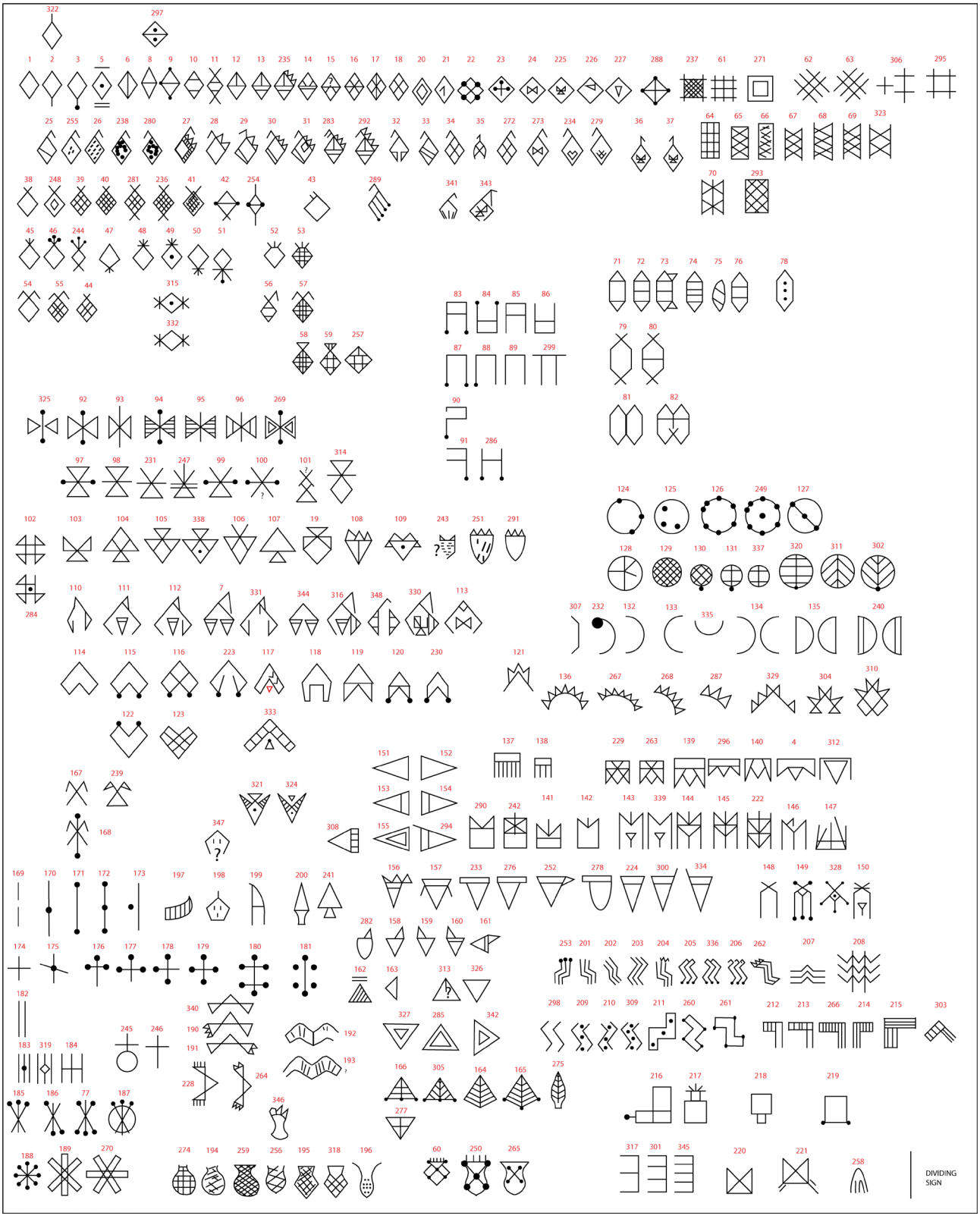


Fig. 3b: LE glyph list according to shapes (F. Desset).

Tab. 2: List of the 9 cuneiform inscriptions used in the decipherment of LE writing (organized chronologically). For the terms *kun* and *kunanki*, see section 1.

Group no.	Text no.	Support	Rulers mentioned	Dating	Language	references
I	**1**	silver alloy beaker (*kunanki*?)	Kıntatu	ca. 2000	Elamite	Mahboubian 2004, 46 f.
I	**2**	copper alloy beaker (*kun*?)	Itatu I, Kıten-Rakıtapi, (Eparti I, Kıntatu)	ca. 1980	Sumerian	Steinkeller 2007, 221 f.[9]
I	**3**	silver alloy beaker (*kunanki*?)	Šilhaha, (Eparti II)	ca. 1950	Elamite	Mahboubian 2004, 48 f.
I	**4**	copper alloy beaker (*kunanki*)	Ata-hůšů, Ibni-Adad	2nd half of 20th c.	Akkadian	Sollberger 1968, 30 f.
I	**5**	copper alloy beaker (*kun*[10])	Zemt-Akone (/Temti-Agun) I, Kůk-sanit	2nd half of 20th c.	Akkadian	Glassner 1996; 2013, 325
I	**6**	silver alloy beaker (*kunanki*)	Eparti II, Zemt-Akone (/Temti-Agun) I, Kůk-sanit	2nd half of 20th c.	Akkadian	Müller-Karpe 2012; Glassner 2013, 325 f.; 2014
I	**7**	silver alloy beaker (*kunanki*)	Pala-išan, Ůkal, (Zemt-Akone/Temti-Agun I)	ca. 1900	Akkadian	Mahboubian 2004, 40 f.
II	**8**	two fragmentary tablets from Susa	Sewe-palar-hůhpak	ca. 1780–50	Elamite	Rutten 1949; EKI no. 3 A+B; Grillot/Glassner 1990
II	**9**	silver alloy beaker (see Fig. 4)	Sewe-palar-hůhpak	ca. 1780–50	Elamite	Mahboubian 2004, 44 f.

2.2 From the Known…: the Cuneiform Inscriptions

Decipherment usually proceeds from the known to the unknown and LE writing is no exception in this respect. Previous attempts at deciphering Linear Elamite focused on the textual corpus of Puzur-Sušinak, which consists of both cuneiform inscriptions (in the Akkadian language) and LE texts, sometimes even occurring together on the same object. Unfortunately, the LE texts never translate the cuneiform inscriptions (or vice versa); the two sets of texts just share some proper nouns and some titles that can be considered to be identical or equivalent. As a consequence, only a few sign sequences corresponding to proper nouns could be identified up to now in the LE texts of Puzur-Sušinak.

Therefore, we decided to take another path. The key was that of correlating the LE texts of Group 4, the Kam-Firuz silver beaker inscriptions (the unknown) — which, as became apparent later, recorded highly standardized Elamite royal inscriptions belonging to different rulers of the Šimaški and Sukkalmaḫ dynasties —, with nine cuneiform texts (the known; see Table 2) chosen because they were written on artifacts of the same or similar types and/or because they represent the oldest and most complete examples of Elamite royal inscriptions in cuneiform,[11] on the reasonable assumption that these two groups of texts could contain inscriptions by the same rulers, or have recognizable elements in common (proper nouns, titles, epithets) and a comparable phraseology.

These nine cuneiform inscriptions (henceforth: Cuneiform 1, 2, 3, etc.) belong to two different groups. Cuneiform 1–7 (Group I) are related to the same rulers (from Kıntatu to Pala-išan; ca. late 21st-early 19th centuries BCE) as the eight Kam-Firuz silver beaker inscriptions in Linear

9 With duplicate CUSAS 17, 18 (shallow "bronze" bowl; see Steinkeller 2011, 21 f. and pl. XIII).

10 Glassner (1996; 2013, 325*) read the last line of the inscription on this vessel as "bi_2.in.na.di[m_2]/BÍ.IN.NA.DÍM*" but the pictures published in the auction catalogues of Sotheby's and Christie's (Sotheby's New York, 30 May 1986, lot 128; Christie's London, 12 Dec. 1989, lot 85; Christie's London, 8 July 1992, lot 49) show *ku-un* IN.NA.DI[M_2], with *ku-un* being presumably the name of the vessel in question.

11 Other Elamite cuneiform texts from the Sukkalmaḫ period, such as EKI nos. 67 and 70c (both attributed to Kutır-Nahůnte I and Zemt-Akone [= Temti-Agun] II, ca. 1720/1700 BCE; see Vallat 1990) or the so-called 'Stele of Šir-ůktůh' (Farber 1974), were too fragmentary to be conveniently exploited.

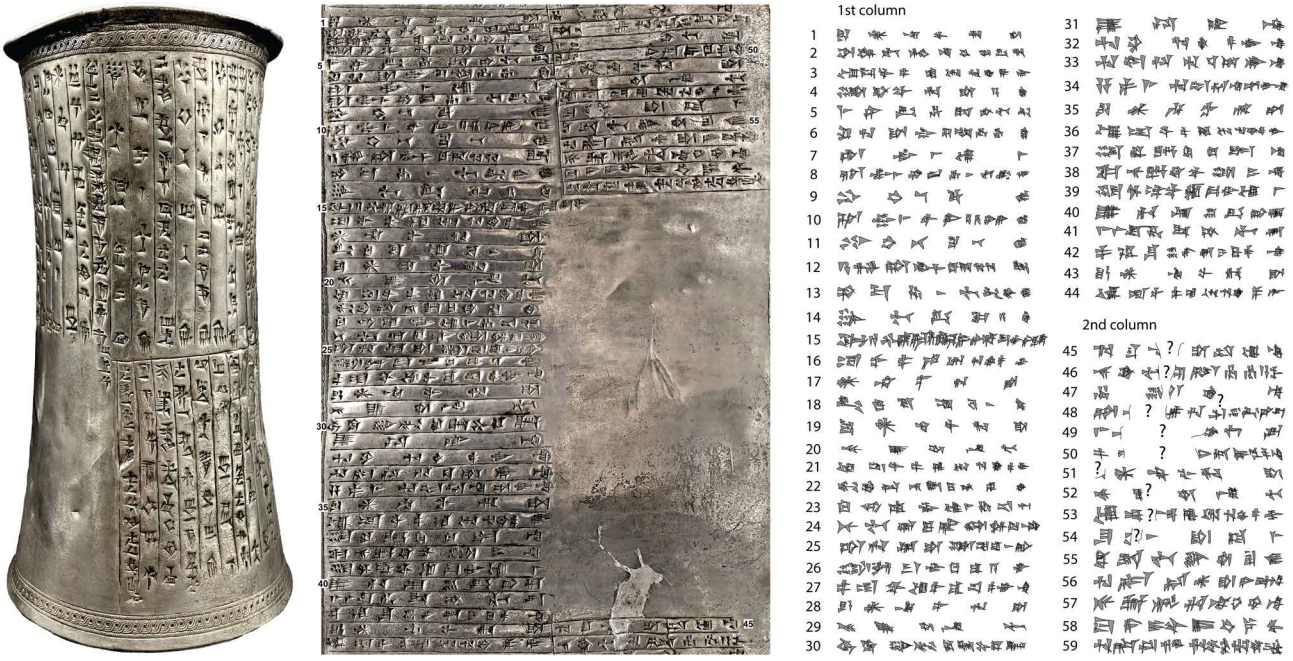


Fig. 4: Pictures and copy of Cuneiform 9 (silver vessel of Sewe-palar-hůhpak; H: 21,5 cm; see Mahboubian 2004, 44–45; drawing: F. Desset).

Elamite (from Itatu I to Pala-išan; LE texts of Group 4) and contain Sumerian, Akkadian, and Elamite texts inscribed on the same types of vessels (*kun* or *kunanki*). Cuneiform 8 and 9 (Group II; see Fig. 4 for Cuneiform 9) are written on different supports and are more recent — both being Elamite inscriptions of Sewe-palar-hůhpak, a contemporary of king Ḫammu-rapi of Babylon in the first half of the 18th century BCE (at least a century after Pala-išan).

If Group I provided important points of comparison and oriented us in the search for known personal, divine, and geographical names in the LE inscriptions of the Kam-Firuz group, it is above all the more recent Cuneiform Group II that has proved to be crucial for the decipherment of Linear Elamite. Indeed, the two inscriptions of Sewe-palar-hůhpak contain a number of titles, epithets, phrases, clauses, and sentences that also occur in several of the Kam-Firuz texts in Linear Elamite. Although additional points of comparison can be found in several other Elamite inscriptions from the so-called 'Sukkalmaḫ' and 'Middle Elamite' periods, the inscriptions of Sewe-palar-hůhpak played a very special role in the decipherment process. While a complete edition of these long and difficult texts is beyond the scope of this work (see Desset [e. a.], forthcoming), we deem it useful to offer here a preliminary treatment of the relevant passages that were used for the decipherment of Linear Elamite.

Pericope 1

Cuneiform 8	**Cuneiform 9**
1. *e* ^{d}*in-su-uš-na-*[*ak*]	1. *e* ^{d}*na-pi-ri-ša*
2. *te-im-ti a-li-im e-*[*li-ri*][12]	2. *te-im-ti ki$_2$-na*(-)*hi-te-ek-ri*
3. *u$_3$ se$_{20}$-we-pa-la-ar-hu-*[*uh-pa-ak*]	3. *u$_3$ se$_{20}$-we-pa-la-ar-hu-uh-pa-ak*
4. *li-ka$_3$-we ri-ša-*[*a-ki*]	4. *li-ka$_3$-we ri-ša-a-ki*
5. *me-ni-ik ha-ta$_2$-am-*[*ti-ik*]	5. *me-ni-ik ha-ta$_2$-am-ti-ik*
6. *ru-hu-ša-ak ši$_2$-il-*[*ha-ha-ki*][13]	6. *ru-hu-ša-ak ši$_2$-il-ha-ha-ki*[14]
7 ff. ...	7 ff. ...

(1–2)O Insušinak, lord of the acropolis/O Napireša, lord ...,[15] (3)I, Sewe-palar-hůhpak, (4)the grand *likawe*, (5)ruler of

12 Restored after EKI no. 48a § 1: *te-em-ti a-li-me-li-ri* (also EKI no. 48b § 1). For variants, see EKI 183.

13 Note the new reading of line 6: Sewe-palar-hůhpak is the /růhů-šak/ of Šilhaha (and not of Šir-ůktůh). Quintana came to the same conclusion in his online corpus (https://www.um.es/cepoat/elamita/?cat=101).

14 The fragmentary stele of Šir-ůktůh (possibly the father of Sewe-palar-hůhpak; ca. 1800 BCE) presents a very similar incipit (ll. 1–6): *e* ^{d}[...] / *te-im-t*[*i* ...] / *u$_3$ ši$_2$-*[*ir-uk-tuh*] / *li-ka$_3$-*[*we ri-ša-a-ki*] / *me-ni-i*[*k ha-ta$_2$-am-ti-ik*] / *ru-hu-š*[*a-ak ši$_2$-il-ha-ha-ki*] (Farber 1974, 77).

15 Cuneiform 8 was found in Susa while Cuneiform 9 probably comes from Fars. Depending on the geographic and cultural setting, Insušinak (in Susa) or Napireša (in the highland) is invoked. However, these two deities often occur in very similar, if not identical,

Hatamti, (6)"nephew" (i. e., collateral male descendent) of Šilhaha, (7 ff.)... (did so and so).

Line 1b: The reading /napireša/ instead of /napiriša/ is due to the LE spelling *na-pi*$_2$*(-r)-ri-ša* (Z: 4; H′: 1; I′: 2*; etc.), with the LE syllabogram *ri* representing, more precisely, the syllable /re/ in the LE writing system (see below, section 4.1.1).

Line 2b: On the basis of the meaning "mace" of cun. $^{hu\text{-}sa}$*hi-te-ek* (Basello, forthcoming), it would be tempting to interpret *te-em-ti ki*$_2$*-na*(-)*hi-te-ek-ri* as "the lord with (lit. of) the *kina*-mace". If so, however, we would expect **te-em-ti ki*$_2$*-na-hi-te-ki-ir*, instead. The cuneiform spelling *hi-te-ek-ri* rather points to a substantivized *k*-participle from a verbal base /hite/,[16] which may (or may not) be connected with the noun /hıt/, "army" (ElW 665, s.vv. *hi-it* and *hi-it-e*). Also note, in this connection, Napireša's epithets *ku-uk-ki ka*$_4^?$*-az-za-ak-ri* (meaning obscure) in EKI no. 45 § 19 (cf. ElW 555, s. v. *ku-uk-ki*) and *ku-uk ka*$_4$*-as-si-it-ri* in EKI no. 54 § 1 (cf. ElW 409, s. v. *qa-as-si-it-ri*), which seem to share the same construction as *ki*$_2$*-na hi-te-ek-ri*. Finally, note that the rendering "leader of the army" for *ki*$_2$*-na*(-) *hi-te-ek-ri* provided by Mahboubian (2004, 44), presumably from an unpublished translation by F. Vallat (see ibid., 7), appears to be ungrammatical. In fact, even assuming that the hapax legomenon *ki*$_2$*-na* means "leader" (from /ki/, "(number) one", + class-marker /n/, + 'final' suffix /a/?[17]), "leader of the army" should then be either **ki*$_2$*-na hi-ti-in* or **ki*$_2$*-na hi-ti-ir*.

Line 3: For this name, see Zadok (1984, 11, 47; 34, 171a; 39, 221) and Krebernik (2006, 75 f.). The various cuneiform orthographies with which it is written — i. e., ZE$_2$*-we-pa-la-ar-hu-uh-pa-ak*, SI*-me-pa*$_2$*-la-ar-hu-uh-pa-ak*, and *še-ep-la-ar-pa-ak* — suggest a reconstruction of the first element as /sewe/.[18]

Line 4: Much has been written on this title (see, among others, Quintana 1999; 2001; Vallat 2001; de Meyer 2002; Anthonioz/Malbran-Labat 2013; Bavant 2014, 302). All these authors considered /likawe/ (and its later cuneiform spellings *li-ka-mi* and *li-ka*$_4$*-me*) to be an abstract noun of the inanimate class meaning "kingdom" and ending with the class-marker of abstract nouns /-me/. It should be noted, however, that /likawe/ ends in /we/, not /me/.[19] Moreover, /likawe/ clearly belongs to the animate class: cf. in EKI no. 54 § 2, *li-ka*$_4$*-me* ^{d}*in-su-uš-na-ak ir ha-ni-iš-ri* ("I, Šilhak-Insušinak, ..., the *likawe* that Insušinak loves"; see also EKI 97, n. 2), with *li-ka*$_4$*-me* being picked up by the resumptive pronoun /i-r/ of the animate class. The phrase /likawe reša/ probably corresponds to the Mesopotamian title sugal$_7$-maḫ/*šukkalmaḫḫum*, "grand chancellor" (cf. below, section 2.3, step 7), and /likawe/ alone to sugal$_7$/*šukkallum* (cf. *li-ka-we* as the title of Itatu I in the LE text Y1).[20]

Line 5: For the term /men-ir/ (here locutive, /men-ik/, because used as an apposition to the 1st person pronoun, "I"), cf. Tavernier (2016a), who argues for /men/ having the sense of "authority"; if so, then /men-ir/ may mean "the one endowed with authority" or the like. For the translation "ruler", which is adopted here, cf. cun. *hal-me-ni-ik*, "(I, ...,) the country's ruler" (see ElW 604).

Line 6: For the much-discussed compound noun /růhů-šak/, see, most recently, Potts (2018), with a summary of the various interpretations that have been proposed. Cf. cun. *ru-hu-pa-ak* (= /růhů-pak/), "niece, collateral female descendant" (ElW 1045). While the sense of "nephew" for /růhů-šak/ is somewhat assured by its rendering in Akkadian as *mār aḫāti*(*m*) (lit. "sister's son") and in Old Persian as *napāt-* (ElW 1044, s. v. *ru-h-hu.šá-ak-ri*), the phrase /růhů-šak šilhaha-ki∼ri/ was used by Elamite kings in the 2nd millennium BCE to relate themselves to Šilhaha, the glorious founder of the so-called 'Sukkalmaḫ Dynasty'.

Pericope 2

Cuneiform 9

19(= 28 = 51). *e* ^{d}*na-pi-ri-ša*

20(= 29 = 52). *nu u*$_2$*-te-en-ti*

(19 = 28 = 51)O Napireša, (20 = 29 = 52)it is you who *lead*.

textual contexts. Also considering the similarities in their iconographies (de Miroschedji 1980), it is conceivable that they were considered to be two different "avatars" of the same deity (at least in certain periods).

16 Cf., e. g., *te-em-ti ši*$_2$*-il-ha-ak-ri*, "the lord, the mighty one" = "the mighty lord" (from /šilha/, "to be powerful"), in EKI no. 54 § 1. The same epithet occurs in Linear Elamite as *ze-m-t ši-l-ha-k*$_2$*-ri*$_2$ (K′). For /hite/ as a verb, also note LE *hi*$_2$*-t-te-k*$_2$*-pi*$_2$ (K′), which could be a plural *k*-participle.

17 For this not yet well-understood morphological element, see, most recently, Krebernik (^{4}2021, 212, § 10.5).

18 This reconstruction is also supported by the use of the sign ZE$_2$ as a syllabogram for /se/ in OB Susa; see cun. *ku-bu-se*$_{20}$*-e* (Scheil 1933, 41 f., no. 355: 23; 45 f., no. 358: 20) and *na-se*$_{20}$*-eḫ* (ibid., 66 f., no. 375 rev. 2. 4). On the contrary, no occurrences of ZE$_2$ as /si/ are known to us in OB texts from Susa.

19 Note *li-ka*$_3$*-we* vs. *ta-ak-me* in the two texts under examination (lines 5 and 7, respectively). This is in accordance with the LE spellings of the terms /likawe/ and /takme/, written consistently as *li-ka-we* and *ta-k-me* (see below, section 2.3, steps 6–7).

20 Also note the occurrence of /likawe/ as a theophoric element in the PN Kůk-likawe (cun. *ku-uk-li-ka*$_3$*-we*), "The protection is (provided by) the *likawe*" (Scheil 1932, 92, no. 234: 35; Susa, OB).

Line 20 (= 29 = 52): *nu* u_2*-te-en-ti* following the invocation of a god also occurs in several Middle Elamite inscriptions from the time of Šilhak-Insušinak I (see, for instance, EKI no. 53 § 2; 54 § 7 et passim; 54a §§ 2 and 7; etc.) and on a foundation tablet of Hůtelůtůš-Insušinak (see below). Cf. also EKI no. 47 § 23: *e napi*(DINGIR)*-riša* (GAL) ^{d}*ki-ri-ri-ša* ^{d}*in-su-uš-na-ak nu-um* u_2*-te-em*(sic!)*-ti* …, "O Napireša, Kirıreša, (and) Insušinak, it is you$^{(pl.)}$ who *lead*. …" (repeated ibid. § 31, with var. u_2*-t*[*e*]*-e*[*n*]*-t*[*i*]). The clause *nu* u_2*-te-en-ti* has variously been translated as "toi, écoute moi!" (Scheil 1911, 28); "du bist mir gnädig" (König, EKI 118 et passim); "as you are gracious to me" (Khačikjan 1998, 38); "you care for me" (F. Vallat apud Mahboubian 2004, 44); "tu m'accordes la bienveillance" (Grillot 2008, 78). See also ElW 306, s. v. *te-en-ti*. All these translations assume that u_2 in u_2*-te-en-ti* represents a dative 1st person personal pronoun, but LE u_2*-te-n-ti* (see below, section 2.3, step 9) makes it clear that u_2 belongs to the spelling of the verb and that no 1st person pronoun is present.[21] Both cun. u_2*-te-en-ti* and LE u_2*-te-n-ti* represent /ute-n-ti/, i. e., a Conjugation III 2nd person (both singular and plural) form of a verb /ute/ whose meaning can possibly be inferred from a passage of an unpublished cuneiform inscription of Hůtelůtůš-Insušinak (private collection, London; photos courtesy David Owen), where we read (ll. 26–28): *e* ^{d}*in-su*$_2$*-uš-na-ak šu-um-ma nu* u_2*-te-en-ti*. If we assume, with Hinz and Koch (ElW 1178, s. v. *šu-ma*), that /šůma/ means "triumph, victory", or the like,[22] then a translation "O Insušinak, it is you who *lead to victory*" can be suggested. Unfortunately, the proposed meaning for /šůma/, though working very well in the above-quoted passage from the Hůtelůtůš-Insušinak text, is nonetheless far from certain, and so is, consequently, the new translation of the clause *nu* u_2*-te-en-ti* that is suggested here.

Pericope 3

Cuneiform 8	**Cuneiform 9**
20. *šu-ut-me ša-at-me*	54. *šu-u*[*t-m*]*e ša-at-me*
21. *ki-it-ti-in te-e-me*	55. *ki-it-ti-in te-e-mi*
22. *hu-ur*$_2$*-tu*$_3$ *an-ša-ni-ip-na*	56. *hu-ur*$_2$*-tu*$_3$ *an-ša-ni-i-pi-na*
23. *a-ki*$_2$ *šu-še-ni-ip-na*	
24. [*n*]*u-un ki*$_2$*-ri-na hi-ih-*[*na*]	57. *nu-un ki*$_2$*-ri-na hi-ih-na*
25. *ma-ni-ip sa-hi-*[*ip*]	58. *ma-ni-i-pi sa-hi-i-pi*
26. *hu-ur*$_2$*-tu*$_3$ *ki*$_2$*-ri-pi*(-)[*up*]	59. *hu-ur*$_2$*-tu*$_3$ *ki*$_2$*-ri-pi*(-)*up*
27. *hu-*⌜*ta*⌝*-a*[*k-na*]	*hu-ut-ta-ak-na*!

$^{(20 = 54)}$Night and day $^{(21a = 55a)}$for a long time $^{(24b = 57b)}$may I *obtain* $^{(21b = 55b)}$the *prosperity* $^{(22 = 56)}$of the people of Anšan $^{(23)}$and Susa[23] $^{(24a = 57a)}$by *worshiping* you (= Insušinak/Napireša). $^{(26–27 = 59)}$May *mani*s of bronze be realized for (= to be used by) my *priests*.

Line 20 = 54: The phrase *šu-ut-me ša-at-me* seems to represent an adverbial expression like Akkadian *mēša*(*~i~u*) *urra*(*~i~u*), "night and day, always" (CAD M/2, 294 f., s. v. *mēšu*, usage c-2′; U/W, 243 f., s. v. *urru* A, usage c); cf. ElW 1117 f., s.vv. *ša-at-ki-me*, *ša-at-me*, and *ša-at-ti-me*; and 1193 f., s.vv. *šu-ut-ku-me*, *šu-ut-me*, and *šu-ut-ti-me*. The meaning "night" for cun. *šu-ut-me* is assured by ^{d}*ši-ut-ma-*⌜*na*⌝ [^{d}*na-a*]-⌜*ma*⌝[*-na-ma*], "by night (or) by day", in the Elamite version of the Bisotun inscription of Darius I (DB i 16, according to the new edition by Aliyari Babolghani 2015, 105, with the text collated on the rock of Bisotun; cf. Cameron 1960, 62[24]) and the corresponding passages in Old Persian and Babylonian (see ElW 1171, s. v. d.*ši-ut-ma-na*).

Line 21 = 55: *ki-it-ti-in* is certainly related to cun. *ki-it-ti-im-ma*,[25] "of much time, long (in time)"; cf. ta_2*-ak-ki-me ki-it-ti-im-ma*, "long life"; *pi-el ki-it-ti-im-ma*, "long years" (cf. Steve 1967, 16); *su-un-ki-me ki-it-ti-im-ma*, "long (period of) kingship" (references in ElW 471, *s.* v. *ki-it-ti-im-ma*). However, *ki-it-ti-in* alone seems to be used adverbially with the meaning "for a long time".[26] As for *te-e-me~mi*, the contexts in which it occurs require the

21 In Linear Elamite, the 1st person pronoun is consistently written with the sign *u* (= /o/), which contrasts phonologically with u_2 (= /u/). Moreover, in Cuneiform 8 and 9 (among others), the pronoun in question is consistently written with the cuneiform sign U_3 (see u_3, "I", in Cuneiform 9: 3. 21. 36. 44. 53; u_3*-me*, "of mine", ll. 7. 23. 39; u_3*-pi*, "of mine", l. 27) and is thus distinguished orthographically from the U_2 sign of u_2*-te-en-ti* (see below, section 4.1.2).

22 Hinz and Koch suggested this meaning for *šu-ma* in EKI 79 § 9. The context (§§ 7–9) is as follows: *napi*(DINGIR)*-riša*(GAL) *a-ak* ^{d}*in-sušinak*(MUŠ$_3$.LAM) u_2 *ip tah*$_2$*-ha-am-pa*$_2$ *ha-al* ^{meš}*pa*$_2$*-la-hu-te-ep-p*[e_3] *a-ak la-al-la-ri-ip-pe*$_3$ … *sir-ma hal-pu-uh ša*$_2$*-al-har mas*$_2$*-si-ih a-ak hi-el šu-ma si-ik-ka*$_4$*-ah*, "(With) Napireša and Insušinak helping me, … I *completely* destroyed the lands of Palahůte and Lalar, I cut *šalhar*-trees, and I erected a *victory*-gate".

23 Only in Cuneiform 8. As Cuneiform 9 was probably written in the highland, it is interesting to note the absence of the reference to the Susians in such a context.

24 Note that *na-a-ma-na* was still visible when the inscription was scrutinized by Cameron.

25 To be analyzed as either /kit(i)-ima/ (see Grillot 2008, 48 f.) or, less likely, /kitin-me-a/ (Krebernik ^{4}2021, 199). Cf. also Mäder 2019, 136 f., comms. to *pi-it-te-im-ma* and *ki-it-ti-im-ma*.

26 Note that the following term, *te-e-me~mi*, is not linked to *ki-it-ti-in* by any class-marker, which means that the two words are not in a "genitival" relationship.

sense of "prosperity, well-being", or the like (cf. ElW 305, s.vv. *te-e-me* and *te-e-mi*).

Line 22 = 56: /hůrt/ (see, most recently, Henkelman 2008, 257, n. 564) seems to denote "(a group of) people" (cf. Akkadian *ṣābu*). Being a collective noun, it is marked by the plural class-marker (see ElW 723, s.vv. *hu-ur-ti-pi* and *hu-ur-ti-be*). Accordingly, *hu-ur$_2$-tu$_3$ an-ša-ni-ip* (/ *an-ša-ni-i-pi*) means "the people of Anšan" (and not "the people of the Anšanites", as is often mistranslated). As regards the final *-na*, we interpret it as the 'neutral' class-marker /n/ + 'final' suffix /a/ (cf. Khačikjan 1998, 15; Grillot 2008, 45–48; Krebernik [4]2021, 204. 212). Since *hu-ur$_2$-tu$_3$ an-ša-ni-ip* (/ *an-ša-ni-i-pi*) alone means "the people of Anšan", *-na* should connect this phrase with a preceding word, which can only be *te-e-me*~*mi*.

Line 24 = 57: The presence of the accusative pronoun /nůn/ makes it certain that *ki$_2$-ri-na* is a verbal form and not a noun (as interpreted by Hinz and Koch in ElW 483, s.v. *gi-ri-na*; Malbran-Labat 1995, 76: "par (ma) dévotion"; and Grillot 2008, 96: "en gratitude"); cf. Krebernik ([4]2021, 199). For the meaning of cun. *ki$_2$-ri* (= LE *ki$_2$-ri*, /kere/), cf. Malbran-Labat (1995, 77): "cette base exprime les relations cultuelles entre le dieu et son dévot dans l'accomplissement de ses devoirs religieux"; and Grillot (2008, 19): "louer, rendre grâce à, faire l'éloge de, féliciter" (for different opinions, see ElW 480 f., s.v. *gi-ri*). For /hih/, see Steve (1967, 9 f.) (cf. ElW 658 f., s.v. *hi-h*).

Line 25 = 58: For /mani/ (presumably a cult object), see ElW 867, s.v. *ma-ni-ip*. For /sahi/, cf. cun. *sa-hi-ya*, "(made of) bronze", in EKI no. 45 § 4 and no. 56 § 2 (see König, EKI 136, n. 6).

Line 26 = 59a: Cf. *hu-ur-tu$_4$ ki$_2$-ri-pu-up/ki$_2$-ri-pe$_3$-ep** in EKI no. 45 §§ 8 and no. 54 § 71*. This phrase (/hůrt kere-p o-p(e)/?) probably means "the group/circle of my clergymen/ministers (of religion)". For /kere-r/, lit. "that of worship", see Grillot (1994, 10; for different opinions, see ElW 481, s.v. *gi-ri-be-ip*; and 483, s.vv. *gi-ri-pi* and *gi-ri-pu-up*). Finally, /hůta/ corresponds to Akkadian *epēšu* (see Steve 1967, 12; ElW 708 f., s.v. *hu-ud-da*; etc.). As this passage also shows, the verbal form *hu-ut-ta-ak-na* applies to both the singular and the plural (contrary to what almost all the grammars of the Elamite language reconstruct, it seems that there is no singular/plural distinction in the 3rd person of the Conjugation II).

Pericope 4

Cuneiform 8

28. [*pe$_3$*]-*et* ⌜*la*⌝-*ha-ak-na*
29. [*ti*]-*a-te ha-al-ma-ak-na*

(28)May the *rebellion be suppressed*, (29)may the opponent (lit. the other) disappear.

Line 28: Restored after LE *pe-t la-ha-k$_2$-na* in Y2: 2 and Z: 5 (see below, section 2.3, step 11; cf. ElW 665, s.v. *hi-it*). The term /pet/ is attested in the Achaemenid period with the meaning of "fight, battle" (see ElW 188, s.v. *be-ut*). We assume, with Grillot (1994, 11), that /pet/ also means "rebellion" (also on the basis of a comparison with the verb /pet(i)/, "to become hostile, to raise up, to rebel"; see below, section 2.3, step 11). Alternatively, we can translate: "may the combat end". For the meaning of the verb /laha/ ("to perish, to cancel"), see Scheil (1917, 44).

Line 29: Cf. ElW 322, s.vv. *ti-at* and [*ti*(?)]-*a-te*. For the verb /halma/, see, most recently, Krebernik/Wasserman (2020, 54).

Pericope 5

Cuneiform 8	**Cuneiform 9**
30. *pe$_3$-ti-ip lu-uk li-im-ma-aš-pi$_2$*	24. *pe$_3$-ti-ip lu-uk li-im-ma-aš-pi$_2$*
31. *ta-r[i-i]p ša-li se$_{20}$-ra-aš-pi$_2$*	25. *ta-ri-ip ša-li se$_{20}$-ra-aš-pi$_2$*
32. *li-ma-[a]k ku-ra-ak*	26. *li-im-ma-ak ku-ra-a-ak*
33. *pa-at-pu-up ra-ap-pa-ak-na*	27. *pa-at-pi u$_3$-pi ra-ap-pa-ak-na*

(30 = 24)The enemies that the *fire* burned, (31 = 25)the *foes* that the *stake kept suspended*, (32 = 26)(both those that were) burned (and those that were) ..., (33 = 27)may they be enslaved under me.

Line 30 = 24: Cf. ElW s.vv. *be-ti-ip* (p. 187) and *lu-uk* (p. 844). For /pet-ir/ or /peti-r/ meaning "enemy", see also the equivalence of this Elamite word (cun. *pi-ti-ir*) with Akkadian *nakru* provided by the juxtaposition of TZ 31: 8 with TZ 32: 10 (Steve 1967, 69). The same two texts provide the equivalence of Elamite /lůma/ (assumed to be a variant of /lima/) with Akkadian *qalû*, "to burn" (ibid.; see also p. 123, s.v. *lu-mu-un-ra*; see also Krebernik/Wasserman 2020, 54).

Line 31 = 25: Whether /tar-ir/ or /tari-r/ means "ally, friend" or rather denotes someone hostile is controversial (see ElW 290, s.v. *ta-ri-ir*). The present context seems to require the latter interpretation (but see cun. *si-ia-an ta-ri-in* and the discussion of the substantive /tarı/ in Lambert 1972, 64–66). As for the verb, /sera/, the context seems to require the meaning "to keep suspended" rather than "to hang (on)" (cf. ElW 1087 f., s.vv. *si-ra*, *si-ra-h*, and *si-ra-ha*).

Line 32 = 26: /kůra/ is generally considered to mean "to scorch" (see ElW 518 f., s.vv. *ku-ra-ak*, *ku-ra-at*, and *ku-ra-at-ni*) but "burned (and) scorched" does not make much sense here. As /lima-k/ appears to pick up /lima-š/, we would expect, by analogy, that /kůra-k/ picks up

/sera-š/ and, therefore, that it has a meaning close to that of the latter.

Line 33 = 27: Cf. Tavernier (2011, 336 f.; 2018, 442). Note the sandhi-writing *pa-at-pu-up* for *pa-at-pi* u_3*-pi* (/pat-(i)p o-pe/). For the verb /rapa/ or /rarpa/, whose general meaning is "to bind", see ElW 1017–1020, s. v. *ra-ar-ba-h*.

2.3 … to the Unknown: the LE Inscriptions

As will be evident, the LE writing system consists of both alphabetic and syllabic (CV type only) signs (see Fig. 6).[27] The decipherment of this alpha-syllabary could be achieved through correlations with spellings and linguistic data provided by contemporary and later cuneiform texts.

As has been pointed out above (section 1), the phonetic reading of several signs was previously determined thanks to the works by Bork, Frank, Hinz, Meriggi, and Corsini. Building on their results, we were able to identify and read a first series of proper nouns (see Fig. 5, steps 1–2),[28] namely Insušinak,[29] Puzur-Sušinak,[30]

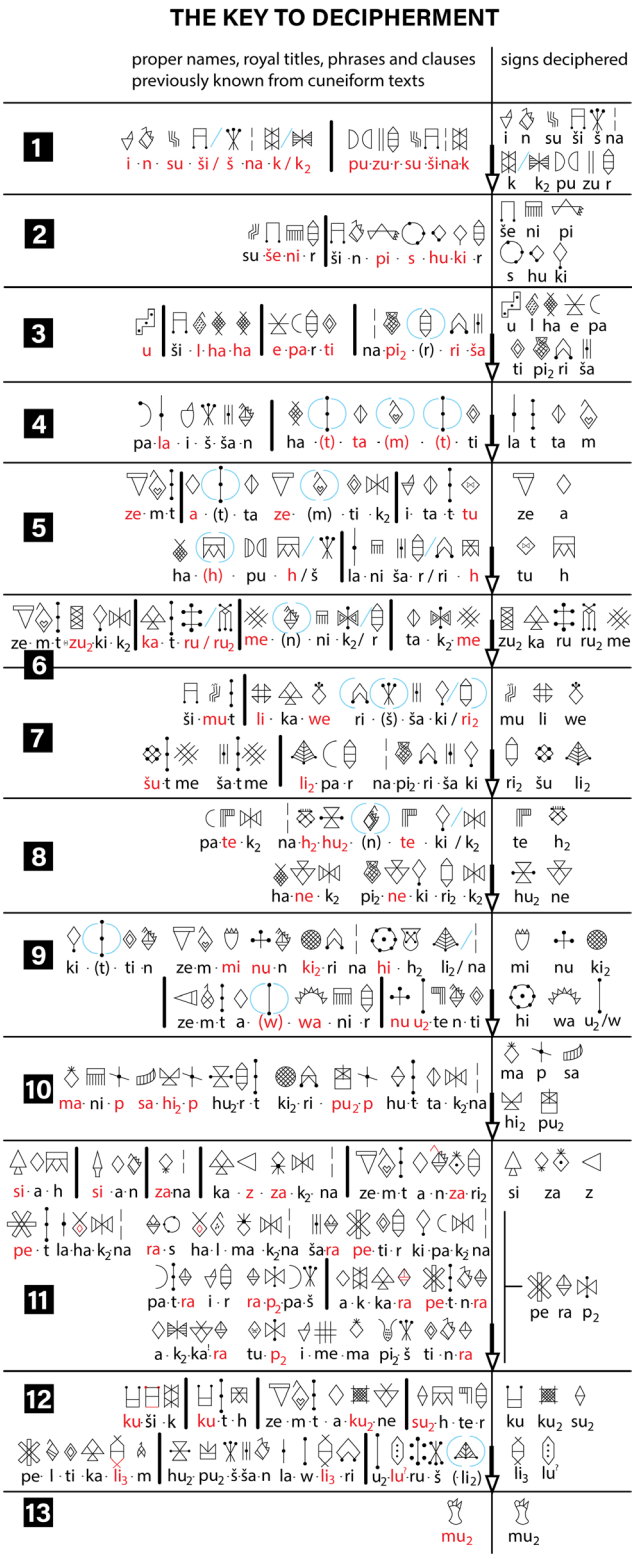


Fig. 5: The key to decipherment (F. Desset). Newly deciphered signs in each step are in red.

27 Note that so far neither logograms nor semantic classifiers (the so-called 'determinatives') have been detected in Linear Elamite.

28 According to Pope (²1999, 95), Leibniz, in 1714, was the first to mention "the utility of proper names in decipherment. […] All the decipherments […] had as their starting point the location and identification of proper names".

29 In LE texts, the theonym in question occurs as either *i-n-su-ši-na-k*~k_2* (A: 1; B: 1*; D: 3*) or *i-n-su-š-na-k*~k_2* (F // G // H — composite text: 2; U: 2*; A′: 4; O′: 1. 5), while cuneiform texts from the first half of the second millennium BCE only attest a form /insušnak/, spelled ^{d}*in-su-uš-na-ak* (see above, section 2.2, Cuneiform 8: 1. 15) or ^{d}*in-su*$_2$*-uš-na-ak* (EKI no. 67 § III; also note the PN Kůk-Insušnak [cun. *ku-uk-in-su*$_2$*-uš-na-ak*] in Scheil 1908, 72, no. 122 rev. 8). Accordingly, we can reconstruct the current pronunciation of this divine name in the Old Elamite period as /insušnak/, with the variant /insušinak/ representing, presumably, an older form, closer to the original Sumerian etymon *Ninsusinak (see ^{d}nin-susin$_x$(MUŠ$_3$.ŠEŠ$_4$) in IAS 82 iv 5 // 86 iii′ 4′; and, for the original reading of MUŠ$_3$.ŠEŠ$_4$(/EREN) in Sumerian as /susin/, Marchesi 2013, 286 with n. 9).

30 Written *pu-zu-r-su-ši-na-k*~k_2* (A: 2; E: 1; F // G // H — composite text: 1; I: 1*; P*). In cuneiform sources the name in question is written with the logographic writings PU$_3$.ŠA-^{d}MUŠ$_3$.ŠEŠ$_4$ (Wilcke 1987, 109 and pl. 44, IB 1537 rev. v′ 15′; Kienast/Sommerfeld 1994, 56, s. v. *Puzur*$_4$-^{d}*inšušinak*), PU$_3$.ŠA-^{d}NIN.MUŠ$_3$.ŠEŠ$_4$ (Gelb/Kienast 1990, 325, Elam 3: 4) and MAN-^{d}MUŠ$_3$.ŠEŠ$_4$ (Scheil 1931, 2, line 12), which may lend themselves to different interpretations. Meriggi (1971, 206) already proposed to read the second element of this name as /šušinak/ instead of /inšušinak/, while for the first element hesitating between /puzur/ and /kutir/. In this connection, note the spellings ^{d}*šu-ši-na-ak*, *šu-ši*$_2$*-na-ak**, and *šu-ši*$_2$*-nak*** in later cuneiform texts in Akkadian, which attest to an Akkadian form /šušinak/ of the Sumerian DN Ninsusinak starting from the OB period; see YOS 12, 491: 5 (PN ^{d}*šu-ši-na-ak-ilī*(DINGIR); time of Samsu-iluna); Wasserman 2019, nos.

Sušen,[31] and Šin-pishůk.[32] Additional sign values were established by Desset (2018b) in his study of the Kam-Firuz silver beaker group. Desset identified the sign *u* used to write the 1st person pronoun, the names of the Sukkalmaḫ rulers Šilhaha and Eparti II, and the theonym Napireša.[33] The consequent reading of signs *e*, *ha*, *l*, *pa*, *pi*$_2$, *ri*, *ša*, *ti*, and *u* (see Fig. 5, step 3) allowed us to proceed further in the decipherment by identifying the following linguistic elements in various subsequent steps (Fig. 5):

Step 4: the name of the Sukkalmaḫ ruler Pala-išan[34] and the toponym Hatamti.[35]

Step 5: the term *ze-m-t*, "king, lord";[36] the title *a*(*-t*)*-ta-ze*(*-m*)*-ti-k*$_2$, "*father-lord*" (locutive);[37] the name of the Šimaškian ruler Itatu I;[38] the verb *ha*(*-h*)*-pu-h*∼*š*, "I/he heard",[39] and the clause *la-ni ša-ri*∼*r-h*, "I fashioned a silver object".[40]

Step 6: the royal title/epithet (?) *ze-m-t zu*$_2$*-ki-k*$_2$, "king of .../the ... king" (locutive);[41] and the words *ka-t-ru*∼*ru*$_2$, "the ..." (a title/epithet?);[42] *me*(*-n*)*-ni-r*, "ruler";[43] and *ta-k*$_2$*-me*, "life".[44]

Step 7: the theonym Šimot;[45] the title *li-ka-we ri-ša-ri*$_2$, "the grand *likawe*";[46] the royal epithet *li*$_2$*-pa-r na-pi*$_2$*-ri-ša-ki*, "servant of Napireša" (locutive);[47] and the temporal expression *šu-t-me ša-t-me*, "night and day".[48]

2: 3*; 3: 5*; 6: 3*. 4**. 5* (Susa, end of the Sukkalmaḫ period); and CT 25, 11 f., K 4339 rev. i 3 (NA explanatory list of gods). We can thus trace the apheretic form of the theonym in question back to the time of Puzur-Sušinak and assume the following development in the manner this divine name was pronounced in Akkadian: */susinak/ (OAkk.) → /sušinak/ (Puzur-Sušinak's time) → /šušinak/ (OB and later).

31 Written *su-še-ni-ir* (A: 3; B: 2; C: 2; E: 2; I: 1), with final /ir/ being the class-marker of the so-called 'delocutive'. Cf. *šu-še-ni-ip* (with the plural suffix /ip/) in Cuneiform 8: 23 (see above, section 2.2, pericope 3) and Cuneiform 9: 42. 50. LE texts thus seem to attest to an older form /sušen/ without palatalization of the first sibilant.

32 Usually written *ši-n-pi-s-h-hu-k*∼*k*$_2$* (A: 4; B: 3*; C: 3–4; E: 4), but *ši-n-pi-s-hu-ki-r* (F // G // H — composite text: 2; U: 1) when the delocutive marker /ir/ is added. Cf. *šim-pi*$_2$*-is*$_2$*-ḫu-uk* in cuneiform (Kienast/Sommerfeld 1994, 64, s. v. *šim-pi-iš-ḫu-uk*). It is possible that the latter spelling is closer to the actual pronunciation of the name. In fact, the dental /n/ before /p/ was subject to labialization in Elamite (n → m/__ p; see Grillot 1987, 10; Khačikjan 1998, 8). If so, then the LE spellings with *n* (*ši-n-pi-s-h-hu-k*, etc.) should be regarded as examples of morphographemic writing or as historical writings reflecting the etymological form of the name in question.

33 For this more accurate reading of the DN (previously read) Napiriša, see above, section 2.2, pericope 1, comm. to line 1b.

34 Written *pa-la-i-š-ša-n* (in K′). Cf. cun. *pa*$_2$*-la-iš-ša-an* (ElW 131, s. v. *ba-la.iš-ša-an*; see also Cuneiform 7 [see above, section 2.2], Cartouche A 1).

35 Usually written *ha-ta-m-ti* (C: 3; E: 3; Y2: 1; Z: 1; F′: 1; J′: 2. 4) but the spelling variants *ha-t-ta-m-t-ti* (I′: 1. 2; K′) and *ha-ta-ti* (X: 1. 3) are also attested. For cuneiform spellings, see Krebernik (2006, 62 f.).

36 Written *ze-m-t* (A: 2; B: 1; F // G // H — composite text: 1; etc.) and corresponding to cun. *si*∼*še*∼*te-im-ti* (see Zadok 1984, 43 f., *sub* 246). For the reading of the first sign of *ze-m-t* as *ze*, rather than *si*, *še*, or *te*, see below, section 4.1.

37 Specifically used for Šilhaha in X: 3 and J′: 4. In this connection, note that in the so-called 'Cylindroid of Ata-hušu' (Scheil 1939, 7 f.), written in Akkadian, Šilhaha is said to be "the *at-ta*$_2$-LU[GAL] (= "*father-lord*") of Anšan and Susa" (lines 5–6).

38 Written *i-ta-t-tu* (Y1 and Z: 1). Cf. the cuneiform spellings $^{(d)}$*i-ta*$_2$*-tu*$_3$ (Cuneiform 2 [see section 2.2 above]: 1; Steinkeller 2011, 21 f.), *i-ta*$_2$*-at-tu*$_3$ (Scheil 1931, 2, line 20; EKI 194, s. v. ^{I}Idaddu), *i-*$^{\lceil}$*ta*$_2$$^{\rceil}$*-at-tu* (Scheil 1931, 2, line 23 — referring to Itatu II), and *i-ta-at-tu*$_3$ (EKI 194, s. v. ^{I}Idaddu).

39 *ha-h-*[*pu*]*-h* in Z: 3; *ha-h-pu*[*-h*] in Z: 9 and H′: 4; *ha-pu-š* in X: 2.

40 See, e. g., Z: 4 (*la-ni ša-ri-h*) and X: 2 (*la-ni ša-r-h*). Cf. ElW s.vv. *la-ni* (p. 815) and *ša-ri-h* (p. 1137).

41 In X: 1; Z: 1; I′: 1; etc. The spelling *zu*$_2$*-ki-k*$_2$ probably represents the term /zok(i)/ (here used as a qualifier of /zemt/, "king"), followed by the locutive class-marker. Cf. cun. *zu-kir* and *zu-ki-ip* in the so-called 'Treaty of Naram-Sin' (see ElW 1310, s.vv., for references).

42 Written *ka-t-ru* (Y2: 1; Z: 1) or *ka-t-ru*$_2$ (X: 1; I′: 1; J′: 2). Meaning unknown; a derivation from /kat/, "throne" (Grillot 2008, 23) is unlikely (see Mäder 2019, 134). It occurs in the phrase /katrů hatamti-k/, "(I, ...,) the *katrů* of Hatamti". For later attestations of this title or epithet, see EKI 37, n. 3; and 195, s. v. *ka*$_4$*-at-ri*∼*ru*. Also note the unique occurrence of /katrů/ in the god Sılır's epithet *ka*$_4$*-at-ru pa*$_2$*-ha*[*-ar ha*]*l ha-tam*$_3$*-ti-ir*, "the benevolent *katrů* of the land of Hatamti" (EKI 54 § 1; for /paha/, see Mäder 2019, 132).

43 *me-ni-r ha-ta-m-ti-pi-r* ("the ruler of the Hatamtites") in F′: 1 but [*me*]*-n-ni-r ha-t-ta-m-t-ti-r* ("the ruler of Hatamti") in I′: 2. Note also LE *me-n-ni-k*$_2$ *ha-t-ta-m-t-ti-k*$_2$ (locutive) in K′, to be compared with cun. *me-ni-ik ha-ta*$_2$*-am-ti-ik* in the royal titulary of Sewe-palar-hůhpak (see above, section 2.2, pericope 1). For later attestations of /men-ik hatamti-k/, see EKI 37, n. 3; and 203, s. v. *me-ni-ik*. See also above, section 2.2, pericope 1, comm. to line 5.

44 Always spelled *ta-k*$_2$*-me* in Linear Elamite (X: 2; Y2: 3; Z: 3. 9; H′: 4). Cf. cun. *ta-ak-me* (Cuneiform 8: 7; Cuneiform 9: 7. 8. 10. 12) and ElW 249, s. v. *ta-ak-ki-me*.

45 Written *ši-mu-t* (D: 4). For this deity and the various orthographies of his name in cuneiform, see, most recently, Henkelman 2011.

46 In F′: 1. Note also *li-ka-we ri-ša-ki* (H′: 2) and *li-ka-we ri-š-ša-ki* (K′). Cf. cun. *li-ka*$_3$*-we ri-ša-a-ki* in the royal titulary of Sewe-palar-hůhpak (see above, section 2.2, pericope 1). For later attestations of this royal title, see EKI 37, n. 3; and 201, s. v. *li-ka*$_4$*-me*. See also above, section 2.2, pericope 1, comm. to line 4.

47 In J′: 3 and K′. Cf. /lipa-k hane-k insušinak-ik/, "(I, ...,) the beloved servant of Insušinak", in the titulary of several Middle Elamite kings (see EKI 37, n. 3; and 201, s. v. *li-ba-ak*).

48 In Y2: 3; Z: 9; and K′. Cf. cun. *šu-ut-me ša-at-me* (Cuneiform 8: 20; Cuneiform 9: 54; see above, section 2.2, pericope 3, with comm. to line 20 = 54).

Step 8: the royal epithets *pa-te-k$_2$ na-h$_2$-hu$_2$(-n)-te-k$_2$∼ki*, "the shepherd of Nahůnte" (locutive);[49] and *ha-ne-k$_2$ pi$_2$-ne-ki-ri$_2$-k$_2$*, "the beloved of Pinekir" (locutive).[50]

Step 9: the clauses *ki(-t)-ti-n ze-m-mi nu-n ki$_2$-ri-na hi-h$_2$-li$_2$∼na*, "may I obtain *prosperity* for a long time by worshiping you";[51] and *nu u$_2$-te-n-ti*, "it is you who *lead*";[52] and the royal title *ze-m-t a(-w*^{53}*)-wa-ni-r*, "king of Awan".[54]

Step 10: the clause *ma-ni-p sa-hi$_2$-p hu$_2$-r-t ki$_2$-ri-pu$_2$-p hu-t-ta-k$_2$-na*, "may *mani*s of bronze be realized for (to be used by) my *priests*".[55]

Step 11: the verb *si-a-h*, "I saw";[56] the nouns *si-a-n*, "temple";[57] and *za-na*, "lady";[58] the precative verbal form *ka-z-za-k$_2$-na*, "may *he be struck*";[59] the royal title *ze-m-t a-n-za-ri$_2$*, "king of Anšan";[60] the sequence of precative clauses *pe-t la-ha-k$_2$-na ra-s ha-l-ma-k$_2$-na ša-ra pe-ti-r ki-pa-k$_2$-na*, "may the *rebellion be suppressed*, may the *opponent* disappear, may the enemy be *subdued*";[61] the clauses *pa-t-ra i-r ra-p$_2$-pa-š*, "he (= Insušinak) enslaved (the city of Hůpošan) under him";[62] *a-k-ka-ra pe-t-n-ra*, "whoever rebels";[63] and *ak-k$_2$-ka^{i}(ne*^{64}*)-ra tu-p$_2$ i-me-ma pi$_2$-š ti-n-ra*, "whoever puts a dedication on the inscription of his (= Puzur-Sušinak)".[65]

Step 12: the past participle *ku-ši-k*, "begotten, created";[66] the verb *ku-t-h*, "I protected";[67] the name of the ruler Zemt-Akone (/Temti-Agun) I;[68] the term *su$_2$-h-ter*, "cabinet";[69] the theonym Peltikalim;[70] and the phrase *hu$_2$-pu$_2$-š-ša-n la-w-li$_3$-ri*.[71] In addition, we tentatively propose to read the verb *u$_2$-x-ru-š(-li$_2$)* as *u$_2$-lu$^{?}$-ru-š(-li$_2$)*,[72] with the

49 *pa-te-k$_2$ na-h$_2$-hu$_2$-te-k$_2$* in Y2: 1 but *pa-te-⌜k$_2$⌝ na-h$_2$-hu$_2$-⌜n⌝-te-ki* in Z: 2. Note also *pa-te-k$_2$ na-*[*h$_2$*]*-hu$_2$-te-k$_2$ pi$_2$-ne-ki-r-ki* in J′: 2–3. Cf. cun. *pa$_2$-te-ek* ^{d}*naḫ-ḫu-un-te-ek* in EKI no. 44a § II and passim in the inscriptions of Šilhak-Insušinak I (see EKI 207, s. v. *ba-te-ik*). For the meaning "shepherd" of the term /pate/, see ElW 166, s. v. *ba-te-ip*.

50 In Y2: 1 and Z: 2. Cf. Cuneiform 2: 4–5 (see above, section 2.2, Table 2), where Itatu I is said to be s i p a ^{d}u t u k i - a ĝ$_2$ ^{d}i n n a n a, "the shepherd of Utu, the beloved of Innana", doubtlessly corresponding to LE *pa-te-⌜k$_2$⌝ na-h$_2$-hu$_2$-⌜n⌝-te-ki ha-*[*ne*]*-k$_2$ pi$_2$-ne-ki-ri$_2$-k$_2$*, "(I, ...,) the shepherd of Nahůnte, the beloved of Pinekir", in Z: 2 (also of Itatu I). Incidentally, this supports the equivalences between Mesopotamian Utu/Šamaš and the Elamite sun-god Nahůnte, and between Mesopotamian Innana/Eštar and the Elamite goddess Pinekir (cf. Stolper 1998; and Koch 2005b).

51 *ki-ti-n ze-m-mi nu-n ki$_2$-ri-na hi-h$_2$-li$_2$* in K′; *ki-t-⌜ti⌝-*[*n ze-m-mi nu-n*] *ki$_2$-ri-na hi-h$_2$-na* in I′: 3. Cf. *ki-it-ti-in te-e-me∼mi ... nu-un ki$_2$-ri-na hi-ih-na* in Cuneiform 8: 21–24 and Cuneiform 9: 55–57 (see above, section 2.2, pericope 3, with comm. to lines 21 = 55 and 24 = 57). See also EKI no. 13 § VI (*ki-it-ti-in me-lu-uk-ma te-em-ma ki$_2$-ri-na nu-un hi-ih-na*); no. 48 §§ 5–6 (*ki-it-ti-in te-e-mi ...* [*... nu-un ki$_2$-ri-na hi-ih-hu-na*]); and no. 53 I ([*ki-it-ti-in te-e-mi ...*] *... nu-un ki$_2$-ri-na hi-ih-hu-na*).

52 In Z: 5 and K′. Cf. *nu u$_2$-te-en-ti* in Cuneiform 9: 19–20. 28–29. 51–52; and passim in later texts (see above, section 2.2, pericope 2, with comm. to line 20).

53 Apparently, the same sign was used both as a vowel (LE *u$_2$* = /u/) and a (semi)consonant (LE *w* = [w]; = non-syllabic allophone of /u/; see below, section 3.1).

54 *ze-⌜m⌝-t a-w-⌜wa-ni⌝-r* in F: 1; *⌜ze⌝-m-t a-wa-⌜ni⌝-*[*r*] in H: 1. This obviously corresponds to cun. *sar*(LUGAL) *a∼a^{i}*(ZA)*-wa-an*^{ki}, "king of Awan", in Akkadian inscriptions of Puzur-Sušinak (see André/Salvini 1989, 65 with n. 35 [on p. 70 f.]).

55 In Z: 8–9. Cf. *ma-ni-ip* (var. *ma-ni-i-pi**) *sa-hi-*[*ip*] (var. *sa-hi-i-pi**) *hu-ur$_2$-tu$_3$ ki$_2$-ri-pi*(-)*up hu-ut-ta-ak-na* in Cuneiform 8: 25–27 and Cuneiform 9: 58*–59 (see above, section 2.2, pericope 3, with comm. to lines 25 = 58 and 26 = 59a). See also EKI no. 45 § 8 (*ma-ni hu-ur-tu$_4$ ki$_2$-ri-pu-up hu-ut-tak-n*[*a*]) and no. 54 § 14 (*hu-up-pa$_2$ sa-hi-i ki$_2$-ri-pa ku-up hu-ut-ta-*[*a*]*k-na*).

56 In Z: 3. Cf. ElW 1096, s. v. *si-ya-h*.

57 In Q. Cf. ElW 1068, s. v. *si-a-an*; and 1095, s. v. *si-ya-an*.

58 In I: 2 and Q. Cf. ElW 1282, s. v. *za-na*.

59 In Y2: 3 and Z: 8. Cf. cun. *ka$_4$-az-za-ak-na* in EKI no. 54 § 73 (see also ElW 411, s. v. *qa-az-za-ak-na*).

60 In F′: 1: *e-pa-r-ti ze-m-t a-⌜n⌝-za-ri$_2$ ze-m-t-a-ku$_2$-ne* [*li-ka*]*-⌜we⌝ ri-ša-ri$_2$ me-ni-r ha-ta-m-ti-pi-r*. Cf. Cuneiform 6 (section 2.2 above, table 2), Inscription A 1–4: *e-pa$_2$-ra-at šar*(LUGAL) *an-ša-an te-em-ti-a-ku$_8$-ne šukkalmaḫ*(SUGAL$_7$.MAḪ) *elamtim*(ELAM.MA) *u$_3$ ši$_2$-maš-ki*.

61 In Y2: 2–3 and Z: 5–6. Cf. [*pe$_3$*]*-et ⌜la⌝-ha-ak-na* [*ti*]*-a-te ha-al-ma-ak-na* in Cuneiform 8: 28–29 (see above, section 2.2, pericope 4); and [...]*-ak-na ra-al hal-ma-ak-na* in EKI no. 54 § 73.

62 In F // G // H — composite text: 2 (see below, section 6). Cf. *pe$_3$-ti-ip ... pa-at-pu-up* (var. *pa-at-pi u$_3$-pi**) *ra-ap-pa-ak-na* in Cuneiform 8: 30–33 and Cuneiform 9: 24–27* (see above, section 2.2, pericope 5).

63 In F // G // H — composite text: 3 (see below, section 6).

64 The sign in question looks like *ne*, but the context requires *ka*, which graphically is identical to *ne* upside down. In other words, the sign here is actually *ka*, but it is erroneously written upside down as if it were *ne*.

65 In D: 2–3. Note /tup/, which is obviously a loan from Akkadian *tuppu*(*m*), "inscription". For /piš/, "dedication", cf. ElW 197 f., s.vv. *pi-is-si* and *pi-iš*, while *ti-n-ra* almost certainly represents a syncopated form of /tiya-n-r-a/ (verb form of Conjugation III with 'final' suffix /-a/), from the base /tiya/, which is probably an older variant of /ta/, "to deposit, to place".

66 In F // G // H — composite text: 2 (in the phrase: *ku-ši-k ši-n-pi-s-hu-ki-r*, "the one begotten by Šin-pishůk"; see below, section 6).

67 In I′: 3. Cf. ElW 549, s. v. *ku-tu-h*.

68 Written *ze-m-t-a-ku$_2$-ne* (F′: 1). Cf. *še-em-ti-a-ku$_8$-un* (Cuneiform 7, Cartouche A 4), *te-em-ti-a-ku$_8$-ne* (Cuneiform 6, Inscription A 3), and *te-em-ti-a-ku$_8$-un* (ibid., Inscription B 5) (see above, section 2.2, Table 2). See also Zadok (1984, 5, *sub* 6), for additional cuneiform spellings of this name.

69 In A: 1. In cuneiform sources from the Middle Elamite period, this term is variously written *su-uh-ter*/*te-er* (ElW 1099 f.) or *šu-uh-ter* (ibid., 1176). For its meaning, see Marchesi, forthcoming.

70 Written *pe-l-ti-ka-li$_3$-m* (I: 1). Elamite form of Bēlat-ekallim, "Lady of the Palace", a well-known by-name of Innana/Eštar. Cf. ^{d}*in-na-na-pe$_3$-el-ti-ap-pu-ki*(*-i*), "Innana-Peltiapuki" (i. e., "Innana-Lady of ..") in TZ 45: 1. 2 (= EKI 10 A §§ 1. 2).

71 In F // G // H — composite text: 2 (see below, section 6). Cf. cun. *hu-up-ša-an la-am-li-ir-ri* (EKI no. 54 §§ 18. 73) and *hu-up-*[*š*]*a-an la-am-li-ir-na* (EKI no. 70 C § V).

72 In A′: 4–5 and O′: 5–6. Cf. ElW 1221, s. v. *ul-lu-ru-uk* (meaning unclear).

provisional value *lu*? awaiting further data to confirm (or invalidate) it.

Step 13: the sign value mu_2 (hapax legomenon), established thanks to the identification of text M from Susa as a scribal exercise on the syllabary of Linear Elamite (see below, section 3.2).[73]

Through these 13 steps, 72 LE signs were deciphered and read, corresponding to 73 values (because of the divalency of the u_2/*w* sign). They represent 96.3 % of the 1890 sign occurrences found in the corpus of LE inscriptions,[74] while only 70 occurrences (ca. 3.7 %) consisting of 4 rare signs and 33 hapax legomena remain to be deciphered. Even if the claim of a complete decipherment cannot be made yet, mainly due to the still limited number of inscriptions (40 texts known in 2021), it is, however, not very far. More texts are needed to complete the LE phonemic grid (see below, Fig. 6 and Table 4) with the missing sign values.

In his essay on the methods of decipherment, Gelb (1975, 96) classified decipherments into four types: 0: known writing and known language (for example, Sumerian or Akkadian texts written in the Greek alphabet in the so-called 'Graeco-Babyloniaca' tablets); I: unknown writing and known language = decipherment proper; II: known writing and unknown language = language recovery/interpretation (this is the case, for instance, of the Etruscan language); III: unknown writing and unknown language (as, currently, in the case of the Indus script; this type is supposed to be undecipherable but some of these cases may be apparent type III, hiding situations that may be reduced to type I or II).

The decipherment of LE writing obviously corresponds to Gelb's type I (unknown writing and known language). Being phonographic, with a limited number of signs, Linear Elamite was theoretically easier to decipher than a mixed system with a high number of signs due to the presence of logograms (such as Egyptian hieroglyphs, Mesopotamian cuneiform or Anatolian/Luwian hieroglyphs). However, the entirely phonetic character of the LE writing was only recognized at the end of the process of decipherment: the seemingly high number of glyphs (see Fig. 3a), actually due to the presence of many graphic variants (Fig. 3b), hindered this conclusion.

The decipherment was first based on the biscriptualism (Linear Elamite and cuneiform) and bilingualism (Elamite and Akkadian) of the text corpus of Puzur-Sušinak (steps 1 and 2). Unfortunately, the cuneiform texts of the Susian ruler never translate the LE inscriptions (or vice versa), despite the fact that sometimes cuneiform and Linear Elamite even occur side by side on the same object; however, these two series of texts share some proper nouns (written phonographically in the LE texts but mostly logographically in the cuneiform texts) whose recognition in LE inscriptions provided the first pieces of the puzzle. Step 3, methodologically similar to step 1, was more problematic due to the fact that none of the Kam-Firuz silver beakers (LE text group 4) bears both LE and cuneiform inscriptions; the key names Šilhaha,[75] Eparti, and Napireša were hypothesized to occur in the LE texts of the Kam-Firuz silver beakers on the basis of the supposed geo-historical background of these artifacts.[76] This opened the way to an extension of the approach based on the bilingualism of the textual documentation and, above all, to the creation of a second front exploiting the biscriptualism of the Elamite texts, with an attempt to recognize identical or similar (portions of) Elamite texts occurring in both LE and cuneiform inscriptions, including titles and formulas used by the Šimaškian and early Sukkalmaḫ rulers. The two cuneiform texts of Sewe-palar-hůhpak in the Elamite language (section 2.2 above, Cuneiform 8 and 9) then provided the main links to connect the unknown to the known.[77]

The decipherment of Linear Elamite is actually the decipherment of an unknown writing (in the end rather simple to understand due to its phonographic character) recording a language that is only very partially known. Elamite, being

73 As first recognized by Kervran (2019, 35 f.).

74 O and E′ were excluded from this count, as these texts may belong to an intermediate stage of writing between PE and LE scripts, while the duplicates F, G, and H were considered as one single text (F // G // H).

75 This name was potentially pretty easy to identify in LE script, as the sign *ši* was already known, and a sign repeated twice at the end of the writing sequence (*ši*-x-y-y) could be expected.

76 What helped is the fact that cuneiform inscriptions on beakers of the same or similar type (*kun* or *kunanki*) range from the time of Kɪntatu (Cuneiform 1) to that of Pala-išan (Cuneiform 7), that is, from the end of the 21st century to the beginning of the 19th century BCE (see section 2.2 above, Table 2). The names in question do occur several times in these texts:

$ši_2$-*il-ha-ha* (Elamite texts)/$ši_2$-*il-ḫa-ḫa** (Akkadian texts): Cuneiform 3, Fragm. A 1; Fragm. B 1; Cuneiform 4: 2*; Cuneiform 6, Inscr. A 5*; Cuneiform 7, Cartouche A 2*.

$^{(d*)}$*e-pa*$_2$*-ra-at*: Cuneiform 2: 2* (referring to Eparti I); Cuneiform 3, Fragm. B 8* (Eparti I?); Cuneiform 6, Inscr. A 1 (Eparti II).

$^{(d*)}$*na-pi-ri-ša*: Cuneiform 1: 1. 8; Cuneiform 3, Fragm. A 3*. 8*; Fragm. B 9*; Cuneiform 6, Inscr. A 11*.

Note, however, that the second of these names occurs in Linear Elamite in the form Eparti (*e-pa-r-ti*: X: 1; H′: 1; J′: 1; F′: 1), which is attested in cuneiform in Scheil 1931, 2, lines 16 and 22 (*e-pa*$_2$*-ar-ti*), and in later Elamite texts (see EKI 185, s. v. ^{I}Ebarti).

77 Several royal titles and phrases also occur in other 2nd millennium BCE Elamite royal inscriptions collected in EKI.

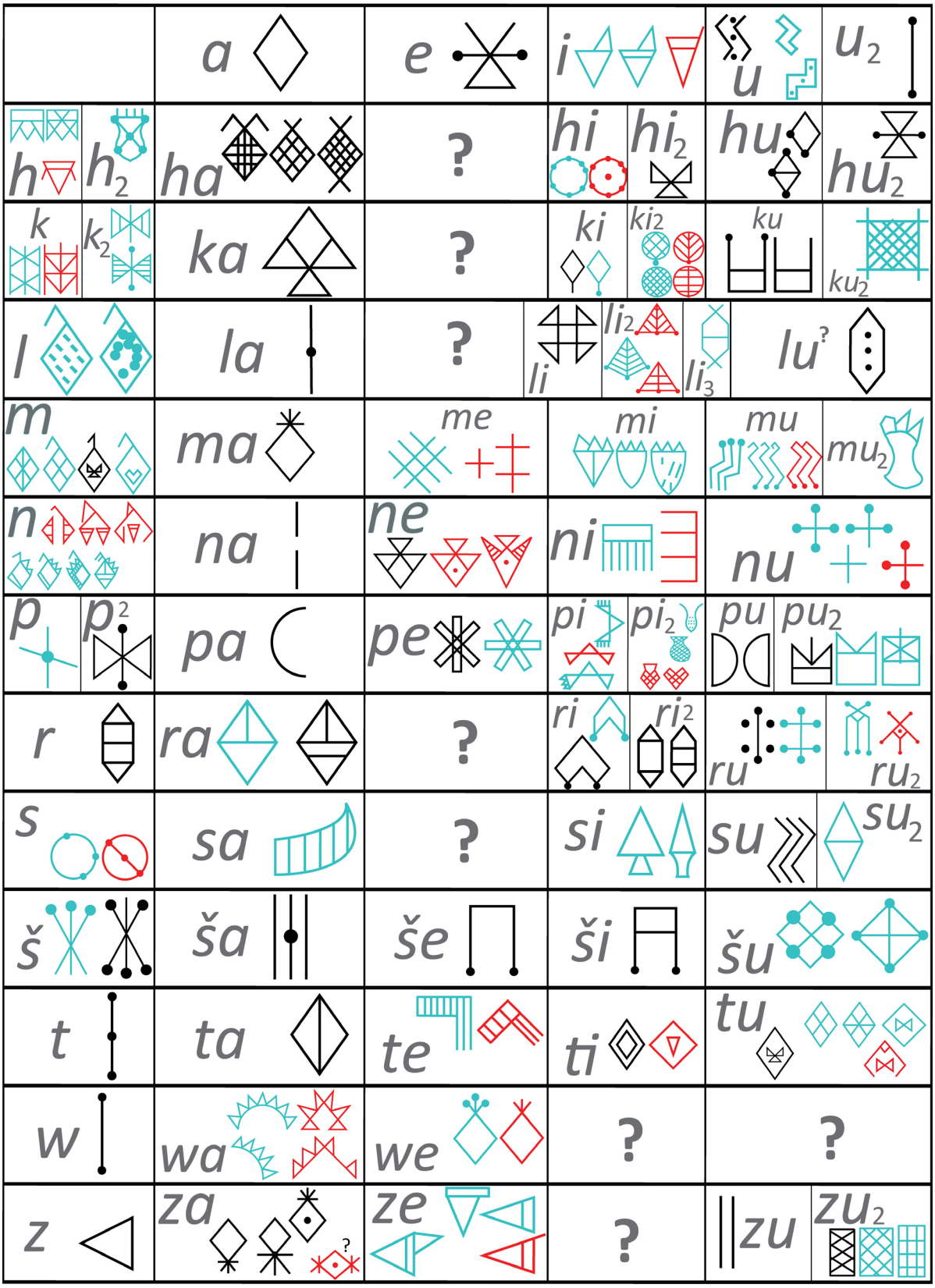


Fig. 6: Grid of the 72 deciphered alpha-syllabic signs on which the transliteration system of LE is based (F. Desset). The most common graphic variants are shown for each sign. Blue signs are attested in South-Western Iran, red ones in South-Eastern Iran. Black signs are common to both areas.

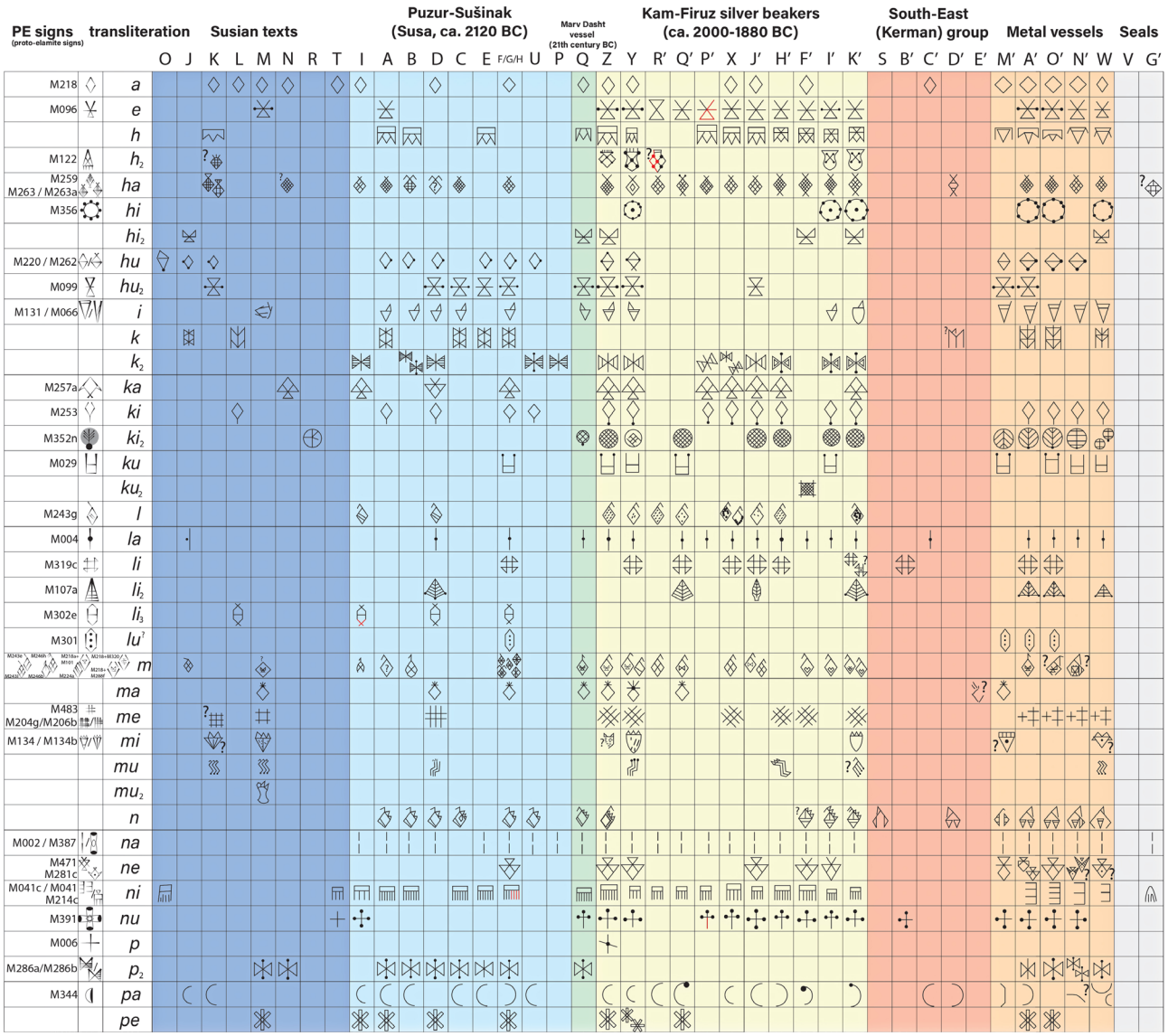


Fig. 7a: Graphic variations of the signs among all the LE inscriptions currently known, part I, from *a* to *pe* (F. Desset). Horizontally, the signs are organized according to the inscriptions where they appear (PE graphic comparisons are also provided). Vertically, the signs are listed in alphabetic order.

a dead and apparently isolated language, is still rather poorly understood. Therefore, although the LE writing system is deciphered and the LE texts read, the translations in some cases remain problematic, as is the case, too, with Elamite texts in cuneiform (see above, section 2.2, Cuneiform 8 and 9). The decipherment of LE script does disclose various features of the Elamite language that have been hitherto hidden behind the veil of cuneiform (such as the phonemic distinctions between /e/ and /i/, and /o/ and /u/; see below, sections 4.1.1 and 4.1.2), but much remains to be done in the linguistic field. This situation now corresponds to some extent to Gelb's type II (known writings and unknown language). In fact, a complete recovery of the Elamite language with the help of bilingual sources is still to be achieved, whatever the writing system used.

3 The Structure of the LE Script

3.1 A Phonographic Writing System

We can provisionally propose that the number of LE signs attested in the 40 inscriptions currently known ranges between 80 and 110 graphemes. Among these (Figs. 6 and 7a–c), 37 are still undeciphered while 72 graphemes

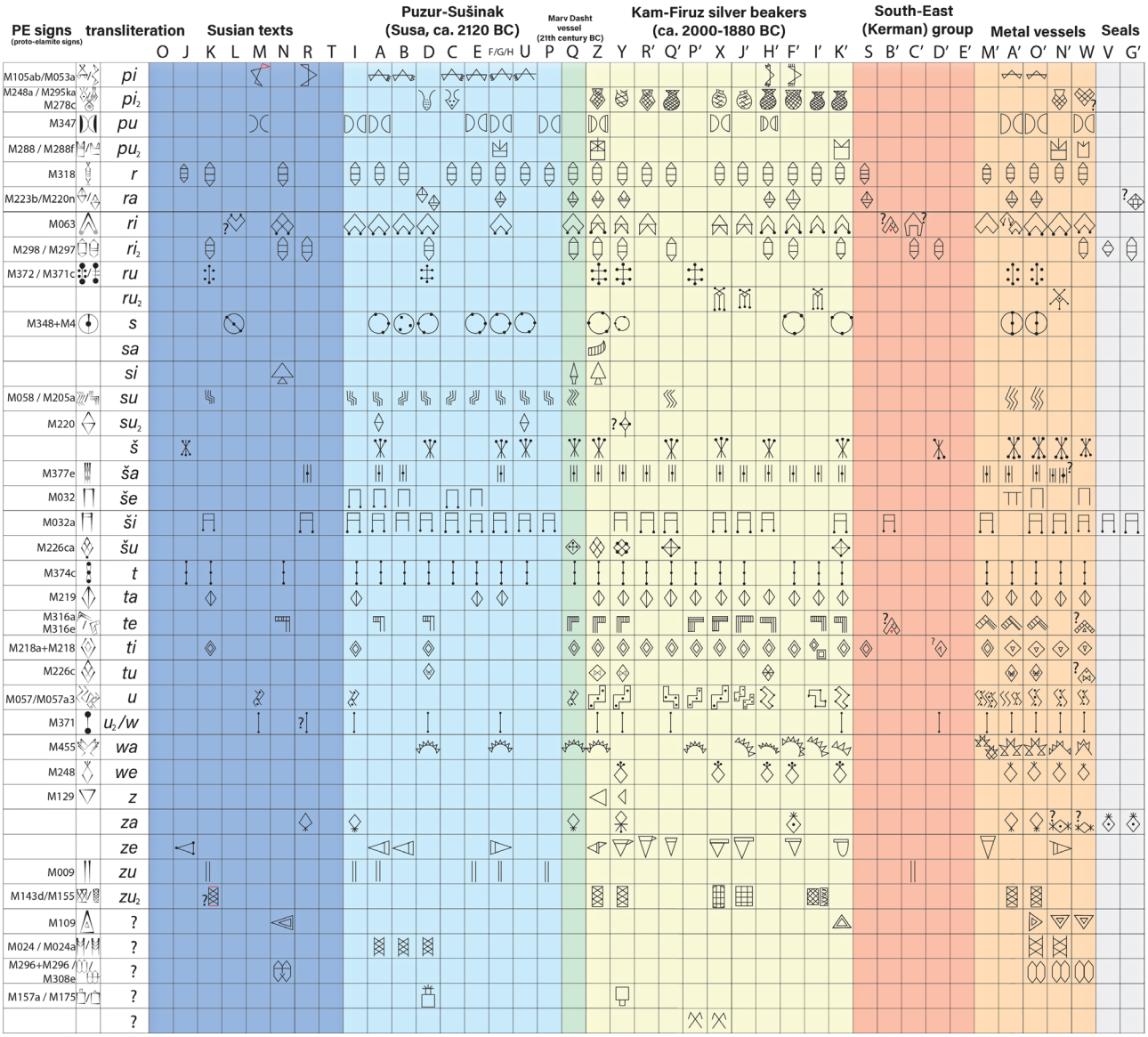
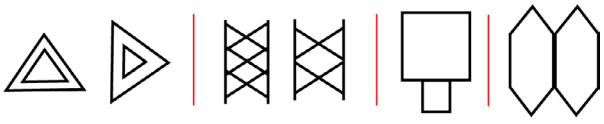


Fig. 7b: Graphic variations of the signs among all the LE inscriptions currently known, part II, from *pi* to zu_2 (F. Desset). The four infrequent LE signs still to be deciphered are displayed after zu_2.

(corresponding to 73 values because of the sign ⁝, which is transliterated as either u_2 or *w*) could be deciphered and integrated in the LE alpha-syllabic phonemic grid (Fig. 6). The 37 signs that are still undeciphered include 4 infrequent signs and 33 hapax legomena (including 6 signs in K, 6 signs in W, and the 11 signs that surprisingly appear at the beginning of Y2; see Fig. 7c).[78] Since hitherto unrecognized graphic variants (allographs) are likely to occur among them, this number is probably more restricted.



Some graphic variants of the four still undeciphered infrequent LE signs (glyphs 327/342, 67/323, 218, and 81)

The 72 deciphered graphemes are all phonographic. While cuneiform, the most common writing system in Mesopotamia and surrounding areas including Western Iran, made

78 Glyphs 73, 90, 147, 184, 156, and 79 in K; glyph 220 in L; glyphs 198 and 192/193 in F // G // H; glyphs 91, 247, 246, 245, 244, 168, 188, 207, 5, 101, and 162 in Y; glyphs 239 and 167 in X; glyph 286 in K′; glyph 208 in B′; glyph 313 in M′; glyph 341 in O′; glyph 326 in N′; glyphs 322, 216, 277, 148, 150, and 331 in W (see Fig. 7c).

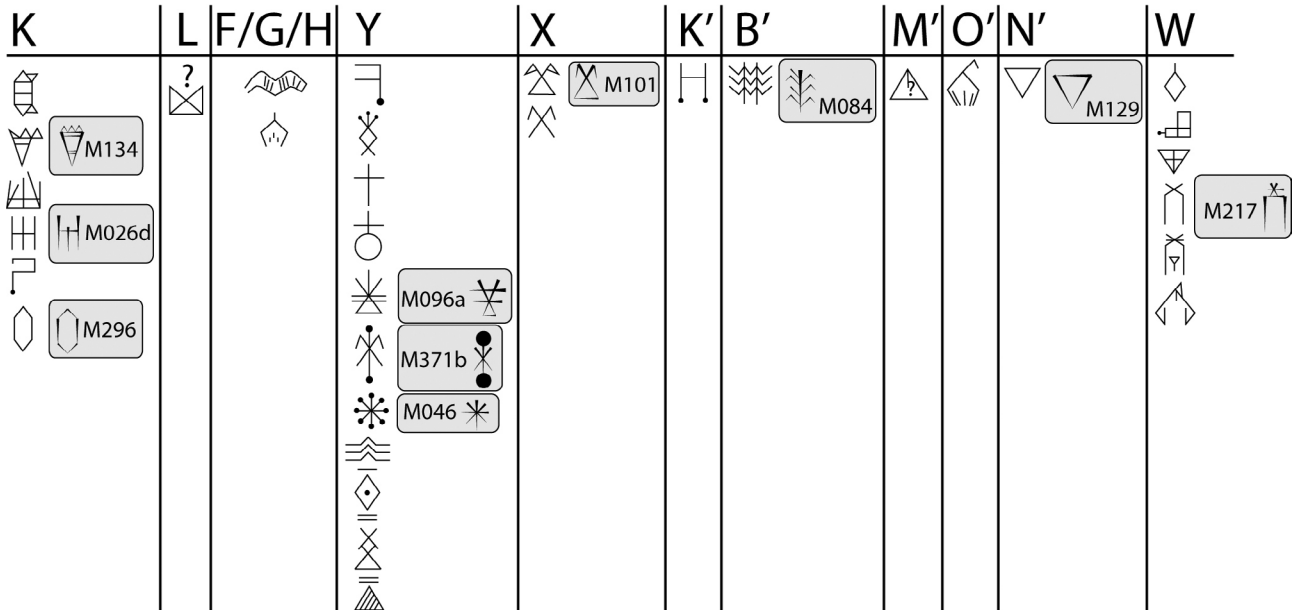


Fig. 7c: LE signs attested only in one inscription (mainly hapax legomena). PE graphic comparisons are also provided (F. Desset).

a wide use of logograms, Linear Elamite appears to avoid logographic spellings. Although it cannot be excluded completely that some of the undeciphered signs had a logographic usage, the possible occurrences of logograms in Linear Elamite would be very limited and their use not systemic.

This writing system has some disadvantages compared to the Mesopotamian cuneiform system: without the use of logograms, more characters are needed to deliver the same content (decreasing number of signs in the system → increasing length of the texts and time to write them). On the other hand, the LE system makes it possible to write and read texts with a much smaller number of signs (with a possible relation to the literacy rate in the population[79]). The essentially phonographic character of LE writing may also have influenced the way in which cuneiform writing was adopted and adapted in the late 3rd/early 2nd millennium BCE to record the Elamite language, with the use of a reduced repertory of signs from which logograms, determinatives, and CVC-syllabograms were initially drastically minimized (see, especially, Cuneiform 1 and 3; see also Gelb ²1963, 121; Steve 1992, 8. 10; and, more in detail, Desset [e. a.], forthcoming).

Elamite scribes employed five signs to record vocalic phonemes in LE script: *a*, *e*, *i*, *u*, u_2 for /a/, /e/, /i/, /o/, /u/, respectively (see below, section 4.1.2). Vowel signs could not be arbitrarily combined with consonant signs to represent syllables (this was the role of the CV signs), but were used in specific contexts:

- alone (V), to record pronouns or interjection (*e*, *i*, *u*);
- preceding a consonantal (V-C…: *u-n*, *i-r*, *i-n-su-ši∼š-na-*$k_{(2)}$, *i-n-ta-ta*, *a-n-za*, *i-š-ša-n*, *a-t-ta*, *a-k-ka-ra*, *i-r-k*…) or syllabic sign (V-CV…: *a-ni*, *a-wa*, *i-ta-t-tu*, *e-pa-r-ti*, u_2*-te-n-ti*, u_2*-ta*…) at the beginning of a word;
- following a syllabic sign (CV-V; see below, section 4.1), perhaps to represent diphthongs (/ai/ and /ei/ are probably attested, spelled CV-*i*) and glides (*y* and *w*, spelled respectively C*i*-V and C*u*-V); for instance, *si-a-n* (Q), *si-a-h* (Z: 3), and *ti-a-h∼š* (Q, M′: 2; A′: 2–3, 3, O′: 3, 4), to be interpreted as /siyan/, /siya-h/, and /tiya-h∼š/; or *ši-ku-a-t* (M′: 1; O′: 3), probably to be read /šikwat/. Very rare cases of CV_1-V_1 notations (such as *pa-a-ri*$^{?}$*-ri*$_2$ in C′) may represent exceptional examples of plene writing of possibly long vowels (see below section 3.4).

Consonant signs occur in the following contexts:

- following a V or CV sign, to express VC phonemic sequences (spelled V-C; see above) or CVC syllables (CV-C: see, among others, *pa-la-r* for /pa-lar/, *pu-zu-r* for /pu-zur/, *su-ši-na-*k_2 for /su-ši-nak/, *ha-t-pa-k* for

79 But "one should not suppose that a simpler writing system led automatically to a high level of literacy […]. Learning a script is not the same as learning to read and write. The latter is a process that takes years […]. In fact, it is doubtful whether literacy was at all a necessary skill for the vast proportion of people in antiquity. While it certainly seems reasonable to assume that the invention of the alphabet made the process of scribal training easier, no immediate correlation can be made between alphabetic writing and broad literacy" (Lam 2010/2015, 189).

/hat-pak/, *su$_2$-h-te-r* for /soh-ter/, *ši-mu-t* for /ši-mot/, *pe-t* for /pet/, *ša-t-me* for /šat-me/, *hu$_2$-m-pa-n* for /hům-pan/);
- together with another C sign, in two different contexts: 1) in a few cases of (C)V-C-*t*∼*k* words, such as *ze-m-t*, *hu$_2$-r-t*, *mu-h-t*, *še-p$_2$-k*, or *i-r-k*; 2) in rare occurrences of vocalic elisions (CV-C→C-C), such as *ša-r-h* or *ku-t-h*, probably standing for /šar(i)-h/ and /kut(i)-h/;
- preceding a CV sign with the same consonant (C_1-C_1V) in geminate spellings such as *ra-p$_2$-pa-š*, *hu-t-ta-h*, or *i-ta-t-tu* (see below, section 3.4).

This system can be said to be suitable for a language in which most of the lexemes (bases) have a CVC (e. g., /pet/, spelled as CV-C: *pe-t*) or CVCV (e. g., /zana/, spelled CV-CV: *za-na*) syllabic structure, with a few cases, also, of VCV (e. g., /awa/, spelled V-CV: *a-wa*) and CVCCV (such as /halma/, /šilha/, and maybe /sohte/, spelled as CV-C-CV) words; and which have C (*-k*, *-r*, *-p*, *-n*, perhaps *-t*, and verbal *-k*, *-h*, and *-š* are attested) or CV (*-ki*, *-ri*, *-re*, *-me*∼*we*, *-ra*, *-ma*, *-wa*, *-na*, and verbal *-na*, *-ra*, and *-le* are attested) grammatical suffixes.

As most of the purely syllabic writing systems appear to work with 40 to 90 different signs,[80] either some logograms are to be expected among the undeciphered signs or our assessment of the number of signs (80 to 110) is slightly too high because of still unidentified graphic variants (several pairs of apparently redundant homophonic signs could be identified; see below, section 3.3). LE script can be described as an alpha-syllabary or semi-syllabary, surprisingly similar to the cuneiform system that was employed to record the Old Persian language between the 6th and the 4th centuries BCE, with 36 phonemic signs, consisting of 3 vowel signs (*a*, *i*, *u*), 4 C*i* signs, 7 C*u* signs and 22 C(*a*) signs (in addition to a word divider sign, 5 to 8 logograms, and numerals).

3.2 Phonemic Typology of Graphemes

Among the 72 deciphered graphemes (corresponding to 73 values), the following phonemic types could be identified (see Fig. 6):

5 vowel signs (V: *a, e, i, u, u$_2$*);[81]

15 consonant signs (C: *h, h$_2$, k, k$_2$, l, m, n, p, p$_2$, r, s, š, t, w, z*);

53 syllabic signs (CV: *ha, hi, hi$_2$, hu, hu$_2$, ka, ki, ki$_2$, ku, ku$_2$, la, li, li$_2$, li$_3$, lu?, ma, me, mi, mu, mu$_2$, na, ne, ni, nu, pa, pe, pi, pi$_2$, pu, pu$_2$, ra, ri, ri$_2$, ru, ru$_2$, sa, si, su, su$_2$, ša, še, ši, šu, ta, te, ti, tu, wa, we, za, ze, zu, zu$_2$*).

Text M (Fig. 8), a lenticular tablet known since 1935, is a very important document in this regard. This school exercise shows that the LE writing system was conceptualized and standardized for teaching purposes in 3rd millennium BCE Susa, and confirms the sign typology presented here. Vowel and consonant signs were considered apart, forming a phonemic grid filled with the corresponding syllabic CV signs (Table 3; see also below, Table 5), according to the vocalic scheme /e, u, o, a, i/.[82]

Tab. 3: Phonemic grid attested in text M.

	e	*u$_2$*	*u*	*a*	*i*!
p$_2$	*pe*	*pu*	[*pu$_2$*]	[*pa*]	*pi*
m	*me*	*mu$_2$*	*mu*	*ma*	*mi*

This phonemic grid probably represents a retrospective theorization of an inherited (and not created ad hoc) system, aimed at presenting and learning it in a rationalized way. It is conceivable that the grid was shaped in a contingent way through a series of arbitrary decisions made by scribes during the 3rd millennium BCE.

The sign ⁝, otherwise clearly perceived as vocalic (*u$_2$*, as its presence in the above-mentioned school tablet among the signs *e*, *u*, *a*, and *i* shows), is also attested in the sequences *a-⁝-wa-ni-r* (F // G // H: 1; see below, section 6), *la-⁝-li$_3$(-ri)* (D: 1 and F // G // H: 2) and *nu-⁝-we* (N′: 4), to be probably understood as *a-w-wa-ni-r* (/awan-ir/), *la-w-li(-ri)*, and *nu-w-we*. This suggests that it was probably read /u/ (and not /o/; see below, section 4.1.2) and that this phoneme also had a non-syllabic allophone [w] (cf. Khačikjan 1998, 9, *sub* 2.5.2). The latter value redundantly occurs before *w*V syllabic signs (*w-w*V; on

80 Coe ²1999, 42–43. This can be compared to the Mycenaean Linear B syllabary with theoretically ca. 65 "basic signs" (only 60 are currently known) + 27 additional ones belonging to a complementary sub-syllabary, but also to the Cypriot syllabary (56 signs), the Cree syllabary (70 signs), the Cherokee syllabary (86 signs), the Inuktitut syllabary (108 signs), the Chinese syllabary 'fan-ch'ieh' (62 signs), or the Japanese hiragana and katakana (50 signs for each of them).

81 In this connection, it is worth mentioning that Meriggi (1971, 173–174), even though he could not determine the vocalic nature of these 5 signs, noticed that they were very frequently used in anthroponomical notations in PE tablets (they are among the 6 most frequent signs attested in writings of proper nouns) and that, for this reason, they were probably phonographic.

82 In Mesopotamia, the cuneiform list *tu-ta-ti* had a similar function, with syllabic triplets following the vowel order /u, a, /i/ (Veldhuis 2014, 147–148, § 4.1.1.2), which partially matches the LE vocalic sequence (/e, u, o, a, i/).

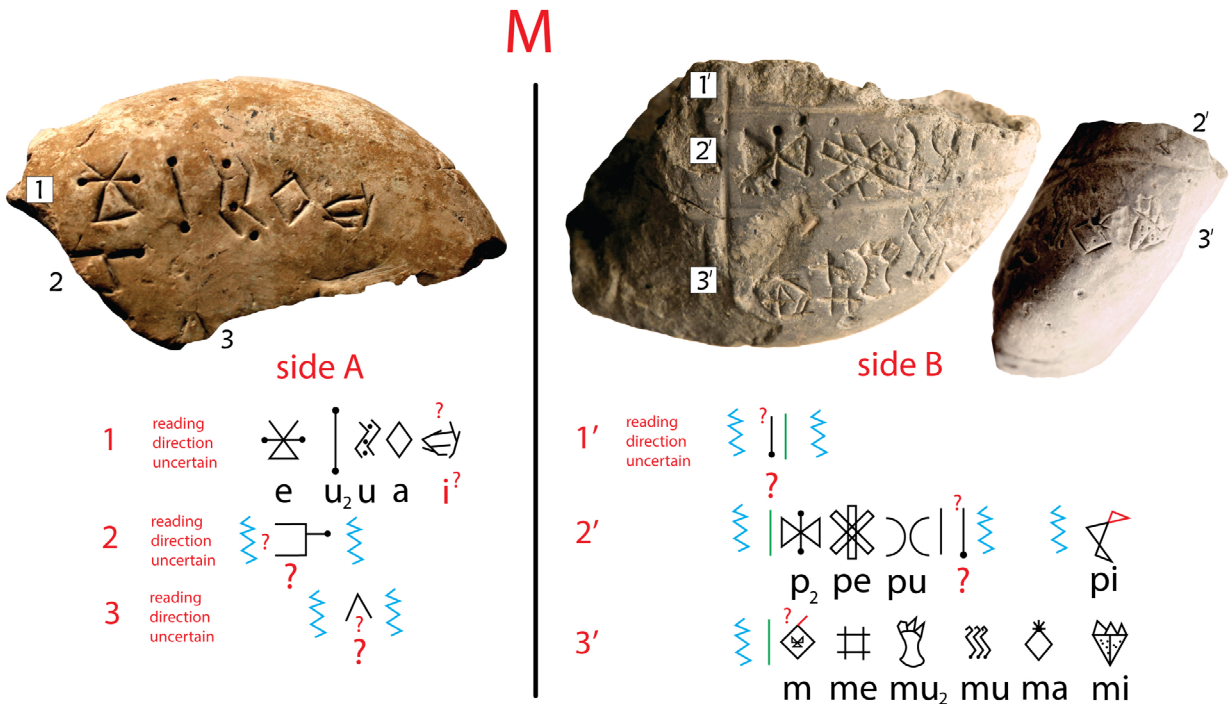


Fig. 8: Text M: the Susa lenticular school tablet (F. Desset; photos courtesy of the Louvre Museum).

geminate spellings, see below, section 3.4). Accordingly, C*u* signs may also represent the phonemic sequence /Cw/ before vowels, as appears to be the case with the theonym written *ši-ku-a-t* (M′: 1; O′: 3), probably to be read /šikwat/ (cf. cun. *ši-ka*$_3$*-at*; ElW 558 and 1155; and Zadok 1984, 22).

Tab. 4: The 72 deciphered LE signs arranged according to a phonemic grid (see Fig. 6).

	a	*e*	*i*	*u* / *u*$_2$
h / *h*$_2$	*ha*	?	*hi* / *hi*$_2$	*hu* / *hu*$_2$
k / *k*$_2$	*ka*	?	*ki* / *ki*$_2$	*ku* / *ku*$_2$
l	*la*	?	*li* / *li*$_2$ / *li*$_3$	*lu*?
m	*ma*	*me*	*mi*	*mu* / *mu*$_2$
n	*na*	*ne*	*ni*	*nu*
p / *p*$_2$	*pa*	*pe*	*pi* / *pi*$_2$	*pu* / *pu*$_2$
r	*ra*	?	*ri* / *ri*$_2$	*ru* / *ru*$_2$
s	*sa*	?	*si*	*su* / *su*$_2$
š	*ša*	*še*	*ši*	*šu*
t	*ta*	*te*	*ti*	*tu*
w	*wa*	*we*	?	?
z	*za*	*ze*	?	*zu* / *zu*$_2$

According to the phonemic grid of the deciphered signs (Table 4), some 8 signs seem to be theoretically missing or not identified yet (*he, ke, le, re, se, wi, wu*, and *zi*). While some of these phonetic values can be expected to be found among the undeciphered signs, the situation may be more complicated, since in LE writing, CV syllables could theoretically be expressed by a consonant sign + a vowel sign (even though such spellings are not attested in the texts currently known). Moreover, due to the genesis process of LE script (see below, section 5), syllabic signs might have not existed for all the possible syllabic combinations, disturbing the later attempts to rationalize the system, as it happens, for instance, in the Old Persian writing system.

An apparent snag in the system is the presence of apparent homophonic signs.

3.3 Homophones

The phonemic values identified for 72 signs, mainly through comparisons with cuneiform texts, seem to point to the existence of 15 seemingly homophonic pairs and a triplet: *u*|*u*$_2$, *h*|*h*$_2$, *hi*|*hi*$_2$, *hu*|*hu*$_2$, *k*|*k*$_2$, *ki*|*ki*$_2$, *ku*|*ku*$_2$, *li*|*li*$_2$|*li*$_3$, *mu*|*mu*$_2$, *p*|*p*$_2$, *pi*|*pi*$_2$, *pu*|*pu*$_2$, *ri*|*ri*$_2$, *ru*|*ru*$_2$, *su*|*su*$_2$, and *zu*|*zu*$_2$. Among them, 3 pairs are probably mere graphic variants (*k*|*k*$_2$, *p*|*p*$_2$, and *ru*|*ru*$_2$) and 3 pairs can be considered for now as true homophonic signs (*h*|*h*$_2$, *li*|*li*$_3$, and *pi*|*pi*$_2$).

The remaining pairs are homophonic only apparently, because of the cuneiform apparatus used for their identification; in fact, the two members of these pairs are phonemically different. Thus, among the C*i*-signs *hi*|*hi*$_2$, *ki*|*ki*$_2$, *li*|*li*$_2$|*li*$_3$, and *ri*|*ri*$_2$, some members of these pairs were probably pronounced /Ci/ while the others /Ce/. The same is true of the (C)*u* signs, such as *u*|*u*$_2$, *hu*|*hu*$_2$, *ku*|*ku*$_2$, *mu*|*mu*$_2$, *pu*|*pu*$_2$, *su*|*su*$_2$, and *zu*|*zu*$_2$, some to be pronounced /(C)u/, some others /(C)o/ (see below, sections 4.1.1 and 4.1.2).

Graphic variants:

k|*k*$_2$: these seemingly different signs are probably graphic variants (allographs) of the same grapheme, since they appear to be mutually exclusive: *k* is attested in text groups 1 and 6, *k*$_2$ in Group 4, while both of them appear in Group 2 (Puzur-Sušinak inscriptions; in P, A, C, E, and F // G // H; in I, B, D, and U). The phenomenon of graphically different variants remains unexplained (*k*$_2$ could be considered as half of sign *k* cut in a transversal way). The use of the sign *k*$_2$ as a variant of *k* appears to be limited to South-Western Iran's most recent texts, starting in the time of Puzur-Sušinak (Group 2; 22nd century BCE) and ending with the Kam-Firuz silver beaker group (Group 4; 20th century BCE).

p : only occurs in Z: 8: *ma-ni-p*, *sa-hi*$_2$*-p*, and *ki*$_2$*-ri-pu*$_2$*-p*.

p$_2$: occurs in all texts, except Z. Therefore, *p*, which only occurs in Z, is probably a graphic variant of *p*$_2$.

ru | *ru*$_2$: these signs, slightly different graphically, exclude each other and can be considered as variants. The latter is probably a more recent variant of the former; it appeared around 1950 BCE at the time of Eparti II and Šilhaha, and is attested in the title *ka-t-ru*$_2$ (X: 1; J′: 2; I′: 1), spelled *ka-t-ru* in more ancient texts (Y2: 1; Z: 1).

[NB In the case of these "signs" suspected to be allographs, their distinction in transliteration by means of the numerical subscript must be considered provisional.]

True homophonic signs:

h : found in all the occurrences of the 1st person sing. suffix of Conjugation I (*ša-ri*∼*r*∼*ri*$_2$*-h*, *ti-a-h*, *hu-t-ta-h*, *pe-li-h*, *ha-h-pu-h*, *ha-ne-h*, *si-a-h*, ...); it is also attested in the words *su*$_2$*-h-te-r* (A) and *mu-h-t/mu-h-tu* (in K′; W: 8; and H′: 3) as well as a redundant sign before *hu* in *ši-n-pi-s-h-hu-k*$_{(2)}$, to express the graphic gemination of *h*.

h$_2$: only occurs in the Kam-Firuz silver beaker group (Group 4), in *hi-h*$_2$ (see n. 51 above) and *ru*$_2$*-h*$_2$*-nu-te-wa* (I′: 2), in addition to being used as a redundant sign before *hu*$_2$ in *na-h*$_2$*-hu*$_2$*(-n)-te* (see n. 112 below).

Contrary to *k*|*k*$_2$, *p*|*p*$_2$, and *ru*|*ru*$_2$, *h* and *h*$_2$ do not exclude each other as it would be expected for true graphic variants; they appear together in texts Y, Z, I′, and K′, possibly hinting at different phonemes. However, it is to be noted that the words spelled with both *h* and *h*$_2$ signs in Linear Elamite were all written with the same sign in cuneiform, that is, AH = *ah*, *eh*, *ih*, *uh* (for example, cun. *na-ah-hu-un-te* and *mu-uh-tu*$_3$; cf. LE *na-h*$_2$*-hu*$_2$*-n-te* and *mu-h-t/mu-h-tu*). For this reason, either the phonemic difference between the two LE signs was considered very minimal or their use depended on an "orthographic" rule related to a yet to be determined tradition/convention associating a specific sign with specific words.

li : attested in the verbs *pe-li-h* (A′: 4; and O′: 4) and *li-m-ma-š* (F // G // H: 2), as well as in the title *li-ka-we* (Kam-Firuz silver beaker inscriptions, Group 4).

li$_3$: attested notably in *pe-l-ti-ka-li*$_3$*-m* (I: 1), *la-w-li*$_3$*-ri* (F // G // H: 2) and *la-w-li*$_3$*-* (D: 1).

While *li*$_2$ (/le/) is probably phonemically different from *li* and *li*$_3$ (see below, section 4.1.1), the latter two signs are probably homophones (/li/), and not mere graphic variants, since they do not exclude each other, appearing together in text F // G // H (*la-w-li*$_3$*-ri* and *li-m-ma-š*; see below, section 6).

pi : *ši-n-pi-s-h-hu-k*/*ši-n-pi-s-hu-ki-r* (Puzur-Sušinak inscriptions, Group 2), *ki-k-n-pi-s-hu-š* (A′: 3; and O′: 2. 4), *pa-la pi-ra-h* (H′: 3).

pi$_2$: *pi*$_2$*-š* (D: 3), *na-pi*$_2$ (N′: 1), *na-pi*$_2$*-ri-ša* and *pi*$_2$*-ne-ki-r* (Kam-Firuz silver beakers, Group 4).

In addition, *pi*$_2$ seems to have been used to write the class-marker of the 3rd person plur., for instance in *hi*$_2$*-t-te-k*$_2$*-pi*$_2$ (K′), *a-pi*$_2$ (W: 1. 3. 5. 8), and *ha-ta-m-ti-pi*$_2$*-r* (C: 3; and E: 3; Puzur-Sušinak inscriptions); however, note *ha-ta-m-ti-pi-r* in F′: 1. Furthermore, *pi* and *pi*$_2$ occur together in texts C (*ši-n-pi-s-h-hu-k* and *ha-ta-m-ti-pi*$_2$*-r*) and F′ (*ha-ta-m-ti-pi-r* and *na-pi*$_2$*-ri-ša*). Like signs *h*|*h*$_2$ and *li*|*li*$_3$, this is a real case of homophonic signs, probably resulting from the long history of LE writing as the heir of PE writing, with a system of signs not yet completely "rationalized" in the late 3rd millennium BCE.

3.4 Geminate Spellings

Among the 15 consonant signs (C) used in LE script (*h, h*$_2$*, k, k*$_2$*, l, m, n, p, p*$_2$*, r, s, š, t, w*, and *z*), 12 are currently attested in geminate spellings (C$_1$-C$_1$V), perhaps to express fortis (i. e., with more energy) or long consonants in opposition to lenis or short ones.[83] Thus *h* is attested before *hu* (*ši-n-pi-s-h-hu-k*); *h*$_2$ before *hu*$_2$ (*na-h*$_2$*-hu*$_2$*-n-te*); *k*$_{(2)}$ before *ka* and *ki*; *m* before *ma, me, mi* and *mu*; *n* before *na* and *ni*; *p*$_2$ before *pa* and *pu*; *r* before *ri*; *š* before *ša* and *ši*; *t* before *ta, te, ti* and *tu*; *w* before *wa* and *we*; *z* before *za*. Three consonant signs are not attested in geminate spellings: *l, p* and *s*. While *p* only appears in Z and is probably a variant of *p*$_2$ (see above, section 3.3), the lack of geminate spellings of *l* and *s* could be accidental and they can be expected to occur in other yet to be discovered texts.

Before 2000 BCE, only *h, k, k*$_2$*, m, n, p*$_2$*, š, t*, and *w* were attested in geminate spellings, whereas the Kam-Firuz silver beaker inscriptions (Group 4; 2000–1880 BCE) also attest to the use of *h*$_2$, *r*, and *z*. The distribution of these spellings in each textual group is as follows:

Text groups 1, 5, and 7: no geminate spellings are attested.
Text group no. 2:
in A: *i-n-su-ši-na-k-ki-r*; *zu-p*$_2$*-pa-š*;
in A, B, E (and C?): *ši-n-pi-s-h-hu-k*;
in D: *a-k*$_2$*-ka-ra*;
in F // G // H: *a-k-ka-ra*; *a-w-wa-ni-r*; *hu*$_2$*-pu*$_2$*-š-ša-n*; *li-m-ma-š*; *ra-p*$_2$*-pa-š*; *hu-t-ta-k-ne*;
Text group 3:
in Q: *ma-ra-p*$_2$*-š-ša-i-r*; *hu*$_2$*-m-š-ša-t*;
Text group 6:
in M′: *hu*$_2$*-r-t-ti*;
in A′ and O′: *la-p*$_2$*-pu*; *hu-t-ta-h*;
in N′: *za*$^?$*-a-n-ši-*$\left|\diamondsuit\right|^{(\check{s}a)}$*-š-ši-n*; *hu-t-ta-h*; *nu-w-we*; *a-š-ha-m-me*; *me-š-n-na*;
in W: *ha-t-ti*; *za-t-tu-me* (maybe also *na-ki-k-ki-n*);
Text group 4:
in Y: *i-ta-t-tu*; *na-h*$_2$*-hu*$_2$*-te*; *ka-z-za-k*$_2$*-na*; *su*$_2$*-m-mu-h-na*;
in Z: *i-ta-t-tu*; *na-h*$_2$*-hu*$_2$*-n-te*; *hu*$_2$*-p-ša-k*$_2$*-ki-r*; *hu-t-ta-k*$_2$*-na*; *ka-z-za-k*$_2$*-na*;
in J′: *a-t-ta ze-m-ti-k*$_2$; *na-h*$_2$*-hu*$_2$*-te*;
in an unpublished fragmentary inscription in the Mahboubian Collection (Desset [e. a.], forthcoming):
li$_2$*-t-ti*
in I′: *ha-t-ta-m-t-ti*; *me-n-ni*; *na-pi*$_2$*-r-ri-ša*; *ki-t-ti-n*;
in K′: *na-pi*$_2$*-r-ri-ša*; *pa-la-i-š-ša-n*; *li*$_2$*-li*^{1}*-pa-r*; *ri-š-ša*; *me-n-ni*; *ha-t-ta-m-t-ti*; *la-n-ni; hi*$_2$*-t-te-k*$_2$*-pi*$_2$; *ze-m-mi*.

Geminate spellings occur with verbs (*zu-p*$_2$*-pa, li-m-ma, ra-p*$_2$*-pa, hu-t-ta, ka-z-za, su*$_2$*-m-mu*) and nominal elements (*hu-r-t-ti, a-t-ta, ri-š-ša, me-n-ni, ki-t-ti-n, la-n-ni, hi*$_2$*-t-te, ze-m-mi, li*$_2$*-t-ti*). They are overrepresented in the writing of proper nouns, both anthroponyms/theonyms (*i-n-su-ši-na-k-ki-r, ši-n-pi-s-h-hu-k, hu*$_2$*-m-š-ša-t, la-p*$_2$*-pu, za*$^?$*-a-n-ši-*$\left|\diamondsuit\right|^{(\check{s}a)}$*-š-ši-n, a-š-ha-m-me, i-ta-t-tu, na-h*$_2$*-hu*$_2$*(-n)-te, na-pi*$_2$*-r-ri-ša, pa-la-i-š-ša-n* as well as maybe *za-t-tu-me*) and toponyms (*a-w-wa-ni-r, hu*$_2$*-pu*$_2$*-š-ša-n, ma-ra-p*$_2$*-š-ša-i-r, ha-t-ta-m-t-ti*).

Looking at the distribution of geminate spellings in the various words in which they occur, one gets the clear impression that these spellings have to do with the position of the accent. In fact, geminate spellings are usually attested at the beginning of the second syllable of a word or word component according to two different well-defined orthographic patterns: (C$_1$)V—C$_2$V-... → (C$_1$)V—**C$_2$**-C$_2$V-...[84] and (C$_1$)V-C$_2$—C$_3$V-... → (C$_1$)V-C$_2$—**C$_3$**-C$_3$V-...[85]

83 Tavernier 2011, 320; 2018, 425. This situation would be similar to that of the Hittite language where there is no opposition between voiced and voiceless consonants (as is the case also in Elamite) but between "so-called 'short' and 'long' consonants. A long *t*, for instance, is a *t* where the tongue is held against the upper teeth just a little longer before it is released than in a short one. [...] Using the Syrian cuneiform, Hittite scribes simply ignored the voiced/voiceless contrast that came with the script, but spelled short consonants single and long ones double" (cf. van den Hout 2010/2015, 103; Pozza 2011).

84 The following examples are attested in LE texts (here and below, the supposed stressed syllables are capitalized): *zu-p*$_2$*-pa* (/zuPA/), *li-*

These geminate spellings may reflect a specific pronunciation of the initial consonant of the second syllable (which can be considered as stressed) of a word or word component as fortis. The fact that they are overrepresented in the writing of proper nouns could indicate a particular attention paid to the precise representation of these words, possibly for two different reasons:

1) to make clear their morphological segmentation. In fact, by applying the hypothesized rule of the stress on the second syllable, we can perhaps identify the underlying morphological structure of some names thanks to such geminate spellings. Thus, for instance, the spelling *ši-n-pi-s-ḫ-hu-k* may indicate that this name consists of two elements: /šin/ and /pisHŮK/ (spelled $C_1V\text{-}C_2$—**C_3**-C_3V-...); *a-š-ha-m-me* and *i-ta-ṭ-tu* should perhaps be segmented as /aš-haME/ (with the CV+CV element /haME/, spelled C_1V—**C_2**-C_2V) and /i-taTU/ (with the CV+CV element /taTU/, also found in the PN /kın-taTU/, spelled in the same manner); while *ma-ra-p_2-š-ša-i* could be segmented as either /ma-rapŠA(y)i/, with the CVC+CV+(C)V element /rapŠA(y)i/, or /maRA-pøŠA(y)i/ with the CV+CV+(C)V element /pøŠA(y)i/ (and a hypothetical lost/elided vowel in the first, pre-tonic syllable);
2) to represent the current pronunciation of a word while maintaining its historical orthography. For example, the spelling *hu_2-pu_2-š-ša-n* possibly reflects the original pronunciation of the toponym as /hůPOšan/ but also, through the geminate spelling, the current pronunciation of it as /hůpŠAN/ (as attested to by cun. *ḫu-up-sa-na* and *hu-up-ša-an*; see Vallat 1993, 104), with the elision of the vowel /o/ in pre-tonic position;[86] the spelling *na-pi_2-r-ri-ša*, which is attested in the most recent LE texts (I′ and K′), may reflect a new pronunciation of the theonym in question (originally /naPIreša/, written *na-pi_2-ri-ša* in the most ancient texts from Kam-Firuz) as /napREša/. The spelling with geminated *r* suggests that this name was no longer understood as composed of two CV+CV elements (/napi/ and /reša/) but rather as a unique, single word (in contrast to the spelling *li-ka-we ri-š-ša*, where /reŠA/, normally stressed on the second syllable, was clearly perceived as distinct from /likawe/).

The examples of Hůpošan, Napireša, and (In-)sušinak (clearly composed of two elements), with their "defective" pronunciations /hůpŠAN/, /napREša/, and /(in-)sušNAK/, seem to attest the loss of a vowel in the syllable that precedes the stressed one. In a sense, *hu_2-pu_2-š-ša-n* and *na-pi_2-r-ri-ša* can be regarded as "compromise spellings", representing /hůpošan/ and /napireša/ (etymological forms), but "meaning" /hůpŠAN/ and /napREša/ (actual pronunciations). It is interesting to see that the god of Susa could be spelled either *i-n-su-ši-na-$k_{(2)}$* (historical orthography reflecting the ancient [original?] pronunciation of the name as /in-suŠInak/) or *i-n-su-š-na-$k_{(2)}$* (current pronunciation: /in-sušNAK/) without any "compromise spelling" (**i-n-su-ši-n-na-k*, representing /in-suŠInak/ but "meaning" /in-sušNAK/) attested yet. It seems that, in this case, the current pronunciation could be spelled directly, without any "compromise".

Finally, *i-n-su-ši-na-k-ki-r*[87] and *hu-ze-hu_2-p-ša-k_2-ki-r* are particular cases. The geminate spellings here are possibly related to the morphological suffixation of the class-marker /(i)r/: the addition of this suffix may have caused a shift of the stress to the last syllable with a consequent change in the manner of pronouncing /k/.

A special case of "compromise spelling" is perhaps the use of *li*$^+$ to repeat the first syllable of the word *li_2-pa-r* in K′ (*li_2-li$^+$-pa-r*). In this case, the scribe probably created

m-ma (/liMA/), *ra-p_2-pa* (/raPA/), *hu-t-ta* (/hůTA/), *ka-z-za* (/kaZA/), *su_2-m-mu* (/soMO/), *a-t-ta* (/aTA/), *ri-š-ša* (/reŠA/), *me-n-ni* (/meNI/), *ki-t-ti-n* (/kiTIN/), *la-n-ni* (/laNI/), *hi_2-t-te* (/hiTE/), *ze-m-mi* (/zeMI/), *li_2-t-ti* (/leTI/), *la-p_2-pu* (/laPU/), *na-h_2-hu_2(-n)-te* (/naHŮNte/), *i-š-ša-n* (/iŠAN/), *za-t-tu-me* (/zaTUme/), *a-w-wa-ni-r* (/aWAnir/), *ha-t-ti* (/haTI/), *a-$k_{(2)}$-ka-ra* (/aKAra/), *nu-w-we* (/nůWE/) (for references, see Desset [e. a.], forthcoming, glossar). See also the most ancient Elamite texts in cuneiform, such as Lambert 1974, text no. 2: *pi-ir-ra-ah* (/piRAH/), *ha-at-ta-ah* (/haTAH/), *mas-si-i-ah* (/maSIyah/); the cuneiform inscription of Kıntatu (Cuneiform 1): *al-la-la* (/aLAla/), *ak-ka_3* (/aKA/), *za-ap-pa_2-an-ti* (/zaPANti/), *uk-ku* (/ůKŮ/), *pu-ut^{l}-ta^{l}-a-aš* (/puTAŠ/), *am-me-na-ne* (/aMEnane/); the cuneiform inscription of Šilhaha (Cuneiform 3): *ku-ul-la-an-ri* (/kůLANri/), *ku-ul-la-ak-ki-me* (stress also on the 3rd syllable?), [*a*]*m*$^{?}$*-ma* (/aMA/ = /aWA/); the cuneiform inscriptions of Sewe-palar-hůhpak (Cuneiform 8 and 9): *am-ma* (/aMA/ = /aWA/), *ku-ul-la-ah/ku-ul-la-ak* (/kůLAH∼K/), *ki-it-ti-in* (/kiTIN/), *li-im-ma-aš* (/liMAŠ/), *ra-ap-pa-ak-na* (/raPAKna/), *ik-ku* (/iKŮ/), *ik-ka* (/iKA/), *hu-ut^{l}-ta-ak-na* (/hůTAKna/); etc. On the contrary, the 'Treaty of Naram-Sin' (Hinz 1967) displays very few examples of geminate spellings (such as *na-ap-pi* = /naPI/ or *lut-ti-ir* = /lůTIR/): the scribe who wrote it did not pay attention to record stressed syllables by means of geminate spellings because he was probably not Elamite but Akkadian (cf. the verbal notations *hu-ra-ak-li*, *ku-ru-uk-li*, *ha-$aš_2$-ik-li*, and *ha-$aš_2$-ak-li*, which would have been probably spelled by an Elamite scribe as **hu-ur-ra-ak-li* = /hůRAKle/, **ku-ur-ru-uk-li* = /kůRŮKle/, **ha-$aš_2$-ši-ik-li* = /haŠIKle/ and **ha-$aš_2$-ša-ak-li* = /haŠAKle/).

85 LE *hu-r-t-ti* (/hůrTI/), *pi-s-h-hu* (/pisHŮ/), *hu_2-m-š-ša-t* (/hůmŠAT/), *me-š-n-na* (/mešNA/) (for references, see Desset [e. a.], forthcoming, glossar).

86 Another possible example of LE historical spelling is *ši-n-pi-s-ḫ-hu-k* (see n. 32 above).

87 Cf. spellings such as ^{d}*in-su-uš-na-ak-ki*, ^{d}*in-su-uš-na-ak-ki$_2$-ik*, ^{d}*in-šu-ši-na-ak-ki*, etc., in later cuneiform texts (ElW 760 f.).

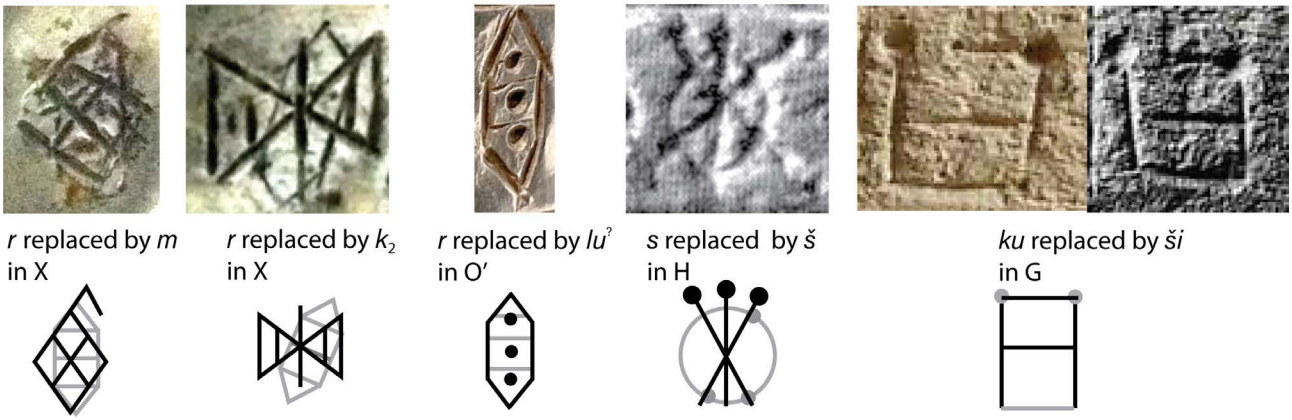


Fig. 9: Corrected mistakes involving the consonant sign *r* in inscriptions X and O′, the consonant sign *s* in H, and the syllabic sign *ku* in G (F. Desset).

a new sign ad hoc, *li*$^{+}$ (which is for this reason attested only in this inscription), based on the original sign *li*, suppressing a corner and adding a diacritical central point to slightly distinguish this variant from the original sign (sign *za*, as well as maybe sign *ne*, displays a graphic variation where a central dot was added and the sign turned upside down).

Signs li (on the left) and li^{+} *(on the right)*

This redundant syllabic sign was perhaps used as a sort of phonemic complement in the writing sequence *li*$_2$-*li*$^{+}$-*pa-r*, to be understood as *li*$_2^{li+}$-*pa-r*. As there was probably a phonemic difference between the signs *li* and *li*$_2$ (to be respectively pronounced /li/ and /le/; see below, section 4.1.1), the word "servant", initially spelled *li*$_2$-*pa-r*, /lepar/, would have been written afterwards *li*$_2^{li+}$-*pa-r*, /lipar/, both to respect the original spelling (historical orthography) but also to reflect the current pronunciation /lipar/ ("compromise spelling"). In this connection, note that the phonemic evolution /e/→/i/ is also attested in the case of the verb "to fashion (a metal artifact)", originally /šare/, but from 1950 BCE onwards pronounced /šari/ (Desset [e. a.] forthcoming).

The texts commissioned by Pala-išan (ca. 1900/1880 BCE), I′ and K′, seem to have a particular preference for geminate spellings: Hatamti, since the time of Puzur-Sušinak invariably written with four signs (*ha-ta-m-ti*), is written *ha-t-ta-m-t-ti* in I′/K′; Napireša, in all the other Kam-Firuz silver beaker texts written with four signs (*na-pi*$_2$*-ri-ša*), is written *na-pi*$_2$*-r-ri-ša* in I′/K′; /likawe reša/, in H′ written with five signs (*li-ka-we ri-ša*), is written *li-ka-we ri-š-ša* in K′; /lani/ ("silver"), usually written with two signs (*la-ni*), is written *la-n-ni* in K′; /zemi/, written in Z and Y with two signs (*ze-mi*), is written *ze-m-mi* in K′; /meni/, written in F′ with two signs (*me-ni*), is written *me-n-ni* in I′/K′; /le~ipar/, written in J′ with 3 signs (*li*$_2$*-pa-r*), is written *li*$_2^{li+}$*-pa-r* in K′ (see above for this special case).

These examples from I′ and K′, the most recent LE texts currently known, appear to reflect an over-phonetization process around 1900/1880 BCE. This is probably a later development, a sort of "swan song" gesture with the intent to precisely record the sounds of the language, maybe in relation to the then-growing use of cuneiform to record the Elamite language. I′ and K′ are also characterized by slightly simplified signs (signs *wa*, *h*$_2$ and *mi*) as well as more curved sign forms (signs *i* and *ze*), which might be seen as the ultimate graphic trend of LE writing in South-Western Iran (see Figs. 7a and 7b).

Signs wa, h$_2$*, mi, ze and i in K′*

Besides the geminate spellings of consonants, some vowel signs were seemingly used redundantly in South-Eastern Iran/Kerman texts (text groups 5 and 6) in CV$_1$-V$_1$ spellings, such as *za*$^{?}$-*a-n-ši-ša-š-ši-n* (N′) and *pa-a-ri*$^{?}$-*ri*$_2$ (C′). Since there is no further convincing evidence for long vowels in Elamite, they are likely to have been used to redundantly mark the vowel already written with the preceding sign.

3.5 Defective Writings and Writing Mistakes

Several cases of omission of vocalic sounds are attested (above all, in the inscriptions of Group 6); in particular before the consonant /n/: *i-n-su-š*(/i/)-*na-k* (F // G // H: 2; U: 2; A′: 4; O′: 1 and 5), *ti*-(/a/)-*n-ra* (D: 3), *pe-t*(/i/)-*n-ra* (F // G // H: 3), *ti-t*(/i/)-*n* (M′: 1), *ki-k*(/i∼o/)-*n* (A′: 3 and O′: 2 and 4), *ki-t*(/i/)-*n* (N′: 2), perhaps *hu-h*(/ů/)-*n* (N′: 2) and *me-š-n* (N′: 5); and in the writings of some verbal forms, such as *ku-t-h* (I′: 3), *ša-r-h* (X: 2 and J′: 5), and *ha-n-š* (D′).

There are also examples of consonant omissions. In X and in an unpublished fragmentary inscription of the Mahboubian Collection (Desset [e a.], forthcoming; time of Eparti II and Šilhaha, ca. 1950 BCE), the consonant sign *m* is omitted in Hatamti and /ata-zemt-ik/, respectively spelled *ha-ta-ti* (usually written *ha-ta-m-ti* in other texts) and *a-ta-ze-ti-k*$_2$ (written *a-t-ta-ze-m-ti-k*$_2$ in J′: 4). Moreover, while the verbal notation *ha-h-pu-h∼š* ("I/he heard") appears in Z and H′, in X this verb is written *ha-pu-š* (with the omission of *h*).[88] Such cases of consonant omissions can be regarded as examples of graphic simplifications of consonant clusters.[89]

However, a closer look at X shows that this text was hastily written, and that it exhibits other kinds of omissions (for instance, *ta-k-me me* instead of *ta-k-me u̲-me* for /takme o-me/, "for my life") as well as interesting corrections of previous mistakes involving the consonant sign *r*, wrongly written in the words *ze-m-t* (*ze-r-t*) and *zu*$_2$*-ki-k*$_2$ (*zu*$_2$*-ki*$_2$*-r;* a grammatical mistake in the class-marker). An additional example of a corrected error involving *r* can be seen in O′, in the word *na-lu*$^?$*-r-i-e* (previously written *na-r-r-i*-e; signs *r* and *lu*$^?$ are graphically very similar with a rhombic shape). Other corrections are found in H, in the last sign of the sequence *pe-t-ra-š̲*, written as *s* (*pe-t-ra-s*) before being corrected to *š*; and in G, where *ku-ku-k* was written instead of *ku-ši-k* (the *ku* sign is identical to *ši* upside down), and then the scribe attempted to correct it (see Fig. 9, for all these examples of corrections). Finally, note *a-k*$_2$*-n̲e-ra* instead of *a-k*$_2$*-ka-ra* in D: 2 (with *ne* being identical to *ka* upside down).

3.6 Dividing Sign and Text Layout

Usually written from right to left (excepted B, E, J′, and the caption Y1 near the carved figure, while the situation is more complicated in D due to its carrier; as for V, on a seal, it has to be read on the impression from right to left; see above, Table 1) and from the top to the bottom (with the exception of I: 1. 2. 3, written from the bottom to the top on a statue), LE inscriptions display varied text layouts and distinct uses for the dividing sign (a vertical stroke), probably reflecting different scribal practices.

The oldest LE texts (Group 1) do not display the dividing sign, while horizontal lines are clearly marked, with a framing vertical line preserved in cones J and K as well as in the tablet M (see Fig. 8).

The dividing sign is employed in Puzur-Sušinak inscriptions (Group 2) to separate phrases, clauses, and sentences (not always in a consistent way; see, for instance, section 6 and Fig. 12 below), but also divine names in the curse formula of D. In C, the words *hu*$_2$*-r-t* and *ši-n-pi*-[*s-h-hu-k*] are broken on two lines.

Marv Dasht vessel Q makes extensive use of the dividing sign (attested 8 times), separating words (like *za-na* and *ma-ra-p*$_2$*-š-ša-i-r*) but also elements of the same clause (*la-ni-i-na* | *u ša-ri-h*).

In the Kam-Firuz silver beaker inscriptions (Group 4), the situation is contrasted, with an extensive use of the dividing sign between words or groups of words in Z (Itatu I) and F′, I′, K′ (Zemt-Akone [/Temti-Agun] I and Pala-išan) and its absence in the inscribed vessels commissioned by Eparti II and Šilhaha (H′, X, and J′), probably reflecting different scribal schools. Y is an exception, with the dividing sign occurring between titles and between verbal phrases. The most recent inscriptions, K′ and probably I′ (Pala-išan's time, ca. 1900–1880 BCE), display texts inscribed on a single continuous line, wrapping around the vessel like a helix.

In the metal vessel group (no. 6), dividing signs are used between groups of words or clauses in M′, between words or groups of words in A′ and O′, while they are absent in N′ and W. In A′, N′, O′, and W, the text is written in a continuous way, with words occasionally broken on two lines. The last line of W is much longer than the preceding seven, as if the scribe had needed more space to finish the inscription.

In the Kerman group (no. 5), the dividing sign is attested in S (at the beginning of this short inscription) as well as in C′ and D′, probably between proper nouns.

88 Cf. Krebernik [4]2021, 207.

89 See Grillot 2008, 12, for analogous examples in cuneiform spellings.

4 Implications for the Elamite Language

> "[...] le système phonologique de l'élamite ne se laisse pratiquement pas connaître, caché qu'il est derrière l'écran opaque que constitue le système graphique cunéiforme" (Bavant 2019, 379).

Probably already a remnant of a former larger linguistic group in the 3rd millennium BCE and displaying inner regional dialectical variations, because of our ignorance, the Elamite language remains an apparent linguistic isolate,[90] preventing any linguistic comparisons, despite hypotheses trying to connect it to Dravidian languages of India,[91] the Afro-Asiatic linguistic group,[92] or the Caucasian languages.[93] The Elamite language was up to now only documented through a limited number of cuneiform inscriptions ranging from the 23rd to the 4th century BCE,[94] usually repetitive and standardized, with a restricted vocabulary; this explains why this language is still an Etruscan-like *chantier linguistique*,[95] far from being completely understood and awaiting a real complete recovery. For the 2000 years of its documented history, the Elamite language evolved from an original/ancient structure based on nouns and anaphoric pronouns toward a more verb-oriented structure, before being influenced in its syntax and vocabulary in its last known stage (which is also its best-known stage), in the Achaemenid period, by the Old Iranian and Aramaic languages.[96]

Before the decipherment of LE script, the number of Elamite texts known for the earliest documented phase of this language (in the so-called 'Old Elamite' period, from the 23rd to the 16th century BCE) was extremely limited, only including:

1) the so-called 'Treaty of Naram-Sin' from Susa (Scheil 1911, 1–11; EKI no. 2; Hinz 1967, 91–95; Koch 2005a, 283–287; Quintana[97]), dating to ca. 2240/2230 BCE. It was written without any Akkadian loanword in an almost completely phonographic writing (except for the fixed forms of some theonyms and the determinatives ^{dingir} and ^{ki}), using morphologically Mesopotamian (Ešnunna-like) cuneiform signs (Steve 1992, 4);

2) two small tablets from Susa (Lambert 1974; see also Grillot 1987, 49; Tavernier 2011, 338–340), which, based on the shape of the cuneiform signs, can be attributed to the Old Akkadian or Ur III period;[98]

3) two silver (*kunanki*?) vessels related to Kıntatu (ca. 2000 BCE) and Šilhaha (ca. 1950 BCE) (see above, section 2.2: Cuneiform 1 and 3; and Desset [e. a.] forthcoming);

4) two tablets from Susa, (Ville Royale) chantier B, level 5 *ancien* (contemporary with Šilhaha and Ata-hůšů; second half of the 20th century BCE), in part written in Elamite: De Graef 2006, nos. 30 (with some Akkadian words) and 82 (possibly an apprentice's exercise); cf. De Graef 2006, 39–40;

5) an alleged Elamite cuneiform tablet from Girsu/Tello (Louvre AO 4325; Cros/Heuzey/Thureau-Dangin 1910, 201 and 212; see also Krebernik 2018, 28, no. 3), attributed by Steve (1992, 19) to the Isin-Larsa period (20th–19th centuries BCE);

6) a stele commissioned, in the late 19th/beginning of the 18th century BCE, by Šir-ůktůh (Farber 1974; Desset [e. a.] forthcoming);

7) two inscriptions of Sewe-palar-hůhpak (one on two fragments of a tablet from Susa and the other on a silver vessel from the Mahboubian Collection; see above, Cuneiform 8 and 9 and Fig. 4; Desset [e. a.] forthcoming);

8) two previously unattributed Elamite cuneiform inscriptions (EKI no. 67 and no. 70C), identified by Vallat (1990) as related to Kutır-Nahůnte I and Zemt-Akone (= Temti-Agun) II (ca. 1720/1700 BCE);

90 Grillot 1998; Starostin 2002, 5: "It is simply a near-impossible task to establish a close relationship of Elamite with any of the currently known families or macro-families".

91 Connection suggested as early as 1855 by E. Norris and proposed again, more recently, by McAlpin (1975; 1981; 2015): "The underlying working concept [...] is that the Proto-Elamo-Dravidian group, [...] renamed Proto-Zagrosian, split into Elamitic and Dravidian subgroups, and that Brahui belongs to the Elamitic subgroup" (McAlpin 2015, 553).

92 Blazek 1992. More recently, Starostin (2002, 23), synthesizing these propositions, wrote that the Elamite language seems to be a "bridge between Nostratic [including Dravidian] and Afroasiatic [including Cushitic, Chadic and Berber] languages".

93 Bavant 2014, 358; 2019.

94 According to some scholars, the Elamite language was perhaps still spoken later, probably until at least the late 10th century CE in the foothills of Khuzistan (notably in the Ram Hormoz area). Geographers and travelers writing in Arabic between the 8th and 10th centuries CE (Ibn al-Muqaffa, al-Gahiz, al-Istakhri, and al-Muqadassi, among others) reported an incomprehensible language of South-Western Iran, the *Khūzī* (from Old Persian *u-v-j*, perhaps representing *Hūž*, related to the region or city of Susa), reputed very difficult to learn, which was neither Arabic, Persian, Syriac, nor Hebrew (see the reassessment by van Bladel 2021).

95 Malbran-Labat 2016.

96 Grillot 1985, 55; 1987, 45; 1998.

97 http://www.um.es/cepoat/elamita/?cat=81.

98 According to Lambert (1974, 3). According to Malbran-Labat (1996, 57), both texts date to the Old Akkadian period.

9) some Elamite incantations in Mesopotamian collections dating to the Old Babylonian period.[99]

These cuneiform texts from 2250 to 1500 BCE probably under-represent the Elamite component of Susiana in this period. The onomasticon of the inhabitants of Susa, as documented by the written records from the Old Akkadian period (23rd century BCE) and the entire 2nd millennium BCE, reflects a constant linguistic/cultural ("ethnic") duality with an Akkadian majority and an Elamite minority.[100] Although the legal and administrative texts in early 2nd millennium BCE Susa, as well as in Tal-i Malyan/Anšan, were written in Akkadian cuneiform (with sumerograms), De Graef interpreted this use of Akkadian as alloglottography,[101] an artificial *lingua administrativa* behind which would transpire the Elamite language. This is perhaps proven by the use of very specific legal and administrative formulas (in the whole cuneiform sphere attested only in Susa and probably reflecting specific elements of customary law) that include occasional Elamite phrases or Akkadianized Elamite words (such as *kidinnum*, representing the Elamite notion of /kɪten/).[102] Vallat (2007, 79), in his analysis of the royal inscriptions of Susa in Akkadian cuneiform, noticed that some prepositions and pronouns (*ana, ina, ša*) were not used when they were considered unnecessary to understand the text (as is the case in Cuneiform 2, 4, 5, 6, and 7), an irregularity that could suggest a direct translation from an original Elamite version, as certain grammatical functions are only expressed syntactically in Elamite. However, this phenomenon can simply be regarded as a case of linguistic interference, as is usual in bilingual contexts (see also Labat 1970).

Besides the paucity of Elamite cuneiform texts from the late 3rd/early 2nd millennium BCE, another problem hampers our understanding. Elamite has only been documented up to now through the lens of the cuneiform writing system, which was probably not well suited to its phonology and unable to faithfully reproduce some of its phonemes, as is the case for nearly all the writing systems when borrowed to write other languages. Our knowledge of cuneiform itself also depends mainly upon our understanding of the phonological system of the "classic" Semitic languages, which necessarily prejudices our reconstruction of the cuneiform system when it is used for other languages (such as Elamite). All our readings of Elamite words based on cuneiform are in a way *Akkadianized*.[103]

With such a documentary background, the decipherment of LE script provides an important opportunity to gain new insight into the earliest documented phase of the Elamite language (from ca. 2300 to 1880 BCE) and its phonology. To the corpus of more or less 13 late 3rd/early 2nd millennium BCE Elamite cuneiform texts, we can now add a considerable number of LE texts, most of which are reasonably comprehensible (Desset [e.a.] forthcoming; see section 6, for a preliminary presentation of text F // G // H). Moreover, we can now access Elamite through another writing system, presumably better suitable for its notation. However, as our understanding of Elamite recorded in LE script is based on an already established knowledge of Elamite through cuneiform, the problems in our understanding of cuneiform Elamite inevitably bear on our interpretation of LE Elamite, too.

4.1 Phonology

Based on cuneiform[104] and LE inscriptions, the Elamite phonological system can be reconstructed as including:

1) Five vowels: /a/, /e/, /i/, /o/, and /u/, recorded with the five LE vocalic signs *a, e, i, u*, and u_2 (see below, section 4.1.2, for the presence of a fifth vowel: /o/).

2) Perhaps some diphthongs;[105] the spelling *hi-ša-u-ri-i* (A′: 1), /hešaore(y)i/, may attest a diphthong /ao/. Moreover, the variant *za*-x-*m-t* (Y2: 1) of *ze-m-t* could contain a diphthong /aV/. See also below, *sub* 3.

3) The glide /y/, already hypothesized for cuneiform Elamite (Stolper 2004, 72). This may be reflected in (C)*i-a*∼*e*∼*i* spellings, such as: 1) *si-a-n* (Q), *si-a-h* (Z: 3), *ti-a-h*∼*š* (Q; M′: 2; A′: 2–3; O′: 3–4), possibly for /siyan/, /siya-h/, and /tiya-h∼š/; 2) *na lu*ʔ*-r i e* (A′: 4; O′: 5), *h i e ki*

99 See Basello (2012, 180–81); Krebernik (2018).

100 Desset (2017, 11–22) (*permanent duality* opposed to the cultural/ethnic *alternation* proposed by Amiet 1992, 85). De Graef (2019, 93) added new data to this general picture, determining that in the first half of the 2nd millennium BCE, 45 % of the names of the people mentioned in the economic/administrative tablets of Susa were (Sumero-) Akkadian and 15 % Elamite, while 40 % remains undetermined. It is not really clear then on what basis De Graef (2019, 96) concludes that "the spoken language of the greater part of the population *must* have been Elamite".

101 According to Rubio (2007, 33), the phenomenon of alloglottography consists in "writing a text in a language different from the language in which it is intended to be read".

102 De Graef 2019, 97.

103 As is probably also the case for Sumerian, read "through an Akkadian looking glass" (Seri 2010/2015, 90), which "glass", at the same time, made it come down to us.

104 Steve 1992, 14; Stolper 2004, 69–73; Grillot 2008, 11–13; Bavant 2014, 243; McAlpin 2015, 556. 573; Tavernier 2018, 424 f.; Krebernik [4]2021, 195.

105 See Grillot 2008, 10; Khačikjan 1998, 9 f.; Stolper 2004, 72.

(W: 7), and u_2 *r ti e* (N′: 4), perhaps to be read /nalů?riye/, /hiyeki/, and /urtiye/; 3) *la-ni-i-na* (Q; A′: 1; O′: 2; W: 5), probably for /laniyina/. On the other hand, it is uncertain whether the CV-*i* spellings in *ma-ra-p*$_2$*-š-ša-i-r* (Q) and *hi-ša-u-ri-i-k* (A′: 1) represent the glide /y/ (/marapšayi-r/ and /hešaoreyi-k/) or rather the diphthongs /ai/ and /ei/ (/marapšai-r/ and /hešaorei-k/). Therefore, these alleged toponyms, possibly related to Eastern Iran, are provisionally transcribed as /marapša(y)i/ and /hešaore(y)i/.

4) The glide /w/, which is treated differently from the glide /y/, since a specific *w* series is attested with the signs *w* (= u_2, /u/), *wa*, and *we*. C*u* signs also seem to function as C*w* signs when used before a vowel (C*u*-V = /CwV/), as in the case of the theonym *ši-ku-a-t* (M′: 1; O′: 3), probably to be read /šikwat/.[106] At any rate, the signs *w*, *wa*, and *we* point to the existence of the glide /w/. This phoneme is written in cuneiform (according to modern transliteration) with either *w* or *m* signs. The attested words whose LE spellings contain the *w, wa*, or *we* signs (with their transliteration in cuneiform, when available) include:

w: *la-w-li*$_3$*(-ri)* (D: 1; F // G // H: 2; cf. cun. *la-am-li-ir-ri*; ElW 801–802).

wa: *a(-w)-wa-ni-r* (F // G // H: 1; cf. cun. *a-wa-an*; Vallat 1993, 25–26); *a-wa* (Z: 3; cf. cun. *am-ma*; ElW 51–52); *šu-wa-r-a-su* (Q); *-wa* (suffix, usually written *-ma* in cuneiform): ▩*-s(-)hu*$_2$*(-)ri*$_2$*-t*[t][107]*-wa te-la*[l]*-k*$_2$ in D: 1–2; *nu ki*$_2$*-ri-wa ta-h∼š*, *ki*$_2$*-ri nu te-wa ti-a-h*, ... *ru*$_2$*-h*$_2$*(-)nu(-)te-wa* in I′: 2; *ha-s-*▲*-ki*$_2$*-*⊢*-wa* in K′; *ša-hu*$_2$*-lu*$^?$*-wa ti-t-n-wa* in M′: 1; *za*$^?$*-a-n-ši-*▩$^{(ša)}$*-š-ši-n-wa* in N′: 4.

we: *li-ka-we* (Kam-Firuz silver beaker group; cf. *li-i-ka*$_3$*-we-e* in Cuneiform 1: 4; and *li-ka*$_3$*-we* in Cuneiform 8: 4 and 9: 4; see also ElW 821, s. v. *li-ga-we(pi)*; later cuneiform spellings are *li-ka-mi* and *li-ka*$_4$*-me*: ElW 826 and 832, s.vv. *li-ka-mi* and *li-qa-me*); *nu(-w)-we* (A′: 3–4; O′: 4–5; N′: 4–5; cf. cun. *nu-um*); *we-s-ha-la-hi*$_2$*-t* (F′: 2); *we* ◬ *u-we* (O′: 1); *we* (class-marker) in text group 6 (*i-r-k i-n-ti u-we* in A′: 1–2; O′: 2–3; *u nu-we e pe-li-h hu-t-ta-h-li*$_2$ in A′: 3–4; O′: 4; *u a-š-ha-m-me la-ni nu-we ša-ri-h* in N′: 4–5), usually recorded with the LE sign *me* in South-Western Iran texts (see Desset [e. a.], forthcoming).

LE *w* signs are very frequently transliterated in cuneiform with *m* signs: LE *la-w-li*$_3$*-ri* → cun. *la-am-li-ir-ri*; LE *a-wa* → cun. *am-ma*; LE *wa* → cun. *ma*; LE *li-ka-we* → cun. *li-ka-mi*/*li-ka*$_4$*-me*; LE *nu-we* → cun. *nu-um*; LE *we* → cun. *me*. In addition, LE *we-s* could correspond to cun. *me-el* (ElW 908).

5) The velar fricative /h/. Note that two consonant signs, *h* and h_2, were identified in LE script, possibly expressing a phonemic difference between two distinct /h/-sounds (see above, section 3.3).

6) Three plosives: the labial /p/, the dental /t/ and the velar /k/. The choice of the voiceless consonants over the voiced ones in transliteration and transcription is purely arbitrary and related to the history of the discipline (see above, section 1). If LE writing did not seemingly distinguish voiced (/b/, /d/, /g/) from voiceless (/p/, /t/, /k/) plosives, this distinction may have been present in the Elamite language, as the systematic voiced/voiceless distinction in the writing of plosives in early 2nd millennium BCE cuneiform texts (see Cuneiform 8 and Cuneiform 9; Desset [e. a.], forthcoming) may suggest. As this distinction is completely absent in the LE script, it is possible that the latter was defective in this matter.

7) Two liquid sonants: /l/ and /r/.

8) Two nasal sonants: the labial /m/ and the dental /n/.

9) A number of sibilants. Elamite sibilants and affricates were written in cuneiform with *s*, *š*, and *z*(/*ṣ*) signs,[108] a practice that seems to mirror the situation in LE script with:

9.1) The voiceless alveolar /s/ (cuneiform spelling: *s*). The phonetic value could perhaps be inferred from the attestations of the LE consonantal sign *s*. Attested in the name of Puzur-Sušinak's father, spelled *ši-n-pi-s(-h)-hu-k* in Linear Elamite and *šim-pi*$_2$*-is*$_2$*-ḫu-uk* in cuneiform, this phoneme was also pretty close to /š/ (cf. text H: 3, where the verbal form /petra-š/ was first written *pe-t-ra-s* before being corrected to *pe-t-ra-š*), and, above all, to /l/: cf. *ra-s ha-l-ma-k*$_2$*-na* (Y2: 2 and Z: 6) with cun. *ra-al ha-al-ma-ak-na* (EKI no. 54 § 73; for *ra-al*, "forever", see ElW 1018), while LE *we-s* (F′: 2) could correspond to cun. *me-el* (ElW 908); finally, cf. LE *ši-n-pi-s(-h)-hu-k*, /šin-pishůk/, and *ki-k-n-pi-s-hu-š*, /kik-(i∼o)n-pishůš/ (A′: 3; O′: 2. 4) — both

106 One wonder whether C*u*-*w*V spellings, such as *šu-wa-r-a-su* (Q), can be interpreted as C*w*-*w*V, for /CwV/ (/šwar-asu/?).

107 The final *t* is uncertain; it could also be the dividing sign.

108 According to Tavernier (2010, 1075), these three signs would correspond to six or even seven different phonemes: Elamite "probably had six (or seven, if one accepts the retroflex approximant /ẓ/) alveolar fricatives, palato-alveolar fricatives and affricates: the alveolar fricatives /s/ and /s'/, a palato-alveolar fricative (/š/), two affricates (/c/ and /č/) and one yet unknown fricative (/θ/ or /ś/)".

personal names — with cun. *na*$^{?}$*-pi-il̲-ḫu-uš*, /na-pishůš/, the name of the 6th king of Awan in the 'Susa king list' (Scheil 1931, 2, line 6). Therefore, the LE sign *s* and the syllabic signs belonging to the *s* series (*sa*, *si*, *su*, and *su*$_2$) can be interpreted as recording an undetermined voiceless alveolar lateral fricative ([ś] or [ɬ]), sharing common phonetic features with both /š/ and /l/, like the Welsh *ll*. As has been noted by Grillot (1987, 10), the alternation *š*/*l* is also attested in cuneiform Elamite, although very rarely.[109]

The LE consonant sign *s* is attested in the following spellings: *pi-s̲*(-*h*)*-hu* (PNs /šin-pishůk/ and /kik-(i∼o) n-pishůš/); *pe-s̲ e* (A: 5); 𒄩-*s̲*(-)*hu*$_2$(-)*ri*$_2$*-t*$^{?}$ (D: 1); *ra-s̲ ha-l-ma-k*$_2$*-na* (Y2: 2; Z: 6); *we-s̲-ha-la-hi*$_2$*-t* (F′: 2); *a*∼*hu-n*(-) *ha-s̲-ki* (F // G // H: 3); *ha-s̲-*𒀸*-ki*$_2$-𒉿*-wa* (K′). In several cases, it occurs at the end of a word or syllable and just before a word or a syllable starting with an *h* sign (*h, ha, hu, hu*$_2$). It is therefore conceivable that *s* was realized as [ś] only in syllable-final position. Then [ś] would not be an independent phoneme but rather a phonologically conditioned allophone of /s/, which would allow us to place this sign into the *s*-series.

9.2) The voiceless palato-alveolar /š/ (= cuneiform *š* signs);

9.3) An additional sibilant(?), here transliterated as *z*, mostly on the basis of comparisons with cuneiform spellings. Since the absence of opposition between voiceless and voiced appears to be certain in LE writing for the plosive consonants, it may also have been the case for sibilants. The transliteration *z* is consequently problematic. Furthermore, the equivalence between LE *z* spellings and the cuneiform ones is not as systematic as for the LE and cuneiform *s*- and *š*-series. The attested words spelled with a *z* sign in Linear Elamite and their transliteration in cuneiform, whenever available, include:

z: *ka-z̲-za-k*$_2$ (see cun. *ka*$_4$*-az̲-za-ak*; ElW 411).

za: *a-n-z̲a-ri*$_2$ (see cun. *an-ša-an, an-z̲a-an, an-z̲a-ir*∼*ri*; Vallat 1993, 14–16; and ElW 63–64), *ka-z-z̲a-k*$_2$ (see cun. *ka*$_4$*-az̲-z̲a-ak*; ElW 411), *z̲a-*𒀭*-m-t*, *z̲a*$^{?}$*-a-n-ši-*𒋗$_{(ša)}$*-š-ši-n*, *z̲a-na* (see cun. *z̲a-na*; ElW 1282), *z̲a-ši-ri*$_2$, *z̲a-t-tu-me*, *zu*$_2$ *ne z̲a*.

ze: *hu-z̲e-hu*$_2$*-p-ša-k*$_2$*-ki-r* (LE *hu-z̲e* probably corresponds to cun. *hu-t̲e*∼*t̲i*∼*t̲i*$_4$; see Zadok 1984, 14 f.; and ElW 706 f.), *r-z̲e-p* (cf., perhaps, cun. *ra-t̲e-ip*; ElW 1032), *z̲e-ma-n*, *z̲e*(-*m*)*-mi* (see above, section 2.2, pericope 3, Cuneiform 8: 21 and 9: 55; cun. *t̲e-e-me* and *t̲e-e-mi*; ElW 305), *z̲e-m-t* (besides cun. *t̲e-im-ti*, see also the cuneiform variant spellings *si-im-ti* and *še-im-ti*;[110] ElW 308–311; Zadok 1984, 43–44).

zu: *pu-z̲u-r* (see cuneiform Akkadian *puz̲ru*(*m*)), *z̲u-la-ri*$_2$, *z̲u-p*$_2$*-pa-š* (cf. cun. *z̲u-up*∼*um-pa*$_2$, *t̲u-um-pa*$_2$, *t̲u*$_4$*-um-pa*$_2$ and *s̲u-um-pa*$_2$; ElW 1312–1313 and Steve 1967, 55; also *t̲u*$_3$*-um-pa*$_2$ in Cuneiform 1 and Cuneiform 3; finally, see Cuneiform 9: 18, *ik-ku s̲u-um-pa*$_2$*-aš*, to be compared with *ik-ku t̲u-um-pa*$_2$*-ah* in EKI no. 28 A § 24).

zu$_2$: *u*$_2$ *z̲u*$_2$ 𒁀 *m*$^{?}$*-š*, *z̲u*$_2$*-ki*(-*k*$_2$) (cf. cun. *z̲u-ki* and *z̲u-uk-ki*; ElW 1106 and 1313), *z̲u*$_2$ *ne za*, and *z̲u*$_2$*-n-z̲u*$_2$*-n*.

As can be seen, several words spelled with a *z* sign in LE display discrepancies in their cuneiform transliteration; thus LE *z̲a* corresponds to cun. *z̲a* and *s̲a*; LE *z̲e* to cun. *s̲i*, *s̲e*, *t̲e*, *t̲i*, and *t̲i*$_4$; LE *z̲u* to cun. *s̲u*, *t̲u*, *t̲u*$_3$, *t̲u*$_4$, and *z̲u*.

These discrepancies may suggest that the phoneme that has been transliterated here as *z* in LE texts (*z*, *za*, *ze*, *zu*, *zu*$_2$) could actually be a voiceless interdental non-sibilant fricative ([θ]) or an affricate sibilant (either [ts] or [tz]). Due to this uncertainty about the exact phonetic interpretation of this phoneme ([θ], [ts] or [tz]?), we provisionally transliterate and transcribe it as *z* and /z/.

Finally, the LE *ze* sign deserves some comments. Contrary to LE *za*, *zi* and *zu*, the *ze* sign (mainly attested in the words /zemt/ and /zemi/) has not a corresponding homonymous value in the Elamite cuneiform syllabary.[111] LE *ze* is mostly transliterated in cuneiform as *te* or, less frequently, *še* (perceived, presumably, as the phonemically closest available signs). However, both LE *te* and LE *še* with the corresponding phonemic values /te/ and /še/ are already attested in the LE phonemic grid through solid readings,[112] so LE *ze* cannot be either /te/ or /še/; this fact leaves only the phonemic values /se/ and /ze/ available for *ze*. The variant *za-*𒀭*-m-t* (Y2: 1) of *ze-m-t*[113] then suggests that *ze* belongs to the same sibilant series as *za*, and

109 Cf. *š* appearing as *l* before dental stops in Standard Babylonian.

110 Tavernier 2010, 1072.

111 See Steve 1992, 14–15 (fig. 3, p. 15, with the cuneiform signs recording the vocalic phoneme /e/).

112 LE *t̲e*: *na-h*$_2$*-hu*$_2$*-t̲e-k*$_2$ (Y2: 1; J′: 3), *na-h*$_2$*-hu*$_2$*-n-t̲e-ki* (Z: 2), *na-ru-t̲e* (D: 4), *su*$_2$*-h-t̲e-r* (A: 1), *pa-t̲e-k*$_2$ (Y2: 1; Z: 2; J′: 2), *t̲e-na* (Q), *t̲e-wa* (M′: 2; A′: 2; O′: 3), *u*$_2$*-t̲e-n-ti* (Z: 5; K′), *t̲e-ki*$_2$*-h* (H′: 3), *hi*$_2$*-t-t̲e-k*$_2$*-pi*$_2$ (K′), *t̲e-la*^{i}*-k*$_2$ (D: 2).
LE *š̲e*: *su-š̲e-ni-r* (I: 1; A: 3; B: 2; C: 2′; E: 2), *š̲e-p*$_2$*-k* (B: 2; C: 2′; A′: 1; O′: 2), *š̲e-k* (W: 4–5).

113 The spellings *ze-m-t* and *za*-x-*m-t* represent the only real case of variation (unrelated to defectiveness or gemination) currently known in the LE corpus.

that the LE *ze* sign should probably be transcribed /ze/ (= /θe/, /tse/, or /tze/) and not /se/.

4.1.1 Phonemic Distinction between (C)*e* and (C)*i* Signs

The LE signs *e* and *i*, *me* and *mi*, *ne* and *ni*, *pe* and *pi*|*pi*$_2$, *še* and *ši*, *te* and *ti* (as well as *ze* and *si*) could previously be determined (see Figs. 5 and 6) on the basis of comparisons with cuneiform, since cuneiform signs *e*, *me*, *ne*, *pe*/*be*, *še*, and *te*/*de* do exist.[114] This is not the case for other signs of the C*e* and C*i* types, which explains the problematic presence of pairs and even a triplet of (pseudo-) homophonic signs in the transliteration system of Linear Elamite, namely *hi*|*hi*$_2$, *ki*|*ki*$_2$, *li*|*li*$_2$|*li*$_3$, and *ri*|*ri*$_2$.

However, the inner logic of the LE writing system may allow us to phonemically distinguish the members of these pairs and of the triplet. If one of the signs in these four pairs and the triplet can phonemically be determined as /C$_1$i/, then the other sign in the pair (or one of the other two in the triplet) should be considered as /C$_1$e/.

In this connection, the pattern of addition of the class-markers /k/, /r/ and /p/ to words ending with a consonant is helpful; note the following schema:

C + epenthetic /i/ + class-marker (/k/, /r/, or /p/) → (written) C*i* + class-marker sign (*-k*$_{(2)}$, *-r*, or *-p*):

ze-ti-k$_2$ (X: 3)	to be morphologically interpreted as /ze(m)t-	i-k/
ze-m-ti-k$_2$ (J′: 4)	/zemt-	i-k/
su-še-ni-r (Group 2)	/sušen-	i-r/
a(*-w*)*-wa-ni-r* (F // G // H: 1)	/awan-	i-r/
ha-ta-m-ti-pi$_2$*-r* (Group 2)	/hatamti-p-	i-r/
ha-ta-m-ti-pi-r (F′: 1)	/hatamti-p-	i-r/

This pattern helps recognize C*i* signs in the following spellings:

sa-hi$_2$*-p* (Z: 8)	to be morphologically interpreted as /sah-	i-p/ →	*hi*$_2$ = /hi/ (and *hi* = /he/)[115]
ši-n-pi-s-hu-ki-r (F // G // H: 1; U: 1)	/šin-pishůk-	i-r/ →	*ki* = /ki/ (and *ki*$_2$ = /ke/)
i-n-su-ši-na-k-ki-r (A: 1)	/insušinak-	i-r/ →	*ki* = /ki/ (and *ki*$_2$ = /ke/)
hu$_2$*-p-ša-k*$_2$*-ki-r* (Z: 4)	/hůpšak-	i-r/ →	*ki* = /ki/ (and *ki*$_2$ = /ke/)
pi$_2$*-ne-ki-ri*$_2$*-k*$_2$ (Y2: 1, Z: 2)	/pinekir-	i-k/ →	*ri*$_2$ = /ri/ (and *ri* = /re/)

As far as the signs *li*|*li*$_2$|*li*$_3$ are concerned, Cuneiform 1 (inscription of Kıntatu) displays several vocalic notations (probably to be considered as phonemic complements) that allow recognizing LE *li* as /li/ and LE *li*$_2$ as /le/:

Cuneiform 1: 4
li-i-ka$_3$*-we-e* — LE *li-ka-we* (Y2, H′: 2, X: 3, J′: 4, K′) → *li* = /li/

Cuneiform 1: 14
pe-li-i — LE *pe-li-h* (A′: 4, O′: 4) → *li* = /li/

Cuneiform 1: 12
li-e-it — LE *li*$_2$*-t-ti* (unpublished fragment) → *li*$_2$ = /le/

Finally, LE *li*$_3$ is attested in the spelling *pe-l-ti-ka-li*$_3$*-m* (I: 1), representing an Elamite by-form of the Akkadian DN *Bēlat-ekallim*; this assures its phonemic value as /li/. Consequently, LE *li* and LE *li*$_3$ are real homophonic signs (both represent /li/; see above, section 3.3), while LE *li*$_2$ = /le/.

4.1.2 Phonemic Distinction between (C)*o* and (C)*u* Signs

As the phoneme /o/ is not well established in Akkadian,[116] it cannot be clearly observed in Elamite through cuneiform writing.[117] However, the decipherment of LE script led to the identification of 5 vowel signs (see LE text M in section 3.2 above), the most common number of phonemic vowels among all the languages in the world.[118] Vocalic signs *u* and *u*$_2$ are probably to be understood as /o/ and /u/.[119]

114 See Steve (1992, 15, fig. 3), for the existing cuneiform signs of the vocalic series /e/.

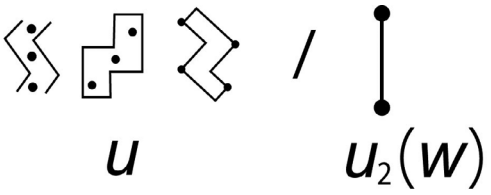
115 This sequence is spelled *ma-ni-i-pi sa-hi-i-pi* in Cuneiform 9: 58, confirming the phonemic value /hi/ of LE *hi*$_2$.

116 Cf. Westenholz 1991.

117 Cf. Basello 2017, 369–71, for the evidence in Achaemenid Elamite (*u* = /au/ [Hinz: /o/] and *u*$_2$ = /u/).

118 Maddieson 2013. Out of 564 languages analyzed, 287/50.9 % display 5/6 vowels; 184/32.6 % between 7 and 14 vowels; and 93/16.5 %, between 2 and 4 vowels.

119 According to Paper (1955, 17), the distinctive uses of cuneiform signs *u*$_2$ and *u*$_3$ in Achaemenid Elamite suggests the existence of /o/ or /aw/ (see also, more recently, Tavernier 2011, 320 and 2018, 425).



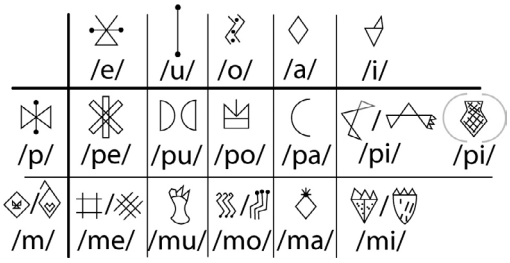
The vocalic LE signs u and u_2

The phonemic distinction between (C)*u* and (C)*o* signs can also be postulated on the inner logic of the LE writing system. Among the seven pairs of apparent LE homophonic signs belonging to the vocalic series *u*, i. e. *u*|u_2, *hu*|hu_2, *ku*|ku_2, *mu*|mu_2, *pu*|pu_2, *su*|su_2, and *zu*|zu_2 (while *lu*?, *nu*, $ru_{(2)}$, *šu*, and *tu* remain isolated; see above, Table 4 and Fig. 6), if one of the signs can be identified as /(C_1)u/, then the other one should be considered as /(C_1)o/ (as already stated in section 4.1.1 for C*i* and C*e* signs; see also section 3.3).

In this regard, the following observations can be made:

- as the Akkadian word *puzru*(*m*) was spelled *pu-zu-r* (text group 2), the real phonemic value of LE *pu* is probably /pu/. If this deduction is correct, then LE pu_2 should represent the phoneme /po/;
- in tablet M (Fig. 8; see below, Table 5), *pu* is associated with u_2 and what must be interpreted as mu_2 (this last sign is for now a hapax legomenon; see above, section 2.3, Step 13), corresponding to /u/ and /mu/. This confirms the previously proposed reading of LE u_2 as /u/ (see above, section 4.1), based on the use of sign u_2 as the glide *w* (cf. *a-w-wa-ni-r*). As a consequence of these identifications, LE *u* and *mu* should be considered as recording the phonemes /o/ and /mo/;

Tab. 5: Text M arranged according to a phonemic grid and its phonemic interpretation.



	e	u_2	*u*	*a*	*i*!
p_2	*pe*	*pu*	[pu_2]	[*pa*]	*pi*
m	*me*	mu_2	*mu*	*ma*	*mi*

	/e/	/u/	/o/	/a/	/i/
/p/	/pe/	/pu/	/po/?	/pa/?	/pi/
/m/	/me/	/mu/	/mo/	/ma/	/mi/

- the assumed values /o/ and /po/ of the signs *u* and pu_2 are also supported by the spelling *ki*$_2$-*ri*-pu_2-*p* (Z: 8), which is a *Sandhischreibung* of /kere-p o-p(e)/ (cf. above, section 2.2, pericope 3, comm. to line 26 = 59a). This proves that *u*, the sign that is normally employed to write the first person pronoun, and pu_2 have the same vowel. It is interesting to note that the use of LE *u* as /o/ and u_2 as /u/ is symmetrical to the use in the earliest cuneiform texts in Elamite of u_3 as /o/ (= LE *u*) and u_2 as /u/ (= LE u_2), with examples from Cuneiform 8 and 9 (see above, section 2.2) such as *nu* u_2-*te-en-ti* (/nů ute-n-ti/) and u_3 *se*$_{20}$-*we-pa-la-ar-hu-uh-pa-ak* (/o sewe-palar-hůhpak/);[120]
- the Akkadian word *puzru*(*m*), found in LE *pu-zu-r*, allows us to state that LE *zu* is to be read /zu/. This means that LE zu_2 should correspond to the phoneme /zo/ and that the word zu_2-*k*(*i*) was actually pronounced /zok(i)/;
- as LE *su* is consistently used in the writing of the toponym Susa (*su-še-ni-r*) and its derivatives (*i-n-su-ši*~*š-na-k*$_{(2)}$ and *pu-zu-r-su-ši-na-k*$_{(2)}$), its phonemic value /su/ is assured (/sušen/, /insušinak/, /puzursušinak/). As a consequence, LE su_2 should probably be understood as /so/ and the words su_2-*h-te-r* (A: 1) and su_2-*m-mu-h* (Y2: 2) pronounced /sohter/ and /somo-h/ (or /soMO-h/, because of the geminate spelling; see above, section 3.4);
- the word "inscription, text", which occurs in the phrase *tu-*p_2 *i-me*, "his inscription" (D: 2), is probably a loanword from Akkadian *tuppu*(*m*) (Sumerian d u b; cf. Tavernier 2007, 57). Therefore, the phonemic value of this word as /tup/ seems assured, implying that LE *tu* equals /tu/;

120 Cun. u_2 and u_3 may have played a role as phonetic determinatives (so-called 'phonetic complements') in the earliest Elamite cuneiform texts, in spellings such as ^{d}*ti-*u_2*-uk* (/tiyuk/) in the 'Treaty of Naram-Sin' (EKI 2, § 1); or *ku-*u_3*-uk-ti*, and *ku-*u_3*-uk-me*, (/kok-ti/, /kok-me/, with the word /kok/, "protection", ElW 553), *pu-*u_3*-hu-up*, and *pu-*u_3*-ku*$_8$ in the *kunanki* inscription of Kıntatu (Cuneiform 1: 2. 8. 15. 17); and *ša-tu*$_3$*-*u_3*-na* (/šato-na/) in Cuneiform 9: 45.

– as the same sign (LE u_2/*w*) was used to record both the vowel /u/ and the glide /w/, a LE C*u* sign placed before a vocalic sign is likely to be phonemically /Cu/ and represent the allophone [Cw] before a vowel. This appears to be the case in the spelling of the theonym *ši-ku-a-t* (M′: 1; O′: 3), probably to be read /šikwat/ (see above, section 3.2). Consequently, LE ku_2 = /ko/, and the name of the ruler Temti-Agun, spelled *ze-m-t-a-ku$_2$-ne* in Linear Elamite (F′: 1), was probably pronounced /zemt-akon(e)/.

Summing up, the signs recording /o/ (LE *u*), /ko/ (LE ku_2), /mo/ (LE *mu*), /po/ (LE pu_2), /so/ (LE su_2), and /zo/ (LE zu_2) can reasonably be hypothesized, if not identified with certainty (see Fig. 10). Since in the case of the LE signs *hu* and hu_2, *lu*?, *nu*, $ru_{(2)}$, and *šu* we are not able to determine whether the vowel was /o/ or /u/, these signs are transcribed (as stated in section 1) as /hů/, /lů?/, /nů/, /rů/, and /šů/ for now.

4.2 A Proposal for the Elamite Phonology (Fig. 10 and Table 6)

Based on the above proposals (phonemic distinction between /Ce/ and /Ci/ signs, and between /Co/ and /Cu/ signs), Table 6 and Fig. 10 display a theoretical regularized phonemic grid for the 72 deciphered LE signs (with still poorly understood supernumerary signs for the phonemes /h/, /li/, and /pi/, while signs *k*|k_2, *p*|p_2, and *ru*|ru_2 are probably not pairs of signs but rather graphic variants; see above, section 3.3), corresponding to 73 values (because of sign u_2/*w*). Although this phonemic grid represents a logical systematization that may not correspond to the actual reality of a writing system with its historically unavoidable idiosyncrasies (but see LE text M, where part of this grid is actually present; see Table 5), it makes it clear that LE writing functioned as a system according to 5 vocalic phonemes (/a/, /e/, /i/, /o/, and /u/), 12 consonantal ones (/h/, /k/, /l/, /m/, /n/, /p/, /r/, /s/, /š/, /t/, /w/, and /z/), and 60 (5×12) syllabic values, corresponding in total to 77 phonemic values (to be compared to the 80 to 110 signs previously hypothesized; see above, section 3.1[121]).

According to Table 6 and Fig. 10, additional signs could be expected in the LE writing system to record 10 phonemic values: /lo/ or /lu/, /no/ or /nu/, /ro/ or /ru/, /se/, /šo/ or /šu/, /to/, /wi/, /wo/, /wu/ and /zi/. The four still undeciphered infrequent LE signs (glyphs 327/285/342, 67/68/69/323, 218, and 81/82; see section 3.1) probably match some of those 10 phonemic values.

Considering the 72 signs/73 values determined, six signs and transliterations can be subtracted if we consider *k*|k_2, *p*|p_2, and *ru*|ru_2 as graphic variants and the pairs *h*|h_2, *li*|li_3, and *pi*|pi_2 as homophones ("supernumerary signs") for the phonemes /h/, /li/, and /pi/, respectively; this would correspond to 66 signs and 67 values. If the signs corresponding to the 10 missing phonemic values are added, it would then correspond to 76 signs/77 values, the expected number calculated for a grid of 5 vocalic, 12 consonantal, and the 60 corresponding open syllabic values theoretically structuring this writing system.

As stated in the introduction, the transliteration system proposed in Fig. 6/Table 4, based on comparisons with cuneiform documentation, and the transcription system proposed in Fig. 10/Table 6, established through the inner logic of LE script, will be used in the edition of the texts (see below, section 6, for text F // G // H and Desset [e. a.], forthcoming).

Due to the probable genetic relation between PE and LE scripts, as two different chronological stages of the same writing system, it could be proposed that some of the hapax legomena, especially in texts showing "archaic" features such as K, are remnants of the most ancient (PE) stage, in a transition phase before further developments toward the regularization of the system according to an alpha-syllabic grid, theoretically defining the more recent LE stage (still with some irregularities, such as the supernumerary signs for the phonemic values /h/, /li/ and /pi/).

LE writing is purely phonographic and, considering the way cuneiform was adopted in Iran, Elamite scribes seem to have willingly rejected logograms and logographic writing in the 3rd millennium BCE. Nevertheless, considering that none of the 40 LE texts deals with bookkeeping, the continuance of the late 4th millennium BCE logographic apparatus may be hypothesized in administrative contexts only, to record numbers and objects more conveniently, with the four main numerical systems attested in PE tablets (Desset 2016, fig. 10) and the PE "object-signs" standing for humans, animals, animal products, grain products, or land surfaces.

121 Meriggi (1971, 175, § 458), probably influenced by the Mycenaean Linear B, astonishingly described some 50 years ago the syllabary used to phonetically record the anthroponyms in the PE tablets according to a grid with 4 V and 40 CV signs: "Noi dovremmo aspettarci segni per le quattro vocali, *a, e, i* e *u* (volendo, sul modello del cuneiforme, trascurare per ora *o*) e poi dieci serie di 4 segni ciascuna con le consonanti *p*/*b, m, t*/*d, n, s*/*z, š, k*/*g, l, r, h*, arrivando cosi a 44 segni".

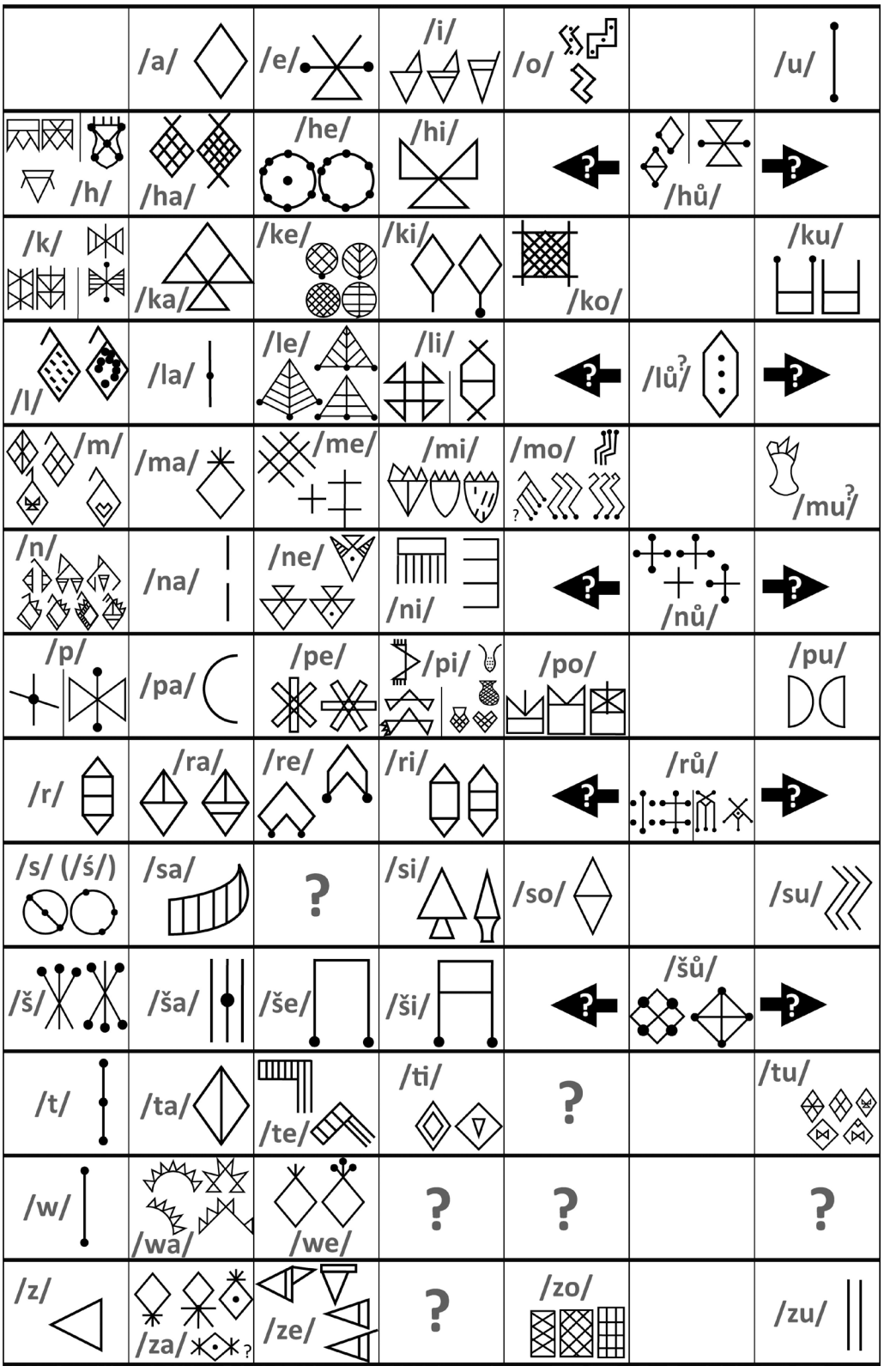


Fig. 10: Tentative grid of the phonemic values of the deciphered LE signs established through the phonemic distinction between /e/ and /i/, and /o/ and /u/ signs, and on which the transcription system is based (to be compared with Fig. 6; F. Desset).
The exact phonemic values of signs *hu* (= /ho/∼/hu/?), hu_2 (idem), lu^2 (= /lo/∼/lu/?), *nu* (= /no/∼/nu/?), *ru* (= /ro/∼/ru/?) and *šu* (= /šo/∼/šu/?) cannot be determined yet.

Tab. 6: Theoretical regularized phonemic grid of the 72 currently deciphered LE signs (to be compared with Table 4 and Fig. 6); the proposed phonemic values (transcriptions) are between slashes and the corresponding signs (transliterations) are given below in italics.

	/a/ *a*	/e/ *e*	/i/ *i*	/o/ *u*		/u/ *u_2*
/h/ *h* / *h_2*	/ha/ *ha*	/he/ *hi*	/hi/ *hi_2*	?	/hů/ *hu*, *hu_2*	?
/k/ *$k_{(2)}$*	/ka/ *ka*	/ke/ *ki_2*	/ki/ *ki*	/ko/ *ku_2*		/ku/ *ku*
/l/ *l*	/la/ *la*	/le/ *li_2*	/li/ *li* / *li_3*	?	/lů?/ *lu?*	?
/m/ *m*	/ma/ *ma*	/me/ *me*	/mi/ *mi*	/mo/ *mu*		/mu/ *mu_2*
/n/ *n*	/na/ *na*	/ne/ *ne*	/ni/ *ni*	?	/nů/ *nu*	?
/p/ *$p_{(2)}$*	/pa/ *pa*	/pe/ *pe*	/pi/ *pi* / *pi_2*	/po/ *pu_2*		/pu/ *pu*
/r/ *r*	/ra/ *ra*	/re/ *ri*	/ri/ *ri_2*	?	/rů/ *$ru_{(2)}$*	?
/s/ (/ś/?) *s*	/sa/ *sa*	?	/si/ *si*	/so/ *su_2*		/su/ *su*
/š/ *š*	/ša/ *ša*	/še/ *še*	/ši/ *ši*	?	/šů/ *šu*	?
/t/ *t*	/ta/ *ta*	/te/ *te*	/ti/ *ti*	?		/tu/ *tu*
/w/ *w*	/wa/ *wa*	/we/ *we*	?	?		?
/z/ *z*	/za/ *za*	/ze/ *ze*	?	/zo/ *zu_2*		/zu/ *zu*

5 Conclusions

At a time in the late 3rd millennium BCE when the other existing systems, Mesopotamian cuneiform and Egyptian hieroglyphs, can be described as mixed (phonographic and logographic; considering its number of signs, this is probably also the case of the still undeciphered Indus script), the Iranian plateau followed an original path in the history of writing with an alpha-syllabary to be considered as the oldest currently known example of a purely phonographic writing system.

Theoretically working with 77 values (5 vocalic, 12 consonantal and 60 syllabic), the LE alpha-syllabic grid probably did not appear around 2300 BCE *ex nihilo*. As has been stated by Gelb ([2]1963, 162), "all syllabic writings are either identical with, or simplified from, the respective syllabaries of the word-syllabic writings from which they are derived". Here we put forward the hypothesis that Proto-Elamite and Linear Elamite scripts were probably not two different writing systems, but the same system at two different chronological stages of evolution.[122] These stages can be labeled as Early (ca. 3300–3000/2900 BCE) and Late (2300–1880 BCE) Proto-Iranian writing,[123] with a

122 As has previously been proposed by Gelb ([2]1963, 89: Linear Elamite as a "developed form" of Proto-Elamite), Reiner (1969, 56: "a more developed form of this writing"), Meriggi (1971, 184: "derivate da quella delle tavolette di contabilità"), Steve (2000, 75–78), and Grillot (2008, 9). For an opposite view, see Englund (2004, 143–44, n. 9).

123 Potts (1999, 71–74; [2]2016, 67–68) also considers the label 'Proto-Elamite', a term which in Scheil's original usage had only a geo-

still inadequately documented stage in between (Middle Proto-Iranian writing; 3000/2900–2300 BCE, probably including notably the poorly understood texts O,[124] K, R, and E′).

Previous approaches to the Early Proto-Iranian writing system were mainly based on graphic comparisons with Proto-Cuneiform (Fig. 11, point 2). The genetic link between Early (PE) and Late (LE) Proto-Iranian writing and the consequent continuous tradition of writing in Iran could allow us to proceed in a regressive way, starting from the vocalic, consonantal, and syllabic values established for the LE signs (see Figs. 6 and 10), and trying to apply these "readings" to their graphic counterparts in the earlier PE writing (see Figs. 7a–7c). The same signs may have been used with similar or identical phonemic values to record the names of the persons involved in the transactions and administrative work documented in the late 4th millennium BCE PE tablets (see Fig. 11, point 4). Now we could try to identify and read those names, also exploiting what we know from the onomasticon of Susa in the Old Akkadian period (Fig. 11, point 3).

More emphasis should be placed on studying the period between 3000/2900 and 2300 BCE and the Middle Proto-Iranian writing stage, currently probably only represented by four documents (O, E′, K, and R). Renewed excavations in Susa and the Jiroft area could provide new opportunities to learn more about the transition from the Early Proto-Iranian/PE to the Late Proto-Iranian/LE stage. The strong Elamite/"Iranian" tendency to phonetism explains the initial adoption of Mesopotamian cuneiform by Elamite scribes around 2000 BCE (see Cuneiform 1, the *kunanki* of Kıntatu) as an adaptation to their previous scribal tradition. Toward 1880 BCE, the transitional period during which both LE and cuneiform writing were used to record the Elamite language ended.

The Proto-Iranian script was seemingly dropped in South-Western Iran, probably because of the then-growing spread of cuneiform writing among the Elamite scribes, as illustrated by the 'Stele of Šir-ůktůh or the texts of Sewe-palar-hůhpak (Cuneiform 8 and 9). Another possible reason for Proto-Iranian writing not achieving the same level of success as Mesopotamian cuneiform (used from ca. 3300 BCE to at least 75 CE and revived since the middle of the 19th century CE) was perhaps its close correlation with the Elamite language and its geographical restriction to the Iranian plateau. It was seemingly never used for another language, nor did it spread in any neighboring area (except perhaps for seals V and G′).

More or less at the same time, around 1850/1800 BCE, the eastern part of the Ancient Near East experienced an unprecedented urban collapse (end of the mature phase of the Ancient Greater Khorasan/Oxus Civilization; end of the Indus Civilization; urban collapse in all Eastern Iran). This may explain the disappearance of the Eastern LE tradition in Kerman (as documented by text groups 5 and 6) and the Indus script. The almost simultaneous spread of Mesopotamian cuneiform in South-Western Iran and the urban collapse in Eastern Iran brought to an end the age in which scripts independent from cuneiform could develop in the Near East. Cuneiform writing will prevail for the next 1000 years, save for the development of the Anatolian/Luwian hieroglyphic system in mid-2nd millennium BCE Anatolia[125] and alphabetic innovations in the second half of the 2nd millennium BCE Levant.

The diffusion of cuneiform writing in Susiana around 2250 BCE and in Fars around 2000 BCE paved the way for the succession of Western-derived writing systems used on the Iranian plateau since then: Mesopotamian cuneiform, Greek alphabet, Aramaic derived alphabets (to record the Parthian, Pahlavi, and Avestan languages), Arabic derived alphabet, and Latin alphabet (the current *Finglish* phenomenon). Consequently, after 1850 BCE, no writing system used on the Iranian plateau can really be considered as indigenous anymore.

graphic connotation, as unfit. As Early Proto-Iranian/PE tablets are still undeciphered and their potential linguistic content still elusive, he deems it more prudent for the time being to label these texts according to the main site's period where they have been found up to now. Desset's position is first to dismiss the concept of "Elam" as inappropriate when dealing with the Iranian plateau from an emic point of view (Desset 2017), second to consider that a script should not be qualified with a language-related term. In the absence of the original name of the script, the best extant option would be a label based on its graphic shape and/or geographic scope. From a geographic point of view, the Proto-Elamite/Early Proto-Iranian and Linear Elamite/Late Proto-Iranian texts currently known were found in a part of the Earth surface called Iran nowadays. This modification of the terminology is similar to the switch from the linguistically connotated 'Luwian hieroglyphs' to the geographic (even if not emic) 'Anatolian hieroglyphs' (Yakubovich 2010/2015, 203).

124 Concerning text O, Scheil (1935, XIV) noted that "assez de signes rappellent ici le vocabulaire proto-élamite, — et cependant, au regard des dimensions du document, on trouvera qu'il contient beaucoup de signes nouveaux", while Meriggi (1971, 185) proposed to consider O as belonging to "una fase di transizione" (see also Hinz 1969, 27 ; Steve 2000, 75).

125 Anatolian/Luwian hieroglyphs were mostly used at the beginning on seals and then for display/monumental inscriptions, while cuneiform writing was contemporaneously used mainly on tablets to record the Hittite language (Rubio 2007, 45–48; van den Hout 2007).

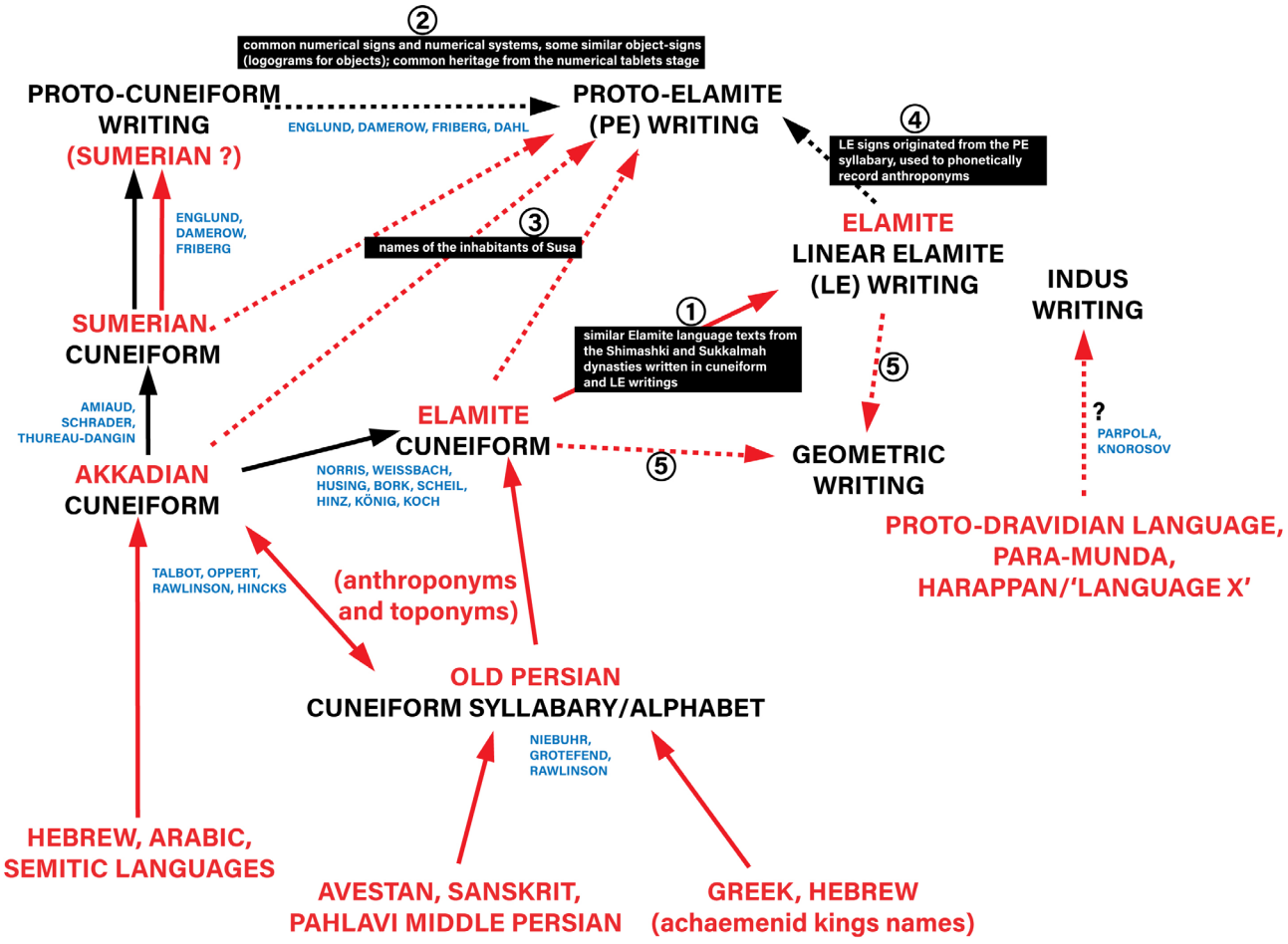


Fig. 11: Schematic history of the decipherment/recovery of some of the Near Eastern writing systems and languages and names of the main scholars involved (in blue) (F. Desset; cf. Desset 2012, fig. 49):

- writing systems are in black, languages in red;
- red arrows point to script decipherment through a language-based approach; black arrows to linguistic recovery through a writing system-based approach;
- dotted line arrows show that the approach is hypothetical since Proto-Elamite (PE), geometric, and Indus scripts are still undeciphered.

Point 1: the decipherment of LE was made possible through a language-based approach since some of the LE inscriptions (Kam-Firuz silver beaker inscriptions; Group 4) record Elamite texts very similar to others written in cuneiform.

Point 2: PE tablets were previously approached through graphic comparisons with Proto-cuneiform (writing system-based approach). This method gave access to common inherited numerical signs and numerical systems, and some logographic object-signs.

Point 3: as some PE sign sequences are probably recording anthroponyms, a language-based approach was attempted (Desset 2012, 46–62; 2016, 82–87), through the Sumerian, Akkadian, and Elamite names attested for the inhabitants of Susa in the Old Akkadian period.

Point 4: the decipherment of LE allows us to adopt a new writing system-based approach, since LE is probably genetically related to PE. The phonemic values determined for the LE signs could be applied in a regressive way to their potential PE graphic counterparts. A combination of approaches nos. 3 and 4 could provide access to PE anthroponomical sequences.

Point 5: as the geometric inscriptions discovered in Konar Sandal South are not related to any other writing system, this precludes a writing system-based approach. If these tablets were recording a language phonemically, the most likely candidate would be Elamite, documented through cuneiform and LE inscriptions (language-based approach).

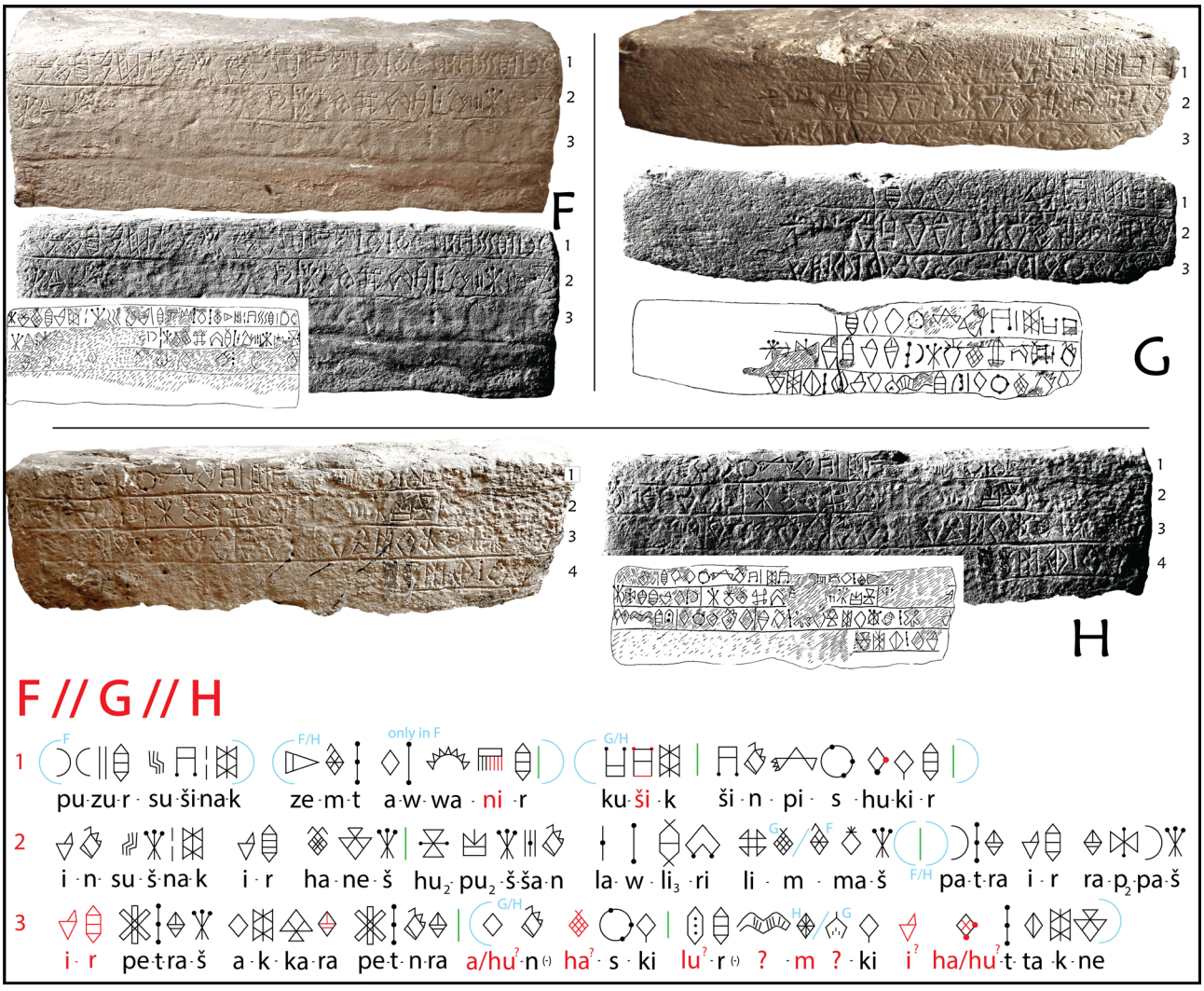


Fig. 12: Composite text F // G // H, Susa, 22nd century BCE, Puzur-Sušinak (F. Desset; photos courtesy of the Louvre Museum; drawings André/Salvini 1989, figs. 5–7). Photos are not to scale (**F**: H: 21,5 cm, L: 63,5 cm, W: 22 cm; **G**: H: 13,7 cm, L: 57 cm, W: 21,3 cm; **H**: H: 15,8 cm, L: 49 cm, W: 12 cm).
In the standardized copy, the writing direction has been changed from right-to-left to left-to-right. Restored signs and uncertain transliterations are in red, as is the transliteration of the sign *lu*?, whose reading is still uncertain. Dividers are in green. Sections not attested in all the exemplars are between blue brackets.

6 Appendix

As an example of deciphering a LE text, a preliminary edition of the Puzur-Sušinak inscription F // G // H (Susa; 22nd century BCE) is offered below.[126] For a (re-)edition of the entire LE corpus, readers are referred to Desset [e. a.], forthcoming.

Inscriptions F (Sb 155), G (Sb 139), and H (Sb 140A) are engraved on stone blocks found at Susa (Fig. 12).[127] Despite some variants, they basically represent the same text, which can be almost completely reconstructed on the basis of these three exemplars.

126 For previous publications, see Table 1, above. For previous attempts to interpret this inscription, see Frank 1912, 41–48; id. 1923, 11–14; Bork 1924, 13–15; Hinz 1962, 12–14; id. 1969, 36 f.; Meriggi 1971, 188–190. 215 f.; Corsini 1986, 30 f.

127 See André/Salvini 1989, 60–69. André and Salvini suggested that these slabs were originally elements of a monumental staircase.

6.1 Text F (Sb 155):

1. *pu-zu-r-su-ši-na-k ze-m-t a-w-wa-ni-r | i-n-su-š-na-k i-r ha-ne-š*
2. *hu$_2$-pu$_2$-š-ša-n la-w-li$_3$-ri li-m-ma-š | pa-t-[ra i-r ra-p$_2$-pa-š i-]ʳrˡ pe-t-ra-š*
3. ʳaˡ-[k-ka]-ʳra peˡ-t-ʳnˡ-[ra | a∼hu-n(-)haˀ]- ʳsˡ-[ki | luˀ-r(-)𒄩-mˀ-ki iˀ ha~hu-t-ta-k]- ʳneˡ

6.2 Text G (Sb 139) + *G (reconstructed)[128]:

*G	G
1. [*pu-zu-r-su-ši-na-k ze-m-t a*(-*w*)-*wa-ni-r* |]	1. *ku-šiˡ-k*[129] | *ši-n-*[*pi*]*-s-hu-kiˡ-r* |
2. [*i-n-su-š-na-k i-r ha-ne-š* | *hu$_2$-pu$_2$-š-ša*]	2. *-n* ʳ*la-w-li$_3$*ˡ*-ri li-m*ˡ*-ma-š*[130] *pa-t-ra i-r ra-*ʳ*p$_2$-pa*ˡ*-š*
3. [*i-r pe-t-ra-š a-k-ka-ra pe-t-n-ra* |]	3. *a∼hu-n*(-)*haˀ-s-ki* | ʳ*luˀ*ˡ*-r*(-)𒄩-ʳ*mˀ*ˡ*-ki iˀ* ʳ*ha~hu*ˡ*-t-ta-k-ne*

6.3 Text H (Sb 140A):

1. [*pu-zu-r*]-ʳ*su*ˡ-[*ši-na-k*] *ze-m-t a-*[*wa*]*-ni-*[*r* | *ku*]*-ši-k* | *ši-n-pi-s-hu-ki-r* | *i-n-su-š-*[*na-k*]
2. ʳ*i*ˡ-[*r ha-ne*]-ʳ*š*ˡ | *hu$_2$-pu$_2$-š-ša-*ʳ*n*ˡ [*la-w-li$_3$*]*-ri li-m-ma-š* | *pa-t-ra i-r ra-p$_2$-pa-š*
3. ʳ*i*ˡ-[*r*] *pe-t-ra-š*[131] *a-k-ka-*ʳ*ra*ˡ [*pe*]*-t-n-ra* | *a∼hu-n*(-)ʳ*haˀ*ˡ*-s-ki* | *luˀ-r*(-)𒄩*-mˀ-ki*
4. [*iˀ*] *ha~hu-t-ta-k-ne*

6.4 F // G (+ *G) // H — composite text:

1. *pu-zu-r-su-ši-na-k ze-m-t a*(-*w*[132])*-wa-ni-r* | (*ku-ši-k* | *ši-n-pi-s-hu-ki-r* |[133])
2. *i-n-su-š-na-k i-r ha-ne-š* | *hu$_2$-pu$_2$-š-ša-n la-w-li$_3$-ri li-m-ma-š* (|) *pa-t-ra i-r ra-p$_2$-pa-š*
3. ʳ*i-r*ˡ *pe-t-ra-š a-k-ka-*ʳ*ra peˡ-t-n-ra* | *a∼hu-n*(-)*haˀ-s-ki* | *luˀ-r*(-)𒄩*-mˀ-ki iˀ ha~hu-t-ta-k-ne*

(1)*Puzur-Sušinak zemt Awan-ir* (*kuši-k Šin-pishůk-ir*)
(2)*Insuš*(*i*)*nak ir hane-š Hůp*(*o*)*šan lawlire lima-š pat-r-a i-r rapa-š* (3)*i-r petra-š aka-r-a pet*(*i*)*-n-r-a … iˀ hata-k-ne* (or *hůta-k-ne*).

(1)Puzur-Sušinak, king of Awan(, the one begotten by Šin-pishůk) — (2)Insušinak loves him, (therefore,) (the city of) Hůpošan, the … — he (= Insušinak) burnt, enslaved under him (and) (3)*presented* to him. Whoever rebels … may *it/this* be *destroyed* (or: *realized*).

128 Text G is complete but it shows only the second half of the lines of the inscription. The missing part had to be written on a separate slab placed next to G (cf. André/Salvini 1989, 66–68 with fig. 9), which was not found. We refer to it as *G.
129 The engraver first made a dittography, repeating the previous *ku*, then attempted to correct it to *ši* (which graphically is identical to *ku* upside down) by adding a horizontal stroke at the top of the sign (see Fig. 9, above).
130 The text has *ha* instead of *m*.
131 Wrongly written as *pe-t-ra-s*, before being corrected to *pe-t-ra-š*.
132 Only in F.
133 Only in G and H.

Line 1: a. *pu-zu-r-su-ši-na-k* /puzur-sušinak/: See n. 30 above.

b. *ze-m-t a*(-*w*)-*wa-ni-r* /zemt awan-ir/: See n. 54 above. See also n. 36, on /zemt/.

c. *ku-ši-k ši-n-pi-s-hu-ki-r* /kuši-k šin-pishůk-ir/: For the PN Šin-pishůk, see n. 32 above. Cf. cun. *ku-ši-ik-e*, "the one begotten by her" (ElW 540). For the verb /kuši/, "to build, create, give birth", see, most recently, Romagnuolo (2012, 187–191).

Line 2: a. *i-n-su-š-na-k i-r ha-ne-š* /insuš(i)nak ir hane-š/: For the DN Insušinak, see n. 29 above. For /hane/, "to love", see EKI 73, n. 1. See also n. 50 above; and, for translating it with the present tense rather than a past tense (as Conjugation I would require), see section 2.2, pericope 1, comm. to line 4.

b. *hu*$_2$-*pu*$_2$-*š-ša-n la-w-li*$_3$-*ri li-m-ma-š* /hůp(o)šan lawlire lima-š/: See above, section 2.2, Cuneiform 8: 30 // Cuneiform 9: 24 with comm. *ad loc.*; and n. 71. The meaning of *la-w-li*$_3$-*ri* (corresponding to cun. *la-am-li-ir-ri~na*) is unknown. Since it occurs only in association with the GN Hůpošan, it should represent an epithet of the latter, either as an attribute or, more likely, as an apposition.[134] As far as Hůpošan is concerned, its name occurs as Ḫupsana (*ḫu-up-sa-na*^{ki}) in an Akkadian cuneiform inscription (written on a seated statue of Puzur-Sušinak and a fragmentary stele) that mentions the conquest of the city by the ruler of Susa (see Scheil 1905, 14 f., pl. 4 [stele]; id. 1913, 7–16, pls. 1–2a [statue Sb 55]; Sollberger/Kupper 1971, 126, IIG2e; Gelb/Kienast 1990, 321–324, Elam 2; Alvarez-Mon 2018, 179 f.) and Hůpšan (*hu-up-ša-an*) in Elamite cuneiform texts (EKI no. 54 §§ 18. 73 and 70 C § V).

c. *pa-t-ra i-r ra-p*$_2$-*pa-š* /pat-r-a i-r rapa-š/: Cf. (*pe*$_3$-*ti-ip* … *ta-ri-ip* …) *pa-at-pu-up* (var. *pa-at-pi u*$_3$-*pi*) *ra-ap-pa-ak-na*, "may they (i. e., *pe*$_3$-*ti-ip*, "the enemies" and *ta-ri-ip*, "the *foes*") be enslaved under me" (Cuneiform 8: 33 // Cuneiform 9: 27; see above, section 2.2, pericope 5); and *pe-ti-ir u*$_2$-*ri ir pa*$_2$-*at-ru-ur ta-at-ni*, "my enemy — may you place him under me" (EKI no. 45 § 7). The hapax /pat-r-a/ is probably to be analyzed as /pat/ (preposition: "under") + /r/ (delocutive class-marker) + /a/ ('final' suffix; cf. Krebernik [4]2021, 212), with /r/ referring to the city of Hůpošan, which is therefore treated as a noun of the animate class.

Line 3: a. *i-r pe-t-ra-š* /i-r petra-š/: Morphologically, we can recognize a third person singular verbal form of Conjugation I preceded by the accusative resumptive pronoun of the animate class. Unfortunately, the verb /petra/ is a hapax legomenon and its meaning is unknown. The proposed translation is but a guess based on the context and imagining the following logical sequence of events: the god Insušinak first burnt the city of Hůpošan, then enslaved its citizens who had surrendered to him, finally gave it to Puzur-Sušinak to govern.

b. *a-k-ka-ra pe-t-n-ra* /aka-r-a pet(i)-n-r-a/: While in later phases of the Elamite language, *aka-r-a* is an indefinite pronoun that occurs only in negative sentences (see Bavant 2014, 274), in the texts of Puzur-Sušinak it functions as an indefinite relative pronoun, meaning "whoever" (see also above, section 2.3, step 11, LE text D: 2–3). As for the verb /pet(i)/, "to rebel", see Hallock 1969, 678, s. v. *beti-*; /pet(i)-n-r-a/ is then a third person singular form of Conjugation III. Note the 'final' suffix /a/ (cf. above, comm. to line 2c), here probably with a subordinating function (the clause in question being a relative clause).

c. *a*~*hu-n*(-)*ha*$^{?}$-*s-ki* | *lu*$^{?}$-*r*(-)𒄩-*m*$^{?}$-*ki*: unclear.

d. *i*$^{?}$ *ha~hu-t-ta-k-ne* /i hata-k-ne/ or /i hůta-k-ne/: The verb at the end of this sentence is epigraphically uncertain: it could be either /hata/, "to destroy" (see Steve 1967, 14 f., TZ 2: 6), or /hůta/, "to do, to make". Although the former makes better sense in the context of a curse formula, the latter cannot be excluded. Be that as it may, here we certainly have a verbal form of Conjugation II, with /ne/ being the precative suffix.

Acknowledgements: We would like to express our gratitude to some colleagues and friends who helped at various stages of the preparation of the present work, notably François Bridey and Julien Cuny (Department of Ancient Near Eastern Antiquities, Louvre) for making inscriptions J, K, L, M, N, O, and R available for study and providing their valuable curatorial insight; Francesco Giannone ('L'Orientale' University) for collating F, G, and H on the squeezes (inv. E 40, 41, and 45) in Scheil's collection of *estampages*, part of the Fond Labat kept at the École Pratique des Hautes Études, Paris, with the kind permission of Michaël Guichard; Annie Caubet, former curator of the Department of Ancient Near Eastern Antiquities at the Louvre, who brought the unpublished inscriptions M′, N′, and O′ to our attention; Massimo Vidale (Padua University), Walther Sallaberger, and two anonymous reviewers, who read previous versions of this manuscript and provided valuable observations and feedback; and, last but not least, Sean Corner (McMaster University), who carefully translated this paper into English.

134 Cf. Scheil (1932, 75): "Le qualificatif *lamlir* […] peut signifier *rûqu* ou *rapsu* "le lointain" ou "le vaste", comme s'exprimaient les Assyriens, en parlant des Gutî ou des Madaï, etc.".

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