Voices in stone: Studies in Luwian historical phonology

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á-mi-i BONUS-*sa-mi tá-ti* MATER-*na-ti-ha* DARE-*ma-za*

Dedicated to my dear parents.

Contents

Acknowledgements

Much scientific progress is said to be accomplished by 'dwarfs, standing on the shoulders of giants'.[1] This dissertation is no different. However, this work does not only rest on the achievements of great-minded (and great-bearded) scholars who founded and developed the field of Indo-European linguistics in the late 19th century and thereafter. It also rests on the various contributions of many personal 'giants', whom I am happy to acknowledge here.

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[1] This aphorism is attributed to Bernard of Chartres (c. 1120 CE), as recorded in John of Salisbury's *Metalogicon*: *Dicebat Bernardus Carnotensis nos esse quasi nanos gigantium humeris insidentes, ut possimus plura eis et remotiora videre*. "Bernard of Chartres used to say that we are as dwarfs sitting on the shoulders of giants, in order to see more and further than they." (own transl.). For a full history of its origins and use up until the second half of the twentieth century, see Merton 1965.

friends and colleagues: Chams ('Hey!') Bernard, Federico Dragoni, Louise Friis, Anthony Jakob, Rasmus Nielsen, Paulus van Sluis, Aljoša ('[xʲæˈɬo]') Šorgo, and Andrew Wigman. Many thanks for the lunches, the coffees, the discussions and the sparring sessions. Special thanks are due to Stefan Norbruis, my partner in crime, whose critical mind and ideas have helped increase the accuracy of many of this thesis' claims beyond what I would have been capable of achieving myself.

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Last but certainly not least, I acknowledge my large and ever-growing debt to Lis Kerr for adding love and happiness to this past year. Thank you for making me confident about life after a PhD, whatever happens.

Introduction

It cannot be denied that the Luwian language has an air of outlandishness about it to those who first become acquainted with it. To no small degree, this is due to its relative obscurity (compared to other languages from the Ancient Near East such as Sumerian, Akkadian or Hittite), as well as the cuneiform and hieroglyphic scripts in which Luwian has been transmitted to us. Even for those who study the language intently, it can be difficult at times to remember that all those meticulously crafted pictures of hands, cattle heads and triangles represent a language used by real people. Likewise, it is easy to forget that these signs represent spoken sounds as well, communicating thoughts and wishes, complaints and ideas to people who could understand them thousands of years ago, even though we did not even know about their existence until they were rediscovered in the last two centuries. This thesis tries to recover some of these sounds from their stone, clay and metal tombs in which they were buried and forgotten.[1]

When I embarked on this PhD journey, my supervisors and I agreed that my main objective would be to provide an updated version of prof. Craig Melchert's (1994) *Anatolian Historical Phonology*. After 25 years of new insights and updated sources, it has become outdated in some respects, even though it remains the most important source for anyone interested in the phonological details of the Anatolian languages and their Proto-Anatolian

[1] It is in this sense that historical linguistics, according to one of my students, can rightfully be called 'linguistic necromancy'.

and Proto-Indo-European origins. At the onset of my project, I knew full well that preparing a new *Anatolian Historical Phonology* would be a near-impossible feat to accomplish within the constraints of a PhD project. Indeed, just after a few months, as the discoveries that would appear in the first chapter of this thesis were materialising, it was clear that my dissertation would not be a mere replacement or update of Melchert's monumental work. Rather than building on Melchert's foundations (which would have involved simply restating a lot of correct observations made by my predecessors), I could make a greater contribution to the field of Anatolian historical phonology by focusing on specific outstanding questions. This is the reason why this dissertation has taken a distinct focus on Luwian and, to a lesser degree, on Lycian. It also explains its current shape, being a collection of five separate studies rather than a monograph.

Central question

Despite the variety of topics treated in these different parts and chapters, one central question resonates through all of them:

"Is there a rationale behind the randomness?"

Each chapter deals with a set of seemingly random elements and attempts to provide an explanation for the observed situation by uncovering hitherto unnoticed structural distributions or complementary relationships. In the first four chapters of this thesis, the 'system' takes the form of *contrast*: they start with the observation that both vowels and consonants are spelled in multiple different ways, even though our current understanding of Luwian phonology assumes that these variants mark one and the same phonetic and phonological feature. As we will see, however, the use of spelling variants is often not as random as commonly thought. One mode of writing often prevails over others in writing a particular lexeme or morpheme while it is wholly absent in the spelling of others. The underlying methodological principle I follow in these chapters is that systematic orthographic variation may well be indicative of underlying phonetic variation, simply put: the

scribes spelled words differently because they pronounced them differently. Naturally, not every spelling contrast needs to be principled, and not every principled spelling contrast needs to have a phonetic contrast at its basis (cf. Chapter 1); nevertheless, I believe this maxim ('contrast conveys meaning') is the most powerful heuristic tool at the disposal of any historical phonologist. As soon as we assume, *a priori*, that an instance of orthographic variation cannot reflect anything linguistic without checking if there is an underlying system, we close our eyes for potential new linguistic discoveries and miss an opportunity to obtain a better understanding of the phonetics and phonology underlying the script.

In Chapter 5, the underlying system takes the shape of *unity* rather than contrast on a different, more abstract level. We will not focus on spelling variation there, but on a set of phonetic developments that characteristically altered the shape of not only Luwian but also Lycian, a closely related language. Although these sound changes have been independently proposed and yield very different results on a phonetic level, there is greater cohesion between them than meets the eye. We will investigate on which fronts these sound changes bear similarity to one another and try to find a common trigger for their phonologisation in developments preceding them.

Outline of this thesis

This thesis consists of five chapters, each of which has been either published or submitted for publication in the past four years. The text has been modified slightly in some areas, in order to show their internal coherence and new insights that were not available at the time of publication and submission. Together, these chapters capture the most important aspects of Luwian phonology: vocalism (ch. 1–2), consonantism (ch. 3–4) and syllable structure (ch. 5). Although there is a clear focus on Luwian, the other Anatolian languages (most notably Lycian and Hittite) are frequently mentioned and used for comparison in order to interpret the Luwian material as accurately as possible.

Chapter 1 investigates two ways in which vowels are spelled in Hieroglyphic Luwian: some vowels are simply written as part of a consonant-

vowel sign, such as the vowel *a* in HLuw. *i-zi-i-ha* 'I did'. Elsewhere, however, we find *i-zi-i-ha-a*, with an additional vowel sign *a*, even though there is no reason to expect that the vowel is phonetically or phonologically different. This chapter departs from the idea that spellings of the latter type ('plene spellings') could be used for aesthetic reasons. Currently, it is assumed that the scribes used these spellings in order to avoid gaps in only a specific subset of hieroglyphic texts. In this chapter, the validity of this space-filler idea is tested for the entire Iron Age corpus.

Chapter 2 is the thematic sequel to the first chapter. It deals with a substantial group of plene spellings that cannot safely be explained as space-fillers, and tests the hypothesis that these vowel signs were used as markers of vowel length instead. The use of extra vowel signs to mark long vowels as opposed to short ones is known from cuneiform languages such as Hittite, but this would be the first time that the same phenomenon is recognised in Hieroglyphic Luwian as well. Even though the presence of phonemic vowel length is commonly assumed for Hieroglyphic Luwian, no direct evidence has been presented thus far of its direct representation in writing.

Chapter 3 is the first chapter of the part of this dissertation dealing with consonantism. It investigates the use of the Hieroglyphic Luwian signs <ta> and <tá>  to spell dental stops followed by the vowel *a*. For many years, these two signs had been regarded as variants that did not spell out any underlying phonetic difference. Recently, however, Rieken (2010) argued that there *is* in fact a distribution: some words are always spelled with <ta> and never with <tá>, while yet others show an interchange of <ta> and <tá>. This article makes some adjustments to Rieken's representation of the distribution, based on data from a larger corpus, and gives two new possible phonetic interpretations that are more in line with phonetic typology.

Chapter 4 continues the investigation of the spelling of dental stops + *a* in Luwian, but this time for Cuneiform Luwian, where we find variation in the use of the cuneiform signs TA  and DA  . Kloekhorst (2010) discovered that the use of these two signs in Hittite is non-randomly distributed, and that different spelling patterns are used to mark different phonetic values. This chapter investigates whether the same spelling distributions can be observed in the Luwian data from the area of Kizzuwatna, and what the differences between Cuneiform Luwian and Hittite spelling might

tell us about the phonetic value of dental stops in Cuneiform Luwian as well as Proto-Anatolian.

Chapter 5 focuses on two independently proposed phonetic developments that took place in the prehistory of the Luwic languages (of which Luwian and Lycian are the most prominent members): *Čop's Law* and *Open Syllable Lengthening*. It is argued that these sound laws operate on complementary inputs and yield the same effects on an abstract level. At the same time, this chapter considers the possibility that the phonologisation of these developments in pre-Proto-Luwic can be understood by looking at the phonological system as it was inherited from Proto-Anatolian. We will investigate whether it is possible to see the two sound laws under scrutiny in this chapter as a logical and natural continuation of a tendency that had already begun to manifest itself in late Proto-Anatolian.

The concluding chapter will summarise the main findings obtained in the preceding chapters, and will briefly consider their consequences for the reconstruction of Proto-Anatolian and Proto-Indo-European.

Aims

This dissertation has the following two main aims. First, on a concrete level, it improves our understanding of the synchronic phonological system of Luwian by pointing out hitherto unnoticed phonetic and phonological contrasts. Similarly, this thesis accounts for the synchronic facts by providing historical scenarios elucidating the linguistic history of Luwian (and Lycian) all the way back to Proto-Indo-European. It uses the past to provide an explanation for the present, and uses the present to reconstruct the past.

On a second, more abstract level, this dissertation tries to eliminate several puzzling aspects of Luwian spelling, phonetics and phonology generally considered random or strange. By uncovering a hidden rationale behind orthographic and phonetic variability, many linguistic phenomena in Luwian are open to comparison with similar features attested in languages spoken in a completely different time period and part of the world. For instance, the erratic spelling of vowels in Hieroglyphic Luwian can now be compared with space-filling practices in other writing systems (such as Maya hiero-

glyphs or the Manichaean script). Its use of plene spelling to write long vowels, on the other hand, is strongly reminiscent of the marking of long vowels in the cuneiform languages, early Latin inscriptions and even modern Dutch.[2] Likewise, 'Čop's Law', describing the tonic gemination that affected the Luwic languages, finds typological parallels in various Austronesian languages (cf. Blevins 2004: 173f.).

As such, these comparisons render Luwian less outlandish than it may seem at first glance. Buried beneath the orthographical peculiarities and phonetic/phonological unknowns, we see systems and changes that are in accordance with patterns we see in many other languages. Ultimately, this is what brings Luwian closer to its own past and to the times after its extinction, in which very similar phenomena are found. In this way, the texts that have managed to preserve this language throughout the millennia do not only provide an opening into the linguistic faculty of Luwian speakers and their predecessors, but also, to a modest extent, that of humanity in general.

[2] In Dutch, however, the distinction between 'long' and 'short' vowels is also expressed in tenseness.

Abbreviations

abl. ablative case
acc. accusative case
act. active voice
adj. adjective
adv. adverb
BCE before common era
c. common gender
Car. Carian
ch. chapter
Chor. Chorasmian
CLuw. Cuneiform Luwian
dat. dative case
DN deity name
encl. enclitic
fr. fragment
fthc. forthcoming
gen.adj. genitival adjective
gen. genitive case
GN geographic name
Go. Gothic
Gr. Greek
Hitt. Hittite
HLuw. Hieroglyphic Luwian
Ho. Hieroglyphisch oben (part of the KARATEPE inscription)
Hom. Homerus/Homeric
Hu. Hieroglyphisch unten (part of the KARATEPE inscription)
HW² Johannes Friedrich et al., *Hethitisches Wörterbuch, 2nd edition*
Il. *Iliad*
imp. imperative mood
inf. infinitive
ins. instrumental case
KBo Keilschrifttexte aus Boghazköi
Khot. Khotanese
KUB Keilschrifturkunden aus Boghazköi
Lat. Latin
loc. locative case
Lyc. Lycian

Lyd. Lydian
med.-pass. medio-passive voice
MH Middle Hittite
MoDu. Modern Dutch
MoEng. Modern English
MoGerm. Modern German
MS Middle Script
n. neuter gender
NH New Hittite
nom. nominative case
NS New Script
obv. obverse side
OCS Old Church Slavonic
OH(itt.) Old Hittite
orthot. orthotonic
OS Old Script
OSL Open Syllable Lengthening
Pal. Palaic
PAnat. Proto-Anatolian
PIE Proto-Indo-European
PIr. Proto-Iranian
pl. plural number
PLuw. Proto-Luwic
PN personal name
poss. possessive
postpos. postposition
pres. present tense
pret. preterite tense
prev. preverb
ptc. participle
ptcl. particle
quot. quotative
refl. reflexive
rev. reverse side
sg. singular number
Skt. Sanskrit
subj. subject
ToB Tocharian B

CHAPTER **1**

Filling in the Facts
The Practice of Space-Filling in Hieroglyphic Luwian Inscriptions

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Filling in the Facts

The Practice of Space-Filling in Hieroglyphic Luwian Inscriptions

1

Abstract: This chapter explores the use of <CV-V> sign sequences (plene writing) in Hieroglyphic Luwian. It is argued that the vowel signs in these sequences are frequently used as space-fillers in almost all texts dateable to the Iron Age. Space-filling explains the presence of many vowel signs commonly taken as linguistically void, and a new transliteration method is proposed to mark these space-fillers in a uniform way. It is also shown that many vowel signs cannot have been used as space-fillers. Rather, these signs are linguistically significant and bound to express a phonetic feature. On a methodological level, this chapter considers how we can meaningfully distinguish space-fillers from linguistically real plene writing, as both were not marked differently by the scribes. The last section examines space-fillers in greater detail: their chronological distribution and vowel quality are treated, as are some conspicuous and rare types of space-filling.

1.1 Introduction

A typical Hieroglyphic Luwian text consists of one or more horizontal lines, whose reading direction changes with every line in a boustrophedon fashion: whenever a given line is read left-to-right, the following one is read right-to-left and vice versa. Within each line, signs are arranged in vertical 'sign columns', each usually containing two to four signs. The signs in each sign column are always read top-to-bottom. As is well known, the Hieroglyphic Luwian script is partly syllabic and partly logographic. By convention, syllabograms are transliterated in italics, e.g. *-mu-*, *-pa-*, *-zi-*, while for logograms, a capitalised Latin denotation is used (e.g. BOS for the sign indicating the concept 'cow' and PES for the sign used for 'to go' or 'foot'). Additionally, many texts employ the sign 𔓂, which is commonly used as a word-divider, transliterated as '|'. This sign marks the beginning of a new

word, starting with the sign directly following it. This sign is not used consistently, and several texts do not use it at all (Hawkins 2000: 4; Payne 2014: 17).[1] However, one text which does make consistent use of word-divider signs is ASSUR letter *a*, written on a lead strip, in which they are placed in a systematic way, cf. Figure 1.1.

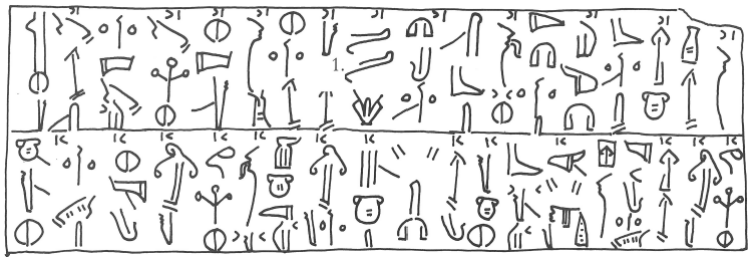

Figure 1.1: ASSUR letter *a* (obv.); after Hawkins (2000, part 3, plate 307).

Conspicuously, every word-divider sign is placed at the head of a sign column. Put differently, every single word in this letter starts at the top of the line. Close inspection of the five other ASSUR letters reveals that, apart from a small number of exceptions, this pattern holds true for all words in the ASSUR subcorpus (late 8th century BCE).[2]

At the same time, ASSUR letter *a* shows another salient feature, this time concerning the way scribes made use of the space available to them. It appears that every square centimetre of the lead strip is filled with signs, and that the scribe has not left any significant gaps in the text. Again, this goes for all ASSUR letters, which are densely and economically packed. Even in letter *b*, which ends before the end of the lead strip is reached, the written sections hardly show any space left unwritten, cf. Figure 1.2.

[1] Cf. Hawkins 2011b for an account of the origin and various functions of this sign in the Hieroglyphic Luwian corpus.

[2] The word-divider sign occurs in the middle of the line in the following instances (with '#' marking the beginning of a new sign column): ASSUR letter *e* § 13 #|*ni-i* |*ARHA*# and ASSUR letter *f*+*g* § 4 #|PRAE-*i* |(PONERE)#*sà-ti-nu-i*#, § 6 #|*ARHA* |*wa*/*i*#*la-mi-na-a*#, § 7 #|*ARHA* |*wa*/*i*#*la-u-ta*#, § 16 #|*tu-u* |VERSUS-*na*# and § 17 #*wa*/*i-na* |*ni-i*#. Apart from these six instances, however, the general pattern observed in ASSUR letters *a*, *b* and *d* certainly holds for *e* and *f*+*g* as well: also in these letters, word-divider signs are overwhelmingly found at the top of a sign column.

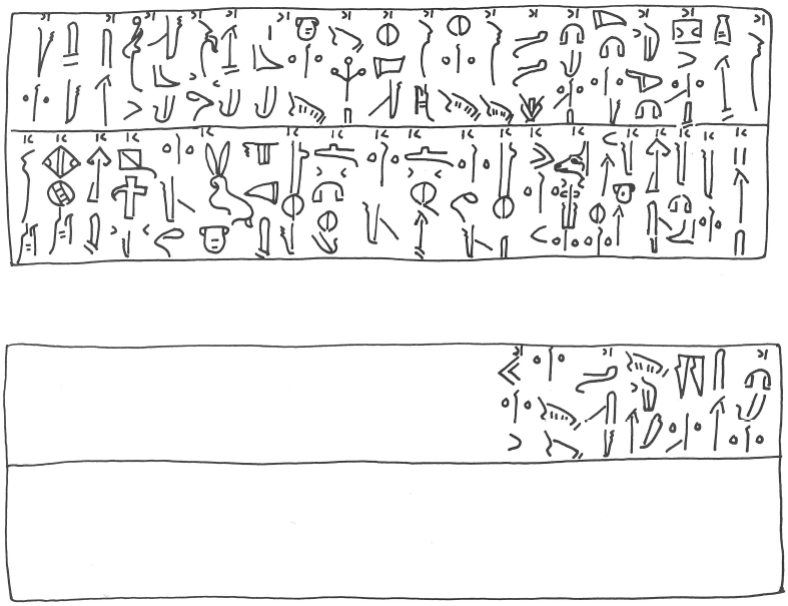

Figure 1.2: ASSUR letter *b*; after Hawkins (2000, part 3, plate 307).

How can these two phenomena be reconciled? Now that we have seen that virtually every word starts at the top of the line (even those which are not headed by a word-divider sign), we may ask ourselves where words typically end. In this respect, the observation that the letters hardly show any unused space suggests that every word in these texts ends at the bottom of the line, allowing the scribe to start a new word at the head of a new sign column.

Can this be considered a coincidence? Was the scribe simply able to fit all words perfectly in one or more columns, starting words at the top of the line and ending them at the bottom without leaving any gaps? Given the fact that Luwian words are certainly not uniform in length and consist of signs of varying dimensions and size, this is difficult to believe. If the scribes had wanted to start every new word at the top of the line, they would not have been able to fill up one or more sign columns perfectly, and sometimes they would have had to leave visible gaps at the bottom of a sign column. Conversely, if the scribes had taken the avoidance of gaps as a guiding principle,

we would expect them to have started new words in the middle of a sign column more often. Clearly, the ASSUR scribes did something extra to ensure that this did not happen.

Let us take a closer look at the ASSUR letters. It has long been recognised by various scholars (e.g. Hawkins 2000: 533) that the scribes of these letters often added the vowel signs <a> (= 𔓰) and <i> (= 𔓱) to words where we do not expect to find them. In fact, the addition of these vowel signs often makes no sense in phonetic and phonological terms. A good example of this practice is found in ASSUR letter *e* § 18 |FEMINA-*ti-na-i*, cf. Figure 1.3.

Figure 1.3: ASSUR letter *e* § 18; after Hawkins (2000, part 3, plate 311).

Whether one chooses to translate this word as a substantive (Hawkins 2000: 536: 'woman') or an adjective (Yakubovich 2013ff. s.v. '*wanatti*(*ya*)-': 'woman's, wife's') in this sentence, it is clear that we need an accusative singular form of the common gender here, ending in /-n/.[3] Therefore, the word-final sign <i> cannot reflect a phonetic [i] or phonological /i/ here, and Hawkins marks its apparent superfluity by transliterating it in superscript in his Iron Age corpus (Hawkins 2000): |FEMINA-*ti-na*$^{-i}$.

It should be noted that the use of superscript for <i> signs that cannot have any phonetic value is not common practice in Hawkins 2000. It is applied only in the ASSUR letters and in the few texts mentioned in footnote 6, where Hawkins' commentary marks them as having a special function (see below). Outside of these texts, word-final <i> is simply transliterated as

[3] The entire sentence runs as follows: |*179.*347.5(-)*wa*/*i-sà-pa-ha-wa*/*i-mu* |FEMINA-*ti-na-i* |VIA-*wa*/*i-ni-i*. Hawkins (2000: 536) translates: 'Send me a woman (for? the) WASAPA!', while the Annotated Corpus of Luwian Texts suggests 'Send me a woman's dress!', interpreting *179.*347.5(-)*wa*/*i-sà-pa* as /uaspan/ 'dress' (acc.sg.c.).

such, although it is still ignored in linguistic analyses whenever it is clearly not *sprachwirklich*. Spurious word-final <a> signs, on the other hand, are commonly transliterated with an apostrophe <'> throughout Hawkins 2000 and Hieroglyphic Luwian scholarship more generally. We will return to the question of how to transliterate these linguistically empty vowel signs at the end of Section 1.2.

It is not only consonant-final words in the ASSUR letters that are affected by the enigmatic addition of word-final <a> and <i>. These signs also show up unexpectedly after words ending in a vowel. A good example is the prohibitive negator |*ni-i-a* 'not' in letter *f*+*g* § 26, cf. Figure 1.4.

Figure 1.4: ASSUR letter *f*+*g* § 26; after Hawkins (2000, part 3, plate 313).

According to Yakubovich 2013ff. this word occurs 33 times in our Hieroglyphic Luwian corpus, and it is normally spelled as either <ni-i> or <ni>. Only here, in the ASSUR letters, do we find |*ni-i-a* with an additional <a>, making it very suspicious. From a language-internal point of view, this <a> is also curious for not being connected to the preceding /i/ using the sign <ia>, which is normally used to mark the glide in between [i] and [a]. Again, we see that this extra sign can hardly be understood in linguistic terms, which is why Hawkins marks it with an apostrophe in his corpus: |*ni-i-'*, indicating that we may safely ignore it in our phonetic and phonological transliterations.

Now, the question arises as to why the scribes took effort to write the <i> in |FEMINA-*ti-na-i* and the <a> in |*ni-i-'* given that their presence cannot be understood in linguistic terms. For this reason, it has generally been accepted that the presence of many <a> and <i> signs in the ASSUR letters is governed by aesthetic considerations. More specifically, Hawkins (2000:

533) marks them as a 'space-filler' or 'word-ender', and indeed, we see that the <i> in |FEMINA-*ti-na-i* and the <a> in |*ni-i-*' close off their respective sign columns and allow the scribe to start a new word at the top line without leaving a gap at the bottom.

The notion that Luwian scribes experienced a *horror vacui* and that they used vowel signs as some sort of space-filler or word-divider is not new. Some scholars have even extended its validity to the entire Hieroglyphic Luwian corpus. Melchert (1994a: 37) notes in general terms that '"scriptio plena" in hieroglyphic spellings has an aesthetic function and does not mark length or accent.'[4] In 1996, he further elucidated his claim by stating that 'one aesthetic principle of the scribes was that all available space should be filled in a balanced way' (Melchert 1996: 121) without, however, elaborating on his idea of what 'balanced' means exactly. Additionally, the same chapter contains the implication that not only the vowel signs <a> and <i> may be used as space-fillers, but also the sign <u> (=  or ).[5]

This latter view has not met with general acceptance by other scholars. Hawkins (2000) makes numerous references to <a> and exceptionally <i> as a 'space-filler/word-ender' in a few texts beyond the ASSUR letters (e.g. Hawkins 2000: 264, *apud* § 6).[6] Nowhere, however, does he mention that <u> is used in a similar way. Melchert himself also seems to have abandoned his earlier view: in his 2010 article on the Hieroglyphic Luwian sign <á>, he only mentions the use of <a> and, in 'some later texts', <i> as a space-filler (Melchert 2010: 148). Payne (2014: 17) follows Melchert and Hawkins:

[4] The term 'scriptio plena' (= 'plene writing') is taken from the cuneiform writing tradition, where it can be defined as the writing of vowel signs which echo the vocalic value of an adjacent CV-sign, e.g. *-pa-a-*, *-u-um-*, *-zi-i-it-*. In Hittite, the various functions of plene writing have been a hotly debated topic for many decades, and no complete consensus has yet been reached. (Kloekhorst 2014: 13–18 provides a succinct overview of previous scholarship.) Research into the function of Cuneiform Luwian plene writing has been undertaken most recently by Rieken (2016: on plene *i*) and earlier by Simon (2010: on word-initial plene writing). Plene writing in Palaic still awaits a dedicated treatment.

[5] More specifically, this becomes clear from an example of space-filling as presented by Melchert (1996: 123): 'The only function of CV-V spellings (such as *-tu-u* 'to him/her') is aesthetic (filling space, as mentioned above).'

[6] Specifically, Hawkins signals the texts MARAŞ 1, MARAŞ 14 and İSKENDERUN in addition to the ASSUR letters. See also Section 1.5.2 below.

'Thus signs *450 *a*, and rarely *209 *i*, experience secondary usage marking the end of a word, possibly originally used as a space filler.' Most recently, Yakubovich (2015: 7) has argued in more general terms that 'plene spellings in hieroglyphic texts (...) have not been sufficiently studied, but at least in some cases they must have had an ornamental function, helping to align word-boundaries with ends of vertical columns.'

1.2 Existence of Space-Fillers in the Iron Age Hieroglyphic Luwian Corpus

In many important respects, the ASSUR letters treated above are similar to the other texts belonging to the Iron Age Hieroglyphic Luwian corpus. Firstly, in almost all texts, there is a very strong tendency to start every new word at the top of the line. This is best visible in texts employing many word-divider signs, which are placed with great consistency at the head of a sign column, as illustrated by lines two and three of TELL AHMAR 5 (late 10th-early 9th century BCE), cf. Figure 1.5.

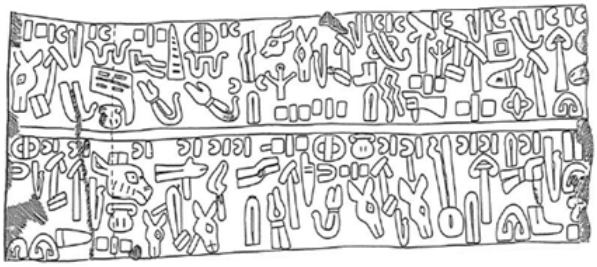

Figure 1.5: TELL AHMAR 5 ll. 2–3; after Hawkins (2000, part 3, plate 96).

As in the ASSUR letters, this rule was not iron-clad, and we find that scribes sometimes started a new word in the middle of a column. A good example is the PORSUK inscription, from the early 7th century BCE (Simon 2013b), where the word-divider signs are not bound to the top line but occur freely in the middle of sign columns as well, cf. Figure 1.6.

It must be said, however, that instances such as this are quite rare. In

Figure 1.6: PORSUK; after Hawkins (2000, part 3, plate 302).

most texts, the use of the word-divider sign in the middle of a sign column forms an exception to the strong general trend of having this sign at the head of a sign column. In fact, of all the texts in Hawkins' (2000) corpus, there are only four texts of considerable size where it could be considered the norm to put the word-divider in column-medial position: ANCOZ 7 (late 9th century BCE), KÖRKÜN (late 9th century BCE), whose sign arrangement is remarkable for other reasons as well, PORSUK (early 7th century BCE), and probably TÜNP 1 (mid-8th century BCE).[7]

Another feature which the larger Iron Age corpus has in common with the ASSUR letters is that the texts hardly show any gaps. Texts generally display a very economical use of available space, and signs are often densely packed together. Nowhere can this be seen more clearly than in KARKAMIŠ A6, cf. Figure 1.7.

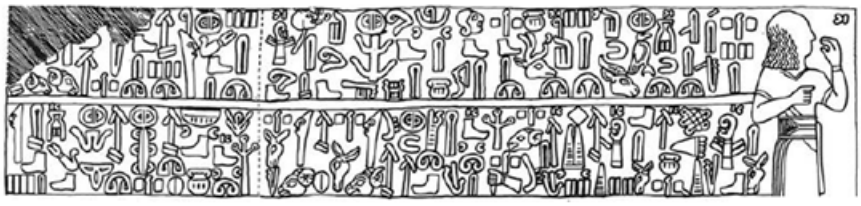

Figure 1.7: KARKAMIŠ A6, ll. 1–2; after Hawkins (2000, part 3, plate 33).

This conscious use of all available space strongly suggests that also the scribes of texts not belonging to the ASSUR corpus experienced a *horror*

[7] The obverse side of KÖRKÜN is adorned by a sculpture of the Storm God, and signs are scattered all around it without any clear line structure. This makes it difficult to determine the order in which signs are to be read in this inscription.

vacui. This notion is strengthened by the fact that we sometimes find scribes adjusting the size and orientation of the signs they use. Clear examples are provided by the slanted <a> signs in MALPINAR § 11 *a-tá-a* /anta/ 'in(side)', BOHÇA § 4 |(DEUS)CERVUS$_2$*-ti-pa-wa*/*i-ta-a* 'Runtiya' (DN, dat.-loc.sg.c.) and TELL AHMAR 1 § 13 *pa-si-a* 'his' (gen.sg.c.), cf. Figure 1.8.[8]

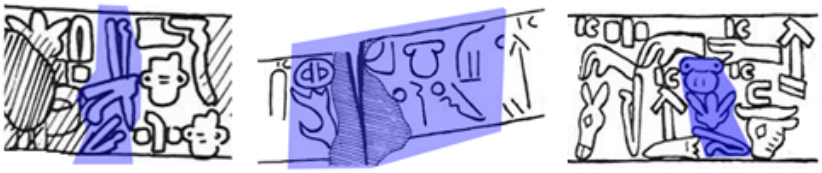

Figure 1.8: MALPINAR § 11 *a-tá-a*, BOHÇA § 4 |(DEUS)CERVUS$_2$*-ti-pa-wa*/*i-ta-a*, and TELL AHMAR 1 § 13 *pa-si-a*; after Hawkins (2000, part 3, plates 168, 265 and 100, respectively).

Also <u> signs occasionally fall prey to this Procrustean bed: they are turned and stretched to make them fill up a certain space more conveniently in KULULU 5 § 10 DELERE-*nú-tu-u* /marnuntu/ 'destroy' (imp.3pl.act.), ÇİFTLİK § 16 *pi-ia-tu-u* /piantu/ 'give' (id.) and ALEPPO 3 § 2 *wa*/*i-tú-u* /=θu/ 'him' (3sg.encl.dat-loc.), cf. Figure 1.9.[9]

Figure 1.9: KULULU 5 § 10 DELERE-*nú-tu-u*, ÇİFTLİK § 16 *pi-ia-tu-u*, and ALEPPO 3 § 2 *wa*/*i-tú-u*; after Hawkins (2000, part 3, plates 271, 249 and 320, respectively).

[8] See the end of Section 1.2 for more information about these so-called 'initial-a-final' spellings.

[9] Following Hajnal 1995: 32[11] and Rieken 2010b: 306, I assume that the Proto-Anatolian 'lenis' stops (< PIE *$b^{(h)}$, *$d^{(h)}$, *$ǵ^{(h)}$, *$g^{(h)}$, *$g^{w(h)}$) surface as fricatives in Hieroglyphic Luwian and were phonetically voiced in intervocalic position, cf. Section 3.4.3.

We face the same problem as in our treatment of the ASSUR letters: how can these two observations, namely words beginning consistently at the top of the line and the absence of significant gaps, co-exist? It transpires that, as with the ASSUR letters, the other Iron-Age texts also commonly contain words that are enlarged with a vowel sign where we would not expect one. Comparable to |FEMINA-*ti-na-i* in ASSUR letter e § 18, we find, for instance, |*kwa*/*i-sa-a* in SULTANHAN § 46 (740–730 BCE), which must stand for /k^{w}is/, the nom.sg.c. of the relative pronoun, cf. Figure 1.10.

Figure 1.10: SULTANHAN § 46 |*kwa*/*i-sa-a*; after Hawkins (2000, part 3, plate 261).

It is commonly accepted that the sign <a> in this word cannot be sprachwirklich; therefore, it is conventionally transliterated using an apostrophe: |*kwa*/*i-sa-'* (cf. Hawkins 2000: 467). While this is certainly correct, we are left questioning why the scribe took pains to write this sign here at all. Why did he not simply start writing a new word after the sign <sa>? The answer becomes apparent from looking at the way the sign <a> is placed within the inscription itself. We see that the sign <a> perfectly fills the space between <sa> and the bottom of the line, and that both the preceding and following words, like |*kwa*/*i-sa-'*, start at the top of the line. This suggests that the sign <a> is used to fill up the sign column, allowing the scribe to start a new word at the top of the line without leaving a gap.

Now, let us turn to words ending in vowels. As in the ASSUR subcorpus, many texts contain words enlarged with vowel signs which defy any linguistic explanation. A good example for words ending in /-a/ is MARAŞ 4 § 14 |*i-zi-i-ha-a* 'I made' showing the 1sg.pret.act. ending /-ha/ attached to the verbal stem *izi-* 'to do', cf. Figure 1.11.

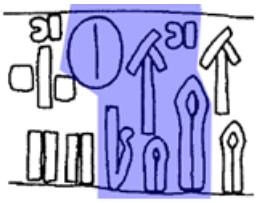

Figure 1.11: MARAŞ 4 § 14 |*i-zi-i-ha-a*; after Hawkins (2000, part 3, plate 109).

The sign <ha> is normally used to express the verbal ending /-ha/ on its own. For this reason, this word is commonly transliterated as |*i-zi-i-ha-*', and its word-final <a> is disregarded in linguistic analyses (cf. Hawkins 2000: 257). As with |*kwa*/*i-sa-*', however, this leaves the presence of <a> here unexplained. Why would the scribe have written this sign if it serves no linguistic purpose? From its placement in the inscription, we can see that this sign's main *raison d'être* may well be to fill a potential gap below the preceding sign <ha>.

Until now, we have only seen cases of spurious word-final <a>, which is commonly transliterated using an apostrophe, and <i>, which Hawkins (2000) transliterates as superscript only in a very limited body of texts (cf. footnote 6 and Section 1.5.2) if it is interpreted as a space-filler. However, our corpus contains many other examples of <i> which clearly cannot have been sprachwirklich and whose presence can be motivated easily from a space-filling perspective. The same goes for the many unexpected appearances of the vowel sign <u> in our corpus, which are never transliterated in any special way in Hawkins 2000 although the same logic applies to them. For the former, one may take KARKAMIŠ A2+3 § 24 (DEUS)TONITRUS-*tá-ti-i* (abl.-ins. of *Tarhunt-* [DN], ending in /-θi/). A clear example of the latter is found in ANCOZ 7 § 14 |*á-sa-tu-u* 'they must be' (imp.3pl.act., ending in /-ntu/), cf. Figure 1.12.

As with <a> in |*i-zi-i-ha-*' treated above (Figure 1.11), it is generally agreed that both <i> and <u> in the examples under scrutiny here have no bearing on the phonetic or phonological analysis of the word of which they are part, which leaves their presence unexplained. Again, we see that an interpretation in terms of space-filling provides a perfect motivation for their addition:

Figure 1.12: KARKAMIŠ A2+3 § 24 (DEUS)TONITRUS-*tá-ti-i* and ANCOZ 7 § 14 |*á-sa-tu-u*; after Hawkins (2000, part 3, plates 21 and 186, respectively).

their placement at the bottom of the sign column strongly suggests that the vowel signs here are used as space-fillers, ensuring that the scribe did not leave a gap at the bottom of the line.

It is strange and confusing, however, to have multiple different transliterations for these unreal vowel signs (i.e. apostrophe for <a>, sometimes superscript for <i> and no marking at all for <u>), while their presence can be attributed to the same underlying mechanism. For consistency's sake, I therefore propose that all three vowel signs be transliterated using superscript whenever they are used as space-fillers: thus not only (DEUS)TONITRUS-*tá-ti*$^{-i}$ and |*á-sa-tu*$^{-u}$, but also |*i-zi-i-ha*$^{-a}$ and |*kwa*/*i-sa*$^{-a}$.

The observation that not only the ASSUR letters but also other Iron Age texts attest the use of <a>, <i>, <u> as space-filler signs allows for comparison between the two: while the ASSUR letters show a seemingly random interchange of <a> and <i> as space-filler vowels, the choice for a vowel sign in nearly all other texts seems to be governed by a specific rule. The examples |*i-zi-i-ha*$^{-a}$, (DEUS)TONITRUS-*tá-ti*$^{-i}$ and |*á-sa-tu*$^{-u}$ attest to the fact that scribes used the vowel sign corresponding to the vocalism of the preceding sign. In other words: words ending in <-Ca> are regularly supplemented by <a>; words in <-Ci> by <i> and those in <-Cu> by <u>. Note that this principle also holds for words ending in a consonant, such as |*kwa*/*i-sa*$^{-a}$ /k^{w}is/. Even though the vocalic component of the sign <sa> is irrelevant for the phonological and phonetic analysis of this word, it nevertheless determines the quality of the space-filler vowel sign as <a>. The rare exceptions to this rule outside the ASSUR subcorpus will be treated below (Section 1.5.2).

At this point, it should also be mentioned that, apart from space-filling, Hieroglyphic Luwian texts show another group of word-final <a> signs that do not mark a real phonetic word-final [-a]. These are instances of a phenomenon called 'initial-a-final', which occurs in words starting with /a-/ or /ʔa-/ and involves writing these sequences with word-final <a>, as in KARKAMIŠ A23 § 8 <mu-a> for /ʔamu/ 'I'.[10] The idea is that /a-/ and /ʔa-/ were still pronounced word-initially, but somehow came to be written with word-final <a>. This scribal practice is very common in texts belonging to the Transitional Period (1180–850 BCE), after which it rapidly disappears from our texts (Melchert 2010: 151; Burgin 2016: 16). Many instances of spurious word-final *a* in texts dated before 850 BCE can be interpreted in this way without having to recourse to space-filling. Nevertheless, space-filling remains the only viable interpretation of various occurrences of plene <a>, <i> and <u> in many Transitional Period texts, e.g. KARKAMIŠ A13*d* § 3 |*á-tá-na-wa*/*i-na*$^{-a}$ '?' (acc.sg.c., cf. Figure 1.23), KARKAMIŠ A11*b*+*c* § 17 |*za-ti*$^{-i}$ 'this' (dat.-loc.sg.), BOROWSKI 3 § 4 |(PES$_2$)*tara*/*i-zi-ha*$^{-a}$ '?' (1sg.pret.act.), KARKAMIŠ A2+3 § 15 |(PES$_2$.PES)*tara*/*i-pi-tu*$^{-u}$ (imp.3sg.act.). This clearly shows that space-filling as a phenomenon in fact coexisted alongside initial-a-final, and that we can also use it to explain the presence of spurious <a>, <i> and <u> in Transitional Period texts. We will return to the question of how to distinguish initial-a-final from space-filling in Section 1.4.

1.3 Existence of True Plene Writing

The existence of the practice of space-filling in the Iron Age corpus raises the important question as to whether we can now interpret every single sequence of <CV-V> in Hieroglyphic Luwian as an aesthetically motivated space-filler. To test this hypothesis, we need to look for counterexamples

[10] Hawkins' (2000) corpus of Iron Age inscriptions does not employ a special transliteration to mark initial-a-final because the phenomenon had not been recognised as such at the time of publication: it therefore marks instances of initial-a-final <a> with an apostrophe just like any other spurious word-final <a> sign. Currently, initial-a-final is transliterated using an asterisk: *mu-*a*, as in, e.g., Hawkins 2011a.
My analysis of /ʔamu/ with a glottal stop phoneme /ʔ/ is based on Kloekhorst 2004.

in the form of <CV-V> sequences where it is highly unlikely or impossible that the vowel sign has been added to fill in any gaps. A good place to start looking for these is in word-initial or word-medial <CV-V> combinations. A clear example is KARKAMIŠ A11*b*+*c* § 23 |*za-a-zi-pa-wa*/*i-tá* 'these' (nom. pl.c.), cf. Figure 1.13.

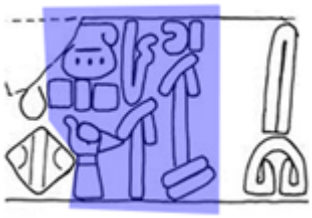

Figure 1.13: KARKAMIŠ A11*b*+*c* § 23 |*za-a-zi-pa-wa*/*i-tá*; after Hawkins (2000, part 3, plate 17).

Note that the sign <a> here does not fill any gaps that would have been left by the scribe starting the next word at the top of a new sign column: the scribe could easily have written <|*za-zi-pa*-°> in the first two columns if he had wanted to do so. Therefore, the scribe's addition of <a> here seems to be motivated by other factors than aesthetics. It is probable that the <a> is not merely ornamental but reflects some linguistically real feature here, which the scribe wanted to express.

The same can be argued for the sign <i> in KARKAMIŠ A12 § 1 |"IUDEX"-*ní-i-sa* 'ruler' (nom.sg.c.), cf. Figure 1.14.

Figure 1.14: KARKAMIŠ A12 § 1 |"IUDEX"-*ní-i-sa*; after Hawkins (2000, part 3, plate 23).

Again, the scribe could simply have written the sign <sa> at the top of the following column, yielding **|"IUDEX"-*ní-sa*. In accordance with the rules for space-filling established above, we would expect him to fill the gap appearing underneath <sa> with the sign <a>: **|"IUDEX"-*ní-sa*$^{-a}$. The fact that the scribe wrote word-medial <i> instead indicates that he wanted to mark something special about the /i/ in this word. Lastly, also the sign <u> is also used in several <CV-V> spellings where it cannot have been used as a space-filler: a good example is found in SULTANHAN § 26 |*wa*/*i-tu-u* 'to him', cf. Figure 1.15.

Figure 1.15: SULTANHAN § 26 |*wa*/*i-tu-u*; after Hawkins (2000, part 3, plate 259).

This is one of the uncommon cases where a word-divider is put not at the head, but in the middle of a sign column. Interestingly, exceptions like this one are extremely helpful in detecting non-filling word-final vowel signs. We see that the <u> after <tu> does not close off an existing column. On the contrary: it opens up a new one. If the scribe had wanted to, he could have finished |*wa*/*i-tu* at the bottom of the line and started the new word neatly heading a following column. It is clear that the scribe felt that the <u> was necessary here and that he wanted to express something with it.

Cases like these show that not all vowel signs in <CV-V> spellings should be interpreted as mere ornaments. They do not fill any gaps and do nothing to allow the scribe to start the next word at the top of the line.[11] Rather, these instances are best taken as 'true' Hieroglyphic Luwian plene writings,

[11] The notion that at least <a> sometimes functions as a secondary word-divider, as argued by Hawkins (2000: *passim*) and Payne (2014: 17), seems unnecessary. While it is true that we find many instances where <a> fills an entire column after a word (e.g. KARKAMIŠ A1*a* § 4 *mu-pa-wa*/*i-a*), these can always be interpreted as cases of initial-a-final (see below,

and we may expect to find their appearance governed by some phonetic and/or phonological reality. The function, or functions, of true plene writing in Hieroglyphic Luwian will be investigated in Chapter 2.

1.4 Distinguishing Space-Fillers from True Plene Spellings

Now that we have seen that <CV-V> combinations can reflect both orthographic space-filling and true plene writing, the question that logically imposes itself now is how we can distinguish one from the other. How can we tell whether an <a>, <i> or <u> in any given <CV-V> sequence is used as a true plene spelling or as a space-filler?

Unfortunately, it is not possible to give a universal set of guidelines with which every vowel sign in <CV-V> combinations can be mechanically classified as either a space-filler or a true plene spelling. The only way to decide this is by looking at the placement of each individual sign within a word and within the inscription itself, which can give important clues as to whether the sign should be taken as a true plene spelling or not.

In word-medial position (cf. |*za-a-zi-pa-wa*/*i-tá*, Figure 1.13), it is not so difficult in most cases to make the distinction between space-filler and true plene: the vast majority of vowel signs occurring in the middle of words do not fill a certain gap and can therefore be taken as true plene (Section 2.3.1). There are cases, however, where vowel signs in the middle of words may very well function as space-fillers: naturally, these are impossible to detect through the use of a transliteration. We will see some more examples of this 'medial space-filling' in Section 1.5.3.

In word-final position, on the other hand, the decision to interpret a vowel sign as a plene spelling or a space-filler is more difficult and often relies on data from other attestations of the same word. This is illustrated by the example of KIRÇOĞLU § 2 *za-a* 'this' (nom.-acc.sg.n.), cf. Figure 1.16.

A priori, it is impossible to determine whether <a> is a space-filler or

end of Section 1.4) or as a word-initial <a> belonging to a following *a-wa*/*i-*°. There is no need to attribute a separate word-dividing function to the sign <a>.

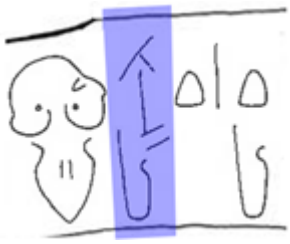

Figure 1.16: KIRÇOĞLU § 2 *za-a*; after Hawkins (2000, part 3, plate 204).

an instance of true plene spelling on the basis of this attestation alone. The placement of <a>, closing off a sign column, would merely support an interpretation in terms of space-filling, but cannot prove it in any definitive way. On the other hand, the possibility that <a> closes off the sign column by sheer coincidence prohibits us from interpreting it as a case of true plene. All in all, the matter cannot be decided without taking external evidence into account.

Now, in the case of <za-a> in particular, such evidence is provided in the form of a cliticised attestation which allows us to argue in favour of an interpretation as true plene. We find *za-a* followed by the enclitic quotative particle /=ua/ in MEHARDE § 1 *za-a-wa/i* 'this', cf. Figure 1.17.

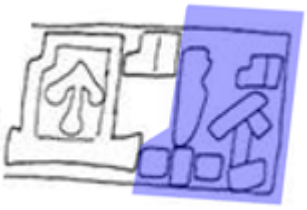

Figure 1.17: MEHARDE § 1 *za-a-wa/i*; after Hawkins (2000, part 3, plate 226).

Since the scribe did not need the <a> to fill a gap after the end of a word, we can safely rule out an interpretation as space-filler here and take the <a> as true plene. Support for this conclusion comes from other forms in the paradigm of *za-* 'this'. Corresponding to the nom.-acc.sg.n. here, we find nom.sg.c. *za-a-sa* (8x) 'this' and the acc.sg.c. *za-a-na* (6x) 'id.' elsewhere in

Hawkins' Iron Age corpus. In each of these fourteen attestations, <a> must be a true plene spelling, as it is not used to avoid a gap. The true plene in the related form nom.pl.c. |*za-a-zi-pa-wa*/*i-tá* 'these' (Figure 1.13) fits this observation nicely. By virtue of this evidence, it is possible or perhaps even likely that also the <a> in KIRÇOĞLU § 2 *za-a* represents true plene spelling here. Note, however, that this interpretation is not directly borne out by the sign placement of *za-a* itself.

Next to cliticisation, rare occurrences of column-medial word-divider signs (cf. Section 1.2) also aid in deciding whether a word-final vowel could ultimately represent a true plene spelling or not. We have seen an example of this already in |*wa*/*i-tu-u* 'to him' (cf. Figure 1.15). Another example with <i> is SULTANHAN § 42 |*ni-i* 'not', with |*á-sa-tu*$^{-u-a}$ 'it must be' (imp.3sg.) beginning half-way in the same sign column, cf. Figure 1.18.[12]

Figure 1.18: SULTANHAN § 42 |*ni-i*; after Hawkins (2000, part 3, plate 261).

The <i> in this example does not fill a gap in the column, as the scribe was apparently able to start a new word just below it. Therefore, we must conclude that it indicates true plene writing.

Instances like these are rare, however, and in most cases it is simply impossible to definitively 'prove' that a given word-final vowel sign is linguistically real or used as a space-filler, especially when we do not know what a word means or what its origins are. To avoid marking space-filler vowels as genuine plene in our transliterations, it is probably methodologically

[12] The double space-filler in |*á-sa-tu*$^{-u-a}$ will be treated separately in Section 1.5.3.

best to take the following as a central guiding principle: vowel signs in word-final <CV-V> sequences are to be represented as linguistically 'empty' space-fillers as often as possible. Only when their placement in the text makes it highly unlikely that a vowel sign fulfils an ornamental function should we interpret them as true plene. The consequence of this procedure is that potentially many instances of true plene writing will be falsely marked as space-fillers, but that is arguably preferable over marking space-filler vowels unjustifiably as true plene. In a later, more interpretative stage of the research, we may use sure instances of true plene vowels to reconsider attestations of the same word which were previously marked as space-fillers. In other words, we may use our knowledge of MEHARDE § 1: *za-a-wa/i* to reinterpret KIRÇOĞLU § 2 *za*$^{-a}$ as a likely candidate for true plene, and we should take this into account when we make phonological and morphological analyses of this word. For transliteration purposes, however, I would suggest staying close to the text, and cite this word as KIRÇOĞLU § 2 *za*$^{-a}$, to represent its sign arrangement as truthfully as possible without using external evidence from different attestations or texts.

Applying this *modus operandi* to Hawkins' (2000) Iron Age corpus results in two collections of words containing <CV-V> sequences. First, there are those words for which an interpretation in terms of space-filling is anywhere from possible to likely; the second collection consists of words that cannot contain space-fillers and must therefore be classified as true plene. The appendix to this chapter shows this method applied to the SULTANHAN stele, illustrating what considerations come into play when deciding between an interpretation in terms of true plene or space-filling. The importance of drawing a distinction between space-fillers and instances of true plene becomes evident if we want to uncover the function(s) of the latter group. If we take all <CV-V> sequences together as one undifferentiated bulk, we cannot hope to find any linguistically meaningful distributions in the use of plene writing, because many of these are actually instances of space-filling. In this respect, space-fillers are 'noise', blurring whatever patterns may exist in the use of true plene writing. Once we are able to recognise space-fillers and remove them from consideration, we are in a better position to discover the function of true plene writing in Hieroglyphic Luwian and see whether it matches, for instance, plene writing in Cunei-

form Luwian.

The same methodology applies to words affected by initial-a-final (see Section 1.2), even if one more option is present in such cases. More specifically, whenever we find a word spelled with word-final <Ca-a> in a text dated to ca. 1180–850 BCE (Transitional Period), we face a choice between not two (i.e. true plene or space-filling), but three possible interpretations of <a>: true plene spelling, space-filling or initial-a-final. Again, I argue that it is methodologically most commendable to interpret a given word-final plene <a> as true plene only after other explanations (space-filling or initial-a-final) have safely been ruled out.

Also with regard to transliteration, I suggest that we do the same as in the case of *za-a*, as exemplified by two attestations from KARKAMIŠ A2+3 (dated to the late 10th, early 9th century BCE), cf. Figure 1.19.

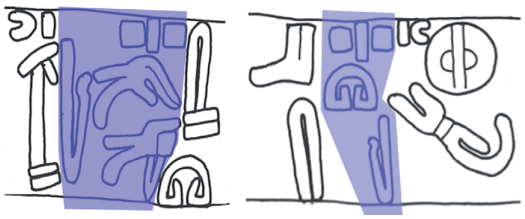

Figure 1.19: KARKAMIŠ A2+3 § 20 |*wa*/*i-tà-tá-***a* and § 24 *wa*/*i-sa*$^{-a}$, respectively; after Hawkins (2000, part 3, plate 21).

The first example, KARKAMIŠ A2+3 § 20 |*wa*/*i-tà-tá-a*, is to be analysed as a combination of *wa*= (quotative particle) + =*ada*= (3pl.nom.-acc.) + =*ta* (locative particle). It is commonly assumed that this clitic chain started with /a-/; moreover, the sign <a> cannot be interpreted as a space-filler, as it occupies a whole sign column by itself. Therefore, we should transliterate and interpret this example as an instance of initial-a-final: |*wa*/*i-tà-tá-***a*. In the same text, we find KARKAMIŠ A2+3 § 24 *wa*/*i-sa*$^{-a}$, which combines *wa*= (quotative particle) with =*as* (3sg.nom.c.). Its morphological interpretation is straight-forward. We know that this text shows multiple unequivocal examples of initial-a-final (cf. above), which strongly suggest that also the <a> of *wa*/*i-sa-a* presents a case of initial-a-final. However, this is not evident from the sign arrangement in this particular word, whose <a> could well

be taken as a space-filler: *wa/i-sa*$^{-a}$. Therefore, while I am convinced that we should interpret this word as an instance of initial-a-final, I nevertheless suggest that we cite it in our transliteration as *wa/i-sa*$^{-a}$ (with superscript $^{-a}$) to mark that an interpretation as a space-filler cannot be ruled out (unless we take external evidence into account).

The focus of the remainder of this chapter will lie predominantly on the space-filler collection, and more specifically, the different varieties of space-filling found within the Iron Age corpus.

1.5 Space-Filling Characteristics

1.5.1 Time Period

After a manual classification of all <CV-V> sequences in the Iron Age Hieroglyphic Luwian corpus (as collected in Hawkins 2000) as either space-fillers or instances of true plene, some interesting results materialise. It appears, for instance, that not every text contains signs for which an interpretation as space-filler is possible. Although many fragmentarily transmitted texts simply do not contain enough linguistic material to decide whether the absence of space-fillers is due to chance or not, there are also several lengthy inscriptions in which space-filling is hardly employed or even absent. These inscriptions are the following.

- all texts from the MALATYA subcorpus (12th–10th centuries BCE), except PALANGA, of unknown date, and ŞIRZI (8th century BCE);
- the KIZILDAĞ-KARADAĞ inscription group (whose date is problematic but most likely high; belonging to the TABAL subcorpus);
- the oldest KARKAMIŠ texts, scil. KARKAMIŠ A4*b* (11th–10th centuries BCE), A14*a*, A14*b* (both 10th century BCE);
- TOPADA (ca. 732–729 BCE; belonging to the TABAL subcorpus);
- KÖRKÜN (late 9th century BCE, belonging to the KARKAMIŠ subcorpus);

- TÜNP 1 (mid-8th century BCE; belonging to the KARKAMIŠ subcorpus);
- ANCOZ 7 (late 9th, early 8th century BCE; belonging to the COMMAGENE subcorpus);
- PORSUK (early 7th century BCE; belonging to the TABAL subcorpus; cf. Figure 1.6);
- CEKKE (mid-8th century BCE; belonging to the KARKAMIŠ subcorpus).

Note that these texts where hardly any vowel sign can be taken as an instance of space-filling are mainly limited to two distinct groups. On the one hand, there are the oldest texts in the corpus (KIZILDAĞ-KARADAĞ and the oldest texts from KARKAMIŠ and MALATYA, especially KARAHÖYÜK [12th century BCE]), where the absence of space-filling might well be a relic from the older Empire period.[13] Additionally, TOPADA is peculiar in its own right for employing a highly unusual signary, on which Hawkins (2000: 460) comments: 'The unusual sign forms suggest a deliberate attempt at archaism with varying degrees of success.' The scribe of TOPADA may well have tried to copy the sign arrangement of older texts, where space-fillers are virtually absent. Interestingly, we can see the use of space-fillers in the Hieroglyphic Luwian texts develop right before our eyes in the texts belonging to the KARKAMIŠ subcorpus. Whereas the oldest texts, such as KARKAMIŠ A4*b* (11th–10th centuries BCE), do not seem to contain any space-fillers at all, later texts (KARKAMIŠ A1*a*, 10th century BCE) show some sporadic use (e.g. § 16 SUPER+*ra*/*i*-^{a}, § 4 DEUS-*ni-zi*-^{i} 'gods' [nom.pl.c.]), which increases rapidly over the 10th and 9th centuries until we reach KARKAMIŠ A6 at the end of the 9th century, where space-filling is ubiquitous. On the other hand, we have KÖRKÜN, TÜNP 1, ANCOZ 7 and PORSUK, which are exactly those texts in which, for reasons unknown, word-division signs could be placed freely in the middle of a sign column. The use of space-filling was unnecessary in these texts, as scribes were apparently not constrained by the

[13] The Empire inscriptions warrant further investigation, but a quick look at the SÜDBURG inscription (Hawkins and Neve 1995: Abbildung 35) reveals that no filling is found there either.

requirement to start a new word at the top of the line. CEKKE belongs to neither of the two groups and its behaviour awaits further explanation.

1.5.2 Space-Filler Vowel

As indicated above, the choice of <a>, <i> or <u> as space-fillers is generally dictated by the vocalic quality of the preceding CV-sign. For instance, we have seen that <u> has been added as a space-filler in ANCOZ 7 § 14 |*á-sa-tu*$^{-u}$ 'they must be', which ends in /-ntu/, cf. Figure 1.12. This also goes for consonant-final words such as KULULU 1 § 11 |*á-pa-na*$^{-a}$ 'that' (acc.sg.c.) /ʔ(a)ɸan/, where a space-filler <a> echoes the preceding sign <na>.

However, the ASSUR letters treated at the start of this chapter already show several instances where a non-corresponding vowel sign seems to be used as a space-filler. We may recall that ASSUR letter e § 18 |FEMINA-*ti-na*$^{-i}$ (cf. Figure 1.3) shows a space-filler <i> where the addition of <a> would be expected on the basis of the rules established in the rest of the corpus. Close inspection of the entire Iron Age corpus reveals that only the following texts contain frequent *non-corresponding* space-filler vowels. All of these have already been observed by Hawkins (2000: 264, *apud* § 6).[14]

- İSKENDERUN (late 9th century BCE; e.g. § 3 |*za-na*$^{-i}$ 'this' [acc.sg.c.]);
- MARAŞ 1 (late 9th century BCE; e.g. § 11 |*i-mara*/*i-si-pa-wa*/*i-mu*$^{-i}$ 'to me' [1sg.dat.-loc.]);
- MARAŞ 14 (ca. 800 BCE; e.g. § 4 *wa*/*i-mu*$^{-i-a}$ [id.]), cf. Figure 1.20;
- ASSUR letters (late 8th century BCE; examples: Figure 1.3 and 1.4).

It is particularly noteworthy that there seem to be only two subcorpora where non-corresponding space-filler vowel signs are quite frequently used: MARAŞ (to which also İSKENDERUN belongs) and ASSUR. Most of the time, however, non-corresponding space-fillers constitute a body of exceptions in

[14] The use of non-corresponding vowel signs as space-fillers in these texts is arguably more obvious than the use of *corresponding* space-filler vowel signs in others. It comes as no surprise, therefore, that Hawkins mentions only these texts as making use of vowel signs as 'word-ender//space filler' Hawkins (2000: l.c.).

Figure 1.20: MARAŞ 14 § 4 *wa/i-mu*$^{-i-a}$; after Hawkins (2000, part 3, plate 115).

texts which otherwise show perfectly expected space-filling patterns. A list, intended to be exhaustive, is presented below.

- KARATEPE (late 8th century BCE) § XV Hu. |(NEPOS)*ha-su*$^{-a}$ 'for the family' (dat.-loc.sg.c.). An unexpected space-filler vowel occurs only here in the entire bilingual inscription.[15]
- KARKAMIŠ A5*a* (8th century BCE) § 5 & § 6 |*wa/i-mu*$^{-u-i}$ (2x) 'for me' (1sg.dat.-loc.). The complications occurring in words ending in two vowel signs will be treated in Section 1.5.3.
- ALEPPO 2 (late 10th–early 9th century BCE) § 14 |URBS-*ni-zi*$^{-a}$ 'cities' (nom./acc.pl.c.; cf. Figure 1.25). Expected space-filler vowel signs are found in § 15 |PES-*wa/i-ti*$^{-i}$ 'to come' (3sg./pl.pres.act.) and § 17 |*pi-pa-sa-wa/i*$^{-i}$ 'to present' (1sg.pres.act.). We will return to this word in Section 1.5.3.
- MARAŞ 11 (date unclear) § 9 DEUS-*ni*$^{-a}$ 'to the god' (dat.-loc.sg.). Corresponding space-filling is attested in § 8 (DEUS)TONITRUS-*hu-ti*$^{-i}$ 'for Tarhunt' (dat.-loc.sg.) and, possibly, § 3 *pa-ti*$^{-i}$-[*pa*/*ha*]-*wa*/*i* 'for him' (id.).

[15] Note that the image of the inscription provided in Çambel, Röllig and Hawkins 1999: plate 62 suggests that the <a> in § LVI Hu. |*ha-sá-tu*$^{-a}$ 'let them beget' (imp.3pl.act.; *sic* Hawkins 2000: 56) rather belongs at the end of following § LVII Hu. *ma-pa-wa*/*i* 'much' so that we should read *ma-pa-wa/i*$^{-a}$ instead. In the latter case, the <a> can be interpreted as a corresponding space-filler after the sentence-initial clitic /=ua/.

– ANCOZ 7 (late 9th–early 8th century BCE) § 4 URBS-*ni-i-zi*$^{-a}$ ‘cities’ (nom.pl.c.), cf. Figure 1.21. Note that Hawkins’ tracing actually suggests URBS-*ni*$^{-a}$*-i-zi*, which presents us with an even more marked word-internal non-corresponding space-filler. This same inscription shows expected use of a space-filler vowel <i> in § 4 DEUS-*na-si*$^{-i}$ ‘of the gods’ (gen.pl.c.) and <u> in *á-sa-tu*$^{-u}$ (imp., treated above, cf. Figure 1.12).

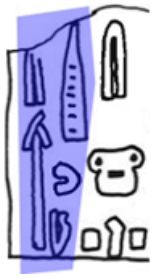

Figure 1.21: ANCOZ 7 § 4 URBS-*ni-i-zi*$^{-a}$; after Hawkins (2000, part 3, plate 186).

– SULTANHAN § 13 *wa/i+ra/i-ia-zi*$^{-a}$ ‘assistances’(?) (acc.pl.c.; cf. also the appendix).

– KULULU 5 (8th century BCE) § 3: *hu-la-sa*$_4$*-ia*$^{-i}$ (PN; dat.-loc.sg.c.).[16] We may analyse this word as having the dat.sg. ending /-aia/ which we only find in personal names. In the same inscription, we find corresponding space-filler vowel signs in § 2 DOMINUS-*ni-sá*$^{-a}$ ‘ruler’ and § 10 DELERE-*nú-tu*$^{-u}$ /marnuntu/ ‘let them destroy’ (cf. Figure 1.9).

– HİSARCIK 1 (late 8th century BCE) § 5 |*á-wa/i*$^{-a}$ ‘I shall make’. Hawkins (2000: 484) rightly notes the semantic and lexical difficulties in interpreting this sentence, but it seems hard to escape the conclusion that |*á-wa/i* should be a verbal form here: /ʔaui/ (1sg.pres.act.). The sign <a> here is wholly unexpected, and must be a space-filler: |*á-wa/i*$^{-a}$.

[16] I am grateful to my colleague Stefan Norbruis for bringing this word to my attention.

– KULULU 2 (mid-8th century BCE) § 3 |*á-mi-ia-za*$^{-i}$ 'my' (dat.-loc.pl.). We would expect <a> to be used here instead, cf. Figure 1.22. Note that elsewhere in this text, we find expected space-filling with <a> (e.g. § 5 |*hwa*/*i-sà*$^{-a}$ 'who' [nom.sg.c.]), <i> (e.g. § 2 |*á-mi-zi*$^{-i}$ 'my' [nom.pl.c.]) and <u> (e.g. § 7 |*tu-wa*/*i-tu*$^{-u}$ 'they must put' [imp.3pl.act.]).

Figure 1.22: KULULU 2 § 3 |*á-mi-ia-za*$^{-i}$; after Hawkins (2000, part 3, plate 272).

1.5.3 Special Types of Space-Filling

Not every instance of space-filling involves a simple <CV-V> sequence at the end of the word. In some cases, it can be argued that space-filler vowels are also applied word-medially, or that two space-fillers are used (<CV-V-V>) instead of one. In what follows, an overview of these various types of space-filling will be given.

In a few cases, graphic filling seems to be triggered by the shape of the inscription: we can see scribes working their way around sculptures and trying to close up free space before a break or the end of the text. A good example of this is found in KARKAMIŠ A13*d* (late 10th–early 9th century BCE) § 3 |*á-tá-na-wa*/*i-na*||$^{-a}$ |*kar-ka-mi-si-za*(URBS), where the sign <a> is added near the shoulder of the standing figure, cf. Figure 1.23. We cannot interpret this <a> as initial-a-final here, as the word preceding it (|*á-tá-na-wa*/*i-na* '?') already starts with <á>. In addition, we see that the following signs <|kar> (beginning a new word) would not fit the space left by the sculpture unless

the word-divider <|> was squeezed into the gap and <kar> was twisted to follow the curvature of the sculpture. It is therefore quite possible that <a> has been added as a space-filler here, to ensure that the first signs of |*kar-ka-mi-si-za*(URBS) could be placed in a straight column without leaving a gap.

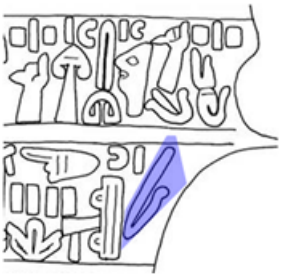

Figure 1.23: KARKAMIŠ A13*d* § 3 |*kwa*/*i-i-sa* |*á-tá-na-wa*/*i-na*||$^{-a}$ |*kar-ka-mi-si-za*(URBS); after Hawkins (2000, part 3, plate 25).

Another example is KARKAMIŠ A23, which is dated to the late 10th–early 9th century BCE and starts with EGO-*wa*/*i-mi-i* 'I'. We see that the sign <i> fills an entire column, which, at first sight, seems to rule out an interpretation of this sign as a space-filler, cf. Figure 1.24.

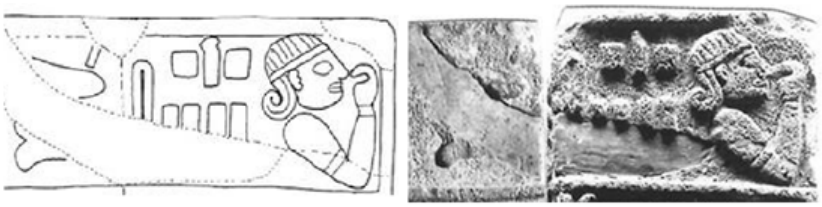

Figure 1.24: KARKAMIŠ A23 § 1 EGO-*wa*/*i-mi-i* (drawing and photograph); after Hawkins (2000, part 3, plates 27 and 26, respectively).

However, the photograph provided in Hawkins 2000 clearly shows that this is where one face of the inscription ends. After writing <EGO-*wa*/*i-mi*>, the scribe was left with a long, thin piece of stone in which he could not fit the subsequent wide signs <ka> and <tú>. He may well have decided to fill

this strip with <i>, and therefore we cannot simply assume that this sign is a true plene spelling. We should interpret it as a space-filler here because it is possible to do so: EGO-*wa*/*i-mi*$^{-i}$. Similar examples where the use of space-fillers may well have been necessitated by sculptural art or the shape of the inscription are ALEPPO 2 § 7 |URBS-*ni-zi*$^{-a}$ 'cities' (nom./acc.pl.c.) and MARAŞ 4 § |*pa-ti*$^{-i}$ /pháti/ 'that' (dat.-loc.sg.), cf. Figure 1.25.[17]

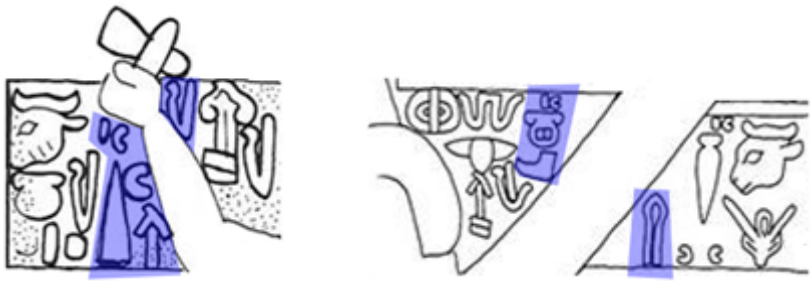

Figure 1.25: ALEPPO 2 § 7 |URBS-*ni-zi*$^{-a}$ and MARAŞ 4 § 3 |*pa-ti*$^{-i}$; after Hawkins (2000, part 3, plates 98 and 109, respectively).

In the latter example, <i> may well be an instance of true plene, but an interpretation in terms of space-filling is equally plausible in this particular passage. Note that the following word-initial signs <|("ANNUS")> would not fit underneath the sculpture and that the space-filler <i> allows <|("ANNUS")> to be placed at the head of a new sign column. Therefore, interpreting the <i> as a space-filler seems the best course of action.

Lastly, there are also vowel signs which seem to be employed as line fillers: BOROWSKI 3 § 4 |(PES$_2$)*tara*/*i-zi-ha*$^{-a}$ '?' (1sg.pret.act.) and HAMA 4 § 15 (end): ("*163")*mu-ha-ha*$^{-a}$ '?', cf. Figure 1.26.

As briefly mentioned above, space-filling rarely occurs in the *middle of words*, most often because a following long sign such as <za> did not fit the

[17] Word-final <a> in |URBS-*ni-zi*$^{-a}$ is a rare instance of non-corresponding space-filling (see Section 1.5.2). We could imagine that the scribe's choice of <a> (instead of expected <i>) was necessitated by the tapered shape of the space left by the arm of the sculpture, which did not allow for a nice fit of <i>. Alternatively (but perhaps less plausibly), one could argue that the space-filler vowel in this case was not felt to belong to the preceding word. In any case, there is no need to take <a> as a true plene vowel here.

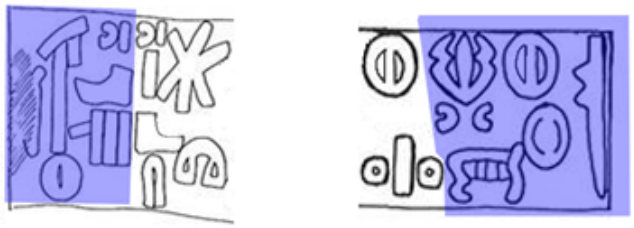

Figure 1.26: BOROWSKI 3 § 4 |(PES$_2$)*tara*/*i-zi-ha*$^{-a}$ and HAMA 4 § 15 ("*163") *mu-ha-ha*$^{-a}$; after Hawkins (2000, part 3, plates 93 and 213, respectively).

remainder of the column. The scribe was left with an imminent gap in the middle of a word and decided to fill it up using a vowel sign, as if he were filling up a sign column at the end of a word. This is well illustrated by KULULU 1 § 5 |(DEUS)TONITRUS-*hu*$^{-u}$*-za-na*$^{-a}$ 'Tarhunza' (acc.sg.c.) and ibid. § 10 |(DEUS)TONITRUS-*hu*$^{-u}$*-za-sá* 'id.' (nom.sg.c.), cf. Figure 1.27.

Figure 1.27: KULULU 1 § 5 |(DEUS)TONITRUS-*hu*$^{-u}$*-za-na*$^{-a}$; after Hawkins (2000, part 3, plate 245).

After writing <|(DEUS)TONITRUS-hu->, the scribe was left with a small gap at the bottom of the line where <za> could not possibly fit. He therefore filled this gap (using the corresponding space-filler vowel sign <u>) and wrote <za> in the following column. Other attestations of word-medial space-filling are listed below.

– JISR EL HADID fr. 2, line 2 *wa*/*i-mu*$^{-u}$*-ta* 'me' (1sg.acc.);

– MALPINAR § 9 *zi*$^{-i}$*-wa*/*i*[...]'this' (abl.-ins.);

- KARKAMIŠ A6 § 3 |"PES$_2$"(-)*hi*$^{-i}$*-nu-wa*/*i-tá* 'caused to pass'(?) (3pl.pret.act.);
- KARKAMIŠ A6 § 4 *zi*$^{-i}$*-na* 'this' (abl.-ins.);
- KARKAMIŠ A25*a* § 6 *kar-ka-mi-si*$^{-i}$*-za*(URBS) 'Carchemishean' (dat.-loc.sg.), cf. Figure 1.28;

Figure 1.28: KARKAMIŠ A25*a* § 6 *kar-ka-mi-si*$^{-i}$*-za*(URBS); after Hawkins (2000, part 3, plate 29).

- The ASSUR letters contain various instances of medial space-filling. In most cases, these are easy to spot, as these texts are among the few in which the space-filler vowel does not regularly correspond to the vocalism of the preceding CV-sign.
  - Letter *a* § 6 |*tara*/*i-pa*$^{-i}$*-mi-i-sa* (PN; nom.sg.c.; cf. Hawkins' commentary: Hawkins 2000: 542);
  - Letter *a* § 10 |*472(-)*ma*$^{-i}$*-sa*$_5$+*ra*/*i-zi*$^{-i}$ '?' (acc.pl.c.), unless this word happens to contain a diphthong;
  - Letter *d* § 6 |*sa-na-wa*/*i*$^{-i}$*-i-zi*$^{-i}$ 'good' (acc.pl.c.). Notice that the <i> signs used as space-fillers here are noticeably smaller in size than their true plene counterpart.
  - Letter *e* § 27 |*sù*+*ra*/*i-wa*/*i-za-ha*$^{-i}$*-wa*/*i-mu*$^{-u}$ '?', where again the 'non-corresponding' space-filler vowel sign <i> is used after the clitic conjunction /ha/ 'and';
  - Letter *f*+*g* § 3 |*a-za*$_5$$^{-a}$*-za-ha-wa*/*i-za* 'we' (1pl.nom.; in one of the '*hatura*-clauses', cf. Waal 2016);

– Letter *f*+*g* § 9 *kwa*|*i-sà*$^{-a}$*-wa*|*i-sa*$^{-a}$ (§ 9) /k^{w}is/ 'who' (nom.sg.c.);
– Letter *f*+*g* § 30 |"PES$_2$"(-)*wa*|*i*$^{-a}$*-za-sa-ti* '?' (verb, 3sg.pres.act.);
– Letter *f*+*g* § 38 |*á-pa*$^{-i}$*-ia-pa-wa*|*i* 'that' (nom.-acc.pl.n.).

Lastly, we arrive at the complicated question how we should interpret *words ending in two vowel signs* (i.e. <CV-V-V>), such as BOR § 3 |*á-mu-u-a* 'I', cf. Figure 1.29.

Figure 1.29: BOR § 3 |*á-mu-u-a*; after Hawkins (2000, part 3, plate 296).

In theory, three different interpretations are possible for the final two vowel signs:[18]

I Double filling (<CV^{-V-V}>): the word is complete after the last CV-sign and one vowel sign is not enough to avoid an impending gap.

II True plene + space-filler (<CV-V^{-V}>): the word is complete after <CV-V> and one V-sign is needed to fill the sign column.

III True plene + initial-a-final (<CV-V-**a*>): the word is complete after <CV-V> and the sign <a> is added as initial-a-final. We may conventionally transliterate these sequences using an asterisk, cf. Section 1.2, footnote 10.

[18] Note that a fourth option "space-filler + initial-a-final" runs counter to intuition. By definition, space-fillers are only added to complement a fully written word. It would therefore be strange to see a scribe filling up a sign column and starting another one to put the initial-a-final vowel in, but cf. below.

A full list, extracted from Hawkins' (2000) Iron Age corpus and, to my knowledge, exhaustive, is given below. From these attestations, it appears that whenever two separate vowel signs follow each other, scribes seem to avoid the use of two identical vowel signs. Most often, they use <a> as the second sign. Thus, there seems to have been a constraint against using the same vowel twice, which is not only valid in the case of double filling, but also after plene vowels.[19] It seems to have been broken only three times: SULTANHAN § 36 |*ni*$^{-i-i}$ 'not'; SULTANHAN § 46 |*za+ra*/*i-ti-ti*$^{-i-i}$ 'desire(?)' (3sg.pres.act.) and ASSUR letter *f*+*g* § 51 |*ni*$^{-i-i}$ 'not'.[20]

Since the second vowel sign in the series is nearly always <a>, it is impossible to say on the basis of the transliteration alone whether a given vowel is a space-filler, true plene or initial-a-final. Again, only by looking at their individual placement in the inscription can we assign sequences of <CV-V-V> to one of three categories above. In two attestations, the two vowel signs are written in a separate column, indicating that at least the first one must be real. For these words, initial-a-final can safely be ruled out as well, either because there is already an initial <á> present or because the word is not supposed to start with /(ʔ)a-/. Thus, we can securely attribute them to class II (true plene + space-filler):[21]

– KARKAMIŠ A6 § 8 |*á-mi-i*$^{-a}$ 'my' (1sg.dat.-loc.), cf. Figure 1.30;

– KARKAMIŠ A6 § 18 & § 23 |*kwa*/*i-i*$^{-a}$ 'when' (2x).

The placement of <a> in other attestations suggests that it can neither be interpreted as space-filling, nor as true plene. Therefore, it was probably used as initial-a-final in these cases (class III):

[19] To my knowledge, a sequence of *-a-a* is not found in the Iron Age HLuw. corpus.

[20] ÇALAPVERDİ 1 § 5 |BRACCHIUM-*mi+ra*/*i-i*$^{-i}$ '?' should rather be read |BRACCHIUM-*mi+ra*/*i-ri+i*$^{-i}$, as cited in Hawkins 2000: 550.

Notably, the same verbal stem |*za+ra*/*i-ti-*(*i-*) is found spelled with true plene writing in TELL AHMAR 1 § 20 ([“]VAS[”])*z*[*a*]+*ra-ti-i-ta* (3sg.pret.act.). This raises the suspicion that we should also interpret the form in SULTANHAN with true plene: |*za+ra*/*i-ti-i-ti*$^{-i}$, although this is not supported by the placement of the signs.

[21] One reviewer notes another reason not to expect initial-a-final in KARKAMIŠ A6: this text can be dated to the period after 850 BCE, when initial-a-final is no longer used (but cf. footnote 22).

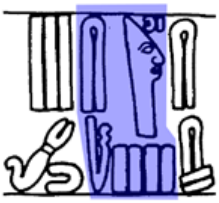

Figure 1.30: KARKAMIŠ A6 § 8 |*á-mi-*$^{-a}$; after Hawkins (2000, part 3, plate 33).

– ADIYAMAN 1 § 8 |*pa-si-i-*a* 'his' (gen.sg.c.), cf. Figure 1.31.[22]

– BOROWSKI 3 § 9 *mi-i-*a* (id.);

– TELL AHMAR 2 § 13 *mi-i-*a* 'my' (1sg.dat.-loc.);

Figure 1.31: ADIYAMAN 1 § 8 |*pa-si-i-*a*; after Hawkins (2000, part 3, plate 170).

In yet other words, we can safely rule out initial-a-final for the same reasons as noted above or because they are dateable to the Late Period (after ca. 850 BCE). This leaves us with two options: class I (double filling) or class II (true plene + filler). As discussed above, it is methodologically preferable to mark vowel signs as true plene only if it is impossible to interpret them as

[22] Note that ADIYAMAN 1 can be dated to ca. 805–773 BCE (Hawkins 2000: 345), and most scholars would agree that initial-a-final had disappeared by this time (cf. Section 1.4). However, since the <a> of § 8 |*pa-si-i-a* seems to resist an interpretation in terms of space-filling or true plene spelling, I can only regard it as an instance of initial-a-final. This is problematic, as—to my knowledge—this would constitute the only unequivocal case of initial-a-final dated to the Late Period (i.e. after 850 BCE).

space-fillers. Therefore, the cases below will be taken as belonging to class I (double filling).

- ASSUR letter *c* § 5 |*ni*$^{-i-a}$ 'not';
- ASSUR letter *f* +*g* § 12, § 15, § 26 |*ni*$^{-i-a}$ (id.; 3x), cf. Figure 1.4;
- ASSUR letter *f* +*g* § 26 |*ni*$^{-i-a}$ (id.);
- ASSUR letter *f* +*g* § 32 |*ni-pa-wa*/*i-tu*$^{-u-a}$ /=θu/ 'to him' (3sg.dat.-loc.);
- ASSUR letter *f* +*g* § 51 |*ni*$^{-i-i}$ 'not';
- BOR § 3 |*á-mu*$^{-u-a}$ 'I' (1sg.nom.), cf. Figure 1.29;
- KARKAMIŠ A5 §§ 5 & 6 |*wa*/*i-mu*$^{-u-i}$ /=mu/ 'me' (1sg.dat.-loc.; 2x);
- KARKAMIŠ A29*f* 1 *zá-tí*$^{-i-a}$ 'this' (dat.-loc.sg.c.);
- KAYSERİ § 16 ("PES$_2$.PES")*tara*/*i-pi-ru*$^{-u-a}$ '?' (imp.3sg.act.);
- KAYSERİ § 18 |*pa-sa-iá-tu*$^{-u-a}$ '?' (id.);
- KULULU 4 § 5 COR-*la-ti*$^{-i-a}$ 'soul' (abl.-ins.);[23]
- MALPINAR § 6 (PONERE)*sà-ti-tu*$^{-u-a}$ '?' (imp.3pl.act.);
- MARAŞ 14 § 2 |*wa*/*i-mu*$^{-i-a}$ /=mu/ 'me' (1sg.dat.-loc.), cf. Figure 20;[24]
- SULTANHAN § 19 |PUGNUS-*ri*+*i-ti*$^{-i-a}$ 'arise' (3sg.pres.act.);
- SULTANHAN § 36 |*ni*$^{-i-i}$ 'not', cf. above;
- SULTANHAN § 42 |*á-sa-tu*$^{-u-a}$ (imp.3sg.act.), cf. Figure 1.18;
- SULTANHAN § 46 |*za*+*ra*/*i-ti-ti*$^{-i-i}$ 'desire(?)' (3sg.pres.act.), cf. the start of Section 1.5.3.;
- TELL AHMAR 1 § 21 |*za*-[*a*]-*ti*$^{-i-a}$ (id.).

[23] The logogram transliterated as VAS in Hawkins 2000 has received a new transliteration COR in Van den Hout 2002: 182.

[24] One reviewer suggests that this word's final <a> in this attestation may also be read as a true plene spelling with the following word *za-na* 'this' (acc.sg.c.), yielding |*wa*/*i-mu*$^{-i}$ *za-a-na*. This reading would be supported by six more attestations of *za-a-na* with true plene writing in the Iron Age corpus.

Lastly, there are attestations with word-final <a> which cannot easily be assigned to one of the three classes defined above.

- IZGIN 1 § 2 *mi-i-a* 'my' (1sg.dat.-loc.);
- MARAŞ 8 § 1 EGO-*mi-i-a* /=mi/ (refl.ptcl.);
- KARKAMIŠ A1*a* § 25 *wa*/*i-mi-i-a* /=mi/ (refl.ptcl.);
- KARKAMIŠ A14*a* § 9 LIS(-)*z*[*a*-...-*t*]*ú-u-a* 'litigate' (imp.3pl.act.);
- KARKAMIŠ A28*m* ...]-x-*mi-sa-pa-wa*/*i-ti-i-a*: inscription is damaged;
- TELL AHMAR 2 § 8 *wa*/*i-ti-i-a* /=θi/ (refl.ptcl.);
- TELL AHMAR 5 § 11 *pa-si-i-a* 'that' (gen.sg.c.);
- TELL AHMAR 1 § 14 *mi-i-a* 'my' (1sg.dat.-loc.);
- TELL AHMAR 1 § 19 *pa-si-i-a* 'that' (gen.sg.c.);
- TELL TAYINAT 2 fr. 1a LOCUS-*la*/*i-ti-i-a* 'place' (dat.-loc.sg.n.).[25]

I see several possibilities, but none of them are without difficulties. The first possibility is to take the two word-final vowel signs as space-fillers (class I), e.g. *wa*/*i-mi*$^{-i-a}$. The downside of this interpretation is that it leaves us with several forms showing deletion of initial *a*. Given the overall rarity and regional distribution of deletion of initial *a* (Burgin 2016: 15), this is not very attractive. Alternatively, we could take the word-final <a> as an instance of initial-a-final. This, however, leaves the status of the preceding vowel open. If we interpret the penultimate vowel sign as a space-filler, e.g. *wa*/*i-mi*$^{-i}$-**a*, this means we must allow for word-medial space-filling before instances of initial-a-final. If the penultimate vowel sign is taken as a true plene writing (class III), e.g. *wa*/*i-mi-i-***a*, it becomes very difficult to explain these true plene spellings in the reflexive pronouns /=mi/ and /=θi/, and in the imp.3pl.act. ending /-ntu/, which are otherwise consistently spelled without true plene writing. I must leave this question open for now.

[25] Rieken & Yakubovich (2010) have recently proposed to transliterate the signs L 319 and L 172 (<ta$_4$> and <ta$_5$>, respectively, in Hawkins 2000) as *la*/*i* and *lá*/*í*.

1.6 Conclusion

The notion that the scribes of Hieroglyphic Luwian used the vowel signs <a> and <i> as space-fillers in the ASSUR letters and some texts of the MARAŞ subcorpus can and should be extended to almost all texts of the Iron Age Hieroglyphic Luwian corpus, including those texts which attest initial-a-final. The vowel sign <u> also occurs in many instances throughout the corpus where its function seems to be aesthetic rather than linguistic. These two observations allow us to understand the hitherto unexplained presence of many vowel signs in our texts which Luwian scholars have long known that they cannot be sprachwirklich. Currently, the convention is to transliterate these spurious vowel signs differently (or not at all) according to the quality of the vowel and the subcorpus in which they occur. However, since the same space-filling mechanism underlies all of them, this practice is inconsistent and potentially confusing, and I have therefore proposed in this chapter to transliterate space-filler vowels in a uniform way using superscript, e.g. |*i-zi-i-ha*$^{-a}$, (DEUS)TONITRUS-*tá-ti*$^{-i}$, |*á-sa-tu*$^{-u}$.

Barring ASSUR and MARAŞ, where the choice of the space-filler vowel (<a> or <i>) does not seem to be governed by any strict rules, the space-filler vowel virtually always mirrors the vocalic quality inherent to the preceding sign.

However, <a>, <i> and <u> are not always used as space-fillers. In cases where they cannot be taken as either a space-filler or, in the case of <a>, as initial-a-final, they must have served another function. We may call these instances true plene writing, and its function will be investigated in the next chapter. Distinguishing between space-filling, initial-a-final and true plene writing is not always straightforward, but I have argued that we should transliterate any vowel sign as a space-filler by default whenever its placement in the text allows for such an interpretation. In this way, we can avoid marking space-filler vowels falsely as instances of true plene or initial-a-final and carefully separate potential space-fillers on the one hand from irrefutable instances of plene writing and initial-a-final on the other.

An investigation into the use of vowel signs as space-fillers in Hawkins' (2000) Iron Age Hieroglyphic Luwian corpus reveals that the practice is not

restricted to the mere addition of one vowel sign to fill up a vertical sign column at the end of words. In some cases, space-filling occurs when adjoining sculptural works or natural breaks in the text leave gaps. In others, space-filling is found in the middle of a word, where a following sign would not fit. Lastly, there also seem to be cases where not one but two vowel signs are used to fill a certain gap, although it is difficult to distinguish this 'double filling' from combinations of true plene plus space-filler and initial-a-final plus space-filler.

Appendix: SULTANHAN (Hawkins 2000: pl. 258f.)

To illustrate the methodological approach suggested above (cf. Section 1.4) for distinguishing space-fillers from true plene, an analysis will be given here of all <CV-V> sequences used in the SULTANHAN stele (dated ca. 740–730 BCE), excluding the top and the base. Note that this text postdates the Transitional Period and is therefore not expected to contain any instances of initial-a-final.

Transliteration	**Space-filler/True plene**
1 § 1 EGO-*mi*$^{-i}$	Space-filler. The <i> allows the scribe to start the next word at the top of the line without leaving a gap.
1 § 1 |*wa*/*i-su-SARMA-ma-sá*$^{-a}$	Space-filler in between the signs <sá> and <SARMA>.
1 § 1 |HEROS-*li-i-sá*	True plene. The scribe could have written **HEROS-*li-sá-a* (with post-consonantal filling <a>) if he wanted to.
1 § 2 |*za-a-na*	True plene.
1 § 2 |*tu-wa*/*i+ra*/*i-sà-si-i-na*	True plene.

Continued on next page.

Transliteration	**Space-filler/True plene**
2 § 3 |*á-pi*$^{-i}$	Space-filler. The sign <pi> is quite wide, so a gap would remain above it if the scribe simply started writing the next CRUS-*nú-wa*/*i-mi-i-na* in a straight column after *á-pi*.
2 § 3 |BOS(ANIMAL)-*ri*+*i*$^{-i}$	Space-filler.
2 § 3 *a*+*ra*/*i-ma-sa-ri*+*i*$^{-i}$	Space-filler.
2 § 4 |*hwa*/*i*$^{-i}$	Space-filler.
2 § 5 |*á-wa*/*i-tà*$^{-a}$	Space-filler.
2 § 6 |*wa*/*i-ti*$^{-i}$	Space-filler.
2 § 6 |*mara*/*i-wa*/*i-li-sá*$^{-a}$	Space-filler.
2 § 6 |*ARHA*$^{-a}$	Space-filler. Notice the tiny <a> here.
2 § 7 |("VITIS")*wa*/*i-ia-ni-sa-pa-wa*/*i*$^{-a}$	Space-filler. This space-filling <a> shows that the sentence-initial quotative particle commonly written <wa/i> is actually [wa], not [wi].
3 § 7 |*sa-na-wa*/*i-ia-ta*$^{-a}$	Space-filler.
3 § 8 [|*wa*/*i*]-*su-SARMA-ma*-[*ia*$^{?}$...]-*a*	Too broken to decide.
3 § 8 [...]-*ti*$^{-i}$	The sign placement suggests space-filling, but we cannot know for sure that the word ended after <-ti-i>, as is suggested here.
3 § 8 [|*mu-w*]*a*/*i-ta-li-na*$^{-a}$	Space-filler.
3 § 9 |*wa*/*i-tu*$^{-u}$	Space-filler, but cf. below *apud* 6 § 26.
3 § 9 |*á-ru-ni-i-zi*	True plene.
3 § 9 |*á-pa-si-i-zi*	True plene, cf. also *á-pa-si-i-na* in BOYBEYPINARI IVD3 § 20.

Continued on next page.

Transliteration	Space-filler/True plene
3 § 10 |*kwa*/*i*$^{-i}$	Space-filler.
3 § 11 |*kwa*/*i-i-pa-wa*/*i*	True plene, on the basis of the clitics following it.[1]
4 § 12 |*wa*/*i-na*$^{-a}$	Space-filler.
4 § 12 |*á-pi*$^{-i}$	True plene. The <i> opens up a new column which the scribe, who probably felt he was running out of room, filled with a new word unusually starting in the middle of the sign column.
4 § 13 |sa_5+*ra*/*i-wa*/*i-ti-wa*/*i*+*ra*/*i-ia*$^{-a}$	Space-filler.
4 § 13 |*za-a-zi*	True plene.
4 § 13 |*wa*/*i*+*ra*/*i-ia-zi-a*	The inscription rather suggests a reading CUM-*ni-a*, but in either case, the interpretation of <a> as a space-filler is problematic, as it does not copy the vocalism of the preceding vowel sign.[2]
4 § 13 |*á-tà*$^{-a}$	Space-filler.
4 § 15 |("TERRA")*ta-sà-kwa*/*i*+*ra*/*i-ri*+*i-pa-wa*/*i-ta*$^{-a}$	Space-filler.
4 § 15 |SUPER+*ra*/*i*$^{-a}$	Space-filler.
5 § 16 *a-wa*/*i*$^{-a}$	Space-filler.
5 § 17 |*wa*/*i-ti*$^{-i}$	Space-filler.
5 § 19 |SUPER+*ra*/*i-ha*$^{-a}$	Space-filler.
5 § 19 |PUGNUS-*ri*+*i-ti*$^{-i-a}$	Double space-filler (Section 1.5.3).
5 § 21 |*wa*/*i-tu*$^{-u}$	Space-filler.

Continued on next page.

Transliteration	**Space-filler/True plene**
5 § 21 |DEUS-*ni-i-zi*	True plene. This form occurs 5x in our corpus, next to 1x DEUS-*ni-i-na* (KARKAMIŠ A16*a*, § 3).
5 § 21 |MALUS-*tà-ti*$^{-i}$	Space-filler.

[1] Note that the sign <i> of the immediately preceding word |*kwa*/*i-i* has been marked as space-filler by default, because it is not possible to argue on the basis of that attestation alone that the vowel there is an instance of true plene. Given the fact that the <i> in |*kwa*/*i-i-pa-wa*/*i* (which ultimately belongs to the same lemma as |*kwa*/*i-i*) is a true plene form, it is highly that the <i> of |*kwa*/*i-i* should also be taken as true plene. For the present purposes, however, this use of external evidence has been kept to a minimum to show how one can judge individual cases.

[2] If Yakubovich's 2013ff. interpretation of CUM-*ni* as /anni/ is correct, we could interpret this <a> as initial-a-final. Note, however, that there are otherwise no clear instances of initial-a-final in this text.

We could continue this practice for the top and the base of the SULTANHAN stele as well as for the rest of the corpus. As we have seen, many vowel signs can be interpreted as space-fillers, but there are also vowel signs present in this inscription which are definitely not merely pleasing to the eye and must therefore be interpreted as true plene.[26]

[26] Only one case resists a straight-forward interpretation: § 13 |*wa*/*i*+*ra*/*i-ia-zi*$^{-a}$ 'assistances'(?) (acc.pl.c.; cf. Hawkins 2000: 469).

CHAPTER 2

Signs of Length
Towards an interpretation of non-filling plene spellings in Hieroglyphic Luwian

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Signs of Length

Towards an interpretation of non-filling plene spellings in Hieroglyphic Luwian

2

Abstract: In Chapter 1, it was argued that *plene spellings* (CV-V sign sequences) in Hieroglyphic Luwian can be divided into two types: space-fillers on the one hand, and non-fillers on the other. This chapter focuses on plene spellings of the latter kind, as attested in texts from the Iron Age. It is demonstrated that these non-filler plene writings are non-randomly distributed across morphemes and lexemes, indicating that this mode of spelling marks a phonetic feature. Using secure etymologies and analyses, it is proposed that non-filler ("linguistically real") plene spellings mark the presence of long vowels or disyllabic sequences. The validity of this hypothesis is subsequently tested against less secure and doubtful etymologies as well as counterexamples. Finally, it is concluded that the hypothesis holds, thereby providing, for the first time, direct evidence for the writing of vowel length in Hieroglyphic Luwian.

2.1 Introduction

Hieroglyphic Luwian texts contain one or multiple horizontal lines, whose reading direction changes boustrophedonically with every line: after each line which is read left-to-right, the next one is to be read right-to-left and vice versa. The lines themselves are made up of vertical 'sign columns', each containing around two to four signs which are read from top-to-bottom. The signs themselves fall broadly into one of two categories. On the one hand, there are logograms, which are transliterated with capitals and represent an underlying concept or word, e.g. DARE for *piya-* 'to give'. Syllabograms, on the other hand, are used to spell out words phonetically and are transliterated using italics e.g. *pi-ia-ha* 'I gave'. They mainly consist of combinations of a consonant and a vowel. In addition, there is also a special sign which indicates the word boundary ( ; incised variant:), transliterated as |. With

very few exceptions, this sign is placed at the top of a sign column, indicating that the beginning of a new word regularly coincides with the beginning of a new sign column, cf. Figure 2.1.

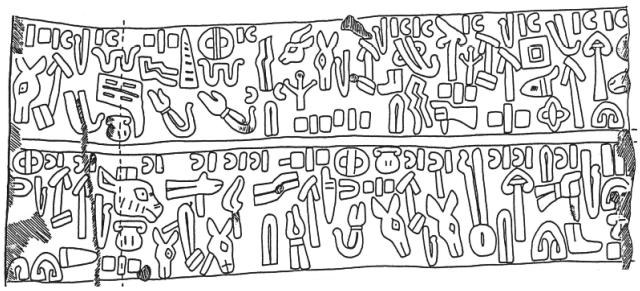

Figure 2.1: TELL AHMAR 5, lines 2–3; Hawkins 2000 (plate 96).

This example shows another marked tendency found in Hieroglyphic Luwian texts, namely the use of all available space. There are hardly any substantial gaps in the texts, which is a feature common to all texts datable to the Iron Age.

On numerous occasions, we encounter a conspicuous phenomenon in the HLuw. texts transmitted to us, whereby the vowel of a CV-sign is graphically doubled by a separate vowel sign, such as *-ta-a-*, *-mi-i-* and *-nu-u-*. This feature has been called *plene writing* in analogy to structurally similar graphic practices in the cuneiform languages. The presence of plene writing in Hieroglyphic Luwian has not attracted much scholarly attention over the years, although it is a common feature in nearly all texts of the Iron Age corpus. In addition, plene-spelled vowel signs often stand out for their appearance in places where they do not seem to have any linguistic significance. This is exemplified well by ASSUR letter *e* § 23 |*sa-na-wa*/*i-zi-na-a* 'good' (acc.sg.c.), cf. Figure 2.2.[1]

As this word is an acc.sg.c., we expect it to end in /-n/, and simply the sign <na> 𔓑 would express this ending sufficiently. Following <na>, however, the stonemason added <a> 𔖙, which cannot represent a real phonetic or phonological vowel (in which case we would have to read /-na/). For this

[1] In this as well as every subsequent figure, the black arrow indicates the direction of reading.

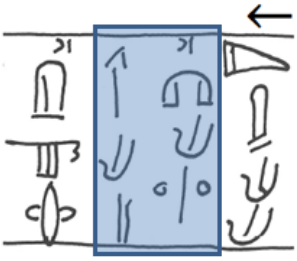

Figure 2.2: ASSUR letter *e* § 23 |*sa-na-wa*/*i-zi-na-a*; Hawkins 2000 (plate 311).

reason, word-final <a> is generally interpreted as a space-filler, which serves no linguistic purpose but is merely employed to fill the remaining space below <na>, ensuring that the scribe could start a new word at the beginning of a new sign column without leaving a gap. To mark its linguistic irrelevance, this <a> is commonly transliterated as <'>, yielding the transliteration |*sa-na-wa*/*i-zi-na-*' we find in Hawkins 2000: 536.

As I have argued in Section 1.2, this use of plene vowel signs as space-fillers is not limited to the sign <a> and the MARAŞ and ASSUR subcorpora. In fact, it may account for hundreds of plene writings of not only <a>, but also <i> and <u> in the entire Iron Age corpus. Good examples of <i> and <u> in their use as space-fillers are not difficult to find. Two examples are KARKAMIŠ A2+3 § 24 |(DEUS)TONITRUS-*tá-ti-i* (DN; abl.-ins.) and ANCOZ 7 § 14 |*á-sa-tu-u* 'be' (3pl.imp.act.), cf. Figure 2.3.

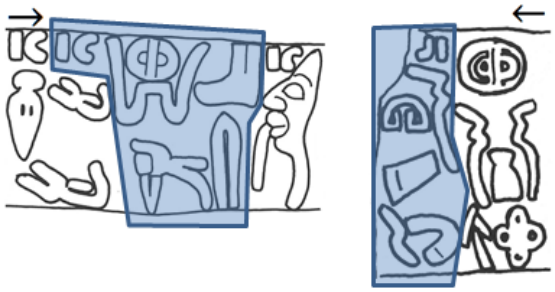

Figure 2.3: KARKAMIŠ A2+3 § 24 |(DEUS)TONITRUS-*tá-ti-i* and ANCOZ 7 § 14 |*á-sa-tu-u*; Hawkins 2000 (plates 21 and 186, respectively).

The ablative-instrumental ending /-aθi/ of the first example and the 3rd person (sg./pl.) imperative ending /-(n)tu/ of the second example both have cognates in other Anatolian languages, from which we can safely infer that they must have ended in short unaccented vowels. The signs <ti> and <tu> would be perfectly capable of expressing these vocalic values by themselves, leaving the plene <i> and <u> unexplainable in linguistic terms. However, since <i> and <u> seem to fill a gap at the bottom of their respective sign columns, these are also best interpreted as space-fillers. In order to mark all three space-filling vowel signs in a uniform way, I have suggested transliterating them using superscript: $^{-a}$, $^{-i}$ and $^{-u}$. For the three words treated thus far, this yields: |*sa-na-wa*/*i-zi-na*$^{-a}$, |(DEUS)TONITRUS-*tá-ti*$^{-i}$ and |*á-sa-tu*$^{-u}$.

In the same chapter (Section 1.3), however, it was argued that not all cases of plene writing can be explained through space-filling. Many plene spellings did not help the scribe to fill a space which he would otherwise have to leave unwritten. Good examples are the <a> in KARKAMIŠ A11*c* § 33 *za-a-ti-ia-za* 'this' (dat.-loc.pl.); the <i> in BABYLON 1 § 9 (DEUS)TONITRUS-*ti-i* (DN; dat.-loc.sg.); the <u> in SULTANHAN § 26 *wa*/*i-tu-u* 'he' (enclitic 3sg.dat.-loc.), cf. Figure 2.4.

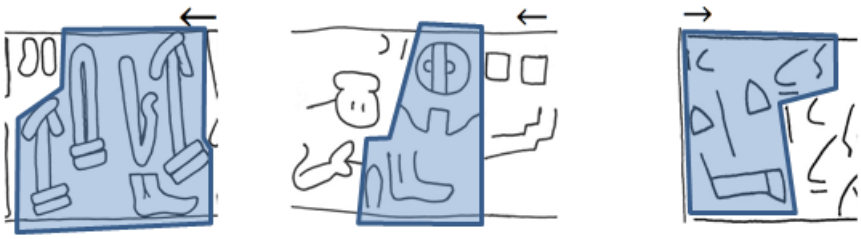

Figure 2.4: KARKAMIŠ A11*c* § 33 *za-a-ti-ia-za*, BABYLON 1 § 9 (DEUS)TONITRUS-*ti-i* and SULTANHAN § 26 *wa*/*i-tu-u*; Hawkins 2000 (plates 17, 210 and 259, respectively).

In *za-a-ti-ia-za*, the <a> does not fill a specific gap at the end of a word. In fact, the scribe could have omitted <a> and written <ti> and <ia> on top of each other in a separate column, which would have been more space-efficient. In the second example, the signs <DEUS>, <TONITRUS> and <ti> form a separate sign column which neatly reaches the bottom of

the line. The placement of <i> does not contribute to a more efficient use of available space and does not fill any impending gaps. Therefore, it must have been placed there for another reason than mere aesthetics. Lastly, the sign <u>  in *wa*/*i-tu-u* is also clearly not written in order to close off a sign column. Rather, it opens up a new one and even causes the next word to start halfway down the second sign column, which clearly deviates from common Iron Age practice. This indicates that the <u> was not used as a space-filler here and that the scribe of SULTANHAN must have added it for another reason.

These three examples are far from unique: in Hawkins' 2000 corpus of Iron Age Hieroglyphic Luwian inscriptions, I have found a total of 517 plene spellings that are not easily explainable as space-fillers. These 'non-filling' plene spellings form the main focus of this study, which aims to provide a plausible account for their presence.[2]

2.2 Systematic contrast

Assuming that the 517 plene spellings mentioned above were not written out of a need for space-filling, the question that then arises is: why *were* they added? Two plausible hypotheses spring to mind. First, these plene spellings might serve some aesthetic function, perhaps as another mode of space-filling. Second, they could mark a linguistic feature: word accent, vocalic length, vowel nasality, vel sim.

We can evaluate these two hypotheses by looking at the lexical items in

[2] Note that under the current definition, plene writings in the middle of the word, like the *i* in SULTANHAN § 21 DEUS-*ni-i-zi* 'god' (nom./acc.pl.) will be counted as non-filler plene writings, under the assumption that the scribe also could have written DEUS-*ni-zi-i*, with a sure space-filler, as attested in, e.g., KULULU 1 § 13. Naturally, one may disagree with this and analyse both (i.e. word-internal and word-final) plene spellings as potential space-fillers. Extending the definition of space-fillers in this way allows for an easier explanation for the difficult data presented in Section 2.7. On the other hand, it also requires one to account for the coexistence of two space-filling techniques (i.e. word-final and word-internal space-filling). For this research, only data from Hawkins 2000 has been taken into account. Plene spellings in Empire period texts and texts published after 2000 await their own treatment.

which these plene spellings are found. In the case of the first hypothesis, we would expect to find plene vowel signs embedded in or attached to a wide variety of morphemes or lexemes without any meaningful pattern; in that case, the presence of a non-filling plene spelling would then be independent of the phonetic or phonological shape of its host. In the other scenario, we would rather expect the opposite: the non-filling plene spellings would then be limited to a select group of morphemes or lexemes. Some elements would show consistent or at least frequent use of plene writing, while others would not show any at all. This would indicate that their non-filling plene writing marks a specific phonetic peculiarity of certain morphemes or lexemes that the scribe wanted to express. A short investigation into the spelling of certain HLuw. lexical items, chosen for their relatively frequent occurrence, yields the following results, cf. Table 2.1.[3]

	Non-filling plene spellings	**Non-plene spelling**	**Space-filling plene**
*á-**mi**-* 'my' (nom.+acc.c.)	22	46	0
*á-**pa**-* 'that'	0	131	1
CUM-*ni* 'with'	0	116	0
(DEUS)*ku*-AVIS-*pa-pa-* (DN)	0	29	0
i-zi- 'to do'	53	5	2
kwa/*i-* 'who, which'	54	88	0
ni- 'not'	9	8	11
tá-ti-(*ia-*) 'father(ly)'	0	50	0
wa/*i-ni-t*° 'stele'	0	19	0
za- 'this' (nom.+acc.c.)	30	74	1

Table 2.1: Distribution of non-filling plene spellings and non-plene spellings

[3] Omitted from this count are damaged and emended words as well as those whose phonological structure is obscured by logographic writing.

The distribution is clear: some vowels, such as the second *i* in *i-zi-*, the vowel in *kwa/i-* and the *a* in *za-* show non-filling plene writing quite often, while other vowels such as the *a* in *tá-ti-* and the *i* in CUM-*ni* never show non-filling plene writing. This indicates that non-filling plene writing was apparently reserved for words of a particular phonetic structure. In other words: some vowels (second *-i-* in *i-zi-i-*, *-a-* in *za-a-*) carry a certain linguistic property which the scribes could express by using non-filling—henceforth: 'linguistically real'—plene spellings. Other vowels (*-i-* in CUM-*ni*, second *-a-* in *á-pa-*) lacking this feature were never written as such.[4] This indicates that linguistically real plene writing is not a random phenomenon. Rather, it contrasts with non-plene writing and marks a linguistic, presumably phonetic, property which is present in some, but certainly not in all words.[5]

At the same time, it should be noted that linguistically real plene writing in Hieroglyphic Luwian is not absolutely consistent: the lemmata *i-zi-i-* 'to do', *za-a-* 'this' and *kwa/i-a-/kwa/i-i-* 'who, which' all have non-plene variants

[4] A different approach to demonstrate this distribution has been taken by Kloekhorst 2016b. Rather than starting with morphemes and looking whether they are spelled with plene writing or not, one can also collect all plene spellings and look at which morphemes they are used in. Thus, Kloekhorst found that the sign <zi> is found 679 times in Hawkins 2000. In 110 cases, the <zi> is spelled plene: <zi-i>. Now, 41 of these plene spellings occur word-finally as part of the nom./acc.pl.c. endings *-Ca-zi-i/-Ci-zi-i*: in each of these cases, however, we can interpret the plene <i> as a space-filler: *-Ca-zi^{-i}/-Ci-zi^{-i}*. The remaining 69 linguistically real plene spellings are used exclusively in only three different stems: *i-zi-i-* 'to do' and its derivative *i-zi-i-sa-ta-* 'to honour' (61x); *zi-i-na* 'this' (abl.-ins.; 7x) and ("OCCIDENS")*á-pa-zi-i-ti* (1x) '?'. The same is true for the sign <za>, which is found 1219 times in Hawkins 2000. If we discard non-plene spellings and potential space-fillers, we are left with 54 secure instances of linguistically real plene <za-a> (Kloekhorst l.c.). It appears that these linguistically real plene spellings are found in only two lemmata: INFANS.*NI.za-a-sa* 'child', attested once (KARKAMIŠ A4*a* § 1) in a quite damaged line, and *za-a-* 'this', accounting for the remaining 53 linguistically real plene spellings. These restrictions indicate that linguistically real plene writing was reserved for specific morphemes which, as a result, must have had a special linguistic property.

[5] Note that this observation lowers the probability of the hypothesis that linguistically real plene writing was used to mark the word accent. Barring clitic elements, most Luwian words must have been accented, given that we find commonly accent-based effects in Cuneiform Luwian (plene writing and Čop's Law) in nouns, pronouns and verbs. Only a select number of words and morphemes show linguistically real plene writing, however.

i-zi- (5x), *za-* (74x) and *kwa*/*i-* (88x) next to them.[6] While this does not invalidate the non-random contrast found above, it does mean that the absence of linguistically real plene writing in rarely attested words may well be due to chance. We cannot use it when considering rare words to prove that they did not possess the linguistic feature(s) denoted by linguistically real plene writing. Only the presence of linguistically real plene writing is immediately relevant for our interpretation of a morpheme's phonetic value.[7]

Having established that non-filler plene writing must represent a linguistic feature, we may now ask ourselves what this feature is. To uncover this feature, we need to analyse and compare all words in which linguistically real plene spellings are found, in order to see whether they have anything in common. In what follows, I will consider all morphemes in which linguistically real plene spellings are found, classified into three groups of descending relevance and followed by a treatment of problematic cases.

First, I will discuss those morphemes and lexemes whose phonological interpretation is (relatively) secure, either because of the presence of good cognates and strong etymologies or because of language-internal considerations. These examples allow us to pinpoint the function of linguistically real plene writing as precisely as possible and to formulate a working hypothesis.

The second group contains morphemes and lexemes whose phonolo-

[6] The 53 linguistically real plene spellings of *i-zi-*(*i-*) 'to do' make up 88% of its 60 attestations (not counting attestations of the weak stem *i-zi-ia-* or spellings with the sign <zi/a>). This percentage is much higher than those of linguistically plene spellings found in, for instance, *za-*(*a-*)*sa* (35%) and *za-*(*a-*)*na* (11%). It remains to be seen whether these differences carry any importance for the interpretation of these words' phonetic and phonological structure.

[7] In a certain way, this situation is reminiscent of HLuw. rhotacism, which is a phonetic change by which intervocalic lenis dental stops appear as *r* in Hieroglyphic Luwian, cf. KULULU 5 § 11 *a+ra*/*i-tu* 'eat' (3pl.imp.act.) /arantu/ for */aθantu/ < PIE **h*$_1$*d-éntu* (Morpurgo Davies 1982/1983: 250[16]). However, not every lenis dental is spelled with rhotacism, and sometimes we find rhotacised forms next to non-rhotacised forms in the same text. For example, BULGARMADEN § 13 contains the verbal form *ha+ra*/*i-ri+i* 'smash' (3sg.pres.act.; /-ri/), which is the rhotacised variant of **ha+ra*/*i-ti* (/-θi/). Two lines later, we come across BULGARMADEN § 15 *ha+ra*/*i-tu* 'id.' (3sg.imp.act.). This form is built on the same stem and must therefore also have had a lenis dental in its ending: /-θu/. This /-θu/, however, has not been rhotacised to /-ru/ (***ha+ra*/*i-ru*). For this reason, we cannot use one attestation without rhotacism to argue that the lemma itself was never rhotacised.

gical interpretations and etymologies are less secure. Strictly speaking, we cannot use these examples as further evidence or counterevidence to the hypothesis stated in the previous section. At best, they can be used to make the hypothesis more or less plausible.

Thirdly, there are morphemes and lexemes whose interpretations and etymologies are doubtful or downright unknown. They are too unreliable to play any significant role in determining the function of linguistically real plene writing, which renders them only tangentially relevant for the present discussion.

2.3 Group I: etymologically clear words

2.3.1 *za-a-sa* and *za-a-na* 'this'

I will start my investigation of the linguistically real plene material with one of the lexemes that most often show plene writing in Hawkins' Iron Age corpus: the proximal deictic pronoun *za*-(*a*-) 'this': (51x). Etymologically, we can compare this word to CLuw. *za*-(*a*-), Hitt. *ka-a*- and perhaps also Pal. *ka-a*- 'id.', all of which continue PIE **ḱó*- 'this'. The singular direct cases of their paradigms are given in Table 2.2.[8]

By virtue of their plene spellings, Hittite *ka-a-aš* and CLuw. *za*-(*a*-)*aš* are synchronically analysed as /kás/ and /tsá́s/ respectively, with a long accented vowel (Melchert 1994a: 264, Kloekhorst 2008: s.v. '*kā-/kū-/kī-*'). It is generally assumed that the vowel of their preform, PIE **ḱó*-, was regularly lengthened in Proto-Anatolian (Kloekhorst 2014: 583f., Melchert 2015a: 3f. "in closed syllables"). The long vowel in resulting PAnat. **ḱṓ*- accounts for the plene writing we find in the nominatives Hitt. *ka-a-aš* /ḱá́s/ and CLuw. *za-a-aš*, and can explain the plene writings in HLuw. *za-a-sa* and *za-a-na* as well. Accordingly, these can be interpreted as /tsá́s/ and /tsá́n/, respectively. The Luwian and Palaic neuter singular forms must also go back to PIE **ḱó*-, and it is assumed that these represent /tsá́/ (Melchert 1994a: 278) and

[8] The remarkable dative singular *za*-(*a*-)*ti* and the ablative-instrumental form *zi*-(*i*-)*na* are treated in Sections 2.6.6 and 2.6.3, respectively. The adverb *za-a-ti* 'thus, here', as well as the other (plural/oblique) case-forms of *za*-(*a*-), are treated in Section 2.6.2.

	OHitt.	Pal.	HLuw.	CLuw.	PLuw.[1]
nom.sg.c.	*ka-a-aš*	–	*za-a-sa* (8x),[2] *za-sa* (15x)	*za-a-aš* (7x), *za-aš* (9x)	**tsə́s*
acc.sg.c.	*ku-u-un*	–	*za-a-na* (6x), *za-na* (38x)	*za-am*(=*pa*) (2x)	**tsə́n*
nom.-acc. sg.n.	(*ki-i*)	*ka-a-at*(-)	*za-a* (7x),[3] *za* (63x)	*za-a* (1x)	**tsə́*
nom.-acc. pl.n.	(*ke-e*)	–	*za-a-ia* (1x), *za-ia* (32x)	*za-a* (9x)	**tsə́*

[1] I take PLuw. **ə* (> Lyc. *e*, Luw. *a*) and **ə̄* (> Lyc. *e*, Luw. *ā*) as the results of the general pre-Proto-Luwic mergers of PAnat. **e* and **o* (< PIE **h_3e*), and PAnat. **ē* and **ō*, respectively, following Yakubovich (2017a: 3), who draws upon Melchert 1992: 49.

[2] It is noteworthy that nine out of 15 attestations of non-plene *za-sa* (nom.sg.c.) stem from one and the same text: KARKAMIŠ A7.

[3] This number does not include 12 attestations of *za-a* whose final <a> is ambiguous. This means that we cannot decide on the basis of its placement in the inscription whether we should take it as a space-filler or a linguistically real plene vowel. I would transliterate such cases as space-fillers (i.e. *za*$^{-a}$) as per Section 1.2.

Table 2.2: Direct case forms of the proximal deictic pronoun in Hittite, Palaic and Luwian

/ká-/ (Melchert 1994a: 210), respectively. In these forms, plene <(z)a-a> in the Hieroglyphic Luwian forms therefore represents an underlying long accented vowel /á́/.

2.3.2 *ni-i* 'not'

Next, we have the prohibitive negation *ni-i* (also spelled *ní-i*) 'not!'. It is attested nine times with linguistically real plene writing in Hawkins 2000. Apart from this, we find 11 instances of ambiguous <ni-i> and <ní-i> (cf. Table 2.2). Lastly, there are eight non-plene spellings: *ni*, *ní*. We also find HLuw. *ni-i-sá* with linguistically real plene spelling (against once non-plene *ni-sa*). Both variants can be compared with CLuw. *ni-iš* (18x), *ni-i-š*$^{\circ}$ (3x),

ni-i-iš (5x), *ne-iš* (1x) and Palaic *ni-i* (1x).

All these cognate forms are commonly interpreted as having a long accented vowel /í/ (Melchert 2003: 206; Kloekhorst 2008: s.v. '*natta*'), and again we see that, in Hieroglyphic Luwian, linguistically real plene writing corresponds to an underlying long accented vowel.

2.3.3 *pa*+*ra*/*i*-*i* 'before'

Third on our list is the adverb *pa*+*ra*/*i*-*i* 'before', written securely with linguistically real plene <i> once: KARKAMIŠ A1*a* § 16 *pa*+*ra*/*i*-*i*^{a}.[9] Notably, we never find non-plene ***pa*+*ra*/*i* in Hawkins' (2000) corpus.[10] In addition, there are 14 attestations of PRAE-*i*, whose interpretation and utility are unclear: the word-final <i> in these cases might well have been intended as linguistically real plene, but we cannot exclude their use as space-fillers at the end of a sign column. Its CLuw. counterpart *pa-ri-i* and direct cognate Lyc. *pri* 'forth' are obviously connected, but so so are Hitt. *pa-ra-a* /prắ/ 'forth' and Hitt. *pé*-(*e*-)*ra-an* 'before, in front of' ~ HLuw. *pa*+*ra*/*i-na* 'id.' ~ CLuw. *pár-ra*-(*a*-)*an* 'id.' (prev., postpos.). These forms can be understood as lexicalised case forms of an ablauting paradigm **pér*-/*pr*-, from which HLuw. *pa*+*ra*/*i-i*, CLuw. *pa-ri-i* and Lyc. *pri* continue the dative **pr-éi*. We may therefore interpret HLuw. *pa*+*ra*/*i-i* as /prī́/ (Melchert 1994a: 248). Its spelling with linguistically real plene <i> reflects a long accented /í/.

2.3.4 LITUUS+*na-a*- 'to see'

In TELL AHMAR 1 § 11, we find a 3sg.pret.act. form of LITUUS+*na*-(*a*-) 'to see' (attested 16 times as non-plene). This form is read as LITUUS+*na-tà-a*

[9] The <i> in this word represents a linguistically real plene vowel (which cannot be interpreted as a space-filler) and therefore I transliterate it using a full-size letter. The <a>, on the other hand, can be taken as a space-filling vowel sign and is therefore transliterated using superscript.

[10] The context of TELL AHMAR 1 § 5 *pa*+*ra*/*i* is severely damaged. The ligature *pa*+*ra*/*i* is found underneath the sign SUPER+*ra*/*i* which means that the scribe would have started writing this new word in the middle of the sign column. While this is not impossible (cf. the same text, § 13 |*zi-la*), it runs counter to the general trend of starting new words at the top of a sign column. Therefore, I exclude it from the present discussion.

by Hawkins 2000 and Yakubovich 2013ff. but a closer inspection of the sign placement on Hawkins' hand-copy suggests otherwise, cf. Figure 2.5.

Figure 2.5: TELL AHMAR 1 § 11 LITUUS+*na-a-tà*; Hawkins 2000 (plate 100).

Admittedly, the order of the signs is quite messy here, with the last <na> of SUB-*na-na* 'under' written under the following LITUUS+*na-*. However, the placement of <a> and <tà> leaves no room for doubt: we should read LITUUS-*na-a-tà* instead. The linguistically real plene spelling -(*n*)*a-a-* finds a sound parallel in its Cuneiform Luwian counterpart *ma-na-a-* 'to see', whose paradigm has lenis endings throughout (Morpurgo Davies 1982/1983: 257). Traditionally, the stem is analysed as /mnā́-/, based on the reconstruction of Starke (1980: 142ff.), who traced it back to PIE *$*mneh_2$- (comparing Gr. μιμνήσκω 'to remind [oneself]'). This etymology is followed by Kimball 1999: 264, Kloekhorst 2014: 549 and Melchert 2015b: 161[6]. Yet again, linguistically real plene spelling in Hieroglyphic Luwian corresponds to a long accented vowel.

2.3.5 Denominal verbs: "AUDIRE+*MI*"-*ti-i-* 'to hear' & ("COR")*za*+*ra*/*i-ti-i-* 'to desire'

The verb 'to hear' is spelled with linguistically real plene writing four times in Hawkins 2000: TELL AHMAR 1 § 25 "AUDIRE+*MI*"-*ti-i-tá* (3sg.pret.act.); KARKAMIŠ A6 § 4, § 5, § 6 AUDIRE+*MI-ti-i-ta* (3pl.pret.act.). In addition, there are three non-plene attestations.[11] This verb is commonly interpreted

[11] Scil. BABYLON 2 § 3 AUDIRE-*ti-ta* (3sg.pret.act.), KARKAMIŠ A27*ff* 2 AUDIRE+*MI-ti-t*[*a*...] (3sg./pl.pret.act.) and KARKAMIŠ A31 § 14 AUDIRE+*MI-ti-ti* (3sg.pres.act.).

as a derivation from the word for 'ear', attested in CLuw. as *tumman*(*t*)-, with the PIE thematic verbal suffix *-*ié*/*ó*- Melchert 1993: 6. The same suffix features in the etymology of another denominal verbal stem: (*"*COR*"*)*za+ra*/*i-ti-i-* 'to desire'. This verb is derived from the word for 'heart' (CLuw. *za-a-ar-za* /tsárt=sa/) and attested with linguistically real plene writing in TELL AHMAR 1 § 20 ([*"*]COR[*"*])*z*[*a*]+*ra-ti-i-ta* (3sg.pret.act.). On four occasions, we find this word spelled with non-plene writing in the HLuw. corpus, e.g. KARABURUN § 7 *za+ra*/*i-ti-ti*^{i}.

In both verbs, the spellings of their 3sg.pret.act. ending with the signs <ta> and <tá> betray that the ending contained a fortis dental stop (/-ta/) which did not undergo Proto-Anatolian lenition. This corroborates the commonly reconstructed preform for this ending, PAnat. */-iéto/, where lenition is not expected. The question now is how this Proto-Anatolian */-iéto/ developed into its shape we find in Luwian. It is generally assumed that the **é* was coloured to *i* by the *i* that immediately preceded it (Melchert 1994a: 262). Thus PLuw. */ie/ > */ii/.[12] It is likely that the linguistically real plene in HLuw. represents this original disyllabic sequence: /tummantiíta/. However, we cannot exclude that at some stage in pre-HLuw., this was contracted to /-ī́-/ or perhaps even /-í-/. Thus, in these two verbs, the linguistically real plene spelling may in principle represent disyllabic /-ií-/, long accented /-ī́-/ or short accented /-í-/ (but cf. Section 2.4).[13]

The Cuneiform Luwian attestation 3sg.pret.act. *tu-um-ma-an-te-it-ta* 'to hear', which is commonly taken as the cuneiform counterpart of HLuw. AUDIRE+*MI-ti-i-ta*, may also have contained either a disyllabic sequence /-ií-/ or short accented /-í-/. If the consistent absence of CLuw. plene writing is significant in this suffix, it may suggest that an interpretation /-ī́-/ is unlikely for the Luwian variety found in our cuneiform texts. Note, however, that this

[12] This colouring is also found in the outcome of PIE *$ǵ^{(h)}e$-, which develops into PLuw. **i*- through phonetic *[ji-] < *[je-], cf. HLuw. (MANUS)*i-sà-tara*/*i-*, CLuw. *i-iš-ša-ra*/*i-*, Lyc. *izre*(/*i*)- 'hand' < PIE *$ǵ^{h}és$-*r*-.

[13] It is unclear whether (*"*LONGUS*"*)*ia+ra*/*i-i-* 'to extend' belongs to this class or rather to the '*i-zi-i*-class' (cf. Section 2.5.1), whose strong and weak stems also end in *-i-* and *-ia-*, respectively. Its two linguistically real plene attestations KARKAMIŠ A15*b* § 17 (*"*LONGUS*"*)*ia+ra*/*i-i-ha* (1sg.pret.act.) and TELL TAYINAT l. 2 frag. 1a (*"*LONGUS*"*)*ia+ra*/*i-*⌜*i*⌝*-tá* (3pl.pret.act.) can be explained in both cases.

need not disprove a long accented /-ī́-/ for the Hieroglyphic Luwian corpus.

2.3.6 DELERE-*nu-u-na* 'destroy'

Lastly, we turn to DELERE-*nu-u-na* 'destroy' (BABYLON 1 § 15), an infinitive in /-una/ (Melchert 2003: 194), cf. Figure 2.6.

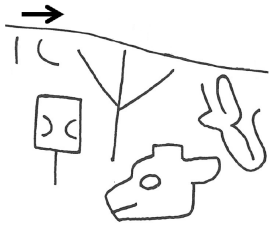

Figure 2.6: BABYLON 1 § 15 DELERE-*nu-u-na*; Hawkins 2000 (plate 210).

Apart from CLuw. *pa-aš-šu-u-na* 'swallow' (attested 1x: KUB 24 7 iii 31), this is the only infinitive spelled with linguistically real plene writing in both Luwian languages. The verbal stem underlying DELERE-*nu-u-na* is probably /marnu-/, a *nu*-causative added to the root **mer*- 'to disappear' (Hawkins 2000: 154, Kloekhorst 2008: s.v. '*mer-*'). When the infinitive ending was added to the bare stem, the result must initially have been /marnuuna/, with a disyllabic sequence. This sequence may have been preserved as such, or it could have been contracted to a long vowel, yielding Luw. /marnūna/. Therefore, in this word too, Hieroglyphic Luwian linguistically real plene writing is used to represent either a disyllabic sequence [uu] or a long vowel [u:]. Unfortunately, it is impossible to recover the place of the accent in this form.

2.4 Setting up a working hypothesis

The examples treated in Section 2.3 show that linguistically real plene writing corresponds to a variety of different vowels. It is important to note that cases such as HLuw. *za-a-sa* 'this', where linguistically real plene writing corresponds to a long accented vowel, do not necessarily imply that linguist-

ically real plene writing marks a combination of *both* vocalic length and the accent. It is also possible that linguistically real plene writing was used to mark either of these features. For instance, the scribe may have wanted to mark only that the /á/ was accented. The fact that it also was long may then simply be coincidental. Therefore, we must allow for two more possible functions of linguistically real plene writing: it may have marked simply an accented vowel /V́/ or a long vowel /V̄/. All possible interpretations of linguistically real plene writing, based on the examples in Section 2.3, are summarised in Table 2.3.

Linguistically real plene spellings	**Possible interpretations**			
	/V̄́/	**/V́/**	**/V̄/**	**/VV/**
za-a-	X	X	X	
ni-i	X	X	X	
pa+ra/i-i	X	X	X	
LITUUS-*na-a*	X	X	X	
AUDIRE+*MI-ti-i-*	X	X	X	X
(“COR”)*za+ra/i-ti-i-*	X	X	X	X
DELERE-*nu-u-na*	?	?	X	X

Table 2.3: Possible interpretations of linguistically real plene spelling

We could take from this list that in all good examples, linguistically real plene writing in Hieroglyphic Luwian corresponds to a long accented vowel /V̄́/, and conclude that its function may well have been to mark a combination of both vocalic length and the accent. However, there are two other pieces of data that allow us to get a more precise picture. The etymological accounts of these examples (Sections 2.4.1 and 2.4.2) are unfortunately relatively uncertain, but nevertheless allow us to draw interesting conclusions about the phonetic interpretation of linguistically real plene writing.

2.4.1 Ablauting verbal suffix *-i-*/*-ai-*

First, there are the verbal stems belonging to the *-i-*/*-ai-*class, cf. CLuw. *du-ú-pí-ti*/*du-pa-in-ti* = Lyc. *tubidi*/*tubeiti* 'to strike'. This class of verbs is easily recognised by the characteristic ablaut in its stem: the weak stem ends in *-ai-*, while the strong stem shows a final *-i-*, which is occasionally spelled with plene writing in Cuneiform Luwian, cf. 3sg.pret. *tar-ši-i-ta* '?', 1sg.pret. *la-ḫu-ni-i-ḫa* 'to wash', cf. Section 5.3. In addition, the strong stem shows lenited verbal endings, which are the result of Proto-Anatolian lenition.[14] There are four HLuw. verbs belonging to the *-i-*/*-ai-* verbal class whose strong stems show linguistically real plene <i>, as presented below.

1. **(*274)*ha-ta-li-i-* 'to speak':**
   KARATEPE 1 Hu. § 28 (*274)*ha-ta-li-i-ha*, MARAŞ 4 § 2 ⌜(*274)⌝[*ha*]-*ta-li-i-ha* (1sg.pret.act.). Attested weak stem forms such as (*274)*ha-ta-la-i-ta* (3pl.pret.act.) confirm that this word belongs to the *-i-*/*-ai-* class;

2. **(LIBARE)*sa*$_5$+*ra*/*i-li-i-* 'to offer':**
   KARKAMIŠ A1*a* § 31 (LIBARE)*sa*$_5$+*ra*/*i-li-i-tú* (3sg.imp.act.). The lenis ending in TELL TAYINAT 1 fr. 2 (LIB]ARE)⌜*sa*$_5$⌝+*ra*/*i-li-tà* (3sg.pret.) and the weak stem in (LIBARE)*sa*$_5$+*ra*/*i-la-i-ti* (3pl.pres.act.) indicate that the stem ends in *-i-*/*-ai-*;

3. **(SA$_4$)*sa-ni-i-* 'to overturn, to remove':**
   ERKİLET 2 § 2 *sa-ni-i-ti* (3sg.pres.act.). For the weak stem, cf. KARKAMIŠ A1a § 4 (SA$_4$)*sá-na-i-ta* and CLuw. *ša-an-na-i-in-du*;

4. **(PES$_2$.PES)*tara*/*i-pi-i-* 'to attack, to plough':**
   KARKAMIŠ A2+3 § 15 ("PES$_2$.PES")*tara*/*i-pi-i-tu* (3pl.imp.). We can distinguish a weak stem with *-ai-* in KARKAMIŠ A16*a* § 7 |PES$_2$.PES-*pa-i-tu*$^{-u}$ (id.).

[14] Lenis stops are written with singleton consonants in the CLuw. corpus: <°V-ti>, not <°V-Vt-ti>, while in Lycian, the difference was represented by using different signs: fortis <t> vs. lenis <d>. In the HLuw. verbal system, lenis stops are only distinguishable in the 3sg. verbal endings. In the preterite, the lenis ending is spelled with the sign <tà> whereas the fortis ending is exclusively spelled using <ta> or <tá> (Rieken 2008). Lenis stops may also appear rhotacised, yielding pres.act. /-ri/, pret.act. /-ra/ etc.

The *-i-*/*-ai-* verbal suffix has been connected to PIE **-eie*/*o-* by Melchert (1997: 134ff.) who proposes that **-eie-* > "**-eyi-*, whence contraction to **-ey-* and then regularly Luvo-Lycian (long) *-ī-*". However, as Melchert himself points out, a preform 3sg. **-eié-ti* would not give the lenited endings we see in Luwian and Lycian. Therefore, he assumes that already in Proto-Anatolian, the accent was analogically retracted from the suffix to the root: **CVC-eiéti* >> **CVC-éieti*. This, in turn, would lead to PLuw. **CVC-ī́di* through regular phonetic development. At the same time, however, Melchert (1997: 134ff.) cites CLuw. *du-ú-pí-ti*/*du-pa-in-ti* whose plene writing compels him to reconstruct root accent: **CV́C-eieti*. Synchronically, we therefore seem to have two accentual patterns for this class of verbs, which, when applied to the four HLuw. verbs treated above, yield the following possible phonological interpretations:

- /h(a)t(a)lī́-/, /sralī́-/, /s(a)nī́-/, /t(a)r(a)pī́-/ (suffixal accent);
- /hát(a)lī-/ or /h(a)tálī-/, /srálī-/, /sánī-/, /t(a)rápī-/ or /tár(a)pī-/ (radical accent).

Both analyses would satisfy the conditions for lenition of the verbal endings. Note, however, that interpretations involving a short accented stem-final vowel (i.e. **/h(a)t(a)lí-/, **/sralí-/, **/s(a)ní-/, **/t(a)r(a)pí-/) run into trouble: a short accented vowel does not trigger lenition. Therefore, the linguistically real plene spellings in the strong stem of these words cannot have been used to denote a short accented vowel /V́/. We may therefore strike this possibility from our list of hypotheses, leaving us with three possible interpretations for HLuw. linguistically real plene writing, cf. Table 2.4.

2.4.2 Enclitic 3sg. *=tu-u*/*=tú-u* (dat.-loc.)

One final refinement can be made by looking at the sentence-initial clitic 3sg.dat.-loc. *=du* 'he/she/it', which is securely spelled with linguistically real plene seven times: <=tu-u> or <=tú-u>. We have already seen one attestation of these spellings in Section 2.1 (cf. Figure 2.4), where we cannot explain the plene vowel in terms of space-filling. A further 25 attestations of <tu-u> or <tú-u> are ambiguous: their plene vowel can be regarded as a space-filler or

Linguistically real plene spellings	**Possible interpretations**		
	/V́/	**/V̄/**	**/VV/**
za-a-	X	X	
ni-i	X	X	
pa+ra/i-i	X	X	
LITUUS-*na-a*	X	X	
AUDIRE+*MI-ti-i-*	X	X	X
(“COR”)*za+ra/i-ti-i-*	X	X	X
DELERE-*nu-u-na*	?	X	X
(*274)*ha-ta-li-i-*	X	X	
(LIBARE)sa_5+*ra/i-li-i-*	X	X	
(SA_4)*sa-ni-i-*	X	X	
(PES_2.PES)*tara/i-pi-i-*	X	X	

Table 2.4: Possible interpretations of linguistically real plene spelling

a linguistically real plene spelling.[15] Lastly, 86 cases are written non-plene <=tu>/<=tú>. HLuw. *=du* should be compared to CLuw. *=du* ‘for him’ (56x)[16] and Pal. *=du* (5x), none of which are attested with plene writing in our text corpora (Carruba 1970: 44).

Melchert (1994a: 37) has argued that “it is also clear from spellings like *-tu-u* for the **enclitic** ‘(to) him’ that ‘scriptio plena’ in hieroglyphic spellings has an aesthetic function and does not mark length or accent” (emphasis in original). Indeed, it is a defining characteristic of clitics that they “are inherently without stress of their own” (Spencer and Luís 2012: 75). This makes

[15] As per Section 1.4, these examples will be interpreted as (potential) space-fillers by default, to avoid falsely interpreting them as linguistically real plene spellings.

[16] This number is based on the attestations listed in Melchert’s *Cuneiform Luwian Lexicon* (1993). Notably, 55 of these are spelled with the sign DU; only 1 is written with TU.

it highly unlikely that =*du* was ever accented.[17] Thus, we should dismiss the possibility that plene writing in these forms marks a long accented vowel (V́). Instead, it is worth considering that the vowel may have been long and *unaccented*: /=θū/. From a typological point of view, long (unaccented) vowels are certainly not barred from appearing in clitics, cf. Gr. πως 'somehow' and the pronominal clitics *mě* (1sg.acc.-gen.), *tě* (2sg.acc.-gen.), *nás* (1pl.acc.-gen.) and *vás* (2pl.acc.-gen.) in Czech.

Crucially, the interpretation of <=tu-u>/<=tú-u> as /=θū/, with a long vowel, finds independent support from inner-Luwian evidence. Its corresponding sentence-initial clitic pronoun of the 1st person, /=mu/ 'me', loses its vowel when followed by clitics starting with a vowel other than *u* (Plöchl 2003: 64). For instance:

1.) **KARKAMIŠ A11*b*+*c* § 11:**
wa/*i-ma-tà*$^{-a}$ |PRAE-*na* (PES$_2$)*hwa*/*i-ia-ta*
'They [the gods] marched before me.' (Hawkins 2000: 103)

In example 1, *wa*/*i-ma-tà*$^{-a}$ should be analysed as *wa*=*m*(*u*)=*ada*, that is, as a combination of =*wa* (quotative particle), =*mu* (1sg.acc.-dat.) and =*ada* (3pl.nom.c.). Notably, 3sg. =*du* behaves differently, cf.:

2.) **ALEPPO 2 § 18:**
('(That) which I shall present to my brother in goodness,')
|*ARHA-pa-wa*/*i-tú-wa*/*i-tà-ta* |*kwa*/*i-sa* |CAPERE-*i*
'whoever shall take it away from him' (Hawkins 2000: 236)

The clitic chain starting after *ARHA* 'away' is =*pa*=*wa*=*du*=*ada*=*ta*, combining =*pa*= 'but' + =*wa*= (quot. ptcl.) + =*du*= (3sg.dat.) + =*ada*= (acc.sg.n.) +

[17] It is true that clitics may become accented in some cases (cf. Spencer and Luís 2012 for examples from Bulgarian [83], Macedonian [89] and Modern Greek [91]), but these result from secondary stress. In these situations, stress is not an inherent feature of the clitic itself, so it is applied indiscriminately to multiple hosts. This is not the situation in HLuw., where we never find linguistically real plene spelling in such highly frequent clitics as =*ha* 'and', =*pa* 'but', etc. Rather, it seems limited to =*du* (3sg.dat.-loc.) and =*du* (2sg.dat.-loc., cf. Section 2.6.7).

=*ta* (locatival particle).[18] The vowel of =*du* is clearly not elided here, as it is kept separate from the following =*ada*= with a glide: <wa/i>. These different behaviours of =*mu* and =*du* are difficult to understand if both end in a short unaccented /u/. By taking the vowel of =*du* as long (and unaccented), we are able to account for this different treatment.[19] Unfortunately, there are no generally accepted reconstructed Proto-Anatolian pre-forms for =*du* we can use to support or refute our hypothesis by tracing the expected phonetic developments.[20]

Returning to our list of possible functions of linguistically real plene writing, we see that =*du* effectively rules out the possibility that the Luwian scribes used plene writing to represent both vocalic length and the accent /V́/. Two options are left, cf. Table 2.5.

As a working hypothesis, I thus conclude that *linguistically real plene writing in Hieroglyphic Luwian was primarily used to mark a long vowel. In addition, it could also mark a disyllabic sequence*.[21] In many words, a long vowel

[18] This interpretation of clitic chain-final /=ata/ as a combination of /=aθa=/ (nom.-acc.sg.n.) and /=ta/ (locatival particle) has been proposed by Rieken (2008: 641).

[19] This situation is reminiscent of Greek verse, where word-final vowels are elided only if they are short (Smyth and Messing 1956: 18). The long vowel of δή, for instance, is never elided in front of vowel-initial words, cf. Hom. *Il.* 4.180 καὶ δὴ ἔβη οἶκον δὲ φίλην ἐς πατρίδα γαῖαν (although it does fall prey to epic correption). The short vowel of δέ, on the other hand, regularly disappears before words starting with a vowel, e.g. three times in Hom. *Il.* 1.199: θάμβησεν δ' Ἀχιλεύς, μετὰ δ' ἐτράπετ', αὐτίκα δ' ἔγνω. By taking the vowel of HLuw. =*du* as long, we can explain the non-elision of its vowel in a similar way.

[20] One anonymous reviewer suggests that we can explain the presence of a long vowel in =*du* 'him' (3sg.dat.-loc.) as the result of analogical processes. To her/his mind, the long vowel in the second-person orthotonic pronoun /tū́/ 'you' (cf. Section 2.5.4) was taken over by its enclitic counterpart and yielded /=θū/ 'you' (dat.-acc.; cf. Section 2.6.7). As described in Yakubovich 2010: 171, this form eventually replaced the inherited third-person clitic, which therefore appears as /=θū/ with a long vowel in our Hieroglyphic texts.

[21] To some, it may seem a little awkward that one graphic device would have been employed to represent two phonetically distinct sequences. In this respect, it is interesting to consider the matter from the viewpoint of moraic phonology. Mora theory assigns weight units ('morae') to syllabic segments, which determine the weight of the syllable. Syllables of a CV structure are assigned one mora and they are taken as light. Syllables with a structure CV̄, on the other hand, are treated as CV-V, with two morae, and are subsequently taken as heavy (Hyman 1985: 9f.). Thus, both open syllables with long vowels (CV̄) and sequences of

Linguistically real plene spellings	**Possible interpretations**	
	/V̄/	/VV/
za-a-	X	
ni-i	X	
pa+ra/i-i	X	
LITUUS-*na-a*	X	
AUDIRE+*MI-ti-i-*	X	X
(“COR”)*za+ra/i-ti-i-*	X	X
DELERE-*nu-u-na*	X	X
(*274)*ha-ta-li-i-*	X	
(LIBARE)sa_5+*ra/i-li-i-*	X	
(SA_4)*sa-ni-i-*	X	
(PES_2.PES)*tara/i-pi-i-*	X	
tu-u/tú-u	X	

Table 2.5: Possible interpretations of linguistically real plene spelling

happens to coincide with the word accent, as in *za-a-sa* ‘this’ (nom.sg.c.). However, I would argue that the presence of the accent had no bearing on the scribes’ choice to add a plene vowel.

2.5 Group II: words with less secure etymologies

We now turn to words and morphemes whose synchronic phonological analysis is still under debate. At best, they are compatible with the hypothesis that linguistically real plene writing marks vocalic length, yet they cannot really support it in any definite sense. On the other hand, the examples in

two light syllables (CV-V) are equivalent in the sense that both consist of two morae.

this section are not secure enough to disprove the thesis that linguistically real plene writing marks vocalic length.

2.5.1 *i-zi-i-* 'to do, make'

The common verbal stem *i-zi-*(*i-*) 'to do, make' is securely spelled with linguistically real plene writing 53 times, as opposed to only five non-plene spellings.[22] In addition, there are various derivations from this stem that are also commonly written with linguistically real plene spellings. These are listed below.

1. *i-zi-i-sa-t*(*a*)- 'to honour':
    a KULULU 4 § 12 *i-zi-i-sa-ta-ha* (1sg.pret.act.);
    b KARKAMIŠ A1*a* § 34, A1b § 2f. *i-zi-i-sa-ta-i* (3sg.pres.act.);
    c KARKAMIŠ A17*b* § 3 *i-zi-i-sa-ta-tú*$^{-u}$ (3sg.imp.act.);
    d KARATEPE 1 § 48 Ho. *i-zi-i-sa-tú-na* (inf.; its parallel KARATEPE 1 § 48 Hu. has non-plene *i-zi-sa-tú-na*);
2. KARKAMIŠ A6 § 15 & § 17 *i-zi-i-sa-ta+ra*/*i*(=*wa*/*i*=*ma-za*) 'honour' (2x, abl.-ins.);
3. MALPINAR § 10 *i-zi-i-ia-t*[*i*$^{?}$*-z*]*a*$^{?}$, § 14 *i-z*[*i*]*-i-ti-i-za* 'offering' (nom.-acc.sg.n.);
4. MARAŞ 14 § 7 *i-zi-i-ia-tara*/*i-za*$^{-a}$ 'offering, ritual' (nom.-acc.sg.n.).

The verbal stem *i-zi-i-* is followed by lenited (and rhotacised) verbal endings, e.g. TELL AHMAR 1 § 16 *i-zi-i-tà* (3sg.pret.), KULULU 5 § 4 *i-zi-i-ri+i* (3sg.pres.). For this reason, Rieken (2007: 273) has reconstructed the proto-form of this stem as **Híǵ-ie-*, with a secondary accent retraction from older **Hiǵ-ié-*. Kloekhorst (2016b) notes that, while PIE **Híǵ-ie-* would indeed give lenited verbal endings, it leaves the almost consistent plene writing of the

[22] These are: KÖTÜKALE § 6 *i-zi-ti* (3sg.pres.act.), KÖTÜKALE § 3 *i-zi-*[*ha*] (1sg.pret.act.), İSPEKÇÜR § 4 *i-zi-ha* (id.), KARATEPE 1 § 18 Ho. *i-zi-tà* (3sg.pret.act.) and KARATEPE 1 § 67 Hu. *i-zi-lá*/*í* (id.).

strong stem unexplained. He therefore reconstructs the stem as an ablauting *i*-stem, **Hiǵ-éi-/*Hiǵ-i-*, exactly on account of its near-consistent plene writing and its inflectional similarities to CLuw. *ī-/i-* 'to go' (also with lenis endings).[23] However, since this reconstruction is based on the assumption that linguistically real plene writing marks vocalic length, it would be circular to use this verb as an argument in favour of this assumption. Nevertheless, it should be noted that the hypothesis that linguistically real plene spelling marks vocalic length does not create any serious problems for the interpretation of this verb.

2.5.2 *á-wa/i-i-* 'to come'

The HLuw. verbal stem (PES)*á-wa/i-i-* 'to come' is found spelled with linguistically real plene writing on six occasions, while its non-plene variant (PES)*á-wa/i-* occurs 18 times.[24] Both the HLuw. form and its CLuw. counterpart *a-ú-i-* 'id.' show lenis endings, e.g. HLuw. İSKENDERUN § 2 (*"*PES*"*)*á-wa/i-tà* (3sg.pret.act.; with <tà>) ~ CLuw. *a-ú-i-ta* with single spelling of the *t* (Morpurgo Davies 1982/1983: 257). This verbal stem is usually interpreted as comprising a preverb meaning 'hither' + PIE **h₁éi-/h₁i-* 'to go'. Melchert (1994a: 66) argues that Luwian must have generalised the strong stem **h₁éi-*, which regularly develops into PLuw. */ī́/.[25] If Melchert's interpretation of CLuw. *a-ú-i-* also holds for HLuw. (PES)*á-wa/i-i-*, then the latter's linguistically real plene spelling would reflect a long vowel. This would fit our working hypothesis that linguistically real plene spelling marks vocalic length.

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[23] **Hiǵ-éi-/*Hiǵ-i-* would be an athematic *i*-present, as is known from Skt. *kṣéti/kṣiyánti* < PIE **tḱ-éi-/*tḱ-i-*, cf. Rix et al. 2001: s.v. *'tḱe̯i-'*

[24] The linguistically real plene attestations are KULULU 1 § 13 *á-wa/i-i-tu* (3pl.imp.act.); KARKAMIŠ A1*a* § 17 PES-*wa/i-i-ha-*a* (1sg.pret.), § 21 & § 24 PES-*wa/i-i-ha* (1sg.pret.); KARKAMIŠ A11*b* § 14 PES-*wa/i-i-ha*; TELL AHMAR 2 § 21 PES-*wa/i-i-ti* (3pl.(?)pres.) and GAZİANTEP l. 2 PES-*wa/i-i-ti*$^{-i}$.

[25] Cf. CLuw. 3sg.pres.act. *i-ti* 'goes'. Note that the length of the initial vowel cannot be deduced from the orthography, as word-initial spellings like /V-C°/ are ambiguous with regard to plene writing. However, the lenited verbal ending -ti shows us that the preceding vowel was long and accented: CLuw. /ítti/.

2.5.3 (DEUS)TONITRUS-*hu-ti-i* (DN)

The dat.-loc.sg. ending of the Storm-god's name is written twice with linguistically real plene: BABYLON 1 § 9 (DEUS)TONITRUS-*ti-i* (cf. Figure 2.4) and PALANGA § 7 TONITRUS-*hu-ti-i*. In addition, there are eight ambiguous cases ending in *-ti-i*/*-ti*$^{\cdot i}$, and ten non-plene forms ending in *-ti*. This name is also attested in Lycian, where we find *trqqas* (nom.sg.c.) and *trqqñti* (dat.sg.c.), and in CLuw.: ^{d}IŠKUR-*an-za* (voc.sg.c.), ^{d}IŠKUR-*un-ti* (dat.sg.c.). Nowadays, the commonly accepted etymology is PIE **trh$_2$-u-(e)nt-* (Kloekhorst 2006: 100; Melchert 2015a: 2). The attested forms in Luwian and Lycian indicate that this word originally must have shown ablaut: CLuw. ^{d}IŠKUR-*an-za* and Lyc. *trqqas* (presumably /-H^{w}ants/ and /-k^{w}as/, respectively) both seem to continue a full grade in the suffix: **trh$_2$-u-ént-s*. In the suffixes of HLuw. TONITRUS-*hu-ti*(*-i*) and Lyc. *trqqñti*, on the other hand, we seem to be dealing with the zero-grade variant **-nt-*.[26] In these two datives, it is most straightforward to assume that the accent therefore rested on the ending, so that we may explain all forms from an original hysterodynamic paradigm **trh$_2$-u-ént-s*/**trh$_2$-u-nt-ós*.[27] For this paradigm, the reconstructed hysterodynamic dative ending is PIE **-éi*. Now, on the basis of CLuw. *i-ti* 'go' (3sg.pres.act.) < PIE **h$_1$éi-ti* and CLuw. *zi-*(*i-*)*i̯a-ri* 'lie' (3sg.pres.med.-pass.) < PIE **kéi-o-*(*ri*), we know that PIE **éi* normally gives /ī/ in Luwian (Melchert 1994a: 265)[28] Without any evidence to the contrary, it is safe to assume that HLuw. (DEUS)TONITRUS-*hu-ti-i* is a direct continuation of a PIE hysterodynamic dative **-nt-éi*, yielding /-ntī́/. If this is correct, then we see once more that the linguistically real plene spelling in Hieroglyphic Luwian corresponds to a long (accented) vowel.

[26] This is assumed by Melchert (2015a: 2), who cites Lyc. *trqqñt-* as continuing **trh$_2$-wnt-́*.

[27] Similarly Kloekhorst (2008: 838), who notes that this name looks like the **-nt-* participle of an old *u*-present **terh$_2$-u-*. In this regard, it is interesting to recall that a hysterodynamic inflection has been reconstructed for athematic **-nt-*participles on independent grounds by Beekes (1985: 64–77). This is corroborated by examples such as Skt. nom.sg.m. *san* < **h$_1$s-ént-s*, acc.sg.m. *santam* < **h$_1$s-ént-m*, gen.sg.m. *sataḥ* < **h$_1$s-nt-ós*.

[28] Note that the CLuw. initial <i-> in *i-ti* is ambiguous with regard to plene writing and does not tell us anything about the underlying vocalic length. However, the singleton ending <-ti> (instead of **<-it-ti>) shows that lenition has taken place, which means that the preceding vowel *i-* must be long (and accented): /ī́/.

2.5.4 *tu-u* 'you' (dat.-loc.)

In ASSUR letter *f*+*g* § 16, we find the orthotonic variant of the personal pronoun *tu-u* 'you' (2sg.dat.-loc.), which is securely spelled with linguistically real plene writing. In Hawkins 2000, it is the only attestation of this particular form, while we have cognates in Palaic (acc.-dat. *tu-ú*, Carruba 1970: 44) and Middle/New Hittite (acc.-dat. *tu-uk*, cf. Kloekhorst 2014: 493). Because HLuwian *tu-u* is free-standing (as opposed to enclitic *=du*, on which see Section 2.6.7), it is likely that its *-u* was accented. Still, it is not self-evident whether we should take the underlying vowel as long (/tū́/) or short (/tú/). It is well-known that PIE **é* and **ó* in open syllables yield a long /á́/ in Luwian, cf. CLuw. *na-a-u̯a-* 'not' < **né-*, CLuw. *u̯a-a-šu* 'well' < **uósu-* (Section 5.3 and Melchert 1994a: 263f.). In his *Anatolian Historical Phonology*, Melchert generalises this open-syllable lengthening of accented vowels, arguing that **í* and **ú* also underwent lengthening to Luwian /ī́/ and /ū́/.[29] Accordingly, he surmises that HLuw. *tu-u* is to be analysed as /tu:/, to which he adds: "but not directly provable from spelling!" (1994a: 262). Although it is quite possible that **í* and **ú* are lengthened in the same way as **é* and **ó*, I am not aware of any incontrovertible positive evidence, as all of Melchert's examples require a secondary accent shift (Melchert 1994a: 261f.). For this reason, I am hesitant to take the interpretation of HLuw. *tu-u* as /tū́/ as absolutely secure. On the other hand, such an interpretation would be effortlessly compatible with the hypothesis that linguistically real plene writing marks an underlying long vowel.

2.5.5 *sá-a-* 'to release'

One attestation of the verb *sa-* 'to release' is spelled with linguistically real plene writing: MARAŞ 4 § 10 *sá-a-ha* (1sg.pret.act.). In the rest of Hawkins 2000, this verb is attested 11 times without plene writing. The same verb is found in Cuneiform Luwian and in Lycian. In Cuneiform Luwian, we find a *ḫi*-conjugated stem *ša-*(*a-*): *ša-a-i* (3sg.pres.act.), *ša-*(*a-*)*at-ta* (3sg.pret.act.),

[29] The effects of open syllable lengthening in the Anatolian languages and its interplay with other phonetic developments in the prehistory of the Luwic languages are discussed in more detail in Chapter 5.

ša-(*a-*)*an-du* (3pl.imp.act.). In Lycian, on the other hand, we seem to be dealing with a *mi*-conjugated stem: *hadi* (3sg.pres.act.), *hade* (3sg.pret.act.), *hadu* (3sg.imp.act.). The plene spelling in Cuneiform Luwian suggests a long (accented) vowel /á/. This is also required by the Lycian 3sg. forms: they show the lenited endings *-di*, *-de* and *-du* (instead of their fortis counterparts *-ti*, *-te*, *-tu*), indicating that the vowel preceding them must have been long (and accented): /á/. Within the hypothesis proposed here, we can now explain the unique linguistically real plene spelling of HLuw. <*sa-a-*> as a way of marking the length of the underlying vowel.

2.5.6 Ablative-instrumental ending -C*a-a-ti*/-C*a-a-ri*+*i*

The ablative-instrumental ending is spelled with linguistically real plene <Ca-a> on three occasions: ALEPPO 2 § 24 MALUS-*la*/*i-a-ti* 'malice', BOYBEYPINARI 1 § 4 *kwa*/*i-a-ti* (Goedegebuure 2010: 9) and the personal name SULTANHAN § 45 *wa*/*i-su-SARMA-ma-sa-a-ri+i*. The effects of rhotacism are visible in the latter example, indicating that the ending contained a lenited dental /θ/. This is corroborated by the cognates of this ending in Cuneiform Luwian and Lycian. In Cuneiform Luwian, we find that the ending is consistently spelled with a singleton, <Ca-(a-)ti>, while in Lycian, the sign <d> is used: <-Vdi>. I follow Kloekhorst (2014: 554f.) by taking the lenition in these endings to have been caused by a preceding long accented vowel (*/-V́ti/ > PAnat. */-V́di/). In Hittite, evidence for this Proto-Anatolian long vowel is found in the archaic ablative ending *-āz*, cf. *ták-na-a-az* /tgnáts/ 'earth' and *ḫa-an-ta-a-az* /Hantáts/ 'forehead'. Also in Cuneiform Luwian, the abl.-ins. ending is found spelled with plene writing, for example *ma-al-li-ta-a-ti* 'honey'. The Proto-Anatolian ancestors of Hittite *-āz*, CLuw. *-ādi* and Lyc. *-edi* have been reconstructed as *-ó́ti and *-ó́di (Kloekhorst 2014: 555). The latter is expected to yield Luwian /-áθi/ with a long vowel, which neatly co-occurs with the three Hieroglyphic Luwian linguistically plene writings under scrutiny here.

At the same time, it should be underlined that the HLuw. corpus has many ablative-instrumental forms which do not show any signs of a long vowel. Only three of the over 200 phonetically spelled abl.-ins. forms attested in the Iron Age corpus are written securely with linguistically real

plene writing. Even though it has been stated in Section 2.2 that linguistically real plene writing never occurs with absolute consistency within one lexical item, its extreme rarity in the case of the abl.-ins. is somewhat disconcerting. Nevertheless, a scarcity of plene spellings in ablative-instrumental forms is not limited to Hieroglyphic Luwian. Our Cuneiform Luwian corpus contains 273 ablative-instrumentals with phonetically spelled-out endings.[30] The vast majority (202; 74%) of these are spelled non-plene as <Ca-ti>; only 56 (26%) attestations are written with plene spelling: <Ca-a-ti>. Naturally, as long as Cuneiform Luwian plene writing of *-a-* lacks a detailed study, any interpretation of these ratios remains necessarily speculative. Assuming, however, that Cuneiform Luwian plene writing marks long vowels (as it does in Hittite), we must account for the relatively frequent occurrence of non-plene <Ca-ti> in one way or another. Kloekhorst 2014: 555 solves the problem by assuming that there were two different abl.-ins. endings in Proto-Anatolian: accented **-ṓdi* and unaccented **-ti*. In the Luwic languages, he argues, the lenited variant was generalised, yielding both accented PLuw. **-ṓdi* and unaccented **-odi*. Through regular development, these turned into Luw. *CVC-ā́di ~ CV́C-adi*.

Admittedly *ad hoc*, but nonetheless possible, is the suggestion that the Iron Age HLuw. ending *-adi* was generalised at the expense of *-ā́di*. MALUS-*la*/*i-a-ti*, *wa*/*i-su-SARMA-ma-sa-a-ri+i*, *kwa*/*i-a-ti* and conceivably also *za-a-ti* (cf. 2.6.6) would thereby represent archaic forms.

2.5.7 *á-pi-i* 'back, afterwards'

The adverb *á-pi*(*-i*) 'back, afterwards' is attested with linguistically real plene writing twice: SULTANHAN § 12 *á-pi-i*; SULTANHAN § 41 *á-pi-i*(*-wa*/*i-tà-a*), alongside two ambiguous plene spellings *á-pi-i* (SULTANHAN § 3, § 45). In addition, Hawkins 2000 lists non-plene *á-pi* 23 times. Notably, all four examples of linguistically real plene *á-pi-i* stem from the SULTANHAN inscription, which raises the possibility that we are dealing with a peculiarity of a certain scribe, rather than a pan-HLuwian linguistic phenomenon. I will leave this question open for now. Nevertheless, the assumption that the lin-

[30] Numbers based on a manual count in Melchert 1993.

guistically real plene writings of *á-pi-i* are *sprachwirklich* does not pose any immediate danger to the hypothesis that linguistically real plene marks vocalic length, as I will argue here.

Since Oshiro 1988: 251f. HLuw. *á-pi*(*-i*) has been connected to HLuw. *á-pa-na* 'behind' and Hitt. *a-ap-pa-an* 'id.', which are further related to Lyc. *epñ* 'afterwards' and *epi* (local adverb) as well as CLuw. (*a-*)*ap-pa-an* 'behind' and *a-ap-pa* 'back, again'.[31] These forms are petrified case-forms of an old nominal paradigm, with HLuw. *á-pi*(*-i*) and Lyc. *epi* both containing an old athematic dative-locative ending (either **-éi* or **-i*). Now, if the final *-i* of *á-pi*(*-i*) truly continued the PIE locative singular ending **-i*, as Hawkins (2000: 555) suggests, then it would be hard to explain why the SULTANHAN scribe wrote a linguistically real plene vowel after *á-pi* in § 12 and § 41. The hysterodynamic dative-locative singular ending **-éi*, on the other hand, would be much less problematic. As we have already seen in Section 2.5.3, a PAnat./PIE diphthong **éi* is expected to yield a long vowel /ī/ in Luwian. The scribe may have wanted to express this using linguistically real plene spelling in HLuw. *á-pi-i* /ʔapī́/.

One could object to this scenario that a desinentially accented protoform **Hp-éi* is difficult to reconcile with Hitt./CLuw. *a-ap-pa*, which is presumed to continue a radically accented allative **Hóp-o*/**Hép-o*. Put differently, we would expect to find Hitt./CLuw. ***ap-pa-a* < **Hp-ó* in that case. However, we must not forget that attested Hitt./CLuw. *a-ap-pa* itself cannot be the regular outcome of PIE **Hópo*, from which we would expect ***a-pa* (with a lenited stop). For this reason, Kloekhorst 2014: 558f. has proposed that Hitt. *a-ap-pa* and all related forms continue an ablauting paradigm with either static inflection (nom. **Hóp-s*, gen. **Hép-*(*o*)*s*, with generalised radical accentuation) or mobile inflection (nom. **Hóp-s*, gen. **Hp-ós*). In addition, it is worth noting that the expected dat.-loc.sg. of the latter paradigm is exactly **Hp-éi*, which would regularly develop into HLuw. *á-pi-i*.

[31] The existence of an enclitic =*appi* in Cuneiform Luwian is not assured (Melchert 1993: s.v. '*appi*').

2.5.8 *ti-i-wa/i-t*° 'Sun-god'

The name of the Sun-god is spelled with linguistically real plene writing twice: in KÜRTÜL § 6 (DEUS)*ti-i-wa/i-ti*-x and as the second part of the composite personal name KARATEPE 1 § 1 Hu. [I](LITUUS)*á-za-ti-i-wa/i-tà-sá*. It is cognate with Hitt. *šḭ̯uatt-* 'day', CLuw. *Tiu̯ad-* 'Sun-god' and Pal. *Tiu̯at-* 'id.'. According to Kloekhorst (2008: s.v. '[(d)]*šḭ̄u̯att-*'), these words continue an ablauting paradigm: pre-Proto-Anatolian nom.sg. **diéu-t-s*, acc.sg. **diu-ót-m̥*, gen.sg. **diu-t-ós*. Already in Proto-Anatolian, the full grade of the suffix **-ot-* must have been generalised throughout the paradigm. The Luwian form could either continue PAnat. **díu-od-* (with zero grade in the root; as per Melchert 1994a: 240) or **diéu-od-* (with full grade in the root, cf. Rieken 1999: 105). In both cases, the result would contain a phonetic feature for which Hieroglyphic Luwian plene writing is expected within the hypothesis investigated here. Zero-grade PAnat. **díu-od-* would develop into PLuw. **tḭ́uəd-* through regular lengthening of accented vowels in open syllables before [w], cf. Melchert 1994a: 240 and Section 5.3. Full-grade PAnat. **diéu-od-* would presumably yield raising of PAnat. **e* > **i* under influence of the preceding [j]: PLuw. **tiíu-əd-* (cf. also Section 2.3.5. Subsequently, this disyllabic sequence presumably contracted to HLuw. *tḭ́uad*. In either scenario, the plene spelling in HLuw. *ti-i-wa/i-*° plausibly represents an accented long vowel *ī́*.

2.6 Group III: word with unclear etymologies

In this section, we turn to morphemes and words that are very difficult to interpret phonologically. They often have neither good cognates nor convincing etymologies. For this reason, they are of limited use for testing our hypothesis.

2.6.1 *a/i*-stem nouns/adjectives

In terms of tokens, the largest group of linguistically real plene spellings consists of direct case endings of nouns and adjectives belonging to the *a/i*-stem class, which is traditionally referred to as the '*i*-mutation' class. A defining

feature of this class is that the stem of its common-gender nouns and adjectives contains *-i-* in the direct cases (nominative and accusative). Words of this class continue original PIE consonant stems, *i*-stems and thematic stems (also including adjectives with the suffix *-ia-*), cf. Norbruis fthc.

In Hawkins' Iron Age corpus (2000), I have counted 189 linguistically real plene writings of <i> in the direct case endings <-Ci-i-s°> (nom.sg.), <-Ci-i-na> (acc.sg.) and <-Ci-i-zi> (nom./acc.pl.). These include the participles in *-mi-*(*i-*), e.g. KULULU 2 B1 *u-wa*/*i-mi-i-sá* 'drinking'; KARKAMIŠ A11*b* § 1 *á-za-mi-i-sa* 'loved'; derivations with the 'ethnic' suffix *-wa*/*i-ni-*(*i-*), e.g. HAMA 8 § 1 *i-ma-tu-wa*/*i-ni-i-sa*(REGIO) 'Hamathite, from Hama'; genitival adjectives in *-a-si-*(*i-*), e.g. BOYBEYPINARI IVD3 *á-pa-si-i-na* 'that'.

Ever since this stem class was first identified in Starke 1982: 408f.[3], scholars have tried to explain the origins of its stem-final *-i-* in various ways (see Rieken 2005: 51f. for a short *Forschungsgeschichte*). Starke himself (l.c.) tried to trace the *-i-* back to the PIE ablauting suffix *$*-ih_2$-/-ieh_2-* ('devḯ-suffix'), used to form feminine nouns in various Indo-European languages. This connection was followed by both Oettinger (1987: 42) and Melchert (1994a: 261, 2003: 187 etc.), and the latter analyses the vowel as long (/ī/) on account of plene writing in Cuneiform Luwian. More specifically, "The length of the inserted *-ī-* is assured by plene spellings such as nom.sg. *da-a-u-i-iš* 'eye' (where the accent is surely on the first syllable)" (Melchert 2003: 188). Rieken 2005 rather derives the *i*-mutated forms from an older ablauting *i*-stem paradigm *-i-*/*-oi-*. To account for the length of the mutation *i* in the common gender nominative/accusative singular, she envisages an accent shift from the root to the *-i-*, analogous to the suffixal accentuation in the oblique cases. Subsequently, this accented *-i-* would have been lengthened (Rieken 2005: 67) as follows: pre-Luw. nom.sg.c. **CV́C-is* > **CVC-ís* > **CVC-ī́s*.

However, the length of the mutation-*i* in Cuneiform Luwian is not beyond doubt. Rieken (2017) has recently collected and analysed all Cuneiform Luwian plene spellings of *i*. One of the conclusions she reaches is that "there is no reason to assume that the *i*-mutation vowel was long" (2017: 27). If this conclusion also holds for the *-i-* in Hieroglyphic Luwian *a*/*i*-stem nouns and adjectives, we cannot interpret their frequent plene spellings as markers for underlying vowel length.

One possible reconciliation of both data sets takes the same point of

departure as Rieken 2005, assuming that the Luwian *a*/*i*-stem paradigm originates from inherited *i*-stem paradigms. One could assume that, in time, the inherited *-ei-*/*-i-*ablaut was levelled out by extending the oblique variant *-ei-* to the direct cases of the paradigm. This replaced the original nom.sg.c. **-C-i-s* and acc.sg.c. **-C-i-n* endings by nom.sg.c. **-C-ei-s* and acc.sg.c. **-C-ei-n*, which would develop to **-C-ī-s* and **-C-ī-n* through regular phonetic development.[32]

2.6.2 Pronominal paradigms: *kwa*/*i*-(*i*-)/*kwa*/*i*-(*a*-) 'who, which'; *za*-(*a*-)/*zi*-(*i*-) 'this'

Linguistically real plene writing also features heavily in the paradigms of *kwa*/*i-* 'who, which' and *za*/*i-* 'this'. Their paradigms are given in Table 2.6.

The direct singular cases of *za*-(*a*-) have already been treated in Section 2.3.1, and we will return to the ablative-instrumental *zi-i-na* and the dative-locatives singular *kwa*/*i-a-ti*$^{(-i)}$ and *za-a-ti* in Sections 2.6.3 and 2.7.1, respectively. The other case forms of these two pronominal stems will be treated here.

The direct cases of the HLuw. relative/interrogative pronoun nom.sg.c. *kwa*/*i-i-sa*$_x$, acc.sg.c. *kwa*/*i-i-na*, nom.pl.c. *kwa*/*i-i-zi* and acc.pl.c. *kwa*/*i-i-zi* all show an *-i-* which is lacking in the oblique cases (Melchert 2003: 191). In addition, the *-i-* is often spelled with linguistically real plene writing. This corresponds well to the frequent plene spellings we find in the cuneiform attestations: alongside 34 non-plene CLuw. *ku-iš*, we find five plene *ku-i-iš*, and alongside one non-plene *ku-in*, there are three attestations of *ku-i-in*. Lastly, three counts of non-plene *ku-in-zi* contrast with two plene *ku-i-in-zi*. The plene spellings of Cuneiform Luwian are thus significant and indic-

[32] A different line of development is taken by Norbruis (fthc.), who argues that the plene spellings in *a*/*i*-stem words are simply space-fillers, used in penultimate position. While this explanation avoids the difficulty of having to explain the mismatch between CLuw. non-plene spelling and HLuw. linguistically real plene spelling, it still faces the challenge of accounting for two concurrent space-filling practices. In addition, it should address cases like KARKAMIŠ A11*c* § 25 ("FLUMEN+MINUS")*sà-ku+ra*/*i-wa*/*i-ni-i-zi-ha* 'of Sakura' (nom.pl.), where the plene spelling is not found in penultimate position.

	Linguistically real plene/Non-plene spellings			
	***kwa/i-* 'who, which'**		***za/i-* 'this'**	
nom.sg.c.	*kwa/i-i-sa*$_x^{(-a)}$	34x/85x	*za-a-sa*	8x/14x
acc.sg.c.	*kwa/i-i-na*$^{(-a)}$	1x/5x	*za-a-na*	5x/39x
nom.-acc.sg.n.	*kwa/i-a-za*	5x/5x	*za-a*	7x/59x
dat.-loc.sg.	*kwa/i-a-ti*$^{(-i)}$	4x/4x	*za-a-ti*	11x/25x
nom.pl.c.	*kwa/i-i-zi*	2x/9x	*za-a-zi*	9x/13x
acc.pl.c.	*kwa/i-i-zi*	2x/1x	*za-a-zi*	7x/5x
nom.-acc.pl.n.	*kwa/i-ia*	0x/11x	*za-a-ia*	1x/32x
dat.-loc.pl.	—	n.a.	*za-a-ti-ia-za*	3x/5x
abl.-ins.[1]	*kwa/i-a-ti*	1x/0x	*zi-i-na*	4x/11x

[1] Note that this count does not include KARKAMIŠ A17*c* § 1 *kwa/i-a-ti* and § 2 *kwa/i-a-ti*$^{-i}$, whose interpretation is unsure. Their form suggest that they originally must have been dative-locatives or ablative-instrumentals.

Table 2.6: HLuw. *kwa/i-(i-)/kwa/i-(a-)* 'who, which' and *za-(a-)/zi-(i-)* 'this'

ate that the vowel in the relative/interrogative pronoun was long.[33] If this is true, the CLuw. data may show independent support for length of the *-i-* in HLuw. *kwa/i-(i-)*. The nom.-acc.sg.n. *kwa/i-(a-)za* is usually analysed as /k^{w}antsa/, with the thematic ending /-an/ followed by the particle *=sa/za*, which is commonly attached to singular neuter nom.-acc. forms (Melchert 2003: 191, Yakubovich 2015: 15). To explain the linguistically real plene writ-

[33] One could object to this view that the plene written <i> was used as a glide [wi] here, similarly to plene <i> in CLuw. *da-a-u-i-iš* (Section 2.6.1). Note, however, that the scribes did not deem it necessary to write a glide between a labiovelar and /i/ in the Hittite paradigm of *ku-iš* /k^{w}is/, *ku-in* /k^{w}in/, *ku-it* /k^{w}it/ etc. (We only find one attestation of *ku-i-it* in OS, for which cf. Kloekhorst 2014: 433.) If both the CLuw. form and the Hittite form had the same underlying phonetic structure [k^{w}is], [k^{w}in] etc., then I would expect them both to be written in the same manner. Rather, the fact that the CLuw. forms were written differently from the Hittite forms by the very same scribes suggests to me that they were phonetically distinct.

ing in this form in terms of vocalic length, one could argue that the vowel was analogically lengthened after other case-forms containing a long /ā/, such as *kwa*/*i-a-ti* (dat.-loc.sg., cf. Section 2.7.1) and *kwa*/*i-a-ti* (abl.-ins.).[34]

Lastly, we find linguistically real plene writing of *a* in the oblique and plural cases of *za*-(*a*-) 'this'. Next to the nom./acc.pl.c. HLuw. *za-a-zi*, we find CLuw. *zi*-(*i*-)*in-zi* (nom.pl.c.) and *zi-i-in-za* (acc.pl.c.), containing an *-i-*. At first sight, the distribution of the *-i-* in the CLuw. paradigm may suggest influence from the *i*-mutated paradigms. However, the *-i-* in CLuw. *zi*-(*i*-)*in-zi* and *zi-i-in-za* occasionally shows plene spelling (Rieken 2017: 23). This does not correspond well to the synchronic CLuw. mutation-*i*, which was only spelled with plene writing in specific environments, as has been argued in Section 2.6.1.[35] The CLuw. forms with *i* may therefore be old (at least the nom.pl.c.), meaning that the vocalism of HLuw. *za*-(*a*-)*zi* must be secondary. Analogical replacement of original HLuw. **zi-i-zi* >> *za*-(*a*-)*zi* on the basis of the singular cases *za*-(*a*-)*sa* and *za*-(*a*-)*na* is perfectly understandable, as it would have regularised the paradigm. The long accented vowels of the singular forms *za-a-sa* and *za-a-na* would have been taken over in the plural cases, where they were represented by linguistically real plene writing. A similar analogy must have taken place in the case of dat.-loc.pl. *za*-(*a*-)*ti-ia-za*, which formally looks like the dat.-loc.sg. form *za*-(*a*-)*ti* with the synchronic dat.-loc.pl. ending *-anz*, and possibly also in the case of *za*-(*a*-)*ia*, the nom.-acc.pl.n., whose origins are unclear.

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[34] Phonologically, it is also possible to analyse nom.-acc.sg.n. *kwa*/*i-a-za* as /kwát=sa/, showing the expected reflex of PIE pronominal nom.-acc.sg.n. ending **-ód*, which we also find in *za-a* 'this' < PIE */ḱód/, cf. Pal. *ka-a-at*. Note, however, that this leaves unexplained why the element *=za*/*sa* is present in *kwa*/*i-a-za* while it is missing in *za-a*.

[35] Rieken (2017: 3) argues that the length of *zi-i-in-zi*/*zi-i-in-za* was analogically taken over from the case-forms containing *za-a-*. Since we are dealing with two different vowels, however, this solution does not seem attractive. Rather, I follow Melchert (2009: 114), who claims that *zi-i-in-zi* goes back to PIE **ḱoi*, which also yielded Hitt. *ke-e* (Kloekhorst 2012a: 259, cf. also Skt. *te* and Hom. Gr. τοι, both nom.pl.m. < PIE **toi*). The addition of the plural marker *-nzi* (whatever its origins), which is ubiquitous among nouns and adjectives, would be trivial.

2.6.3 Pronominal ablative-instrumental *zi-i-na, á-pi-i-na*

One major innovation found in the hieroglyphic texts (unattested in the CLuw. corpus) is its use of special ablative-instrumental forms in the deictic pronouns (Goedegebuure 2007). For *za-*(*a-*) 'this' we find *zi-i-na* (2x), *zi-i-pa-wa*/*i*$^{(-a)}$ (2x) with linguistically real plene writing. Unsure are MALPINAR § 9 *zi*^{i}*-wa*/*i*[...] and KARKAMIŠ A6 § 4 *zi*^{i}*-na*, as the <i> in these attestations may also be interpreted as a word-internal space-filler, cf. Section 1.5.3. Lastly, Hawkins 2000 contains 11 non-plene occurrences: *zi-na*, of which five occur in the KARATEPE bilingual inscription. For the distal deictic pronoun *á-pa-* 'that', we find linguistically real plene *pi-i-na-*a*, in KARKAMIŠ A11*b* § 14, next to four attestations of non-plene *á-pi-na* and *pi-na-*a*. It is tempting to compare these pronominal adverbs to similar ones in Cuneiform Luwian. There we find one attestation of *a-pa-ti-i-i*[*n*] 'thus' (vs. 3x *a-pa-ti-in*) and two of *ku-u̯a-a-ti-i-in* 'as; how?' (vs. 6x *ku-u̯a-*(*a-*)*ti-in*), whose plene spellings suggest that the *-i-* was long. Unfortunately, however, there is no secure etymology to substantiate this suggestion.

2.6.4 Genitive singular ending *-Ca-si-i*

Another innovation found in Hieroglyphic Luwian is a new genitive singular ending in *-Ca-si*(*-i*). Its word-final *i* is securely spelled with linguistically real plene writing on the following three occasions:

1. KARKAMIŠ A1*a* § 32 (PANIS)*tu+ra*/*i-pa-si-i* 'bread';
2. BABYLON 1 § 7 *"*AEDIFICIUM*"-si-i* 'building'(?);
3. ADIYAMAN 1 § 8 *pa-si-i-*a* 'that'.

According to Melchert (2012a: 279), building on Yakubovich 2008: 211, this ending originates in the PIE gen.sg. ending **-osio*. He argues that unaccented non-high vowels would have developed into [ə] in word-final position: PAnat. *[-osjə]. This [ə] later merged with /i/ after it was coloured to [i] by the preceding glide: *[-osjə] > *[-osji] > Luw. /-as(s)i/.[36] If this scenario is

[36] As a parallel to this development, Melchert (2012a: 279) provides Hittite *takku* 'if' <

true, we would have an unaccented, short vowel in HLuw. *-Ca-si-i*, which is difficult to reconcile with its linguistically real plene spelling. However, we can also imagine that the colouring of [ə] > [i] in word-final **-osio* > **-osiə* > **-osii* happened in the same way as **-ie-* to **-ii-* in "AUDIRE+*MI*"*-ti-i-tá* (cf. Section 2.3.5. In the latter case, we have seen that the plene spelling may represent a disyllabic sequence /ii/ or a long vowel /ī/. The same interpretation is thus applicable to the HLuw. genitives in *-Ca-si-i*: PIE **-osio* > PAnat. **-osiə* > pre-Luw. **-osii* > HLuw. /-asii/ or /-asī/. This all necessarily remains very speculative.

2.6.5 *á-mi-i* 'my' (dat.-loc.sg.)

The dat.-loc.sg. of 'my' is attested 32 times in Hawkins 2000. Six times, we can be sure that its *-i* is spelled with linguistically real plene writing: KARKAMIŠ A6 § 8 *á-mi-i*$^{-a}$; BOROWSKI 3 § 9 *mi-i-*a*; TELL AHMAR 1 § 14 *mi-i-*a*; TELL AHMAR 2 § 13 *mi-i-*a*; TELL AHMAR 1 § 20 *mi-i-ha-wa*/*i-*a*; ALEPPO 2 § 17 *mi-i-pa-wa*/*i-*a* 'my'. 17 cases of *á-mi-i* and *mi-i-a* are ambiguous: their plene vowel signs may or may not have been used as space-fillers. We also find nine non-plene attestations of *á-mi* and *mi-*a*. The HLuw. paradigm of *á-mi-* 'my' is very peculiar. On the one hand, its nom.-acc.sg.n. *á-ma-za* next to nom.sg.c. *á-mi-i-sa* and acc.sg.c. *á-mi-i-na* suggest that the paradigm behaves like an *a*/*i*-stem (cf. Section 2.6.1). On the other hand, the dat.-loc.pl. *á-mi-ia-za* /ʔamiants/ and the abl.-ins. *á-mi-ia-ti* /ʔamiaθi/ rather suggest that the stem was synchronically interpreted as an *-i*(*a*)-stem, and Yakubovich 2013ff. also lists this word as such: "ami(ya)-". The dat.-loc.sg. of *-ia*-stems shows two different endings: *-i* and *-ia* (cf. HLuw. *tadi*(*a/i*)- 'fatherly': dat.-loc.sg.c. *tá-ti*$^{(-i)}$ and *tá-ti-ia*). The ending *-ia* looks very archaic and must be the older of the two, while the ending *-i* could easily have been introduced

**tok*^{w}*e* and *nekku* 'not?' < **nek*^{w}*e* (but cf. Kloekhorst 2008: 97, where a case is made for general loss). Recently, Sideltsev and Yakubovich (2016: 34[32]) have argued that the distribution between *-kki* and *-kka* in Hitt. *kuiški* 'something' may also be explained in this way. According to them, pre-Hitt. **-Cke* > **-Ckə*, after which the shwa was coloured by the vowel in the preceding syllable: if the preceding syllable contained [i(ː)], then the word-final shwa merged with /i/, e.g. nom.sg.c. *kuiški*, nom.-acc.sg.n. *kuitki*, dat.-loc.sg. *kuedanikki*. In all other cases, the new word-final shwa merged with /a/: nom.pl.c. *kuiēšqa*; acc.pl.c. *kuiušga*.

from other stem-classes (e.g. the *a*/*i*-stems), cf. Norbruis in prep.(a). It is clear that *á-mi-i* contains this analogical ending *-i*, but we may ask ourselves how it came to be incorporated in the paradigm of *á-mi-i*(*a*)- 'my'. It is not unthinkable that a pre-Luwic stem */ʔami-/ enlarged by the dat.-loc. ending /-i/ first yielded */-i-i/ in a disyllabic sequence. The linguistically real plene writing in HLuw. *á-mi-i* would then be an attempt by the scribes to render a preserved disyllabic sequence or the result of contraction to /-ī/.

2.6.6 *za-a-ti* 'thus, here'

Hawkins 2000 contains one example of the adverb *za-a-ti* 'thus, here' with linguistically real plene spelling: KARKAMIŠ A19*j* *za-a-ti*. In addition, we find 16 attestations which are spelled non-plene, either with rhotacism (i.e. *za-ri+i*) or without, as in *za-ti*. Goedegebuure (2010) proposes considering the adverb *zati*/*zari* as an old ablative-instrumental form, which was later replaced by *zi-*(*i-*)*na* (cf. Section 2.6.3). This interpretation takes *zati*/*zari* as the regular reflex of Proto-Anatolian *-*ṓdi* (< PIE *-*óti*), which we would expect to yield HLuw. /áθi/, cf. Section 2.5.6.[37] If Goedegebuure's identification of *za-*(*a-*)*ti* as an old ablative-instrumental is correct, then the linguistically real plene spelling would correspond to a long accented /á́/, supporting our hypothesis. At the same time, the rarity of linguistically real plene writing in *za-a-ti* (only once in 17 attested cases) would correspond neatly to the overall rarity of linguistically real plene spellings in the ablative-instrumental case ending. Alternatively one may also account for the linguistically real plene spelling by virtue of analogy. The long accented /á́/ present in the direct cases of *za-a-* 'this' could easily have been introduced in its cognate adverb *za-*(*a-*)*ti*.

2.6.7 Miscellanea

Lastly, linguistically real plene writing is found in various uncommon lexical items whose etymology is unknown or still debated. Consequently, these

[37] For the lenition after PIE **ó*, cf. Section 5.2.1, fn. 9).

words cannot be used to support or contradict an interpretation in terms of vocalic length or accent, cf. Table 2.7.

Attestation	**Text**
(*"*OCCIDENS*"*)*á-pa-zi-i-ti* '?'	MARAŞ 7 Side A
HÁ+*LI-i-sa* (PN)	BOYBEYPINARI 2 § 17
(CASTRUM)*ha*+*ra*/*i-ní-i-sà* 'fortress'	KARATEPE 1 § 23 Ho.
(*"*LOQUI*"*)*ha-ti-i-ti* 'to speak, proclaim' (3sg./pl.pres.act.)	ASSUR letter *f* +*g* § 1
kar-ka-mi-i-si-sa$_5$(URBS) 'Carchemishean'	GÜRÜN § 1b
kwa/*i*+*ra*/*i-i* 'since, if' (3x)	KARKAMIŠ A11*c* § 30 & § 31; KARKAMIŠ A13*d* § 5
[I]*ma-li-i*-TONITRUS-*pa-sá* (PN)	KARKAMIŠ A7 § 7
ma-sa-ha-ni-i-ti 'to make grow' (3sg.pres.act.)	SULTANHAN § 22
SUB-*na-a-na*$^{-a}$ 'under', 'demote' (with *i-zi-i-*) (preverb)	ALEPPO 3 § 4
na-a-pa '?'	ASSUR letter *f* +*g* § 5
OMNIS+*MI-ní-i-ma-za*$_4$ 'all'; *ta-ni-mi-i-*(*ha-a-wa*/*i*)[38] 'every' (dat.-loc.sg.)	KARATEPE 1 § 50 Ho.; KARKAMIŠ A6 § 20
(INFANS)*ni-mu-wa*/*i-i-za-sa* (2x) 'child'; *ni-mu-wa*/*i-i-za-sa* 'child'	TELL AHMAR 1 § 1 & § 19; MARAŞ 4 § 1
CRUS-*nú-wa*/*i-mi-i-na* 'to set up'	SULTANHAN § 3
[I]*pa-na-mu-wa*/*i-ti-i-sa* (PN)	BOYBEYPINARI 2 § 17

Continued on next page.

[38] But cf. Section 2.7.2.

Attestation	**Text**
(*"*CULTER*"*)*pa*+*ra*/*i-tú-ni-i-tú* 'to sever'(?) (3pl.imp.act.)	KARKAMIŠ A11*c* § 27
pa+*ra*/*i-i*(=*ha*$^{-a}$) 'over'(?)	KARKAMIŠ A1*a* § 10
pi-i-ha-mi-na 'glorified'	KARKAMIŠ A27*o*
SERVUS-*lá*/*í-a-sa* (PN)	BABYLON 2 § 1
SUPER+*ra*/*i-a-wa*/*i-ta* 'high' (Hawkins 2000); 'over' (Yakubovich 2013ff.)	TELL AHMAR 5 § 12
PUGNUS-*ri*+*i-i-ia-ha* 'exalted' (Hawkins 2000); 'solemnly' (Yakubovich 2013ff.)	KARKAMIŠ A15*b* § 2
(MANUS.*273)(-)*su-hi-i-ti-ha* (1sg.pret.act.)	KARKAMIŠ A15*b* § 14
tara/*i-pa-a-ti* 'to trample'(?)	KARAHÖYÜK § 22
tá-ti-i 'father' (dat.-loc.sg.)	MARAŞ 4 § 8
MONS-*ti-i* 'mountain' (dat.-loc.sg.)	ÇALAPVERDİ 1 § 3
=*tu-u* 'you' (2sg.dat.-loc.encl.; 3x)[39]	ASSUR letter *c* § 5; ASSUR letter *a* § 4; ASSUR letter *f* +*g* § 15
"9"-*wa*/*i-i-za*(-*ha-wa*/*i-tú*) 'ninth part' (2x)	KARKAMIŠ A13*d* § 4 & § 7
"(*187)*zú*"-*mi-la-a-na* '?'	ASSUR letter *c* § 8

Table 2.7: Miscellaneous lexical items with linguistically real plene writing

[39] Unlike its third-person counterpart /=θu/, second-person /=θu/ is not attested before a vowel-anlauting clitic. Therefore, we cannot judge whether it would show elision of its vowel or not (cf. Section 2.4.2).

2.7 Difficult cases

In Sections 2.3 to 2.6, we have seen all the data supporting or at least compatible with the hypothesis that linguistically real plene writing marks vocalic length or a disyllabic sequence. In this section, we will consider the evidence which *prima facie* threatens this hypothesis. In most cases, strong etymological considerations seem to preclude the presence of a long (accented) vowel in places where we find linguistically real plene spelling. Closer inspection, however, reveals that almost all of these forms can be explained in alternative ways.

2.7.1 *za-a-ti* and *kwa/i-a-ti* (dat.-loc.sg.)

The dative-locative singular of the paradigm of *za-(a-)* 'this' (cf. Sections 2.3.1 and 2.6.2) is *za-(a-)ti*, which is spelled 11 times as *za-a-ti* with linguistically real plene writing; *za-ti* with non-plene writing is found 25 times in the Iron Age corpus. The dat.-loc.sg. of *kwa/i-(i-)/kwa/i-(a-)* 'who, which' is *kwa/i-a-ti*, found with linguistically real plene spelling four times. Its non-plene variant *kwa/i-ti* is also attested four times.

Goedegebuure 2010: 3–5 has argued that *za-(a-)ti* must contain a fortis dental stop to account for the consistent absence of rhotacism. She also connects dat.-loc.sg. *za-(a-)ti* to its direct cognate in Hittite: *ke-e-ti*. Both HLuw. *za-(a-)ti* and Hitt. *ke-e-ti* can be used to reconstruct the proto-form PIE **ḱéd^{h}i* (Kloekhorst 2012a: 258, further specifying Goedegebuure 2010: 14). This **ḱéd^{h}i* would have undergone Čop's Law in Proto-Luwic and would have eventually yielded */tsáti/ with a fortis dental /t/ and a short /á/. If HLuw. *za-(a-)ti* still represented expected /tsáti/, then its linguistically real plene spelling would correspond to a short accented vowel, counter to our hypothesis. However, given the innerparadigmatic pressure exerted by the long stem-vowel variants *za-a-as* (nom.sg.c.), *za-a-na* (acc.sg.c.), *za-a* (nom.-acc.sg.n.) and *za-a-ti* (adv.), analogical leveling of an older dat.-loc. singular †*za-ti* /tsáti/ >> *za-a-ti* /tsáti/ seems quite trivial.

The linguistically real plene writing of parallel *kwa/i-a-ti* is problematic for the same reasons: by virtue of Čop's Law, we would expect its proto-form **k^{w}éd^{h}i* (cf. Hitt. *ku-e-da-ni* [OS]) to yield HLuw. */k^{w}áti/ with a short

vowel. In this case too, analogy would not be unexpected: the parallel dative-locative singular *za-a-ti* or other forms of the paradigm with a long vowel (such as the abl.-ins. *kwa/i-a-ti*) could have served as models, transforming †*kwa/i-ti* into *kwa/i-a-ti*.

2.7.2 *kwa/i-ti-i=ha, ku*-AVIS-*pa-pa-a=ha*[...] and abl.-ins. °C*a-ti-i=ha*

We now turn to several attested forms which all have in common that they show an unexpected linguistically real plene vowel immediately preceding the enclitic conjunction *=ha* 'and'.

First, there is the HLuw. indefinite pronoun 'anyone, anything', consisting of the relative/interrogative pronoun *kwa/i-* and *=ha* 'and'. The dative-locative singular of this pronoun is attested twice with linguistically real plene writing: KULULU 1 § 14 *kwa/i-ti-i-ha* and KARKAMIŠ A6 § 25 *kwa/i-ti-i-ha* 'someone, anyone'. Two non-plene forms are found: HAMA 4 § 5 *kwa/i-ti-ha* and AKSARAY § 8 *kwa/i-tí-ha*$_x$. In accordance with our hypothesis, we should take the linguistically real plene *i* as representing a long vowel: /kwatī=ha/.[40] However, this is at odds with the spelling of the unextended form of the dat.-loc.sg. relative pronoun *kwa/i-*(*a-*)*ti* (eleven attestations) and dative-locative singular forms of the other pronouns: *za-*(*a-*)*ti*$^{-i}$ 'this' (36x) and (*á-*)*pa-ti*$^{-i}$ 'that' (47x). These forms never show plene spellings of the *i* which cannot be interpreted as space-fillers. In addition, the sparsely attested Cuneiform Luwian cognates of these pronominal datives, viz. *ku-u̯a-at-ti* 'who/which' (four attestations) and *a-pát-ti*/*a-pa-a-at-ti* 'that' (2x) never show plene writing of their final vowel, suggesting that it was short in Cuneiform Luwian.

Next is the name of the god Kubaba, spelled *ku*-AVIS-*pa-pa-* in HLuw. Hawkins 2000 contains 44 phonetic spellings of this name, but only once do we find linguistically real plene spelling: KARKAMIŠ A19*r ku*-AVIS-*pa-pa-a-ha*[...] (acc.sg.c.) with the addition of the enclitic conjunction *=ha*.[41] The

[40] There is no reason to assume that the *-i-* in these forms was disyllabic.

[41] Note, however, that the <a> in KARKAMIŠ A6 § 21 (DEUS)*ku*+AVIS-*pa-pa-a* is ambiguous.

linguistically real plene <a> suggests that the stem-final vowel is long: /ā/. Again, however, there is comparative evidence which renders this implausible. More specifically, the same name is attested in Hittite as ^{d}*Ku-pa-pa*° (38x), $^{d.MUNUS}$*Ku-pa-a-pa*° (2x), ^{d}*Ku-ba-ba* (1x), ^{d}*Ku-ba-pa* (1x) or ^{d}*Ku-pa-u̯a*$_{a}$ (2x) (Van Gessel 1997: 264–266), never with plene word-final *a*.

Lastly, we return to the HLuw. abl.-ins. ending, whose plene spellings of *a* were examined in Section 2.5.6. In this section, we will take a closer look at its other vowel, *i*. It is spelled with linguistically real plene writing on three occasions in the Iron Age corpus:[42]

1. ARSLANTAŞ (Tell Ahmar) § 6 (BOS)*wa*/*i-wa*/*i-ti-i*=*ha* 'cow';
2. KARKAMIŠ A15*b* § 1 (DEUS)SOL-*tà-ti-i*=*ha* (DN);
3. KARATEPE 1 § 49 Hu. *ha-tà*+*ra*/*i-ti-i*=*há* 'life'.

The linguistically real plene writing in these attestations compels us to interpret these ablative-instrumentals as /-ă̆θī/ with a long final vowel /ī/. However, this is not borne out by the Cuneiform Luwian evidence. Of all CLuw. ablative-instrumentals in Melchert 1993 and Yakubovich 2013ff. (the latter lists 284), not one is spelled with plene spelled word-final i, which rather indicates that the final vowel was a short /-i/.

Comparing these ablatives to the pronominal dat.-loc.sg. *kwa*/*i-ti-i-ha* and the deity name *ku*-AVIS-*pa-pa-a-ha*, a striking similarity emerges: in all cases, the unexpected plene vowel is followed by the clitic =*ha* 'and'. It is highly unlikely that this is a coincidence. The presence of the clitic =*ha* must in some way or another be related to these unexpected linguistically real plene spellings. There are several ways to explain this correlation in terms of a causal connection. A few possible explanations are mentioned here:

1. **Aesthetic reasons.** To the scribe, writing °-*i-ha* may somehow have been more convenient, or otherwise preferable to writing °-*ha*$^{-a}$ (with

[42] At first sight, the final sign of KARKAMIŠ A11*c* § 34 (BONUS)*wa*/*i-sa*$_{5}$+*ra*/*i-ti-i* 'goodness' (abl.-ins.) cannot be explained as a space-filler. However, one can also take it as a space-filler belonging to the following word *pa-ti*$^{-i}$-**a*. The resulting spelling *pa-ti*$^{-i-i}$-**a* with two consecutive identical space-filling vowel signs is rare but certainly not unparalleled, cf. Section 1.5.3.

a filler vowel sign). While this is theoretically possible, we have several examples of *Ci-ha* where space-filling is used by adding an extra word-final <a>, for instance in BULGARMADEN § 6 *á-mi-ia-ti-ha-a* 'my' /ʔamiaθi=ha/. In order to uphold this theory, one would have to account for the distribution of two different space-filling practices.

2. **Phonetic lengthening.** Alternatively, we could set up a general phonetic rule, by which every short vowel is lengthened after the addition of /-h(a)/. This would be a very powerful rule with a large number of counterexamples.

3. **Accent shift.** Another possibility is that the addition of the clitic *=ha* caused a right-ward accent shift. In unextended *kwa/i-*(*a-*)*ti*, *ku-*AVIS-*pa-pa* and *Ca-*(*a-*)*ti*, the accent was originally on the penultimate syllable.[43] It is possible that the addition of *=ha* attracted the accent. Thus pre-HLuw. *[kʷáti=ha] > *[kʷatí=ha]. The resulting form would then be expected to undergo lengthening of short accented vowels in open syllables, yielding [kʷati:=ha].[44] In a way, the situation would be reminiscent of Latin, where the addition of *=que* 'and' causes a similar shift of accent: *bónus* + *=que* > *bonús=que* (Weiss 2009: 111).[45] The largest problems with this hypothesis are that there are no secure clitic-induced accent shifts attested elsewhere in Anatolian, and there are no unequivocal cases of lengthening before *=ha*.[46]

None of these options is without problems, and I will not insist on any of them. I can only emphasise that the linguistically real plene writing in

[43] For Hittite, this is suggested by the plene writing in ^{d}*Ku-pa-a-pa* (2x).

[44] Cf. Section 2.5.4 and Melchert 1994a: 261f.

[45] Cf. also Spencer and Luís 2012: 85–89 for references to similar phenomena in Polish and Macedonian.

[46] David Sasseville kindly brings CLuw. *la-al-pí-i-in=ti-i=t-ta* 'eyelash' /lalpin=ti=tta/ (KUB 32.10+ i? 10; acc.sg.c.) to my attention, where the presence of a pronominal clitic coincides with the plene writing of *i*. This situation stands in contrast to five attestations of non-plene *la-al-pí-in* without any clitic. This correlation between plene spelling and clitics looks similar to the one described for HLuw. here. However, in the absence of a full investigation of CLuw. plene writing, the significance of the presence or absence of plene writing remains unclear.

the three ablative instrumentals in °-*ti-i-ha*, *ku*-AVIS-*pa-pa-a-ha*, *kwa*/*i-ti-i-ha* and possibly also *ta-ni-mi-i-ha*(*-a-wa*/*i*) (cf. Section 2.6.7) must in some way be connected to the presence of *=ha*. Therefore, they do not necessarily damage the overall picture that linguistically real plene writing marks vocalic length or a disyllabic sequence.

2.7.3 1sg. *=mu-u*

The 1sg.dat.-loc. enclitic *=mu* 'me' is written with linguistically real plene spelling only once in Hawkins' (2000) Iron Age corpus, scil. KARKAMIŠ A5*a* § 7 *wa*/*i-mu-u-ta*, cf. Figure 2.7. The same corpus shows are 25 additional ambiguous attestations of <=mu-u>.

Figure 2.7: KARKAMIŠ A5*a* § 7 *wa*/*i-mu-u-ta*; Hawkins 2000 (plate 65).

This single secure linguistically real plene *=mu-u* is opposed to around 140 non-plene attestations of <=mu>. As mentioned in Section 2.4.2, the vowel of *=mu* is frequently elided when it is combined with clitics that start in a vowel, cf. *wa*/*i-ma-sá*, representing *=wa* (quot.ptcl.) + *=mu* 'me' + *=as* 'he/she' (nom.sg.c.). This also suggests (but does not prove) that its vowel was short. Contrary to other personal pronoun clitics we have seen, namely *=tu-u* (2sg.) and *=tu-u* (3sg.), dat.-loc.sg. *=mu*(*-u*) has well-attested cognates in the other Anatolian languages: CLuw. *=mu* (11 attestations) 'for me', Palaic *=mu* and Hittite *=*(*m*)*mu*. Nothing in the spelling of these related forms suggests the presence of a long vowel.

Because there is strong diachronic and synchronic evidence suggesting that the /u/ in HLuw. *=mu*(*-u*) synchronically cannot have been long, I must

leave the linguistically real plene spelling in KARKAMIŠ A5*a* unexplained for now.

2.7.4 Quotative particle =*wa*/*i-a*

According to a count based on Yakubovich 2013ff. the so-called 'quotative particle' /=wa/ is attested over 1450 times in Hawkins 2000. Only once do we find it spelled securely with linguistically real plene writing: ASSUR letter *e* § 2 *sa-pi-su+ra*/*i-wa*/*i-a-ti* 'Peace (be) to you!', cf. Figure 2.8.

Figure 2.8: ASSUR letter *e* § 2 [|]*sa-pi-su+ra*/*i-wa*/*i-a-ti*; Hawkins 2000 (plate 311).

This phrase has to be analysed as /sapisur=wa=θi/, containing *sapisur-* 'peace' and the clitic =*di* 'you' (2sg.dat.-loc.refl.), as indicated by ASSUR letter *f+g* § 2 *sa-pi-su+ra*/*i-a-wa*/*i-ma-za* /sapisur=wa=mants/ 'id.', where only =*di* is replaced by =*manz*, the plural form of the same reflexive dat.-loc.pl. pronominal clitic. I have no explanation for this highly unusual and rare spelling.

2.8 Conclusion

We began with the observation that plene spellings in Hieroglyphic Luwian can be divided into those which can be interpreted as space-fillers and those which cannot. It has been the aim of this chapter to account for the presence of the latter group of 517 'linguistically real' or 'linguistic' plene spellings.

Next, we established that linguistically real plene writing is not a random phenomenon: it is only found in some morphemes (e.g. *za-a-*, *i-zi-i-*,

-tu-u/*-tú-u*) while it is completely absent in others (e.g. the *-a-* in *á-pa-* and *tá-ti-* and the *-i-* in CUM-*ni*). This shows that linguistically real plene spelling was deliberately (though inconsistently) used in some words to mark a certain linguistic/phonetic feature. On the basis of *za-a-* 'this', *ni-i* 'not' (proh.), *pa+ra*/*i-i* 'before', LITUUS+*na-a-* 'to see', the verbs in *-i-*/*-ai-* and the clitic *=du* 'him', the hypothesis was formulated that linguistically real plene writing, in principle, marks a long vowel (either accented or unaccented). In addition, the denominal verbs "AUDIRE+*MI*"*-ti-i-* 'to hear' and ("COR")*za+ra*/*i-ti-i-* 'to desire' as well as the infinitive form DELERE+*nu-u-na* seem to indicate that it could also represent a disyllabic sequence.

For the lexemes and morphemes treated in Section 2.5, linguistically real plene writing is found conveniently in places where we would expect the presence of a long vowel or disyllabic sequence according to our current analyses. The items under scrutiny in Section 2.6, on the other hand, do not have secure etymological accounts, but it has been shown that they do not contradict the notion that linguistically real plene writing is primarily a marker of vocalic length.

The few items listed under Section 2.7 at first sight seem to contradict the hypothesis. Fifteen of them (*za-a-ti* [11x] and *kwa*/*i-a-ti* [4x]) can be explained through trivial analogical development, however. Eight true plene writings remain (viz. *kwa*/*i-ti-i-ha* [2x], *ku*-AVIS-*pa-pa-a-ha*, *-Ca-ti-i-ha* [3x, abl.-ins.], *=mu-u* and *=wa*/*i-a*), occurring in places where we do not expect to find a long vowel or a disyllabic sequence.[47]

Still, these are not numerous enough to disprove the hypothesis, which I hereby maintain: linguistically real plene writing in Hieroglyphic Luwian was used to mark long vowels or disyllabic sequences. Incidentally, and for the first time, this conclusion provides evidence for a direct representation of the phonemic opposition between long and short vowels in the Hieroglyphic Luwian writing system.

This conclusion has consequences for future research into the morphemes and lexemes listed in Section 2.6 which do not have a good etymology.

[47] Note that under a wider definition of space-filling, by which also penultimate vowel signs can be space-fillers, these 8 counterexamples could be readily explained. The problems complicating such an account, however, are listed in fn. 2.

The insight that these items may well have contained a long vowel will limit the number of possible historical scenarios, serving as a guide for future etymological endeavours.

CHAPTER 3

The Spelling and Phonology of the Dental Stops in Hieroglyphic Luwian

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The spelling and phonology of the dental stops in Hieroglyphic Luwian

3

Abstract: This chapter investigates the distribution and use of the Hieroglyphic Luwian signs <ta> and <tá>, expanding on and reacting to Rieken 2010. It appears <ta> and <tá> are used contrastively not only in a select subset of texts from the Karkamiš region, but in large parts of the Hieroglyphic Luwian corpus in general. Word-internally, <tá> appears to be used wherever we expect to find a short stop (either voiced or voiceless), while <ta> is used for long (fortis) stops. This suggests that consonantal length was at least a *phonetic* feature in the phonological system underlying Hieroglyphic Luwian.

3.1 Introduction

The Anatolian hieroglyphic syllabary used to write Luwian is infamous for its wide variety of signs having—as far as we know—the same phonetic value. This is illustrated by the sign inventory in Hawkins 2000: 28–34, which lists up to four sign variants purportedly marking the phonetic value [tu], seven in the case of [ta] and no less than eight for [sa]. Some of these variants, such as <tu$_4$>, <sa$_6$>, <sa$_7$> and <sa$_8$>, show up only in a few texts or time periods, so that their opposition to highly frequent signs such as <tu> and <sa> is relevant only in a small number of HLuw. texts. Other variants, however, such as <ta> and <tá>, or <sa> and <sá>, are encountered throughout the HLuw. corpus and clearly belong to the regular syllabary.

Recent research has shown that there are often significant distributions hiding behind what we consider to be allographic sequences. After eliminating a lot of previously assumed allography, we now know that many sign variants actually write distinct phones. Thus, Kloekhorst 2004 demon-

strated that there is a remarkable distribution in the use of the signs <a> and <á>, and argued that the latter writes the reflex of PIE *h_1.[1] In addition, Rieken 2008 convincingly demonstrated that the sign <tà> does not alternate with other signs in the *ta*-series, and that it marks the HLuw. reflex of the PAnat. lenis stop */d/. Two years later, Rieken and Yakubovich (2010) argued that <ta$_4$> and <ta$_5$> represent lateral sounds rather than dental stops, proposing the transcriptional values <la/i> and <lá/í>, respectively. Lastly, Rieken (2010b) treated the use of the signs <ta> and <tá> in the HLuw. texts from Karkamiš. Since her 2008 article on <tà>, it was believed that <ta> and <tá> were used interchangeably to write the HLuw. fortis dental stop /t/ (< PIE **t*), and indeed, many words can be found spelled with both <ta> and <tá>, e.g. KARKAMIŠ A6 § 18 *á-sa-tá* vs. ibid. § 12 *á-sa-ta*$^{-a}$, both meaning 'he was'. However, Rieken noted that there was a non-random distribution between <ta> and <tá>, indicating a phonetic contrast. It is this last study that the present chapter reacts to and aims to refine.

3.2 Rieken's account of HLuw. <ta> and <tá>

Rieken's (2010b) study on the use of HLuw. <ta> (L 100) and <tá>  (L 29) sets off with the observation that the use of <ta> and <tá> is non-randomly distributed. While it is true that some lexemes are found spelled with both <ta> and <tá>, there appear to be many items which are clearly spelled with <ta> only. More specifically, Rieken has shown that consistent spelling with the sign <ta> is found 1.) in word-initial position, where it represents the result of a merger of all inherited dental stops (< PIE **t*, **d*, **d^h*), and 2.) in intervocalic position, for dental stops which correspond to fortis stops in the other Anatolian languages (< PIE **t*). On the basis of this evidence, Rieken argues that <ta> spells out a voiceless stop [t(ː)] in these environments.

Rieken also shows that we find an alternation between <ta> and <tá> in three environments. Most prominently, it is found to spell the second member of consonant clusters (having *n* and *s* as their first members), as found in, for instance, HLuw. *á-sa-ta*/*tá* 'he was' /ʔasta/. Rieken argues that both

[1] The discussion has been continued in Melchert 2010, Simon 2013a and Burgin 2016.

<ta> and <tá> are also found to spell the result of Čop's Law, a pre-Proto-Luwic sound change which fortited original intervocalic lenis stops (< PIE $*d^{(h)}$): see Section 3.5.1. Lastly, we find both <ta> and <tá> to spell the initial dental stops of words which have voiced alveolar consonants elsewhere in the word (< **nt*, **d*, **r*), such as *ta*/*tá-ru-sa* 'statue' (< PIE **doru-*). All in all, Rieken concludes that the sign <tá> was used to spell a voiced stop [d(ː)]. Its use would have been optional, and scribes could also use the sign <ta> to represent this phonetic value.

Thus, Rieken arrives at a system where <ta> writes either a voiceless or voiced stop [t(ː)/d(ː)], while <tá> is reserved for a voiced stop [d(ː)], as summarised in Table 3.1.[2]

Phonetic value	**Spelling**	**Source**
[t(ː)]	<ta>	1.) Intervocalic fortis dental stops.
		2.) Word-initial dental stops.
[d(ː)]	<ta>/<tá>	1.) Second part of a consonant cluster (i.c. after *n* or *s*).
		2.) Result of Čop's Law.
		3.) Assimilation to a voiced alveolar consonant (< **nt*, **d*, **r*) elsewhere in the word.
[ð]	<tà>	Intervocalic lenis dental stops.

Table 3.1: Summary of Rieken's (2010b) analysis of HLuw. <ta> and <tá>

Rieken's 2010b observation that the use of <ta> and <tá> is not completely random is an important step forward in the study of Luwian orthography, and her paper contains several interesting insights. Nevertheless, I believe her data and analysis can be improved on several points.

[2] Rieken attributes the phonetic value [ð] to <tà> based on a comparison with Lycian, cf. Section 3.4.3.

- The corpus used by Rieken for investigating the use of <ta> and <tá> is restricted both geographically and chronologically: it contains only texts from Karkamiš composed in 1100–850 BCE. Texts from other periods and other areas are not subjected to a detailed treatment.[3]
- No definitive judgement is passed on the length of these stops, meaning that it is still undecided whether consonantal length was a phonetic or phonological feature in Hieroglyphic Luwian.[4]
- Rieken's (2010b: 304) conclusion that <tá> marks a voiced stop is hard to reconcile with its occurrence after [s]/[ʃ], where voicing of an originally voiceless stop is unlikely.
- The phonological system of Hieroglyphic Luwian is not compared to that of the other Anatolian languages, and its consequences for our reconstruction of Proto-Anatolian are not considered.

Therefore, a new study of the signs <ta> and <tá> on a larger scale seems in order, and its results are presented here. I will first present the data: an

[3] Rieken's reason for focusing on specifically these "classical" texts is that they purportedly exhibit the highest level of scribal competence ("Phase der höchsten Schreibergelehrsamkeit", 2010a: 308). She argues that this is borne out by 1.) a higher degree of consistency in the use of <sà> to denote [ʃ], a conditioned allophone of /s/ (Rieken 2010b), and 2.) the consistent use of 'initial-a-final', a peculiar spelling phenomenon by which <a> is written at the end of words that are otherwise written with initial <a> or <á>. With regard to this final point, one should point out that 'initial-a-final' is also abundantly attested in texts from Tell Ahmar and Aleppo (Burgin 2016: 31f.), so that it cannot be considered a defining feature of the texts composed in Karkamiš. More importantly, one could just as easily contend that the scribal tradition from 1100–850 is less refined than that after 850 BCE, since texts from the latter period differentiate <a> from <á> in a systematic fashion, while those from 1100–850 hardly use <á> in the first place (Burgin 2016: 8). Finally, one may raise the general objection that a scribal tradition that happens to distinguish one sign pair is not necessarily more refined on all accounts. The fact that the Karkamiš texts seem to distinguish <sa> from <sà> in a systematic way does not automatically mean they also distinguish <ta> from <tá>, or any other sign pair.

[4] Rieken (2010b: 306) merely notes that it is thinkable that the stops were geminated. ("Daß mit der Bewahrung der plosiven Artikulationsart wie möglicherweise auch beim stimmlosen Plosiv eine Gemination einherging, ist denkbar."). Also in the case of Čop's Law, she keeps the option open that the resulting geminate spellings we find in the cuneiform script are merely graphic.

overview of the use of <ta> and <tá> in the entire extant HLuw. corpus (Section 3.3). We will see that our extended dataset confirms Rieken's idea that there were multiple non-random spelling patterns involving <ta> and/or <tá>, suggesting a phonetic distinction. My own phonetic analysis of these spelling patterns will follow (Section 3.4), after which I treat a few counterexamples to this distribution in Section 3.5. Lastly, I will summarise and compare the phonetics and phonology of the Hieroglyphic Luwian dental stops to those in the other Anatolian languages, and trace their development into Proto-Anatolian in Section 3.6.

3.3 Data

As my corpus, I have taken all texts published in Hawkins 2000, supplemented by texts from the Bronze Age (Empire period; dated before approximately 1150 BCE) and those which have been discovered after the publication of Hawkins' (2000) corpus.[5] An automated search yields 1325 instances of <ta> (942x) and <tá> (383x) in 192 texts, thus showing that <ta> is more than twice as common as <tá>. The use of <ta> and <tá> does not seem to be determined geographically (i.e. by the place of attestation): plotting the occurrences of different spellings on a map shows no significant geographical patterns with regard to the availability or use of <tá> as opposed to <ta>. Chronologically, however, Rieken's (2010b: 308) observation that there is a clear transition visible from the oldest to the youngest texts, is confirmed. In the Empire period, <ta> is relatively rare when compared to <tá>. In the youngest HLuw. texts, by contrast, this picture is completely turned around, as can be seen in Table 3.2.[6]

[5] The Empire texts are the following: EMİRGAZİ, FRAKTİN, HATİP, KARABEL, KARAKUYU, KINIK, KÖYLÜTOLU-YAYLA, MALKAYA (graffiti), SÜDBURG, TARKONDEMOS (seal), YALBURT. Iron Age texts included in this study but not present in Hawkins' (2000) corpus are: ADANA 1, ALEPPO 4–7, ANCOZ 11–12, ANKARA 2, ARSUZ 1–2, BABYLON 3, BEYKÖY, ÇALAPVERDİ 3, ÇINEKÖY, DÜLÜK BABA TEPESİ, EREĞLİ, GEMEREK, GÜRÇAY, IMAMKULU, ISTANBUL 2, JISR EL HADID 4, KÂHTA 1, KIRŞEHİR, KUŞÇU-BOYACI, LATMOS, PANCARLI, POTOROO, ŞARAGA, TALL ŠṬĪB, TELL AHMAR 6, TELL TAYINAT (seal), YASSIHÖYÜK, YUNUS. Not all of these contain <ta> or <tá>.

[6] Texts whose dating is unclear (e.g. MARAŞ 11) are not taken into account here.

Time period	**<ta>**	**<tá>**	**<ta> %**
Empire period	8	32	21%
1200–1101	3	12	20%
1100–1001	3	22	12%
1000–951	37	28	57%
950–901	55	27	67%
900–851	151	117	56%
850–801	65	26	71%
800–751	123	44	74%
750–701	358	63	85%
700–651	130	7	95%

Table 3.2: Attestations of <ta> and <tá> in Hieroglyphic Luwian. The horizontal line indicates when <ta> overtakes <tá> in terms of frequency.

On the level of individual texts, we can see that the ratios of <ta> vs. <tá> differ significantly. Several texts do not show any opposition between <ta> and <tá> at all and categorically use one or the other. In texts with just one or two attestations, such as SUVASA (0x <ta>; 1x <tá>), this may well be due to chance. However, some of the later texts and subcorpora show so many instances of <ta> that the absence of <tá> is likely to be structural rather than incidental. A number of these containing 6+ attestations of <ta> (the number is arbitrarily chosen) are listed in Table 3.3.

It seems that at least some scribes did not have <tá> in their active syllabary, meaning that their texts are uninformative for determining whether <tá> represents a phonetically/phonologically different entity than <ta> or not. Initially, we should therefore exclude those texts that do not exhibit a contrast between <ta> and <tá> (114 in total) from our investigation.[7]

[7] This unavoidably leads to the exclusion of texts with only a handful of attestations of <ta> and <tá>, where the absence of both signs may well be due to chance. This is prefer-

Text name	Attestations (<ta>/<tá>)	Subcorpus	Rough dating (Hawkins 2000)
ASSUR letters	44/0	ASSUR	late 8th BCE
SULTANHAN	38/0	TABAL	740–730 BCE
KULULU lead strips	19/0	TABAL	mid-late 8th BCE
KULULU 1	12/0	TABAL	mid-8th BCE
BULGARMADEN	11/0	TABAL	738–710 BCE
KULULU 2	9/0	TABAL	mid-8th BCE
ISTANBUL 2	7/0	TABAL	8th BCE
KÖRKÜN	7/0	KARKAMIŠ	late 9th BCE
KULULU 5	7/0	TABAL	8th BCE
TÜNP 1	7/0	KARKAMIŠ	mid-8th BCE
İSKENDERUN	6/0	MARAŞ	late 9th BCE
ŞARAGA	6/0	KARKAMIŠ	8th BCE

Table 3.3: Texts with 6 or more attestations of <ta> showing no contrast.

The 78 texts which do show an opposition (i.e. contain both <ta> and <tá>) contain 998 instances of <ta> (638x) and <tá> (360x). They are found all throughout the HLuw. corpus, from the Empire period (SÜDBURG) up until the 8th century BCE (KIRŞEHİR).[8] Naturally, however, this does not mean that the distribution remained unchanged throughout this period. It may well be possible that only the earliest texts use different spellings to differentiate between two phonetically/phonologically different sequences, while this is no longer the case in later texts. This is an important avenue for

able, however, over including false spellings of <ta> which do not accurately reflect its original phonetic value.

[8] YALBURT, EMİRGAZİ and SÜDBURG are the only Empire-period texts in which both <ta> and <tá> are represented. See Section 3.5.2, however, for the observation that the single attestation of <ta> in YALBURT is very unsure (next to 13x <tá>), making it uncertain whether its scribe actually used <ta> and <tá> contrastively.

future research. For this chapter, I will restrict myself to general observations.

The distribution of <ta> and <tá> in the full Iron Age corpus is given below. As marked already in Rieken 2010b, the use of <ta> and <tá> is by no means random. We can distinguish three groups of morphemes/lexemes: those that are spelled consistently with <ta>, those that are consistently spelled with <tá> and those which seem to be spelled alternatingly with <ta> and <tá>. I will treat these groups in order in the sections that follow below.[9]

3.3.1 Group 1: consistent <ta> spelling

The most common items (3+ attestations) which are spelled with consistent TA-spelling are given below, in Table 3.4.

Lemma	**<ta>**	**Translation**
tanim(a/i)-	12	'every, all'
[I]*Hamiyata-*	11	PN
SUPER+*ra/ita*	10	'above'
(TERRA)*taskwa/ir(i)-*	9	'earth'
(*274)*hatali-*	9	'to smash'
(FORTIS)*muwatal(a/i)-*	8	'mighty'
kwa/ita(na)-	7	'where'
(ORIENS)*kisatam(i)-*	6	'east'
(LITUUS/DEUS)AVIS-*tani(a/i)-*	5	'good times'
(AEDIFICARE)*tama-*	5	'build'
taw(i)-	4	'eye'
ta(nu)-	4	'stand; put'

Continued on next page.

[9] Note that the frequent occurrence of alternating spellings is markedly different from that of <tà>: Rieken (2008: 637f.) has shown that <tà> as a rule never alternates with <ta> or <tá> and is strictly kept apart.

Lemma	<ta>	Translation
(VIA)*harwa*/*ita*(*hit*)-	4	'road; travel'
(VITIS/LIBARE)*sarlata*-	4	'offering'
(MALUS$_2$)*haniyata*(*str*(*i*))-	3	'badness'
taminama-	3	'?'

Table 3.4: Consistently <ta> spelled items in Hieroglyphic Luwian.

The few words on this list that are phonetically and/or etymologically analysable suggest that consistent <ta> spelling was used to represent 1.) word-internal fortis stops and 2.) word-initial dental stops.

Examples of intervocalic fortis stops are found in HLuw. *mu-wa*/*i-ta-li*- 'mighty' (cf. CLuw. *mu-u-u̯a-at-ta-al-la-ti* 'might' [abl.-ins.]), (*274)*ha-ta-li*- 'to smash' (cf. Hitt. *ḫatta-*^{ri}, Lyc. *χtta*- < PIE **h*$_2$*et*-, cf. Starke 1990: 309f.) and perhaps (VITIS/LIBARE)*sa*$_5$+*ra*/*i-la-ta*- 'offering', if CLuw. *šar-la-at-ta*- 'exaltation, worship' is comparable (cf. Starke 1990: 539).

In addition, consistent <ta> spelling is the unmarked way to spell word-initial dental stops (63x). As we will see, the only robust group of word-initial <tá> spellings belongs to the stem *tá-ti*- /taθi-/ 'father' (72x). The remaining 18 word-initial <tá> spellings occur either in lexemes without clear etymologies such as *tátu*- (0x <ta>, 4x <tá>; cf. Section 3.3.3) or as occasional variants to words otherwise spelled with <ta>: *tanant*(*a*/*i*)- 'empty', *taru*- 'tree, statue', *tataria*- 'curse' and the names *Tasku*- and *Taita*-. We will see that special explanations are readily available for (nearly) all of them.

3.3.2 Group 2: alternating <ta>/<tá> spelling

The most common morphemes and lexemes spelled with both <ta> and <tá> are given below, in Table 3.5.

Lemma	**<ta>/<tá>**	**Translation**
=ta	165/79	'locatival' particle
-ta	60/24	3sg.pret.act. (fortis)
anta(*li*)-	24/42	'inside'
-ta	43/20	3pl.pret.act.
-ta	45/9	3sg./pl.pret.[10]
zanta (<INFRA-*ta*/*tá*>)	18/5	'down'
(DEUS)*Tarhunt*-	11/5	DN
(REX)*hantawata*(*hi*)-	4/4	'king(ship)'[11]
(LOCUS)*alant*-	6/2	'place'
(SCALPRUM)*kutasar*(*i*)-	6/1	'stele'
-tanz	2/5	pronominal dat.pl.
(DEUS)*Tasku*-	4/2	DN
(VACUUS)*tanant*(*a*/*i*)-	4/1	'empty'
(STATUA/LIGNUM)*taru*-	4/1	'tree, statue'
(VACUUS)*tanant*(*a*/*i*)-	2/2	'empty'
[I]*Taita*-	2/2	PN
(THRONUS)*isatarata*-	3/1	'throne'
(*218)*sakatalisa*-	3/1	'?'
(LOQUI)*mara*/*ita*-	3/1	'words/requests'
aparanta <POST+*ra*/*i-ta*/*tá*>	3/1	'after'
izisata-	3/1	'honour' (verb)

Continued on next page.

[10] This category consists of orthographically ambiguous verbal forms whose number is unclear. Some of them are found in unclear contexts, in which no subject is clearly identifiable. Others have either multiple singular subjects or neuter plural subjects. In those cases, either singular or verbal forms can be found (cf. Melchert 2003: 201f.).

[11] The postnasal dental stop in the root for 'king' is not attested in phonetic spelling, but spellings with both <ta> and <tá> would be most likely.

Lemma	<ta>/<tá>	Translation
(LOQUI)*tataria*-	1/3	'curse'
(FRONS)*hanta*-	2/1	'face'
(*314)*hasatan*(*i*)-	2/1	'support'
tiwatal(*i*)-	1/2	(measure)
Anaita(*wan*(*i*))(REGIO)-	1/1	GN
CAPUT-*t*(*i*)-	1/1	'nobleman'

Table 3.5: Alternating <ta>/<tá> spelled items in Hieroglyphic Luwian.

Spellings with alternating <ta> and <tá> are found most often in consonant clusters. More specifically: they occur in the spelling of fortis/lenis dental stops (historically) preceded by [n] and those preceded by [s]/[ʃ], cf. Rieken (2010a).[12]

Alternating <ta>/<tá> spellings represent postnasal dental obstruents in the verbal ending *-ta* (3pl.pret.act.; < PIE **-nto*), (LOCUS)*alant*- (cf. Yakubovich 2017b: 7), *anta* (+ derivatives), (VACUUS)*tananta*- (cf. Rieken 2010b: 306), *zanta*, the divine name *Tarhunt*- and (FRONS)*hanta*-.[13]

We also find <tá> in consonant clusters involving *s*: this accounts for six instances of 3sg.pret.act. forms which are spelled with <tá>, cf. Section 3.5.2. Additionally, it may account for the <ta>/<tá> spellings of *izisata*- 'to honour' and (*314)*hasatana*- if we assume that these words contained clusters of the shape *-st*-. Rieken also includes the locatival particle *=ta* (163/81) here, following Josephson (1972: 419) and Melchert (2003: 210) who connect it to Hitt. *=ašta*. This etymology presupposes that *-s*- was lost in this word (according to Rieken 2010b: 305 due to enclision and phonetic erosion), while it remained in other words.

[12] Note that the PN *Hartapu*- is spelled consistently (7x) with <tá> (*há+ra/i-tá*°) in KIZILDAĞ 1–4, KARADAĞ 1–2 and BURUNKAYA. Unfortunately, these texts only have attestations with <tá> and should therefore be excluded from our current analysis for now.

[13] For the inclusion of the DN *Santa*-, see the following section.

Exceptions to this pattern are intervocalic cases of the 3sg.pret.act. fortis ending *-ta* which are occasionally spelled with <tá> where we would expect consistent <ta> spelling. Almost all of these forms have other explanations available to them, as we will see in Section 3.5.3.

3.3.3 Group 3: consistent <tá> spelling

Consistent <tá> spelling is attested for very few items only. All items occurring more than once are listed in Table 3.6.

Lemma	**<tá>**	**Translation**
tati(*a*/*i*)-/*ṯatal*(*i*)-	72	'father(ly)'
(DOMUS)*haristani*-	5	'upper floor'(?)
tatu-	4	'?' (all from EMİRGAZİ)
Santa°	2	DN
tamihi-	2	'abundance'

Table 3.6: Consistently <tá> spelled items in Hieroglyphic Luwian

Apart from HLuw. *tá-ti*- (and its derivatives), this spelling category does not have any frequently found members. The absence of <ta> spellings for (DOMUS)*haristani*- 'upper floor(?)' (5x <tá>), which is compared to Hitt. *ḫarištani*- by Starke (in Hawkins 2000: 99), may well be due to chance. The same is true of the DN *Santa*- (0/2), which occurs twice as the first element of a PN in CEKKE: § 17c ^{I}*sà-tá*-FRATER-*la-sa-ha* and § 17i ^{I}*sà-tá*-(*m*)*u*$^{?}$-*sá-ha*. This dataset does not include 8 attestations of *Santa*- written with <ta> in texts which do not show an opposition between <ta> and <tá>.[14] Thus, it may well be coincidental that we do not find any <ta> spellings for (DEUS)*Santa*-. All in all, I do not think that consistent <tá> spelling was used for any other lexical item besides *tá-ti*- in our HLuw. texts.

[14] These are BEIRUT (2x), KULULU 2 (2x), KULULU lead strip 2, NIMRUD, ŞARAGA and TÜNP 1.

In conclusion, therefore, we find the following distribution in Hieroglyphic Luwian texts that have both <ta> and <tá>

- **Consistent <ta>:** word-initial & intervocalic fortis stops
- **Alternating <ta>/<tá>:** postconsonantal stops
- **Consistent <tá>:** only *tá-ti-*(*ia-*) + *tá-tà-li-* 'father(ly)'

Overall, this distribution is very similar to that observed in Rieken 2010b, see Section 3.2. Nevertheless, data from the extended corpus requires us to update Rieken's distribution in three respects. First, Rieken treats *tá-ti-* together with words with initial <tá> that have an additional alveolar consonant in the root (cf. *tataria-*, *taru-*, *tanata-* in Section 3.5.3). This is perfectly reasonable from the perspective of the Karkamiš texts from before 850 BCE. As we have seen, however, the extended corpus reveals that *tá-ti-*'s spelling is unique. Whereas *taru-* and *tataria-* are spelled with both <ta> and <tá>, *tá-ti-* occurs only with <tá> (72x), suggesting a special phonetic value. Secondly, dental stops after *s* are not spelled consistently with <tá> (Rieken 2010b: 302: 0x <ta>, 7x <tá>), but with <ta> and <tá> alternating, cf. HLuw. *asta* 'he was' (3sg.pret.act.; 2x <ta>, 5x <tá>). This puts them into the same category as dental stops after *n*. Lastly, the same is true for *anta* 'inside', which appears to be spelled not only with <ta> (Rieken: 16/0) but with both <ta> and <tá> (24/41). Thus, the spelling of *anta* (and its derivative *antali-*) is no different from that of other words containing **-nT-*: all have co-occurring spellings with <ta>.

The distribution of <ta> and <tá> suggests that morphemes and lexemes written with both <ta> and <tá> were at least phonetically different from those written exclusively with <ta>. It indicates that words which are consistently spelled with <ta> have a specific phonetic feature which is lacking in words spelled with alternating <ta>/<tá>, or vice versa. Thus, we may ask ourselves, as Rieken has done, what this/these feature(s) is/are. To investigate this, we should look in more detail at all phonetic environments in which each of these spelling patterns are found, starting with the postconsonantal <ta>/<tá> spellings.

3.4 Analysis

3.4.1 Alternating <ta>/<tá>: post-consonantal position

As mentioned above, the words in this subgroup contain dental stops after *n* or *s*. Rieken 2010b: 304f. correctly mentions that in these environments, the PAnat. opposition between fortis (< PIE **t*) and lenis (< PIE **d*$^{(h)}$) stops appears to have been neutralised: both are spelled in exactly the same way, cf. 3pl.pret.act. <-ta/tá> < PIE **-nt̲o* vs. <a-ta/tá> < PIE **-nd̲*$^{(h)}$-. An example of an original fortis dental stop preceded by HLuw. *s* is found in HLuw. *á-sa-ta*/*tá* 'he was'. I have not been able to find sure examples of original lenis dental stops after *s*, but there are no signs indicating that fortis and lenis stops did not merge in this position.

The phonetic values of the results of these mergers after *n* and *s* are difficult to pinpoint. In her treatment of HLuw. <tá> spellings of postnasal dental stops, Rieken (2010b: 304) correctly points out that it is very common for post-nasal stops to undergo shortening and/or voicing, referring to Kümmel 2007: 53f.[15] Accordingly, the result of the merger of PAnat. **nt* and **nd* was most probably HLuw. [nd] or [nt]. In her article, Rieken (2010b: 306) opts for [nd] and concludes that <tá> was used to write [d(ː)].

While the idea that <tá> marks a voiced stop [d] works well for cases where the dental stop follows a nasal, this is more difficult for stops preceded by the voiceless fricatives [s] or [ʃ], as voicing is not very likely in this position. Rieken 2010b: 304f. notes that "eine spezifische Sonorisierung bzw. Lenierung in der Position nach **s* durchaus bezeugt [ist]", referring to Kümmel 2007: 52. On closer inspection, Kümmel (l.c.) discusses how consonants lose a contrastive phonetic feature (e.g. aspiration) when in contact with a fricative, and how the resulting phone is reinterpreted as a different phoneme (rephonologisation). As an example, Kümmel gives Eastern Middle Iranian (Sogdian, Chorasmian, Khotanese), where **t* > *d̥* /*f,x_*: in contact with a fricative, voiceless aspirated **t* [t^{h}] lost its aspiration, which was a determining feature of the fortis stops. The resulting voiceless unaspirated stop [t]

[15] Kümmel notes instances of post-nasal voicing in Sindhi, Punjabi, Old Persian, Middle Iranian, Armenian, Middle Greek, and Uralic (Sámi, Hungarian, Selkup), among others.

was thus reanalysed as an allophone of the lenis stop /d/ [d̥]. At a later stage, the fricative was voiced in an unrelated development (Sims-Williams 1989: 167f.), which in turn voiced the following dental stop, thus yielding fully voiced consonant clusters, which are attested in writing.[16] Other cases mentioned by Kümmel (2007: 52) in which stop oppositions are neutralised after voiceless fricatives (West-Iranian dialects, Icelandic etc.) do not involve direct stop voicing either.

In Luwian, however, there is no evidence suggesting that aspiration was a phonologically distinctive feature as it was in Iranian, so that we cannot use the same reanalysis scenario to account for the Luwian stop system. In addition, given that the change from [st] to [sd] is not very plausible, I argue that it is unlikely that HLuw. *á-sa-ta*/*tá* 'he was' shows the result of voicing. Rather, I propose that the neutralisation of the fortis-lenis opposition after *s* took the shape of shortening. It is not difficult to imagine how long stops lost their phonologically defining feature length in contact with /s/ and merged with the short stops: [st:] > [st].

In conclusion, HLuw. postconsonantal dental obstruents (written with <ta> and <tá>) mostly likely had in common that they were phonetically short. It is plausible that the dental stop was voiced after *n* ([nd]) and voiceless after *s* ([st]); as we will see later (Section 3.6), these phonetic interpretations are supported by comparative data from the cuneiform languages and Lycian. I support Rieken's analysis that the use of the sign <tá> was not obligatory (given that we also find <ta> in postconsonantal position). Unlike Rieken, however, I argue that <tá> marks a short stop in this position and does not express consonant voicing.

[16] This development is illustrated by Chorasmian *'βδ* and Khotanese *hauda*, both having the meaning '7' < Proto-Iranian **hafta* [haɸt^{h}a]. After the voiceless fricative [ɸ], the fortis stop [t^{h}] lost its aspiration, leading to reanalysis of the resulting non-aspirated stop as lenis: PIr. *[haɸt^{h}a] > *[haɸd̥a]. Subsequently, the fricative seems to have been voiced in postvocalic position: *[haβd̥a]. In turn, this voiced the following lenis stop, yielding *[haβda] which lead to attested Chor. *'βδ* and Khot. *hauda*. I emphasise here that the voiced consonants we find in these forms (Chor. *δ*, Khot. *d*) did not receive their voicing directly from a preceding voiceless fricative [ɸ].

3.4.2 Consistent <ta>: word-initial/intervocalic position

In word-initial position, HLuw. does not show any distinction between the reflexes of PIE dental stops. I agree with Rieken and Melchert that this signals a general word-initial merger (Rieken 2010b: 303; Melchert 1994a: 252). Examples suggesting this merger are *tama-* 'to build' (5/0; < PIE **demh₂-*) and *ta*(*nu*)- 'to stand' (4/0; < PIE **steh₂-*), which I assume show the regular reflex of both fortis and lenis stops in this position.[17] Synchronically within Hieroglyphic Luwian, words with inherited dental stops are opposed to the word *tá-ti-*, which will be treated below, together with the phonetic interpretation of the opposition in this position of the word, in Section 3.4.4.

Intervocalic <ta> spellings regularly correspond to geminate spellings in Hittite and Cuneiform Luwian and the sign <t> in Lycian, all continuing the PAnat. fortis stop */t/ [tː]. Good examples are the intervocalic fortis stops in the 3sg.pret.act. ending HLuw. *-ta* (< PIE **-to*, e.g. HLuw. *pi-ia-ta* ~ CLuw. *pí-i-i̯a-at-ta* ~ Lyc. *pijete* 'he gave'), and the stem (*274)*hatali-* 'to smash, smite' (9x <ta>) ~ Hitt. *ḫatt-*^{ari} 'to stab' < PIE **h₂et-*.

It is clear that the intervocalic fortis stops (spelled with <ta>) are kept distinct from the postconsonantal stop (spelled with <ta>/<tá>). It is likely, therefore, that there is a phonetic difference between the two. Given that the postconsonantal stop may well have been a short stop [t/d], I propose that the HLuw. intervocalic fortis stop was voiceless and *long* [tː] for the reason that it is the same phonetic value which is assumed for the cuneiform languages (Hittite, Cuneiform Luwian, Palaic, cf. Melchert 1994a: 20).[18] In addition, this is the phonetic value of the intervocalic stops in Proto-Anatolian, as assumed by Melchert 1994a: 62 and Kloekhorst 2016a: 223–226.[19]

[17] I will argue below (Section 3.5.3) that secondary developments are responsible for the occasional <tá> spellings in items such as *taru-* 'tree, statue' (4/1).

[18] I do not see any reason to assume why the geminate spelling in Cuneiform Luwian (e.g. CLuw. *a-pat-ti* < PAnat. **Hob^{h}éd^{h}i*, cf. Goedegebuure 2010: 87) would have been only 'graphic' and not phonetic, as Rieken (2010b: 305) seems to take as a possibility: "Durch Čop's Regel hat sich im Luwischen betones **é* zu *á* entwickelt, während der darauf folgende stimmhafte Laut (ggf. nur graphisch) geminiert wurde."

[19] More recently, Yates (fthc. 35) has taken an agnostic stance on this point.

3.4.3 Intermediate conclusion

We thus arrive at a system with a clear complimentary distribution between a short stop [t/d] (spelled with <ta> and <tá>) in consonant clusters, as opposed to a long stop [t:] (spelled with <ta> only) in intervocalic position. At this point, one may ask why the scribes wrote supposedly shortened post-consonantal stops (e.g. in *a-ta*/*tá* 'inside' and *á-sa-ta*/*tá* 'he was') using the signs <ta> and <tá>. Why did the stonemasons not use the sign <tà>, the sign representing the result of a PAnat. lenis stop, which is commonly assumed to have been short intervocalically (Melchert 1994a: 20)?

A solution to this question is provided by Rieken (2010b: 306): simply put, the scribes did not use <tà> to write a synchronic short stop because the lenis stop represented by <tà> had developed into something else. In other words: at some point, all Proto-Anatolian intervocalic lenis stops */VdV/ presumably developed into consonants which were not identifiable anymore with the short stops which had appeared after *n* and *s*. Accordingly, Hajnal (1995: 32[11]) and Rieken (ibid.) propose that Proto-Anatolian intervocalic lenis stops had developed into fricatives: *[d] > HLuw. [ð] /V_V, as they did in Lycian, cf. Section 3.6. The resulting fricative would have been spelled with the sign <tà>.[20] As in Lycian, this fricativisation would have affected only intervocalic stops, not those in consonant clusters. Phonologically, I assume that the original lenis stops which kept their occlusivity in consonant clusters were thus automatically reanalysed as fortis consonants.

By way of an intermediate conclusion, we can succinctly account for most of the data presented above by positing that the main opposition in the Hieroglyphic Luwian dental obstruents was one of stops versus fricatives: /t/ vs. /θ/. The signs <ta> and <tá> would mark the stop, while <tà> expressed the fricative. The stop phoneme seems to have had several allophones: intervocalically, I have suggested that they were long [t:]. After consonants, however, they were short (and voiced or voiceless, depending on

[20] The phenomenon of HLuw. rhotacism, by which HLuw. /θ/ alternates with /r/ in texts from the late 9th century BCE onward (Goedegebuure 2010: 76–78) fits in perfectly with Hajnal's and Rieken's analysis of the HLuw. lenis obstruent as [ð]: the change from [ð] to [r] is phonetically well understandable and has many parallels among the world's languages, cf. Kümmel 2007: 79.

the preceding consonant). All this is summarised in Table 3.7. Note that the word-initial stop is given here simply as [t], but cf. Section 3.4.4 immediately below for further discussion.

	#T-	**-VTTV-**	**-VTV-**	**-C[+voice]T-**	**-C[-voice]T-**
Spelling	<ta>	<ta>	<tà>	<ta>/<tá>	<ta>/<tá>
Phonetics	[t]	[tː]	[ð]	[d]	[t]
Phonology	/t/	/t/	/θ/	/t/	/t/

Table 3.7: Intermediate summary of the spelling, phonetics and phonology of the Hieroglyphic Luwian dental stops

The story does not end here. There is one frequently attested root which adds a further complication to the system.

3.4.4 Consistent <tá>: *tá-ti-*(*ia-*) + *tá-tà-li-* 'father(ly)'

The spelling of the stem *tá-ti-* (○/72) 'father' is unique in our HLuw. corpus. Not only is it remarkable for its <tá> spellings in word-initial position, but it is also the only well-attested stem that is spelled with <tá> *consistently*.[21] Another sign of HLuw. *tá-ti-*'s special connection to the sign <tá> is the fact that <tá> is used as a logogram meaning 'father(s)' in YALBURT block 4, § 2: *TÁ*.AVUS-*zi*/*a* 'fathers (and) grandfathers' (cf. Hawkins and Neve 1995: 69). As we will see below (Section 3.6), the other Anatolian languages that have inherited this root treat it in the same way as any other inherited word. It is not spelled in a special way in those languages.[22]

[21] The lexemes *tatu-* (○/4) '?' and *tamihi-* (○/2) 'abundance'(?) are also spelled consistently with word-initial <tá>. However, both their rarity and the fact that they are each found in one text only (EMİRGAZİ and KARATEPE 1, respectively) render them less striking than *tá-ti-*, whose use is much more widespread.

[22] Although Hittite *at-ta*(-)/*ad-da*(-) 'father' is unrelated to HLuw. *tá-ti-* and its congeners, it also shows a unique spelling pattern (Kloekhorst fthc. 6[22]) with regard to its dental stop. Depending on their etymology, most Hittite words containing a geminate dental are spelled either with (near-)consistent TA (< PIE **t*, e.g. *kat-ta* 'down') or DA (< PIE **TH*, e.g.

The question now is how we should interpret this spelling. One could argue that the distinction between *tá-ti-* and the rest of the lexicon is simply graphic and does not indicate anything linguistic. However, as long as there is no clear motivation for a non-phonetic spelling in the word for 'father', I think we should take this spelling at face value, indicating a phonetic feature that is present in *tá-ti-* but absent in other words or vice versa. Based on the two phonetic realisations <tá> seems to have in word-internal position, I see two plausible phonetic interpretations: the spelling of *tá-ti-* indicates either [t] (as in [st]) or [d] (as in [nd]). In either case, because the distinction between [t] and [d] was not synchronically conditioned, the opposition must have been phonological: the first dental element in *tá-ti* constitutes a different phoneme than that of other words with initial dental obstruents, such as *tanim*(*a*/*i*)- 'all' or *taskwa*/*ir*(*i*)- 'earth', which are spelled consistently with <ta>.

1. If we assume that *tá-ti-* began with a phonetically voiced stop [d], then our phonological overview of Hieroglyphic Luwian should include a phonological opposition between voiced /d/ (in *tá-ti-*) and voiceless /t/ (all other words) in word-initial position. The scribes' choice for the sign <tá> to spell this word is not difficult to understand. The only other place where a voiced dental stop was found in the language, was in postnasal position: [nd]. The scribes would have taken over the spelling with <tá> from there and generalised it in order to spell word-initial [d-] as well. In word-internal position, there seems to have been no phonological voicing contrast (as voice was determined by the preceding consonant): both [d] and [t] seem to be spelled in the same way. The resulting picture is tabulated below, cf. Table 3.8.

   In this scenario, it remains unclear where this unique pronunciation of 'father' comes from. Rieken (2010b: 305f.) connects *tá-ti-* to words which are only occasionally spelled with word-initial <tá>, such as *tananta*/*i-* '(to) empty' (4/1) and *taru-* 'tree, statue' (4/1) (see Section

uddar/*uddan-* 'word'). Hitt. *atta*(-)/*adda*(-) fits neither category, as it is spelled with TA ca. 70%. According to Kloekhorst (ibid.), this indicates a unique long voiced stop [d:].

	#T-	-VTTV-	-VTV-	-C[+voice]T-	-C[-voice]T-
Spelling	<ta> vs. <tá>	<ta>	<tà>	<ta>/<tá>	<ta>/<tá>
Phonetics	[t] vs. [d]	[t:]	[ð]	[d]	[t]
Phonology	/t/ vs. /d/[1]	/t/	/ð/	/t/	/t/

[1] The phoneme /d/ only occurs word-initially.

Table 3.8: HLuw. dental stops if HLuw. *tá-ti-* starts with [d-].

3.5.3). In these words, she argues, the <tá> spellings could represent sporadic word-initial voicing under influence of a voiced alveolar or dental element (i.c. *r*, *n*) elsewhere in the word.[23] Phonetically, this scenario would explain the voicing of the initial stop, but the difference between *tá-ti-* (always <tá>) on the one hand and *taru-* etc. (mostly <ta>) is still unaccounted for.

2. Alternatively, we could assume that the <tá> in *tá-ti-* 'father' represents a phonetically voiceless stop [t], which fits well with its proposed origin as a babble word (*Lallwort*).[24] As is well known, children start pronouncing word-initial stops with what is known as 'short lag voice onset time', meaning that the release of the initial plosive and the onset of vocal cord vibration take place nearly simultaneously, resulting in [t], cf. Macken and Barton 1980. Only later do children acquire fully voiced stops (with 'lead VOT' or 'prevoicing') and/or aspirated stops (defined by 'long lag VOT'). If we assume that the initial consonant of *tá-ti-* reflects the pronunciation of children at an early stage of L1 acquisition, *tá-ti-* may well have started with a voiceless stop [t]. The anlaut of all other words (spelled with consistent <ta>) must have been different, but was presumably also voiceless, given that consistent

[23] In the case of *tá-ti-*, this would be the second dental obstruent (*tá-t̲i-*), which must be a lenis obstruent ([ð]) because it rhotacises in, e.g., CEKKE § 16 *tá-ra+a-za* (dat.pl.).

[24] Synchronically, the 'father'-root is not a babble word in Hieroglyphic Luwian, but rather the regular word for 'father'. Historically, however, its roots in children's language are—as far as I know—uncontested (Kloekhorst 2008: s.v. '*atta-*').

<ta> spelling is otherwise used to spell word-internal *voiceless* geminates. As it is not unusual for word-initial voiceless stops to become aspirated (Kümmel 2007: 168f.), perhaps the inherited word-initial voiceless stop was slightly aspirated in word-initial position: [t^h]. Alternatively, it may have been a word-initial geminate [tː]. Whatever the precise phonetics, this word-initial dental stop would presumably have been an allophone of the long fortis stop /tː/. In this case, we have to assume a phonological opposition between a long stop, a short stop and a fricative, cf. Table 3.9.

	#T-	**-VTTV-**	**-VTV-**	**-C$^{[+voice]}$T-**	**-C$^{[-voice]}$T-**
Spelling	<ta> vs. <tá>	<ta>	<tà>	<ta>/<tá>	<ta>/<tá>
Phonetics	[t^h/tː] vs. [t]	[tː]	[ð]	[d]	[t]
Phonology	/tː/ vs. /t/	/tː/	/θ/	/t/	/t/

Table 3.9: HLuw. dental stops if HLuw. *tá-ti-* starts with [t].

The 'cost' of this scenario is an additional phonetic development (*t > t^h /#_) or the assumption that word-initial dental stops merged into a word-initial geminate [tː-].[25] It also requires that the pronunciation of Hieroglyphic Luwian 'father' was at some point readjusted to that of infants.[26] The benefits are that the spelling distributions are well explained (<tá> marks a short stop in all positions of the word; consistent <ta> marks a geminate or aspirate), and allows us to explain why consonantal length was preserved in the language (and written!) in intervocalic position. Lycian seems to have lost consonantal length differences (as far as we can tell) when it transformed its fortis-lenis

[25] Word-initial geminate stops are relatively rare, but certainly not unattested. See Muller 2001: 204ff. who lists a few dozen languages that have them.

[26] It is impossible to say when this happened. The fact that only Hieroglyphic Luwian seems to preserve the distinction suggests a dialectal innovation. It is also possible that the marked pronunciation of the 'father'-word was Proto-Luwic, and that the difference with other inherited words was lost in the individual prehistories of Cuneiform Luwian and Lycian.

> opposition from one based on length into one based on frication. We can understand why the same did not happen in HLuw. if long stops were kept distinct from short ones in word-initial position.

The choice for one of the scenarios proposed here depends on the personal preference of the reader; I will not insist on either of them here. The main phonological opposition between the Hieroglyphic Luwian fortis and lenis dental obstruents was presumably one in frication. In addition, there may have been a marginal voicing opposition in word-initial position or a distinction between long and short stops.

3.5 Exceptional cases

Several more cases need our attention. These are all instances of <tá> outside of consonant clusters or the stem *tá-ti-* and occur in word-initial or intervocalic position, and will be treated below.

3.5.1 Pronominal dat.-loc.pl. forms

This category contains dat.-loc. plural forms of the demonstrative pronouns *za*/*i-* 'this' and *apa-* 'that', as well as the relative/interrogative pronoun *kwa*/*i-* 'who, which'. The data from the extended corpus confirm Rieken's (2010b) observation (based on the Karkamiš corpus) that these forms are not exclusively spelled with <tá>. Next to five attestations with <tá> we find two spellings with <ta>.[27] The dental stop in this word is therefore spelled as if it were part of a consonant cluster.

Rieken (2010b: 305) has argued that these forms show the result of Čop's Law. This sound law describes a lengthening of short intervocalic consonants that are immediately preceded by a short accented vowel (Čop 1970;

[27] These are: KARKAMIŠ A25*a* § 2 *pa-tá-za-pa-wa*/*i-ta-***a*, KARKAMIŠ A11*b* § 8 *pa-tá-za-pa-wa*/*i-ta-***a*, AKSARAY § 4a *á-*[*pa*]*-tá-za*$_x$, all representing *apatanz*, the dat.pl. of *apa-* 'that'; EMİRGAZİ § 19 *kwa*/*i-tá-zi*/*a*, from *kwa*/*i-* 'who/which'; YALBURT § 2 *zi*/*a-tá-zi*/*a-pa-wa*/*i*, from the proximal deictic pronoun *za*/*i-* 'this'. The two spellings with <ta> are KARATEPE 1 § XXIII, 119–124 Hu. *á-pa-ta-za* and KARATEPE 1 § XXXIII, 171–176 Hu. *á-pa-ta-za-pa-wa*/*i-ta*.

Section 5.2): pre-PLuw. **ÝCV* > PLuw. **ÝCCV*. Indeed, we would expect its reconstructed PAnat. form, which contains **-éd^{h}-*, to undergo Čop's Law (cf. Goedegebuure 2010: 87; Kloekhorst 2012a: 261f.). If this scenario is correct, then this would mean that the result of Čop's Law (spelled with both <ta> and <tá>) did not merge with the inherited fortis (long) stops, which are spelled with consistent <ta>. Thus, Čop's Law would have created a new phonological opposition between inherited fortis stops [t:] on the one hand and secondarily fortited stops [d:] on the other hand (Rieken 2010b: 305, following Melchert 1994a: 252).

This analysis is not very attractive for two reasons. First, the Lycian data suggest that lenis stops which were fortited by Čop's Law *did* merge with inherited fortis stops: the Lycian form *ebette* 'these' (dat.-loc.pl., parallel to HLuw. *á-pa-ta*/*tá-za*) is spelled with <t>, not with <Ṽt>, the spelling normally used to mark a voiced stop in intervocalic position.[28] Secondly, it is difficult to understand how the result of a long/geminated voiced short stop (*[d] > [d:] according to Rieken and Melchert) would have been written in exactly the same way as the presumably short and voiceless dental stops [t] we find in *á-sa-ta*/*tá*.

For these reasons, I am more inclined to follow the suggestion made by Kloekhorst (2012a: 262), who views *á-pa-ta*/*tá-za* as the result of analogy from other cases of the paradigm of PAnat. **Hob^{h}o-* 'that', cf. Table 3.10.

Kloekhorst argues that HLuw. *á-pa-ta*/*tá-za* reflects pre-Luwic **ʔobé-nʔ-d-oms*, with an element **-nʔ-* taken over from the gen.pl., where it is found in the forms Hitt. *apĕnzan* and Lyc. *ebẽhẽ*. While this is possible by itself, I believe that not only the gen.pl. may have exerted analogical pressure to introduce *n* in the HLuw. dat.-loc.pl. form. Also the nom.pl.c. and the acc.pl.c. show *n* directly after their respective stems *za-* and *apa-*. Adding *n* to the stem of the dat.-loc.pl. form would therefore constitute a trivial regularisa-

[28] The Cuneiform Luwian material cannot help us here: the cognate of HLuw. *á-pa-ta*/*tá-za* is not attested in CLuw., nor do we find cases of Čop's Law which are spelled with the signs TA or DA. For Lycian *ebette*, note that the effects of Čop's Law are only shown by the use of <t> /t/ (instead of <d> /d/), not by its geminate spelling <tt>. It is generally assumed (Kloekhorst 2012a: 261f.; Hajnal 1995: 116[125]) that the geminate in *ebette* is secondarily introduced from a syncopated stem *eptte-*/*ebtte-* 'their', where the geminate is regular in postconsonantal position.

	Hitt.	CLuw.	HLuw.	Lyc.	PLuw.[1]
nom.pl.c.	*apē*	–	*á-pa-zi*	–	**ʔəbənsi*
gen.pl.	*apĕnzan*	–	–	*ebẽhẽ*	**ʔəbənsom*
dat.-loc.pl.	*apĕdaš*	–	*á-pa-ta-za* *á-pa-tá-za*	*ebette*	**ʔəbətos*
acc.pl.c.	*apūš*	*apinz*	*á-pa-zi*	*ebeis*	**ʔəbəns*
nom.-acc.pl.n.	*apē*	–	*á-pa-ia*[2]	*ebeija*	**ʔəbə-ia*(?)

[1] For PLuw. **ə*, cf. Section 2.3.1, Table 2.2.

[2] Attested as KARKAMIŠ A11*b* § 12 *pa-ia-*a* (with initial-a-final) and ASSUR*f*+*g* § 38 *á-pa*$^{-i}$*-ia-pa-wa*/*i*, where the sign *i* is used as a word-internal space-filler, cf. Section 1.5.3.

Table 3.10: Attested and reconstructed forms of PAnat. **Hob*^{h}*o-* 'that'

tion of the paradigm. Unlike Kloekhorst, however, I argue that the dental stop in the resulting /ʔaɸantants/ was not written <tá> for its postnasal character, but rather on account of its shortness.

To sum up, I contend that the dental stops in the HLuw. pronominal forms *á-pa-ta*/*tá-za* 'those', *kwa*/*i-tá-zi*/*a* 'who/which' and *zi*/*a-tá-zi*/*a* 'this' do not necessarily present a counterexample to the distribution presented here, according to which intervocalic fortis/long stops are spelled consistently with <ta>.

3.5.2 <tá> spelling in the 3sg.pret.act. ending

The fortis variant of the 3sg.pret.act. ending (< PAnat./PIE **-to*) is spelled with <ta> in most cases (60x). In addition, there are 24 counts of 3sg.pret.act. endings spelled with <tá>. These are given below in Table 3.11.

In 11 of these verbal forms, the 3sg.pret.act. ending *-ta* may be part of a consonant cluster. This is assuredly the case for the roots *as-* 'to be' and quite possibly also for *sakatalis-* '?' and *up-* 'to bring about', if we are allowed to interpret the verbal stems as ending in a consonant. In addition, the three <tá> spellings of (MORI)*wa*/*i-la-tá* 'he died' may continue a root form-

Text	Attestation
AKSARAY § 10	*á-sa-tá* ‘to be’
BOYBEYPINARI 1-2 IIID § 7	*sà-ka-ta-li-sà-tá* ‘?’
KARKAMIŠ A11*b* § 2	*sa-tá-*a* ‘to be’
KARKAMIŠ A6 § 18	*á-sa-tá* ‘to be’
TELL AHMAR 1 § 8	*sa-tá-*a* ‘to be’
TELL AHMAR 6 § 4	*sa-tá-*a* ‘to be’
ALEPPO 2 § 12	DARE-*tá* ‘to give’
ARSUZ 2 § 11	PONERE-*wa*/*i-tá* ‘to put’
BOYBEYPINARI 1-2 IC § 4	(PES)*u-pa-tá-*° ‘to bring (about)’
BOYBEYPINARI 1-2 IIIC1 § 5	(PES)*u-pa-tá* ‘to bring (about)’
CEKKE § 2	PONERE-*tá* ‘to set up’
CEKKE § 3	*pu-pa-li-tá* ‘to compose’(?)
KARAHÖYÜK § 4	SOLIUM-*tá* ‘to set/to sit’
KARKAMIŠ A21 § 4	SOLIUM-*nú-tá* ‘to set’
KARKAMIŠ A24*a*2+3 § 6	“PES_2”(-)*wa*/*i-za-tá* ‘to carry off’
TELL AHMAR 6 § 8	(MORI)*wa*/*i-la-tá* ‘to die’
TELL AHMAR 1 § 10	(“MORI”)*wa*/*i-la-tá* ‘to die’
TELL AHMAR 1 § 18	(“MORI”)*wa*/*i-la-tá* ‘to die’
TELL AHMAR 1 § 25	“AUDIRE+MI”-*ti-i-tá* ‘to hear’
TELL AHMAR 5 § 4	*hwa*/*i-nu-wa*/*i-tá* ‘to make run’
YALBURT 8	*hwi*/*a-i*(*a*)*-tá* ‘to run’
YALBURT 12 § 4	*hwi*/*a-i*(*a*)*-tá* ‘to run’
YALBURT 16+10 § 4	*hwi*/*a-i*(*a*)*-tá* ‘to run’
YALBURT 4 § 3	*á-zi*/*a-tá* ‘to love’

Table 3.11: 3sg.pret.act. forms spelled with <tá>

ation, *walta*, consisting of a stem *wal-* (< PAnat. **uel-* or **g^{w}el-*, with Melchert 1994a: 238) to which the ending *-ta* was added. If this is true, we may assume that the long (fortis) stop of the ending was shortened (and voiced) in contact with the stem-final *l*, like *n*. The resulting form was then spelled with <tá>. A similar interpretation is possible for SOLIUM-*tá* 'he sat/set' (KARAHÖYÜK § 4) and "PES$_2$"(-)*wa*/*i-za-tá* 'he carried away' (KARKAMIŠ A24*a*2+3 § 6). In these two verbal forms, the ending may well have directly followed the stem: /(ʔ)asta/ and /uatsta/.

The remaining 13 instances of a 3sg.pret. ending with ending with <tá> are not obviously found in post-consonantal position. For most of these, however, special explanations can be found.

– The subject of ARSUZ 2 § 11 PONERE-*wa*/*i-tá* 'to put' is (*A*)*T*[*ANA*]-*sa*-[*pa*]-*wa*/*i-mu*(REGIO) 'the city/land Adana'. Perhaps we are allowed to interpret the verbal form here *ad sententiam* as a plural form ("the inhabitants of Adana"). We may then interpret PONERE-*wa*/*i-tá* as /tuanta/ 'they put', and the spelling with <tá> would be regular as part of a cluster.

– The context of KARKAMIŠ A21 § 4 SOLIUM-*nú-tá* is quite damaged:

KARKAMIŠ A21 §§ 3–4:

3. § 3 ...] (DEUS)*ku*+AVIS MANUS-*tara*/*i ARHA*$^{?}$(-)*i*+*a-t*[*á*

4. § 4 ... || ...]*190.THRONUS *tá-ti mi-i za*$_4$*-la* SOLIUM-*nú-tá*]

"(...) Kubaba ...-ed [me?] the hand, (...) [and me(?) she] caused to sit on my paternal throne(?)" (Transl. after Hawkins 2000: 160.)

A different reading involving a 3pl. subject is still possible, although no obvious candidate presents itself.

– The context of TELL AHMAR 5 § 4 *hwa*/*i-nu-wa*/*i-tá* 'he made run' is very unclear. Instead of taking 'my father' from § 2 as the subject (thus Hawkins 2000: 232), perhaps § 2 *za-a-zi* |(*256)*ka-lu*/*i*/*a-na-zi* 'the granaries' is applicable here, although it does not improve our understanding of the context.

– The four attestations of <tá> in the YALBURT inscription (*hwi*/*a-i*(*a*)-*tá* and *á-zi*/*a-tá*) are striking, but closer inspection reveals that the only attestation of <ta> in this text is very uncertain: YALBURT block 11 § 2 *a-ta*$^{?}$-*pa*-x(URBS$^{?}$/REGIO$^{?}$), cf. Figure 3.1. YALBURT may therefore belong to the group of texts which do not have an opposition between <ta> and <tá>, and should be left out of consideration.[29]

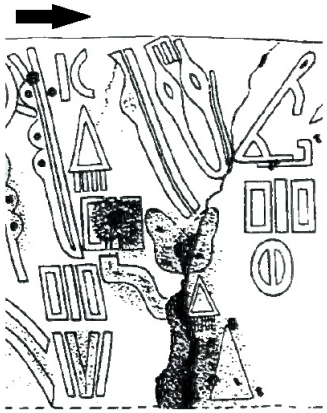

Figure 3.1: YALBURT block 11 § 2: *a-wa*/*i-mi* |*416-*wa*/*i-ní*-[*sa*$^{?}$] *a-ta*$^{?}$-*pa*-x (URBS$^{?}$/REGIO$^{?}$) *mu-wa*/*i-ha*. (Transliteration taken from Hawkins and Neve 1995: 68, drawing taken from Poetto 1993: 145. The arrow indicates the direction of reading.)

I have no special explanation for "AUDIRE+*MI*"-*ti-i-tá* 'he heard', occurring in TELL AHMAR 1 § 25, which does not show any other remarkable uses of <tá>. The same goes for CEKKE § 2 PONERE-*tá* and § 3 *pu-pa-li-tá*. However, these 3 spellings are clearly exceptional in light of the 70 3sg.pret.act. forms which do follow the main pattern observed in this chapter or which can be explained in alternative ways: as a rule, <ta>/<tá> alternations are found in consonant clusters. Therefore, I do not think these examples necessarily invalidate the distribution defended here.

[29] If these doubts are justified, then also the significance of the <tá> spelling in the pronominal form YALBURT § 2 *zi*/*a-tá-zi*/*a*-(*pa-wa*/*i*) has to be reconsidered.

3.5.3 Words containing apical consonants

The final group of <tá> spellings that are found outside of consonant clusters are mainly found in word-initial position, cf. Table 3.12.

Lemma	**<ta/tá>**		**Texts + §§**
[I]*Taita-* (PN)	1/1	**<ta>:**	SHEIZAR § 1
		<tá>:	ALEPPO 6 § 1
tananta- 'empty'	4/1	**<ta>:**	KARAHÖYÜK § 3 KARKAMIŠ A11*b* § 12 MARAŞ 1 § 4 MARAŞ 8 § 3
		<tá>:	KARKAMIŠ A12 § 6
(STATUA/LIGNUM)*taru-* 'tree, statue'	4/1	**<ta>:**	ALEPPO 2 § 8 KARKAMIŠ A18*e* § 4 MARAŞ 14 § 7 MALPINAR § 1
		<tá>:	KARKAMIŠ A25*a* § 7
(DEUS)*Tasku-* (DN)	4/2	**<ta>:**	ANCOZ 1 § 3 ANCOZ 7 §§ 4 & 9 ANCOZ 10 § 4
		<tá>:	ANCOZ 5 § 1 ANCOZ 10 § 1
(LOQUI)*tataria-* 'curse'	1/3	**<ta>:**	KARKAMIŠ A3 § 24
		<tá>:	KARKAMIŠ A3 § 21 ALEPPO 2 § 14 TELL AHMAR 2 § 19

Table 3.12: Rare attestations of <tá> next to <ta>

The names (DEUS)*Tasku-* and [I]*Taita-* are of unknown origin and not analysable from an Indo-European perspective. Their unusual spelling may

thus reflect the scribes' attempt to write a foreign phonetic sequence with no perfect correlate in Luwian itself.

For the other word-initial <tá> spellings in this list, I think the easiest solution is the one proposed by Rieken (2010b: 305), who analyses them as the result of occasional voice assimilation. Each of these forms has a voiced alveolo-dental element elsewhere in the word (**r*, **n*), which may have occasionally affected the dental stop by voicing it. If this analysis is correct, it may provide another argument in favour of word-initial <tá> marking a voiced stop [d], rather than an unvoiced stop [t] in word-initial position.

3.6 Comparison and reconstruction

We may now compare the results of our analysis of the Hieroglyphic Luwian dental stops with what we know about the spelling and phonetics of dental stops in the other Anatolian languages, and so consider how they may have developed from Proto-Anatolian.

3.6.1 Word-initial dental stops

We have seen that most HLuw. lexemes with word-initial dental stops before *a* are spelled with <ta>, indicating a general merger of word-initial stops. Similar mergers seem to have occurred in Lycian, Hittite and Cuneiform Luwian. In Lycian, both original fortis and lenis stops in word-initial position are written using the sign <t>, marking a voiceless stop [t] (Melchert 1994a: 283–286), cf. Lyc. *Trqqñt* (DN) < PIE **trh₂-u-* and *tadi* 'he puts' < PIE **dʰeh₁-ti*. A general merger of word-initial dental stops is also attested for Old Hittite (consistent TA-spelling; Kloekhorst 2010) and Cuneiform Luwian (alternating TA/DA spelling, cf. Section 4.7), although the phonetic outcome does not appear to be the same. We cannot reconstruct a general merger of all word-initial stops for Proto-Anatolian: Hittite evidence shows that word-initial **ti-* must have been distinct from **di-* until pre-Hittite times, as both seem to yield different reflexes: PIE **ti-* > Hitt. *z-*, as in Hitt. *zi-i-ik* 'you' < PIE **tiH-* (Kloekhorst 2008: 26; Melchert 1994a: 117), while PIE **di-* > Hitt. *š-*, as in Hitt. *šīu-* 'god' < PIE **diēu-* (Kloekhorst 2008: 26[41]; Melchert 1994a: 104).

This requires us to assume at least two Proto-Anatolian word-initial dental stop phonemes, with independent mergers in Hittite, Luwian and Lycian.

The remarkable spelling of HLuw. *tá-ti-* is not paralleled in the other languages which have inherited this root. Orthographically, the anlaut of Cuneiform Luwian *t*/*da-a-ti-*, Lycian *ted*(*i*)-, Carian *tedi-* and Lydian *taada-* 'father' is identical to that of words with inherited fortis or lenis dental stops (cf. Section 4.7). This means that the unique pronunciation of HLuw. *tá-ti-* is either an archaism (if the other Anatolian languages have simply lost the distinction) or an innovation (if Hieroglyphic Luwian somehow introduced the Lallwort phonetics secondarily). In any case, the remarkable pronunciation of the anlaut of HLuw. *tá-ti-* and its phonological opposition to inherited PIE word-initial dental stops need not continue anything old.

3.6.2 Word-internal dental stops

Intervocalically, Hieroglyphic Luwian consistent <ta> spellings correspond to fortis dental stops in Cuneiform Luwian ([tː], Melchert 1994a: 229) and Hittite ([tː], Melchert 1994a: 92), which are commonly written with geminate spelling <-Vt-tV->. In the alphabetic script of Lycian, the intervocalic fortis dental stop is rendered with the sign <t>, representing a voiceless stop [t] (Melchert 1994a: 282). I follow Melchert 1994a: 62 and Kloekhorst 2016a: 223–226 in assuming that the Proto-Anatolian precursor to the intervocalic fortis stops was a phonetically long and voiceless stop, e.g. *[tː].

In postconsonantal position, I have argued that Hieroglyphic Luwian shows the result of general shortening and voice assimilation to the preceding consonant. Both developments are well attested in the other Anatolian languages:

1. After voiced consonants, PIE **t* and **d^h* appear to have merged into Old Hittite [d] (spelled alternatingly with both voiced and voiceless signs: TA/DA, TI/DI etc. alternating), cf. Kloekhorst fthc. 6–11, thus showing a similar merger (loss of length + voicing) as Hieroglyphic Luwian.[30] Cuneiform Luwian does not seem to distinguish reflexes

[30] PIE **d* does not seem to have undergone voicing by a preceding voiced consonant,

of PIE **nt* from those of **nd* or **nd^{h}*: all three are spelled with the signs TA and DA alternating, cf. Section 4.4. Also in Lycian, postnasal stops were voiced, the resulting [d] being marked with a sign that normally writes a fortis stop, <t>, preceded by a nasal: Lyc. <ñt> (word-initial or post-consonantal) or <Ṽt> (post-vocalic), cf. Lyc. *ñte* 'inside' (< PIE **d$^{(h)}$*) and 3pl.pret.act. *-Cñte*/*-Ṽte* (< PIE **-nto*). We know that Lyc. <ñt> represents a voiced stop [d] because it is used to represent Gr. δ in borrowed personal names (e.g. Lyc. *Ñtemuχlida-* ← Gr. Δημοκλείδης).[31]

2. After voiceless consonants, both Hittite (Kloekhorst 2013) and Cuneiform Luwian (Section 4.6) display an overwhelming preference for TA spellings, which marks the presence of a voiceless stop [t]. In Lycian, dental stops are regularly lost after *s*, cf. *esu* 'he must be' < **h$_1$es-tu*. There is no way of determining whether this loss was preceded by a general merger of fortis and lenis stops or not, but it seems likely that the change from fortis PAnat. *[t:] > ø /s_ went through an intermediary stage *[t]. Thus: pre-PAnat. *[st:] > *[st] > Lyc. [s].[32]

Thus, our interpretation of the Hieroglyphic Luwian stops as short and voiceless/voiced depending on the preceding consonants finds many correspondences in the other Anatolian languages.

Hieroglyphic Luwian <tà> spelling represents the reflex of the Proto-Anatolian intervocalic lenis stop **d*, continuing a PIE **d$^{(h)}$* or PIE **t* that has

since it was blocked by an intervening glottalic element, cf. Kloekhorst 2013: 137f. This prevents us from reconstructing a complete merger of PIE **nT* into a Proto-Anatolian postnasal voiced stop. However, I see no objections to a merger of PIE **nt* and **nd^{h}* in pre-Proto-Anatolian, by way of a neutralisation of length and voicing.

[31] A similar use is attested in Lydian, where the sign <t> appears to spell [d] after nasals in Lyd. *αlikšantru-* ← Gr. Ἀλέξανδρος. Again, this suggests that fortis stops were voiced after nasals (Melchert 1997b: 45). In Carian, the sign <δ> corresponds to Greek δ and Egyptian *d*, indicating a voiced stop. The fact that we find this sign in Car. *trqδ*, the cognate of CLuw. *Tarḫunt-*, Lyc. *trqqñt-* etc. (< PIE **-nt-*), indicates that also in Carian, original fortis (voiceless) stops have undergone voicing after nasals.

[32] As far as I know, there are only cases of **s* + fortis stop in Lycian. Presumably, also lenis stops were lost in this position. Attested cases of Lycian word-internal *-st-* go back to secondary formations (such as *qasttu* 'he must destroy' [iter.] < syncopated **g^{wh}en-ske-tu*).

been lenited in Proto-Anatolian. In Hittite, this stop is spelled with the signs TA and DA alternating, cf. Hitt. *a-ta-an-zi* ~ *a-da-an-zi* 'they eat'. Kloekhorst (2013: 139f.) has argued that this alternation represents a voiced stop [d]. Cuneiform Luwian shows consistent TA-spelling in this position, suggesting the presence of a short voiceless stop [t] (Section 4.5). Finally, Lycian, uses the sign <d> to write intervocalic lenis stops. As mentioned in Section 3.4.3, it is commonly believed that this sign does not write a voiced *stop*, but rather something else, perhaps a voiced fricative [ð]. I agree with Hajnal (1995: 32[11]) and Rieken (2010b: 306) that a similar phonetic interpretation is applicable to Hieroglyphic Luwian, so that HLuw. <tà> may well represent a voiced fricative [ð]. I will argue in Section 4.5.1 that we must reconstruct a short voiceless stop *[t] for Proto-Anatolian, for the reason that the alternative, PAnat. *[d] (as reconstructed in Melchert 1994a: 54) would require intervocalic devoicing to arrive at the Cuneiform Luwian reflex [t]. If we start from PAnat. *[t], we only have to assume voicing of the intervocalic lenis stop in Hittite, Lycian and Hieroglyphic Luwian. Additionally, Lycian and Hieroglyphic Luwian may show the effects of subsequent fricativisation ([d] > [ð]).

3.7 Summary and conclusion

The established correlations between spelling, phonetics and phonology in Hittite, Luwian and Lycian can be summarised as follows, cf. Table 3.13.

In this chapter, my analysis of the use of <ta> and <tá> in Hieroglyphic Luwian departs from that of Rieken 2010b with the observation that (dental) stops in contact with [s]/[ʃ] are more likely to be voiceless than voiced, as voicing in this position is typologically unlikely. Consequently, I have interpreted the alternating <ta>/<tá> spelling pattern in postconsonantal position as primarily *short* stops, which could be voiced or voiceless according to the consonant preceding them. This means that the intervocalic fortis stops (written consistently with <ta>) cannot have been distinct from the postconsonantal ones in terms of voice. I have proposed that they are rather distinctive in length, which fits well with both the phonetic value of etymologically comparable sequences in the cuneiform languages and the Proto-

	#T-	-VTTV-	-VTV-	-C[+voice]T-	-C[-voice]T-
OHitt.					
Spelling	<TA>	<TA>	<T/DA>	<T/DA>	<TA>
Phonetics	[t]	[tː]	[d]	[d]	[t]
Phonology	/tː/	/tː/	/t/	/t/	/t/
CLuw.					
Spelling	<T/DA>	<TA>	<TA>	<T/DA>	<TA>
Phonetics	[d]	[tː]	[t]	[d]	[t]
Phonology	/t/	/tː/	/t/	/t/	/t/
HLuw.					
Spelling	<ta> vs. <tá>	<ta>	<tà>	<ta/tá>	<ta/tá>
Phonetics	[t] vs. [d]	[tː]	[ð]	[d]	[t]
Phonology	/t/ vs. /d/	/t/	/θ/	/t/	/t/
or:					
Phonetics	[tː] vs. [t]	[tː]	[ð]	[d]	[t]
Phonology	/tː/ vs. /t/	/tː/	/θ/	/t/	/t/
Lyc.					
Spelling	<t>	<t>	<d>	<t>	<t>
Phonetics	[t]	[t]	[ð]	[d]	[t]
Phonology	/t/	/t/	/θ/	/t/	/t/
PAnat.					
Phonetics	*[tː] vs. *[t]	*[tː]	*[t]	*[d]?	*[t]?
Phonology	*/tː/ vs. */t/	*/tː/	*/t/	*/t/?	*/t/?

Table 3.13: Spelling, phonetics and phonology of dental stops in Hittite, Luwian, Lycian and Proto-Anatolian.

Anatolian intervocalic fortis stop as reconstructed in, e.g., Kloekhorst 2008: 21–25 and Melchert 1994a: 62. A second major difference between my analysis and that of Rieken revolves around HLuw. *tá-ti-* 'father'. I have argued that this lexeme contrasts with other words in the language that have word-initial dental stops. I have presented two ways to interpret the opposition phonetically: in terms of voicing or length/aspiration.

With respect to its marking of phonetic and phonological features of the dental stop, Hieroglyphic Luwian takes a middle position between the cuneiform languages on the one hand and Lycian on the other. Like the cuneiform languages and unlike Lycian, it distinguishes long stops (only <ta>) and short stops (both <ta> and <tá>). Like Lycian, on the other hand, it consistently marks a contrast between stops (<ta> and <tá>) and another type of consonant, presumably a fricative (<tà>). Hieroglyphic Luwian thus shows both the signs of a new stop vs. fricative system, while still showing the vestiges of a long vs. short stop opposition in its orthography, and perhaps even in its phonology.[33]

[33] As an avenue for future research, I suggest a detailed focus on different chronological periods, so as to combine the distribution found in this chapter with the diachronic replacement of <tá> by <ta> we observed in Section 3.1. As we have seen, this replacement was gradual from the Empire texts to our latest texts onwards. It is to be expected that some items drop their <tá> spellings relatively quickly, while others retain theirs for longer. The rate of replacement in some lexemes or time periods may reveal extra details about the use of <ta> and <tá> in Hieroglyphic Luwian.

CHAPTER 4

The Spelling of Dental Stops in Cuneiform Luwian

Submitted to Historische Sprachforschung.

The Spelling of Dental Stops in Cuneiform Luwian

4

Abstract: This chapter investigates the use of the cuneiform signs TA and DA in the spelling of dental stops in (Kizzuwatna) Cuneiform Luwian. It is shown that depending on the phonetic environment, different spelling patterns are found, indicating a phonetic contrast. Furthermore, it appears that the spelling distributions discovered for Cuneiform Luwian correspond well to those found in the contemporaneous Middle/New Hittite corpus (Kloekhorst 2010; Kloekhorst 2013; Kloekhorst fthc.), allowing us to draw conclusions on their phonetic realisation. Where Cuneiform Luwian *does* differ from Hittite in spelling etymologically similar sequences, the divergences are mostly explainable in phonetically trivial ways. However, there are a few instances where the preponderance of certain spelling patterns challenge our current understanding of the phonological systems of Cuneiform Luwian and Proto-Anatolian. Most notably, Cuneiform Luwian spelling suggests that the intervocalic lenis phoneme was voiceless, providing evidence that the Proto-Anatolian fortis-lenis opposition was one in consonantal length, rather than voice.

4.1 Introduction

When the Hittites took over the Old Babylonian (Akkadian) cursive cuneiform script and started composing their own texts, they adopted its great variety of CV (consonant-vowel) signs. The syllabary does not only differentiate signs according to their vocalic quality (e.g. KA 𒆏, KE/I 𒅀, KU 𒆠) but also according to consonantal voicing (e.g. KA 𒆏 vs. GA 𒄀; KU 𒆠 vs. GU 𒄿). In general, the Old Babylonian scribes used these signs to distinguish different consonants and vowels with great consistency, cf. Von Soden and Röllig 1991: xxx–xxxi. For Hittite, scholars commonly agree that different signs (KA vs. KU) were used in a similar way to mark differences in vo-

calic quality. It is a matter of contention, however, whether the Hittites also used the consonantal variants of signs (KA vs. GA) contrastively. The idea that voiceless and voiced signs in pairs like TU vs. DU and KE/I vs. GE/I are used interchangeably is prompted by the fact that many words are attested with both variants. This is exemplified by Hoffner and Melchert (2008: 16), who write in their authoritative Hittite grammar: "[W]hen writing Hittite, the scribes do not even use contrastively those CV signs with initial stop that distinguish voicing in the Akkadian syllabary: *a-ta-an-zi* and *a-da-an-zi* 'they eat', *ta-ga-a-an* and *da-ga-a-an* 'on the ground', *ad-da-aš* and *at-ta-aš* 'father'."[1]

In recent years, however, this view has been challenged in a series of articles by Kloekhorst (2010; 2013; fthc.), demonstrating that Hittite text compositions from all time periods show a non-random use of the cuneiform signs TA 𒋫 and DA 𒀭. This, Kloekhorst argues, indicates a phonetic and phonological contrast. More specifically, consistent use of the sign TA would mark the presence of a voiceless stop [t(ː)], while the (occasional) use of DA would indicate a voiced [d] or ejective [t(ː)ʔ] stop.[2]

In this chapter, I will investigate whether also the Cuneiform Luwian data show any significant patterns in the use of the signs TA and DA. If Cuneiform Luwian lexemes and morphemes show non-random spelling distributions so that some morphemes/lexemes are spelled consistently with TA and others with DA just as happens in Hittite, then this may be taken to indicate that they sounded different to the scribe. In that case, we can use spelling phenomena to determine the phonetics of the CLuw. dental stops in greater detail.[3]

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[1] See Kloekhorst 2010: 199f. for a general overview of previous literature where similar opinions are expressed.

[2] Note that the choice of sign merely denotes the *quality* of the consonant. Consonantal length, as is well known, is expressed by geminate spellings in certain environments. Thus: <Vt-ta> = [tːa], while <V-ta> marks [ta]/[da], cf. Melchert 1994a: 18.

[3] One might argue that patterns in the use of TA and DA represent mere spelling conventions which do not reflect the actual pronunciation of the writer or speaker. Even if this were the case, however, these conventions come from earlier times when they *did* correspond faithfully to pronunciation. A good example is MoEng. *knight* vs. *night*: both words are pronounced identically, but written with or without <k>. Synchronically, the *k*-spelling of *knight* is certainly an arbitrary convention, but historically, it was pronounced as [kn]

After closely examining the Cuneiform Luwian dental stop spellings, I will compare them to those found in Middle and New Hittite compositions (Middle Script/New Script, henceforth: MS/NS), as these are contemporary to the Luwian textual material. As is well known, the Cuneiform Luwian material is attested much more poorly than Hittite, which means that identification of spelling patterns and comparisons to Hittite are often based on very little material.

4.2 Data

As my corpus, I used Melchert's *Cuneiform Luwian Lexicon* (1993), which is an index containing Luwian words from two distinct sources. On the one hand, it contains words found in Luwian texts written in cuneiform, as collected by Starke (1985); on the other hand, Melchert's lexicon lists Luwian words scattered throughout Hittite texts (often, but not always, marked with a so-called *Glossenkeil*). On the basis of mainly morphosyntactic arguments, Yakubovich (2010: 15–75) has argued extensively that these two groups reflect dialectal variants: the Luwian material within Hittite contexts reflects a Luwian dialect spoken in Hattuša we may call 'Empire Luwian', while material from the Luwian texts proper appears to have been composed elsewhere, mainly in the Kizzuwatna area, and is therefore said to represent a Luwian dialect called 'Kizzuwatna Luwian'.

With this in mind, I have separated the Empire Luwian material from the Kizzuwatna Luwian material, so as not to confound any differences in phonetics and spelling there may exist between these two dialects. Another reason to treat Luwian words from these two contexts in isolation (at least for the time being), is that we do not know to what extent the Luwian material found in Hittite contexts was adapted to Hittite spelling and phonology. In order to avoid as much non-Luwian influence as possible, this chapter

as it is still is in German *Knecht* and Dutch *knecht* (as opposed to MoGerm. *Nacht*, MoDu. *nacht*). I would argue that it is unlikely that we find such etymological spellings in Cuneiform Luwian, especially since there are no signs of cuneiform being used to write Luwian before the Hittites adopted the script. Spelling patterns in the cuneiform material are therefore best taken at face value, unless there are strong indications to do otherwise.

will focus solely on the Kizzuwatna Luwian material. In total, 845 (undamaged, unemended) attestations of the signs TA and DA were extracted from Melchert's lexicon. These have been classified according to their phonetic environment: I distinguish TA and DA used to spell word-initial stops, intervocalic geminate stops, intervocalic singleton stops, post-nasal stops and post-consonantal (non-nasal) stops, cf. Table 4.1.

	TA-/ DA-	**-VTTA-/ -VDDA-**	**-VTA-/ -VDA-**	**-nTA-/ -nDA-**	**-CTA-/ -CDA-**	**Total**
TA	128	179	222	103	66	698
DA	39	15	32	51	10	147
Total	167	194	254	154	76	845
TA%	77%	92%	87%	67%	87%	83%

Table 4.1: Cuneiform ('Kizzuwatna') Luwian TA/DA in Luwian contexts

It is immediately clear that TA is much more common than DA in all environments distinguished here, occurring slightly less than five times as often (698x TA vs. 147x DA ≈ 5 : 1) in total. This overall ratio, however, does not hold for each phonetic environment. The TA : DA ratio varies quite a bit between post-nasal dental stops (2 : 1) and word-initial position (3 : 1) on the one hand, and intervocalic geminates (12 : 1) on the other, for instance. This suggests that the use of TA and DA is not random, but sensitive to the phonetic environment in which they are used. Statistical analysis confirms this idea: the relationship between phonetic environment and spelling appears to be highly significant: $X^2(4, N = 845) = 48.24$, $p < .001$.[4] This conclusion

[4] For this analysis, a chi-square test of independence was used. This statistical test assesses whether two variables (in this case: phonetic environment and spelling with TA or DA) are independent or not. The result of this analysis ($p < .001$) indicates that if we assume that phonetic environment and choice for TA/DA are completely unrelated, the chance of finding the observed distribution in Table 4.1 is lower than 0.1%. It follows that we should reject the hypothesis that the phonetic environment has no bearing on the use of TA/DA, and adopt the alternative hypothesis: the phonetic environment greatly influences the choice for TA/DA in the Cuneiform Luwian material. After removing two texts with an exceptional

supports the idea that spelling variation in Cuneiform Luwian reflects underlying phonetic differences, at least to a certain degree.

In the following sections, each of the environments will be treated in turn to see if we can find any clear spelling patterns. Assuming that these are indicative of a phonetic contrast, I will try to uncover the phonetic values of the dental stop underlying these patterns. I will start with the intervocalic geminates, as the distribution of TA vs. DA appears to be most skewed in this environment.

4.3 Intervocalic geminates (*-Vt-ta-/-Vd-da-*)

As is well known, geminate spelling in Cuneiform Luwian marks a fortis stop, representing the regular reflex of PIE **t*. It is also used to spell the result of Čop's Law (Čop 1970, Kloekhorst 2006/2008), a sound law describing how original lenis dental stops (< PIE **d*$^{(h)}$) were fortited in pre-Proto-Luwic.[5]

At first sight, fortis stops in Cuneiform Luwian appear to be written in all three theoretically possible different ways: some morphemes/lexemes are spelled consistently with the sign TA; others are spelled with the signs TA and DA alternating; lastly, there is also a handful of items spelled consist-

distribution of TA and DA spellings (KUB 25.39 and KBo 29.38 [23 attestations in total], cf. Sections 4.3 and 4.5), the relation between environment and spelling is found to be even more significant ($X^2 = 53.14$). Pairwise analysis on the remaining 821 attestations using the Bonferroni-adjusted *p*-value of .005 confirms that the most significant differences are found 1. between intervocalic geminates and postnasal stops ($X^2 = 36.00$, $p < .001$); 2. intervocalic singletons and postnasal stops ($X^2 = 24.91$, $p < .001$); 3. between intervocalic geminates and word-initial stops ($X^2 = 17.22$, $p < .001$).

[5] It is still debated whether the result of Čop's Law merged with the inherited fortis stops (Kloekhorst 2006/2008: 133) or remained phonetically distinct (thus, e.g., Melchert 1994a: 20 and Rieken 2010b: 305). Orthography could help us decide in this matter: if the result of Čop's Law is spelled differently from inherited fortis stops (< PIE **t*), then it becomes attractive to think that these two elements were also distinct phonetically. If they are spelled identically, however, the phonetic difference between the two may not have been very substantial. Unfortunately, the dataset at hand does not allow us to make any conclusions regarding this discussion: there do not seem to be clear results of Čop's Law that are spelled with TA or DA. Thus, we cannot decide whether they are spelled identically to inherited fortis stops or not.

ently with the sign DA. The most common items (3 attestations or more) are given below, cf. Table 4.2.

Spelling	Lemma	TA	DA
TA only	*-ttari*/*-ttaru* (3sg.pres./imp.med.-pass.)	10	-
	paratta- 'impurity' (vel sim.)	4	-
	muḫattara- '?'	3	-
	-attar(/*-attn-*) (abstract suffix)	3	-
TA/DA	=*tta* (sentence-initial particle)	65	2
	-tta (3sg.pret.act.)	55	7
	ḫatta° 'to chop, (to) hoe'[1]	13	1
DA only	*paddaliia-* 'carry off' (vel sim.)	-	3

[1] For ease of reading, I have included the spellings of derived forms in these counts. Thus, the entry *ḫatta*° includes CLuw. *ḫatta-* (3/0) 'violent blow', *ḫattašt*(*a*)*r*(*i*)- (2/0) 'violence, terror', *ḫattai*(*a*/*i*)- (2/1) 'violent', ^{GIŠ}*ḫattara-* (4/0) 'hoe' (vel sim.) and *ḫattari*(*ia*)- (2/0) 'to hoe' (vel sim.).

Table 4.2: Spelling of Cuneiform Luwian intervocalic geminate dental stops

It is immediately clear that DA-spellings are very rare in the spelling of intervocalic geminates. Furthermore, a closer look at the group of items spelled with alternating TA/DA reveals that several of their DA-spellings are unlikely to be straightforwardly representative for the CLuw. spelling of the result of PIE **-t-*.

In this group of alternating TA/DA spellings, we will first focus on the 7 DA-spellings used to write the fortis verbal ending *-tta* (3sg.pret.act.; < PIE **-to*). It turns out that three of these stem from the same text: KUB 25.39 (NS, CTH 773: "Song of Ištanuwa").[6] The same text also contains one of the two DA-attestations of the particle =*tta* as well as the single DA-form of *ḫattaia*/*i-*

[6] These are: *ḫu-u-i-ia-ad-da* 'he ran' (KUB 25.39 iv 8), *u-up-pa-ad-da* 'he brought' (KUB 25.39 iv 18) and *ua-ú-ua-li-pa-ad-da* 'he wrapped' (KUB 25.39 iv 1). It has been proposed that the Songs from Ištanuwa (CTH 773) were composed in a special dialect of Luwian,

(2/1) 'violent'. Since it contains so many unusually spelled forms, I regard KUB 25.39 as not representative of the spelling practice of the overall corpus and argue that we can safely remove it from consideration for now.[7]

Apart from the three remarkable DA-spellings in KUB 25.39, there is not much evidence for DA-spellings in Cuneiform Luwian geminates. Most of them are overshadowed in frequency by TA-spellings, and the few items that do show consistent DA-spelling are all so rare, that their spelling with 'consistent' DA may well be due to chance (the only one attested more than three times is CLuw. *paddaliia-* [0/3] 'to carry off'). I do not see a reason to assume a different phonetic realisation based on these DA-spellings. In conclusion, Cuneiform Luwian intervocalic geminates are in principle spelled with consistent TA, which is the regular way to write the result of PIE **t*.[8]

4.3.1 Comparison with Hittite and phonetic interpretation

In Hittite texts written in MS/NS, words with geminate spellings fall in one of two categories, as described in Kloekhorst fthc. 2. The first group consists of words that are overwhelmingly spelled with TA, e.g. *ki-it-ta-ri* 'he lies' (over 200x TA; 3x DA; < PIE **kéi-to*) and *kat-ta* 'down' (over 700x TA, 0x DA; < PIE **ḱmto*). Like Cuneiform Luwian, these spellings seem to reflect the regular result of PIE **t*. According to Kloekhorst (fthc. 4), this spelling represents a long voiceless stop [t:] in Hittite, which matches the phonetic interpretation assumed in Melchert 1994a: 20. In addition, both Kloekhorst (2008: 21–25) and Melchert (1994a: 62) have argued that this was also the underlying phonetic value of the Proto-Anatolian intervocalic fortis stops. Since the Cuneiform Luwian spelling pattern shows a spelling pattern which is identical to the one found in Hittite (near-consistent TA), it is most likely

as they seem to exhibit several grammatical archaisms (cf. Melchert 2003: 147). However, given that other texts from the "Ištanuwian corpus" (e.g. KUB 35.139, KBo 29.32) do not show any unusual spellings, the unusual spellings in KUB 25.39 are more likely to represent the peculiarities of a particular scribe than a dialectal difference in pronunciation.

[7] In contrast to the other texts, the scribe of KUB 25.39 appears to have spelled *all* verbal endings with the sign DA: 3sg.pret.act. *-(d)da* (4x), 3sg.pres.med.-pass. *-da-ri* (1x), 3pl.pret.act. *-nda* (1x). No variants with TA are found in this text.

[8] The four remaining DA-spellings used to write the 3sg.pret.act. *-tta* may have a principled explanation. The relevant forms are discussed in the Appendix.

that the phonetic interpretation of the Hittite intervocalic fortis stops is also applicable to the CLuw. intervocalic voiceless stops: [tː].[9]

The second spelling pattern found in Hittite (MS/NS) to write geminate dental stops consists of a handful of items that are spelled (near-)exclusively with the sign DA (e.g. *padda-^{i}*/*padd-* 'to dig': 0x TA, 32x DA; *uddar*/*uddan-* 'word': 11x TA, 193x DA). These words all go back to PIE dental stops immediately followed by a laryngeal. Kloekhorst (fthc. 1f.) therefore argues that the laryngeal appears as a glottalic element on the stop, yielding a long postglottalised/ejective stop [tː^{ʔ}].[10] As far as we can tell, Cuneiform Luwian provides no evidence for any such category, although decisive evidence is lacking. We have seen that the consistency of DA spellings in items such as *paddali*(*ia*)- 'to carry off' (0/3) is possibly due to chance. On the other hand, none of the CLuw. words spelled with geminate dental stops is safely reconstructable with a dental stop followed by a laryngeal, so that we cannot know how the scribes would have spelled the reflex of this sequence in cuneiform writing.

To conclude, I think it is safe to argue that the CLuw. data conform well to the Hittite (MS/NS) data: intervocalic geminates (< PIE **t*) are in principle spelled with consistent TA-spelling, marking a long voiceless stop [tː]. The few DA-spellings we find are not likely to write the regular reflex of intervocalic PIE **t* in Cuneiform Luwian and are too rare to justify a second phonetic realisation of these stops.

4.4 Post-nasal position (°*n-ta-*/°*n-da-*)

The most common spelling pattern of Cuneiform Luwian dental stops after *n* shows an alternation of TA and DA, cf. Table 4.3 (only items with 3+ attestations).

The Cuneiform Luwian results of both Proto-Anatolian fortis */t/ (< PIE **t*) and lenis */d/ (< PIE **d$^{(h)}$*) appear to be spelled with TA and DA after *n*,

[9] Consonantal length as a feature of geminate spelled stops in CLuw. does not appear to be universally accepted. Yates (fthc. 35) is uncertain about the phonetic interpretation of CLuw. geminate vs. singleton spellings, while Rieken (2010b: 305) allows for the possibility that the gemination in spelling is graphic.

[10] The stops are phonetically long, given their geminate writing, cf. footnote 2.

Spelling	Lemma	TA	DA
TA only	*-anta* (distributive suffix)	5	-
	=ta (sentence-initial particle)	4	-
	āššiu̯antattar/-atn- 'poverty'	4	-
TA/DA	*-nta* (3pl.pret.act.(iter.))	29	9
	ānta 'inside'	15	22
	zanta 'down'	9	7
	āpparant(a/i)- 'future'	3	1
	īnta '?'	2	1
DA only	*wandaniia-* '?'	-	3

Table 4.3: Spelling of Cuneiform Luwian postnasal dental stops

e.g. *-anta/-anda* (3pl.pret.act. ending < PIE **-nto*), *ānta/ānda* 'inside' (< PIE **-nd$^{(h)}$-*) and *zanta/zanda* 'down' (< PIE **ḱmto*).

There are only a few words spelled with consistent TA or DA in this position. The most frequent are the distributive suffix *-anta* (5x TA, e.g. KUB 35.71 Vs. ii 2 *ta-u̯a-an-ta-an*[*-za* 'eyes' [dat.-loc.pl.]), followed by *=ta* (locatival particle) and *āššiu̯antattar/-attn-* 'poverty' (both 4x TA), and *u̯andaniia-* '?' (3x DA). It is likely that the spelling consistency of most, if not all of these morphemes and lexems is due to chance, and I see no reason to assume a different phonetic realisation of post-nasal dental stops based on these items.

4.4.1 Comparison with Hittite and phonetic interpretation

The most prominent spelling pattern for Cuneiform Luwian dental stops in post-nasal position has a clear correspondence in Middle and New Hittite. Also in MS/NS Hittite, most sequences continuing PIE **-nT-* end up being spelled with alternating TA and DA spellings, e.g. Hitt. *ši-pa-an-ta/da-an-*

zi 'they libate' (3pl.pres.act.) < PIE **spend-* and Hitt. *e-ša-an-ta*/*da* 'they sit down' < PIE **-nt-*, cf. Kloekhorst fthc. 7f.[11] It is clear that in both languages, we are dealing with a merger of all PIE dental stops after **n*. In Hittite, Kloekhorst (fthc. 7f.) argues that the spelling alternation of TA and DA represents a voiced stop.[12] He thus interprets the stops phonologically as short (lenis) stops which were allophonically voiced in this position: /t/ [d]. The voicing was optionally expressed using the sign DA. The same analysis is applicable to the Cuneiform Luwian post-nasal dental stops, and we can likewise interpret them as being phonetically voiced: [nd] /nt/.

One marked difference between Cuneiform Luwian and Hittite involves CLuw. *ānt*/*da* 'inside', cognate to Hitt. *anda* 'id.'. Hittite *anda* is spelled almost exclusively with DA (Kloekhorst fthc. 7 notes more than 2400 times spellings with DA and only 2 with TA). This spelling pattern is completely unique, as there are no other commonly attested words showing consistent DA-spelling. Kloekhorst (fthc. 7) has argued that the consistent DA-spellings of this word mark the presence of a glottalised stop [t^{ʔ}], showing that PIE **-nT-* (> Hitt. [nd]) yielded something that was phonetically different from PIE **-nTH-* (> Hitt. [nt^{ʔ}]). Its Luwian counterpart *ānt*/*da* (18x *ānta* ~ 22x *ānda*), on the other hand, behaves no different from most other items containing *-nT-*. This indicates that the phonetics of CLuw. *ānt*/*da* were not any different from those of the other combinations of *-n-* + dental stop, and that the distinction between PIE **-nT-* and **-nTH-* was lost in the prehistory of Luwian. Both are spelled in exactly the same way and seem to have merged in a voiced stop [nda], whose voiced character was optionally expressed using the sign DA.

Another difference between Hittite and Cuneiform Luwian is that the Hittite data contains a group of post-nasal dental stops which are spelled consistently with TA and, according to Kloekhorst's (fthc.) interpretation

[11] In OS (Old Script) texts, the reflex of PIE **-nd-* is kept distinct from that of PIE **-nt-* and **-nd^{h}-* (Kloekhorst 2013: 131–139). The former are spelled with consistent TA: *ši-pa-an-ta-an-zi*, while the latter are alternatingly spelled with TA and DA. This distinction is given up, however, in the post-OH period.

[12] Voicing of post-nasal stops is typologically trivial and well-attested, cf. Kümmel 2007: 53f. listing attested cases in Indic, Iranian, Armenian, Middle Greek and Uralic etc. See also Section 3.4.1 for the Hieroglyphic Luwian data.

of Hittite cuneiform spelling, should represent a voiceless dental stop: [nt], e.g. Hitt. *ku-(e-)en-ta* 'he killed' (3sg.pret.act.; never **ku-(e-)en-da*). According to Kloekhorst, this spelling represents the expected 3sg.pret.act. ending [-ta] found after stems ending in a voiceless consonant. From there it spread to nasal-final stems such as *kuen-* as well, creating new instances of [nt] through analogy. Cuneiform Luwian does not seem to provide any evidence for such a class, although this may be due to the fragmentary nature of the material.[13]

4.5 Intervocalic singletons (°*V-ta*-/°*V-da*-)

In Kizzuwatna Cuneiform Luwian, the spelling of intervocalic short stops (singletons) shows a very strong preference for TA (87%) over DA (13%). We can distinguish two groups: morphemes/lexemes written with TA only and those which are spelled with TA and DA alternating. Examples attested four times or more are listed below, cf. Table 4.4. There are no items spelled exclusively with the sign DA that are attested more than twice.

Most Kizzuwatna Cuneiform Luwian words and lexemes with an inherited lenis dental stop appear to be spelled with the sign TA. This applies not only to original lenis stops (< PIE $*d^{(h)}$), as in *pāt̲a-* 'foot' (7x TA) < PIE **pod̲-*, but also to original fortis stops (< PIE **t*) which have been lenited, as in *mallit̲-* (5x TA) 'honey' (< PIE **mélit̲-*).[14]

Similarly to the geminates, the singletons show several spellings with the sign DA that appear to be found in a few texts only. We have already seen KUB 25.39, which does not only show unusual DA-spellings for intervocalic geminates (see Section 4.3 above), but appears to do so for the lenited verbal endings of the medio-passive: *ḫa-a-aš-ši-da-ri* '?' (3sg.pres.med.-pass.; iv 4) and *ú-u̯i*$_5$*-ši-da* 'he pressed' (3sg.pret.med.-pass.; iv 12). Another text with several unusual DA-spellings is KBo 29.38, which has one count of the nom.-

[13] There are no comparable cases of a 3sg.pret.act. ending *-tta* attached to a CLuw. verbal stem in *-n-*.

[14] In pre-Proto-Anatolian, intervocalic long (fortis) stops (< PIE **t*) were shortened (lenited) whenever they were not preceded by a short accented vowel: Pre-PAnat. *[t:] > PAnat. *[t] /V́(...)V_V (cf. Adiego 2001, Section 5.5.1).

Spelling	Lemma	TA	DA
TA only	*tātariu̯amman-* 'curse'	26	-
	ḫīrūn/*ḫīrūt*(*all*(*i*))- '(pertaining to an) oath'	21	-
	-aḫit- (abstract suffix)	12	-
	pāta- 'foot'	7	-
	tītīt- 'pupil of the eye'	5	-
	=ta (sentence-initial particle)	4	-
	mallit(*all*(*i*))- 'honey'	4	-
TA/DA	*=ata* (nom.-acc.sg.n. + nom./acc.pl.)	49	2
	-ta (3sg.pret.act./med.-pass.)	33	7
	^{d}*Tiu̯at-*; *tiu̯atani*(*i̯a*)- 'Sun-god; to curse'	8	2
	at-; *at*(*a*)*ri*(*i̯a*)- 'to eat; to feed'	3	6

Table 4.4: Spelling of Cuneiform Luwian intervocalic singleton dental stops

acc.sg.n. particle *=ada* (rev. 12), a pret.3sg.act. form *at-ti-i-da* (rev. 15) and a geminate DA-spelling of the locatival particle *=tta* (rev. 12; cf. Section 4.3). Given that KUB 25.39 and KBo 29.38 contain so many strange spellings, they are probably not representative for the rest of the corpus, and it is therefore probably best to leave them out of consideration for now.[15] The remaining DA-spellings occur in lexemes and morphemes where they are for the most part vastly outnumbered by TA-spellings.[16]

[15] The same text contains $^{[GI]Š}$*da-ru-u̯a-aš-ša* 'wood' (gen.adj.nom.-acc.pl.n.), whose spelling should now also be regarded with suspicion.

[16] A notable exception to this is the verbal root *at-* 'to eat', attested both in the form of the root verb *at-*/*az-* 'to eat' (1/4) and the verbal stem *atri*(*i̯a*)- 'to feed' (2/2). The latter shows plene writing in between the *t* and the *r* in [*a*]-*da-a-ri-it-ta*: (3sg.pret.act., KUB 35.15 ii(!) 2) and is presumably the same verb as HLuw. EDERE-*tà-ri-i-tu* (3sg.imp.act., MALPINAR § 7), spelled with the sign <tà> that is normally found in between vowels. Both indicate that the dental stop was intervocalic here. Nevertheless, we can be sure that at some point in time, the stem must have contained a cluster *-tr-*, as suggested by CLuw. *at-ra-ḫi-ša* 'food, nour-

The few items that are spelled with consistent DA-spelling either have unclear etymologies/analyses, such as *mūdamūdalit-* (0/2) '?' or occur only once (e.g. *ḫa-an-ta-wa-da-ḫi-ša* in KUB 35.123 iv 7). The consistency of their spelling may thus well be due to the scantiness of the material, and I conclude that it is very unlikely that DA was used to spell the regular reflex of the Proto-Anatolian lenis dental stop.

4.5.1 Comparison with Hittite and phonetic interpretation

If we apply Kloekhorst's analysis of Hittite cuneiform spelling to the Cuneiform Luwian data, the latter's group of near-consistent TA-spellings seems to indicate the presence of a voiceless element. This is in clear contrast with etymologically identical data from Hittite, Hieroglyphic Luwian and Lycian, all of which show evidence for a voiced reflex of the Proto-Anatolian lenis dental stop.

Hittite: In Hittite, both TA and DA are used interchangeably to write intervocalic lenis dental stops. In fact, as Kloekhorst 2013: 139 remarks regarding Old Hittite, "there is not a single well attested word that shows an exclusive spelling with TA or with DA." In MS/NS texts, the situation remains unchanged. This spelling pattern, Kloekhorst argues, represents a voiced stop [d].

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ishment' (KUB 35.133 iv 14) and its Hittite cognate *ētriie/a-* 'to feed'. To explain the unusual clustering of DA spellings in the spelling of these stems, we could assume voicing of the stop in this cluster: *[tr] > [dr]. In this way,we can interpret the alternation of TA and DA as the scribes' attempt to write a voiced stop [d], similarly to dental stops after *n* (Section 4.4) and *l* and *r* (Section 4.6). The addition of the thematic suffix *-*ie/o-* must have been completed in Proto-Anatolian already, given that both Hittite and Luwian show this formation. In Luwian, the resulting cluster *[driV] was apparently realised as *[dr̥i̯V], with *[r̥] developing regularly into Luwian [ar]. This explains the full vowel we see in the 3sg.pret.act. finite verbal form [*a*]-*da-a-ri-it-ta*. The voiced dental may have been taken over by the base verb *at-* 'to eat', explaining why we find unusually many DA-spellings for this root as well. If this scenario is true, this means that Pre-Luwian must have had both voiceless and voiced short stops in between vowels, indicating a phonemic contrast (*/t/ vs. */d/). This scenario is very speculative and accounts only for these unusual spellings. It does not affect the central point made here, that lenis stops in Cuneiform Luwian are normally spelled with TA rather than DA.

Lycian: Proto-Anatolian intervocalic lenis stops are spelled with the sign <d> in Lycian. In intervocalic position, this sign is generally believed to represent a voiced element. Most likely, however, <d> did not spell a voiced *stop*, given that Lycian expresses this using <ñt>, cf. Lyc. *Ñtarijeusehe* (gen.) ← **Dārayauš*. Rather, it is commonly assumed that Lyc. <d> represented a voiced fricative [ð] (Morpurgo Davies 1982/1983: 252, Hajnal 1995: 15).

Hieroglyphic Luwian: In Hieroglyphic Luwian, the reflexes of lenis stops and lenited fortis stops are spelled with <tà>, cf. Rieken 2008. The sound represented by this sign was in all likelihood voiced, since it alternates with [r] from the end of the ninth century onward ('rhotacism', cf. Melchert 2003: 179f. Goedegebuure 2010: 76–78). It is unlikely, however, that it represented a voiced stop [d], given that this was probably expressed by both <ta> and <tá>, cf. Rieken 2010b: 304, Section 3.4.3. Therefore, it has been proposed that the HLuw. intervocalic lenis obstruent was in fact a voiced fricative [ð], similar to Lycian <d> [ð] (Hajnal 1995: 32[11], Rieken 2010b: 306).

Thus, the Proto-Anatolian lenis dental stop seems to have yielded varying reflexes in its daughter languages. Cuneiform (Kizzuwatna) Luwian appears to have had a voiceless phoneme. Given the reflexes in the other languages mentioned above, a stop [t] or a fricative [θ] are the most plausible options. If it were a fricative, I personally would have expected to find more cases of spellings with the sign ŠA (or perhaps even ZA).[17] For this reason, I will assume in the remainder of this chapter that the consistent TA spellings in Luwian represent voiceless stops, although an interpretation as fricatives is far from impossible.[18] For now, the most important conclusion to

[17] This would be comparable to Palaic, where the voiceless labiodental fricative /f/ (occurring in loanwords from Hattic) was spelled with the special signs ṲA$_{a}$ and ṲU$_{ú}$, alternating with PA and PU (Melchert 1994a: 195). Of course, this does not necessarily have to be the case for the dental fricative [θ] as well.

[18] If it is a fricative, the change from stops to fricatives can be pushed back to pre-Proto-Luwic, as Hieroglyphic Luwian and Lycian also show evidence for fricativisation (see below). If the TA-spellings in Kizzuwatna Luwian represent a stop, fricativisation must have happened in Lycian and Hieroglyphic Luwian individually.

be drawn is that the Kizzuwatna Luwian reflex of the Proto-Anatolian lenis stops was probably *voiceless*.

In Hittite, we seem to be dealing with voiced stop [d] while Lycian and Hieroglyphic Luwian arguably show a voiced fricative [ð]. Now the question is what we should reconstruct for Proto-Anatolian itself. I see two options. On the one hand, we can reconstruct a Proto-Anatolian voiceless short stop *[t], which was retained as such in Cuneiform Luwian. In that case, Hittite, Lycian and Hieroglyphic Luwian must have independently undergone voicing in intervocalic position: [t] > [d] (followed by fricativisation in Lycian and Hieroglyphic Luwian: *[d] > [ð]). Alternatively, we may reconstruct a voiced stop *[d] in Proto-Anatolian and assume that Hittite, Lycian and Hieroglyphic Luwian kept the original voicing while Cuneiform Luwian underwent devoicing from *[d] to [t] in intervocalic position.

I would argue that the first scenario is preferable, given the trivial character of intervocalic voicing and the awkwardness of devoicing in this position. As a consequence, I believe that the Proto-Anatolian (and, therefore, also the Proto-Luwic) lenis stop must be reconstructed as short and voiceless */t/ *[t], and that it only developed into a voiced stop in Hittite and a voiced fricative in Lycian and (presumably) Hieroglyphic Luwian. The resulting picture is that the Proto-Anatolian fortis stops were phonologically distinct only in length from their lenis counterparts: fortis /tː/ [tː] vs. lenis /t/ [t]. Thus, the Cuneiform Luwian consistent TA-spellings support a Proto-Anatolian phonological distinction in consonantal length (treated most recently in Kloekhorst 2016a: 223–226), and argue against models which take voicing as the phonologically distinguishing feature between fortis and lenis stops (such as Kimball 1999: 46 and Melchert 1994a: 53).

To conclude, the Cuneiform Luwian spelling of intervocalic lenis dental stops differs strongly from those found in Hittite. In Hittite, they are spelled with both TA/DA from Old Hittite onward, suggesting a voiced stop [d]. Cuneiform Luwian, on the other hand, shows near-consistent TA spelling, which strongly suggests the presence of a voiceless stop [t].

4.6 Post-consonantal position (°*C-ta-*/°*C-da-*)

In Cuneiform Luwian, there is only data for dental stops after *n* (see Section 4.4), *š*, *ḫ*, *r* and *l*. I have not been able to find examples of dental stops after *k*, *p* or *m* in the Kizzuwatna corpus. The forms we have are distributed according to the consonants preceding them in the following way (Table 4.5).

	š	*ḫ*	*r*	*l*
TA	40x	1x	18x	7x
DA	2x	0x	5x	3x
TA%	95%	100%	78%	70%

Table 4.5: CLuw. TA/DA distributed across preceding consonants

4.6.1 Comparison with Hittite and phonetic interpretation

The paucity of good attestations necessarily renders any conclusion about spelling *patterns* rather uncertain. Nevertheless, we can clearly see that after voiceless *š* (and *ḫ*), TA is much more common than DA.[19]. Also, DA occurs more frequently after the voiced consonants *r* and *l*, although not to the same degree as in post-nasal position.

For both the Old Hittite and Middle/New Hittite corpora, Kloekhorst (fthc. 8) notes that "we virtually only find the sign TA following *ḫ*, *k*, *p* and *š*." He concludes that this spelling indicates that in this position, dental stops were phonetically voiceless and non-ejective. In position after *r* and probably also after *l*, Hittite Middle and New Script texts show an alternation of TA and DA, indicating, according to Kloekhorst, that the dental stop following it was voiced, regardless of its original quality as fortis or lenis. In this respect, Hittite dental obstruents after *r* and *l* behave similarly to those following *n*.

[19] The only CLuw. DA-spellings after *š* are the verbal form *da-aš-da-a-u-i* '?' (1sg.pres.act.) and *az-za-aš-da* 'you/he ate'.

Despite the poor attestation of the CLuw. material, it nevertheless shows spelling patterns that are nearly similar to those observed in Hittite: we find a similar predominance of TA after voiceless consonants, suggesting a phonetic interpretation of [t], and an alternation of TA and DA after *r* and *l*, which may indicate a voiced reflex in this position: [rd] and [ld].

4.7 Word-initial position (*#ta/da-*)

Cuneiform Luwian data involving word-initial stops are difficult to analyse, as the morphemes and lexemes in question lack convincing etymologies in most cases. There seem to be two main groups: words that are spelled consistently with TA, and words that are spelled with alternating TA and DA. The relevant data (3+ attestations) are listed below, cf. Table 4.6. There are no morphemes or lexemes spelled consistently with DA that are attested more than twice.

The few etymologisable items in the TA/DA-spelled group, even though they are poorly attested, suggest that all PIE dental stops, whatever their source, merged into one phoneme that could be spelled with TA and DA: CLuw. *t/dāru(š)-* (3/4) 'statue; wood' < PIE **dóru-*; CLuw. *t/dā-* (2/2) 'to step' < PIE **(s)teh₂-*. CLuw. *t/dāu̯i-* (7/10) 'eye' and CLuw. *t/dāin-* (8/5) 'oil' are also spelled with both word-initial TA and DA. Although their connection to their Hittite cognates *šākuu̯a-* 'eye' and *šākan-/šakn-* 'oil' is difficult in its formal details, it seems that these two stems synchronically had the same phonetic anlaut as words starting with inherited dental stops.[20]

It is unclear what the origin of the words spelled with consistent TA might have been, as they lack good etymologies.[21] Whatever the origin of

[20] Also CLuw. *t/dāti-* 'father' and its derivatives are spelled with both TA and DA, following the same pattern as the inherited words. Their HLuw. counterpart *tá-ti-* 'father' (+ derivatives) stands out for being practically the only word that is spelled with word-initial <tá> (72x), while words from all other sources are almost universally spelled with initial <ta>, cf. Section 3.3.3. It thus seems that HLuw. *tá-ti-*'s unique position is not reflected in the CLuw. data, which rather suggests that the first consonant of CLuw. *tāti-* was homophonous to those of the inherited stock of words with a word-initial dental stop.

[21] CLuw. *tappaš-* (2/0) 'heaven' (< PIE **neb^{h}o/es-*) is attested too poorly to conclude anything about the consistency of its spelling. CLuw. *talupp(i)-* 'clod (of earth)' has, to my mind

Spelling	Lemma	TA	DA
TA only	*taparu-* '?' (something evil)	21	-
	talupp(i)- 'clod (of earth)'	9	-
	tapar- 'to rule, govern'	9	-
	tapāl- '?'	6	-
	tāpa(n)- '?'	5	-
	talku- '?'	3	-
TA/DA	*tātariia̯mman-* 'curse'	18	6
	tāt(i(a/i))- 'father(ly)'	14	2
	tāu(i)- 'eye'	7	10
	tāin(i(a/i))- 'oil(y)'	8	5
	tāru(š)- 'statue; wood'	3	4
	tā- 'to step'	2	2
	tāu̯an(i)- 'stalk, stem'(?)	3	1
	tarāu̯i(i̯a)- 'hand over'	1	2

Table 4.6: Spelling of Cuneiform Luwian word-initial dental stops

this class of words, there are no indications that consistent TA-spelling was employed to spell inherited word-initial dental stops.

There are no well-attested words which are consistently spelled with DA, apart from a few dis and hapax legomena. The absence of concurrent TA-spellings might therefore well be due to chance.[22]

unconvincingly, been connected to Hitt. *tarupp-*/*talupp-*^{zi} 'to gather, unite' and Gr. τολύπη 'ball of wool' (see Melchert 1998 for a discussion).

[22] Even if the word *dakkui-* (1x DA) truly means 'dark' and is cognate to Hittite *dankui-* 'id.', it is found in a text containing many other unexpected DA-spellings (KUB 25.39, cf. Section 4.3) and it is therefore best left out of consideration.

4.7.1 Comparison with Hittite and phonetic interpretation

The Hittite spelling of word-initial stops is treated in detail in Kloekhorst 2010: 202–209 and the Middle/New Script spelling specifically in Kloekhorst fthc. 13. In Old Hittite text compositions, we find two distinct spelling patterns for words with an IE etymology. Nearly all words continuing PIE word-initial dental stops are spelled consistently with TA. Kloekhorst (2010: 204) has argued that this spelling pattern represents a word-initial voiceless stop [t-]. There are two words with IE etymologies that do not follow this pattern, however: the verbal stems *dai-^{i}/ti-* 'to put' and *dā-^{i}/d-* 'to take', which are consistently spelled with DA in forms where their initial dental stop is followed by the vowel *a*. On etymological grounds—both stems starting with a combination of a dental stop and a PIE laryngeal—Kloekhorst (fthc. 4) argues that this spelling indicates the presence of a postglottalised stop [t^{ʔ}].

In MS/NS texts, this situation has changed: nearly all words (including those continuing PIE dental stops) are spelled with alternating TA and DA, such as Hittite *ta*/*da-ma-a-iš* 'other' (nom.sg.c.) and *ta*/*da-lu-ga-uš* 'long' (acc.pl.c.). Kloekhorst (l.c.) argues that the alternation of TA/DA spellings represents a voiced stop [d], and that word-initial voicing must have occurred somewhere in between Old Hittite and Middle and New Hittite. The consistent DA-spellings in Hitt. *dai-^{i}/ti-* 'to put' and *dā-^{i}/d-* 'to take' seem to persist in Middle and New Hittite text compositions. From this, Kloekhorst (fthc. 13) concludes that the Old Hittite postglottalised stop [t^{ʔ}] was maintained in Middle/New Hittite.

The Cuneiform Luwian situation corresponds well to the Hittite data (MS/NS): in both languages, inherited word-initial dental stops seem to have merged and are spelled with both TA and DA (cf. Table 4.6). If we apply Kloekhorst's phonetic interpretation of Hittite to Luwian, this seems to indicate the presence of a voiced stop [d-]. This conclusion, however, is at odds with the Old Hittite (see above), Lycian (Van den Hout 1995: 133) and Hieroglyphic Luwian (Rieken 2010b: 303, Section 3.4.2) material, which all suggest that inherited PIE word-initial dental stops in these languages ended up as voiceless [t-]. It thus appears that Cuneiform Luwian underwent word-initial voicing from *[t-] to [d-], possibly as part of a joint development with Hittite.

Unlike Middle/New Hittite, Cuneiform Luwian does not seem to have a special group of words spelled consistently with DA in word-initial position. As mentioned above, consistent word-initial DA-spelling in Hittite is found in only two verbal stems: Hitt. *dai-^{i}/ti-* 'to put' and Hitt. *dā-^{i}/d-* 'to take'. It is noteworthy that the CLuw. cognate of the latter is the verb CLuw. *lā-* 'id.', which is surprisingly spelled with *l-*. It is tempting to assume with Norbruis (in prep.[b]) that PIE **TH-* developed into CLuw. *l-* through regular sound change. If this is true, the absence of a class of well-attested, consistently DA-spelled words in Cuneiform Luwian vis-à-vis Hittite would be perfectly regular and expected.

Another divergence from Hittite is the existence of a group of words that are consistently spelled with TA. This spelling pattern seems to imply a voiceless [t-], suggesting that Luwian, as opposed to Hittite, acquired a phonetic contrast in word-initial position between stops which are written with consistent TA (presumably [t-]) and those written with alternating TA and DA (presumably [d-]). The origin of this new group of words spelled consistently with TA is unfortunately quite uncertain.

4.8 Conclusion

In Table 4.7 below, I have summarised all major Cuneiform Luwian spelling patterns we have seen in the sections above, together with those observed in Hittite. In word-initial and post-nasal position, inherited stops are usually spelled with both TA and DA, while in intervocalic position, inherited long and short stops are written with TA. In addition, post-consonantal dental stops appear to be spelled with TA after voiceless consonants, and with an alternation of TA/DA seems to be used after voiced consonants, although there is only very little data.

Environment	Spelling	Hittite (MS/NS)	Cuneiform Luwian	Phonetic interpret.
Word-initial	TA only	-	✓[1]	[t]
	TA/DA	✓(PIE **T*)	✓(PIE **T*)	[d]
	DA only	✓(PIE **TH*-)	-	[t^{ʔ}]
Intervocalic geminates	TA only	✓(PIE **t*)	✓(PIE **t*)	[tː]
	TA/DA	-	-	n.a.
	DA only	✓(PIE **TH*)	-	[tː^{ʔ}]
Intervocalic singletons	TA only	-	✓(PIE **d*$^{(h)}$)	[t]
	TA/DA	✓(PIE **d*$^{(h)}$)	-	[d]
	DA only	-	-	n.a.
After *n*	TA only	✓[2]	-	[t]
	TA/DA	✓(PIE **nT*)	✓(PIE **nT*)	[d]
	DA only	✓(PIE **nTH*)	-	[t^{ʔ}]
After *p, š, ḫ*	TA only	✓	✓	[t]
	TA/DA	-	-	n.a.
	DA only	-	-	n.a.
After *l, r*	TA only	-	-	n.a.
	TA/DA	✓	✓?	[d]
	DA only	-	-	n.a.

[1] Possibly secondary.
[2] Analogical.

Table 4.7: Summary

Comparing Cuneiform Luwian with Hittite, we can identify three main differences:

- Middle and New Hittite shows consistent DA-spelling for combinations of an inherited dental stop followed by a laryngeal (**TH*). In Cuneiform Luwian, by contrast, post-consonantal laryngeals do not seem to have left any traces on preceding dental stops. This can be seen in word-initial, post-nasal and intervocalic (geminate) position, e.g. CLuw. *ānta*/*ānda* vs. Hittite *anda*.[23] As far as we can tell, inherited combinations of dental stops and a following laryngeal all seem to have merged into one group.
- Cuneiform Luwian has acquired a group of words which are spelled with consistent word-initial TA. None of these has a good etymology, making it hard to see how they entered the language. In Middle/New Hittite, all word-initial dental stops are generally spelled with alternating TA/DA (< PIE **T*-) or consistent DA (< PIE **TH*-).
- Proto-Anatolian intervocalic lenis (short) stops show up as voiced obstruents not only in Hittite, but also in Lycian and Hieroglyphic Luwian. In Cuneiform Luwian, however, they are spelled consistently with TA. I have argued that the Cuneiform Luwian spelling reflects a voiceless stop /t/ [t], which is an archaism with regard to [d] found in Hittite and [ð] found in Lycian and (presumably also) Hieroglyphic Luwian. The main implication of this find is that we should also reconstruct the Proto-Anatolian lenis stop as a voiceless short stop */t/ *[t]. Thereby, the main difference between Proto-Anatolian fortis and lenis stops appears to be one in consonantal length, not voice, providing support for Kloekhorst 2016a: 223–226.

In all other respects, Cuneiform Luwian dental stops preceding *a* seem to be spelled in a similar way to Hittite, and Kloekhorst's interpretation of

[23] As mentioned in Section 4.7, PIE word-initial **TH*- may well have yielded CLuw. *l*- through regular phonetic development. This explains why we do not find any etymologisable items which are spelled with consistent DA, which we would expect to continue PIE **TH*-.

phonetic values behind the Hittite spelling patterns of TA and DA seems applicable to the Cuneiform Luwian data as well. Moreover, neither of the three points of divergence listed here call for improbable assumptions that render the phonetic analysis unlikely. We can account for at least two of them using typologically trivial phonetic developments (voicing of intervocalic stops; $^{*}H > ø \,/T\_V$).

We can thus conclude that the cuneiform signs TA and DA were used to spell Hittite and Luwian dental stops in a similar, non-random way. The close orthographical similarity between Cuneiform Luwian and Hittite for the same etymological and/or phonetic sequences should not surprise us much. The Cuneiform Luwian material transmitted to us was found among the Hittite material in the Ḫattuša archives, often even in the form of extended passages within otherwise Hittite texts. Therefore, most, if not all, of the CLuw. corpus was written by the same scribes who wrote Hittite texts.

The most important consequence of the current analysis for our reconstruction of Proto-Anatolian phonology concerns the main point on which Hittite and CLuw. spelling seem to differ. The spelling of the intervocalic lenis stops in CLuw. with consistent TA clearly suggests the presence of a voiceless element, presumably [t], which is more likely to be an archaism than an innovation (Section 4.5.1). Thus, the Cuneiform Luwian evidence encourages us to reconstruct a Proto-Anatolian length opposition for fortis and lenis stops: fortis /t:/ [t:] vs. lenis /t/ [t]. The effects of voicing we find in the intervocalic stops in Hittite, Lycian and Hieroglyphic Luwian, may well have come about independently.

More research is needed on the spelling of dental stops preceding vowels other than *a* and on other consonant series in general. It remains to be seen whether the spelling patterns and phonetic interpretations analysed here are also found with other stop + vowel combinations.

As a closing note, I would like to return to the Empire Luwian material (362 attestations of TA and DA), which I have left out of consideration for now, since we cannot exclude the influence of Hittite spelling practices for these words (cf. Section 4.2).

I have compared the use of TA and DA in the Empire Luwian material with that in the Kizzuwatna Luwian material (again using a chi-square

test of independence, see Section 4.2), in order to evaluate if there is any difference between the two.[24] The result of this analysis is that the use of TA and DA in Kizzuwatna Luwian words does not differ significantly from that of Empire Luwian words. Ḫattuša scribes apparently used TA and DA to write words from both dialects in a similar way.[25] As we have seen in the preceding discussion, most phonetic environments show the same spelling of TA/DA in Hittite and Luwian, so that any Hittite influence on the Empire Luwian material would remain unnoticed anyway. However, even in spelling the lenis stops—the point where Hittite and Luwian diverge most clearly—Empire Luwian shows the same spelling pattern as Kizzuwatna Luwian: an overwhelming preference for TA spellings (as opposed to the TA/DA alternation commonly found in Hittite). The distributional data for TA and DA in Empire Luwian are presented below, cf. Table 4.8.

	TA-/ DA-	**-VTTA-/ -VDDA-**	**-VTA-/ -VDA-**	**-nTA-/ -nDA-**	**-CTA-/ -CDA-**	**Total**
TA	42	68	103	36	49	298
DA	20	8	9	23	4	64
Total	62	76	112	59	53	362
TA%	68%	89%	92%	61%	92%	82%

Table 4.8: Cuneiform ('Empire') Luwian TA/DA

These data can be interpreted in multiple ways. The fact that the Em-

[24] In all 5 phonetic environments distinguished in this chapter (word-initial stops (p = .17), intervocalic geminates (p = .46), intervocalic singletons (p = .20), post-nasal stops (p = .42) and post-consonantal stops (p = .59)) the p-values are higher than the significance threshold of 0.05. This means that we should maintain our null-hypothesis, which says that TA/DA-spelling and dialectal variation are independent from one another. Scribes writing Empire Luwian did not use TA/DA in a significantly different way, compared to Kizzuwatna scribes.

[25] Note that this does not mean that I reject the dialectal split proposed in Yakubovich 2010. I am merely arguing that the split is not manifested in the spelling of the dental stops using TA and DA.

pire Luwian intervocalic lenis stops seem to follow the Kizzuwatna Luwian spelling pattern rather than the Hittite one may suggest that the 'hittitisation' of Luwian words (even in Hittite contexts) may not have been very far-reaching. This complicated discussion, however, deserves a more extensive treatment elsewhere, including careful investigation of more spelling features of Hittite and Luwian cuneiform.

Appendix: DA-spellings in the 3sg.pret. verbal endings

In the preceding sections, we have seen that both the fortis and lenis variant of the 3sg.pret.act. ending -(*t*)*ta* are mostly spelled with the sign TA. Nevertheless, we find several unusual spellings with the sign DA for these endings as well. Given the small amount of attestations, it is distinctly possible that these DA-spellings represent 'noise' (scribal errors *vel sim.*) and do not represent a special phonetic feature. However, it is remarkable that these DA-spelled variants of these endings are limited to verbal stems of a specific shape. This opens up the possibility that the occurrence of these DA-spellings is structural rather than coincidental, and that there is a more principled explanation behind their use. This appendix will explore this idea.

Geminate DA-spellings in *-dda* (3sg.pret.act.)

In Section 4.3, we have seen that the fortis 3sg.pret.act. verbal ending *-tta* is spelled overwhelmingly with the sign TA: 55x. Nevertheless, there are seven attestations of the same ending spelled with DA. As discussed above, three of these can be considered peculiarities of a certain scribe or text, given that they are found concentrated in one tablet (KUB 25.39) that contains several other unusual DA-spellings. The four remaining attestations of DA in the 3sg.pret.act. ending *-tta* belong to only three lemmata, each having at least one attested variant with TA co-occurring alongside it. First, CLuw. *lā-* 'to take' has 2x *la-a-ad-da* 'he took' (KUB 32.8+5 iii 15, 16), next to 3x *la-at-ta* and 5x *la-a-at-ta*. Secondly, the reduplicated variant of this stem, *lāla-* 'id.',

has one attestation of *la-a-la-ad-da* 'he took' (KUB 35.43 iii 2), next to the TA-spellings [*l*]*a-la-a-at-t*[*a*] (1x, KUB 35.13, 19) and *la-la-at-ta* (1x, KUB 35.43 iii 23). Lastly, the 3sg.pret.act. of the stem *tā-* 'to stand' is spelled once as *da-a-ad-da* 'he stepped' (KUB 35.88 ii 2), occurring next to the morphologically identical form *ta-at-ta* (1x, KUB 35.133 ii 27). It is very well possible that these DA-spellings are simply mistakes and do not mark anything linguistic. Nevertheless, it is noteworthy that these DA-spelled endings are attached to verbal stems which are commonly reconstructed with a final PIE laryngeal on independent grounds: PIE **deh$_3$-* 'to take' and **(s)teh$_2$-* 'to stand', respectively. Therefore, as an alternative to interpreting these DA-spellings as scribal anomalies, I tentatively put forward the possibility that these four instances of *-dda* rather write the result of a specific phonetic development. The PIE laryngeal may have left a trace in the form of a glottalic element on the following dental stop before it disappeared: PIE **VHT* > **VʔT* > **Vˀ T*. In the case of the 3sg.pret.act. ending in particular, the result would then have been a long preglottalised stop [-ˀtː-], which was spelled with DA.

The scribes' choice for the sign DA to represent this long preglottalised stop should not come as a surprise. We may recall (Section 4.3.1) that Hittite has a group words spelled (near-)exclusively with DA, which all continue PIE dental stops in contact with a following laryngeal, e.g. Hitt. *padda-^{i}/padd-* 'to dig' < PIE **b^{h}od^{h}h$_2$-*. Kloekhorst (fthc. 1f.) has argued that the spellings with DA mark the presence of an ejective stop [-tːˀ-]. If this analysis is accepted, it provides clear precedence for the use of DA to write glottalic or glottalised consonants.[26]

One obstacle to this scenario is that **VHC* is generally thought to have yielded **V̄C* in Proto-Anatolian already, with compensatory lengthening of the preceding vowel, cf. Melchert 1994a: 67, 69, 73. This is borne out by forms such as PIE **d^{h}eh$_1$-ti* 'he puts' > Lyc. *tadi*. The <d> marks a lenis fricative [ð] which can only be the result of pre-Proto-Anatolian lenition, meaning that a long accented vowel must have preceded it: pre-PAnat. **d^{h}eH-ti* > **dē-ti* > **dē-di* (lenition). We cannot have our cake and eat it too: a PIE laryngeal

[26] The use of DA to represent a glottalic/glottalised dental stop was taken over from Old Babylonian Akkadian, where the sign was used to write the emphatic stop /ṭ/, cf. Kloekhorst 2010: 231–238.

cannot be lost with compensatory lengthening of the preceding vowel *and* simultaneously survive as preglottalisation on the following consonant.

However, we should remember at this point that even though the stem-final laryngeal was lost in preconsonantal position, it may well have been retained longer in intervocalic position, for instance in the 3sg.act. forms of the present (pre-PAnat. **dóʔ-ei*) or preterite (pre-PAnat. **dóʔ-e*); for the endings cf. Melchert 2013: 137 and Kloekhorst 2008: 137). In fact, Kloekhorst (e.g. 2014: 374–376) has argued on independent grounds that traces of old PIE laryngeals can be found in the OS spellings of Hitt. *ḫé-e-a-u-e-eš* 'rains' (nom.pl.) < PIE **$h_2$éih_3-eu-*, Hitt. *ne-(e-)a* 'makes a turn' (3sg.pres.med.-pass.) < PIE **néh$_1$-o* and Hitt. *zé-(e-)a-ri* 'cooks' (3sg.pres.med.-pass.) < **tieh$_1$-o*.

Since traces of intervocalic laryngeals seem to have been preserved in Hittite—and, by extension, also in Proto-Anatolian—it is possible that they were retained in Luwian as well, so that for instance pre-PAnat. **dóʔ-ei* > Luw. [laːʔi].[27] If this is true, Proto-Anatolian must have inherited two allomorphs of the strong (full-grade) stem of PIE laryngeal-final verbal stems. In the case of PIE **deh$_3$-* 'to take', these would be preconsonantal PAnat. **dōʔ-C* next to prevocalic PAnat. **dōʔ-V*. Secondly, Proto-Anatolian may well have seen the anlaut of the weak stem (< PIE **dh$_3$-*) being generalised throughout the paradigm.[28]

Lastly, we know that the inherited 3sg.pret.act. ending **-t*, (preserved in Hitt. *te-e-et* 'he said') would have been lost in Luwian. For this reason, it is commonly assumed that the endings *-tta* en *-ta* we find in Luwian must have been taken from the medio-passive ending, going back to PIE **-to* (Melchert 1994a: 278).[29]

The result, pre-Luwian **lāʔtːa*, shows the combination of a glottal stop followed by a dental stop. I hesitatingly propose here that the glottal stop

[27] This may well be the phonetic realisation behind HLuw. *la-i* (KÖRKÜN obv. § 11) 'he takes', even though this cannot be proven based on the spelling.

[28] This is because both Luwian (*l-*, cf. Section 4.7.1 above) and Hittite (consistent DA-spellings, cf. Section 4.7.1) show the same anlaut throughout the active paradigm, without any differences between the strong stem and the weak stem.

[29] In the case of CLuw. *lātta*, we know that this replacement took place *after* Proto-Anatolian, because the fortis ending is not subjected to Proto-Anatolian lenition (cf. footnote 14).

would eventually be lost in this position as well, but not without leaving its trace as preglottalisation on the dental stop. This may have resulted in a preglottalised voiceless long stop [-ˀtː-], comparable to that found in some pronuncations of Modern English intervocalic voiceless stops (e.g. *letter* as ['lɛʔtɐ], cf. Lodge 2009: 177). The entire process can be summarised as follows, cf. Table 4.9 below.

PIE		**PAnat.**		**Pre-Luwian**		**Luwian**
**dóh$_3$-e*	>>[1]	**dˀóʔ-e*	>>[2]	**lāʔ-tːa*	>[3]	[laːˀtːa]

[1] The weak stem (< PIE **dh$_3$-*) is generalised to the strong stem.
[2] The ending *-tta* is taken over from the medio-passive, replacing **e*.
[3] Glottalisation of dental stop.

Table 4.9: Development of the *ḫi*-conjugation 3sg.pret.act. form of Pre-PAnat. **doh$_3$-/dh$_3$-* 'to take'

As a result, CLuw. would have had two fortis 3sg.pret.act. endings: [-tːa] and [-ˀtːa]. Since the laryngeal conditioning the use of TA or DA had disappeared, speakers presumably had no means of synchronically motivating or predicting the use of either. This means that the two endings would not only have been phonetically distinct, but also phonemically. It thus appears that Cuneiform Luwian synchronically may have had a marginal phonological opposition between /tː/ and /ˀtː/.

One final question is how we should interpret the TA/DA-alternating spellings for preglottalised [-ˀtːa]. One interpretation is that the scribes used both TA and DA to refer to this ending, feeling that neither of them was perfectly suited to represent the underlying phonetics. Alternatively, we may speculate that the four spellings with DA (*la-a-ad-da*) represent the original preglottalised variant [-ˀtːa], and that it was gradually being replaced by its much more common variant [-tːa] (spelled with consistent TA), yielding *la-a-at-ta*. Unfortunately, we cannot test this hypothesis, as none of the texts containing these four DA-spelled geminates are demonstrably older than those containing TA-spelled ones.[30]

[30] All DA-spelled geminates belong to the New Hittite corpus, according to *HetKonk*

Singleton DA-spellings in *-da* (3sg.pret.act.)

We now enter even more speculative territory by taking a look at the very few DA-spellings used for the *lenis* 3sg.pret.act./med.-pass. ending *-ta*. As we have seen (Section 4.5), this ending is spelled 33x with TA, and 7x with DA. Two of these seven DA-spellings are found in KUB 25.39, a text containing other peculiar DA-spellings which I have argued (Section 4.3) are not representative for the whole corpus. The five remaining DA-spellings, however, belonging to one verbal root only: CLuw. *ā-/āi̯a-* 'to do', which is commonly connected to PIE **Hieh$_1$-* 'to throw' (Rix et al. 2001: s.v., Melchert 1994a: 75). Four of them occur within the same text (*a-da*: KBo 13.260 ii 16, 18, 20, 22); the fifth one (*a-a-da*: KBo 29.27 i 4) is found in a text which otherwise does not contain any unusual uses of TA/DA. Note that we also find spellings with TA for the same grammatical form: *a-ta* and *a-a-ta*. (Melchert 1993: s.v. '*ā-/āya-*'). If these DA-spellings do not represent general noise or the peculiarities of a certain scribe, one could explain the presence of these rare DA-spellings for 3sg.pret. *-da* in a similar way to the fortis/geminate *-dda* above. At some point, the original 3sg.pret.act. form must have undergone the change from PIE **VHC* to PAnat. **V̄C* described above: PIE **Hieh$_1$-t* > PAnat. **ʔiē-t*.[31] The 3rd person *plural* on the other hand, could have possibly preserved the laryngeal, since it was there in intervocalic position: **Hih$_1$-énti* > pre-PAnat. **ʔiʔ-énti*. In order to regularise the paradigm, the resulting stem-final laryngeal reflex was introduced into the strong stem, yielding pre-Luwian **ʔiāʔ-*. After the introduction of the ending *-ta* (< PIE **-to*, see preceding Section), the laryngeal might have been lost in this position, except for a trace of preglottalisation on the following dental stop. Thus, one could presuppose the following scenario, cf. Table 4.10.

This process would have led to the creation of a new, short preglottalised stop [ˀt]. Again, since the laryngeal conditioning the allomorph [-ˀta] <-da> had disappeared, speakers must have been unable to synchronically determine its use on the basis of its phonetic surroundings. Thus, Cuneiform Luwian would seem to have acquired a marginal phonemic distinction

(Košak 2002ff.).

[31] For the word-initial glottal stop (< PIE **H-*), cf. Simon 2010. The argument made here is not affected by its presence.

PIE		**PAnat.**		**pre-Luw.**		**CLuw.**
**Hieh$_1$-t*	>[1]	**ʔiē-t*	>>[2]	**ʔiāʔ-ta*	>[3]	[ʔ(a)jaːˀta]

[1] PIE **VHC* > **V̄C*.

[2] Analogical reintroduction of **ʔ* (< PIE **H*) from verbal forms where it was retained intervocalically, e.g. 3pl.pres.act. PIE **Hih$_1$-énti* > pre-PAnat. **ʔiʔ-énti*. In addition, the 3sg.pret.act. ending **-t* is replaced by the lenis ending **-da* < PIE **-to* (3sg.pret.med.).

[3] Glottalisation of dental stop.

Table 4.10: Development of CLuw. *ā-/ā̯ia-* 'to do'

between short stops with and without glottalisation: /t/ vs. /ˀt/. The scribes would have used DA in their attempts to express the latter in the 3sg.pret. verbal forms of *a-(a-)t/da*.

It is needless to say that this scenario is highly speculative. While it is true that the shape of the Luwian root (if it is of PIE stock) suggests the presence of a root-final PIE laryngeal, we only have very few examples of this verb, and the etymological connection between CLuw. *ā-/ā̯ia-* 'to do' and PIE **Hieh$_1$-* 'to throw' is not immediately obvious from a semantic or formal point of view. The preceding is therefore given here only for consideration, and I will not insist on the presence of a CLuw. phoneme /ˀt/.

Summary

To conclude, I have argued here that there is little but suggestive evidence that Cuneiform Luwian may have distinguished not only between long and short dental stops, but also between stops with and without preglottalisation. An overview is presented in Table 4.11 below.

Phonological value	Phonetic value per environment				
	Word-initial	Intervocalic	After *n*	After *p, š, ḫ*	After *l, r*
/tː/	([t-])[1]	[-tː-]	-	[-Ct-]	-
/t/	[d-]	[-t-]	[-nd-]	-	[-Cd-]
/ˀtː/	-	[-ˀtː-]	-	-	-
(/ˀt/	-	[-ˀt-]	-	-	-)

[1] Not inherited and of unknown origin; see Section 4.7.

Table 4.11: Cuneiform Luwian dental stops

A notable difference between glottalised stops in Hittite and Luwian is the order of the stop and the laryngeal: Hittite DA-spellings are triggered by PIE dental stops *followed* by laryngeals (PIE *-*TH*-) and are most likely to represent an ejective stop [tˀ]. Cuneiform Luwian DA-spellings, on the other hand, seem to appear whenever the dental stops were *preceded* by a laryngeal (PIE *-*HT*-), presumably yielding a preglottalised stop [ˀt].[32]

[32] The CLuw. picture with a opposition between long and short preglottalised stops is not paralleled in Hittite, where all evidence for glottalised (ejective) stops can be subsumed under one fortis phoneme: /tːˀ/. Nevertheless, an opposition between long and short glottalised consonants *per se* is not unheard of. Amharic, for instance, displays a phonemic contrast between long and short ejectives (transcribed with *ṭ, p, ṣ* etc.: *wäṭ* 'stew' vs. *wäṭṭ* 'solid, homogenous'; Leslau 1995: 13).

CHAPTER 5

Luwic Lengths
Syllable weight gradation in the Luwic languages

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Luwic Lengths

Syllable Weight Gradation in the Luwic Languages

5

Abstract: This chapter offers a new perspective on Čop's Law and Open Syllable Lengthening, two commonly accepted sound laws that lengthened both consonants and vowels in the Luwic languages. It is proposed that both developments take similar inputs and ultimately yield the same effect: neutralisation of the syllable weight opposition in accented (stressed) syllables. This development is in line with a tendency already observable in Proto-Anatolian, according to which unstressed syllables were made light, while stressed syllables were made heavy. Thus, it is argued, in the prehistory of the Luwic languages, vocalic length, consonantal length and syllable weight in general became increasingly dependent on the position of the stress and therefore became phonologically neutralised to a certain extent.

5.1 Introduction

The Luwic languages, of which Luwian and Lycian are best known, show a phonological opposition between two series of consonants: traditionally, these are referred to as 'fortis' and 'lenis'. In addition, Luwian seems to have distinguished long and short vowels. Each of the three attested writing systems applied to these languages (cuneiform, hieroglyphic, alphabetic) has a different way of expressing these distinctions.[1]

The cuneiform scribes used geminate and singleton spelling (<VC-CV> vs. <V-CV>) to mark the differences between fortis and lenis consonants,

[1] In this chapter, I will make frequent use of the labels 'Hieroglyphic Luwian' and 'Cuneiform Luwian' to refer to two "[corpora] of linguistic data recorded using a particular writing system" (as per Yakubovich 2010: 70), without implying that the distinction in writing system marks an important dialectal divide. The phonetic changes that are at the heart of this chapter seem to have been completed in Proto-Luwian times already.

respectively. In the hieroglyphic script, fortis dental stops followed by *a* are indicated using the signs <ta> and <tá>, while the sign <tà> expresses the lenis stop (Rieken 2008). As far as we know, fortis/lenis distinctions for other consonants are not expressed in hieroglyphic writing. Lastly, the alphabetic script of Lycian employs different signs to indicate the contrast between fortis and lenis obstruents (<p> vs. <b>, <t> vs. <d> etc.).

The phonetic realisation of fortis (< PIE **p*, **t*, **ḱ*, **k*, **k*^{w}) and lenis (< PIE **b*^{h}, **d*$^{(h)}$, **ǵ*$^{(h)}$, **g*$^{(h)}$, **g*$^{w(h)}$) consonants has been the subject of debate for over a century, and no real consensus has been reached on all details. With regard to the cuneiform languages, most scholars agree that fortis consonants were at least phonetically longer than their lenis counterparts: [tː/dː] vs. [t/d] (Melchert 1994a: 20f.; Kloekhorst 2008: 21–25).[2] In Lycian, on the other hand, there are indications that the distinctive factor between fortis and lenis consonants was frication (Van den Hout 1995: 131–133), and the same has been claimed for Hieroglyphic Luwian (Hajnal 1995: 32[11]; Rieken 2010b: 306).[3] In both languages, it is commonly assumed that the fricatives represent an innovation, since it is typologically much more common for occlusives to become fricatives than the other way around (Melchert 1994a: 301; Kümmel 2007: 55, 147).

Vowel length is also marked in different ways. In cuneiform writing, long vowels are marked using *plene writing*: <Ca-a>/<a-aC> = [aː]; <Ca>/<aC> =

[2] For this reason, I will use geminates (/tt/) and singletons (/t/) contrastively in my phonological representation of Hittite, Cuneiform Luwian and Palaic forms, e.g. Hitt. *mi-li-it-ta-aš* /milittas/ 'honey' (gen.sg.) vs. CLuw. *ma-al-li-ta-a-ti* /mallitāti/ 'id.' (abl.-ins.).

[3] Rieken (2010b) arrived at this interpretation in her analysis of the HLuw. sign <tá>, arguing that it represents [da], with a voiced stop. Therefore, she proposes that <ta> = [t(t)a] or [d(d)a], <tà> = [ða] and <tá> = [d(d)a], identifying the synchronic distinction between HLuw. fortis and lenis consonants with the one we find in Lycian (where <t> = [t], <d> = [ð], <ñt> = [d]). However, in an earlier paper (Rieken 2008), she attributed the same phonetic value [da] to the sign <tà>, as it appears to merge with /r/ in texts after ca. 800 BCE ('rhotacism', cf. Morpurgo Davies 1982/1983: 246-250, Melchert 2003: 179–182, Goedegebuure 2010: 76–78). These analyses are irreconcilable, but both have been suggested on good grounds. A new analysis of Luwian dental stop phonology as apparent from the hieroglyphic corpus is provided in Chapter 3, where it is argued that <tá> writes a short stop [t/d]. In my phonological representations of these languages, I will use the symbols /t/ and /θ/ to distinguish fortis from lenis, respectively.

[a].[4] Moreover, the hieroglyphic scribes may have occasionally marked the presence of a long vowel using plene writing (Chapter 2). In Lycian, lastly, vocalic length seems to have been lost.

For the most part, the distribution between long and short vowels and consonants is governed by their etymological origins. Fortis (long) stops generally represent the reflexes of the Proto-Indo-European tenues (**p*, **t*, **ḱ*, **k*, **k*^{w}), cf. CLuw. *-tta* /-tta/ ~ Lyc. *-te* /-te/ (3sg.pret.act.) < PIE **-to*. Lenis (short) stops, on the other hand, normally continue Proto-Indo-European mediae (aspiratae), cf. CLuw. *pa-a-t̠a-* /pāta-/ ~ Lyc. *ped̠i-* /peθi-/ 'foot' < PIE **pod̠/ped̠-*.

Inherited long vowels in Luwian are generally the direct continuants of PIE/PAnat. diphthongs (e.g. CLuw. *ḫu-u-ḫa-ti* /hṓhati/ 'grandfather' [abl.-ins.] < PIE **h*$_2$*éuh*$_2$-),[5] accented long vowels (e.g. CLuw. *za-a-ar-za* /tsā́rtsa/ 'heart' < virtual PIE **ḱḗrd-*), or combinations of accented vowels and tautosyllabic laryngeals (e.g. CLuw. *ša-a-at-ta* /sātta/ 'he released' < PIE **sóh*$_1$*-to*).[6]

These general observations do not explain the phonological shape of *all* words in the Luwic languages, however. For instance, we often find that lenis consonants continue PIE tenues (e.g. PIE **h*$_1$*éi-ti* > CLuw. *i-ti* /ʔī́ti/ 'he goes', never ***i-it-ti* /ʔī́tti/).[7] In addition, plene spellings are often conspicuously absent in vowels that on etymological grounds can be assumed to con-

[4] This interpretation of plene writing seems to be supported by the majority of scholars nowadays (Melchert 1994a: 27; Kimball 1999: 59; Kloekhorst 2014: 13–18, q.v. for a succinct overview of previous scholarship). For Cuneiform Luwian, Rieken (2017) has recently confirmed the long-standing hypothesis that plene writing of *i* marks vocalic length as it does in Hittite. Plene writing in Palaic awaits a separate treatment, but it is unlikely that its basic principles will be any different from Hittite and Luwian.

[5] Note that the plene spelling in *ḫu-u* is ambiguous: we often find plene spelling after the sign *ḫu* where we do not expect to find a long vowel, and it has been proposed that the sign U in <ḫu-u> serves to disambiguate ḪU 𒄷 from the sign RI 𒊑, which closely resembles it in form (Kimball 1999: 67). In the case of CLuw. *ḫu-u-ḫa-ti*, however, the length of the vowel in the initial syllable can be inferred from the shortening effect it had on the following consonant, due to Proto-Anatolian lenition, see Section 5.5.1.

[6] The fortis stop in CLuw. *ša-a-at-ta* must be analogical. Note that the lengthening effects mentioned here make it very likely that the Proto-Anatolian accent had at least a very strong stress component (Melchert 1994a: 47).

[7] For the word-initial glottal stop in Hittite (< PIE **H*), cf. Kloekhorst 2006: 95; Kloekhorst in prep. Its presence or absence is not important for the argument made here.

tinue a long vowel, monophthongised diphthong or combination of vowel + laryngeal, e.g. CLuw. *-a* (*a*-stem nom.sg.c. ending < PIE **-eh_2*). As is commonly accepted, most of these discrepancies are caused by various prehistoric lengthenings and shortenings which are specific to the Anatolian subbranch of Indo-European.

In this chapter I will focus on two separately proposed sound laws with clear lengthening/fortition effects in Luwian and, to some extent, also in Lycian. Presumably, therefore, these laws had run their course already in Proto-Luwic:

1. **Čop's Law** (e.g. Čop 1970; Melchert 1994a: 252f.; Kloekhorst 2014: 571–585.)
2. **Lengthening of accented short vowels in open syllables** (e.g. Hrozný 1917: 186[1]; Melchert 1994a: 131–133, 215–218, 261–264).

This chapter will not provide a new interpretation of the attested linguistic material in our Luwian and Lycian corpora, nor will it propose any substantial changes to the scope and formulations of these sound laws beyond those advanced in other studies. Rather, it will offer a new way of viewing these well-known sound laws by showing their underlying coherence. I will argue that these are not two random, independent rules, as they are often presented in the scholarly literature. Rather, they demonstrate a high degree of functional similarity on a more abstract, phonological level, by taking complementary inputs while yielding identical results. Together, these two developments constitute a general Luwic fortition under influence of the accent. In the second half of this chapter it will be shown that a motivation for the eventual phonologisation of these two changes in the Luwic languages can be found in the Proto-Anatolian phonological system. The resulting picture, as we will see in Section 5.6, is an extension of ideas already proposed in Kloekhorst 2006/2008 and Hajnal 1995: 50f.[48]. Without taking over these authors' ultimate conclusions, it combines their approaches to lay bare the complimentary structural relations between four distinct phonetic developments in the history of the Luwic languages.

5.2 Čop's Law

In 1970, Bojan Čop observed that on numerous occasions, fortis consonants in Luwian correspond to lenis consonants in their Hittite counterparts, e.g. CLuw. *ma-al-li* /malli/ ~ Hitt. *mi-li-it* /milit/ 'honey', CLuw. *ta-ap-pa-aš(=ša)* /tappas=sa/ ~ Hitt. *ne-(e-)pí-iš* /nĕpis/ 'heaven'. He explained this variation as the result of a historical development: "Die indogermanischen Konsonanten *l*, *r*, *n*, *m*, **bh*, **dh*, **gh* wurden im Luwischen nach einem betonten kurzen indogermanischen **ĕ́* in doppelte Konsonanten verwandelt (...). In der Orthographie des Keilschrift-Luwischen werden diese Konsonanten *ll*, *rr*, *nn*, *mm*, *šš*, *pp*, *tt*, *kk* geschrieben." (1970: 96). In the following years, this sound law received general acceptance and was termed "Čop's Law" as more instances were found in Luwian.[8] Some strong examples are Cuneiform Luwian *ma-ad-du* /máttu/ 'wine' (< PIE **méd^{h}-u*; Morpurgo Davies and Hawkins 1987: 283) and *pár-ra-an* /párran/ 'before, in front' (< PIE **pér-om*; Čop 1970: 86). Only in the last decade did it become clear that Čop's Law also affected Hieroglyphic Luwian and Lycian, cf. HLuw. *zati* /tsáti/ 'this' (dat-loc.sg.), HLuw. *ápati* 'that' (dat.-loc.sg.) (both < PIE **-éd^{h}i*; in these words, Čop's Law manifests itself as the absence of rhotacism; Goedegebuure 2010: 87) and Lycian *ebette* 'that' /eφete/ (dat.-loc.pl.; < **-éd^{h}os*; Kloekhorst 2012a: 261f.). We find a (fortis) stop phoneme /t/ in both languages. If the fortition due to Čop's Law had not affected these words, we would have expected to find a fricative /θ/: HLuw. ***za-ti* /tsáθi/ (alternating with rhotacised ***za+ra/i*) and Lyc. ***ebede* /eφeθe/.

Despite the wide adoption of Čop's Law in some form or another in historical accounts of Luwian phonology, no absolute consensus has been reached on its precise conditioning and effects. In particular, it is unclear which consonants are affected by Čop's Law and whether only consonants after certain vowels are geminated by this rule. These features will be discussed in the sections below.

[8] Melchert 1994b has also argued for a 'limited version of Čop's Law' affecting word-initial syllables in Proto-Anatolian already, citing examples from Hittite and Lydian. Recently, however, he has retracted this view (Melchert 2015a).

5.2.1 Vocalism

In his 1970 article, Čop only mentioned **éCV* as a potential input for his newly found law, and this view is held until this day by several scholars who believe that consonants preceded by the other Proto-Anatolian short vowels (**áCV*, **óCV*, **íCV*, **úCV*) were not liable to gemination, e.g. Melchert 2015a: 4; Rieken 2010b: 305; Goedegebuure 2010: 87. The reason to assume this restriction to **é* is that almost all of the examples we have for Čop's Law continue PAnat. **é*. This should not surprise us for two reasons. First, other short accented vowels **á*, **ó*, **í* and **ú* must have been quite rare: PAnat. **á* and (short) **ó* in open syllables can only continue PIE **h_2é* and **h_3é*, respectively, while **i* and **u* were regularly unaccented in PIE unless they attracted the accent analogically (cf. CLuw. *pīi̯a-* in Section 5.3 for an example).

Secondly, I assume with Kloekhorst 2008: 120 that PIE **ó* was lengthened to **ő́* in pre-PAnat. already, as it causes Proto-Anatolian lenition (cf. Section 5.5.1) in forms such as Hitt. *ša-a-ku-u̯a-* /sá́g^{w}a-/ 'eye' < **sók^{w}o-* and Hitt. *ša-a-ḫi* /sá́hi/ 'he stuffs' < **sóh$_2$-ei*.[9] Thus, words like PIE **dóru-* > CLuw. *ta-a-ru-*

[9] This early lengthening of PIE **ó* is not commonly accepted, cf. Melchert 2015a: 9f. Melchert (2012b: 175) cites Hittite *da-a-ak-ki* /tá́kki/ 'resembles' < PIE *dókei* and *ḫu-u̯a-ap-pí* /h^{w}áppi/ 'throws' < PIE **$h_2$wópei* as counterexamples, and indeed, these forms show an unlenited (geminate) stop after an original PIE **ó*. At the same time, however, unlenited stops are regularly expected in the plural forms of this paradigm (Hitt. *ták-ka-an-zi* /takkánzi/ and *ḫu-up-pa-an-zi* /huppántsi/ from which these stops could have been analogically introduced into the strong stem. In addition, Melchert *does* allow for a special lenition of just PIE **h_2* after **ó* (following Kimball 1999: 397), marking "the well-known "stronger" or "longer" quality of what we call phonological "short" */o/ in PIE" (Melchert 2012b: 179). The geminate/singleton alternation we see in Hitt. *nā́ḫi*/*naḫḫánzi* 'to fear' would be regular, and was extended from there to stems ending in *s* (*ḫā́ši*/*ḫaššánzi* 'to beget') and subsequently spread from there to other verbs as well (e.g. Hitt. *ištā́pi*/*ištappánzi* 'to clog up'). I prefer to interpret the 'stronger'/'longer' quality of */o/ as something which caused it to be lengthened early, so that we can take the leniting effects of **h_2* as an instance of the independently established Proto-Anatolian lenition laws (see Section 5.5 and Kloekhorst 2014: 551[2017]). In this way, the ablaut we see in *ḫā́ši*, *ḫaššánzi* and other verbs belonging to this class is phonetically regular. I readily concede that an early lengthening of **ó* is not without problems and requires alternative solutions for etymologies proposed in the past, e.g. the Luwian suffix *-att(a)-* (if it truly continues **-ó-tV-*, as one reviewer suggests). I would argue, however, that these inconveniences do not outweigh the problems associated with the massive analogical spread of the Hittite *ḫi*-conjugation stem pattern from a relatively small group of

/tárru/- (never **tarru-* /tárru-/) are no good counterexamples to a more general application of Čop's Law to all short accented vowels. I assume that PIE **dóru-* had developed into **dóru-* in Proto-Anatolian already, meaning that it was unaffected by Čop's Law, which required a short vowel.

Nevertheless, after the lengthening of pre-PAnat. **ó* > PAnat. **ó́*, a new short PAnat. **ó* developed from PIE **h_3e*. This new short **ó did* undergo Čop's Law, as can be seen from CLuw. *ḫarrani(a/i)-* /hárrani(a/i)-/ (< PAnat. **Hóron-* < PIE **$h_3$ér-on-*), which provides a good example of a geminated stop after another vowel than **é*. Since so much hinges on this etymology, it is worth treating it in more detail.

HW² (Vol. *Ḫ*, p. 271f.) lists 14 attestations in NH texts (not counting duplicates). We come across the following forms: *ḫar-ra-ni-eš*, *ḫar-ra-ni-iš*, *ḫar-ra-ni-i-iš* (nom.sg.c.); *ḫar-ra-ni-in*, *ḫar-ra-ni-i-in* (acc.sg.c.), [*ḫar-r*]*a-ni-i-uš*! (acc.pl.c.). There is also one attestation of *ḫarrani(a/i)-* in a CLuw. text (KUB 35.97, 2'; cf. Starke 1985: 247), but the text is too fragmentary to determine the meaning of the word. The New Hittite contexts clearly show that the word must refer to an oracle bird, e.g.

KUB 5.22 obv. 28:
nu=kan ḫar-ra-ni-i-iš ^{d}UTU-*un* EGIR UGU SIG$_5$-*ṷ̣a-*[*az ú-et*]
"Der *ḫ*-Vogel [kam] in Richtung auf die Sonne zu hinten nach oben von der günsti[gen (Seite)]" (transl. *HW²* Vol. *Ḫ*, p. 271f.).

A direct identification of *ḫarrani(a/i)-* as a mere variant of Hittite *ḫāran-* 'eagle' is impossible, as per *HED* (Vol. 3, p. 139) and Melchert 1993: s.v., because of the *-rr-* and *-r-*. Nevertheless, The close similarity between *ḫarrani(a/i)-* on the one hand and Hittite *ḫa-a-ra-n°* /hā́ran-/ 'eagle' and Palaic [*ḫa-*]*a-ra-na-aš* /hā́ran-/ 'id.' (gen.sg.; cf. Melchert 1994a: 196; both < PAnat. **Hóron-* < PIE **$h_3$éron-*) on the other is clear. For this reason, Starke 1987: 265[80] has proposed that *ḫarrani(a/i)-* represents the direct cognate of the Hittite and Palaic forms.[10] A good indication of the Luwian character of this word is the spelling of its ending, which frequently shows plene *i*, e.g. *ḫar-ra-ni-i-iš* (nom.sg.c., KUB 5.22 obv. 28) and *ḫar-ra-ni-i-in* (acc.sg.c. KUB 18.5

*h_2-final verbal stems, as proposed by Melchert.

[10] This argument is repeated in Starke 1990: 76 and Kloekhorst 2014: 584f.

+ 49.13 i 28). While final *-īš*/*-īn* is hardly ever seen on Hittite nouns and adjectives (the only notable exception being Hitt. *nakkī-* 'important'), it has a clear parallel in Luwian, where we find formations such as CLuw. *ta-a-ti-i-iš* 'paternal' (nom.sg.c.) and GÉME-*i-iš* 'of a female servant' (nom.sg.c.). As per Melchert 1990: 200f. and Rieken 2017: 24f., these are best interpreted as denominal adjectives built on PAnat. **-io-* (< PIE **-io-*), which were transferred to the highly productive *i*-stem ('i-mutated') class. Its plene spellings *-Ci-i-iš* (nom.sg.c.) and *-Ci-i-in* (acc.sg.c.) would then represent the resulting [-ijis] (nom.sg.c.) and [-ijin] (acc.sg.c.), respectively. The stem *ḫarrani*(*i̯a*)- can be interpreted in the same way, as a derivative in **-ia-* from an unattested stem **ḫarran-* or **ḫarrani-*.

It is highly unlikely that CLuw. *ḫarrani*(*i̯a*)- straightforwardly has the meaning 'eagle' for two reasons. First, it co-occurs with Hittite *ḫāran-* (represented Sumerographically as TI_8) in several contexts, suggesting that it cannot refer to the same type of bird as the Hittite word.[11] Secondly, we have just seen that this word is a derivative from the 'eagle'-root, means that it is unlikely to mean 'eagle' itself. Nevertheless, exactly this latter point opens up the possibility anew that the derivational basis **ḫarran-* itself, on which *ḫarrani*(*a*/*i*)- seems to have been built, is in fact the Luwian cognate of Hittite *ḫāran-*. While the derivative *ḫarrani*(*a*/*i*)- cannot mean 'eagle', its root may still have had that semantic value. Instead, *ḫarrani*(*a*/*i*)- may have referred to an eagle subspecies, as suggested by Haas (2008: 35), or a bird with eagle-like properties.[12]

In any case, given the strong formal and semantic similarity existing between Luw. *ḫarrani*(*a*/*i*)- and Hittite *ḫāran-*, Starke's identification of *ḫarrani*(*a*/*i*)- as etymologically related to Hittite *ḫāran-* is likely to be correct. It follows that the geminate *-rr-* alternating with the singleton *-r-* in Hittite and Palaic is only explicable through Čop's Law. The analysis CLuw. *ḫarrani*(*a*/*i*)- ~ Hitt. *ḫāran-* < PAnat. **Hóron-* (for the PAnat. reconstruction, cf.

[11] Cf. KUB 18.5 + 49.13 ii 36f.: *na-aš-ta* ⌜TI_8[MUŠEN]⌝ *ḫar-ra-ni-i-iš-ša* ⌜ÍD⌝*-az ša-ra-a pé-ra-an aš-šu-u̯a-az ú-e-er* 'Ein Adler und ein *ḫarranī*-Vogel kamen vom Fluß nach oben, vorne vom günstigen (Bereich), geflogen.' (Sakuma 2009: 575).

[12] It is not uncommon to find animal names containing names of similar but unrelated animals. In the case of English bird names, compare the lark sparrow (*Chondestes grammacus*), which is not a lark, and the turkey vulture (*Cathartes aura*), which is not a turkey.

Kimball 1999: 141 and Melchert 1994a: 98) shows that Čop's Law is not restricted to PAnat. **éCV*, but also takes PAnat. **óCV* (< **h_3éCV*) as its input, suggesting that the consonant gemination is not dependent on just the vowel **é*, and may well have applied to **á/í/úCV* as well (becoming **á/í/úCCV*; thus Kloekhorst 2006/2008: 132). Since evidence for the input of this change is expected to be quite rare (see the beginning of this section), the absence of positive evidence for this generalisation is not very surprising. Furthermore, this claim is not vitiated by any counterevidence: there are no cases of Proto-Anatolian **á/í/úCV* which did not yield **á/í/úCCV*. Personally, I am therefore inclined to believe that vocalic quality does not affect Čop's Law. Nevertheless, this point is not of crucial importance for the rest of this chapter. Even if PAnat. **áCV*, **íCV* and **úCV* did not undergo Čop's Law, these sequences would still undergo vowel lengthening as per OSL (see Section 5.3).

In addition, it is often claimed that apart from gemination, Čop's Law entails a change from **é* to *á* (Melchert 1994a: 305; Rieken 2010b: 305). In part, this idea is prompted by CLuw. *ti-i̯a-am-mi-* /tiámmi-/ 'earth', which is cognate to HLuw. *ta-ka-mi-ⁱ* /t(a)kmí/ and Hitt. *te-e-kán* /tḗkan/.[13] All forms continue PIE **d^{h}ég$^{(h)}$om-* in some way or another. Kimball (1983: 427[20]) takes the endingless locative form PIE **d^{h}ǵ$^{(h)}$ém* as the starting point for CLuw. *ti̯ammi-*, which would yield **dǵém* in Proto-Anatolian. In principle, this form is expected to show raising through regular sound change: PAnat. **ǵe* > PLuw. **(i̯)i*. Accordingly, **dǵém-* should have developed into ***di̯ím-*(?).[14] The attested form (CLuw. *ti̯ammi-*) betrays no such effect, however. For this reason, Melchert (1994a: 254) argues that the "raising is blocked by the prior effect of "Čop's Law": **dyḗm*(*V*)- > *t*(*i*)*yamm-*", implying that Čop's Law changed PAnat. **é* to **á* before PAnat. **ǵe-* could develop into **i̯i-*.

Although suggestive, this analysis of CLuw. *ti̯ammi-* is not the only possible solution, and its formal features have been explained in various alternative ways. Čop (1970: 91) and Hajnal (1995: 102f.[72]) argue for a second-

[13] For the superscript *-ⁱ* in *ta-ka-mi-ⁱ* as a potential space-filler, cf. Chapter 1.

[14] This development is also found in CLuw. *i-iš-ša-ri-* (probably [jis:ri-] or contracted [i:s:ri-]) = Lyc. *izri-* [izri-] 'hand' < PAnat. **ǵés-r-* and CLuw. *im-ma-r°* /immr-/ 'open country' = HLuw. *i-mara/i-* /immri-/ < PAnat. **ǵem-ro-* (Melchert 1994a: 262).

ary accent shift from inherited PAnat. **d^{h}ég^{h}om-* to pre-PLuw. **d^{h}eg^{h}óm-*. Kloekhorst (2008: s.v. "*tēkan*") proposes that the change (**ǵe* >) **i̯e* > **i̯i* was blocked in *ti̯ammi-* because of the preceding dental **d-*.

Incontrovertible evidence showing that there was no change in vocalic quality associated with Čop's Law is hard to find. In Luwian, both PAnat. **é* and **á* merge anyway, making any prehistoric difference impossible to spot. In Lycian, inherited **é* and **á* are usually kept apart, but the effects of umlaut and proportional analogy make the evidence difficult to interpret. Such is the case of Lyc. *ebette* /eφete/ 'this' (8x; dat.-loc.pl.) < PAnat. **Hobéd^{h}os*, which can only be equated with Hitt. *a-pé-*(*e-*)*da-aš* /ʔapĕtas/ 'that' if we explain the former's fortis stop /t/ through Čop's Law (Kloekhorst 2014: 572f.). The fact that we do not find Lyc. ***ebatte* would indicate that no separate change from **é* to **á* has taken place here, and that the gemination caused by Čop's Law should be detached completely from the change PIE **é* > Luwian *á*. However, we cannot exclude that a stem **eba-* would have been analogically replaced by its more common stem variant **ebe-*.

In the end, the evidence in favour of the claim that Čop's Law came with a change in phonetic quality is meagre. The only example that could provide evidence in this direction is CLuw. *ti̯ammi-*, but the history of this form is open to multiple interpretations. In absence of better evidence in favour of any change beyond the fortition of the intervocalic stop, I will adopt the most conservative definition of Čop's Law as a merely consonantal change that did not alter the quality of the vowel.[15]

5.2.2 Consonantism

It is clear that Čop's Law affected inherited PIE resonants (e.g. CLuw. *ma-al-li* /málli/ < PIE **mélit*) as well as aspiratae (e.g. CLuw. *ma-ad-du* /máttu/

[15] Personally, I share the sentiment expressed in Melchert 1994b: 305: "One aspect of the phonetics of "Čop's Law" remain puzzling: why are the changes in coloring of the vowel and the gemination of the following consonant (both unremarkable per se) inextricably bound together in this case?" My suggestion would be to say that the change from **e* to **a* and Čop's Law (the gemination proper) are unrelated changes and that vowel quality itself is not linked to Čop's Law in any way. I do not see how the two could be connected on a phonetic level.

'wine' < PIE **méd^{h}u*). It is also clear that Čop's Law did not affect the Proto-Anatolian fortis stops **p*, **t*, **ḱ*, **k*, **k^{w}* or the phoneme **H* (< PIE **h$_{2/3}$*), since these were phonetically long anyway. Also unaffected are the semivowels **i* [j] and **u* [w], as shown by CLuw. *ḫa-a-ú-i-* /háui-/ 'sheep', see Section 5.3.

It is still debated whether the PIE mediae (**b*, **d*, **ǵ*, **g*, **g^{w}*) were geminated by Čop's Law, and this depends on the etymologies to which one adheres. In Čop's original article, it was claimed that the mediae remained unaffected, based on CLuw. forms belonging to the paradigm 'to eat' (< PIE **h$_{1}$ed-*), such as CLuw. *a-du-na* /ʔatuna/ 'to eat' (inf.), which does not show a fortited stop (written ***a-ad-du-na*). All of Čop's examples could in principle, however, have reintroduced a lenis stem consonant from the weak stem (PIE **h$_{1}$d-*), where fortition did not take place anyway, for instance the 3pl.imp.act. form *a-da-an-du* < PIE **h$_{1}$d-éntu*. Other scholars, such Melchert (1994a: 231), Kimball (1999: 261) and Yakubovich (2016: 294), *do* assume gemination of the PIE mediae, based on cases such as CLuw. *a-ad-du-u̯a-l°* /ʔáttual-/ 'evil' (~ Hitt. *i-da-a-lu-* /ʔitálu-/ < PIE **h$_{1}$éd-u-* *'biting', CLuw. *pa-ad-du-na-aš* /páttunas/ 'carrying'(?) < **pédV-* and *u̯a-at-ta-an-ti-* /uáttanti-/ 'having a spring as source'(?) < **uédV-*. Kloekhorst (2014: 574–580), however, has put forward different explanations for all these examples.[16] The matter is still undecided, and because the discussion is less relevant for the remainder of this chapter, I will leave the question open.

Likewise, opinions differ on whether the Proto-Anatolian lenis velars were affected by Čop's Law. It is commonly accepted that these phonemes (**ǵ*, **g*, **g^{w}*) were lost or developed into semivowels under certain conditions before Proto-Luwic (for details and treatment of cases where they appear to have been retained, cf. Melchert 1994a: 253–256 and Kimball 1994).[17]

[16] Kloekhorst (2014: 230–235, 405–414, 580–583) argues that any short accented vowel would have been lengthened by immediately following PIE mediae through what he calls "Winter's Law in Anatolian": PIE **VD* > PAnat. **V́D*, while PIE **VD^{h}* > PAnat. **VD*. It follows from this that inherited PIE **VDV* > PAnat. **V́DV* and thus remains untouched by Čop's Law.

[17] Specifically, we find the following developments: **ǵ* > **i̯* > ø (e.g. PAnat. **ǵés-r* > **i̯ísr-* [with colouring of **i̯e-* > **i̯i-*] > CLuw. *i-iš-ša-ri-* 'hand'); **g* > ø (cf. PIE **d^{h}uégh$_{2}$tr-* (Kloekhorst 2011) > Lyc. *kbatra* /cɸatra-/, HLuw. *tú-wa/i-tara/i-* /tuatra/i-/); **g^{w}* > **u* [w] (cf. PAnat. **g^{w}ṓu-* > Lyc. *wawa-/uwa-* /wawa-/, /uwa-/, HLuw. *wa/i-wa/i-* 'cow' /uau(i)-/).

We can date the weakening of the word-internal lenis velars relative to Čop's Law in two different ways.

The chronology by which the loss of lenis velars *precedes* Čop's Law is sometimes used to derive CLuw. *pár-ra-(i-)i̯a-* /parrai(a/i)-/ 'high' from PIE **b^{h}érǵ^h-V-*. Thus, PIE **b^{h}érǵ^h-V-* > PAnat. **bérg-V-* > pre-PLuw. **bár-V-* > PLuw. **bárr-V-* > CLuw. *párra-* (Melchert 1994a: 254).[18] However, this scenario is vitiated by Luw. **nān(i)-* 'brother'.[19] Based on comparison with Hittite *ne-ek-na-* /nekna-/ and Lycian *nẽni-* /nẽn(i)-/ 'brother', Luw. **nān(i)-* must continue PAnat. **négno-*. After the loss of the lenis velar (**nágno-* > **náno-*) and Čop's Law (**nánno-*) in pre-Proto-Luwic, the expected result in Luwian is ***nánn(i)-*, not **nān(i)-*.[20]

For this reason, the alternative chronology, by which the loss of lenis velars *follows* Čop's Law is more attractive. It implies that intervocalic lenis velars were fortited and retained. Čop (1970: 90f.) applied this chronology in order to derive the HLuw. hapax ("TERRA")*ta-ka-mi-i* (SULTANHAN § 39) 'land' (dat.-loc.sg.) from PIE **d^{h}ég$^{(h)}$om-* via PLuw. **takkam-*, with a geminate/fortis velar (thus also Melchert 1994a: 256). On the other hand, Oettinger

[18] For the shwa in Proto-Luwic, cf. Section 2.3.1, Table 2.2.

[19] The form itself is unattested, but we do have several derivations from this stem: CLuw. *na-a-ni-i̯a-* /nā́ni(a/i)-/ 'of a brother', HLuw. *na-na-sa$_5$+ra/i-* /nanasr(i)-/ 'sister', CLuw. *na-a-na-aš-ri-* /nānasri(a/i)-/ 'of a sister', ensuring its existence. It is unclear whether the broken form CLuw. *na-a-na-ḫi-*[...] (KBo 29.24, 6), analysed as *nānaḫit-* 'brotherhood' by Melchert 1993: s.v. belongs here.

[20] Starting from PAnat. **négno-* and **bérǵ-*, what seems to have happened is that the loss of the lenis velars coincided with a compensatory lengthening of the preceding phoneme (**é* and **r*, respectively). Thus, **négnV-* > **nā́nV-* > *nā́nV-* and **bérǵV-* > **bárrV-* > *párrV-*. (My thanks go to Stefan Norbruis for this suggestion.) For the development PIE **ḗ* (> PLuw. **ə́*) > *á*, cf. Hajnal 1995: 61–65, *pace* the traditional analysis of PIE **é* > PLuw. **í* found in, e.g., Melchert 1994a: 241 and Rieken 2005: 69.) Thus, Čop's Law need not be invoked in this case: since loss of the lenis velar and compensatory lengthening happened simultaneously, there was never a point in time at which **nénV-* existed to serve as the input for Čop's Law. Inevitably, this explanation renders **nān(i)-* and *parrai(a/i)-* useless for determining the relative chronology of Čop's Law and the loss of the lenis velars. They are, however, two potential examples of compensatory lengthening in Luwian, and another one potential example will be discussed in the following section. These examples fit well with the idea developed in Section 5.4, according to which accented syllables were exceptionlessly made heavy.

2002: 101 and Kloekhorst 2014: 583 prefer to take *$d^{h}ǵ^{(h)}$-*m-éi* (which also yielded Hittite *taknī* 'id.') as the proto-form and assume that the lenis velar was not lost in this (interconsonantal) position: CLuw. /tkmī/. If this is true, Čop's Law simply did not operate in this word.

In conclusion, we can formulate Čop's Law as follows: all pre-PLuw. intervocalic short consonants—except for [j], [w]—were lengthened when they are immediately preceded by a short accented vowel: PAnat. **VCV* > PLuw. **VCCV*.[21] Thus, Čop's Law constitutes a case of post-tonic gemination.

5.3 Open Syllable Lengthening (OSL)

Almost a quarter-century after the discovery of Čop's Law, Melchert 1994a: 261, 263 described another sound law whose effects are visible in Luwian: a lengthening of accented short vowels in open syllables: **V*(*CV*) > **V́*(*CV*). Apart from several Luwian examples, Melchert notes that similar vocalic lengthening effects are found in Hittite (1994a: 131) and Palaic (1994a: 215ff.). In addition, recent insights have refined the picture for Hittite (Kloekhorst 2014: 218, 385, 483, 519) and added new HLuw. evidence to the dossier (cf. Chapter 2). I will treat these cases in the Excursus at the end of this chapter. In the remainder of this section, the most important Luwian cases of open syllable lengthening, abbreviated henceforth as *OSL*, will be treated.

First, there is CLuw. *na-a-(ú-)u̯a* /nā́ua/ 'not'. Even though the final element *-u̯a* is unclear, its base has clear correspondences in other IE languages (Lat. *ne*, OCS *ne*, Go. *ni*) and continues PIE **ne*.[22] The presence of a long

[21] This development has many parallels among the world's languages, such as Italian (*legíttimo* 'legitimate', *ábbaco* 'abacus', *mácchina* 'machine' (Borrelli 2000: 26ff.) and various Austronesian languages (Blevins 2004: 173ff.).

[22] Eight attestations of *na-(a-)ú-u̯a-ti*, *na-ú-u̯a-te* /nāuati/ have previously been interpreted as ablative-instrumental case forms of an adjective *nāu̯(a/i)-* 'new' (Melchert 1993: s.v.; Melchert 1994a: 244), connected to Hitt. *nĕu̯a-*, Lat. *novus*, Skt. *náva-*, Gr. νέος, Go. *niujis*, ToB *ñuwe-* etc., all from PIE **néu-o-*. Recently, however, Marcuson (2016: 293[304]) has convincingly argued (following Yakubovich 2013ff.) that these forms are better interpreted as *nāu̯a* 'not' + *=ti* (reflexive particle). Although some difficulties remain, Hittite parallels to the Luwian clauses in which *na-(a-)ú-u̯a-ti* and *na-ú-u̯a-te* are found suggest that they correspond to *Ú-UL* 'not' in the Hittite text. In both interpretations ('not' and 'new'), the

vowel is independently suggested by HLuw. NEG_2-*a* /nā/, whose word-final <a> cannot be interpreted as a space-filler and is most likely to be a marker of vocalic length, cf. Section 2.4.2.

In addition, I take CLuw. *ḫa-a-ú-i-* /hāu(i)-/ 'sheep' to show the reflex of PAnat. **Hóui-* < PIE **h₃eu-i-*, following Kloekhorst 2006: 92f.[23]

Next, there is a class of Cuneiform Luwian *ḫi*-verbs with plene writings in their root syllable, suggesting the presence of a long vowel.[24] These are the following.[25]

1. *pīa-* 'to give', e.g. CLuw. *pí-i-a-at-ta* /pīatta/ (3sg.pret.act.)
2. *lūua-* 'pour', e.g. CLuw. *lu-u-ua-an-da* /lūanta/ (3pl.pret.act.)
3. *tūua-* 'put', e.g. CLuw. *du-ú-ua-an-du* /tūantu/ (3pl.imp.act.)
4. *šūua-* 'fill', e.g. CLuw. *šu-u-ua-at-ta* /sūatta/ (3sg.pret.act.)

long vowel in the forms can only be explained through OSL.

[23] This reconstruction, also found in, e.g., Martirosyan 2009: s.v. "*hoviw*", is not accepted by everyone, mainly on account of Tocharian B $\bar{a}_u w$- 'ewe', which seems to require a preform with $*h_2$ (cf. Adams 2013: s.v. "$\bar{a}_{(u)}w$", Pinault 1997: 190–193). The reconstruction with $*h_2$ forces one to put both an *o*-grade (to account for Gr. ὄϊς) and *e*-grade (to account for the absence of Brugmann's Law in Skt. *ávi-*) in the PIE *i*-stem paradigm: PIE $*h_2ou\text{-}i\text{-}/*h_2eu\text{-}i\text{-}$. Apart from the curious homophony with the 'bird'-root $*h_2eu$-, this alternating *o*/*e*-ablaut would be morphologically unexpected for a common gender PIE *i*-stem. I therefore prefer to view ToB $\bar{a}_u w$- as an inner-Tocharian innovation, and reconstruct PIE $*h_3eu\text{-}i\text{-}$.

[24] The *ḫi*-character of *pīa-* and *tūua-* is indicated by the typical 3sg.pres. *ḫi*-ending *-i*: HLuw. *pi-ia-i* and PONERE-*wa*/*i-i* (3sg.pres.act.). Unfortunately, such diagnostic forms are not present for *lūua-* and *šūua-* (the alleged 3sg.pres.act. *šu-u-ua-i* is found in a broken context). For *lūua-*, an original *ḫi*-conjugation paradigm is inferred on the basis of its Hittite reduplicated cognate *lilḫuua-*^{i} (~ CLuw. *lilūua-*). I have tentatively added *šūua-* here based on structural grounds: like *lūua-* (< $*lh_3u\text{-}V$) and *tūua-* (< $*d^{h}h_1u\text{-}V$), *šūua-* may well continue $*CHu\text{-}V$: $*sh_{1/3}u\text{-}V$ (cf. Kloekhorst 2008: s.v. "*šuue/a-*^{zi}"), and it shows plene spelling in its first syllable: 3sg.pret.act. *šu-u-ua-at-ta*.

[25] For Hittite, Kloekhorst 2008: 55–57 has argued that the spelling pattern *Cu-ú-ua* is not contrastive with *Cu-u-ua*, given the rarity of the former in this language. The Cuneiform Luwian data show that both spellings occur, but a cursory search in Melchert 1993 reveals that they alternate in some lemmata. This would suggest that also in Luwian, the signs <U> and <Ú> are interchangeable in the position /C_a, and I tentatively mark both spellings with /Cūa/ in my phonological transcriptions, acknowledging that more research is needed to confirm this. For the present discussion, however, the length of the vowel is most important.

We know that incidentally, plene spellings of *i* and *u* are found before homorganic glides (<I-I̯A>, <U-U̯A>) in places where it is unlikely that they mark vocalic length, e.g. CLuw. *ta-a-ti-i-i̯a-an* 'fatherly' (nom.-acc.sg.n.; KUB 35.43 ii 5), occurring next to expected *ta-a-ti-i̯a-an* (KUB 35.45 ii 2; KBo XXIX 9*, 11) 'id.'.[26] Nevertheless, these graphic(?) plene spellings are only attested a few times in the entire corpus, which makes their relative prevalence in the verbal stems here quite salient. I am therefore more inclined to follow Melchert (1994a: 240f.) in interpreting these plene spellings as markers of vocalic length. Melchert argues that in *pīi̯a-*, *lūu̯a-* and *tūu̯a-*, a secondary shift of the accent to the verbal root has taken place, after which the vowel was lengthened: **piV́i̯-* > **píi̯V-* > **pī́i̯V-*. While the motive of the accent shift is unclear, we find effects of a similar accent retraction (and accent-based lengthening) in the Hittite cognate to CLuw. *piya-*: the verb *pai-*^{i}/*pi-* 'to give' shows occasional plene spelling of its root syllable in the forms *pí-i-ú-e-ni* /pīueni/ (6x, 1pl.pres.) and *pí-i-ú-en* /pīuen/ (1x, 1pl.pret.), cf. Kloekhorst 2014: 478f. The lengthening in these Luwian forms following this accent retraction can only be explained through OSL.

Another possible case of OSL is HLuw. *tiwad-* 'Sun-god', attested with plene spelling of the *i* in KÜRTÜL (DEUS)*ti-i-wa*/*i-ti*-x /tīuaθ-/ and as the second element of the compound name KARATEPE 1 § 1 Hu. ^{I}(LITUUS)*á-za-ti-i-wa*/*i-tà-sá*. The plene spellings in this word are unlikely to serve an aesthetic purpose, and it has been argued that they mark vocalic length instead (Section 2.5.8). An accent-based lengthening has also been suggested independently for its Hittite cognate *ši-*(*i-*)*u̯a-at-t*° /sĭuatt-/ 'day' (< PAnat. **díuot-*, cf. Melchert 1994a: 131). Alternatively, the long vowel in the Luwian form can also be explained from a full-grade form (**diéu-ot-*), cf. Rieken 1999: 105. In that case, OSL need not have applied.

In addition, OSL could explain the long vowel attested in CLuw. *ku-ú-rV-* /kūr-/ 'to cut', attested in *kūramman-* 'cutting', *kūri-*/*kurāi-* 'cut into slices' and the form *ku-ú-ru-na* /kūruna/ 'to cut' (inf.) (Melchert 1993). The contexts in which these verbal forms are found do not straightforwardly corroborate their identification as cognates of Hittite *kuer-*^{zi} 'to cut' (< PIE **k*^{w}*er-*), which presumably rests on formal considerations. If this connection is cor-

[26] These cases are not treated in Rieken's (2017) study of plene *i* (and *e*) in CLuw.

rect, however, the plene spellings of *ku-ú-rV-* may well represent the results of OSL, following a retraction of the accent to the weak stem: **k^{w}rV́-* > **kurV́-* > **kúrV-* > **kű́rV-*, as per Melchert 1994a: 241. Alternatively, the long vowel may be due to contraction of [uwa] to [u:], mentioned in, e.g., Melchert 2004: 474 and Rieken 2017: 24, although the details of this development are very unclear.[27]

HLuw. *tu-u* /tū/ 'you' (orthot.dat.sg.) < PIE **tú* (Melchert 1994a: 262; Section 2.5.4) could very well show the effects of open syllable lengthening, although we may also be looking at the results of a separate lengthening of accented monosyllables.[28]

Lastly, another possible case of OSL is found in verbal stems ending in *-ī-*/*-āi-*.[29] These are: CLuw. *ḫapi-*/*ḫapāi-* 'bind', *gangati-*/*gangatāi-* 'treat with the g.-plant', *mali-*/*malāi-* 'think', *šannī-*/*šannāi-* 'overturn', *šarlī-*/*šarlāi-* 'offer', and *dūpi-*/*dupāi-* (~ *dūpai-*) 'strike'.[30] The weak stem of verbs belonging to this verbal class is spelled with either *-Ca-a-iC-* or *-Ca-i-iC-*, cf. CLuw. *ša-<an>-na-a-en-ta* (3pl.pret.act.) vs. *ša-an-na-i-in-du* (3pl.imp.act.) < *šannī-*/*šannāi-* 'overturn'. The plene *-i-* in *-Ca-i-iC-* may well be interpreted as [ji], as per Rieken 2017: 26. The occasional spellings with *-Ca-a-iC-*, however, seem to suggest that the *-a-* was long: /-CāiC-/. If Melchert's (2018) etymology of this verbal class in terms of PIE **-éie-*/*-éio-* is correct, then the accen-

[27] There are a few cases in Luwian where [uwa] seems to alternate with [u:], e.g. *du-ú-un-du* /tūntu/ ~ *du-ú-u̯a-an-du* /tūantu/ 'they must put'. Despite this, there are still many counterexamples to this change, such as CLuw. *pūu̯a* 'formerly' and *pūu̯atil-* 'past', never ***pū* or ***pūtil-*. The matter still awaits a dedicated treatment.

[28] This is impossible to decide on the basis of this form alone. Monosyllabic lengthening has been proposed for Hittite by Kloekhorst 2012b: 251f. although it has been noted before that accented words, as a rule, are never spelled with just one sign (Sturtevant and Hahn 1951: 24, Otten and Souček 1969: 49, Hoffner and Melchert 2008: 25). As far as I know, the validity of monosyllabic lengthening for other Anatolian languages has not been investigated in full detail, but I am not aware of any counterexamples.

[29] Plene writing of the *-i-* is quite rare and not attested for any of the *-ī-*/*-āi* verbs listed here. It is found in other verbs of this class, such as *taršīta* (3sg.pres.act.) vs. *taršāintu* (3pl.imp.act.) '?'. In addition, HLuw. (SA$_4$)*sa-ni-i-ti* (3sg.pres.act.) and (LIBARE)*sa$_5$+ra*/*i-li-i-tú* (3sg.imp.act.), which are cognate to CLuw. *šannī-* and *šarlī-*, both show non-space-filling plene writing. As argued in Section 2.4.1, these may well be interpreted as indications of vocalic length.

[30] Cf. *du-ú-pa-im-mi-in* (ptc.acc.sg.c.) /tūpaimmin/ vs. *du-pa-a-im-mi-in* /tupāimmin/.

ted vowel in the weak stem could only have yielded long -*á́*- through OSL: *[-éjo-] > *[-á:ja-], after which syncope would have yielded [-á:j-]. This development is quite uncertain, however.

In summary, even though there are often multiple interpretations for the examples presented here, their combined force makes a compelling case for the presence of Open Syllable Lengthening in the prehistory of Luwian. Not only PAnat. **é*, but presumably also **ó* (< PIE **h₃é*) and secondarily accented **ú* and **í* seem to have yielded long vowels in open syllables in Luwian, cf. CLuw. *nāu̯a* 'not' (< PIE **né*) and *pīi̯a-* 'give'. The absence of good examples for **á* (< PIE **h₂é*) is likely to be coincidental, so that we may generalise the scope of OSL to include vowels of all qualities: PAnat. **á*, **é*, **í*, **ó*, **ú*. It is important to note that this development in principle only affected short accented vowels which either 1.) stood in word-final position or 2.) were followed by a glide (PAnat. *[w] or *[j]).

5.4 Synthesis: Proto-Luwic fortition

So far, we have looked at two distinct sound changes: Čop's Law was responsible for the lengthening of short consonants in pre-Proto-Luwic (**ÝCV* > **ÝCCV*). In addition, we have seen evidence for a lengthening of short vowels in open syllables that took place in Luwian, but possibly even as early as Proto-Luwic (**ÝCV* > **V́CV*).[31] Apart from the fact that both sound laws describe a phonological lengthening, they have more aspects in common, regarding both their input and their output, cf. Table 5.1.

Input	**Output**
ÝCV (*C* ≠ [w]/[j])	*ÝCCV* (Čop's Law)
Ý(*CV*) (*C* = [w]/[j] or word-end)	*V́*(*CV*) (OSL)

Table 5.1: Input and output of Čop's Law and OSL

[31] On a phonetic level, OSL may have even operated in Proto-Anatolian, cf. the Excursus.

Both changes probably affected all accented short vowels (**á*, **é*, **í*, **ó*, **ú*). The only difference here is that open syllable lengthening (OSL) only affected vowels preceding [w], [j] or the end of a word, while Čop's Law applied to short accented vowels that did *not* precede [w], [j] or the end of a word. In this respect, Čop's Law and OSL are complementary developments.

While the respective outputs of Čop's Law (**VCCV*) and OSL (**V́CV*) look quite different from a phonetic and phonological point of view, they are equivalent under a 'moraic' analysis: both sound laws take light syllables as their input and yield a heavy syllable, cf. Figure 5.1.[32]

On the basis of this analysis, one could ask whether the similarities (input vowel quality, quality and accentuation, and output syllable weight) and complementarities (combinations with consonants) of these phonological changes are simply due to chance. Is it a coincidence that two sound laws with such similar conditionings and outcomes affected the same language (Luwian or possibly even Proto-Luwic)? I believe this is not the case. Rather than taking Čop's Law and OSL as two unrelated and distinct sound laws, we would do more justice to their similarities by interpreting these sound changes as two complementary parts of one general Proto-Luwic fortition.[33] Together, they affected all inherited light accented syllables and added one mora to make them heavy: Čop's Law by adding a syllable coda (**V́.CV* >

[32] Cf. Hyman 1985 for a general introduction to moraic phonology. *Morae* are weight units assigned to syllables: 'light' syllables are said to consist of one mora, while 'heavy' syllables contain two. The classification of syllable structures as 'heavy' or 'light' is language-specific, although there appear to be two main types, exemplified here by Latin and Lardil (Hayes 1989: 255f.). In languages such as Latin, *CVC* and *CVV* syllables are heavy, while *CV* is light. Languages like Lardil, however, only take *CVV* as heavy, whereas both *CV* and *CVC* are light. Luwian would follow the pattern of Latin, by which syllables with a coda (*CVC*) or a long vowel (*CV̄* = *CVV*) count as heavy. For another application of moraic theory to the historical phonology of the Anatolian languages, cf. Section 5.4.1.

[33] This observation bears resemblance to what is commonly called a phonological 'conspiracy' (Kisseberth 1970). This term describes how multiple different phonological rules appear to work together to satisfy a certain synchronic constraint. While I believe Kisseberth's attention to the functional unity of disparate developments is very appropriate, I do not share his synchronic, constraint-based analysis. Rather, I believe the synchronic situation in Luwian is better explained as the result of two *diachronic* developments (i.e. Čop's Law and OSL), and that these changes were not actuated in order to avoid a particular phonological system in Luwian.

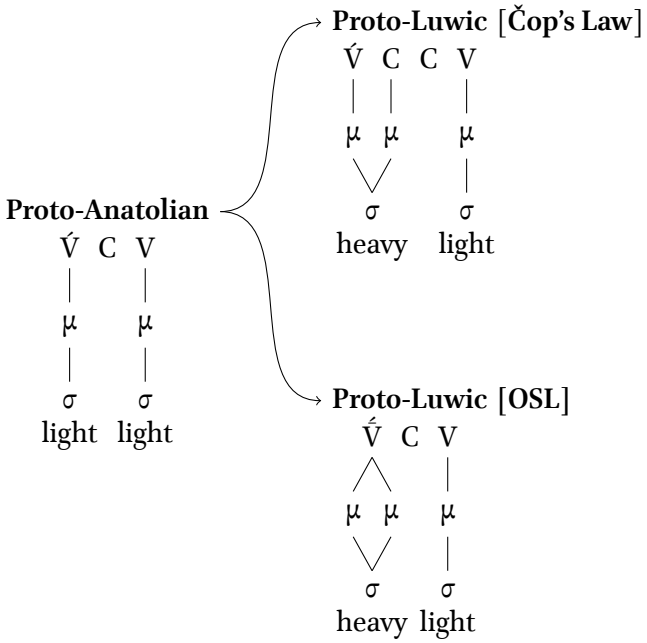

Figure 5.1: Luwic fortition

VC.CV*) and OSL by lengthening the vowel (V.CV* > **V́.CV*). Thus, they eliminated all light accented syllables from the language and made sure that all accented syllables became heavy.[34] The result was that the phonological opposition between heavy and light syllables was neutralised in accented position.

5.4.1 Interrelatedness of Čop's Law and OSL

One remaining question is why light accented syllables in the Luwic languages underwent two fortiting developments instead of one. Why did Čop's Law not affect both PIE **mélit-* 'honey' *and* PIE *h*$_3$*éui-* 'sheep', creating not

[34] In this interpretation of Čop's Law as a reinforcement of the connection between the accent and heavy syllable weight, it is no less than expected that consonant clusters are exempt from gemination. We would also not expect any concomitant change in vowel quality associated with Čop's Law, cf. Section 5.2.1.

only attested CLuw. *malli-* but also Luw. ***ḫau̯u̯(i)-*? For this, we need to take a closer look at features that set glides apart from other consonant classes.

Synchronically, the Luwian phonological system shows an clearly maintained opposition between singleton and geminates, except for the glides. This is very much in line with the typological observation that [jj] and [ww] are among the consonants most likely to be missing from a language's geminate inventory. This is the case for Classical Nahuatl (Andrews 2003: 35), Modern Icelandic (Garnes 1974: 38), Kurdish and Yatee Zapotec, which have length oppositions for all segments except glides, (cf. Hansen and Myers 2017: 184 and Maddieson 2008: 1928f. for references and more examples). Phonetically, this relative rarity of geminate glides among the world's languages seems to be related to difficulties in the perception of length contrasts in glides. Experimental research suggests that this is due to blurrier boundaries between glides and their surrounding vowels, as well as smaller differences in amplitude between glides and neighbouring vowels, cf. Kawahara and Pangilinan 2017. In my opinion, there are two ways in which the perceptual difficulties for a length contrast in glides can account for the absence of geminate glides in Luwian (and its relative rarity among the languages of the world in general):

1. Length oppositions in glides hardly ever arise.
2. Once a length opposition between long and short glides develops, it is very easily lost again.

These two explanations account in different ways for the absence of a glide length contrast in Luwian. On one hand, we could argue that Čop's Law was constrained in some way, so that it only affected obstruents, liquids and nasals (i.e. all consonants except for glides). However, if Čop's Law is truly a rhythmic post-tonic gemination rule operating on the level of the syllable, as proposed in this analysis, we would not expect it to select only particular types of consonants, especially seeing that a fair number of the world's languages *do* have a long vs. short opposition in glides, despite their overall relative rarity.[35]

[35] For instance: Hungarian (*fejje* 'milk'.3sg.subj. vs. *feje* 'head'.poss.3sg. [dr. Anikó Lipták,

Therefore, I want to propose an alternative scenario, without insisting that it is superior to the one presented above: perhaps Čop's Law *did* in fact affect all consonants (including glides), yielding pre-PLuw. **V̆u̯u̯V* and **V̆i̯V*. Due to the instability or imperceptibility of such a length contrast, however, these geminated glides were soon degeminated again, leaving behind traces in the shape of compensatory lengthening.[36] Thus; PIE **h₃éui-* > PAnat. **Hóui-* > pre-PLuw. **háu̯u̯ə/i-* (Čop's Law) > **hā̆u̯ə/i-* (degemination + compensatory lengthening) > CLuw. *ḫā̆u̯(i)-*. At first sight, the second scenario is much more convoluted than the first, giving the impression of a needlessly complicated *Duke of York gambit* (*A > *B > A; Pullum 1976). Nevertheless, there are several points which add credibility to this scenario.

First, the assumed extra steps (degemination and compensatory lengthening) are not unmotivated. The perceptual difficulties in distinguishing long from short glides have already been noted before; for this reason, length contrasts for glides are presumably more prone to neutralisation, explaining the relative rarity of length opposition for glides in the world's languages. In addition, Proto-Luwic had a concrete impetus for degemination of [jj]: it is commonly assumed that at some point in pre-Luwian, intervocalic *[j] was lost without a trace in between identical vowels (Rieken 2005: 67–71; Norbruis fthc.). With the loss of *[j], the opposition between singleton and geminate glides likewise vanished, allowing the phonetic duration of the glides to shorten. Unfortunately, since there is no similar general loss of intervocalic *[w], this scenario will not explain the degemination of *[w]. For another possible instance of compensatory lengthening in Luwian, cf. footnote 20 above.

By expanding the scope of Čop's Law to account for all consonants, we can also explain the long vowels in verbs where the accent has been secondarily retracted to the root syllable, such as *pī̆i̯a-* 'to give', if the accent retraction took place before Čop's Law took effect. This leaves OSL to account only

p.c.]) and Arabic ([ʕaw̲æʤæ] 'crookedness of' [acc.sg.] vs. [ʕaw̲ːæʤæ] 'he made it crooked' [dr. Marijn van Putten, p.c.]). Cf. Maddieson 2008: 1929 for a typological survey and more examples.

[36] I am grateful to professor Adiego for suggesting this option to me. Needless to say, the responsibility for the opinion expressed here is mine.

for word-final light accented syllables such as HLuw. *tū* 'you' and *nā* 'not'.[37]

Lastly, the Luwian situation finds a parallel in Tiberian Hebrew. In this language, consonant gemination is found at clitic junctures or required in the form of a morphologically distinctive feature. All consonants are liable to be geminated except for a class of guttural consonants (*h*, *ḥ*, *ʔ*, *ʕ*). Instead of lengthening, these consonants instead show lengthening of the preceding vowel (Joüon and Muraoka 2009: 77).[38] It is commonly accepted that at some point in time, these guttural consonants *were* in fact capable of gemination, but were subsequently degeminated with lengthening of the preceding vowel (Blau 1993: 38).[39]

The two scenarios presented here are given here simply for consideration. They do not change the linguistic facts we see in our texts. Also, a choice for one or the other does not alter our main conclusion for the first part of this chapter: OSL and Čop's Law are two complementary developments, which together made all light accented syllables heavy.

5.5 Systemic pressure

The Luwian state of affairs, in which all accented syllables are heavy, has a great number of parallels among the world's languages (Gordon 1999: 23–31), and seems to be a stable point of convergence of stress-based phonological systems. Apart from universal tendencies, however, there are also strong language-internal indications that Proto-Luwic was especially prone to remodelling along the lines of a strengthening of accented syllables. Several (pre-)Proto-Luwic sound changes had rendered accented light syllables

[37] In addition, it is notable that all of these cases involve monosyllabic words. If these cases are due to monosyllabic lengthening, and if CLuw. *ku-ú-r*° is the result of contraction from **ku-u̯a-ar-* as an anonymous reviewer suggests to me, then we might not even need to assume OSL in the prehistory of Luwian at all.

[38] Especially the following description of the Hebrew data is also valid for Luwic: "[V]owels lengthen, exactly where consonants cannot geminate." (Lowenstamm and Kaye 1986: 109).

[39] Naturally, the Hebrew situation differs from Luwic in the sense that 1.) gemination serves a grammatical function in Hebrew; 2.) geminated gutturals are attested languages closely related to Hebrew, such as Arabic, where degemination did not take place.

increasingly rare and thus attenuated the functional load of the contrast between light and heavy accented syllables to a considerable degree. In what follows, I will argue that Čop's Law and OSL simply represent the final neutralisation of this contrast, creating a situation in which all light accented syllables were made heavy. To understand this, we need to treat several developments which profoundly reshaped the pre-Proto-Luwic phonological system. I will treat these in order below.

5.5.1 Phonetic changes from pre-PAnat. to pre-PLuw.

1. PIE *ó > PAnat. *ó́. Kloekhorst (2014: 549–559) has argued in detail that this lengthening of PIE short accented *ó must precede the Proto-Anatolian consonantal lenition effects treated below, cf. footnote 9. Even if one does not follow this chronology, however, it is generally agreed that PIE *ó > Luw. ā in both open and closed syllables, e.g. CLuw. $^{\text{GIŠ}}$*ta-a-ru-* /tā́ru/ 'wood' < PIE **dóru-* and CLuw. -(*a-*)*aš-ša*/*ši-* /-āssa/i-/ < PIE *-ósio* (Melchert 2012a: 282). This change increased the syllable weight of many accented syllables, making them heavy if they were originally light: **ó*(*CV*) > **ó́*(*CV*).

2. Eichner-Adiego's consonantal lenition laws. These two laws describe a phonetic change affecting inherited PIE tenues (**p*, **t*, **ḱ*, **k*, **k*^{w}) as well as PIE **h*$_2$ and **h*$_3$. As mentioned in Section 5.1, these normally show up as fortis consonants in the various Anatolian languages. Preceded by a long accented vowel or in between two accented vowels, we find lenis reflexes instead, indicating that a lenition has taken place in these environments (Eichner 1973: 79–83, 100[86]; Morpurgo Davies 1982/1983).

At the turn of the century, Adiego (2001) proposed that these two lenition rules can be regarded as one and the same sound change. Reanalysing the long accented vowel of the 'first lenition law' as a combination of an accented mora + an unaccented one ($\bar{\acute{V}}$ = *V́V* = μ́μ), he was able to subsume both conditioning environments under the same law: pre-Proto-Anatolian fortis consonants between two unaccented morae are lenited: pre-PAnat. **V́*(...)*VCCV* > PAnat. **V́*(...)*VCV*

(henceforth: "Eichner-Adiego's Law"). The main effect of this sound law was that originally heavy unaccented syllables saw a decrease in syllable weight. Thus: **VCCV* (heavy + unaccented) > **VCV* (light + unaccented).

3. Unaccented vowel shortening (*$\bar{V}$ > **V*). The applicability of this sound change for the Anatolian languages has been defended on several occasions by Eichner (1973: 79, 86[15]; 1986: 206–7[10]; 1988: 136[45]), who has argued that it must have been completed in Proto-Anatolian, although he does not treat all of the material in full detail. A Proto-Anatolian date is also maintained by Hajnal (1995: 43, 81). Melchert, on the other hand, has a more careful formulation: "[**O**]**riginal** unaccented long vowels are shortened in PA: (…) However, this does **not** apply across the board to secondary long vowels from loss of tautosyllabic laryngeal or contraction of diphthongs" (Melchert 1994a: 76, emphasis in original).

With regard to the Luwic languages, it is difficult to assess the validity of Eichner's unconditional shortening of all unaccented long vowels.[40] Lycian is mostly uninformative in this respect, as it does not show any sign of a vocalic quantity opposition. By contrast, the Hieroglyphic Luwian material may show plene spellings in the function of marking vocalic length, but does so only inconsistently (Section 2.2). The Cuneiform Luwian material, lastly, is most often too badly attested to allow us to judge whether absence of plene writing testifies to a short vowel or is simply due to chance. Nevertheless, Cuneiform Luwian does have a few interesting forms which suggest that

[40] Similar shortening effects are found in Hittite (e.g. *te-e-kán* /tēkan/ 'earth' < **dʰégʰ-ōm*, never ***te-e-ka-a-an* **/tēkān/) and Palaic (e.g. *-a* [nom.-acc.n.pl.] < PIE **-eh₂*), supporting Eichner's idea of an early (PAnat.) shortening. On the other hand, Kloekhorst (2008: 98) has shown that the result of PAnat. unaccented **ē* > pre-Hitt. **e* does not undergo the weakening of PAnat. **e* into Hitt. *i* and *a* (e.g. PIE **nébʰ̲es* > Hitt. *ne-(e-)pí-iš* /népis/ 'heaven', but PIE **h₁és-ē̲r* > Hitt. *e-še-er* /ʔéser/ 'they were', cf. Melchert 1994a: 143). This suggests that the shortening of PAnat. **ē* post-dates the weakening rules we find in Hittite, and that it cannot be of Proto-Anatolian date. A general Proto-Anatolian shortening of long unaccented vowels can only be accepted if it can be demonstrated that the weakening of original PIE **e* is of Proto-Anatolian date as well. It is clear that the matter deserves a full dedicated treatment.

indeed some prehistoric shortening of unaccented long vowels has taken place:

- **Combinations of vowels + tautosyllabic laryngeals** yield a long vowel if they are accented: CLuw. *ma-na-a-ti* /mnáti/ 'he sees' (3sg.pres.) < **mnéh₂-ti*. In unaccented position, however, they are spelled consistently non-plene, as in the *a*-stem nouns and adjectives such as *ku-um-ma-aš* 'holy' (nom.sg.c.) < **-eh₂-s* (cf. Norbruis fthc.), and the nom.-acc.pl.n. ending *-a* in general (e.g. in CLuw. *da-a-u-a* /tāua/ 'eyes'), which is traced back to PIE **-eh₂*. Also worth considering are CLuw. *la-a-la-ad-du* /lálattu/ 'let him take' (3sg.imp.act.), if this truly continues virtual **dV-doh₃-tu*, and CLuw. *pa-ap-pa-ša-i* /páppasai/(?) 'he swallows', if this single attestation truly continues the reflex of PIE **-peh₃-s-* (Kloekhorst 2008: s.v.). These suggest that the original length developing from a combination of vowel + tautosyllabic laryngeal was not retained in unaccented syllables.[41]
- **Inherited diphthongs** likewise result in long vowels in Luwian when they bear the accent, as seen in CLuw. *zi-i-in-zi* /tsīntsi/ 'these' (nom.pl.c.) < PIE **ḱói-* (Melchert 2009: 114), and CLuw. *ḫu-u-ḫa-ti* /hṓhati/ 'grandfather' (abl.-ins.) < PIE **h₂éuh₂-*.[42] On the other hand, there is a derivative from the same stem: CLuw. *ḫu-ḫa-<ad>-da-al-l[a]* /hohattalla/ 'grandfatherly', whose *o* was presumably unaccented and short. Note however, that this is word is a hapax, so that its not being spelled with plene writing may be coincidental.
- **Inherited long vowels** are long when accented, cf. CLuw. *za-a-ar-za* 'heart' /tsā́rt=sa/ < PIE **kḗrd* (following Hajnal 1995: 65, *pace* Melchert 1994a: 243) and *āddu̯āl* 'evil' (nom.-acc.sg.n.) <

[41] The attestations *la-la-a-at-ti* /lalátti/ (2sg.pres.act.) and *la-la-a-i* /lalái/ (3sg.pres.act.) rather seem to show the accentuation of the simplex verb *lā-^{i}* 'id.'

[42] In this respect, also Lycian *χuga-* /kuxa/ 'grandfather' is telling: the lenis /x/ <g> continues a lenited laryngeal (PAnat. */h/), which can only be the result of Eichner-Adiego's consonantal lenition. This indicates that the vowel preceding Lycian *-g-* must have been long and accented.

*-*ól*.[43] All cases which may show the reflex of an unaccented long vowel have alternative explanations. For instance, Cuneiform Luwian *ḫarrani*(*a*/*i*)- (oracle bird; see Section 5.2.1) may continue the inherited nom.sg. *h_3*ér-ōn*, but since it is probably a derivation, it is more likely that it continues the oblique stem *h_3*ér-on*-, which did not contain a long vowel.

The result of this shortening can be compared to that of Eichner-Adiego's Proto-Anatolian lenition laws: both laws describe how heavy unaccented syllables are stripped of one mora, so that they become light and unaccented.

4. Proto-Luwic loss of word-final stops (*-*T* > *-ø). All word-final stops in both Luwian and Lycian have been lost (Melchert 1994a: 278, 323). There are only a few clear examples and each of them involves the loss of a final dental stop, e.g. CLuw. *ma-al-li* /málli/ 'honey' (nom.-acc.sg.n.) < PIE **mélit*; HLuw. *za-a* /tsā́/ 'this' < PIE **kód*, HLuw. *-Ca-hi*(=*sa*) /-ahi/ (nom.-acc.sg.n.; abstr. suffix. < **-ahid*), Lyc. *ti* 'what' < PIE **k*^{w}*id*. The dearth of examples makes it difficult to determine how this rule should be dated with respect to OSL.[44] Nevertheless, it is clear that this change decreased the weight of word-final unaccented heavy syllables, turning them into unaccented light syllables.

These four independently motivated sound laws, which are phonetically easily understandable and typologically common, had a profound effect

[43] The initial syllable *ādd*-, which I interpret as /ʔatt-/ with a glottal stop following Simon 2010, must have been analogically introduced from related forms where the accent was word-initial. This is necessary to account for the geminate, which is normally explained through Čop's Law.

[44] In theory, PAnat. **k*^{w}*íd* 'what?' could provide us with an answer. If PIE **k*^{w}*íd* > **k*^{w}*í* > **k*^{w}*ī́*, then that would prove that OSL was still operative after the PLuw. loss of word-final stops. Unfortunately, CLuw. *ku-i* /k^{w}i/ 'what' (nom.acc.sg.n.), its regular reflex, is inconclusive regarding the length of its final vowel. On the one hand, its *-i* could represent /ui/, as in CLuw. *da-a-u-i-iš* 'eye' /tāuis/, suggesting a short vowel (Rieken 2017: 26). On the other hand, it is unclear whether long accented word-final sequence of /-uī-/ would have been written differently, since we have no attestations of **-Cu-i-i* to contrast it with. Therefore, CLuw. *ku-i* may also represent /k^{w}ī́/.

on the Proto-Anatolian and pre-Proto-Luwic distribution of syllable weight with regard to the accent. Heavy unaccented syllables were only found in pretonic position and in front of consonant clusters; in all other positions, they had been made light. Accented syllables, on the other hand, were almost always heavy. The only remaining light accented syllables in Proto-Anatolian were those continuing PIE **éCV* and **-é#* (including cases where **é* is coloured by an adjacent laryngeal: **$h_{2/3}$éCV* and **$h_{2/3}$é#*).

Thus, we arrive at a system in which almost all inherited unaccented syllables had been made light. This indicates that the weight of a syllable had almost become predictable in accented and, to a certain degree, also in unaccented (not pretonic) syllables. The combination of Čop's Law and the phonologisation of OSL in Proto-Luwic can be seen as a logical extension and the final chapter of these developments. In two different ways, they increased the weight of these accented light syllables (**ÝCV* > **ÝCCV*; **ÝCV* > **V́CV*) and neutralised the already marginalised weight opposition between heavy and light syllables, which carried little functional load, in accented syllables. In this way, syllable weight was tied to accentuation even more strongly and became completely predictable/allophonic in accented positions.

5.6 Neutralisation of contrastive syllable weight in Proto-Luwic?

A few years after Adiego's (2001) combination of Eichner's two lenition laws into one single Proto-Anatolian consonant lenition law (cf. Section 5.5.1, above),Kloekhorst (2006/2008) discovered that this consonant lenition law is complementary to Čop's Law. While intervocalic consonants which are immediately preceded by an *unaccented* mora were subject to lenition in Proto-Anatolian, intervocalic consonants immediately preceded by an *accented* mora were lengthened in accordance with Čop's Law. The complementary effects of Eichner-Adiego and Čop's Law on intervocalic consonants are summarised as follows, cf. Figure 5.2.

PAnat.		**Luw.**
**V́CV*	>	*V́CCV*
**V́CCV*	=	*V́CCV*
**V́CV*	=	*V́CV*
**V́CCV*	>	*V́CV*
**VCV*	=	*VCV*
**VCCV*	>	*VCV*

Table 5.2: Effects of Eichner-Adiego and Čop's Law on Proto-Anatolian and Proto-Luwic (taken from Kloekhorst 2006/2008: 133).

Kloekhorst (2006/2008: 133) concludes as follows: "Effectively, we see that the length of a consonant has become automatic in Luwian: after an accented short vowel all consonants become long; after an accented long vowel and in between two unaccented vowels all consonants become short. (...) [A]t a certain point in the (pre)history of Luwian the quantity of intervocalic consonants was fully governed by the place of the accent in the word and the quantity of the accented vowel".[45]

We can now extend Kloekhorst's unification of Čop's Law and Eichner-Adiego to include even more developments. More specifically, these two accent-dependent sound laws, governing the length of intervocalic consonants, are symmetrically complemented by two accent-dependent developments governing vowel length, cf. Figure 5.3.

Together, these four phonological developments seem to neutralise not only the Luwic contrast between long and short intervocalic consonants, but also between long and short vowels. Unaccented syllables would see the shortening of both vowels and long consonants, while either short consonants or short vowels would be lengthened in accented syllables. Purely theoretically, therefore, it seems that syllable weight itself was well on its way

[45] By way of parallel, Kloekhorst (2006/2008: 134[8]) refers to Saami, where a similar development is thought to have taken place: in one particular dialect, consonants were weakened in certain positions but additionally strengthened in all other positions.

	Proto-Anatolian (lenition/shortening)	**Proto-Luwic** (fortition/lengthening)
Consonantism	Eichner-Adiego $*VCCV > *VCV$	Čop's Law $*\acute{V}CV > *\acute{V}CCV$
Vocalism	Unaccented vowel shortening $*\bar{V} > *V$	OSL $*\acute{V}(CV) > *\acute{\bar{V}}(CV)$

Table 5.3: Anatolian syllable weight gradation

to becoming allophonic and predictable at some point in the (pre)history of the Luwic languages. All accented syllables were made heavy, while many unaccented syllables had been made light.

However, even theoretically, this system does not bring about a full dephonologisation of (pre-)Luwic syllable weight. Apart from cases where the inherited length of consonants and vowels has been analogically reintroduced, there are three environments which violate the accented-heavy vs. unaccented-light pattern by maintaining heavy syllables in unaccented position.[46]

Consonant clusters such as $*VC_1C_2V$ were unaffected by the PAnat. consonantal lenition law, so syllables ending in a cluster remained heavy, even if they were unaccented, e.g. *-š(ša)r-* /s:r/ in CLuw. *iš-ša-ri-i* /isŕi/ 'hand' (dat.-loc.sg.c.).

[46] An example of the analogical introduction of long vowels in unaccented syllables is CLuw. *da-a-i-na-a-ti* 'oil' (abl.-ins.). The dative-locative of the same paradigm, Ì-*i* /-ī́/ and its Hittite cognate nom.-acc.sg.n. *ša-a-kán* /sā́kan/, gen. *ša-ak-na-a-aš* /s(ə)knā́s/ show that the paradigm was originally mobile. In CLuw. *da-a-i-na-a-ti* the direct case stem /tāin-/ (with a full vowel) was apparently taken over into the oblique stem. As is well known, long (syllable-closing) consonants are frequently reintroduced in the Luwian verbal endings: **-tti* (3sg.pres.act.), **-tta* (3sg.pret.act.) and **-ttu* (3sg.imp.act.). Clear examples are CLuw. *ša-a-at-ta* /sātta/ 'he released' (cf. Section 5.1) and CLuw. *la-a-ad-du* /lāttu/ 'he must take' (cf. Section 4.8. In both cases, the unlenited stop after a long accented vowel must be analogous.

Word-final consonants (not including stops, which were lost, cf. Section 5.5.1) ensured that unaccented syllables remained heavy by providing them a coda, e.g. /-is#/ in CLuw. *ma-a-aš-ša-ni-iš* /māssanis/ 'god' (nom.sg.c.).

Pretonic consonants presumably also retained their inherited length and kept pretonic syllables long, although good examples where the geminate cannot have been restored analogically are very difficult to find. An example is CLuw. *pár-ra-a-an* /parrān/ 'before' (preverb), whose geminate may have been reintroduced on the basis of *pár-ra-an* /parran/ 'id.' (preposition).[47]

The environments described here involve a lot of data, ensuring that the point of full dephonologisation of consonant/vowel length and syllable weight was probably never reached.[48] Regardless, a clear tendency towards neutralisation of these contrasts cannot be denied. After Eichner-Adiego, unaccented vowel shortening and the lengthening of PIE **ó* in pre-Proto-Anatolian, there was an imbalance in the system: speakers had become used to making accented syllables almost always heavy while most unaccented syllables happened to be light. In this situation, it is easy to see why Čop's Law and OSL, which started off as simple fortiting developments under influence of the accent, eventually became phonologised. They happened to bring the weight of **éCV* and word-final **-V́* closer to that of the other accented syllables in the language and therefore had a greater chance of being phonologised. Thus, I hope to have shown that Čop's Law and OSL merely represent regularisations of a pattern that was already starting to materialise in pre-Proto-Anatolian, and that the pre-Proto-Luwic system of available syllable structures provides a possible motivation for the phonologisation of Čop's Law and OSL, revealing a greater unity behind all these sound laws on a more abstract level.

[47] Cf. also Kloekhorst 2014: 595f. for a treatment of the behaviour of pretonic consonants in Hittite.

[48] For this reason, I do not follow Hajnal 1995: 50f.[48] and Kloekhorst 2006/2008: 133 who conclude (too strongly in my opinion) that vocalic (Hajnal) and consonantal (Kloekhorst) length had ceased to be phonologically distinctive in the prehistory of Luwian.

5.7 Conclusion

In the prehistory of Luwian (and Lycian), four sound laws recast the distribution of long and short consonants and vowels as it was inherited from Proto-Indo-European. After a wave of lenitions/shortenings in Proto-Anatolian—Eichner-Adiego's consonantal lenition laws and the shortening of unaccented long vowels—Proto-Luwic saw two complementary fortiting developments: Čop's Law and the lengthening of all remaining accented short vowels in open syllables.

We have seen that the two pre-Proto-Anatolian leniting developments, along with other phonetic changes, resulted in the situation in which almost all accented syllables became (super)heavy, while many unaccented syllables were rendered light. This tendency towards an ever closer connection between the accent on the one hand and segmental length and syllable weight on the other provided a motivation, or catalyst, for Čop's Law and open syllable lengthening. The latter two simply represent generalisations of this inherited pattern and eliminated the last remaining light accented syllables from the language by making them heavy.

Together, these four sound laws ensured that not only syllable weight but also vowel and consonant length became increasingly bound to—and therefore predictable by—the presence or absence of the accent. Despite this tendency, the Proto-Luwic phonological system probably never reached full phonological neutralisation of these three factors, as consonant clusters, word-final consonants and pretonic consonants remained unaffected by the changes investigated here.

More broadly, I have claimed that sound laws are not always isolated and in general do not happen randomly (although the precise cause is often not retrievable). Wherever possible, we should try to consider sound laws not as a disjointed set of transformations, but rather as parts of a system. This enables us to understand how they follow from synchronic phonological patterns and how they induce or block further phonetic developments. In this respect, phonetic and phonological changes, like languages in general, are very much a child of their own place and time.

Excursus: OSL in Proto-Anatolian

In Section 5.3, we only looked at the results of Open Syllable Lengthening in Luwian, while actually, Melchert (1994a: 131, 215ff., 261) reports similar effects in Hittite and Palaic. Nevertheless, Melchert (1994a: 132) argued at the same time that OSL cannot have taken place in Proto-Anatolian, but must have taken place in each of these daughter languages independently, for reasons we will see below.

Recent research has now brought to light even more evidence for an accent-based lengthening of short vowels in open syllables, following new studies of plene writing in Hittite (Kloekhorst 2014: 218, 385, 483, 519) and Hieroglyphic Luwian (Chapter 2). This puts some strain on Melchert's analysis of OSL in terms of independent lengthening developments, and makes it more attractive to think about one pre-Proto-Anatolian lengthening after all. This possibility will be explored in this excursus. I will briefly go over the most important evidence for all languages, paying attention to the scope and conditioning of OSL in Hittite, Palaic and Luwian, before returning to the question whether we can actually reconstruct (some form of) OSL in Proto-Anatolian.

Hittite

The idea that accented short vowels were lengthened at some point in the (pre)history of Hittite is far from new, going back to the earliest days of Hittitology (cf. Hrozný 1917: 186[1]: "Tondehnung", who based himself on Hitt. *antuḫša̲tar* < **ó*). The scope and dating of this phenomenon, however, has been a matter of considerable debate.[49]

According to Melchert (1994a: 107), lengthening in open syllables was a synchronically active rule in Hittite, as is visible from, e.g., *ku-it-ma-a-na-aš* /k^{w}itmān=as/ 'while', where the addition of the enclitic nom.sg.c. pronoun

[49] In the cuneiform languages under scrutiny here (Hittite, Cuneiform Luwian, Palaic), a long vowel is indicated by the use of an extra vowel sign (*plene writing*), e.g. <CV-V> or <V-VC> instead of <CV> or <VC>. Although the function of plene writing has been debated for many decades, the current communis opinio seems to favour the idea that its main function was to mark vocalic length, cf. Melchert 1994a: 27, Kimball 1986: 84.

=*aš* seems to have triggered an accent shift to the syllable *-ma-*, followed by lengthening of the vowel in an open syllable. Because the lengthening was still synchronically active in Hittite, Melchert (1994a: 131) has argued that the result of this lengthening was only phonetic. Phonologically, accented vowels in open syllables remained short. Also Kloekhorst (2012b, 2014) believes that the lengthening of vowels due to OSL was subphonemic, although his approach is very different from that of Melchert. Kloekhorst (2012b) argues that the phonetic lengthening due to OSL can be observed directly in the spelling: etymologically short accent vowels in open syllables are spelled with plene writing approximately half of the time, e.g. Hitt. *pé-e-ra-an* (53x OS) ~ *pé-ra-an* (52x OS) 'before' < PIE ***pérom*. In this sense, they are different from etymologically long accented vowels (near-consistent plene writing, e.g. *pé-e-da-* (54x OS) ~ *pé-da-* (4x OS) 'to carry' < PIE *(h_1)*poi-*) and etymologically unaccented vowels (usually never plene spelled, e.g. the *i* in *ne-e-pí-iš* 'heaven'). The systematic contrast in spelling between especially the first two groups, Kloekhorst argues, indicates that accented short vowels in open syllables (group 1) were phonetically half-long ([peˑran]), not quite as long as the fully long vowels in group 2: [peːta-]. In other words, short accented vowels in open syllables were lengthened due to OSL, but not to the extent that they merged with the inherited long accented vowels.

We find examples of OSL nearly all Hittite vowels: /á/ (*pa-ad-da-*(*a-*)*ni* [patʾːaˑni][50] 'basket' [dat.-loc.sg.] < PIE **peth*$_2$*-én-i*; Kloekhorst 2014: 348f.), /é/ (*ge-*(*e-*)*nu* [keˑnu] 'knee' < PIE **ǵénu-*; Kimball 1983: 333), as well as /í/ (*ši-*(*i-*)*u̯a-at-t*° [siˑwatː-] 'day' < PAnat. **díuot-* [Melchert 1994a: 131] or alternatively **diéuot-* [Kloekhorst 2014: 477f.]) and /ú/ (Hitt. *-ŭlV-* found in, e.g., *aš-šu-*(*ú-*)*li* /asːuˑli/ 'favour' [dat.-loc.sg.]; Kloekhorst 2014: 516). Thus far, no examples of phonetically lengthened /ó/ have surfaced, but this vowel was quite rare in Hittite anyway. It is very likely, therefore, that in principle all Hittite vowels were affected and lengthened by OSL.

[50] For the idea that Hittite DA-spellings represent postglottalised or ejective stops, cf. Kloekhorst 2013: 128f.

Luwian

The Luwian evidence has been treated in Section 5.3. The effects of OSL are found in both the Cuneiform Luwian and Hieroglyphic Luwian text corpora. We find evidence of its effects on nearly all short accented vowels: Proto-Anatolian **é* (CLuw. *nāu̯a* 'not' < PIE **né*), presumably also **í* (HLuw. *ti-i-wa/i-t°* /tīuaθ-/ 'Sun-god' < **díuod-*, cf. Melchert 1994a: 131) and **ú* (CLuw. *tūu̯a-* 'to put'), as well as **ó*, if CLuw. *ḫāu̯i-* does in fact continue PIE **h₃eui-*.

We have also seen, however, that OSL was significantly bled by another sound law: Čop's Law, which closed open syllables with a short accented vowel before OSL could take effect: PAnat. **mélid-* developed into PLuw. **mə́llid-* (Čop's Law) before the *é* could be lengthened in an open syllable to ***mə́lid-* > Luw. ***mā́li-*.[51] For this reason, the only plausible cases of OSL in Luwian are found in front of the glides [j] and [w], and in word-final position.

Palaic

The Palaic data is expectedly meagre but nonetheless, a few cases of OSL have been proposed for this language as well.[52]

Pal. *pí-i-ša* /pīsa/ 'give' (2sg.imp.act.) is interpreted as the stem *pi-* 'give', enlarged by an imperfective suffix *-ša-* (~ Hitt. *-šša-^{i}*), as attested with the same root in CLuw. *pí-pí-iš-ša* /pipissa/ 'give' (2sg.imp.act.) and HLuw. *pi-pa-sa-* /pipassa/(?). Notably, the Palaic plene spelling could show the result of an accent retraction similar to that of CLuw. *pūi̯a-* and Hitt. *pūu̯en(i)*, see above and Melchert 1994a: 200. Another example is Pal. *šu-ú-na-at* /sūnat/ 'fill' (3sg.pret.act.); *šu-ú-na* /sūna/ 'id.' (2sg.imp.act.), cf. Melchert 1994a: 202. The plene spellings in the root can be compared to that of CLuw. *šu-u-u̯a-* 'id.', perhaps with a similar accent shift from **su-nóH-* to **sú-noH-*, cf. Melch-

[51] For an alternative explanation for forms involving glides, cf. Section 5.4.1.

[52] As long as plene writing in Palaic has not been investigated in full detail, we cannot know for certain that it marks vocalic length, as in Hittite and Cuneiform Luwian. It is not to be expected, however, that plene writing has a dramatically different function in Palaic compared to Hittite and Luwian, as the Palaic texts we have were presumably composed by the same scribes who also wrote the Hittite and Cuneiform Luwian texts.

ert (1994a: 89). Two final examples are Pal. *tu-ú* /tū/ 'you' (acc.-dat.sg.), the cognate of HLuw. *tú-u* 'id.' < PAnat. **tú* (treated in Section 5.3), and Pal. *nu-ú* /nū/ 'now', meaning 'now' (< PIE **nú*, cf. Melchert 1994a: 202). In both of these forms, however, we may also be dealing with lengthening of accented monosyllables.[53]

We have examples of OSL affecting at least the vowels /i/ and /u/ in Palaic, but I see no reason not to assume, with Melchert (1994a: 204), that in principle all vowels could be lengthened by this development.

Proto-Anatolian OSL

With all this in mind, we turn to the dating of OSL within Anatolian. Melchert (1994a: 132) has argued that open syllable lengthening must be a post-Proto-Anatolian rule. His reason for assuming this involves Hitt. *tuk* 'you' (acc.-dat.sg.), which shows a short vowel and the added element *-k* with regard to its Pal./HLuw. cognate *tū* 'id.' < PAnat. **tú*. Melchert correctly observed that a full phonologisation of OSL cannot have taken place in Proto-Anatolian already, since its expected result ***tū* would have developed into Hitt. ***tūk* after the specifically Hittite addition of *-k*. In addition, I suggest that another argument to take the phonologisation of OSL as a post-PAnat. rule comes from Luwian. If Proto-Luwic had already undergone a general lengthening of all instances of **ÝCV* to **V́CV*, there would have been no input for Čop's Law, which takes the same input. For instance, if the *é* in PAnat. **pérom* 'before' had been phonologically lengthened to **é́* in Proto-Anatolian, then resulting **pé́rom* would never have yielded attested Luw. *parran* through Čop's Law.

Nevertheless, the fact that we find the effects of OSL in each of the four Anatolian languages in which we can identify signs of vowel length makes it quite uneconomical to assume three independent instances of the same phonetic development: pre-Hittite, pre-Palaic and pre-Proto-Luwic. Rather, I believe we can account for the lengthening effects in all four languages

[53] Other potential cases of OSL in Palaic mentioned by Melchert (1994a: 200ff.), including Pal. *ḫa-ši-i-ra-* /hasīra-/ 'dagger'(?) < PIE **Hn̥síro-* and Pal. *pa-a-pa-* 'father' < PAnat. **bába-* are not compelling.

by assuming that pre-Proto-Anatolian *did* undergo open syllable lengthening, but only on a phonetic level. In open syllables, short vowels were pronounced slightly longer than in closed syllables: accordingly, /é/ = [e] in closed syllables, [eˑ] in open syllables.

This situation seems to have remained unchanged in Hittite, where OSL did not bring about any phonological change. Thus, when pre-Hittite added *-k* to inherited */tú/ *[tuˑ] (< PAnat. *tú*), the vowel was automatically shortened: [tu]. The phonetic length remained tied to the accent and the syllable structure, and did not become phonological in Hittite.

In Luwian, OSL must have remained subphonemic until after the completion of Čop's Law in Proto-Luwic (**VCV* > **VCCV*). Taking the same example as above, I assume that PAnat. **pérom* developed a half-long allophone in its initial open syllable: *[peˑrom], which remained phonologically short. When Čop's Law closed the syllable (pre-PLuw. */pérom/ > PLuw. */pə́rrom/), the half-long vowel automatically reverted to short: [əˑ] > [ə], leaving no trace of its original phonetic length. The remaining phonetically half-long vowels which did not undergo Čop's Law eventually merged with their long counterparts (e.g. *nāu̯a* 'not' and HLuw. *tū* 'you'). It is difficult to say when exactly this merger took place. Lycian seems to have lost vowel length oppositions, while the Lydian script does not seem to mark it in a consistent way (cf. Gérard 2005: 37; Kloekhorst 2018). It is possible, therefore, that the phonologisation of open syllable lengthening was completed in Proto-Luwic already.

The same is—as far as we can see—true for Palaic: also in this language, the vowels which were lengthened through OSL eventually merged with their inherited long counterparts. A schematic representation of these developments is given in Figures 5.2 and 5.3.

Conclusion

With regard to the conditioning and scope of Open Syllable Lengthening, the Hittite (and Palaic) data show very little restrictions to its application, as we find traces of OSL on all short vowels, either word-final or immediately preceding (lenis) stops and resonants—semivowels included—whenever

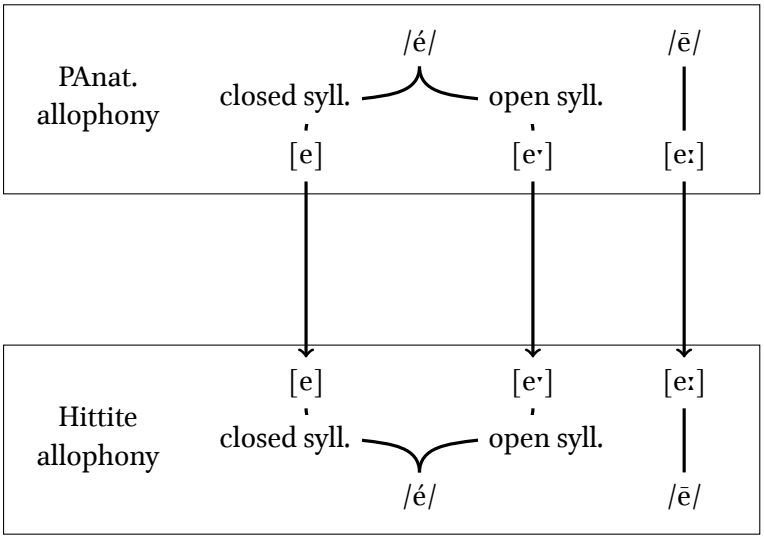

Figure 5.2: OSL in Hittite

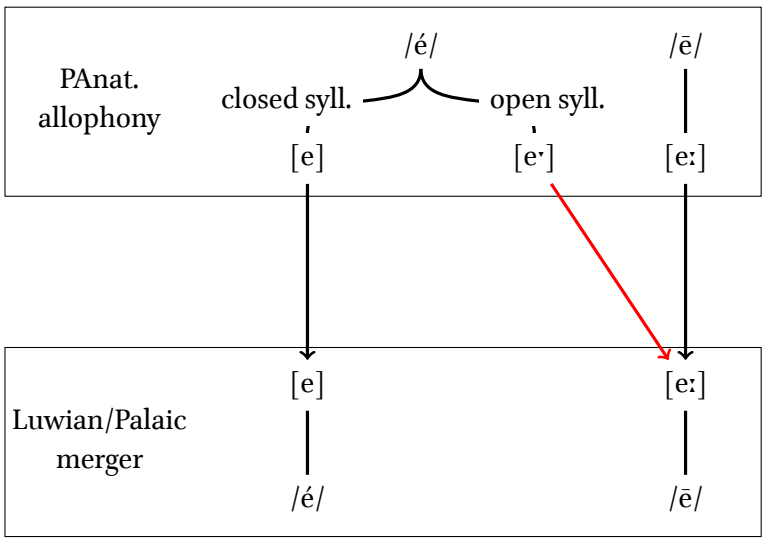

Figure 5.3: OSL in Luwian and Palaic

they stood in open syllables and were accented. In Luwian, on the other hand, the effects of OSL appear to have been decidedly more modest. We only find cases of OSL before glides ([j] and [w]) and in word-final position. These restrictions seem to be secondary, however, as they have an inner-Luwic explanation, and I therefore conclude that in Proto-Anatolian, OSL in principle affected all cases of *-*V́*# and *-*V́CV-*.

I agree with Melchert that the effects of OSL cannot have been phonologised in Proto-Anatolian already. Not only his analysis of Hitt. *tuk* but also the synchronic phonetic half-length in Hittite as well as the relative chronology of OSL and Čop's Law attest to this. Nevertheless, I have argued that we can still find a common origin for the lengthening effects in Hittite, Luwian and Palaic if we assume that an accent-based lengthening of accented short vowels in open syllables existed in Proto-Anatolian on a phonetic level.

Summary and implications

In the preceding chapters, we have analysed various key features of Luwian phonology and reached several conclusions that differ from and build upon previous analyses put forward in the scholarly literature. These conclusions do not only have consequences for our reconstruction of Proto-Anatolian and Proto-Indo-European, but also illustrate some of the methodological tools necessary to conduct historical phonological research based on material from a dead language.

In Chapters 1–2, we have looked at the use of so-called 'plene spellings' in the Hieroglyphic Luwian corpus, such as *pa-a*, *mu-u* and *ti-i* (as opposed to simply *pa*, *mu* and *ti*). The function of these spellings has hitherto not been fully understood. We have seen that the seemingly superfluous vowel signs (<a>, <i>, <u>) in many of these plene spellings serve to fill up any remaining space at the end of a word. By using these vowel signs as non-linguistic space-fillers, scribes were able to make use of all available space without leaving any significantly sized gaps. Nevertheless, it was demonstrated that not all of these HLuw. plene spellings can be taken as space-fillers. In several instances, their additional vowel signs do not seem to help the scribe avoid textual gaps, suggesting that they serve another purpose. On the basis of etymological and comparative analysis, it was proposed that these plene spellings rather mark the presence of long vowels or disyllabic sequences, quite similarly to how vowel length is expressed in the cuneiform script.

The most important conclusion reached in these chapters is that we can now confirm that the Luwian variety written in hieroglyphs opposed long to short vowels, and that the hieroglyphic script was used to express this opposition. This insight has opened up a wealth of hitherto disregarded material in the form of Hieroglyphic Luwian plene spellings. We are now able to distinguish plene spellings that serve as space-fillers from those that are markers of vocalic length or a disyllabic sequence. While some plene spellings, such as those found in the endings of the *i*-stem nouns and adjectives (nom.sg.c. *Ci-i-sa*, acc.sg.c. *Ci-i-na* etc., Section 2.6.1), remain difficult to interpret, it is clear that others, like the enclitic personal pronoun *=tu-u*/*=tú-u* 'he/she/it' (dat.-loc.sg.; Section 2.4.2) and (DEUS)TONITRUS-*hu-ti-i* (DN, dat.sg.; Section 2.5.3) are strong candidates for markers of vocalic length. The discovery that these plene spellings represent synchronically long vowels limits the amount of possible etymologies and helps us reconstruct their ancestral forms. The long final *-ī* in (DEUS)TONITRUS-*hu-ti-i*, for instance, can no longer be equated with the synchronically common ending *-i*. We can now see that it must rather be the preserved reflex of the PIE hysterodynamic dative singular ending **-éi*. Similarly, this interpretation limits the amount of possible etymological precursors to words whose etymology is unknown, such as *pi-i-ha-mi-na* 'glorified'(?) (Section 2.6.7), whose long *ī* can now only plausibly continue a PIE diphthong or a combination of PIE *i* and a laryngeal.

Chapter 3 marked a shift of focus from vowels to consonants, and offered an extension of and reaction to the ideas proposed in Rieken 2010b, about the phonetic values of the hieroglyphic signs <ta> en <tá>  . Taking into account the entire known HLuw. text corpus, it was argued that the phonetic difference between these signs is better interpreted in terms of consonantal length rather than consonantal voicing: the hieroglyphic sign <tá> was used to write a short stop [t]/[d] and is mostly used in word-internal consonant clusters and the word *tá-ti-* 'father', whereas <ta> represents a long stop [t:] and is only found intervocalically or word-initially.

This insight helps us analyse Luwian words containing either of these signs, not only those found in Karkamiš subcorpus (Rieken 2010b: 308f.), but in all HLuw. texts in which <ta> and <tá> both occur. Thus, words with

word-internal <tá> most probably contain consonant clusters, as in the case of TELL AHMAR 6 § 8 (MORI)*wa*/*i-la-tá* which I have proposed we should analyse as /ualta/ 'to die' (3sg.pret.act., cf. Section 3.5.2). More importantly, the orthographic distinction between long and short consonants may well preserve traces of an older language stage, in which the distinction was still phonologically contrastive. This idea is neatly compatible with the conclusions reached in the following chapter.

Chapter 4 took a closer look at the orthography, phonetics and phonology of the Cuneiform Luwian dental stops. The use of two signs (<TA> 𔓨 and <DA> 𔓩) in our corpus is analysed and subjected to statistical analysis. The non-random spelling patterns emerging from this analysis turned out to be largely comparable to patterns involving the same signs in Hittite. This suggests that the Proto-Anatolian dental stops surface in a phonetically similar way in both Hittite and Luwian. Nevertheless, there are also clear differences, especially regarding the spelling of the intervocalic 'lenis' dental stops. The Luwian spelling patterns found for these stops suggest that the synchronic difference between fortis and lenis consonants might have been contrastive only on account of length: fortis /t:/ [t:] vs. lenis /t/ [t]. Compared to the other Anatolian languages, in which the difference between 'fortis' and 'lenis' obstruents involves a voicing contrast (at least phonetically), the Cuneiform Luwian material appears to have preserved an older state of affairs. As argued in Section 4.5.1, the CLuw. spelling pattern supports the reconstruction of a consonantal length contrast in Proto-Anatolian and, by extension, Proto-Indo-European. The main findings in this chapter can therefore be used indirectly as an argument in favour of an early Anatolian split, which was completed before the common ancestor of the other Indo-European language branches developed its length-based stop opposition into one based on voicing, as argued in Kloekhorst 2016a: 235–241.

In Chapter 5, lastly, we considered two independently proposed sound changes that operated in the Proto-Luwic language stage, *Čop's Law* and the lengthening of accented short vowels in open syllables (OSL). It was proposed that these changes do not only take complimentary inputs (i.e. short accented open syllables), but also yield the same output on an ab-

stract phonological (moraic) level: an accented heavy syllable. The second half of this chapter accounted for the functional symmetry of these two changes by analysing the phonological system as it was inherited by Proto-Luwic. It turned out that *Čop's Law* and OSL can be seen as extensions of a phonological pattern that had already been starting to materialise in Proto-Anatolian, leading to the situation in Proto-Luwic where syllable weight, vowel length and consonantal length became dependent on the place of the stress accent and lost much of their contrastive value to a significant degree.

On a broader, methodological level, this dissertation has emphasised the importance of investigating non-random spelling patterns when working with ancient written languages. If certain words or morphemes are consistently written in a certain way while others are written in another, this is a strong indication in favour of an underlying phonetic and/or phonological contrast. Moreover, Chapters 3–4 in particular have shown that for a solid interpretation of these spelling patterns, both how the words they are found in were pronounced and how they might have changed over time, linguistic typology is of cardinal importance. In order to assess the plausibility of our phonological interpretations and reconstructions, we must apply our knowledge of linguistic systems and sound change in general.

The pronunciation of ancient languages and its prehistory is by definition inaccessible to direct observation: we cannot test our hypotheses directly by soliciting the knowledge of native speakers. This is no less true for the Luwian language, whose last speakers passed away thousands of years ago and whose texts, preserved fragmentarily in stone, clay and metal, are virtually the only form in which it has reached us. We must recognise that the language underlying these nearly forgotten texts was used and changed in the same way as other languages spoken in past and present, and that we can use our knowledge of language change to interpret the Luwian data as well. Only then can we start to leap across the millennia and excavate these long forgotten voices.

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Nederlandse samenvatting

Deze dissertatie bevat vijf hoofdstukken die allemaal in de vorm van artikelen gepubliceerd of ter publicatie aangeboden zijn en elk een ander aspect van de Luwische historische fonologie behandelen. De eerste twee hoofdstukken behandelen het Luwische klinkersysteem, de twee daaropvolgende de medeklinkers. De rode draad in deze hoofdstukken is de conclusie dat spellingvariatie in veel gevallen niet willekeurig is, maar bepaald wordt door onderliggende principes die wijzen op een fonetisch contrast. Door deze contrasten bloot te leggen begrijpen we beter hoe de Luwiërs het spijkerschrift en het hiërogliefenschrift gebruikten om hun taal weer te geven, en kunnen we het Luwische foneemsysteem en zijn voorgeschiedenis nauwkeuriger in kaart brengen. Het laatste hoofdstuk is abstracter van aard: het bekijkt twee fonetische ontwikkelingen die weliswaar volledig onafhankelijk lijken maar bij nader inzicht toch ook een zekere samenhang vertonen.

De eerste twee hoofdstukken onderzoeken de manier waarop klinkers geschreven worden in het Luwische hiërogliefenschrift. Bijna alle teksten laten veelvuldig een afwisseling zien tussen spellingwijzen met en zonder toegevoegde klinkertekens, zoals *pa-a*, *mu-u* en *ti-i* naast *pa*, *mu* en *ti*. Het eerste hoofdstuk laat zien dat veel van deze toegevoegde klinkertekens gebruikt worden om de ruimte aan het einde van een woord op te vullen. Op deze manier voorkwamen de schrijvers dat er gaten in de tekst achterbleven. Het tweede hoofdstuk onderzoekt een resterende groep van spellingen met toegevoegde klinkertekens die niet onmiddelijk bijdragen aan het voor-

komen van lacunes in de tekst. Deze klinkertekens zijn daarom ook niet op te vatten als vulmateriaal, maar doen in sommige gevallen dienst als markeerders van klinkerlengte, bijvoorbeeld Hiëroglyfisch Luwisch *tu-u* [tu:]. Dit bewijst niet alleen dat het Hiëroglyfisch Luwisch klinkerlengteverschillen kende, maar ook dat deze in het schrift gemarkeerd werden.

In hoofdstuk drie wordt gekeken naar de spelling van dentale stops in het Hiëroglyfisch Luwisch. Eerdere literatuur (Rieken 2010) noemt een distributie in het gebruik van de tekens <ta> 𔕰 en <tá> 𔖪, die tot dat punt als willekeurige allografen werden gezien. Rieken neemt echter niet het hele corpus in beschouwing en gaat niet na wat de gevolgen van deze distributie zijn voor het Luwische foneemsysteem. Het onderhavige hoofdstuk drie doet dit wel, scherpt de distributie tussen <ta> en <tá> aan, en levert twee nieuwe fonetische interpretaties aan voor het onderliggende fonetische verschil tussen beide tekens.

Hoofdstuk vier behandelt de spelling, fonetiek en fonologie van de Luwische dentale stops, maar richt zich nu op het Spijkerschriftluwisch. Het blijkt dat de spijkerschrifttekens TA 𒋫 en DA 𒍑, die in de literatuur als vrij inwisselbaar worden gepresenteerd, eigenlijk duidelijke patronen laten zien. In sommige fonetische omgevingen vinden we een sterke voorkeur voor een van beide tekens, terwijl ze in andere omgevingen sterk lijken te wisselen. In dit paper wordt onderzocht welke fonetische realisatie aan elk van deze spellingspatronen ten grondslag ligt. Het blijkt dat het Spijkerschriftluwische gebruik van TA en DA grotendeels identiek is aan dat van het Hittitisch. Het grootste verschil tussen beide talen behelst de weergave van de intervocalische 'lenis' plosieven. Het Spijkerschriftluwisch lijkt in dezen een oudere situatie te bewaren dan het Hittitisch.

Het laatste hoofdstuk werpt een nadere blik op twee klankveranderingen die in de geschiedenis van het Luwisch hebben plaatsgevonden: *Čop's Law* en de rekking van geaccentueerde korte klinkers in open lettergrepen. Het blijkt dat beide klankwetten in het Luwisch complementaire effecten hebben (die binnen een moraïsche interpretatie zelfs identiek zijn): beide ontwikkelingen zorgden ervoor dat geaccentueerde lichte lettergrepen verzwaard werden. In het tweede deel van dit hoofdstuk wordt betoogd dat deze verzwaring van geaccentueerde lettergrepen misschien wel ten dele veroorzaakt is door een aantal fonetische ontwikkelingen die in de geschie-

denis van het Luwisch geaccentueerde lettergrepen verzwaarden en ongeaccentueerde lettergrepen verlichtten. Deze veranderingen leidden ertoe dat syllabezwaarte en klinker- en consonantlengte tot op zekere hoogte aan contrastieve waarde verloren en bijna gedefonologiseerd werden.

Curriculum Vitae

Xander Vertegaal was born in Nijmegen (the Netherlands) on May 8th 1992. He was raised in Boxmeer and attended the Elzendaal College there, finishing in 2010 with exams in French, German, Latin and Ancient Greek. He continued his study of the latter two at the Radboud University Nijmegen, obtaining his BA (*summa cum laude*) in Classics with a thesis on Ancient Greek verbal reduplication in 2013. That same year, he moved to Leiden in order to do a Research Master in Linguistics with a focus on Comparative Indo-European Linguistics. He graduated in 2015 (*summa cum laude*) with an MA thesis on the use and development of the nominal suffix *-ēla* in Latin, which was awarded a thesis award (first prize) by the *Indogermanische Gesellschaft* in 2016. In September 2015, he joined the VIDI project "Splitting the mother tongue: The position of Anatolian in the dispersal of the Indo-European language family", led by Dr. Alwin Kloekhorst. This thesis contains the main results of the research conducted within that project.