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SOUND CHANGES FROM OLD PHRYGIAN TO NEW PHRYGIAN IN AN AREAL CONTEXT

ALJOŠA ŠORGO

ABSTRACT · Phrygian, an extinct Indo-European language from Central and West Anatolia, is attested in inscriptions from about the 8th century BCE to the 6th century BCE (Old Phrygian) and from the 1st to the 3rd centuries CE (New Phrygian). A synchronic overview of Old and New Phrygian phonology and phonetics shows that a number of sound changes affected the language between both periods of attestations (with Phrygian inscription W-11 from the early 3rd century BCE providing a glimpse of the language between both stages). Some of these developments are: 1) simplification of the vowel system; 2) nasalisation and changes in quality of vowels followed by nasals in coda position; 3) simplification of consonant clusters and the emergence of contrastive gemination, which was subsequently lost; 4) weakening of stops in coda position. The developments are discussed within a broader Anatolian context and the similarity between a number of phonetic and phonotactic features in Lycian and the Phrygian developments are noted.

KEYWORDS: Diachronic linguistics, Phrygian, Old Phrygian, New Phrygian, Stop weakening, Unreleased stop, Gemination, Nasalization, Linguistic area, Language contact, Sprachbund, Anatolian Greek, Anatolia, Anatolian languages, Luwian, Lycian, Lydian.

1. INTRODUCTION

PHRYGIAN is an extinct Indo-European language attested in inscriptions from Central and West Anatolia in the first millennium BCE and the early first millennium CE. Old Phrygian documents date from about the 8th to the 6th century BCE and are written in a native alphabet. The language then disappears from the written record almost entirely until the New Phrygian era, when a number of inscriptions in the contemporary Greek alphabet are known from the 1st to the 3rd centuries CE (Ligorio & Lubotsky, 2018, 1816-1818).

By the New Phrygian era, the importance of the language was obviously diminished, as was the case for other languages in the area other than Greek, but the period leading up to this point would have seen a large degree of cultural and linguistic exchange between Phrygian and its neighbours (Brixhe, 2002, 248-252). It is likely that some of the sound changes which separate Old and New Phrygian were the result of its linguistic environment.

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2. SOUND CHANGES FROM OLD TO NEW PHRYGIAN

2. 1. 1. Vocalism

Old Phrygian possessed a phonological vowel length distinction, which had apparently been lost by the New Phrygian era. The short vowels remained unchanged, while the long vowels were shortened, with Old Phrygian /ō/ also being raised: OPh. /ā/ > NPh. <α> /ă/; OPh. /ō/ > NPh. <ου> /u/. The short diphthongs, save OPh. /ei/, remained unchanged: OPh. /ai/ > NPh. <αι>; OPh. /oi/ > NPh. <οι>; OPh. /au/ > NPh. <αυ>; OPh. /eu/ > NPh. <ευ> (Ligorio & Lubotsky, 2018, 1819-1822).

The reflex of the Old Phrygian diphthong /ei/ in medial position is usually written <ει> in New Phrygian (e.g. γεγρειμεναν), but there are two secure instances where <ει> and <ι> are seemingly confused with each other (τιτετεικμενος^ο 19 for expected τιτετικμενος, and γεγριμεναν^ο 58 for expected γεγρειμεναν). These are most likely scribal errors made under the influence of imperial Koiné Greek, where <ει> had already acquired the value [i] (Allen, 1968, 66).

In final position, the reflex of Old Phrygian /ei/ was written as <η>, <ει>, <ι>, or <ε> in New Phrygian, most notably in the singular dative case of consonant stems. Since this segment, like the diphthongs, always scans as long in New Phrygian malediction formulae, whereas formerly long vowels scan as short (Lubotsky, 1998, 416), it is likely that the monophthongization of this diphthong is relatively late and took place within the New Phrygian period (*ibid.*, 415), with the sound presumably developing to [ē]. This explains the spellings with <η>: in contemporary Greek this grapheme represented a long mid-high front vowel [ē] (Allen 1968: 71).

The Old Phrygian long diphthongs /ōi/ and /āi/, only found in coda position, lost their glide element and subsequently developed in the same way as Old Phrygian /ō/ and /ā/, namely, to <ου> and <α> (Ligorio & Lubotsky, 2018, 1822). This development, in particular for /āi/, does not appear to have been entirely regular, and in some cases it appears that the vowel was shortened and the glide preserved (Brixhe, 1983, 119; Lubotsky, 1998, 416); forms with both <α> and <αι> coexist for the same lexical items in the same syntactic role (cf. μανικα^ο 29 ~ μανικαι^ο 2; σα^ο 21 ~ σαι^ο 35). Whether these are instances of historical spellings (Brixhe, 1983, 119) or, as seems more likely, at least in some cases, analogical developments, is currently unclear.

One peculiarity of New Phrygian is the development of the plural dative ending of o-stems, descended from PIE *-ōis. This ending is written as <-ως> almost consistently, appearing as <-ος> only three times. This makes it very likely we are dealing with a separate segment: /o₂/, most likely [ō] (Lubotsky, 1998, 414).

2. 1. 2. Pre-nasal raising of mid vowels

Both Old and New Phrygian inscriptions indicate that mid vowels were raised before a nasal in coda position: <en> and <in> are used interchangeably, as are

<on> and <un>. Brixhe (1983, 119-120) proposed that the distinction between mid and high vowels was neutralised before a final nasal. The consistent spelling of the New Phrygian indefinite pronoun $\kappa\iota\nu$ ($^{\circ}9$, $^{\circ}30$, $^{\circ}98$, $^{\circ}100$), etymologically $*k^wim$, with <ι>, however, demonstrates that high vowels were preserved in the final syllable, so it seems more parsimonious to assume that mid vowels [ɛ] and [ɔ] were simply raised to mid-high vowels [ɛ̃] and [ɔ̃] before a final nasal.

There is evidence for the nasalisation of vowels before a final nasal, some of it implying that these nasalised mid vowels were somewhat more centralized than their plain counterparts.¹ Compare $\sigma\epsilon\mu\nu\nu$ ($^{\circ}76$, $^{\circ}100$, $^{\circ}107$), $\kappa\alpha\kappa\iota\nu$ ($^{\circ}14$), $\kappa\alpha\kappa\epsilon\nu$ ($^{\circ}40$, $^{\circ}97$, $^{\circ}119$), $\kappa\alpha\kappa\epsilon\upsilon\nu$ ($^{\circ}45$), and $\kappa\alpha\kappa\epsilon$ ($^{\circ}21$, $^{\circ}88$, $^{\circ}99$, $^{\circ}124$) with expected $\sigma\epsilon\mu\omicron(\upsilon)\nu$ and $\kappa\alpha\kappa\omicron(\upsilon)\nu$.² This confusion of the front and back quality of vowels may be due to a centralised pronunciation of nasalised mid vowels (as already suggested by Orel [1994, 60]), moving them toward [ɛ̃]~[ẽ] and [ɔ̃]~[õ], which made them more difficult to distinguish and possibly merged them for some speakers. Notably, such spelling vacillation does not occur in non-nasal contexts.

2. 1. 3. Overview of Old Phrygian and New Phrygian vocalic systems

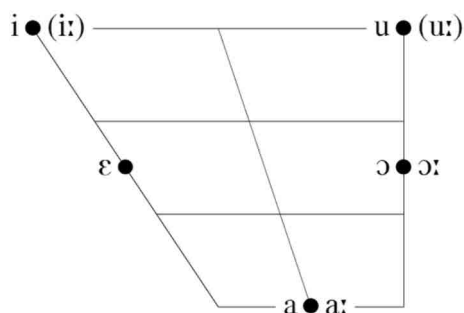


FIGURE 1. The vocalic segments of Old Phrygian, based on Ligorio & Lubotsky (2018, 1818-1819 *et passim*).

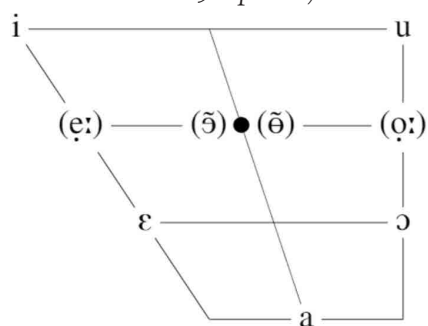


FIGURE 2. The vocalic segments of New Phrygian, based on Ligorio & Lubotsky (2018, 1818-1819 *et passim*) and the preceding analysis.

¹ See 2. 2. 3 below.

² Some of these examples have alternative readings and scribal error cannot be entirely excluded.

2. 2. 1. *Consonantism*TABLE 1. Consonantal segments of Old Phrygian, based on Ligorio & Lubotsky (2018, 1819-1820 *et passim*).

	labial	dental	alveolar	palatal	velar
voiceless stop	/p/ <p>	/t/ <t>			/k/ <k>
voiced stop	/b/ 	/d/ <d>			/g/ <g>
affricate		/dz/ <↑>, <ś>			
fricative		/s/ <s> /s:/?			
nasal	/m/ <m>	/n/ <n> /n:/?			
resonant			/r/ <r> /l/ <l>		
semi-vowel				/j/ <y>, <i>	/w/ <v>

TABLE 2. Consonantal segments of New Phrygian, based on Ligorio & Lubotsky (2018, 1819-1820 *et passim*).

The segments of the consonantal system of Phrygian remained almost entirely unchanged throughout its recorded history.¹

	labial	dental	alveolar	palatal	velar
voiceless stop	/p/ <π>	/t/ <τ>			/k/ <κ>
voiced stop	/b/ <β>	/d/ <δ> /s/ <σ>			/g/ <γ>
fricative		/z(:)/ <ζ>			
nasal	/m/ <μ>	/n/ <ν>			
resonant			/r/ <ρ> /l/ <λ>		
semi-vowel				/j/ <ι>	/w/ <ου>, <ο>

2. 2. 2. *Obstruents in coda*

The most common New Phrygian obstruent in coda position is <-ζ>, appearing in numerous grammatical endings, e.g. the nominative singular masculine ending -s (Ligorio & Lubotsky, 2018, 1823 ff.).

On the other hand, the plosives written as <τ>, <δ>, and <κ> are rarer and appear to be restricted to certain environments, which was not the case in Old Phrygian.

¹ The only change might have been the development of the sound represented with the grapheme <↑> in Old Phrygian, which is written <ζ> in New Phrygian (Brixhe 1982, 229-246). Since the exact phonetic value of <↑> is disputed (see Brixhe 1982, 238 *et passim*; Orel 1997, 13), the phonetic development (if there was any) remains uncertain.

Final <τ> appears in two forms, with very few exceptions: 1) in the 3rd person singular non-present grammatical ending (αδδακετ, αββερετ, ...); and 2) as part of the “geminating” preposition *ad/αδ* before a dental.¹ Since the second category can be discounted as a case of assimilation, the only true examples of word-final <τ> are restricted to a single grammatical ending. Furthermore, some instances of this grammatical ending show unexpected realisations: αδακεν με °5, αδδακεμ μανκαι °35, αδδακεκ γεγρειμ[ε]ναν °32, αδ[α]κε ατε[τικμενο]ς °51, αδ[δα]κε μανκαι °60, αδδακε ταικαν °62. In three of these examples, the ending is assimilated to the following segment, and in the other three it is lost entirely.² Two of these instances of loss (but not the case of °51) may likewise be explained as assimilation to geminates, but with degeminated spellings.³ In °51, where ατε[τικμενο]ς begins a new clause and αδ[α]κε is thus in clause-final position, the /t/ is lost entirely. The optimal explanation seems to be that final /t/ was weakly pronounced by at least some speakers (phonetically this most likely means it was unreleased) and as a result was prone to loss or assimilation.

The same must hold for final <δ>: it only appears a single time in the New Phrygian corpus, as part of the “geminating” preposition *αδ* before a vowel (αδ ατεμας °14). The preverb *αδ*, no doubt etymologically the same entity, likewise appears as *αδ* in front of vowels (e.g. αδειτου). In front of plosives, however, both the preverb and the preposition *αδ* undergo assimilation of their final element (e.g. ακ κε < *αδ κε; αββερετ < *αδ=βερετ) with occasional degemination (e.g. α Τιε < *αδ Τιε).⁴

Word-final <κ> appears in two positions: before a vowel and before a velar. Instances before a vowel are illusory, as they are all simply the conjunction *κε* with its final element elided before a vowel (cf. Greek *καί*).⁵ Those cases that do not go back to an assimilated final <τ> or <δ> (dealt with above) are: αδιθρερακ ξευνοι °31, δαδωνκε οκκ αυγοι °69, μιρου ικ κναικαν °116. <οκκ> is most likely *οτ κε.⁶ αδιθρερακ is cited by Orel (1997, 332) as an example of a final /s/ assimilating to /k/;⁷ this proposal is problematic, since there are numerous instances of -s#k- not undergoing assimilation in New Phrygian, so the development, if upheld, would surely be irregular. If the interpretation as a personal name is correct, it seems preferable to me to assume the name ended in a plosive, either *-k# or *-p#.⁸

¹ The final element of the “geminating” preposition assimilates to a following plosive, producing a geminate.

² The specific case of αδακεν με °5 as resulting from assimilation will be dealt with below.

³ Comparatively common in New Phrygian; whether this phenomenon reflects actual degemination or a spelling simplification is uncertain.

⁴ This process might have been operational in Old Phrygian already, depending on the reading of B-05: Brixhe (2004, 48) reads *ad kqliyay*, while Neumann (1997, 18) reads *-akaliyay*.

⁵ NB: Greek *καί* and Phrygian *κε* are not to be etymologically equated.

⁶ The same preposition is found in *κε οτ εκτει[...]* °92 and *οτ τιττετικμενος* °124.

⁷ The word was proposed to be a personal name *Αδιθρερας* by Neumann (1986, 82).

⁸ Nominatives of stems ending in a plosive (save -t#) in Phrygian do not synchronically have a sigmatic nominative: cf. OPh. NSg. *-vanak* ~ GSg. *vanaktos* ‘king’. The nominative of *Αδιθρερατ- would surface as *Αδιθρερας (cf. NSg. *Βας* ~ ASg. *Βατ-αν* [‘the god] Bat’).

ικ κναικαν ^ο116 shows an unknown preposition with its final element geminated.¹

It thus seems exceedingly likely that final stops were unreleased in New Phrygian, which would make them prone to loss or assimilation.² The prevalence of spellings with -τ# in verbal forms is most likely the result of restoration of /-τ/ on the basis of other 3rd person singular forms (e.g. -τι, -τορ, -τοι).

2. 2. 3. Nasals in coda

In a limited number of cases, expected final nasals in New Phrygian are unwritten: κικε ^ο21, ^ο88, ^ο99, ^ο124 instead of κικεν ^ο40, ^ο97, ^ο119; σεμου ^ο19 for standard σεμο(υ)ν. Since nasals are stops from a phonetic perspective, a development identical to that of the oral stops would not be unexpected. If we uphold this idea, nasals in coda were unreleased, which explains their not being written.

The two examples σεμουμ κνουμιν ^ο5 and αδδακεμ μανκαι ^ο35 are seemingly anomalous, since all instances of word-final -μ# were removed from the language by regular sound change.³ αδδακεμ is obviously an assimilated variant of αδδακετ, but -μ#κ in σεμουμ for standard σεμουν remains puzzling. The fact that vowels change their quality before nasals may provide us with a solution. If vowels before final nasals were allophonically nasalised and final nasals subsequently became lost for some speakers, nasalisation of final-syllable vowels would be a salient feature of the language that would remain preserved. These vowels could only be spelled with a nasal coda or simply as their non-nasalised counterparts, both of which are attested. Spellings with -Vμ can in this case be interpreted as an attempt at writing a nasalised vowel and are thus not true examples of final -μ.

αδακεν με ^ο5, αδδακεμ μανκαι ^ο35, and αδ[δα]κε μανκαι ^ο60 can now be interpreted as representing fundamentally the same phenomenon: [-ketm-] > [-keṫm-] > [-kēm̄m-], and [-kēm̄m-] with degemination in ^ο5 and ^ο60: the nasalised vowel is written plainly in ^ο60 and with -ν in ^ο5. Especially αδδακεν is telling, since there is some evidence that sequences of -nm- were assimilated in Phrygian even across word boundaries.⁴

The aberrant spellings of κνουμαν- (κνουμμανει ^ο44, κν[ου]μμανει ^ο53, [κνο]υμμανει ^ο101, κνουμμανει ^ο105) may be understood within this framework as being attempts at writing a nasalised vowel (word-internally in this case presumably due to presence of nasals before and after the vowel) and the assumption of hypercorrect spellings is no longer required (*pace* Brixhe 1999, 296).

¹ As proposed by Alexander Lubotsky (personal communication).

² For an overview of sandhi phenomena in New Phrygian, see also Brixhe (1999, 309-313).

³ The loss of final *-m is of considerable age: *-m̄ > OPh. -an, as in *meh_{term} > OPh. materan 'mother (acc. sg.)' (W-01a).

⁴ See Brixhe's suggestion (2004, 18 *et passim*) for inscription W-11 and Vine (2010), who derives *iman* from *enmen-, with the form *inmeney* still preserved (or graphically restored?) in Old Phrygian.

2. 2. 4. Rise and loss of germination

Apparent gemination of consonants in Phrygian can for the most part be explained as assimilation across word boundaries, most commonly of prepositions (e.g. preposition $\alpha\delta$, sporadically $\mu\epsilon$).¹ The vast majority of word-internal geminate spellings occur with a preverb and verb combination: $\alpha\delta$ = $\delta\alpha\kappa\epsilon\tau$, $\tau\iota\tau$ = $\tau\epsilon\tau\iota\kappa\mu\epsilon\nu\omicron\varsigma$, $\alpha\beta$ = $\beta\epsilon\rho\epsilon\tau$, etc. These preverbs must be derived from prepositions, which are still synchronically attested in New Phrygian. Gemination in these instances can thus be explained as preservation of a former sandhi phenomenon.

In a number of instances (approximately one third), these combinations of preverb and verb do not show a geminate spelling. Since the standard New Phrygian malediction formula has a dactylic rhythm (with syllables being long due to either including a diphthong or *per positionem*) (Lubotsky, 1998, 413 *et passim*), it has been proposed that New Phrygian geminates represent etymological spellings (Brixhe, 1978, 14) and could be used as metrical license to create heavy syllables (Lubotsky, 1998, 416). It seems preferable to assume, however, that New Phrygian was in the process of simplifying geminates, word-internally at first and subsequently across word boundaries, which better describes those instances where geminates are spelt inconsistently in two preverbs within the same inscription,² and those where they are simplified in internal position, but preserved across word boundaries.³ If one assumes geminates were not a synchronic feature of any stage of New Phrygian, these cases lack a systematic explanation. I will proceed under the assumption that geminates were indeed a feature of the phonetic system of New Phrygian in at least its early stages for the time being, but the issue remains to be conclusively settled.

In addition to these etymologically transparent cases of gemination, there are a limited number of word-internal geminate spellings that cannot be explained in this manner. Excluding instances of obvious mistakes (e.g. $\mu\alpha\kappa\kappa\alpha$ ^o94 for expected $\mu\alpha\nu\kappa\alpha$), attempts at writing what I assume are nasalised vowels or the very few examples of word-initial geminates, which do not always seem to be the result of assimilation across word boundaries, these internal geminates mostly seem to be restricted to $-\nu\nu-$ and $-\sigma\sigma-$.⁴ It seems likely these geminates arose due

¹ $\mu\epsilon$ presumably for metric reasons. For $\alpha\delta$, see 2.2.2.

² A result of either metrical spelling at a time when gemination was still tolerated and understood as producing a correct metric form, or, in metrically incorrect cases, after gemination had already been lost and was inserted as hypercorrection.

³ There is in fact only one inscription, namely ^o7, where a geminate is simplified across a word boundary ($\alpha\tau\iota\epsilon$, for expected $*\alpha\tau\tau\iota\epsilon$), but preserved in internal position ($\tau\iota\tau\tau[\epsilon\tau\iota\kappa\mu\epsilon\nu\omicron\iota]$ with preserved gemination), but this inscription can also be understood as belonging to the set where gemination was no longer a synchronic feature of the language and was included without a proper understanding of the metric form.

⁴ The spellings $\kappa\omicron\upsilon\sigma\sigma\lambda\lambda\omicron\nu$ and $\lambda\kappa\kappa\iota\tau\omicron\rho$ both appear in ^o72 and are incongruent with the scenario outlined here. Since these entirely unexpected spellings appear in a single badly worn inscription (Calder, 1913, 103), it is likely that we are dealing with a specific peculiarity of the inscription or an incorrect reading.

to special developments of certain consonant clusters. While the origin of $-\sigma\sigma-$ is uncertain, but is surely due to assimilation of some kind, the forms $\delta\epsilon\delta\alpha\sigma\sigma\iota\nu\nu\iota$ and $\epsilon\gamma\omicron\upsilon\upsilon\nu\omicron\upsilon$ in $^{\circ}130$, with endings descended from PIE $*-enti$ and $*-ont\bar{o}$, seem to establish rather clearly that one source of New Phrygian $-\nu\nu-$ is $*-nt-$.¹ This development cannot be reliably dated, but may have already occurred before the Old Phrygian era (Ligorio & Lubotsky, 2018, 1822). These geminates would presumably also have been simplified at some point.

2. 2. 5. Other changes

The treatment of $sT-$ clusters in initial position in New Phrygian is unclear. The only example of such a cluster is in $\sigma\kappa\epsilon\lambda\epsilon\delta\rho\iota-$ / $\sigma\kappa\epsilon\rho\epsilon\delta\rho\iota-$, a word of obviously non-native origin due to its alternation of $\langle\lambda\rangle$ and $\langle\rho\rangle$, which is otherwise not present in Phrygian. The lack of sT clusters in initial position in Phrygian, if not accidental due to limited attestation of the language, does most likely reflect a wider areal constraint.²

In medial position, only $-st-$ / $-\sigma\tau-$ appears, and its presence in forms belonging to the verb $\sigma\tau\alpha-$ (e.g. $\epsilon\sigma\tau\alpha\epsilon\zeta$ $^{\circ}31$ with augment, $\sigma[\epsilon]\sigma\tau\alpha\mu\epsilon\nu\alpha\nu$ $^{\circ}15$ as a reduplicated passive participle) indicates that it was preserved in this environment. There are no examples of $-\sigma\pi-$ in New Phrygian and the fate of sk (found in Old Phrygian, albeit rarely), which never appears in New Phrygian, is uncertain. Brixhe's assertion (2002, 263) that Phrygians had difficulty with the cluster $/st/$ in all positions is based exclusively on the evidence of Greek spoken in Phrygian areas. There are, however, no traces of simplification of such clusters in medial position in Phrygian itself. The only two Phrygian examples provided, $\epsilon\iota\tau\omicron\upsilon < *es-t\bar{o}d$ and $\tau\iota\tau\epsilon\tau\iota\kappa\mu\epsilon\nu\omicron\zeta < *ste-stig-$ (both in Brixhe, 2002, 263), are better understood as arising from the roots $*h_1ei-$ 'to go' (as already Haas, 1966, 89) and $*deik-$ 'to show' (Lubotsky, 1998, 420). The origins for the simplification of medial $-st-$ in Greek in Anatolia should thus be sought elsewhere.

2. 3. Phrygian inscription W-11

Inscription W-11 from Dokimeion (extensively covered in Brixhe, 2004, 7-26) is the first known Phrygian inscription to be written in the Greek alphabet and dates to the end of 4th century BCE or the beginning of the 3rd century BCE (Brixhe, 2004, 7), thus providing a glimpse of the language between its more copiously attested phases. As a result, some of the changes from Old to New Phrygian may be more precisely dated. The features of the language of this inscription that are in line with developments into New Phrygian are:

- the dative singular ending of \bar{a} -stems (OPh. $-\alpha\upsilon$ / $-\bar{a}\iota$ /) has lost its glide and become $\langle-\alpha\rangle$;

¹ The reading $\alpha\delta\epsilon\iota\tau\tau\omicron\upsilon\upsilon$ $^{\circ}12$, as in e.g. Haas (1966, 116), should now be amended to $\alpha\delta\epsilon\iota\nu\omicron\upsilon\upsilon$ (Hämig *apud* Ligorio & Lubotsky, 2018, 1822), and presents no issues.

² Other languages in the area have eliminated initial $sT-$ clusters. See section 3.

- /ō/ has been raised to <ou> (Brixhe, 2004, 16-17);
- the dative singular ending of *o*-stems (OPh. *-oy* / *-ōi* /) is written <-oi>, but possibly only in loanwords from Greek (namely *κλευμαχοι* 'PN' and *σοροι* 'sarcophagus');
- the rule *v#μ > μ#μ > μ* might have already been in effect (Brixhe, 2004, 18), cf. *ματι μακρον* in line 3 and *ματιν* in line 5.

The raising of /ō/ to /u/ seems to indicate that long vowels have already been lost by the time this inscription was written, though this is by no means certain. The spelling of the dative singular ending <-oi> is puzzling when compared to the dative singular ending <-α>: one would expect the two long diphthongs to shorten simultaneously. If the assumption that instances of this spelling with a glide only appear in loanwords is correct, it is possible that we are dealing with a Greek declensional ending (-ω, in this case) rendered as -oi in Phrygian.

The assimilation of a final nasal may indicate that some nasalisation was already taking place at this point. Uncertainty regarding word divisions makes the state of geminates and final plosives in this inscription unclear.

3. NEIGHBOURING LANGUAGES

After the Phrygian migration to Anatolia around the turn of the first millennium BCE, the Phrygians came into contact with the southern and western Anatolian languages. The Phrygian kingdom of Midas (c. 8th century BCE) spanned from Cilicia in the south to the Aegean coast in the west (Melchert [ed.] 2003, 99). The languages spoken to the south of Phrygia proper, in the area around Cilicia, were most likely of Luwic provenance (*ibidem*, 126 ff.), that is, belonging to the same sub-branch of the Anatolian languages as or descended from Luwian. Lycian and Lycian B (if separate languages at all) are attested to the southwest of Phrygia during the mid-first millennium BCE (Melchert 1994, 39). Lydian was spoken to the west during the same period (Melchert 1994, 42) and the Lydian population might in fact have been displaced to classical Lydia by the migration of Phrygians (Beekes 2002, 214 ff.). Carian, Pisidian, and Sidetic are three sparsely attested Anatolian languages bordering the Phrygian speaking area with inscriptions dating to the second half of the first millennium BCE for Carian and Sidetic, and to the first half of the first millennium CE for Pisidian (Melchert 1994, 44-45).

The languages spoken in Bithynia, to the north of Phrygia, are unknown. Thucydides identifies the Bithynians as Thracians living in Asia (4.75), while Strabo claims they were «formerly Mysians», who «received this new name from the Thracians – the Thracian Bithynians and Thynians» (12.3).

Galatian was a continental Celtic language spoken to the northeast of Phrygia whose speakers migrated into Anatolia around the 3rd century BCE. Only an extremely limited number of vocabulary items are known and there are no inscriptions; the language appears to have been similar to Gaulish (Mixajlova 2013, 196-197). The Celtic name Βρογιμαρος, attested multiple times outside Anatolia, appears in the Greek parts of inscription ^o130 from Nacoleia (Avram 2015, 205-206), which strongly implies extensive interaction of Phrygians and Galatians in the area.

Greek was the language that exerted the most influence on Phrygian. There is a considerable amount of evidence that Greek and Phrygian belong to a single Greco-Phrygian branch of Indo-European, which separated into Proto-Greek and Proto-Phrygian around 2000 BCE (as extensively argued for in Neumann 1988).¹ After this separation into two distinct languages, Phrygian began to be strongly influenced by Greek, as evidenced by loanwords from the Mycenaean era (Neumann 1988, 16), the adoption of an early version of the Greek alphabet (Lejeune 1969, 42 ff.), the emulation of Greek poetic forms (Lubotsky 1998, 413 *et passim*; Lubotsky 2017, 438 ff.), the adoption of the Greek alphabet in the New Phrygian era, and the presence of numerous loanwords along with the use of Greek personal names in Phrygian. Before the Koiné period, the primary dialect in contact with Phrygian was Ionic, but due to geographic proximity, contact with Aeolic is also likely.

3. 1. Phrygian and Luwian

TABLE 3. Consonantal segments of Luwian, based on Melchert (ed.) (2003, 177). Segments with a K-subscript were proposed by Kloekhorst (2008, 118 ff.).

	labial	dental	alveolar	velar	laryngeal/glottal
fortis stop	/p/ [p:]	/t/ [t:]		/k/ [k:], /k ^w / [k ^w :] _K	/ʔ/ _K
lenis stop	/b/ [b]	/d/ [d]		/g/ [g]	
fortis fricative		/s/			/H/, /H ^w / _K
lenis fricative					/h/, /h ^w / _K
affricate		/t͡s/			
nasal	/m/	/n/			
resonant			/r/, /l/		
semivowels	/w̃/, /j̃/				

The synchronic contrast between pairs of stops is most likely one of fortis versus lenis, namely geminated versus simple (Melchert, 1994, 229). Sonorants and fricatives may also appear geminated.

The only permitted final consonants or consonant clusters in Luwian are /-nts/, /-ts/, /-s/, /-r/, /-l/, and /-n/ (Melchert [ed.] 2003, 184).² All other final consonants were removed through regular sound change (Melchert 1994, 247). The list of permitted codas is practically identical to that of New Phrygian. The only exceptions are final /-nts/ and /-ts/, both of which underwent special developments before the Old Phrygian era and thus never existed in written Phrygian in the first place. The development of final *-ts to -s (cf. NSg. Βαζ ~ ASg.

¹ Some innovations of Proto-Greco-Phrygian include: *h₁, *h₂, *h₃ > *e, *a, *o; the creation of the pronoun *auto-, and the creation of the 3rd person singular imperative middle ending *-esd^hō (Ligorio & Lubotsky 2018, 1816-1817).

² With /-n/ also from *m.

Βαταν) is still a synchronic feature of New Phrygian. There are no examples of final *-nts*: this cluster, like *-ns*, had developed into *-is* before Old Phrygian already (Ligorio & Lubotsky 2018, 1820), so there are no inherited examples, nor is there evidence of any new formations after that period which could produce such a cluster.

The absence of /sT/ in initial position is systematic in Luwian (Melchert [ed.] 2003, 248), which is common among languages of Anatolia. In inherited lexemes, the *s in *sT- is lost (e.g. *st_εm̄nt- ‘orifice’ > tūmmant- ‘ear’ [Melchert, 1994 271]).

The development of *-nm-*, which underwent assimilation into *-m-* in Phrygian, is uncertain in Luwian (Melchert 1994, 269).

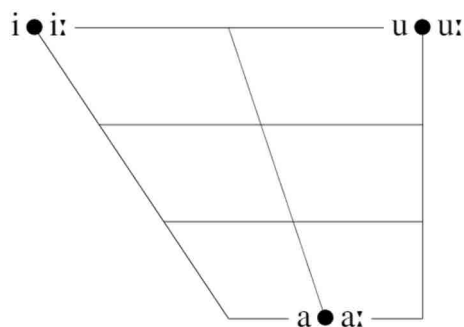


FIGURE 3. The vocalic segments of Luwian, based on Melchert (ed.) 2003, 179.

All Luwian vowels may appear in any position within the word under the proper accentual conditions (Melchert [ed.] 2003, 179; Melchert 1994, 250). The nature of Phrygian accent is currently unknown and vocalic alternations in Phrygian are extremely limited, so it is premature to draw any conclusions about similarities with Luwian in this respect.¹

There seems to be very little overlap between the phonetic and phonotactic systems of Luwian and Phrygian. The post-Old Phrygian retreat of the language to more central locations in Anatolia would have greatly reduced the possible area of contact and limited opportunities for mutual influence. The reduction of permissible coda consonants is the only feature of Phrygian development that shows any similarity to Luwian phonotactic constraints. The lack of stops in coda is also shared with neighbouring Lycian and might reflect a southern areal constraint that spread to Phrygian.²

3. 2. Phrygian and Lycian

There is no phonemic voicing distinction of stops in Lycian. They are allophonically realized as voiced after nasals (Kloekhorst 2008, 125). The graphemes <ṁ>

¹ Some examples of vocalic alternation can be found in inscription ^o25, which contains σιμμων, αββιρετο, and [ζ]ιμελωσ, all with <ι> for expected <ε>. This might be the result of pretonic position (Ligorio & Lubotsky 2018, 1821; cf. Luwian *e / _.' > i [Melchert 1994, 262]), but is by no means certain.

² See also 3. 2 below.

TABLE 4. Consonantal segments of Lycian, based on Kloekhorst (2008, 119-128).

	labial	dental	alveolar	palatal	velar	glottal
voiceless stop	<p> /p/	<t> /t/ <θ> /th/ <τ> /tʰ/		<k> /c/	<q> /kʷ/ <x> /k/	
voiceless fricative	 /β/	<d> /θ/ <s> /s/		<K> /ç/	<g> /x/	<h> /h/
voiceless affricate		<z> /t͡s/				
nasal	<m> /m/ <ṁ> [m̃]	<n> /n/ <ṅ> [ñ]				
resonant			<r> /r/ <l> /l/			

and <ṅ> represent unreleased nasals, which may be syllabic in interconsonantal position (Melchert 1994, 41).

While the consonantal system itself is dissimilar to the Phrygian one, some Lycian phonotactic constraints are strongly reminiscent of Phrygian ones. Of particular note is the fact that /s/ is the only permissible final consonant in Lycian (Melchert 1994, 297): all other final consonants are lost (Melchert 1994, 323), the only exception being <-z> in Lycian B, which develops from **-nts*.

The treatment of final nasals may likewise be compared to that of Phrygian. Final nasals are lost and cause nasalisation of a preceding vowel (Kloekhorst 2008, 123; Melchert 1994, 323). Nasalized high vowels [ĩ] and [ū̃] were denasalized during Lycian pre-history, but re-emerged at a later time (Kloekhorst 2008, 121-123). Before a stop in inlaut, a **VN* sequence develops into /Ṽ/ (*ibid.*; Melchert 1994, 307-308).

Due to the effects of syncope, synchronic Lycian shows a large number of graphical consonant clusters in both initial and medial position, some of which may be broken up by an anaptyctic vowel (Melchert 1994, 297-299). Lycian gemination of the second consonant in a cluster (Melchert 1994, 295) has no parallel in Phrygian.

Treatment of initial **sT-* is uncertain. Some examples are likely borrowings from Greek, but the treatment of clusters suggests that inherited **sT-* may have developed into /həT.T/ with an anaptyctic vowel (with regular **s* > /h/ in Lycian) (Melchert 1994, 304-305).¹

The limited number of geminates outside of clusters arose from assimilation of consonant clusters, while inherited geminates were all simplified (e.g. Lyc. *ēme/i-* 'my' < Proto-Anatolian **ámmo/i-*) (Melchert 1994, 316).

¹ Perhaps seen in *hppñterus* '(a title)', if from **spond-* 'libate' (Melchert 1994, 304-305).

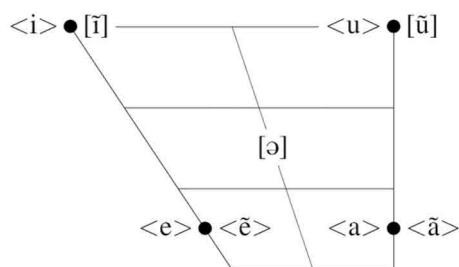


FIGURE 4: The vocalic segments of Lycian, based on Kloekhorst (2008, 119-123).

All synchronic Lycian vowels may appear in any position (Melchert 1994, 299). One peculiarity of the Lycian vowel system is that the old mid vowels **e* and **o* merged into <e>; likewise, **e*N and **o*N both merged into <ẽ> (Melchert 1994, 293). As noted above, the nasal vowels <ẽ> and <ã> are the result of the development VN / _#, _C > ÷̃. In diachronic terms, in addition to other changes, pre-Lycian vowels underwent umlaut (Melchert 1994, 196) and accentually conditioned syncope which resulted in the appearance of anaptyctic vowels to break up certain clusters and the syllabification of resonants (Melchert 1994, 318-321 *et passim*). These phenomena are in no way observed in Phrygian.

Vowels before nasals in final position show two developments that may be compared to Phrygian: 1) <ẽ> and <ã> are sporadically raised to <i> and <u> respectively (Melchert, 1994, 324),¹ which is a relatively common occurrence in both Old and New Phrygian;² and, in prehistoric times, 2) final *VN may be syncope to <ñ> immediately following the accent (*ibid.*). While the position of the Phrygian accent is unknown, the apparent centralisation of Phrygian nasalised mid vowels might be due to a similar phenomenon: a syllabic [ŋ] resulting from syncope would presumably be perceived as [əŋ]/[ə̃] by the Phrygians. If we are indeed dealing with a phenomenon that spread from Lycian, further exploration of this topic may shed some light on the position of the Phrygian accent.

The three major developments from Old Phrygian to New Phrygian, i.e. the formation of geminates through assimilation, the reduction of permissible codas, and the emergence of nasal vowels from final -VN# sequences with an accompanying change in vowel quality, have clear parallels to processes in Lycian and are thus indicative of a sustained contact between the two languages or at least of their belonging to a common language area.

3. 3. Phrygian and Lydian

As with Lycian, there is no phonemic voicing distinction in Lydian,³ though voiced allophones of voiceless sounds do appear in certain positions (Kearns 1994, 56).

¹ E.g. *muhāi* next to *māhāi*, and *ebēññi* next to *ebēññē* (Melchert 1994, 324).

² See 2. 1. 2 above.

³ Melchert (1994, 333-334) argues for a voiced affricate value of the sound represented by <c>, but considers voicing non-contrastive in stops (Melchert 1994, 351).

TABLE 5. Consonantal segments of Lydian, based on Kearns (1994, 56 *et passim*).

	labial	dental	palatal	velar	labiovelar
stop	/b̥/	/d̥/	/j̥/	/g̥/	/g̥ʷ/
fricative	/ɸ/	/s/	/ç/		
affricate		/d̥s/	/d̥ç/		
nasal	/m/	/n/	/ɲ/		
trill		/r/			
lateral		/l/	/ʎ/		
approximant	/w/				

The sound denoted with the grapheme <v> is difficult to interpret phonetically. It has been interpreted as a palatal nasal (Kearns 1994, 40 ff.), but the fact that it appears only in post-vocalic final position and is either deleted or replaced with <n> in post-vocalic pre-consonantal position, a weakened articulation is very likely (Melchert 1994, 339). In post-consonantal final position, expected <v> is sometimes replaced with <n>, possibly indicating strengthening (*ibidem*).

Resonants in post-consonantal final position and between consonants are realized syllabically, making it likely <-Cn> for <-Cv> is also an attempt at writing a syllabic nasal (*ibidem*; Kearns 1994, 42).

All consonants, except for <ʎ> and <v>, can appear in initial position. As with the other Anatolian languages, initial *sT-* does not appear in Lydian (Melchert 1994, 352).

In final position, almost all consonantal phonemes may appear,¹ as well as a large variety of clusters (Melchert 1994, 352-3); the only changes in final position are the result of sandhi phenomena before enclitics (Melchert 1994, 351). This is in stark contrast to Phrygian, where final consonantal clusters were simplified throughout its recorded history (Ligorio & Lubotsky 2018, 1821).²

Geminates in Lydian are mostly the result of consonant assimilations or secondary combinations of similar consonants. The presence of spellings with and without geminates suggests that they are unstable and tend to be eliminated (Melchert 1994, 355).

The vowels <e>, <o>, <ẽ>, and <ã> are always accented. Only <a>, <i>, and <u> may appear in unaccented position, with old unaccented /e/, /o/, and /a/ surfacing as <a> (Melchert 1994, 350-366).

The widespread syncope of Lydian that resulted in its many consonant clusters (Melchert 1994, 373-376) has no parallel in Phrygian, which seems to have retained vowels in all positions.

¹ Excluding <p> /b̥/ and <q> /g̥ʷ/ (due to a Proto-Anatolian constraint), as well as <r> /r/ (Melchert 1994, 352).

² E.g. **kts* > OPh. *-k*; **nt* > OPh. *-n*, etc.

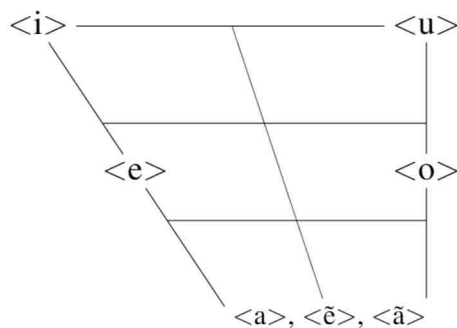


FIGURE 5. The vocalic segments of Lydian, based on Melchert (1994, 342-343).

<ẽ> and <ã> are surely nasalized vowels (Melchert, 1994, 343). <ẽ> originates from a short accented vowel before a nasal in a closed syllable, while <ã> originates from an accented vowel before a nasal in an open syllable. <a> may occur before nasals in unaccented position, while in accented position <ẽ> and <ã> appear, but no <e> or <o> (*ibid.*).

The weakening of final nasals and the existence of nasalized vowels in both Lydian and Lycian suggests we are dealing with a West Anatolian areal feature that subsequently spread to Phrygian and local Greek.

3. 4. Phrygian and Greek

Phrygian and Greek have been in contact throughout Phrygian history. The pre-Old Phrygian development of $*-Vn(t)s$ to $-V\tilde{n}s$ has a remarkable parallel in Lesbian Greek (Ligorio & Lubotsky 2018, 1820), pointing to an early contact between the two languages, possibly from before the Phrygian migration into Anatolia. While there was considerable interaction between the two languages (see Neumann, 1988, 16 ff.), there does not appear to have been any notable phonological influence of Greek on Phrygian up to the Hellenistic period. The contact of the two languages was naturally much more extensive after Alexander's invasion and the subsequent Hellenization of Phrygia (Brixhe 2002, 247).

The influence of Koiné Greek on Phrygian seems to have been most extensive with regard to the lexicon (Brixhe 2002, 256-259). The phonological systems of the two languages appear to have been similar enough that not much interference was possible in any case: loanwords from Greek into Phrygian are mostly faithfully preserved, with the exception of voiceless aspirates, which were for the most part substituted with simple voiceless plosives, but were occasionally preserved in spelling (Brixhe 2002, 258).¹

Central Anatolian Greek has some peculiarities which most likely arose due to areal influences. Koiné aspirates are written as simple voiceless plosives, but

¹ One example of a written voiceless aspirate is $\theta\alpha\lambda\alpha\mu\epsilon\iota$ °₄ 'tomb, chamber', a loan of Greek $\theta\alpha\lambda\alpha\mu\acute{\iota}\varsigma$ (West 2003, 82).

voiceless plosives are sometimes also written with graphemes for aspirates, indicating that there was no distinction between the two (Brixhe, 2002, 262). As already discussed in 2.2.4, the special treatment of *st*-clusters in Greek in this area is certainly a feature of the local dialect (e.g. *ιστήλην* for *στήλην* [Brixhe 2002, 263]), but is probably best ascribed to a non-Phrygian local influence.¹ The treatment of Greek mid vowels (Brixhe 2002, 261-263) seems to be in line with that of Phrygian.

While I concur with Brixhe (2002, 264-265) regarding the weak articulatory nature of a final nasal in Phrygian (likewise a feature of local Greek [*ibidem*]), I interpret forms with nasals as original, with nasalisation of the preceding vowel and the occasional loss of graphic nasals a result of its unreleased pronunciation.² Brixhe (2002, 264; 1983, 123-124), on the other hand, interprets forms such as *κακε* as original (in this instance an adverb), while spellings such as *κακεν* display a parasitic nasal or hypercorrection, which could only appear because nasals were so weakly pronounced. I see no syntactic motivation to assume an adverb instead of the expected adjective in these examples and consider the scenario outlined in 2. 1. 2 and 2. 2. 3 a better explanation of the data.³

4. CONCLUSIONS

This paper considered the following phonetic developments of languages in close geographic proximity to Phrygian: 1) development of final clusters; 2) development of final stops; 3) development of final nasals; 4) development of vowels before nasals; 5) gemination of consonants; 6) other vocalic and consonantal developments.

The results are summarised in the following table:

TABLE 6. Comparison of phonetic features of languages spoken in Anatolia during the first millennium BCE.

	Phr.	Lyc.	Luw.	Lyd.	Gr.
final clusters?	-	-	(only <i>-nts</i>) +	-	+
final plosives?	-	-	-	+	-
final nasals weak?	+	+	-	+	+
nasalized non-high vowels?	+	+	-	+	-
nasalized high vowels?	+	+	-	-	-
gemination marked/lost?	+	+	-	+	-
initial <i>sT</i> -?	?	> * <i>səTT</i> -	> <i>T</i> -	> <i>isT</i> -	> <i>isT</i> -
long vowels?	-	-	+	-	+

¹ Compare for instance the afore-mentioned reduction of **st* > *t* in Luwian.

² See 2. 2. 3. above.

³ Regarding the issue of *σεμουν* with a nasal for the dative singular case, case syncretism, as suggested by Alexander Lubotsky (personal communication), seems a better explanation than Brixhe's assumption of a parasitic nasal (*pace* 2002, 264) or Haas's explanation of movable-ν (*pace* 1966, 75-76).

The sound changes which separate Old and New Phrygian are not particularly uncommon and could have occurred without any outside influence. Nevertheless, the fact that these developments have clear parallels in Lycian phonetic and phonotactic processes strongly implies a period of significant contact between the two languages, most likely within the context of a broader area of convergence.

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