

The relative chronology of Monosyllabic Circumflexion

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1 Introduction

1.1 Monosyllabic Circumflexion

- Tones:

	Lithuanian	Latvian	for PBS
Acute:	⟨˘⟩ ([V̇V] falling)	⟨˘⟩ (sustained), ⟨ˆ⟩ (broken)	<u>underline</u>
Circumflex:	⟨˜⟩ ([V̇V̇] rising)	⟨˘⟩ (falling)	no mark

- de Saussure (1894: 492ff.) hypothesized that PIE long vowels (and also long diphthongs (Kuryłowicz 1948: 1ff.)) are reflected with the acute tone in Balto-Slavic (BS), whereas Kortlandt (1985) considers they yielded circumflex. While *žvėris* (3) ‘wild animal’ (acc.sg. *žvėrį*) < PIE **ǵʰuér* speaks for Saussure’s view, the nominative singular ending of consonantal stems (-*uō*, -*ė*) and many monosyllabic forms speak for Kortlandt’s view.
- The phonetic realization of “acute syllable” remains unclear. The “acute-ness” of a syllable nucleus will be denoted with an underline following a convention introduced by Jasanoff (2004).
- Monosyllabic Circumflexion (MC) is a phenomenon according to which long vowels in monosyllabic words exhibit a circumflex tone instead of the expected acute (in the Balto-Slavic languages ~ Lithuanian; Hanssen (1885: 616), Zinkevičius (1980–81: II, 161ff.), Rasmussen (1999: 481ff.));
 1. pronominal forms (*tiē* [< **toi* pl.nom. ~ *gerieji* ‘the good (pl.nom)’], *tuōs* [< **-ōns* pl.acc. ~ *geruosius* ‘id. (pl.acc.)’; Zinkevičius 1980–81: II, 162])

➔ 2. **reflexes of PIE root nouns** (Latv. *gūovs* ‘cow’ [< **gʷōus* ← acc.sg. **gʷóm* (Larsson 2010a: 73ff.); (Villanueva Svensson 2011: 20)]¹

¹ *šuo* ‘dog’ [< **k̑uō*] (Hanssen 1885) may be an *n*-stem noun, but this can be also considered to have been in the environment of MC.

- ➔ 3. **prepositions/adverbs** (*nuõ* ‘from’ ~ *núotaka* ‘bride’ [Zinkevičius: id.]; *vě̃l* ‘again’ ~ Latv. *vēl* ‘still, yet’ [< PB **ṽeli*; Būga 1924: 95]; *võs* ‘hardly’ ~ OCS *jedъva*, SCr *jèdva*, Čak. *jedvã*; PBS **edvās*)
- 4. 3rd person future forms of monosyllabic stems
šõks – *šókti* ‘to jump;’ *vỹs* – *výti* ‘to drive,’ etc.

1.2 Relative chronology

- Rasmussen (1999: 481ff.) suggests a possibility that MC happened at a Proto-Balto-Slavic stage, based on the pronominal forms and the reflexes of PIE root nouns. But his data are mostly the nouns derived in accordance to the Baltic nominal formation from verbs.
- Kortlandt (1895; 2014) considers that there are two chronological layers of MC.
 - 3rd person future forms in Lithuanian (~ *s*-subjunctive) and Latv. *sãls* ‘salt,’ *gùovs* ‘cow’ represent the older layer in **Proto-Balto-Slavic**.
 - pronominal forms with dialectal variants with the acute tone represent the younger layer in **Lithuanian**.

In this paper, I will show that MC seems to have happened twice as Kortlandt assumes, yet based on different analyses of the reflexes of PIE root nouns and particles in the Baltic languages.

2 Reflexes of root nouns

The Baltic reflexes of the PIE nouns which are securely reconstructed as root-nouns with “long root” according to preceding works, e.g. Schindler (1972); Larsson (2010a); Villanueva Svensson (2011):

- (1) a. *nósis* (1) ‘nose’ (~ Latv. *nãss*)
 - b. *žvérìs* (3) ‘wild animal’ (~ Latv. *zvêrs*)
 - c. *širdìs* (3) ‘heart’ (~ Latv. *sîrds*), *šerdìs* (1/3/4; ~ Latv. *seîde*) ‘core of wood’
- (2) Latvian forms to be considered
 - a. *sãls* ‘salt’ (m./f.)
 - b. *gùovs* ‘cow’ (f.)

- They are typically *i*-stems in Baltic (and Slavic). Expansion of syllabic resonants ($*\check{R} > iR$) affected the accusative endings (PIE $*-m$ (sg.acc.) / $*-ms$ (pl.acc.) $>$ PBS $*-in$ / $*-ins$), together with nom.du. $-\bar{i}$ ($<$ $*-ih_1$), causing root nouns to join *i*-stems (Vaillant (1958: 169ff.); Stang (1966: 219))
→ monosyllabic forms in nom.sg. resulted in disyllabic forms.
- Larsson (2010a: 73ff.) discusses a possibility that MC affected the tone of $*g^w \acute{o}us$ / $*g^w \acute{o}m$ ‘cow’ and $s\acute{a}l-s$ ‘salt.’ Also, it is implied that MC was prior to the generalization of *i*-stem.

2.1 Latv. *gùovs* [2b]

cognates:

other IE: Skt. nom.sg. *gáus*, acc.sg. *gám*, gen.sg. *gós* ‘cow;’ Gk. $\beta o\ddot{\upsilon}\varsigma$,
acc.sg. $\beta o\ddot{\upsilon}\nu$ (Dor. $\beta \acute{\omega}\nu$); Lat. *bōs*;

PIE: nom.sg. $*g^w ou-s$ ($\rightarrow *g^w \acute{o}us$), acc.sg. $*g^w ou-m$ ($>$ $*g^w \acute{o}m$
[Stang’s Law]), gen.sg. $*g^w e\grave{u}-s$

- no evidence for BS ablauting paradigm; but it is possible that BS inherited a monosyllabic accusative singular form with a long root because of the operation of Stang’s law in late PIE: $*g\tilde{o}m$ ($<$ $*g^w \acute{o}m$ $<$ $*g^w oum$; Stang (1965: 292ff.)).
- The reconstruction $*g^w eh_3-us$ / $*g^w h_3-ou-s$ \rightarrow $*g^w \acute{e}h_3-us$ / $*g^w h_3-ou-s$ (influence from $*d\acute{i}\acute{e}us$ ‘god’; Kortlandt 1985: 118; Lubotsky 1990: 133) may pose a few problems. For example, it is never scanned disyllabic (as opposed to *náus*) in Vedic, and some case forms (acc.sg. and loc.sg.) do not match the attested forms at all (Sihler 1995: 335).
- Probably, the *i*-stem was generalized to nom.sg. $*g\tilde{o}us$ / acc.sg. $*g\tilde{o}m$ analogically after other root nouns shifting to *i*-stems. When the stem-forming *-i-* was introduced to the paradigm, the accusative $*g\tilde{o}m$ got *-v-* inserted in the root-final position as a hiatus breaker to result in $*g\tilde{o}vi-m$. The paradigm was leveled with the new nom-acc. stem $*g\tilde{o}vi-$.
- relative chronology:
 - (3) acute assignment \rightarrow MC \rightarrow generalization of *i*-stem \rightarrow Osthoff’s Law (shortening of long diphthong: $*\bar{V}R > \check{V}R$)
 - MC premises the existence of the distinction of acute/non-acute: acute assignment \rightarrow MC

- MC should be prior to the generalization of *i*-stems.
- if Osthoff's law took place before the generalization of *i*-stems, it would have given rise to **Xgous** or possibly **Xgom** (→ Latv. **Xgavis**).

‘cow’			
	nom.sg.	acc.sg.	gen.sg.
PIE	$*g^w o\underset{\sim}{u}s$	$*g^w o\underset{\sim}{u}m$ (> $*g^w \bar{o}m$)	$*g^w e\underset{\sim}{u}-s$
	$*g^w \bar{o}\underset{\sim}{u}s$	$*g^w \bar{o}m$	$*g^w e\underset{\sim}{u}-s$
PBS	acute assignment to long vowels		
	$*g\bar{o}\underset{\sim}{u}s$	$*g\bar{o}m$	$*ge\underset{\sim}{u}-s$
	MC		
	$*g\bar{o}\underset{\sim}{u}s$	$*g\bar{o}m$	$*ge\underset{\sim}{u}-s$
	analogical generalization of <i>i</i> -stem with the vocalism in strong cases with the epenthesis of <i>v</i> in the accusative stem-final position		
	$*g\bar{o}vi-s$	$*g\bar{o}vi-m$	$*g\bar{o}vi-es$
	Osthoff's Law: vacuous operation		

2.2 žvēriš (3) ‘wild animal’ [1b]

cognates:

Baltic: Latv. *zvērs* < PB $*žvēr̥is$

Slavic: OCS *zvěřь*, SCr. *zviĵer*, Sln. *zvēr* < PS $*zvēr̥ь$ (c)

PBS $*žvēr̥is$ ← $*žvēr̥$ < PIE $*ǵ^h uēr̥$

other IE: Gk. *θηρ*, *θηρῶς* (m.), Lat. *fera* ‘wild beast’

‘wild animal’			
	nom.sg.	acc.sg.	obl.
PIE	$*ǵ^h uēr-s$ (> $*ǵ^h uēr̥$)	$*ǵ^h uēr-m$	$*ǵ^h uṛ-'$
PBS	simplification of ablaut and palatalization of $*ǵ^h$		
	$*žvēr̥$	$*žvēr̥-m$	$*žvēr̥-'$
	acute assignment to long vowels and extension of syllabic resonant		
	$*žvēr̥$	$*žvēr̥-im$	$žvēr̥-'$
	MC		
	$*žvēr̥$	$*žvēr̥-im$	$žvēr̥-'$
	generalization of accusative stem in <i>i</i> -stem		
	$*žvēri-s$	$*žvēri-m$	$*žvēri-$
	Osthoff's Law: vacuous operation		

- Its mobile paradigm with the acute root in Lithuanian and Latvian means the vacuous operation of Hirt's Law, which points to an *aniṭ* root.

- The generalized stem **žvéri-* provided the attested forms.

2.3 *nósis* (1) ‘nose’ [1a]

cognates:

- Baltic: Latv. *nāss* ‘nostril,’ *nāse* ‘nose’ < PB **nāsis*
 Slavic: OCS *nosъ*, SCr. *nōs*, *nōsa*, Sln. *nōs* < PS **nosъ* (c) ← **nósa*
 [nom.pl ← nom./acc. du. (Fritz 1996: 15)] < **nás-oh₁*
 other IE: Skt. *nās-/nas-* (f.) ‘nostril’ (du. *nāsā* ‘nose’), Lat. *nāris* (f.)/*nārēs*
 (f.pl.) ‘nose,’ PGmc. **nasō* (f.; < du. **nás-oh₁* cf. Kluge 1882:
 509ff; Thöny 2013: 145ff.)

	‘nostril’				
	nom.sg.	acc.sg.	obl.		nom.du.
PIE	(<i>*nás-s?</i> >) <i>*nás</i>	<i>*nás-m̄</i>	(<i>*ns-?</i> →) <i>*nas-</i>		<i>*nás-(i)h₁</i> (→ <i>*nás-oh₁</i>)
Late PIE	semantic split of paradigm				
			↙		↓
		‘nostril’			‘nose’
	nom.sg.	acc.sg.	obl.		<i>*nás-oh₁</i>
	<i>*nás</i>	<i>*nás-m̄</i>	<i>*nas-’</i>		
late PIE					loss of laryngeal
	<i>*nás</i>	<i>*nás-m̄</i>	<i>*nas-’</i>		<i>*nás-ō</i>
					(→ PS / PGmc.)
PBS	simplification of ablaut				
	<i>*nás</i>	<i>*nás-m̄</i>	<i>*nas-’</i>		<i>*nas-ō</i>
	acute assignment to long vowels and extension of syllabic resonant				
	<i>*nās</i>	<i>*nās-im</i>	<i>*nas-’</i>		<i>*nas-ō̄</i>
	MC				
	<i>*nās</i>	<i>*nās-im</i>	<i>*nas-’</i>		<i>*nas-ō̄</i>
	generalization of accusative stem in <i>i</i> -stem for ‘nostril’				
	<i>*nāsi-s</i>	<i>*nāsi-m</i>	<i>*nāsi-’</i>		<i>*nas-ō̄</i>

- Skt. gen.du. *nas-ós* speaks against the weak stem **nh₂s-* of the reconstruction **neh₂s-/nh₂s-os* (Kortlandt 1985:118), since neither **nh₂s-* (> Skt. *ṅās-*) nor **nh₂s-* (> *ṅnis-*) would give rise to the attested weak stem Skt. *nas-’*, cf. Larsson (2010: 83).
- Besides, an acrostatic paradigm with *ā̄ ~ á* ablaut (Rasmussen 1989: 260; Larsson 2010: 84) and a mobile paradigm with *á ~ ∅* (Schindler 1972: 37) or *á̄ ~ a* ablaut (Mayrhofer 1986–96: Vol. II, 31) are suggested.

- Schindler’s paradigm $*nás-s$ ($> *nás$) / $*ns-'$ developed to Mayrhofer’s ablaut pattern $*nās / *nas-'$?
- The fact that Sl. $*nōsъ$ (c) ‘nose’ does not have the long root generalized (either in Germanic) in contrast to PB. $*nāsis$ ‘nostril’ (cf. Latv. $nāss$ ‘nostril,’ $nāsis$ (pl.) ‘nose’) suggests a possible split of paradigm into ‘nostril’ and ‘nose’ in PBS or before. The paradigm for ‘nostril’ underwent the simplification of ablaut pattern and the generalization of accusative stem in $-i-$.

2.4 $sāls$ ‘salt’ [2a]

cognates:

Baltic: OPruss. sal (unknown length of the root)
 Slavic: OCS $solъ$ (f.), SCr. $sō$, $sōli$, Sln. $sōl$, $solī$ < PS $*sōlъ$ (c)
 other IE: Gk. $ἄλς$, $ἄλός$ m. ‘salt,’ f. ‘sea,’ Lat. $sāl$, $salis$ m./n. ‘salt’

	nom.sg.	acc.sg.	obl.
PIE	$*sál-s$ ($> sāl$)	$*sál-m$	$(*sl-? \rightarrow) *sal-'$
PBS	acute assignment to long vowels and extension of syllabic resonant		
	$*sāl$	$*sál-im$	$*sal-'$
	MC		
	$*sāl$	$*sálim$	$*sal-'$
	generalization of i -stem, keeping the ablaut pattern		
	$*sālis$	$*sálim$	$*sali-$
	Osthoff’s law: vacuous operation		
	$*sāli-s$	$*sáli-m$	$*sali-$

- reconstruction with laryngeal: nom.sg. $*seh_2-ls$ / acc.sg. $*sh_2-el-m$ / gen.sg. $*sh_2-l-os$ (Kortlandt 1985: 119).
- reconstruction as a root noun: nom.sg. $*sāl-s$ / acc.sg. $*sál-m$ / gen.sg. $*sl-ós$ ($\rightarrow *sál-s$ or $*sal-ós$; Larsson 2010: 74ff), also Sihler 1995: 282.
- the Proto Slavic form $*solъ$ has a short root in the same i -stem as in Baltic. This suggests an ablauting paradigm for Proto-Balto-Slavic (Larsson 2010a: 75).
- nom.sg. stem $*sāli-$ was generalized in Baltic, whereas acc.sg. stem $*sáli-$ in Slavic

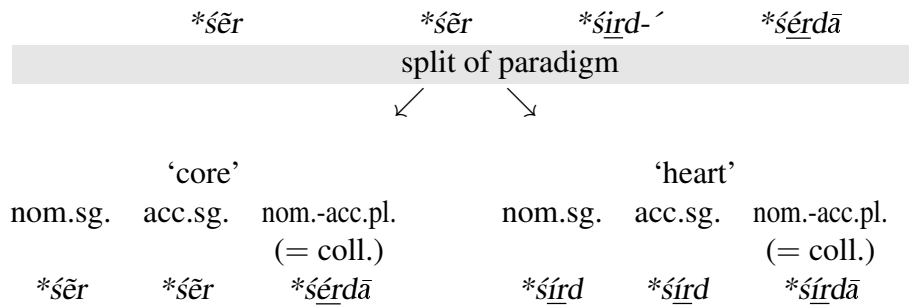
2.5 *širdis* (3) ‘heart’ [1c]

Cognates:

- Baltic: Latv. *siņds*, OPruss. *seyr* (/sēr/ neut. sg.nom. only in *Elbing Vocabulary*; with *a*-stem masc. declension in Catechisms) ‘heart;’ Lith. *šerdis* (1/3/4), Latv. *seīde* ‘the core of wood’ < PB **šerdis* (**šerdīs*?) / **širdīs*
- Slavic: OCS *srědъce*, Cz *sřce* < *širdi-* (~ Gk. *καρδίᾱ*, OIr. *cride* < **k̑rdjom*); OCS *srěda* ‘middle,’ SCR *srijěda* ‘Wednesday’
- other IE: Gk. *κῆρ*, *κῆρος* (n.), Lat. *cor*, *cordis* (n.), Skt. *hārdi* (< **k̑erd-h₂*; n.)

- reconstruction as a root noun: nom.sg. **k̑ér* / gen.sg. **k̑rd-ós* (Szemerényi 1970: 523; Sihler 1995: 282; Larsson 2010: 79)
- Ablauting paradigm in PBS, later a split of the paradigm: both Baltic and Slavic preserve cognates in zero grade and *e*-grade with similar semantic variations. This explains why the oblique stem (not the accusative stem as usual) was generalized for ‘heart.’
- **neuter** gender: cf. Lat. *cor*, *cordis*, Skt. *hārdi*, and Gk. *κῆρ*, *κῆρος* in neuter; it turned animate in a later stage in BS, through a process of neuter plural (= collective) reinterpreted as a feminine **širdā*, or through a thematization as attested by *širdai* (3/4) ‘quarrel.’ (Szemerényi 1970: 531⁴⁸)

	nom.sg.	acc.sg.	obl.	nom.-acc.pl. (= coll.)
PIE	<i>*k̑érd</i> (> <i>*k̑ér</i>)	<i>*k̑érd</i> (> <i>*k̑ér</i>)	<i>*k̑rd-´</i>	<i>k̑érd-(e)h₂</i> (→ <i>k̑érd-(e)h₂</i> ?)
PBS	palatalization of <i>*k̑</i> , and Winter’s law			
	<i>*s̑ér</i>	<i>*s̑ér</i>	<i>*s̑rd-´</i>	<i>s̑érdā</i>
	Acute assignment to long vowels			
	<i>*s̑ér</i>	<i>*s̑ér</i>	<i>*s̑rd-´</i>	<i>*s̑érdā</i>
	extension of syllabic resonant			
	<i>*s̑ér</i>	<i>*s̑ér</i>	<i>*s̑ird-´</i>	<i>*s̑érdā</i>
	MC			
	<i>*s̑ér</i>	<i>*s̑ér</i>	<i>*s̑ird-´</i>	<i>*s̑érdā</i>
	Osthoff’s Law			



- PIE **k̑ēr* → ... → OPruss /*sēr*/ ?? (unknown accentuation); it is more plausible to consider that this also reflects **śīrd-* which may have been thematized (Larsson 2010b: 275).
- **śērd-ā* → Lith. *šerdis* (1/3 (→ 4))
- Lith. *širdis* is attested also as a masculine noun in OLith. It may be more likely that **śīrd* started to accept the *i*-stem inflection due to the coincidence of the oblique endings, while *širdai* is a thematized form meaning ‘*belonging to anger.’
- Since the long vowels generated by Winter’s Law also receive the acute feature, Winter’s Law should be before the acute assignment. (3) can be updated as follows:

(4) Winter’s Law → acute assignment → **MC**
 → generalization of *i*-stem → Osthoff’s Law

3 Particles/prepositions

Does the relative chronology (4) apply to the particles...?

3.1 Old particles

3.1.1 *nū* ‘NOW’

Cognates: Lith. *nūnaĩ*, *nūn*, Latv. *nù²*, *nòu^{2,3}*, OCS *nyně* ‘now;’ Gk. *νῦν* ‘now;’ Lat. *num* (interrogative particle), Ved. *nū́*, YAvē. *nū* (< PI-Ir. **núH*), and Alb. *-ni* (the 2nd.pl. ending of the imperative; < PIE **nú-h₁*).

- Lith. *nūn* = Gk. *νῦν* ? [Trautmann (1920: 251), Fraenkel (1962–65: 509)]
- Lith. *nūn* is syncopated from *nūnaĩ* (= OCS *nyně*), which is from PIE **nuh₁-nāi* (with nominal suffix **-nó-* in m./n. loc. sg. or fem.dat.sg.; see Stang 1966: 276, Dunkel 2014: II, 578¹²), which gave rise to PBS **nūnái*; Gk. *νῦν* = Lat. *num* < **nuh₁-m* [Dunkel (2014: II, 580²⁵)]
- For Latin *num*, compare the secondary and longer form *nunc* ‘now’ which took over the primary meaning, while the secondary meaning is left in the old form *num*; for the semantic change from temporal to interrogative meaning, there is a parallel with OHG. *nū* (Lühr 1997: 340).
- Lith. *nū́*, Ved. *nū́*, YAvē. *nū*, Alb. *-ni* < PIE **nú-h₁* [with modal/instrumental adverbial ending **-h₁* (Dunkel 2014: I, 21, 127ff.)]
- Since the long vowel is likely to be traced back to a sequence with a laryngeal, the circumflex tone in *nū* can be the result of MC.

3.1.2 *võs* ‘HARDLY’

Cognates: Lith. *võs*, *advõs*, *advā*; OCS *jed(ъ)va* ‘hardly’ Fraenkel (1962–65: 1274), Ru. *edvá*, SCr. *jědva*; Čak. *jedvǎ* (Derksen 2008: 139–40); Germanic **-uōz* ‘(emphasis of multiplicative),’ Skt. *kṛt-vas* ‘(multiplicative) time.’

- Unfortunately, no Latvian cognate. Two of the three Lithuanian forms are of secondary origin: *advā* (Bretkūnas, Širvydas) is a borrowing from Belorussian, and *advõs* is probably *võs* + a Slavic adverb **odva* (Fraenkel 1962–65: 2).

²Attested in Alūksne (E), Vārkava (E), and Krustpils (E) (ME II 754), and also in Kaldabruņa (E), Liepna (E), Livāni (E), Lubāna (E), Pilda (E), Skaista (E), Sunāksts (E), and Varakļāni (E) (EH II 29)

³This form is mentioned in Endzelīns (1923: 478) and Endzelīns (1951: 626) as an East Latvian form, which probably is a form more phonetically accurate, considering that the Std. Latv. *ū* corresponds to northern area of ELatv. *ou*. Those East Latvian forms, however, do not provide a clear information about the accentuation, since the falling tone (circumflex) and sustained tone (acute) are merged to the falling tone in the eastern dialects.

- For Proto-Slavic, **ed(ь)vǎ* with the final acute syllable can be reconstructed.
- PBS **edvaHs* is reconstructed in Derksen (2008: 140), however, no convincing evidence for laryngeal. Rather, **edvǎs*.
- PIE **edua-es* (Dunkel 2009: 49ff.)
 - **ed-*: found also in **ed oĭnom* ‘that alone’ (> OCS *jedinъ* ‘one’); an anaphoric pronoun **e-d* in neuter nom.-acc. sg., attested as Hitt. *-at* ‘that,’ Pal. *-at*, CLuw. *-ata*, Skt. *adás, adó* (< *adá-u*) ‘that one.’ Probably, univerbated with **ua-es* in PS.
 - **ua-*: an allomorph of **(s)ua-*, which is etymologically related to Lat. *suād* ‘so,’ Goth. *swa* ‘so,’ probably the quotative particles in Anatolian, Hitt. *-wa(r)* and Luw. *-wa*, Skt. */va/* ‘as’ as in *iva* ‘in the way as, to the (same) degree as,’ *vaí* ‘indeed (emphasizing its previous word).’ The particle **(s)ua-* is reconstructed for PIE, with the meaning ‘so, as’ (Dunkel 2014: 763ff.)
 - **-es*: an emphatic particle, lexically meaning ‘entirely, completely, quite, etc.’
- **ua-es* ‘*just so, barely’ > BS ‘hardly, with difficulty’ through a possible pejoration process, as could be observed in ‘he barely managed it’ to ‘he managed it with effort’ (Dunkel 2014: 765¹¹).
- Length and accentuation of the vowel:

It is assumed in Dunkel (2014: II, 764) that the contraction in **ua es* took place already in PIE (**uǎs*). Such an old contracted vowel in **uǎs* could be expected to be reflected with the acute tone (cf. Latv. *nuõst* ‘away’ below). The tone of the second syllable in the Čak. *jedvǎ* ‘hardly’ may support it.
- The circumflex tone in Lith. *võs* can be possibly from MC.

3.1.3 *tè, tẽ* (PERMISSIVE PARTICLE)

Cognates: Lith. *tè, tẽ*, Latv. *te*, OAve., YAve. *tā* (hortative), Gk. *τῆ* (hortative), in addition, Goth. *þe* ‘um so,’ and OPruss. *tīt* ‘thus, therefore’

- dial. *tẽ* (Kvėdarna, Rietavas, Dusetos, Mosėdis, Salantai)
 - equated with Gk. *τῆ* ‘there,’ which initiates an imperative always in Homer and mostly later, often in the sequence *τῆ νῦν* (Trautmann 1910: 449; Endzelīns 1923: 478; Būga 1958–61: voll, 454²; Fraenkel 1962–65: 1071; Dunkel 2014: II, 789)

- OPruss. *tīt* ‘thus, therefore’ also related; ← *tī* (cf. Gk. τῆ) + *-t* (cf. Cze. *tak* ‘so’) (Trautmann 1910: 449). According to Dunkel’s (2014: I, 178; II, 789) further analysis, **te-h₁* (instr.sg.) + *-te* (temporal particle, attested in Southern Greek dialects, e.g., τότε ‘at that time’ < **tó-te*).
- the relation between *tè* and *tě̃*:
 - *tè* has been shortened from *tě̃*:
 - * Hirt (1892: 29):
 - *tē*, an *i*-less locative of the pronominal stem **to-* with the lengthening in the root, got shortened (possibly in the proclitic position [Endzelins 1923: 478]).
 - *tè* and *tě̃* continue different proto forms [Streitberg (1892: 270ff.); Fraenkel (1962-65: 1071)]:
 - short *tè* may be from the old *i*-less locative form, with the parallel of OCS *te* ‘and;’ while the long form is from the old instrumental singular form, cf. Gk. τῆ.
 - Probably, Streitberg (1892) and his followers are right, considering the difference in the usage between *tě̃* (permissive free morpheme) and *tè* (locative meaning → permissive bound morpheme).
- *tě̃* < **te-h₁* is a good example of MC.

3.1.4 *nuō* ‘FROM’

Cognates: Lith. *nuō*, Latv. *nūo*, OPruss. *no* (< PB **nō*), OCS *na*, Ru. *na* (< PS **na* ‘on(to), in(to)’ < PBS **nō*), Gk. ἄνω ‘above, onto.’

- Lith. *núobara* ~ Latv. *nuōbara* ‘lamb’s wool (collected in spring),’ *núo-pelnas* ~ *nuō-peļns* ‘merit,’ etc. shows the original acute tone of the preposition? (Būga 1923/24: 97)
- Latv. *nuōst* ‘away’ < **nō-steh₂*- rather shows the phonological tonal outcome of the morpheme.
 - An adverb formation with a preposition and one of the suffixes **-tjā-*, **-jā-*, and **-stā-* (< **-steh₂*-) (Forssman 2003: 97ff.):
 - (5) a. Lith. *prúojais* ‘for naught,’ Latv. *pruôjām* ‘away’ ← (PB) preposition **prō* ‘forward, forth, early’ + **-jā-*;
 - b. Latv. *nuōst* (*nuôst*²) ← (PB) preposition **nō* ‘from’ + **-stā-*;
 - c. Latv. *bešā*, *bešū*, *bešu*, *beš* ‘alone, solely’ ← preposition *be* ‘without’ + **-tjā-*.

- Possibly, **nō* did not undergo MC in a disyllabic PBS **nōstā* to be preserved with the acute tone in Latv. *nuõst*.
- Dunkel’s (2014: I, 154,156; II, 52) analysis of PIE **nō* ‘upwards, above:’
 - **no-o* ← locative adverb **no* ‘above, up’ + directional particle **o*
 - **no:* attested in **nó-h₃k^w-o-* ‘looking above/seen above’ (> Skt. *náka-* ‘heavenly vault,’ OCS *vъznakъ* ‘on one’s back’)
 - directional particle **o:* found in verbal prefixes, **pró* ‘forward’ (> Hitt. *parā*, Gk. *πρό*, Goth. *fra*, OCS *pro*, Lith. *pra*), **apó* ‘back’ (Gk. *ὑπό*, Lat. *po-*, Goth. *af*, OCS *opaky* ‘again’), **súpo* ‘down’ (Gk. *ὑπό*, Gaul. *uo-*, OIr. *fo*), etc. (Dunkel 2014: I, 154ff.).
- (5a) and (5b) can be good pieces of evidence for an inherited plain long vowel reflected with the acute tone at least in East Baltic.
- The circumflex tone of Lith. *nuõ* and Latv. *nùo* is highly likely to be resulted from MC.

3.2 Baltic particles

3.2.1 *laĩ* (OPTATIVE PARTICLE)

Cognates: Lith. *laĩ*, Kupiškis *lói*; Latv. *laî*.

- no such particles are found outside of East Baltic. (OPruss. conditional particle *-le* is not a direct cognate, cf. Stang (1966: 443))
- Lith. *laĩ* is from the 3rd person optative form of *léisti* (dial. *láisti*) ‘let,’ and Latv. *laî* also from *laíd*, the shortened imperative form of *laîst* ‘let.’
- Lith. *laĩ* and Latv. *laî* can be historically traced back to Proto East-Baltic at most. Consequently, the circumflex tone of Lith. *laĩ* cannot be attributed to the Monosyllabic Circumflexion which was in operation in PBS, but to an inner-Lithuanian phenomenon.
- This view is also supported by the acute *lói* in east Aukštaitian (< pre-Lith. **láí*), for this form indicates that the metatony that produced *laĩ* happened after the divergence of Lithuanian dialects.

3.2.2 *vĕl* ‘AGAIN’

Cognates: ELith. *vĕl’*, Lith. dial. *vĕl* (Šakiai, Suvalkai), Latv. *vĕl* (ELatv. *viĕl*) ‘still.’

- Būga (1923/24: 95ff.): Lith. *vĕl* and ELith. *vĕl’* < **vĕli*; *vĕl* (also *vĕl’ei*, *vĕlek*) < **vĕli(a)*.

Latv. *vĕl* (dial. *viĕl*) should be from Baltic **vĕli* (with accent on *-i*⁴), where the final adverbial ending **-i*⁵ was lost later, as the narrow root vowel *ē* implies (also Endzelīns (1923: 465)).⁶

- Lith. *vĕl*, *vĕl’*/Latv. *vĕl* is an deadjectival particle, descended from an adjective stem **vĕlu-* which is attested as adjectives, Lith. *vĕlūs* (4) ‘late’ and Latv. *vĕls* ‘id’ (Forssman 2003: 221).
- Diachronic summary:
 - The *métatonie douce* in Lithuanian *u*-stem adjectives observed in a relatively recent history of Lithuanian (e.g., *saldūs* (3) ‘sweet’ [Daukša’s Postilė (1599)] → *saldūs* (4), cf. Latv. *saļds* (Stang 1966: 160)) must have affected also Lith. *vĕlūs* (*3 → 4), cf. Latv. *vĕls*.
 - On the other hand, the formation of the adverb **vĕli* is in PB and much older than the metatony. It must have been formed based on the acute stem **vĕlu-*.
 - Therefore, the acute tone of Latv. *vĕl* shows the original acute tone, while the circumflex tone of Lith. *vĕl* is secondary. One possibility is that it underwent a late MC after the loss of the adverbial ending **-i*. Its acute variants found in Latvian, Lithuanian dialectal forms (parallel to the case of *laī*) and disyllabic forms can be understood as the forms which have not undergone MC.

3.3 Analysis

The old particles which have good etymology in PIE as a monosyllable have either the circumflex tone both in Lithuanian and Latvian, or only in Lithuanian,

⁴The form meant by him is probably **vĕli* (with the acute root and accented ending).

⁵This may be the de-locative adverbial ending PIE **-éj* > PEB **-ie* (Forssman 2003: 143ff.)?

⁶It is known that PIE knew two ways to form adverbs from adjectives: a particular case form and contrastive accent shift. In Lithuanian, we often find pairs like *ilgaĩ* ~ *ilgai* (*ilgas* ‘long’); *skersaĩ* ~ *skeĩsai* (*skeĩsas* ‘across’). Such accent alternation may be a remnant of the old contrastive accent shift (Forssman 2003: 119). **vĕli* and **vĕli(a)* above may be one such case.

lacking the attested equivalent form in Latvian. These forms support the relative chronology in (4).

On the other hand, MC in PBS could not have operated on the Baltic particles, but still have a reflex with circumflex tone in Lithuanian, and the acute tone in Latvian. At least *laĩ* (Latv. *laî*) exemplifies a clear case where Lithuanian form underwent a late MC after the divergence of Lithuanian and Latvian. More particle data and chronological analyses of other categories are needed to confirm this working hypothesis.

4 Conclusion

- the relative chronology based on the root nouns:
Winter's Law → acute assignment → MC
→ generalization of *i*-stem → Osthoff's Law (= 4)
- The particle *laĩ*/Latv. *laî* and *vėĩ*/Latv. *vėî* may imply another MC in Lithuanian, which Kortlandt (2014: 217) considers to spread over West Aukštaitian dialects (and not in the East Aukštaitian).

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