BALTISTICA XLVIII(2) 2013 161–204

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HISTORICAL PHONOLOGY IN SERVICE OF SUBGROUPING. TWO LAWS OF FINAL SYLLABLES IN THE COMMON PREHISTORY OF BALTIC AND SLAVONIC*

1. Introduction

When dealing with a group of genetically related languages one might note that some languages of the group display similarities that are not shared by others. These similarities can be explained in different ways. First, features found only in some members of a group of related languages can be inherited from the common parent-language of the group and secondarily lost by its other descendants. For instance, the special dual inflection of nouns and verbs that is at present found only in two of the many Slavonic languages, i.e. Sorbian (with Upper and Low Sorbian) and Slovenian, is simply inherited from Proto-Slavonic. This is clearly shown by the fact that a dual inflection of verbs with inflectional endings very similar to those of Sorbian and Slovenian was common in all medieval varieties of Slavonic.

Second, it is also possible that features shared only by some languages of a genetic group are due to a secondary influence of some unrelated language or a secondary influence of one member of the group upon one or more of its other members. A clear instance of this is, for example, the morphonological alternation *d* ~ *žd* in some contemporary Slavonic languages such as Bulgarian or Russian. In Russian, this alternation is found side by side with a more

* This paper was first presented at the workshop *New Reflections on Baltic, Slavic and Balto-Slavic* which was held at the *XIX*th *International Conference on Historical Linguistics* in Nijmegen (10–15 August 2009). It is my pleasant duty to thank the participants of the workshop, especially Jenny Larsson, Imke Mendoza, Ronald Kim, Miguel Villanueva-Svensson and Marek Majer, for their valuable comments and suggestions. I also feel obliged to Thomas Olander, Wolfgang Hock, Rainer Fecht, Stefan Schumacher, Dagmar Wodtko and Corinna Scheungraber who commented on previous drafts of the paper and contributed much to its present appearance. Finally, I also have to acknowledge the helpful comments made by the anonymous reviewers of *Baltistica*. The usual disclaimers apply.

common alternation *d* ~ *ž*. The most probable explanation for this situation is to assume that the alternation *d* ~ *žd* in Russian represents one of the numerous features borrowed from Church Slavonic, which was closely related to the medieval predecessor of contemporary Bulgarian. Being the language of orthodox liturgy, Church Slavonic is known to have heavily influenced the spoken vernaculars of orthodox Slavs such as Russians.

Third, a further possibility is that distinctive features in the phonology or grammar of related languages arise independently by secondary developments in these languages. So a merger of older *ě* and *i* both in Ukrainian and in geographically remote North-Western dialects of Russian is best explained as two independent innovations.

Fourth, it is also conceivable that languages with distinctive similarities descend from a parent-language which is younger than the parent-language of the whole group. For instance, it is clear that numerous common features of the Slavonic languages Russian, Byelorussian and Ukrainian are inherited from their common parent-language, Early East Slavonic, itself a daughter-language of Proto-Slavonic, which is not directly attested but was the parent-language of the Slavonic group.

Which explanation is more appropriate in each particular case depends on the particular characteristics of the similarities in the given languages. Thus, homophony between two vocalic case endings which are distinct in the other languages of the group cannot be explained by inheritance from the whole group's parent-language. Such an explanation would presuppose an unconditioned split in the languages not sharing the feature, although splits, unlike mergers, always need conditioning. Phonological or morphological similarities which may be attributed to typologically common developments are better ascribed to independent innovations if secondary contact between the languages in question is for some reason improbable. Similarities which are clearly not inherited from the parent-language of the whole group, which cannot be plausibly attributed to language contact and which are not sufficiently trivial to be generated by chance are best explained by assuming that the relevant languages constitute a genetic subgroup within their group of related languages. This means that the languages with similarities of this latter kind most probably descend from a parent-language situated chronologically somewhere between their first attestation and the disintegration of the common parent-language of their group.

The focus of the present paper is on two branches of the Indo-European language family, Baltic and Slavonic. The Baltic branch of Indo-European

comprises first the well-known languages of the Baltic Sea region Lithuanian and Latvian, which constitute the so-called East Baltic group. The only remaining member of the West Baltic branch is Old Prussian which was spoken until ca. 1700 to the South West of the East Baltic area, in the territory traditionally called Prussia. Together with a couple of unattested dialects of minor tribes, Old Prussian is traditionally believed to have constituted the West Baltic group of Baltic.

The Slavonic branch of Indo-European is traditionally divided into three groups. The so-called West Slavonic group of languages with Polish, Czech, Slovak, and Upper and Lower Sorbian as well as the now extinct Polabian and Slovincian are or were spoken in Central Europe between the Polish Baltic Sea coast in the North and the Carpathian Mountains in the South. The West Slavonic area borders directly on the Southern part of the historical homelands of the Balts. The East Slavonic languages Byelorussian, Russian, Ukrainian and Rusyn are spoken in Eastern Europe. The former two are also direct neighbours of the East Baltic languages. Finally, the Slavonic languages spoken on the Balkan Peninsula, i.e. Bulgarian, Macedonian, Serbo-Croatian and Slovenian, constitute the South Slavonic subgroup. This subgroup of Slavonic also included the oldest attested Slavonic language, Old Church Slavonic.

Due to the situation in historical times, the unattested parent-languages of the Balts and the Slavs were most probably spoken in close proximity to each other. As the daughter-languages clearly show, Proto-Baltic and Proto-Slavonic must have possessed a set of common features which are not found in other branches of Indo-European. However, after approximately one hundred and fifty years of research into Baltic and Slavonic it is still not securely established whether these similarities justify postulating a Proto-Balto-Slavonic parent-language or Proto-Baltic and Proto-Slavonic are better viewed as direct descendants of Proto-Indo-European that merely became more similar by preservation of inherited features, secondary contact due to geographic proximity, and chance.

In the domain of segmental phonology the often assumed intermediate Proto-Balto-Slavonic stage after the break-up of Proto-Indo-European can only be established by typologically peculiar sound changes common to Baltic and Slavonic but not shared by other branches of Indo-European. A recent examination of the evidence collected in the research literature led W. Hock (2000, 135–139) to the conclusion that only the development of Proto-Indo-European syllabic resonants *r̥, *l̥, *n̥, *m̥ into *i plus resonant,

i.e. *ir, *il, *in, *im, in Baltic as well as in Slavonic can securely count as such an exclusive sound change. Cf. such instances as PIE *k^{w}r̥mis 'worm' (cf. Skt *kr̥mis*, Welsh *pryf*) > Lith *kirmìs* or PIE (neuter) *kr̥snóm 'black' (cf. Skt *kr̥ṣṇám*) > OPr *kirsnan*, Proto-Slav *čĭrno (cf. ORu *čĭrno*, OCS *črĭno*). The present paper is aimed at introducing two further probably exclusive sound changes which must be assumed for the common prehistory of Baltic and Slavonic and therefore potentially constitute new phonological evidence for a Proto-Balto-Slavonic parent language.

To reach this goal, I shall first introduce the evidence, suggesting a secondary shortening of long vowels before reflexes of word-final PIE *-m in Baltic and Slavonic (§ 2). In the first part of this section I will establish the quantity of the vowel in the genitive plural ending of Baltic and Slavonic (§ 2.1). Then I will discuss the relevant facts from other Indo-European languages such as Old Irish (§ 2.2) and show that the assumed shortening of vowels before word-final *-m can be supported by the shape of the accusative singular ending within stems ending in *-ā- (§ 2.3). Finally I will demonstrate that the shortening, though not exclusively Baltic and Slavonic, helps to detect a very specific sound change which is not shared by any other branch of Indo-European (§ 2.4).

Second, the well-known Slavonic raising of a short *o in word final position will be discussed (§ 3). In the first part of this section (§ 3.1) I will introduce the relevant material from Slavonic. Then I will demonstrate that a similar raising must be assumed for the corresponding paradigmatic slots in the Baltic inflection as well (§ 3.2). After having established the conditions of the raising (§ 3.3), I will address some less clear cases of raising or non-raising of PIE *o in Slavonic and Baltic (§ 3.4). The following paragraphs are intended to account for the obvious counter-evidence (§ 3.5) and to refine the conditioning of the proposed sound change making it more plausible from a typological perspective (§ 3.6).

The last section of the paper (§ 4) will sum up what has been achieved in the previous sections.

2. Shortening of long vowels before word-final *-m and the loss of word-final *-i

Several old problems in the historical phonology of Baltic and Slavonic can be resolved by assuming a secondary shortening of long vowels before word-final *-m in their common prehistory. The clearest instance of this shortening seems to be the genitive plural ending of nouns, pronouns and adjectives.

2.1. The genitive plural in Baltic and Slavonic

The shape of the ending of the genitive plural in Proto-Indo-European, i.e. in the common parent-language of Baltic and Slavonic, is a disputed matter. Skt *-ām* and Avestan *-ąm* presuppose *-ām for Proto-Indo-Iranian. Greek -ων shows the original timbre of the vowel. The combined evidence of Indo-Iranian and Greek points to something like PIE *-ōm which seems to be additionally supported by Proto-Germanic *-ōn (Old Saxon *-o*, Old English, Old Norse *-a*).

However, the endings of the genitive plural are in all probability historically short in Slavonic as well as in Baltic. For Slavonic this is clearly shown by OCS *-ŭ*. The so-called 'reduced' vowels OCS *-ĭ* and *-ŭ* can only reflect pre-Proto-Slavonic short vowels. In Baltic, the Old Prussian genitive plural ending *-an*, *-un* is equally compatible with a short or a long vowel but Lith *-ų* presupposes Proto-Balt *-uñ with a short *u.

The traditional assumption[1] that Lith *-ų* in the genitive plural of nouns and adjectives might somehow reflect an older *-uon which would presuppose Proto-Balt *-ōn < PIE *-ōm is shown to be wrong by the inflection of determinate adjectives where the end of the word is protected by an enclitic pronoun and therefore no recent reductions occur. Cf. the inflection of Lith *gẽras* 'good' in the indeterminate and in the determinate form

(1)	indeterminate	determinate
nom.pl.	*ger**ì***	*ger**íe**-jie*
instr.sg.	*ger**ù***	*ger**úo**-ju*
nom.du.	*ger**ù***	*ger**úo**-ju*
acc.pl.	*ger**ùs***	*ger**úos**-ius*
gen.pl.	*ger**ų̃***	*ger**ų̃**-jų*

In the inflection of determinate adjectives, the genitive plural ending still has the shape Lith *-ų-jų* with a plain *-ų-*, not a diphthong. By contrast, the endings which contain Lith *u* descending from older *uo (< Proto-Balt *ō) always keep the diphthong when followed by a clitic. Cf. such clear instances as the instrumental singular and the nominative dual ending in Lith *-u* but *-uo-ju* in the determinate form, or the accusative plural ending in Lith *-us* but *-uos-ius* in the determinate form. Note that the diphthong in the accusative plural was, exactly like the vowel in the genitive plural, originally also followed by a nasal. Lith acc. pl. *-us* ~ *-uos-ius* corresponds to OPr *-ans* and

[1] Cf. for instance Stang 1966, 184–185, 272; Kazlauskas 1968a, 175–176; Endzelīns 1971, 136; Olander 2010, 91.

must therefore reflect Proto-Balt *-ōns < PIE *-ōns (cf. Skt *-ān*, Goth *-ans*). It follows that the genitive plural in Lith *-ų*, *-ų-jų* can only reflect Proto-Balt *-uñ with a short vowel.

Despite these clear facts, Stang (1966, 184, 272) maintained Proto-East-Baltic *-uon (< Proto-Balt *-ōn) as the source of the attested genitive plural ending in East Baltic nouns, pronouns and adjectives because he evidently thought that the diphthong *uo was supported by two pieces of direct evidence. The first relevant form was the genitive plural of both genders in the paradigm of Latvian monosyllabic pronouns such as *tas* 'that' or *šis* 'this'. Latvian monosyllables do not take part in the well-known Latvian shortening of long vowels and diphthongs in word-final position. Cf. the case forms of Latv *tas* and *šis* in contrast with two polysyllabic nouns, Latv *vìlks* 'wolf' and *lãcis* 'bear', respectively

(2)					
	nom.pl.	*vìlk**i***	*lãč**i***	***tiẽ***	*š**iẽ***
	acc.sg.	*vìlk**u***	*lãč**u***	***tùo***	*š**ùo***
	instr.sg.	*vìlk**u***	*lãč**u***	***tuõ***	*š**uõ***
	gen.pl.	*vìlk**u***	*lãč**u***	***tùo***	*š**ùo***

Since the genitive plural of Latv *tas*, *šis* has the shape *tùo*, *šùo*, Stang believed that here the older form of the ending, which was secondarily shortened to *-u* in polysyllabic nouns, has been preserved.

The second point which Stang conceived to be a piece of evidence for *uo (< Proto-Balt *ō) in the ending of the East Baltic genitive plural was the variation between the spellings <-uiu> and <-oiu> which is attested in the inflection of the determinate adjectives used in one of the oldest Lithuanian texts, Mažvydas' Catechism of 1547. Since Mažvydas systematically used the letter <o> for *uo* of standard Lithuanian, Stang saw in the variant spelling <-oiu> direct proof for the diphthong in this position.

However, it can be demonstrated that both Latv gen. pl. *tùo*, *šùo* and the spellings <-oiu> in Mažvydas' Catechism may be interpreted differently.

The diphthong *uo* is systematically retained in monosyllabic word-forms not only in Latvian but also in Lithuanian. This is clearly shown by the masculine instrumental singular Lith *tuõ*, *šiuõ* and the accusative plural Lith *tuõs*, *šiuõs* which correspond to Latv *tuõ*, *šuõ* and *tuõs*, *šuõs*, respectively. However, in the genitive plural of both genders, the East Baltic languages clearly deviate from each other in that Lithuanian has *tų̃*, *šių̃* whereas Latvian shows *tùo*, *šùo*.

Which is the language that retains the original situation, is far from obvious. Stang assumed that gen. pl. *tų̃*, *šių̃* of Lithuanian are innovative forms

secondarily created on the model of polysyllabic words. But it is equally possible that gen. pl. *tùo*, *šùo* of Latvian were secondarily reshaped in analogy on polysyllabic nouns. Due to well-known sound changes in the most recent prehistory of Latvian, the genitive plural and the accusative singular share the same ending in the most prominent inflectional paradigms of masculine and feminine nouns and adjectives. Cf. Latv acc. sg. *vìlku*, *mazu* ~ gen. pl. *vìlku*, *mazu* of *vìlks* 'wolf', *mazs* 'small' (cf. Lith *vil̃ką*, *mãžą* ~ *vilkų̃*, *mažų̃*) or acc. sg. *rùoku*, *mazu* ~ gen. pl. *rùoku*, *mazu* of *rùoka* 'hand', *maza* 'small' (cf. Lith *rañką*, *mãžą* ~ *rañkų*, *mažų̃*). It is perfectly possible that this structural property of Latvian noun inflection was secondarily extended to the pronouns. This would mean that Latv *tùo*, *šùo* in the genitive plural and accusative singular both descend historically from the accusative singular and hence have to be compared not with Lith gen. pl. *tų̃*, *šių̃* but with Lith acc. sg. *tą̃*, *šią̃*.[2]

Which scenario is more plausible can hardly be determined. This uncertainty means, however, that Latv *tùo*, *šùo* do not qualify as clear-cut direct evidence for old *uo* in the genitive plural of the East Baltic nouns, pronouns and adjectives.

We can now turn to Mažvydas' Catechism and the variation between <-uiu> (with six attestations) and <-oiu> (used four times) in the genitive plural of determinate adjectives. As has been established by Stang himself in his thorough analysis of Mažvydas' text (cf. Stang 1929, 55–56), the variation between <u> and <o> is not restricted to the genitive plural of determinate adjectives. It is also found in their masculine accusative plural as well as in the locative plural of masculine nouns, pronouns and indeterminate adjectives. In the accusative plural of determinate adjectives, where the contemporary standard Lithuanian ending is *-uosius*, Mažvydas spells <-usius> once and <-osius> five times. In the locative plural of nouns, pronouns and adjectives, where contemporary standard Lithuanian has *-uose*, Mažvydas writes <-usu> five times and <-osu> twice.[3] Taken together, one counts six

[2] The same development might be assumed for the genitive plural of Latvian determinate adjectives which ends in *-uõ*, cf. nom. sg. masc. *mazaĩs* 'small' ~ acc. sg. *mazuõ* ~ gen. pl. *mazuõ*. The origin of the adjectival accusative singular ending (cf. the corresponding case-forms of Lithuanian determinate adjectives such as masc. *mãžą-jį*, fem. *mãžą-ją*) is discussed in Endzelin 1923, 348.

[3] Concerning the final vowel of this ending (High Lith *-e* vs. Low Lith *-u*) cf. the form <Dangwaſu> for *danguosè* 'on heavens' in the Lord's Prayer from Vilnius (written between 1503 and 1530) whose language is clearly High Lithuanian. About the locative plural ending in *-su* in more recent sources and contemporary dialects cf. Zinkevičius 1982, 24–25.

instances of <u> and seven instances of <o>, all corresponding to *uo* in the relevant endings of contemporary standard Lithuanian.

According to Stang (1929, 55–56, 62–63, 127), the variation between <u> and <o> in the latter morphological positions is best explained by reference to the securely established fact that Mažvydas spoke a variety of Low Lithuanian but was influenced by the more prestigious High Lithuanian dialects. In parts of the Low Lithuanian dialect area, the phoneme which sounds like *uo* in most of High Lithuanian is represented by the monophthong *ū* (cf. Zinkevičius 1966, 85–86). Most probably, the spellings <-usius> and <-usu> reflect Mažvydas' own pronunciation whereas <-osius> and <-osu> were attempts to write in a more High Lithuanian vein.

But the same explanation can also be applied to <-uiu> and <-oiu> in the genitive plural of determinate adjectives. The fact that in this case-form Low Lith *ū* is not matched by High Lith *uo* does not render it impossible, since Mažvydas, evidently used to the variation Low Lith *ū* ~ High Lith <o> in inflectional endings, might have unintentionally created an artificial, i.e. hypercorrect High Lith form.[4] This conclusion finds additional support in Stang's (1929, 63) observation that all attestations of <-oiu> are found in more solemn portions of the text where Mažvydas might have felt his Low Lithuanian vernacular to be inappropriate. Stang's idea that Mažvydas was not only influenced by the parochial High Lithuanian of his time but also used an otherwise unknown variety of it (with *uo* in the genitive plural of determinate adjectives) seems to be superfluous.

So, neither Latvian monosyllabic pronouns nor Mažvydas' spellings constitute valid direct evidence for Proto-East-Baltic *-uon (< Proto-Balt *-ōn) in the genitive plural of nouns, pronouns and adjectives.

The only conclusion one can draw from the above discussion is the following. In the immediate prehistory of Slavonic and Baltic the reflexes of PIE *-ōm in the genitive plural contained only short vowels. The long *ō of the PIE ending must therefore have been secondarily shortened in Slavonic as well as in Baltic.

2.2. The genitive plural in Old Irish

It has been claimed that the Proto-Indo-European ending of the genitive plural was actually a short *-om, the long vowels of Skt *-ām*, Av *-ąm* and

[4] Cf. similar hypocorrectisms <bůti>, <bůsi>, <bůk> for inf. *bűti*, 2.sg.fut. *bűsi*, 2.sg. imp. *bűk* 'to be' in Mažvydas' later works. This erroneous use of <ů> which Mažvydas adopted to represent High Lithuanian *uo* after the composition of his Catechism is extensively discussed by Zinkevičius 1977, 385–387; 1978.

Greek -ων being then a recent innovation (cf. Schelesniker 1964, 30–34; Kortlandt 1978; 1983). The major reason for this assumption is the fact that a genitive plural in *-ōm cannot be assumed for the prehistory of a further Indo-European daughter-language, i.e. Old Irish, which belongs to the Celtic branch of Indo-European.

As is securely established, PIE *-ōm should have yielded Proto-Celt *-ūm, for every old *ō becomes *ū in the last syllable of a Proto-Celtic word. This is clearly shown by such items as, for instance, the 1sg. present of thematic verbs in pre-Proto-Celt *-ō (cf. Gk -ω, Lat -*ō*) > Proto-Celt *-ū > Gaul, OIr -*u* or the accusative plural of masculine o-stems in pre-Proto-Celt *-ōns (Skt -*ān*, Goth -*ans*) > Proto-Celt *-ūs > OIr -*u*. Since Proto-Celt *-V̄C always becomes -V̆ in Old Irish, a genitive plural in Proto-Celt *-ūm should have remained as OIr †-*u* which would have caused so-called u-infection in the root and, due to the former presence of a nasal, nasalised the following word in the clause.

However, the actual Old Irish ending of the genitive plural is -*Ø* which causes lowering of *i* and *u* to *e* and *o* in the root and nasalises the following word in the clause. As this ending behaves exactly like OIr -*Ø* < pre-Proto-Celt *-om in the accusative singular of o-stems (cf. Skt -*am*, Gk -ον, OLat -*om*), one has to assume pre-Proto-Celt *-om for the prehistory of the Old Irish genitive plural as well.[5]

Cf. the Old Irish accusative singular and genitive plural of PIE *u̯iHró- > Proto-Celt *u̯iro- m. 'man'

(3)		OIr	Primitive Irish		Proto-Celt
acc. sg.		*fer n-*	*u̯iran		*u̯irom
	<			<	
gen.pl.		*fer n-*	*u̯iran		*u̯irom

However, the stem of PIE *u̯iHró- > Proto-Celt *u̯iro- ends in an *o. The genitive plural in a short *-om would still yield PIE *u̯iHró-om > pre-Proto-Celt *u̯īrṓm with a long vowel in the last syllable. This can only be accommodated within the theory of the genitive plural in PIE *-om if one assumes that this case originally ended in short *-om in the inflection of

[5] Cf. Ziegler 1994, 54 about possible direct attestations of this ending in Irish inscriptions written in the so-called Ogam alphabet (roughly between 400 and 700). The situation in Continental Celtic is somewhat confusing. A genitive plural in short -*on* has probably to be assumed for Gaulish (cf. Lambert 1997, 53). Celtiberian seems to have -*um* which presupposes pre-Proto-Celtic *-ōm (cf. Untermann, Wodtko 1997, 400). Cf. discussion in Eska 2006.

stems in consonants but in long *-ōm (with *ō resulting from a contraction of two vowels) in the paradigm of words with vocalic stem formatives such as PIE *-o-. Reflexes of PIE *-om and *-ōm would subsequently have been generalised in the daughter-languages.

This theory seems to be improbable for the following three reasons. First, not a single Indo-European language exhibits reflexes of both alleged variants. In Indo-Iranian and Greek, where the inflection of stems in consonants is otherwise not influenced by the vocalic stems, the genitive plural ending is only attested with a long vowel. In Slavonic, where stems in consonants and vocalic stems also remain dissimilar in their inflection, the genitive plural occurs with a short vowel only.

Second, the assumed analogical replacement of the genitive plural ending *-ōm in such words as, for instance, OIr *fer* (< Proto-Celt *u̯iro- 'man') by *-om taken over from stems in consonants would not be a plausible assumption for the recent prehistory of Slavonic, Baltic or Old Irish. In the attested languages, such as Old Church Slavonic, Old Prussian or Old Irish, the o-stems were the most prominent inflection class of masculine and neuter nouns and adjectives, both numerically and regarding the frequency of use. This must be assumed also for those stages in the development of these languages that immediately preceded the written records.

Third, and most important, reflexes of short *-om in the genitive plural of pronouns, nouns and adjectives are only found in those languages that show short reflexes of an originally long vowel before word-final *-m elsewhere in their inflection systems. This second long vowel which must have been shortened before word-final *-m is found in the accusative singular of stems ending in PIE *-ah$_2$- which in the daughter-languages regularly yields *-ā- when followed by a consonant.

2.3. The accusative singular of stems ending in *-ā-

The accusative singular of Proto-Indo-European ah$_2$-stems (which yielded Proto-Baltic or Proto-Celtic ā-stems) must have ended in PIE *-ah$_2$m, later *-ām according to the evidence of Skt *-ām*, Avestan *-ąm*, Gk -ᾱν (secondarily -ην in dialects) and Oscan *-aam*. This PIE *-ah$_2$m > *-ām in the accusative singular of the ā-stems should yield Proto-Balt *-ān. However, in Old Prussian the accusative singular of the ā-stems ends in *-an* whose vowel never takes part in the well-known regular rounding of long *ā* after velars and labials and therefore must be short. This reconstruction is clearly confirmed by the Lithuanian evidence (cf. Mathiassen 1989). Cf. the words for 'girl' and 'hand' in the nominative and accusative singular:

(4)		OPr		Lith		Proto-Balt
	nom. sg.	*mergu* --		*mergà*	*rankà*	*mėřgā́ *rȧ̃ñkā́
					<	
	acc. sg.	*mērgan*	*rānkan*	*meřgą*	*rañką*	*mėřgañ *rȧ̃ñkañ

The short Proto-Balt *-añ in the ending of the accusative singular sharply contrasts with the long acute vowel in the accusative plural, cf. Lith acc. sg. *meřgą* 'girl', *rañką* 'hand', *mãžą-ją* 'small' (< Proto-Balt *-añ) ~ acc. pl. *mergàs*, *rankàs*, *mažą́s-ias* (< Proto-Balt *-ā́ns).[6]

Thus, the following development may be assumed for the common prehistory of Slavonic and Baltic:

(5)	all stems'				
	gen. pl.	*-ōm	*-ŏm		OCS *-ŭ*, Proto-Balt *-añ, *-uñ
		>	>		
	ā-stems'				
	acc. sg.	*-ām	*-ăm		OCS *-ǫ*, Proto-Balt *-añ[7]

[6] For some reason the contrast between the singular and the plural is not observable in Old Prussian where the ending of acc. pl. *rānkans* does not take part in the rounding of long *ā* either. That this rounding should normally occur also in the plural inflections of the ā-stems is shown by dat. pl. *mergūmans*, *widdewūmans* of *mergu* 'girl', *widdewū* 'widow'. Perhaps the old rounded accusative plural of *rancko* was secondarily remodelled after the corresponding accusative singular in *-an* due to the structural pressure of the inflectional system as a whole. In the inflection of Old Prussian nouns the ending of the accusative plural always has a vowel of the same timbre as in the corresponding singular, cf. *-an* ~ *-ans* in the o-stems and the majority of ā-stems (*wijran* ~ *wīrans* 'man', *gennan* ~ *gennans* 'woman'), *-in* ~ *-ins* in the i-stems (cf. *nautin* ~ *nautins* 'problem') and *-un* ~ *-uns* in the u-stems (cf. *sunun* ~ *sounons* 'son').

[7] This scenario seems to be superior to Kortlandt's (2005, 153; 2008, 7) attempt to explain the difference between the Lithuanian accusative sg. in *-ą*, *-ą-ją* and the accusative pl. in *-às*, *-ą́s-ias* by a regular loss of laryngeals before a word-final *-m (i.e. PIE *-ah$_2$m > *-am > Proto-Balt *-añ). Kortlandt's sound-law is based solely on the single issue which it aims to explain. By contrast, the basis of the regular shortening before *-m which is hypothetically assumed here are two morphological positions which do not interact with each other. Holzer's (2009, 157) assumption of a laryngeal loss due to the supposedly vocalic pronunciation of the nasal since Proto-Indo-European times is contradicted by clear reflexes of *-ām virtually everywhere in Indo-European (at least in Indo-Iranian, Greek, Italic and Germanic). This makes the reconstruction of an allomorph with a vocalic nasal very doubtful, cf. against mechanistic syllabification rules for Proto-Indo-European Kümmel 2007, 16–19. Holzer's second instance of the assumed development, the 1.sg.prs. of thematic verbs in OCS *-ǫ*, hardly contained a 'secondary'

The long vowel is shortened before word-final *-m in the accusative singular of ā-stems also in the prehistory of Old Irish (cf. Cowgill 1975, 49; Jasanoff 1989, 139). This is demonstrated, for instance, by the o-stem OIr *fer* 'man' and the ā-stem *túath* 'tribe'

(6)		OIr		Primitive Irish		Proto-Celt		pre-Proto-Celt
	gen.pl.	*fer n-*		*u̯irăn		*u̯irŏm		*u̯īrōm
			<		<		<	
	acc. sg.	*túaith n-*		*tōtĕn		*teutăm		*teutām

Nasalisation of the following word in the clause (indicated by *n-*) shows that both forms of accusative singular *fer* and *túaith* must have originally ended in a nasal. The lack of a second syllable presupposes a short vowel in the apocopated inflectional ending. The velar articulation of *r* in *fer* beside the palatalised *th* in *túaith* can only be explained by a difference in the timbre of the vowel which originally followed the consonants.

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ending *-m (the postulated analogy would be very difficult to motivate functionally). Cf. about this ending below in the main text. The assumed shortening of long vowels before word-final *-m in the common prehistory of Baltic and Slavonic is also at variance with Olander's (2010) brilliant explanation of the twofold reflexes of vowels before word-final nasals in Slavonic. Cf. such instances as the accusative sg. of masculine n-stems in PIE *-m̥ (cf. Skt *-am*, Gk -α, Lat *-em*) > pre-Proto-Slav *-im > OCS *-ĭ* without nasalisation of the vowel but the nominative sg. of neuter n-stems in PIE *-n̥ (cf. Skt *-a*, Gk -α, Lat *-en*) > pre-Proto-Slav *-in > OCS *-ę* which is a nasalised vowel. Olander assumes that pre-Proto-Slavonic *-m was already lost when tautosyllabic nasals merged with preceding vowels in Slavonic yielding OCS *ę* and *ǫ*. According to this hypothesis, pre-Proto-Slav *-am in the accusative sg. of ā-stems should have yielded a plain oral vowel in Slavonic whereas the actual reflex is OCS *-ǫ*. Note, however, that Olander's approach has yet to overcome the following two difficulties. First, it only works if one assumes that pre-Proto-Slavonic *-m was lost after a long vowel later than after a short one, cf. the instrumental sg. of ā-stems in pre-Proto-Slavonic *-ām (cf. Lith *-à*, *-ą́-*, Latv *-u*) > OCS (*-oj*)*-ǫ*. This is rather unnatural for such a typologically unremarkable sound change as the loss of a final nasal. The second problem is constituted by the prepositions such as OCS *sŭ* 'with' or *vŭ* 'in' which attach an *n* to the following anaphoric pronoun, cf. OCS *sŭ n-jimĭ* 'with him' or *vŭ n-jemĭ* 'in it' (with instr. sg. *jimĭ* and loc. sg. *jemĭ* respectively). The only possible explanation for this additional *n* is the traditionally assumed conservation of the prepositions' final nasal in sandhi. But if the nasal was *-n before it disappeared (older *mi̯ does not secondarily develop into *nj* in OCS but yields *mlj*), it becomes unclear how to account for the lack of the predicted nasalisation in the final vowel of OCS *sŭ* and *vŭ*. Olander's remarks on this particular point (p. 93 of his article) are not helpful.

The combined evidence of all stems' genitive plural and ā-stems' accusative singular demonstrates that long vowels must have been secondarily shortened in the recent prehistory of Baltic, Slavonic and Old Irish.

2.4. The loss of word-final *-i after *m preceded by a long vowel in the common prehistory of Slavonic and Baltic

If the alleged Old Irish evidence for a Proto-Indo-European genitive plural in short *-om is disregarded, one has to reconstruct PIE *-ōm with a long *ō. Then, the short reflexes of this ending in Slavonic and Baltic can only be accounted for by assuming a secondary shortening of inherited *-ōm to *-om in the common prehistory of these branches (cf. already Streitberg 1892; 1893). This assumption is clearly supported by the development of *-ām to *-am in the accusative singular of stems in PIE *-eh$_2$-, later *-ā-.

However, the characteristic shortening of long vowels before word-final *-m is evidently shared by Old Irish. It might therefore be a comparatively recent sound change which secondarily spread across the already established language borders between Baltic, Slavonic and parts of Celtic. What makes this shortening interesting for the present discussion is another sound change which has to be assumed for the common prehistory of Baltic and Slavonic and might be exclusive here. This sound change only becomes visible against the background of the proposed shortening.

In East Baltic, the instrumental singular of the ā-stems ends in Lith *-à*, in definite adjectives (i.e. before an enclitic pronoun) in *-ą́-*, in Latv in *-u*. All this points to Proto-Balt *-ān for which an older *-ām is the most obvious source due to the *m in the marker of the instrumental singular of all other stem classes, cf. *-i-mi in the i-stems and *-u-mi in the u-stems (cf. Lith. *-i-mì*, *-u-mì*, OCS sg. *-ĭ-mĭ*, *-ŭ-mĭ*).[8]

In Old Church Slavonic, the instrumental singular of the ā-stems ends in *-oj-ǫ*. This *-oj-ǫ* must be borrowed from the pronominal inflection (cf. nom. sg. *ta* ~ instr. sg. *tojǫ* 'that') but the actual ending *-ǫ* ultimately reflects the same *-ān from *-ām as in Baltic.

[8] In Lithuanian, the final vowel of *-imì*, *-umì* in the singular and *-imìs*, *-umìs* in the corresponding plural is traditionally believed to be historically long. This must be true for the immediate prehistory of Lithuanian (cf. the arguments in Stang 1966, 209, 215). However, the Slavonic evidence, i.e. OCS *-ĭmĭ*, *-ŭmĭ* in the singular beside *-ĭmi*, *-ŭmi* in the plural, shows that the vowel in the singular ending must have been short in the prehistory of Slavonic and Baltic. About the corresponding endings in the other branches of Indo-European cf. Hill 2012, 178–200.

This pre-Proto-Baltic and pre-Proto-Slavonic *-ām in the instrumental singular of the ā-stems is best explained as older *-āmi with a secondary loss of *-i after the long vowels were shortened in the genitive plural (*-ōm > *-ŏm) and in the accusative singular (*-ām > *-ăm):

(7)

						Lith	OCS
instr. sg. i-stems	*-imi		*-imi		*-imi	*-imì*	*-ĭmĭ*
instr. sg. u-stems	*-umi		*-umi		*-umi	*-umì*	*-ŭmĭ*
instr. sg. ā-stems	*-āmi	>	*-āmi	>	*-ām	> *-à*	*-(oj-)ǫ*
gen. pl. all stems	*-ōm		*-ŏm		*-ŏm	*-ų*	*-ŭ*
acc. sg. ā-stems	*-ām		*-ăm		*-ăm	*-ą*	*-ǫ*

This loss of *-i after a long vowel followed by a labial consonant, only visible on the back-ground of the secondary shortening before a labial, is potentially an exclusive sound change of Baltic and Slavonic which is probably not shared by any other branch of Indo-European.

The validity of the assumed sound law can probably be confirmed by a further instance which is at the same time morphologically independent of the instrumental case of nouns and adjectives. This second instance is the 1sg. present ending of thematic verbs.[9] The evidence of many Indo-European daughter-languages – such as Gk -ω, Lat -*ō*, Proto-Gmc *-ō (> Goth -*a*, OHG -*u*) – leads to the expectation of reflexes of a plain *-ō. This is also what is found in Baltic. Lith -*ù* (reflexive -*úo-s*), Latv -*u* (reflexive -*uô-s*) and OPr -*a* unambiguously point to Proto-Balt *-ṓ. Unexpectedly the corresponding Slavonic ending is a nasal vowel OCS -*ǫ* which can only have emerged from a vowel followed by a nasal. How the situation in Baltic and Slavonic has to be interpreted historically is probably shown by Celtic, where the 1sg. present of thematic verbs also exhibits two different endings. The first of them is OIr -*u*, Gaulish -*u* < Proto-Celt *-ū which clearly reflects a more ancient *-ō. Beside this ending a somewhat unexpected variant is attested in Gaulish -*umí* and Middle Welsh -*if*. These latter endings presuppose Proto-Celt *-ū-mi which can only be interpreted as the usual Proto-Celt *-ū (from more ancient *-ō)

[9] The similarity of both cases has been repeatedly noticed in the literature, cf. most recently Jasanoff 2003, 102 and H. H. Hock 2007; 2012, 119–120. Note that Jasanoff's idea of a general loss of word-final *-*i* in words with more than two syllables can hardly accommodate the OCS instrumental sg. in -*ĭmĭ* and -*ŭmĭ* or the Old Russian thematic verbs with 3.sg.prs. in -*etĭ* and 3.pl.prs. in -*ǫtĭ*. Hock's conditioning (after a long vowel) works well. However, the proposed linking of the loss to utterance-final prosodic effects does not seem necessary.

enlarged by a historically unclear enclitic element *-mi.[10] It seems obvious that OCS -*ǫ* in all probability reflects the same 1sg. present *-ō secondarily enlarged by *-mi in the same way as happened in Celtic. But this ancient *-ōmi could only have developed into OCS -*ǫ* if it first had lost its final *-i, precisely as in the instrumental singular of ā-stems *-āmi > Proto-Balt *-ā́n (Lith -*à*, -*ą́*-, Latv -*u*), OCS -(*oj*)-*ǫ*.[11]

3. Raising of short *o before word-final *-m and *-s

In this section I intend to discuss the second highly specific law of final syllables which has to be assumed for the common prehistory of Baltic and Slavonic but, at the same time, seems not to be shared by any other branch of Indo-European.

3.1. Proto-Indo-European word-final *-om and *-os in Slavonic

The development of Proto-Indo-European sequences *-om and *-os at the end of a word constitutes one of the oldest problems of Slavonic historical phonology. In general, PIE *o is reflected as Proto-Slav *o which yields a plain *o* in all the older daughter-languages, such as Old Church Slavonic. This can be shown by the following instances

(8)	PIE		OCS	
	*d**ó**mh$_2$os (Gk δόμος, Lat *domus*)	>	*d**o**mŭ*	'house'
	*h$_2$**ó**u̯is (Gk ὄις, Lat *ovis*)	>	***o**vĭca*	'sheep'
	*n**ó**k$^{\text{w}}$ts (Lat *nox*)	>	*n**o**štĭ*	'night'

However, things are somewhat different at the end of a word. Pre-Proto-Slav *-os and *-om seem to develop differently in different inflectional categories. So pre-Proto-Slav *-om (cf. Skt *–am*, Gk -ον, OLat -*om*) devel-

[10] This **mi* is presumably the enclitic locative of the 1sg. personal pronoun. A locative in *-*i* is to be expected beside the well attested enclitic dative PIE 1sg. **moi̯*, 2sg. **toi̯* (cf. Skt *me*, *te*, Gk μοι, τοι, OCS *mi*, *ti*). This is suggested by the corresponding case forms of athematic nouns and adjectives such as, for instance, PIE dat. sg. **pedéi̯* ~ loc. sg. **pedí* 'foot' (cf. Skt *padé* ~ *padí*). The unexpected o-timbre of the ending in PIE dat. sg. **moi̯*, **toi̯* is probably caused by the lack of stress. The hypothetic locative PIE **mi*, **ti* seems to be directly attested in Old Lithuanian accusative and dative *m*, *t* which are found side by side with the dative *mi*, *ti* (< PIE **moi̯*, **toi̯*), cf. Stang 1966, 252–253 with references.

[11] OCS 1sg.prs. *damĭ* and *jamĭ* of *dasti* 'to give' and *jasti* 'to eat' seem to demonstrate that the assumed sound change did not occur if the labial was originally preceded by a consonant. The stems of these athematic presents orginally ended in *d* which only secondary was absorbed by the *m*, cf. the corresponding 3pl.prs. *dad-ętŭ*, *jad-ętŭ*.

ops into Proto-Slav *-ŭ (> OCS -*ŭ*) in the accusative singular of masculine o-stems such as

(9)	PIE		OCS
	*ĝómb^{h}**om** 'tusk' (Gk γόμφον, Skt *jámbham*)	>	*zǫbŭ* 'tooth'
	*u̯l̥k^{w}**om** 'wolf' (Gk λύκον, Skt *vr̥kam*)	>	*vlŭkŭ* 'wolf'
	*moi̯s**óm** 'ram' (Skt *meṣám*)	>	*mĕxŭ* 'wine-skin'
	*d^{h}uh$_2$m**óm** 'smoke' (Gk θῡμόν, Skt *dhūmám*)	>	*dymŭ* 'smoke'

The same pre-Proto-Slav *-om (cf. Skt *–am*, Gk -ον, OLat *–om*) is clearly reflected as Proto-Slav *-o (> OCS -*o*) in the nominative-accusative singular of neuter o-stems such as

(10)	PIE		OCS
	*i̯ug**óm** 'yoke' (Gk ζυγόν, Skt *yugám*)	>	*igo* 'yoke'
	*mēms**óm** 'meat' (Skt *māṃsám*)	>	*męso* 'meat'
	*múHtl**om** 'urine' (Skt *mū́tram*)	>	*mylo* 'soap'[12]

Similarly, pre-Proto-Slav *-os (cf. Skt *–as*, Gk -ος, OLat -*os*) seems to yield Proto-Slav *-ŭ (> OCS -*ŭ*) in the nominative singular of masculine o-stems such as, again,

(11)	PIE		OCS
	*ĝómb^{h}**os** 'tusk' (Gk γόμφος, Skt *jámbhas*)	>	*zǫbŭ* 'tooth'
	*u̯l̥k^{w}**os** 'wolf' (Gk λύκος, Skt *vr̥kas*)	>	*vlŭkŭ* 'wolf'
	*moi̯s**ós** 'ram' (Skt *meṣás*)	>	*mĕxŭ* 'wine-skin
	*d^{h}uh$_2$m**ós** 'smoke' (Gk θῡμός, Skt *dhūmás*)	>	*dymŭ* 'smoke'

However, pre-Proto-Slav *-os (cf. Skt *–as*, Gk -ος, OLat -*os*) is also reflected as Proto-Slav *-o (> OCS -*o*) in the nominative-accusative singular of neuter s-stems such as

(12)	PIE		OCS
	*néb^{h}**os** 'clouds' (Gk νέφος, Skt *nábhas*)	>	*nebo* 'sky'
	*k̂léu̯**os** 'fame' (Gk κλέος, Skt *śrávas*)	>	*slovo* 'word'
	*h$_2$áu̯s**os** 'ear' (Gk οὖς, OIr *áu*)	>	*uxo* 'ear'

Several more or less successful ideas to resolve the problem have been entertained in the field but none of them was successful enough to plausibly explain all the evidence without residue.[13] What has not been appreciated

[12] Cf. on this particular item footnote 18 below.

[13] Cf. most recently Vermeer 1991; Orr 2000, 96–107; Halla-aho 2006, 113–192; and especially Majer 2011 with exhaustive references.

so far is the fact that the historical phonology of the Baltic languages has to struggle with a very similar problem.

3.2. PIE *-om and *-os in Baltic

In general, PIE *o is reflected as Proto-Balt *a which yields *a* in all three Baltic daughter-languages, i.e. Old Prussian, Lithuanian and Latvian. This can be demonstrated by the following clear instances

(13)	PIE		Baltic	
	*n**ó**k^{w}ts (Lat *nox*)	>	OPr acc.sg. ***na**cktin*, Lith ***na**ktìs*, Latv ***na**kts*	‘night’
	*h$_{3}$**ó**k^{w}s (Gk nom.du. ὄσσε)	>	OPr nom.pl. ***a**ckis*, Lith ***a**kìs*, Latv ***a**cs*	‘eye’
	*h$_{2}$**ó**u̯is (Gk ὄις, Lat *ovis*)	>	Lith ***a**vìs*, Latv ***a**vs*	‘sheep’

As expected, PIE *-om evidently develops into Proto-Balt *-añ (> OPr *-an*, Lith *-ą*) in the accusative singular of masculine o-stems and in the nominative-accusative singular of neuter o-stems, cf.

(14)		PIE		Baltic
	acc.sg.m.	*deiu̯**óm** ‘god’ (Skt *devám*)	>	OPr *deiw**an***, Lith *diẽvą*
		*u̯iHr**óm** ‘man’ (Skt *vīrám*)	>	OPr *wijr**an***, Lith *výrą*
		*louk**óm** ‘clearing’ (Skt *lokám*)	>	OPr *lauk**an***, Lith *laũką*
		*u̯ĺ̥k^{w}**om** ‘wolf’ (Gk λύκον, Skt *vŕ̥kam*)	>	Lith *vil̃k**ą***
	nom.-acc.sg.n.	*pēd**óm** ‘ploughshare’ (Gk πηδόν)	>	OPr *ped**an***

However, this simple picture is only valid for nouns. In the inflection of many adjectives, especially of the resultative participles in PIE *-to-, the Old Prussian ending is nearly always *-on* which can only reflect Proto-Balt *-uñ[14] (cf. Kortlandt 1978, 289–290; 2008, 6; 2011, 40):

(15)	OPr	acc.sg. m.	*is-maitin-ton*	‘lost	of	*maitin-t**
			per-klantī-ton	‘condemned’	of	*klantī-t**
			ainan-gemin-ton	‘onlybegotten’	of	*gemin-t**
		nom.-acc.sg. n.	*billī-ton*	‘said’	of	*billī-t*
			dā-ton	‘given’	of	*dā-t*
			po-galb-ton	‘helped’	of	*galb-t**

[14] That Proto-Balt *-uñ may be reflected by OPr -on is shown by the following two instances. First, by the accusative singular ending of u-stems such as OPr *polīgun*, *-on* of *polīgus** ‘equal’, ‘similar’ and *sounon* of *sounus** ‘son’, cf. Lith *lýgus*, *sūnùs*. The second instance is the infinitive in OPr *-ton* which ultimately also reflects the accusative singular of a verbal noun, cf. the corresponding ending in Lith *-tų*, Lat *-tum*, Skt *-tum*, all pointing to PIE *-*tum*.

In the genitive plural of all stem classes of nouns pre-Proto-Balt *-om seems to be reflected as Proto-Balt *-añ according to OPr *-an* or as Proto-Balt *-uñ according to Lith *-ų* (cf. again Kortlandt 1978, 289–290; 2008, 6):

(16)

PIE	gen.pl. m. o-stems *-ōm	>	pre-Proto-Balt *-om	>	OPr *grīkan* of *grīkas* 'sin',
	(cf. Greek -ων, Skt *-ām*)		(cf. OCS *-ŭ*)		Lith *výrų* of *výras* 'man'
PIE	gen.pl. f. ā-stems *-ōm	>	pre-Proto-Balt *-om	>	OPr no clear evidence,
	(cf. Greek -ων, Skt *-ām*)		(cf. OCS *-ŭ*)		Lith *rañkų* of *rankà* 'hand'
PIE	gen.pl. C-stems *-ōm	>	pre-Proto-Balt *-om	>	OPr no clear evidence,
	(cf. Greek -ων, Skt *-ām*)		(cf. OCS *-ŭ*)		Lith *akmenų̃* of *akmuõ* 'stone'

Surprisingly enough, the genitive plural of Old Prussian pronouns ends not in *-an* (< Proto-Balt *-añ), as in the inflection of nouns, but rather in *-un*, *-on* which clearly presupposes Proto-Balt *-uñ, as in Lithuanian nouns, cf.

(17) OPr personal 1pl. nom. *mes* ~ gen. *nusun*, *noūson*
personal 2pl. nom. *ioūs* ~ gen. *ioūson*
demonstrative nom. pl. m. *stai* ~ gen. *stēison*

Thus, pre-Proto-Balt *-om is clearly reflected as Proto-Balt *-añ **and** Proto-Balt *-uñ at one and the same time in the same way as pre-Proto-Slav *-om is reflected as Proto-Slav *-o **and** Proto-Slav *-ŭ.

In the nominative singular of masculine o-stems, pre-Proto-Balt *-os is seemingly always reflected as Proto-Balt *-as (> OPr *-s*, Lith *-as*, Latv *-s*), cf.

(18)

PIE	*deiu̯**ós** 'god' (Skt *devás*)	>	OPr *deiw**s***, Lith *diẽv**as***, Latv *dìev**s***
	*u̯iHr**ós*** 'man' (Skt *vīrás*)	>	OPr *wijr**s***, Lith *výr**as***, Latv *vĩr**s***
	*louk**ós*** 'clearing' (Skt *lokás*)	>	OPr *lauck**s***, Lith *laũk**as***, Latv *laũk**s***
	*u̯ḷ̥k^{w}**os*** 'wolf' (Gk λύκος, Skt *vŕ̥kas*)	>	Lith *vil̃k**as***, Latv *vìlk**s***[15]

However, the situation is quite different in the inflection of the nominal and adjectival o-stems based on verbal roots. In Proto-Indo-European, from every verbal root two different o-stem formations with o-vocalism in the root could be derived, one stressed on the root and one stressed on the last vowel of the stem. The root-stressed deverbal o-stems usually had the semantics of lexicalised infinitives. The meaning of the end-stressed deverbal o-stems came close to that of active participles. Cf. the following clear instances of this derivational pattern taken from Greek:

[15] Proto-Balt *-us is always reflected as *-us* in Old Prussian as well as in Latvian, cf. Proto-Baltic nominative singular of u-stems OPr *bebrus* 'beaver', Latv *liêtus* 'rain', Lith *bẽbrus*, *lietùs*.

(19) φέρω ‘to bring’ → φόρος ‘tax’ ~ φορός ‘bringing’
τρέχω ‘to run’ → τρόχος ‘run’ ~ τροχός ‘running’ > ‘wheel’
τρέπω ‘to turn’ → τρόπος ‘turn’ ~ τροπός ‘turning’> ‘rudder’

In Baltic, deverbal nouns of this derivational type are clearly reflected as pairs of root-stressed nouns in Proto-Balt *-as and end-stressed adjectives in Proto-Balt *-us (cf. for instance Hamp 1984; Vanags 1989, 115–116). Cf. in Lithuanian

(20) 1sg.prs. *lenkiù* ‘to bend’ → *lañkas* ‘bend’ ~ *lankùs* ‘flexible’
1sg.prs. *smìrdu* ‘to stink’ → *smárdas* ‘malodour’ ~ *smardùs* ‘stinking’
1sg.prs. *sérgiu* ‘to guard’ → *sárgas* ‘guard’ ~ *sargùs* ‘cautious’

Traces of this pattern are occasionally also found in Latvian where the majority of the old u-stem adjectives secondarily adopted the io-inflection (21). These adjectives can be recognised by the characteristic palatalisation of the last consonant of the root, cf., for instance, Latv *dziļš* or *plašs* corresponding to Lith *gilùs* ‘deep’ and *platùs* ‘broad’.[16] Note that u-inflection of adjectives is a productive feature in Lithuanian and therefore may be secondary in every particular case. However, this is not true for Latvian, where io-inflection is limited to comparatively few adjectives, which makes each of them particularly telling.

(21) Lith
1sg.prt. *bréndau* ‘to ripen’ → *brañdas*, *brandà* ‘maturity’ ~ *brandùs* ‘ripening’
1sg.prt. *dilaũ* ‘to diminish’ → -- ~ *dailùs* ‘delicate’, ‘fine’
1sg.prt. *dręsaũ* ‘to dare’ → *drąsà* ‘courage’ ~ *drąsùs* ‘daring’, ‘bold’

corresponding with

Latv
1sg.prt. *briêdu* ‘to ripen’ → *bruôds* ‘bud’ ~ *bruôžs* ‘thick’, ‘strong’
1sg.prt. *dilu* ‘to diminish’ → -- ~ *dàiļš* ‘delicate’. ‘fine’
-- → -- ~ *drùošs* ‘daring’, ‘bold’

At least one secondary u-stem of this kind is preserved in West Baltic as well. Lith *dangùs* ‘sky’, ‘palate’ seems to reflect a lexicalised adjective ‘covering’ derived from the verb *dengiù* ‘to cover’. The noun is reflected in Old Prussian as nom. sg. *dangus*, acc. sg. *dangon* ‘sky’, ‘palate’, i.e. again as a clear u-stem.

The evidence of the Baltic reflexes of τρόχος ~ τροχός-derivatives is additionally supported by an adjective with a different morphology. As already mentioned above, in Proto-Indo-European verbal roots could form adjec-

[16] Concerning the origin of this palatalisation in the former u-adjectives and the non-palatalised variants which are occasionally attested in Latvian dialects cf. Endzelin 1923, 343–344.

tives with the suffix *-to- and the semantics of a resultative participle. Such resultative participles typically had zero grade of the root, they were always stressed on the suffix. Cf.

(22) PIE
*doh$_3$ 'to give' → nom. sg. m. *də$_3$tós 'given' (Skt *ditás*, Gk δοτός)
*d^{h}eh$_1$ 'to put' → nom. sg. m. *d^{h}ə$_1$tós 'put' (Skt *hitás*, Gk θετός)
*stah$_2$ 'erect' → nom. sg. m. *stə$_2$tós 'erected' (Skt *sthitás*, Gk στατός)

It is well known that Proto-Indo-European adjectives could be secondarily turned into nouns by shifting the stress from the end of the word to its beginning or vice versa, cf. such cases as Skt *rudhirá-* 'red' → *rúdhira-* n. 'blood' or Gk δολιχός 'long' → δόλιχος m. 'long run'. In the case of a resultative participle this conversion from adjective to noun should be as follows: PIE nom. sg. m. *də$_3$tós 'given' ~ nom. sg. *də́$_3$tos 'gift' or PIE nom. sg. m. *stə$_2$tós 'erected' ~ nom. sg. *stə́$_2$tos 'erected thing'. Now, the latter pair of derivatives seems to have actually existed in the prehistory of Baltic, they are reflected as nom. sg. m. Lith *statùs* 'steep', 'stiff' ~ nom. sg. Lith *stãtas* 'sheaf', 'grain ears collected to a pile on the field', Latv *stats* 'post', 'pillar'.

That many Baltic adjectives with reflexes of Proto-Balt *-us in the masculine nominative singular originally belonged to the inflection of the o-stems is additionally supported by the shape of such adverbs as Lith *artì* of *artùs* 'near', *tolì* of *tolùs* 'far away' or *ankstì* of *ankstùs* 'early' (cf. Forssman 2003, 143–144). These adverbs can only be explained as fossilised locatives in Proto-East-Baltic *-íe > Lith *-ì*. Such locatives belong to the inflection of the o-stems, not the u-stems. This is clearly shown by similar adverbs based on root-stressed nominal o-stems

(23) *namiẽ* 'at home' ~ *nãmas* 'house'
oriẽ 'in the air' ~ *óras* 'air'
vãkarie 'in the evening' ~ *vãkaras* 'evening'[17]

By contrast, the locative of genuine u-stems has a different formation. It is well preserved in the inessive (resp. locative) case of contemporary Lithuanian, such as

(24) *sūnujè* < Proto-Balt *sūnuį̯ + én of *sūnùs* 'son'
medujè < Proto-Balt *meduį̯ + én of *medùs* 'honey'
lietujè < Proto-Balt *leu̯tuį̯ + én of *lietùs* 'rain'

[17] The circumflex intonation in the ending *-ie* of these adverbs stands in a sharp contrast with the acute *-ì* (< Proto-East-Balt *-íe) of those based on adjectives. This deserves a special investigation.

It seems, therefore, to be securely established that pre-Proto-Balt *-os is reflected as Proto-Balt *-as **and** Proto-Balt *-us at one and the same time in the same way as pre-Proto-Slav *-os is reflected as Proto-Slav *-o **and** Proto-Slav *-ŭ.

3.3. Conditioning of the raising

It seems natural to assume that the double reflexes of word-final *-om and *-os in Slavonic as well as in Baltic have the same source. This source can only be a raising of *o to *u in the common prehistory of both branches:

(25)

PIE *-om > *-om > Proto-Slav *-o (OCS *-o*), Proto-Balt *-añ (OPr *-an*, Lith *-ą*)
PIE *-om > *-um > Proto-Slav *-ŭ (OCS *-ŭ*), Proto-Balt *-uñ (OPr *-on*, Lith *-ų*)

PIE *-os > *-os > Proto-Slav *-o (OCS *-o*), Proto-Balt *-as (OPr *-s*, Lith *-as*)
PIE *-os > *-us > Proto-Slav *-ŭ (OCS *-ŭ*), Proto-Balt *-us (OPr *-us*, Lith *-us*)

Typologically, this raising of *-om to *-um and *-os to *-us in the common prehistory of Baltic and Slavonic would be very similar to the well known raising of Old Latin *-om*, *-os* to *-um*, *-us* in the classical language, cf. the dative plural ending *-bos* > *-bus*, then *malos*, *malom* > *malus*, *malum* 'bad', *equos* > *equus* 'horse', *dōnom* > *dōnum* 'gift' etc.

The conditioning of the shared, therefore Proto-Balto-Slavonic sound change *-om > *-um and *-os > *-us can be established on the basis of the Baltic evidence. As shown above, patterns of the type Gk τρόχος 'run'~ τροχός 'running' are reflected in both East-Baltic languages as Lith *lañkas* 'bend' ~ *lankùs* 'flexible' etc. whereas patterns of the type Gk δολιχός 'long' ~ δόλιχος 'long run' are reflected as Lith *statùs* 'steep' ~ *stãtas* 'sheaf'. It seems, therefore, obvious that the raising was conditioned by the place of stress. Unstressed *-om and *-os remained, while their stressed variants developed into *-um and *-us.[18]

[18] The idea of a correlation between the raising of PIE *-om and *-os and the place of stress has already been entertained in the scholarly literature, although only for Slavonic. Hirt (1893, 344–350) assumed that it was the unaccented allomorphs of PIE *-om and *-os which turned into *-um and *-us > OCS *-ŭ*. This was in principle accepted by Illič-Svityč (1979, 114–116), though only for PIE *-om. The empirical basis for Hirt's hypothesis was the observation that in some cases PIE root-stressed thematic neuters seemed to be reflected as Slavonic masculines, cf. for instance OCS *dvorŭ* 'yard' beside Skt *dvā́ram* 'door', Lat *forum* 'market place'. According to Hirt, the development

This hypothesis seems to explain all the available evidence without difficulties. As case forms of Proto-Indo-European nouns and adjectives could be stressed on the first, second or the last syllable, it is only natural that we find reflexes of *-om and *-um side by side in the genitive plural in West Baltic (OPr *-an* beside *-on*, *-un*). The situation in Lithuanian and Old Church Slavonic where only reflexes of *-um are found (Lith *-ų*, OCS *-ŭ*) can be easily explained by a secondary generalisation of the formerly stressed variant. Similar generalisations can be assumed for the accusative singular of masculine o-stems where only reflexes of *-om are found in Baltic (OPr *-an*, Lith *-ą*) but only *-um is attested in Slavonic (OCS *-ŭ*). In the nominative-accusative singular of neuter o-stems, originally unstressed *-om seems to be generalised in Baltic (OPr *-an*), possibly also in Slavonic (OCS *-o*)[19]. The

of PIE *-os and *-om to OCS *-ŭ* in the nominative and accusative singular of root-stressed neuters as well as masculines would explain the alleged change in gender by a phonetically motivated coalescence of both paradigms. However, the number of instances of the assumed change in gender of root-stressed neuters was small and the quality of the evidence doubtful. So in the equation OCS *dvorŭ* ~ Skt *dvā́ram*, Lat *forum*, which is repeatedly cited in the literature as one of the clearest pieces of evidence (cf. most recently Derksen 2008, 10–12; 2011, 59), the Sanskrit lexeme is a recent creation on the basis of an older dual *dvā́rā* (cf. Debrunner, Wackernagel 1930, 245, 319) while the Latin word bears no information on the placement of stress. The additional evidence collected by Ilič-Svityč (1979, 108–113) includes such doubtful items as Slovene *pòd* ~ Gk πέδον 'floor' (note the difference in the root vocalism). The systematic nature of the assumed correlation between the place of stress in old neuters and the gender of their Slavonic descendents has still not been demonstrated beyond reasonable doubt. The few secure instances, such as OCS *darŭ* ~ Gk δῶρον 'gift', are no more remarkable than, for instance, Gk μηρός 'thigh' ~ Lat *membrum* 'limb' etc. and probably best explained in the same way (the neuters being recent back-formations to the collective form such as Gk μῆρα). All in all, in spite of its recent acceptance by many scholars, Hirt's hypothesis is not sufficiently supported by the actual data.

[19] However, on the Slavonic side one rather should expect a nasalised vowel OCS *-ǫ*, cf. the accusative singular of ā-stems in OCS *-ǫ* (< pre-Proto-Slav *-am < *-ām). It is possible that in Slavonic the original ending of the nominative-accusative singular in the neuter nouns and adjectives was recently replaced by the corresponding ending taken over from the demonstrative pronouns such as OCS *to* 'that' (< PIE *tód, cf. Skt *tád*, Goth *þat-a*). In general, the influence of the pronominal declension upon nouns and adjectives seems to have advanced further in Slavonic than in Baltic. Cf. the instrumental singular of the ā-stems in OCS *-ojǫ* taken from *tojǫ* (OCS nom. sg. *lěva rǫka* ~ instr. sg. *lěvojǫ rǫkojǫ* 'left hand' on the model of nom. sg. *ta* ~ instr. sg. *tojǫ* 'that') whereas the original ending is preserved in Lith *-à*, in determinate adjectives *-ą́-*.

only exception in the last two categories is the inflection of participles in *-to-, where *-um is attested in Baltic (OPr *-on*). Such participles are known to have been end-stressed in Proto-Indo-European. As neuter s-stems were always stressed on the root in Proto-Indo-European, OCS *-o* is the expected outcome of their nominative-accusative singular in unstressed *-os, cf.

(26)

PIE		OCS
*néb^{h}os 'clouds' (Gk νέφος, Skt *nábhas*)	>	*nebo* 'sky'
*k̂léu̯os 'fame' (Gk κλέος, Skt *śrávas*)	>	*slovo* 'word'
*h$_2$áu̯sos 'ear' (Gk οὖς, OIr *áu*)	>	*uxo* 'ear'

Thus, the intermediate Proto-Balto-Slavonic stage after the break-up of Proto-Indo-European is additionally supported by the raising of stressed PIE *o to *u in *-os and *-om.

3.4. Further instances of raising or non-raising in Baltic and Slavonic

In this section I intend to show how the proposed theory of raising in Baltic and Slavonic accommodates the reflexes of PIE *-os and *-om in those morphological positions that have not been discussed in the previous paragraphs. These morphological positions are, first, a morphologically isolated nominative singular of the personal pronoun OCS *azŭ* 'I', second, the Slavonic nominative and accusative singular of neuter comparatives such as OCS *draže* of *drago* 'dear', third, the 1sg. of the so-called 'thematic' aorist in Slavonic, fourth the 1pl. present of Slavonic verbs, fifth the masculine nominative and accusative singular of ordinal numerals in Baltic and, finally, the dative plural of nouns, pronouns and adjectives in Slavonic and Baltic. The discussion will show that none of these categories constitutes valid evidence against the suggested theory of raising.

OCS *azŭ* 'I' is traditionally assumed to be the Slavonic counterpart of Skt *ahám*, Young Avestan *azəm*, Old Persian *adam* and Runic Norse *eka*. The combined evidence of Indo-Iranian and Germanic clearly points to PIE *(h$_1$)eĝh$_2$óm 'I' which may also be the predecessor of the Slavonic pronoun if raising of PIE *-óm to OCS *-ŭ* is assumed. Thus the sound shape of OCS *azŭ* confirms the hypothesis proposed in this paper.

The nominative and accusative singular of neuter comparatives such as OCS *draže* of *drago* 'dear', *ljušte* of *ljuto* 'cruel', *xužde* of *xudo* 'bad' always ends in *-e*. The alternations *ž* ~ *g* in *drago*, *št* ~ *t* in *ljuto*, *žd* ~ *d* in *xudo* are clear instances of the well-known palatalisation of consonants in the comparative form by a reflex of PIE *i̯. As OCS *e* can reflect older *e or, after

palatal and palatalised consonants, older *o, the ending of such comparatives as OCS *draže*, *ljušte*, *xuždе* may reflect pre-Proto-Slav *-i̯e(C) or *-i̯o(C). Most obviously, this hypothetical pre-Proto-Slav *-i̯e(C) or *-i̯o(C) has to be equated with the functionally corresponding Proto-Indo-European marker *-i̯os which is traditionally reconstructed on the basis of Skt *-yas* and Lat *-ius* (< OLat *-ios*) in such instances as Skt *vásyas* from *vásu-* 'good', *sányas-* from *sána-* 'old', Lat *levius* from *levis* 'light', *gravius* from *gravis* 'heavy' etc. According to the theory of raising proposed in this paper, the root stress of the Sanskrit comparatives in *-yas* leads us to expect no raising in their Slavonic counterparts. Raising is in fact not found in the material, which nicely confirms the theory.

The masculine forms of the nominative and accusative singular in the Baltic ordinal numerals display no raising, cf. Lith *peñktas*, *peñktą* 'fifth' of *penkì* 'five', *šẽštas*, *šẽštą* 'sixth' of *šešì* 'six' etc. The corresponding Slavonic forms have raising, cf. OCS *pętŭ* 'fifth' or *šestŭ* 'sixth', but this might be secondary. As already noted above, raising seems to be secondarily generalised in the masculine inflection of all Slavonic adjectives. As ordinal numerals syntactically behave like adjectives, raising is to be expected in their inflection, whether it was originally there or not. Lith *-tas*, *-tą* and OCS *-tŭ* in the ordinal numerals must reflect PIE *-th$_2$os, *-th$_2$om, thus reconstructed on the basis of Skt *-thas*, *-tham*, Gk -τος, -τον, Lat *-tus*, *-tum* (< OLat *-tos*, *-tom*) etc. Unfortunately, it seems impossible to tell if this suffix was typically stressed or unstressed in Proto-Indo-European. In Sanskrit, the ordinal numerals in *-thas*, *-tham* are typically stressed on their suffix, cf. Skt *ṣaṣṭhás*, *-ṭám* of *ṣáṭ* 'six', *pañcathás*, *-thám* of *páñca* 'five' etc. In Greek, the same numerals are stressed on the root, cf. ἕκτος, -τον of ἕξ 'six', δέκατος, -τον of δέκα 'ten' etc. The proposed theory of raising predicts raised desinences in the masculine nominative and accusative singular of the Baltic numerals if the suffix was stressed in Proto-Indo-European (as it was in Sanskrit) but unraised desinences if it was unstressed (as in Greek). Since a decision is not possible, nothing prevents one from assuming that the suffix was not stressed in Proto-Indo-European at least in some cases and the absence of raising in Lith *peñktas*, *peñktą* 'fifth', *šẽštas*, *šẽštą* 'sixth' etc. is thus regular.

The next Slavonic ending which must be discussed here is OCS *-ŭ* in the 1sg. of the so-called 'thematic' aorist, such as, for instance, OCS 1sg. *idŭ*, 3sg. *ide* of *iti* 'to walk' or 1sg. *mogŭ*, 3sg. *može* of *mošti* 'to be able'.[20] The

[20] Cf. section 3.5 below on the 3pl. ending of this formation.

thematic aorist of Old Church Slavonic is traditionally believed to be the Slavonic descendent of two originally different verbal formations which remain distinct in several Indo-European languages with more ancient attestation, for instance in Sanskrit and Greek. The first of these formations is the so-called 'imperfect' of Sanskrit and Greek thematic verbs, cf. Skt 1sg. *ábharam* of *bhárāmi* 'to carry', Gk 1sg. ἔφερον of φέρω 'to carry'. The second is the so-called 'thematic' aorist, cf. Skt 1sg. *ávidam* of *vindā́mi* 'to find', Gk 1sg. ἔφυγον of φεύγω 'to flee'. In both categories the 1sg. ends in Skt *-am*, Gk -ον which presupposes PIE *-om. This ending is obviously reflected as OCS *-ŭ* which is therefore a clear instance of the raising of PIE *o in the prehistory of Slavonic.

If one now attempts to establish whether OCS *-ŭ* in the 1sg. of the Slavonic thematic aorist should be viewed as reflecting unstressed PIE *-om or stressed *-óm, one obtains the following results. At first glance, the imperfects of thematic verbs, such as Skt *ábharam*, and the thematic aorists, such as Skt *ávidam*, follow the same stress pattern. But this is only true if the inflectional forms in question contain the so-called 'augment' *a-*, because this morphological element is known to attract stress in Sanskrit. The augmentless inflections attested in the oldest texts show a clear difference between the mostly root-stressed imperfects, such as Skt 1sg. *bháram*, 3sg. *bhárat* and the end-stressed aorists, such as Skt 1sg. *vidám*, 3sg. *vidát*. Since the Old Church Slavonic thematic aorist is probably a descendent of both formations, it can be assumed that its 1sg. ending OCS *-ŭ* is a reflex of the stressed PIE *-óm which originally belonged to the paradigm of thematic aorists.

In the Slavonic present conjugation, four different allomorphs of the 1pl. ending are to be found: *-mŭ* (in OCS, cf. *-m* in Russian and Czech), *-mo* (in Serbo-Croatian, Slovenian and Ukrainian), *-me* (in Bulgarian, Macedonian and Czech), and *-my* (in Old Czech and other West Slavonic languages), cf. Vaillant 1966, 11–12; and, most recently, Reinhart 1992, 291–292; 2012. In these four different endings, *-my* is usually considered to be a recent innovation which has been induced from the nominative of the corresponding personal pronoun OCS *my* 'we'.[21] Of the three potentially inherited allomorphs, Bg, Mc and Czech *-me* can be directly equated with the corresponding East Baltic ending Lith *-me*, Latv *-m* hence presupposing *-me for the common prehistory of Slavonic and Baltic. This hypothetical *-me

[21] Perhaps in such collocations as Proto-Slav *bǫdemŭ my 'we will' > *bǫdem my (by loss of *-ŭ in the 11c.) > Proto-West-Slav *bǫdemy.

most probably reflects the Proto-Indo-European 1pl. ending *-me found in the inflection of the imperfect and aorist (cf. Skt *-ma*, OAv *-mā*, Gk -μεν). The remaining two allomorphs OCS *-mŭ*, Ru *-m* and SCr, Sln, Ukr *-mo* are most easily explained as reflecting the inherited Proto-Indo-European present ending *-mos (cf. Skt *-mas*, Lat *-mus*). The theory of raising proposed in this paper predicts that stressed PIE *-mós in athematic presents such as PIE *h_1s-mós 'we are', *h_1i-mós 'we are walking' etc. (cf. Skt *smás*, *imás*) yielded OCS *-mŭ*, Ru *-m* while the unstressed PIE *-mos in the inflection of thematic presents, such as PIE *b^{h}éro-mos 'we are carrying' etc. (cf. Skt *bhárāmas*, Lat *ferimus*), is reflected as SCr, Sln, Ukr *-mo*. Athematic presents were originally not very numerous in Slavonic but some of them, such as OCS 1sg. *jesmĭ* of *byti* 'to be' or 1sg. *damĭ* of *dati* 'to give', must have been frequent enough to spread their 1pl. ending secondarily among the other presents in the daughter-languages, such as Old Church Slavonic or Russian. Thematic presents of the type OCS 1sg. *berǫ* of *bĭrati* 'to take' are very prominent in Slavonic, a secondary spread of their 1pl. ending *-mo* to other present formations in some daughter languages, such as Slovenian, would be unremarkable. The discrepancy between Russian (with *-m*) and Ukrainian (with *-mo*) which are both East Slavonic as well as between Old Church Slavonic (with *-mŭ*) and Slovenian (with *-mo*) which are both South Slavonic seems to indicate that the assumed generalisations of one allomorph of the 1pl. ending was a very recent development of the Slavonic daughter-languages.[22] Thus the proposed theory of raising is capable of plausibly explaining the otherwise mysterious variation in the 1pl. present ending of Slavonic verbs.

Let us now turn to the most intricate case of raising or non-raising of PIE *-os in Baltic and Slavonic, i.e. the ending of the dative plural. The dative plural ending which is actually to be expected for the common prehistory

[22] The often emphasised fact that in Old Serbian texts the ending *-mo* is attested slightly earlier with athematic than with thematic verbs (cf. most recently Reinhart 2012, 291) does not necessarily contradict the assumed original distribution of *-mŭ* and *-mo* in Proto-Slavonic. In athematic verbs the loss of word-final *-ŭ* and *-ĭ* in the 11th century lead to a secondary homonymy between the 1sg. and 1pl., cf. OCS 1sg. *jesmĭ*, *damĭ* ~ 1pl. *jesmŭ*, *damŭ* 'to be', 'to give' > 1sg. *jesm*, *dam* ~ 1pl. *jesm*, *dam*. It is possible that the lost distinction was re-established in the spoken vernacular by borrowing *-mo* from thematic verbs which at the same time could have borrowed the ending *-m* from the prominent athematic ones. This redistribution of the allomorphs would be roughly similar to the situation observed in contemporary Czech, where verbs with 1sg. in *-m* (which partly reflect athematic and partly thematic formations) always have a 1pl. in *-me*.

of Baltic and Slavonic is *-mos (cf. OLat *-bos*, Venetic *-bos*, Lepontic *-pos*, Messapic *-bas*).[23] In Slavonic, the dative plural of all nouns, pronouns and adjectives invariably ends in OCS *-mŭ*. Cf. OCS *na-mŭ* and *va-mŭ* of *ny* 'we', *vy* 'you (many)' within the personal pronouns, *si-mŭ* and *onĕ-mŭ* of *sĭ* 'this', *onŭ* 'that' in the demonstratives, *kostĭ-mŭ* and *synŭ-mŭ* of *kostĭ* 'bone', *synŭ* 'son' within the stems in *-i- and *-u-, finally *vlŭko-mŭ* and *rǫka-mŭ* of *vlŭkŭ* 'wolf', *rǫka* 'hand' in the inflection of nouns and adjectives with stems in *-o- and *-ā-.

The situation in Baltic is more complex. In Old Lithuanian, the dative plural of all pronouns, nouns and adjectives usually ends in *-mus*. This *-mus* is attested three times in the oldest known Lithuanian text, the Lord's Prayer from Vilnius, which was written down between 1503 and 1530. Old Lith *-mus* seems to be the Baltic counterpart of OCS *-mŭ*. Beside this *-mus* the Old Lithuanian sources (including for instance Mažvydas' Catechism of 1547 which is one of the oldest texts) also attest the ending *-ms* without any vowel. A similar *-ms* is the only dative plural ending of Old Latvian and contemporary Lithuanian. As most recently stated by Olander (2005), the ending *-ms* is very unlikely to reflect a more ancient *-mus* because *u* is otherwise always preserved in final syllables of Lithuanian or Latvian. This is clearly shown for instance by the nominative singular of u-stems such as Lith *lietùs*, Latv *lîetus* 'rain' or Lith *tur̃gus*, Latv *tìrgus* 'market'.

Olander follows Kazlauskas (1968b, 181) and Stang (1975, 49) in suggesting that we should view OLith *-mus* not as a reflex of Proto-Balt *-mus but rather as a recent and specifically Lithuanian weakening of Proto-Balt *-mas, i.e. something like /-məs/ with a slight labialisation of the murmured vowel after a labial. From this *-mas, the Old Latvian ending *-ms* can be derived without difficulties, as old *-as is always reflected as *-s* in Latvian. Cf. for instance the nominative singular of the o-stems, such as Latv *vĩrs* ~ Lith *výras* 'man' or Latv *dìevs* ~ Lith *diẽvas* 'god'. It is not implausible that Old Lithuanian /-məs/ should have secondarily developed into *-ms*. The question as to why old *-mas is weakened to something written <-mus> in the Lithuanian dative plural, whereas *-as is obviously not weakened to anything comparable in the nominative singular of o-stems, is answered by Olander in the following way. Mostly, the dative plural is longer by one syllable than the

[23] Concerning the labial in this and similar case endings in the Indo-European daughter-languages of Europe as well as other problems associated with this case cf. Hill 2012, 178–192 with references.

nominative singular of o-stems, cf. OLith nom. sg. *výras* ~ dat. pl. *výramus* 'men', *ántimus* 'ducks', *úogomus* 'berries', *kárvėmus* 'cows' etc. Longer forms can be expected to be more prone to a secondary weakening in their last syllable than shorter ones.

However, the assumed early weakening and labialisation of Proto-Balt *-mas in Old Lithuanian is only partly supported by evidence independent from the dative plural. The Old Lithuanian verbal nouns in *-imas*, such as *nešìmas* of *nèšti* 'to carry', the active present participles in *-damas*, such as *nèšdamas*, and the passive present participles in *-amas*, such as *nẽšamas*, always contain at least three syllables. The weakening of their last syllable in some dialects already begins in Old Lithuanian times. However, the results of this weakening are never written <-mus> here.[24] These facts make Olander's interpretation of the Old Lithuanian dative plural ending *-mus* as a recent weakening of Proto-Balt *-mas doubtful.

Thus, the situation in East Baltic is best described as follows. In Old Lithuanian the dative plural of all nouns, pronouns and adjectives often ends in *-mus* which can be directly equated with OCS *-mŭ*. This ending would reflect Proto-Balt *-mus. The second Old Lithuanian dative plural ending *–ms*, to be equated with OLatv *–ms*, most probably presupposes Proto-Balt *-mas, which must reflect a more ancient *-mos.[25]

What is now needed is an explanation for the fact that in Baltic dative plural we observe reflexes of Proto-Balt *-mas and Proto-Balt *-mus side by side. This fact constitutes a genuine problem for the theory of raising advocated in the present paper. In a root-stressed o-stem the stress must have been always

[24] Cf. for instance the situation displayed in Mažvydas' Catechism (cf. the description in Stang 1929, 64–69). In this text the reduction of word-final *-as* is already at work, producing many instances of <-s> in the nominative singular of o-stems alongside more frequent <-as>. The dative plural ending is either the usual Old Lithuanian <-mus>, which is attested 25 times, or <-ms> like in Old Latvian and contemporary Lithuanian with 71 attestations. By contrast, in the nominative singular of *-damas*-participles, such as <mirszdams>, <radidams>, <skaitidams>, <sudidams>, only <-dams> is written.

[25] In Modern Standard Lithuanian the nominative singular of deverbal nouns and adjectives with more than two syllables ends in *-imas*, *-damas* and *–amas*, whereas the dative plural is always *-ms*. Most probably the lost *a was secondarily restored in the nominative singular where it was supported by the other case-forms in the paradigm (such as gen. sg. in *-o*, dat. sg. in *-ui* or acc. sg. in *-ą*, all implying a nom. sg. in *-as*) but not in the dative plural, where no such support existed.

on the root, in an end-stressed o-stem it would invariably be on the thematic vowel. In both cases one must expect a dative plural in unstressed pre-Proto-Balt *-mos > Proto-Balt *-mas without raising of the vowel. The same is most probably true for the ā-stems, which originally also had a columnar stress pattern in their inflection. I assume that the raised Proto-Balt *-mus originated in the inflection of athematic nouns and adjectives, such as stems in *-i- and *-u- from where it could secondarily spread to other stem classes in Slavonic as well as in Baltic dialects after the break-up of Proto-Baltic.

In most general terms, the inflection of athematic nouns and adjectives in Proto-Indo-European exhibited case-forms of two different kinds. In the so-called 'strong' cases – in particular the nominative of all numbers as well as accusative, locative and vocative in the singular – the stress could be on the root of the athematic stem or on its stem-class marker. In all the rest of the inflection, i.e. in the so-called 'weak' cases including the dative plural, the stress had to be either on the same syllable or on a syllable to the right of the one stressed in the 'strong' case-forms. According to this rule of stress placement, the dative plural of at least some athematic nouns and adjectives was originally stressed on the ending which then must be expected to show raising of its *o in the common prehistory of Baltic and Slavonic.

The general validity of this picture was recently questioned precisely as it concerns the original stress-pattern of Proto-Indo-European athematic stems in such case form as the dative plural. Olander (2004; cf. 2007) makes the observation that in Sanskrit, which is known to have preserved the original accentuation better than the rest of the Indo-European daughter-languages, such prominent classes of athematic nouns and adjectives as the stems in *-i- and *-u- are never stressed on their inflectional endings in such case-forms as the dative plural. From this fact Olander draws the conclusion that we should reconstruct a stem-stressed dative plural of nouns and adjectives in *-i- and *-u- also for the prehistory of Slavonic and Baltic. However, this conclusion is not necessarily correct, as indicated by following observations.

The most salient feature in the accentuation of Sanskrit athematic nouns and adjectives is the consistent columnar setting of stress in the inflectional paradigm of a vocalic stem. Root-stressed vocalic stems are constantly stressed on their first syllable in all paradigmatic forms. Stems which are stressed on their last syllable in the 'strong' cases (such as the nominative singular) keep the stress on this same syllable in all the other case-forms. Cf. the following examples taken from the inflection of stems in *-i- and *-u-:

(27)

i-stems			u-stems		
nom. sg.	dat. pl.		nom. sg.	dat. pl.	
ṛ́ṣis	*ṛ̥ṣibhyas*	‘seer’	*íṣus*	*íṣubhyas*	‘arrow’
pátis	*pátibhyas*	‘lord’	*síndhus*	*síndhubhyas*	‘river’
kṣitís	*kṣitíbhyas*	‘race’	*ṛ̥bhús*	*ṛ̥bhúbhyas*	‘deft’
agnís	*agníbhyas*	‘fire’	*paśús*	*paśúbhyas*	‘cattle’

The same principle also governs the distribution of stress in the inflection of many stems in consonants, for example the n-stems:

(28)

n-stems		
nom. sg.	dat. pl.	
yúvā	*yúvabhyas*	‘young man’
śvā́	*śvábhyas*	‘dog’
majjā́	*majjábhyas*	‘marrow’

The consonant stems show that the Sanskrit columnar stress pattern of athematic nouns and adjectives cannot be original. According to the *communis opinio*, vocalic resonants such as PIE *n̥ in Skt dative plural *-a-bhyas* (< PIE *-n̥-b^{h}(i̯)os) could only be stressed in Proto-Indo-European or later due to a secondary development. As is usually assumed in the field, a PIE resonant such as *n became vocalic only if the full vowel in the position left or right of it was secondarily lost. In all clear cases such a loss of full vowels correlates with a shift of stress to another morpheme. Therefore, an original placement of stress on the suffix in word forms such as Skt *śvá-bhyas* or *majjá-bhyas* would basically not allow the *n to become syllabic in the first place.

Thus the stress pattern of stems in *-i-, *-u- and *-n- attested in the oldest Sanskrit sources must be considered an innovation. It can hardly be established today, how old this innovation is. It is certainly possible that the secondary columnalisation of stress observed in Sanskrit occurred already in late Proto-Indo-European. In this case, the stress pattern of Sanskrit must be assumed also for the prehistory of Slavonic and Baltic. This would obviously lead to difficulties for the theory of raising advocated in the present paper. However, it is equally possible that the Sanskrit columnalisation of stress is a younger development which took place somewhere between the break up of Proto-Indo-European and the composition of the oldest Sanskrit texts. This being the case, Slavonic and Baltic may have remained unaffected by the innovation, therefore preserving the end-stressed dative plural in *-mós in part of the athematic nouns and adjectives. According to the theory of raising proposed here, this stressed *-mós should develop into *-mus in the com-

mon prehistory of those branches. If one now assumes that this ending could secondarily spread from athematic nouns and adjectives to stems in *-o- and *-ā-, the shape of OCS *-mŭ* is satisfactorily explained. In East Baltic, the original distribution of both allomorphs must have been preserved longer, until some dialects generalised the formerly stressed *-mus of athematic stems, hence OLith *-mus*, others the originally unstressed *-mas of stems in *-o- and *-ā-, i.e. *-ms* in Old Latvian and contemporary Lithuanian.[26]

Thus the proposed theory of stress-dependent raising of PIE *-os and *-om in Slavonic and Baltic is capable of plausibly accommodating those pieces of Slavonic and Baltic morphology that are potentially relevant for the sound change in question but cannot count as directly supporting or directly contradicting the assumed distribution of raised and unraised reflexes.

3.5. The counter-evidence

Before the suggested account of the unexpected doubling of ancient *-os and *-om in Baltic and Slavonic can be considered to resolve the problem, the following difficulty has to be addressed. There are three groups of words which must have ended in stressed PIE *-ós in the nominative singular and in stressed PIE *-óm in the accusative singular but nevertheless do not show any raising in Baltic. In the following few paragraphs I will show that this observation does not in fact invalidate the raising hypothesis.

The first group of such words is constituted by a couple of nouns and adjectives which are known to have been end-stressed in Proto-Indo-European due to the evidence of Sanskrit and Greek. Cf. the following clear items:

(29) PIE *u̯iHrós, -óm 'man' > OPr *wijrs*, *-an*, Lith *výras*, *-ą*, Latv *vĩrs* (Skt *vīrás*, *-ám*)
PIE *d^huh_2mós, -óm 'smoke' > Lith *dū́mas*, *-ą*, Latv pl. *dũmi* (Skt *dhūmás*, *-ám*, Gk θῡμός, -όν)
PIE *pl̥$h_1$nós, -óm 'full' > Lith *pìlnas*, *-ą*, Latv *piĩlns* (Skt *pūrṇás*, *-ám*)

[26] The allomorphy in the dative plural of Old Lithuanian seems to have been secondarily copied into the language of the Old Prussian catechisms. Due to the raising, Old Lith *-ms* was accompanied by *-mus* (< Proto-Balt *-mus) which ended like the accusative plural of o-stems whose ending was *-us* (< Proto-Balt *-ṓns). On this model, the Old Prussian dative plural ending *-ms* received an allomorph *-mans*, cf. the o-stems' accusative plural in OPr *-ans* (< Proto-Balt *-ṓns). Note that this blending of OPr *-mas* and *-ans* into *-mans* (routinly assumed in the literature without reference to Old Lithuanian) must be a very recent development because in the Old Prussian catechisms the regular reflex of Proto-Baltic *ō after a labial would be *ū*, cf. footnote 2 above.

As is clearly shown by Lith *výras*, *-ą*, *dűmas*, *-ą*, *gývas*, *-ą* and the corresponding Old Prussian and Latvian forms, the stressed PIE *-ós and *-óm in the nominative and accusative singular of these items obviously did not turn into *-us and *-um in the prehistory of Proto-Baltic. The ending *-ŭ* in the Slavonic descendant of PIE *d^huh_2mós, -óm 'smoke' and *$pl̥h_1$nós, -óm, i.e. OCS *dymŭ* and *plĭnŭ*, is not probative here because Slavonic seems to have secondarily generalised the raised variants of case endings in question in all thematic nouns and adjectives (cf. § 3.3 above). However, synchronically Lith *výras*, *dűmas* and *pìlnas* belong to an accentual class in which the stress is constantly on the root in all paradigmatic forms including the nominative and accusative singular. This accentual pattern is confirmed by the intonation of the corresponding Latvian lexemes. So-called 'sustained' tone of Latvian, such as in *vĩrs*, *dũmi* and *pilnˀs*, is known to systematically correlate with Lithuanian root stress. The agreement between Lithuanian and Latvian means that East Baltic descendants of PIE *u̯iHrós, -óm, *d^huh_2mós, -óm and *$pl̥h_1$nós, -óm must have taken part in a secondary retraction of the stress from the desinences onto the root. The evidence of those Slavonic languages which preserve traces of the Proto-Slavonic accentual system demonstrates that the Proto-Slavonic descendants of words under discussion were also stressed on the root in the whole paradigm. Cf. SCr (Čakavian) *dȉm*, gen. sg. *dìma* 'smoke' and (Štokavian) *pȕn*, nom. sg. f. *pȕna* 'full' or Ru *dym*, g.sg. *dýma* 'smoke' and *pólnyj* 'full', adv. *pólno* 'enough'. This means that the assumed stress retraction, which is traditionally called Hirt's law and believed to be caused by the reflexes of Proto-Indo-European laryngeals such as *h_2 in 'smoke' and *h_1 in 'full', most probably operated already in the common prehistory of Proto-Baltic and Proto-Slavonic (cf. most recently Olander 2009, 149–150). But in this case one can also assume that the retraction of stress chronologically preceded the raising of *o in stressed word-final syllables, i.e. PIE *d^huh_2mós, -óm 'smoke' and *$pl̥h_1$nós, -óm 'full' may have already developed into something like early Proto-Balto-Slavonic *dűmos, -om and *$pĺ̥$nos, -om when the raising began to operate. This means that such words as Lith *výras*, *-ą*, *dűmas*, *-ą* and *pìlnas*, *-ą* can actually reflect nouns and adjectives with case forms ending in unstressed *-os and *-om in full accordance with the theory of raising advocated in the present paper.

The second class of words which must have possessed case forms in stressed PIE *-ós and *-óm are the monosyllabic interrogative and demonstrative pronouns, cf. PIE nom. sg. m. *k^wós 'who?', acc. sg. m. *k^wóm 'whom?' (cf. Skt *kás*, *kám*, Goth *ƕas*, *ƕan-a*) and acc. sg. m. *tóm 'that' (cf. Skt *tám*,

Goth *þan-a*). Due to their monosyllabicity, these pronouns could only be stressed on their last and only syllable. In Sanskrit, where the original system of Proto-Indo-European accentuation seems to be preserved better than in the other Indo-European languages, such pronouns are not used enclitically. Nevertheless, the expected *u*-reflexes of the case forms in question are only found in Slavonic, cf. OCS *kŭ-to* 'who?'[27]. In Baltic, PIE *k^{w}ós 'who?' is reflected as Proto-Balt *kas (OPr *kas*, Lith *kàs*, Latv *kas*), PIE *k^{w}óm 'whom?' most obviously yields Proto-Balt *kañ (OPr acc. sg. n. *kan*, Lith *ką̃*, Latv *kùo*), PIE *tóm 'that' ends up as Proto-Balt *tañ (Lith *tą̃*, Latv *tùo*).

However, in Proto-Indo-European not all pronouns of this inflectional class were always stressed. In many Indo-European languages, evidence for enclitic variants or forms used entirely or mostly enclitically can be detected. Cf. for instance in Sanskrit *ena-* 'he', 'it' (acc. sg. m. *enam*, n. *enad*), *tva-* 'one' (nom. sg. m. *tvas*, n. *tvad*) or *sama-* 'any', 'every' (acc. sg. m. *samam*, dat. sg. m. *samasmai*). There seems to be evidence for enclitic use of similar pronouns also in Baltic. In Lithuanian, several pronouns with more than one syllable are stressed in a way impossible for nouns and adjectives, cf. *anàs* 'that one', *katràs* 'which one of two?', *tatràs* 'that one of two' (cf. Stang 1966, 303–304). This peculiar accentuation is only understandable if one assumes that the pronouns under discussion had no stress at all in the prehistory of Lithuanian, cf. the equally impossible accentuation of the enclitic copula 3prs. Lith *yrà* 'is'[28]. The lack of stress can also be responsible for the secondary monosyllabicity of OPr *stas* 'this', 'the' which seems to correspond to Lith *šìtas* 'this' (cf. Stang 1966, 232), cf. *šitàs* in Old Lithuanian sources. It is clear that the proposed raising could not occur in such completely unstressed pronouns. Nevertheless, the unstressed pronouns must have inflected in the same way as all other pronouns of their inflection class. This means, for instance, that the masculine dative singular of Proto-Balt *anas 'that one' must have been *ana-smōi̯ (cf. OLith *anãmui*, OPr *tenesmu* of *tāns* < *ta-anas), and that the masculine dative singular of Proto-Balt *katras 'which one of two?' must have been *katr-asmōi̯ – just as the masculine dative singular of

[27] Literally 'who that?', a recent compound with nom.-acc. n. OCS *to* 'that' < PIE *tód (cf. Skt *tád*, Goth *þat-a*).

[28] Latv 3.prs. *ìr* 'is' shows that the vowel at the end of Lith *yrà* is historically Proto-Balt *-a (a historically long vowel would have remained in Latvian as a short one). The enclitic use of the verb is probably the reason for the shortness of *i* in the root of the Latvian form.

the basic interrogative and demonstrative pronouns must be reconstructed as *kȧ-smōi̯ and *tȧ-smōi̯ in the light of OPr *kasmu* and OLith *kãmui*, *tãmui* (cf. in Sanskrit *ká-smai*, *tá-smai*, OCS *ko-mu*, *to-mu*). This identity in the oblique cases could have caused a secondary analogical levelling between both groups of gender pronouns in the nominative and accusative singular, i.e. the pattern dat. sg. *ana-smōi̯, *katr-asmōi̯ ~ nom. sg. *anas, *katras ~ acc. sg. *anañ, *katrañ was secondarily extended to dat. sg. *kȧ-smōi̯, *tȧ-smōi̯ so that a new nom. sg. *kȧs, *tȧs and acc. sg. *kȧñ, *tȧñ emerged. In Slavonic, where the original shape of the masculine nominative singular in stressed gender pronouns was obviously preserved (cf. OCS *kŭ-to* 'who?'), the analogy might have worked in the opposite direction, such that the masculine nominative singular in OCS *-ŭ* was generalised in pronouns as it was in nouns and adjectives.

Thus, monosyllabic pronominal forms such as Lith *kàs* 'who?', *kq̃* 'whom?' do not necessarily constitute counter-evidence sufficient to render the hypothetical raising of stressed *o to *u before word-final *-m and *-s in the common prehistory of Baltic and Slavonic impossible.

The third class of words whose case forms must have ended in stressed *-os and *-om but do not always display *u*-endings in Baltic are the resultative participles in PIE *-tó-. These participles were already mentioned above, cf. (13) on their acc. sg. m. in *-tóm > Proto-Balt *-tuñ > OPr *-ton* and (22) on the nom. sg. m. PIE *stə$_2$-tós 'erected' > Lith *statùs* 'steep', 'stiff'. This evidence indicates that in such formations the masculine nominative singular in PIE *-tós ends up as Proto-Balt *-tus, while the corresponding accusative singular in PIE *-tóm yields Proto-Balt *-tuñ, cf. also the masculine form of the nominative-accusative singular in OCS *-tŭ* from more ancient *-tus and *-tum. Now, Baltic descendants of the Proto-Indo-European resultative participles in *-tó- are a productive formation. In Baltic, participles in *-ta-* can be constructed virtually for every verb. Surprisingly enough, the masculine nominative singular of such participles always ends in OPr *-ts*, Lith *-tas*, Latv *–ts*, which can only reflect Proto-Balt *-tas. The corresponding form of the accusative singular ends in Lith *-tą*, again presupposing Proto-Balt *-tañ. The problem is how this strange doubling Proto-Balt *-tus and *-tas in the nominative, *-tuñ and *-tañ in the accusative can be accounted for in a formation which originally must have been consistently end-stressed.

The answer to this question is simple. In an Indo-European language verbs are often used with one or more adverbial elements, usually called 'preverbs'. Verbs with one or more preverbs typically build participles which are

compounded with the same preverb or preverbs, cf. in Latin *dūcō* ~ *ductus* vs. *con-dūcō* ~ *con-ductus* or *in-dūcō* ~ *in-ductus*. As shown by Sanskrit, such compounds were originally always stressed on the preverb and never on the participle itself. Cf. from the Ṛg-Veda

(30)	verbal root	resultative participle in nom. and acc. sg. m.	resultative participle in nom. and acc. sg. m. with preverbs
	dhā 'to put'	*(d)hitás* *(d)hitám*	*abhí-hitas*, *abhí-hitam* *prá-hitas*, *prá-hitam* *ní-hitas*, *ní-hitam*
	sṛj 'to send off'	*sṛṣṭás* *sṛṣṭám*	*abhí-sṛṣṭas*, *abhí-sṛṣṭam* *ví-sṛṣṭas*, *ví-sṛṣṭam* *sáṃ-sṛṣṭas*, *sáṃ-sṛṣṭam*
	vṛ 'to cover', 'to surround'	*vṛtás* *vṛtám*	*á́-vṛtas*, *á́-vṛtam* *abhí-vṛtas*, *abhí-vṛtam* *ápī-vṛtas*, *ápī-vṛtam*.

Note that in Sanskrit resultative participles of some verbs are hardly ever attested with preverbs, so for instance the very frequent *yuktás*, *yuktám* of *yuj* 'to yoke', while others do not occur without a preverb, cf. Skt *bhṛ* 'to carry' which only displays *á́-bhṛtas*, *prá-bhṛtas*, *ánu-bhṛtas*, *úd-bhṛtas*, *ní-bhṛtas* and so on. Due to this situation, the nominative and accusative singular in unstressed *-tas*, *-tam* are not less frequent in Sanskrit than their stressed counterparts in *-tás*, *-tám*. Now, the unexpected *-tas and *-tañ in the inflection of the Baltic resultative participles can be easily explained as reflecting the unstressed desinences of compounded participles while *-tus and *-tuñ would descend from their uncompounded and therefore end-stressed variants.[29]

[29] The original distribution might be directly preserved in lexicalised resultative participles of lost verbs. A particularly promising case seems to be OLith *prì-mestas* 'measured out', *ne-prà-mestas* 'orderless' beside the uncompounded *mestùs* 'measured, moderate' (all on the basis of the lost Baltic match of Goth *mitan* 'to measure', OIr *midithir* 'to judge'). It cannot be excluded that the adjectival *mestùs* is a back formation to the noun *mẽstas* 'measure' (cf. above on the pattern *lañkas* 'bend' ~ *lankùs* 'flexible' etc. which seems to be secondarily productive in Lithuanian). But this assumption would not explain why the *u*-inflection is restricted to the uncompounded adjective. To me, it seems more probable that, on the contrary, *mẽstas* was secondarily created beside *mestùs* on the model of the same recurrent pattern *lañkas* 'bend' ~ *lankùs* 'flexible' etc.

3.6. The conditioning of the sound change from a typological perspective

The last difficulty which remains to be addressed is the fact that proposed raising of a stressed *o to *u before word-final *-m and *-s in the common prehistory of Baltic and Slavonic is somewhat unusual in phonetic terms, because /m/ and /s/ do not constitute a natural class of consonants. The typologically similar raising of *o to *u in word-final position in Latin words with more than one syllable is not restricted in its operation to the position before *-m* and *-s*. The Latin raising also occurs before other consonants such as *-d* or *-r* or even consonant clusters such as *-nt*. Cf. the neuter nominative-accusative singular of gender pronouns Lat *illud*, *istud* < OLat *-od* (cf. Skt *-ad*, Gk -o), the ending of passive 3sg. Lat *-tur* < OLat *-tor* or the active 3pl. desinence of thematic verbs Lat *-unt* < OLat *-ont*. By contrast, in Baltic and Slavonic the raising of *o to *u apparently did not operate before word-final *-d, cf. the neuter nominative-accusative singular of pronouns such as PIE *tód (Skt *tád*, Goth *þat-a*) > OCS *to*, OPr *ta*. However, the final *-d of this form has been lost in Slavonic as well as in Baltic and it seems perfectly possible that this loss occurred in the common prehistory of these branches. This means that the loss of the final *-d might have preceded the assumed raising of *o before word-final *-m and *-s. Hence the raising hypothesis can be reformulated in a phonetically more satisfactory way. It may be assumed that in the common prehistory of Baltic and Slavonic stressed *o was secondarily raised to *u in the last syllable of a word before a consonant.

There seem to be two pieces of evidence which directly confirm this new formulation of the assumed sound change. As is often the case, there is another piece of evidence which seems to be in direct contradiction. In the following paragraphs I will first discuss the confirming evidence and then deal with the difficulties.

In Proto-Indo-European some pronouns possessed a special adverbial locative form in *-r, which has no parallel in the inflection of nouns or adjectives. The interrogative pronoun PIE *k^{w}ó- (Skt *kás*, Goth *hvas*) 'who?', 'what?' must have possessed such a special locative form. Skt *kár-hi* 'when?' (< 'where?') and Goth *hvar* 'where?' suggest a PIE *k^{w}ór 'where?' which is also presupposed by Lat *cūr* 'why?' < OLat *quōr* < PIE *k^{w}ór-s[30]. However, the adverb 'where?' is usually reconstructed as PIE *k^{w}úr on the basis of the evi-

[30] Cf. the well-known adverbial *-s in such forms as Lat *ab* ~ *abs* 'from', 'off, away', *ec-* ~ *ex* 'out of', *sub* ~ *sus* 'under' etc.

dence of Baltic and Albanian. In Baltic, the adverb is only attested in the East Baltic languages as Lith *kuř*, Latv *kùr* 'where?', it has a clear *u*.[31] The Albanian reflex is *ku* 'where?', 'from where?'. It originally ended in *-r as shown by the old compound *kurrë* < *kur-ne 'never', cf. the secondarily extracted *kur* 'when'.[32] However, Alb *ku*, *kurrë* does not necessarily presuppose older *k^{w}úr. The same development is attested in Alb *kush* 'who?' < *k^{w}os-so which is constructed from PIE *k^{w}ós 'who?' (Skt *kás*, Goth *hvas*) and the masculine nominative singular of the demonstrative *só 'that' (Skt *sá*, Goth *sa*).[33] If Alb *u* reflects an old *o in *kush* < *k^{w}ó-so, it might reflect an old *o also in *ku*, *kurrë* < *k^{w}ór. Thus, reflexes of a clear old *u in the adverb 'where?' are only found in Lith *kuř* and Latv *kùr* while all other languages must or may have reflexes of *o. Under these circumstances, the most natural reconstruction of the original state of affairs is PIE *k^{w}ór with a secondary raising of *o to *u in the prehistory of Baltic.

Most obviously, this clear-cut conclusion has so far been missed in the field for the following reason. Reflexes of an unexpected *u are found in at least one more derivative of PIE *k^{w}ó- 'who?', 'what?', cf. PIE *k^{w}ú-d^{h}e 'where?' (Skt *kúha*, OAv *kudā*, OCS *kŭde* 'where?'). It seemed natural to connect the *k^{w}ú- here with the *k^{w}ú- in the r-adverbial of the same pronominal root. Moreover, *k^{w}úr based entirely on East Baltic evidence basically looks more archaic than *k^{w}ór as presupposed by Skt *kár-hi*, Goth *hvar* and OLat *quōr*. As it seemed, *k^{w}ór 'where?' could be plausibly explained as a recent replacement of more ancient *k^{w}úr. The pattern *k^{w}ó- 'who?', 'what?' ~ *k^{w}ór 'where?' can be expected to emerge secondarily on the model of PIE *tó- 'that' (nom.-acc. n. Skt *tád*, Goth *þat-a*) ~ *tór (Skt *tár-hi*, Goth *þar*) 'there'.

[31] Ostrowski (2008, 464–465) alternatively explains Lith *kuř* 'where?' as constructed from PIE *k^{w}ó- and PIE locatival *-er which is attested for instance in such cases as Skt *uṣar-* (< PIE *$h_2$us-s-ér*) found in compounds beside *uṣás-* 'down' (< PIE *$h_2$us-ós-*). Ostrowski assumes that this hypothetical *k^{w}óer developed into Proto-Balt *kõr which regularly yielded Proto-East-Baltic *kuõr subsequently shortened to Lith *kuř* (Latv *kùr* is not mentioned). For this chain of events, he refers to the dative singular of thematic nouns, where a similar development PIE *-o-ei̯ > Proto-Balt *-õi̯ > Proto-East-Baltic *-uõi̯ > Lith *-ui* has to be assumed. However, in monosyllables Proto-East-Baltic *uõ or *úo is usually not shortened in words bearing stress in Lithuanian or Latvian, cf. Lith nom. sg. *šuõ* 'dog', 3fut. Lith *duõs*, Latv *duôs* 'will give', instr. sg. Lith *kuõ*, Latv *kuõ* 'by whom?' etc. Thus, Ostrowski's hypothesis must be rejected on phonological grounds.

[32] Cf. Demiraj 1997, 226–228; Matzinger 2006, 185.

[33] Cf. again Demiraj 1997, 228; Matzinger 2006, 112; Schumacher, Matzinger (forthc.).

However, this reasoning seems to be mistaken precisely in its crucial assumption. Most probably, the pattern *tó- 'that' ~ *tór 'there' did not exist in the prehistory of the languages under discussion. Out of the five Indo-European branches attesting *k^{w}ór or *k^{w}úr 'where?', reflexes of *tór 'there' are entirely missing in two, i.e. Italic and Albanian. In Indo-Iranian, Skt *kár-hi* 'when?' is attested already in the oldest hymns of the Ṛg-Veda. The corresponding *tár-hi* 'then', 'at that time' occurs for the first time in one of the latest hymns. Thus Skt *tá-* 'that' ~ *tár-hi* 'then' is most certainly a late innovation, itself based on the model of *ká-* 'what?' ~ *kár-hi* 'where?' (cf. Mayrhofer 1992, 636). In Baltic, Latv *tùr* 'there' can hardly qualify as direct evidence for PIE *tór. Moreover, this adverb is not even attested in more archaic Lithuanian. In Old Lithuanian, *kàs* 'what?' ~ *kuř* 'where?' were accompanied by *kìtas* 'other' ~ *kituř* 'elsewhere' (cf. Latv *cits* ~ *citur*) and *vìsas* 'every' ~ *visuř* 'everywhere' (cf. Latv *viss* ~ *visur*), which obviously are secondary creations based on pronominal stems with indefinite semantics.[34] The simple demonstrative Lith *tàs* 'that' did not yet participate in this pattern in Old Lithuanian. Only in Germanic the adverb 'there' (Goth *þar*) could be as ancient as 'where?' (Goth *hvar*), but the evidence of one single branch does not suffice for reconstructing *tó- 'that' ~ *tór 'there' for Proto-Indo-European and therefore for the common prehistory of Indo-European daughter-languages with reflexes of *k^{w}ór. Thus, it is more probable that Proto-Indo-European only exhibited *k^{w}ó- 'who?', 'what?' ~ *k^{w}ór 'where?'. The *u* in Lith *kuř* and Latv *kùr* must be then explained by a secondary development which might be the assumed raising of stressed *o before word-final consonants in the common prehistory of Baltic and Slavonic.[35]

[34] A complete list would also include *vienuř* 'somewhere' of *víenas* 'one', *abejuř* 'on both sides' of ābejas 'both' and *svetuř* 'elsewhere', 'abroad' which must be related to *svetỹs* 'stranger', 'visitor'. Since these adverbs are only poorly attested in Old Lithuanian sources and lack Latvian correspondences, they may be recent innovations of Lithuanian. The adverb Lith *aurè* 'yonder' is enlarged with the locatival postposition *-è*, the original form might be preserved in <aur'> which is once attested in Daukša's writings. This adverb is based on the pronominal stem Proto-Balt *aṷa 'yonder, that' (cf. OCS *ovŭ*, OAv *auua*) which is indirectly attested for Baltic by *avà*, *avè* 'yonder, there' in Lithuanian dialects. The shape of Lith *aurè* presupposes *aṷur 'yonder' which might be also recently created beside *aṷa on the same model Lith *kuř* ~ *kàs*.

[35] Certainly, the suggested account for the vocalism of Lith *kuř*, Latv *kùr* (< PIE *k^{w}ór 'where?') does not eliminate the necessity of explaining also the unexpected *u in PIE *k^{w}ú-d^{h}e 'where?' mentioned above. However, since this *u obviuosly emerged before the disintegration of Proto-Indo-European (cf. Skt *kúha*, OAv *kudā* and OCS *kŭde*), we have to look for an explanation in terms of Proto-Indo-European phonology.

The second piece of evidence speaking in favour of raising also before consonants other than word-final *-m and *-s is provided by the Slavonic descendant of the Proto-Indo-European adverb for 'therein' (the source for the preposition 'in' in many Indo-European languages). As evidenced by the daughter-languages, this adverb must have existed in at least three apophonic variants. The stressed form PIE *$h_1$én, which is securely established for instance by Gk ἔν 'therein' or Goth *in* 'in', is also reflected by the Old Prussian preposition *ēn* 'in, on' and by the Latvian prefix *ìe-* 'in' (< Proto-Balt *eñ). The unstressed PIE *$h_1n̥$ has to be assumed because of the corresponding Lithuanian preposition *iñ* (before vowels and plosives), *į̃* (before other consonants) 'in' (< Proto-Baltic *iñ). Finally, a PIE *$h_1$ón seems to be reflected in such Slavonic nominal compounds as Proto-Slavonic *ǫ-dolŭ 'canyon' (ORu *udolŭ*, Po *wądół*, cf. OCS *dolŭ*, Ru *dol* 'valley') or Proto-Slavonic *ǫ-tŭkŭ 'weft yarn in woven cloth' (Ru *utók*, Po *wątek*, cf. 1sg.prs. OCS *tŭkǫ*, Ru *tku* 'to weave'). Quite unexpectedly, the corresponding preposition 'in' in Slavonic has the shape OCS *vŭ*, Ru *v*, *vo*, Po *w*, *we* (< Proto-Slav *vŭ) which can only reflect pre-Proto-Slav *un. This means that the third apophonic form of the adverb 'therein', PIE *$h_1$ón, is reflected as pre-Proto-Slav *on- when used as first member of a compound but as pre-Proto-Slav *un when used as a free standing preposition. The easiest way to account for this situation seems to be by assuming that stressed PIE *o has been secondarily raised here before a word-final *-n.

Lith *kur̃*, Latv *kùr* 'where?' and OCS *vŭ* 'in' seem to constitute strong supporting evidence for the claim that the raising of stressed *o in the common prehistory of Baltic and Slavonic was not restricted in its operation to the position before word-final *-m and *-s but probably took effect before all word-final consonants which were present in the language at the given time.

The piece of evidence that seems to be clearly at variance with the proposed reformulation of the raising rule is a paradigmatic form of the Slavonic thematic aorist, in particular its 3pl. which ends in OCS *-ǫ*. The Slavonic thematic aorist was already mentioned in § 3.4, where such instances as OCS 1sg. *idŭ*, 3sg. *ide* of *iti* 'to walk' or 1sg. *mogŭ*, 3sg. *može* of *mošti* 'to be able' were discussed. This formation exhibits a 1sg. ending in raised OCS *-ŭ* which can in theory reflect PIE *-óm or *-om (cf. Skt *-ám*, *-am*, Gk -ον). The assumed correlation between the raising of *o in Baltic and Slavonic and the former position of stress naturally makes the stressed PIE *-óm more appealing. The question that now arises is the following. If the raising of stressed *o was regular in word-final syllables ending in any consonants why did it

not also occur in the 3pl. of the thematic aorist, where the attested ending is unraised OCS *-ǫ* (cf. Skt *-án*, *-an*, Gk -ον)?

As has been already discussed above, the Slavonic thematic aorist descends historically from two different formations with identical sets of inflectional endings. One of these formations, the Proto-Indo-European thematic aorist, preserved for instance in Sanskrit and Greek, was end-stressed in all inflectional forms. The other, the imperfect of thematic verbs, was often stressed on the root. This means that the inflection of the Proto-Slavonic thematic aorist originally inherited reflexes of stressed as well as unstressed endings as allomorphs. The endings actually attested in Old Church Slavonic texts must be a recent selection from both sets. This makes it possible to assume that in the 1sg. the formerly stressed and therefore raised allomorph of the ending was generalised, whereas in the 3pl. the formerly unstressed variant without raising was selected.

This hypothesis does not seem arbitrary if one takes into account the structural properties of the relevant paradigm. A 3pl. ending in OCS *-ǫ* had the advantage of fitting into a prominent relational pattern. OCS 3sg. *id**e*** ~ 3pl. *idǫ* or 3sg. *mož**e*** ~ 3pl. *mogǫ* basically follow the corresponding present inflections of the same verbs, i.e. OCS 3sg. *id**e**-tŭ* ~ 3pl. *idǫ-tŭ* or 3sg. *mož**e**-tŭ* ~ 3pl. *mogǫ-tŭ*. Since systematicity of this kind often plays a prominent role in the development of languages with a rich inflectional system, the selection of OCS *-ǫ* in the 3pl. would not be surprising. Thus, the unexpected generalisation of different allomorphs in different paradigmatic slots of Slavonic thematic aorist finds a natural explanation in terms of paradigmatic economy.

One may conclude that the suggested reformulation of the raising hypothesis advocated in the present paper is supported by Lith *kuř*, Latv *kùr* 'where?' and OCS *vŭ* 'in' and at the same time not necessarily contradicted by the 3pl. of the thematic aorist in OCS *-ǫ*.

4. Conclusions

The traditionally assumed intermediate Balto-Slavonic stage after the break up of Proto-Indo-European can now be supported by two highly specific and therefore potentially exclusive developments at the end of a word. The first development is the loss of short PIE *-i after a long vowel plus labial consonant. This sound change must have occurred later than the secondary shortening of long vowels before word-final PIE *-m which is shared by Celtic. The second sound law is the raising of stressed PIE *o to *u in word-final position before consonants.

ISTORINĖS FONOLOGIJOS NAUDA KALBŲ SKIRSTYMUI. DU GALINIŲ SKIEMENŲ DĖSNIAI BENDROJE BALTŲ IR SLAVŲ KALBŲ ISTORIJOJE

Santrauka

Tradiciškai suponuojamą tarpinį baltų-slavų raidos etapą po indoeuropiečių prokalbės skilimo papildomai remia du labai specifiški ir todėl potencialiai ekskliuzyviniai žodžio galo pakitimai. Pirmasis pakitimas yra ide. žodžio galo trumpojo **i* netekimas po ilgojo balsio prieš lūpinį priebalsį, turėjęs įvykti vėliau nei antrinis ilgųjų balsių sutrumpėjimas prieš ide. žodžio galo **m*, iš dalies būdingas ir keltų kalboms. Antrasis pakitimas yra kirčiuoto ide. **o* virtimas **u* žodžio galo pozicijoje prieš priebalsius baltų ir slavų kalbose. Postuluojami garsų dėsniai nustatyti remiantis detalia atitinkamų baltų ir slavų kalbų daiktavardžių, įvardžių bei būdvardžių galūnių analize.

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