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## LONG VOWELS IN BALTO-SLAVIC

## 1. Lengthened grade

According to the traditional doctrine, there are three types of long vowels in Indo-European languages:

(1) Full-grade long vowels. These have acute tone in Lithuanian, and also in Greek final syllables, e. g. *algà* 'salary', *ἀλφή* 'gain'.

(2) Contracted long vowels. These have circumflex tone in Lithuanian, and also in Greek final syllables, e. g. gen. sg. *algōs*, *ἀλφῆς*.

(3) Lengthened grade vowels. These have acute tone in Greek final syllables, e. g. *ποιμήν* 'shepherd'. It is usually assumed that the circumflex tone of the Lithuanian cognate *piemuō* is the result of a secondary development. This point of view is not supported by the material. In the following I intend to show that circumflex tone is regular on lengthened grade vowels in Balto-Slavic.

The origin of the lengthened grade has largely been clarified by J. Wackernagel in his *Old Indic Grammar* [1896, 66–68]. He distinguishes three categories with seven subdivisions:

(a) Secondary nominal derivatives. Wackernagel accepts Streitberg's suggestion [1894, 380] that lengthened grade in this category arose from analogical extension of lengthened grade in monosyllabic word forms.

(b) Roots in monosyllabic nouns, before primary suffixes, in the singular of athematic presents, and in the active *s*-aorist, e. g. *-hārd-*, *hārdi* 'heart', *mārṣṭi* 'wipes', *ājaiṣam* 'conquered'. The long root vowel of these words originated from phonetic lengthening in monosyllabic word forms, e. g. *\*hārd*, *\*jaiṣ*.

(c) Final syllables of nom. sg. and loc. sg. forms of nominal stems in a resonant, e. g. *sākhā* 'friend', *agnā* 'in fire', both with loss of the formative *\*-i*. Here I assume phonetic lengthening before a word-final resonant and subsequent loss of the resonant.

If we want to establish the tonal reflex of lengthened grade in Balto-Slavic, we have to examine what has remained of these categories in Lithuanian, Latvian, and Serbo-Croatian. I think that the following evidence is relevant.

1.1. The nom. sg. form of stems in a resonant ends in a circumflex long vowel in Lithuanian, e. g. *akmuō* 'stone', *duktė* 'daughter'. The only Slavic word which

offers an indication for this category is SCr. *žērāv* 'crane', Czech *žeráv*, which reflects an original nom. sg. form *\*gerōu*, cf. Latin *grūs*. The long vowel of Serbo-Croatian and Czech is in agreement with the Lithuanian circumflex. The short vowel of Slovene *žerjav* was obviously taken from the homonym meaning 'burning', which has the expected short vowel in both Cz. *žeravý* and SCr. *žerava* 'live coal'.

1.2. The sigmatic aorist has disappeared in Baltic, so our information on this category is limited to the Slavic data. There is a single verb which has preserved an unambiguous reflex of the lengthened grade in Serbo-Croatian: 1st sg. *dōnijeh* next to *donèsoh* 'brought'. The long reflex of the jat corresponds with the Lith. circumflex. A second indication is provided by the isolated infinitive *rījet* (Dubrovnik) next to *rèci* 'say' [Vaillant, 1966, 60].

If lengthened grade had yielded the acute tone in Balto-Slavic, we would expect to find the reflex of the acute throughout the aorist in Serbo-Croatian. This is not what we find. Outside the 2nd and 3rd sg. forms, the aorist has the same accent as the infinitive. Since influence of the latter category upon the former is hardly probable, I think that the original accentuation of the sigmatic aorist has been preserved in e. g. 1st sg. *mrījeh*, *ùmrijeh* 'died', *klêh*, *zàklêh* 'swore', Posavian *zaklē*, with neo-acute corresponding to the Lith. circumflex.

It has been objected against this point of view that the absence of *-s-* in the OCS. 2nd and 3rd sg. forms *mrětъ* and *klětъ* may point to an original root aorist [e. g. Stang 1942, 65; Vaillant 1966, 191]. I do not think that the objection holds because the most obvious examples of PIE. root aorist are represented by sigmatic forms in *bystъ* 'was' and *dastъ* 'gave', for which an analogical origin cannot be made plausible. Moreover, OCS. *setъ* 'inquit' can hardly be separated from Alb. *thom* 'say', which must be derived from *\*kēnsmi*. I conclude that the ending *-tъ* was added after the loss of final *\*-s* in all instances except *bystъ*, *dastъ*, and *jastъ* 'ate', where it prevented the loss of *\*-s*<sup>1</sup>. As Dybo has shown for stems in an obstruent [1961, 37], sigmatic aorist forms were end-stressed and asigmatic aorist forms were stem-stressed at a certain stage in the development of Slavic. I think that the same distribution obtained with stems in a resonant.

One may wonder what has become of the sigmatic aorist in Baltic. In my view, the lengthened grade of the root in this category is reflected in the long vowel preterit. The argument rests upon three pieces of evidence.

<sup>1</sup> This chronology forces me to withdraw my agreement [expressed 1979a, 62] with Fortunatov's view that *-tъ* represents the demonstrative pronoun because the latter was probably still *\*so* at the stage when final *\*-s* was lost [cf. Kortlandt, 1982a, 5]. This does not alter my opinion that *-tъ* must be derived from a clitic.

Firstly, the endings of the long vowel preterit are the same as those of original imperfects and differ from those of original asigmatic aorists, which received the characteristic *\*-ā* in East Baltic, e. g. Lith. *lipo* 'stuck', *stójo* 'stood', OCS. *-lþpe, sta*. Sigmatic aorists of stems in an obstruent were replaced with original imperfects, as they partly were in Slavic, e. g. Lith. *vėdė* 'led', OCS. *vede*. Since the long vowel preterit has the same endings, I assume that it has replaced the sigmatic aorist of stems in a resonant. The clearest example is the isolated paradigm of Lith. *iĩti* 'take', *ima* 'takes', *ėmė* 'took', which can now be identified with OCS. *jetī, -yme-, jetǫ*. The preservation of the distinction between thematic aorists and imperfects shows that the sigmatic aorist had not been lost at the time when *\*-ā* spread as a preterit ending. Most probably, the form in *\*-ā* was created in order to supply an imperfect to underived aorist stems in Balto-Slavic, and the long vowel preterit was subsequently created as an imperfect to sigmatic aorist stems in East Baltic. Finally, the aorist was lost and the imperfect became a general preterit. The Lith. difference between the short vowel of *vėdė* and the long vowel of *ėmė* is in this conception parallel to the Slavic difference between thematic *vede* and athematic *jetǫ*.

Secondly, the long vowel preterit has the same tone as the infinitive, e. g. Lith. *gėrė* 'drank', *bėrė* 'strewed', *lėkė* 'flew', inf. *gėrti, beĩti, lėkti*. This is reminiscent of the Slavic aorist. I cannot accept the usual view that the tonal difference in the preterit was introduced on the analogy of the infinitive [e. g. Stang, 1966, 390]. The preservation of the tonal difference on the long vowel shows that the stem was originally followed by a nonsyllabic consonant in the preterit. I therefore assume that we have to start from forms of the type *\*bėrs, \*gėrHs*, and that the substitution of a vocalic ending for *\*-s* was posterior to the rise of distinctive tone, which can be dated to the East Baltic period [cf. Kortlandt, 1977, 324]. It follows that the circumflex tone is the phonetic reflex of lengthened grade.

Thirdly, the preterit in *\*-ē* has mobile accentuation in Lithuanian, even if the corresponding present has fixed stress, apart from the operation of Saussure's law, e. g. *apveĩkia* 'mourns', *apverkė* 'mourned'. Conversely, the preterit in *\*-ā* has fixed stress, even if the corresponding present has mobile accentuation, e. g. *nũperka* 'buys', *nupiĩrko* 'bought'. This is in agreement with the Slavic distribution of end-stressed sigmatic and stem-stressed asigmatic aorist forms, so that we can identify e. g. *gėrė* 'drank' with OCS. *žrětǫ* 'devoured'.

1.3. If Wackernagel's hypothesis that the lengthened grade originated in monosyllabic forms is correct, it must have spread from the 2nd and 3rd sg. forms of the sigmatic aorist to the rest of the paradigm. This view is supported by the absence of lengthened grade from the 1st sg. form of the Vedic injunctive, e. g. *stošam* 'praise', *ješam* 'conquer'. It is also supported by the tonal alternation within the aorist

paradigm of root verbs with mobile accentuation in Serbo-Croatian, e. g. 1st sg. *dāh* 'gave', *līh* 'poured', 3rd sg. *dā*, *lī*. These forms represent *\*doHs-*, *\*leHis-*, monosyllabic *\*dōs*, *\*lēis*, cf. Lith. *dūoti. lieti*. Note that OCS. *litъ* corresponds to *lēja-* < *\*leHie-*, *lijati* < *\*lHi-* in the same way as Lith. *piėšė* 'drew', *pėrė* 'thrashed', *srėbė* 'sipped' correspond to *piėšia*, *pėria*, *srėbia*, OCS. *piše-*, *pъsati* 'write', *pere-*, *pъrati* 'tread', Slovene *srėblje-* < *\*serb-*, *srbati* 'sip', also Lith. *spjovė* 'spat' to *spiauja*, OCS. *pljuje-*, *pljъvati* 'spit'. In my view, the vocalism of Lith. *srėbė* can be identified with the one of Vedic *ásrāk* 'emitted', both forms showing metathesis of *\*sēRCst* to *\*sRē-Cst* in order to avoid the final consonant cluster. It follows that the lengthened grade yielded the circumflex tone in Baltic and Slavic and that *\*dōs* and *\*lēis* originated from loss of the laryngeal after the lengthened grade vowel. The acute tone of Lith. *spjovė* is due to the fact that the laryngeal did not immediately follow the long vowel in *\*spiēuHs*, cf. *gėrė* 'drank' < *\*gērHs*.

1.4 The metatony in SCr *dā*, *lī* is strongly reminiscent of the one in Lith. *duōs* 'will give', *liēs* 'will pour'. We must therefore examine if these forms can be identified with each other. There are two pieces of evidence that this is indeed the case.

In the Lith. 3rd person future form, monosyllabic acute stems are subject to shortening if the root vowel is *y* or *ū* and to metatony in other cases, e. g. *lis* 'will rain', *būs* 'will be', *duōs* 'will give', *dirbs* 'will work'. Exceptions to this rule are of analogical origin, e. g. *vỹs* 'will chase', *siũs* 'will sew', which are thus distinguished from *vis* 'will propagate', *siūs* 'will rage' [cf. Zinkevičius, 1981, 120]. Polysyllabic stems are subject to metatony, not to the expected shortening in accordance with Leskien's law, e. g. *rašỹs* 'will write', *kalbė̃s* 'will speak'. I find it extremely difficult to assume that the generalization of metatony came about under the influence of a few unprefixated verbs like *dė̃ti* 'put', especially because Leskien's law was relatively recent [cf. Kortlandt, 1977, 328]. More probably, the verbs in *-ė̃ti*, *-óti* and *-úoti* were already subject to metatony before the operation of Leskien's law [cf. already Kortlandt, 1975, 86]. Thus, I think that the oldest distribution is preserved in those dialects which have *rašis* 'will write', *daris* 'will do', *sakis* 'will say' next to *žinōs* 'will know', *stovė̃s* 'will stand', *kalbė̃s* 'will speak' [cf. Zinkevičius, 1966, 361]. It follows that the metatony of *dė̃s* 'will put', *jōs* 'will ride', *duōs* 'will give' and *liēs* 'will pour', which served as a model for the latter categories, is much older than the one in *tiē* 'those': I date it to the Balto-Slavic period.

Elsewhere I have argued that the East Baltic future tense developed from a Balto-Slavic subjunctive mood with secondary endings [1982a, 8]. This subjunctive can be identified with the Vedic aorist injunctive. It can also be identified with the Old Irish *s*-subjunctive, which has an athematic ending in the 3rd sg. form, e. g. *téis*, *-téi*, *-té*, *-t* 'goes', which is therefore identical with Lith. *steĩgs* 'will found', OLith. 'will

hurry'. Elsewhere I have argued that the original secondary endings of the Irish *s*-subjunctive are partly reflected in the flexion of the *a*-subjunctive and the *s*-future [1979b, 48–50]<sup>2</sup>. In his classical study on the sigmatic forms of the Latin verb H. Pedersen derives the imperfect subjunctive of this language from the hypothetical preterit of a lost sigmatic future [1921, 14]. This point of view involves several difficulties. First, it remains unclear why the sigmatic future was replaced with a less distinctive formation, especially because the expected endings are attested in the future perfect. Second, the development of the alleged future preterit through a conditional into the imperfect subjunctive took place „sans qu'on puisse indiquer les étapes par lesquelles la formation a acquis sa valeur historiquement attestée“ (ibidem). Third, it must have been a very early development because the subsequent morphological transformations depend on the value of a subjunctive (ibidem). Fourth, the imperfect subjunctive of Latin can hardly be separated from the Celtic subjunctive, which is not used as a conditional either in Irish, which uses the past tense of the reduplicated future, or in Welsh, which uses the imperfect indicative. Consequently, the derivation of these forms from a sigmatic future requires a very long chain of hypothetical developments in Celtic [cf. Pedersen, 1921, 30]. More probably, we have to start from an Italo-Celtic *s*-subjunctive with secondary endings which can be identified with the Vedic aorist injunctive and with the East Baltic future tense. This formation is also reflected in the Tocharian *s*-present, which adopted thematic endings, e. g. B *pakṣän*, *pakṣtär* 'ripens, boils', *tsakṣän*, *tsakṣtär* 'burns', which correspond with Lith. *kèps* 'will bake', *dègs* 'will burn'. The original athemat-

<sup>2</sup> Here I have to withdraw my earlier view that the flexion of the *s*-subjunctive was reshaped on the pattern of the *s*-preterit [1979b, 48] because the motivation for such an analogical development is rather weak. More probably, the athematic forms are original, so that we can identify the *s*-subjunctive with the Vedic injunctive and the East Baltic future. Both views are already mentioned by Thurneysen [1946, 391]. Consequently, the 3rd sg. conjunct form *\*berā* replaced *\*berah* rather than *\*berae*. The thematic forms may have originated from the reanalysis of the 3rd sg. absolute form *\*beras-es* as *\*berase-s*. The expected lengthened grade was eliminated in the same way as it was in the Greek aorist, viz. as a result of Osthoff's law. It follows from the position taken here that Latin *faxō* 'will do' and *quaesō* 'beg', which are often considered to represent the aorist subjunctive [e. g. Pedersen, 1921, 12], must probably be regarded as original athematic formations to be identified with the Irish and Baltic categories discussed here, cf. Venetic *fagsto* 'made'. They may have adopted the thematic flexion of *erō* 'will be', which is generally derived from a thematic subjunctive. The latter view must be questioned, however, because the thematic subjunctive is otherwise limited to Indo-Iranian and Greek, and the latter language presents an athematic middle future 3rd sg. *ἔσται* 'will be'. One therefore wonders if the future of 'to be' represents the original present injunctive in Greek and Latin. In that case, the Osco-Umbrian future paradigm may have developed from the same formation by the substitution of primary for secondary endings. The pre-desinential vowel of O. *pertemest* 'will interrupt', U. *ferest* 'will carry' was evidently taken from the present stem, cf. O. *didest* 'will give', U. *heriest* 'will want'.

ic flexion of this class is probably reflected in the corresponding transitive root subjunctive, where the \*-s- was lost between two obstruents. The vocalism of the Latin imperfect subjunctive is the same as that of the Irish *a*-subjunctive, which represents the *s*-subjunctive of stems in a syllabic laryngeal [cf. Kortlandt, l. c.]. The Latin future perfect *ēmerō* 'will have bought' is apparently based on *erō* 'will be' in the same way as Oscan *fefacust* 'will have done' is based on *fust* 'will be'<sup>3</sup>.

1.5. Apart from the sigmatic aorist and polysyllabic stems in a resonant, lengthened grade vocalism is expected in monosyllabic root nouns. An example is Vedic *vāk* 'speech', Latin *vōx*, which was apparently replaced with Slavic *rěčь* and Prussian acc. sg. *tārin*. The circumflex tone of the Slavic word is evident from SCr. *rīječ*. The establishment of this category is particularly difficult in Baltic and hardly easier in Slavic because root nouns appear as *o*-, *ā*-, and *i*-stems and cannot therefore be distinguished from primary derivatives. A probable example of an original root noun is Lith. *gėlà* 'pain', Slavic *žalb*, Slovene *žála*, Slovak *žial'*, OHG. *quāla*. The circumflex tone of the lengthened grade vowel in this word contrasts with the acute of laryngeal origin in the cognate verb Lith. *gėlti* 'ache', SCr. *žàliti*, Czech *želeti*. The same relationship holds between Lith. *žolė* 'grass' and *žėlti* 'grow', cf. OPr. acc. sg. *sālin* 'herb', SCr. *zèlen* 'green'. Another example of lengthened grade from a root noun is Lith. *mėsà* 'meat', Latv. *miesa*, OPr. *mensā*, SCr. *měso*, Skt. *māṃsām*, *mās*, Gothic *mimz*. A similar formation is SCr. *jāje* 'egg', also *jāje* (Novi, Vrgada, Dubrovnik), Gr. *ωίόν*, Latin *ōvum*, which is a derivative of *avis* 'bird', or rather of its precursor *\*ōus*, *\*u-*. The absence of acute tone in these examples is in agreement with what we have found thus far.

<sup>3</sup> Thus, I replace Kuiper's triad, consisting of a present *\*trēsti* 'flees', a preterit *\*ētērst*, and a subjunctive *\*tērse-* [1934, 212] with a pair of independent formations, viz. a present *\*tresti*, *\*trsentī* and a subjunctive *\*tērst*, *\*tersht*. In a sense, the original system is best preserved in Tocharian. The Old Irish reduplicated future represents a PIE. formation *\*titrestī*, which is related to the sigmatic aorist in the same way as Gr. *τίθημι* 'put' is related to the root aorist. The Irish future originally shared the secondary endings of the subjunctive. Incidentally, the 2nd sg. absolute form *lile* 'will follow', which is usually considered incorrect [e. g. Thurneysen, 1946, 405], is the regular phonetic reflex of *\*lilises-es*, cf. subj. *berae* from *\*berases-es*, whereas 3rd sg. *lilith* shows the same replacement as *beraid* [cf. Kortlandt, 1979b, 48]. The Indo-Iranian desiderative present must be derived from *\*titrse-*, which relates to the reduplicated future in the same way as the aorist subjunctive *\*terse-* relates to the PIE. subjunctive (aorist injunctive): the thematic forms represent the PIE. objective flexion [cf. Kortlandt, 1982b]. Similarly, the reduplicated aorist derives from *\*titre-*, which has the same relation to the reduplicated present *\*titerti* as the thematic aorist has to the root present. The original alternation of the root vowel is preserved in Old Irish *fo-loing* 'supports' < *\*-lunge*, subj. *fo-ló* < *\*-lēugst*, fut. *fo-lil* < *\*-lilugst*, preterit *in-lolaig* < *\*-lulouge*, verbal noun *fulach* < *\*-lugom*.

The following Slavic words can in my view be derived from root nouns [cf. Vaillant, 1974, l. c.]: OCS. *vodotěčb* (30), *měl̃b*, *měl̃b* (31), Lith. *směl̃is*, OCS. *rěčb* (40), Russ. *nočlég* (42), Czech *-běr* (45), *-děř*, *-děra* (46), *-pěr*, *-pěra* (48), *-stěra*, *-věř*, *-věra* (49), *-těr*, *-těra* (50), SCr. *üğār* (m.), *gār* (f.), *žār* (m.), *žāra* (f.), *pðzār* (69), Polish *sap*, *sapa* (77), OCS. *slěp̃b* (92), *běl̃b* (99), Latv. *bāls* (next to *bāls* because of *bal̃ts*), SCr. *vāl*, *ðbala* (168), Lith. *vōlas*, *volē*, SCr. *vār*, *ðbara* (169), Lith. *vōras* [Būga, 1959, 646], Ukr. *čará*, SCr. *čār* (f.), Cz. *čár* (m.), *čāra* (f.), Avestan *čārā*, SCr. *ūdār* (178), *krās*, Cz. *krása* (179), SCr. *užās* (180), OCS. *žalb* (194), SCr. *kār*, Cz. *kāra* (196), SCr. *nēmār*, Cz. *svār* (197), *zár̃*, *zár̃e*, *dávno*, *sám*. I do not claim that all of these words existed in Balto-Slavic times already, but I think that most of them did and that they provided the starting-point for the spread of lengthened grade vocalism through the language. The long vowel is never acute in these words.

1.6. Above I argued that the metatony in the 3rd sg. form of the SCr. aorist *dā* and the Lith. future *duōs* is best explained by the assumption that a laryngeal was lost after a PIE. long vowel in Balto-Slavic. The same hypothesis accounts for the circumflex tone of Latvian *sāls* 'salt' and *gūovs* 'cow'.

Under the assumption that the Greek circumflex on final syllables points to a disyllabic origin and that the last component of a "long diphthong" was assimilated to the preceding vowel before a final resonant, a straightforward comparative reconstruction yields the proto-forms which are adduced under the label "Late PIE." below. The forms which are labelled "Early PIE." represent my internal reconstruction of the original paradigms.

	Vedic	Greek	Late PIE.	Early PIE.
nom.	<i>dyáus</i> 'sky'	Ζεῦς	* <i>diēus</i>	* <i>deius</i>
acc.	<i>dyām</i>	Ζῆν	* <i>diēum</i>	* <i>dieum</i>
gen.	<i>divás</i>	Διός	* <i>diuos</i>	* <i>diuos</i>
nom.	<i>náus</i> 'ship'	ναῦς	* <i>nēH<sub>2</sub>us</i>	* <i>neH<sub>2</sub>us</i>
acc.	<i>nāvam</i>	ναῖν	* <i>nēH<sub>2</sub>um</i>	* <i>nH<sub>2</sub>eum</i>
gen.	<i>nāvás</i>	ναός	* <i>nēH<sub>2</sub>uos</i>	* <i>nH<sub>2</sub>uos</i>
nom.	<i>gáus</i> 'cow'	βοῦς	* <i>g<sup>w</sup>ēH<sub>3</sub>us</i>	* <i>g<sup>w</sup>eH<sub>3</sub>us</i>
acc.	<i>gām</i>	βῶν	* <i>g<sup>w</sup>ēH<sub>3</sub>um</i>	* <i>g<sup>w</sup>eH<sub>3</sub>um</i>
gen.	<i>gós</i>	βοός	* <i>g<sup>w</sup>H<sub>3</sub>ous</i>	* <i>g<sup>w</sup>H<sub>3</sub>ous</i>

The lengthened grade spread apparently from \**diēus* to \**nēH<sub>2</sub>us* and from there to \**g<sup>w</sup>ēH<sub>3</sub>us*. The fact that the latter form is monosyllabic in Vedic and Avestan suggests that Indo-Iranian shared the Balto-Slavic loss of a laryngeal after a long vowel, unlike Greek, where the circumflex points to its preservation. Thus, the Indo-Iranian form can be identified with Latv. *gūovs*. The acc. sg. form *gām* is disyllabic

in Vedic, but not in Avestan, which points to a late analogic development. The vocalism of the oblique cases is preserved in Slavic *govędo*, SCr. *gòvedo* 'head of cattle'.

The original flexion type of Vedic *náus* is reflected in the words for 'salt' and 'goose':

	Balto-Slavic	Greek	Latin	PIE.
nom.	Latv. <i>sāls</i>	ἄλς	<i>sāl</i>	* <i>seH<sub>2</sub>ls</i>
acc.	OCS. <i>solb</i>	ἄλα	<i>salem</i>	* <i>sH<sub>2</sub>elm</i>
gen.	* <i>sl-</i>	ἄλός	<i>salis</i>	* <i>sH<sub>2</sub>los</i>
nom.	Latv. <i>zūoss</i>	χᾶν	<i>ānser</i>	* <i>ǵheH<sub>2</sub>ns</i>
acc.	„ <i>zūosi</i>	χᾶνα		* <i>ǵhH<sub>2</sub>ensm</i>
gen.	Slavic <i>g-</i>	χᾶνός		* <i>ǵhH<sub>2</sub>nsos</i>

The circumflex tone of Latv. *sāls* reflects the lengthened grade which was apparently generalized in the nom. sg. form of this category. The acute reflex of the laryngeal is probably preserved in Lith. *sólymas* 'brine' [cf. Būga, 1959, 584]. The Greek acute shows that the loss of the laryngeal was anterior to the development of the syllabic resonants, cf. Ionic *μείς* 'month' < \**meH<sub>1</sub>ns*, Latin *mēnsis*. The converse chronology holds for Indo-Iranian, where Avestan *māh* 'moon' is disyllabic [Beekes, 1982, 55]. The initial palatovelar obstruent was depalatalized before a syllabic resonant in Slavic *gōsb* (cf. Kortlandt, 1978a, 241, where my reluctance is unwarranted). Other instances of this flexion class are Lith. *dienà* 'day', OPr. acc.sg. *deinan*, OCS. *дѣнь*, Lith. *žiemà* 'winter', OCS. *zima*, Avestan *zyāh*, gen. *zimō*, Hittite *tēkan* 'earth', Lith. *žēmė*, Vedic *kṣās*, gen. *jmās*.

The original flexion type of Vedic *gáus* is reflected in the word for 'nose':

	Balto-Slavic	Vedic	Latin	PIE.
nom.	Latv. <i>nāss</i>	du. <i>nāsā</i>	<i>nāris</i>	* <i>neH<sub>2</sub>s</i>
acc.	Latv. <i>nāsi</i>	(OP. <i>nāham</i> )	<i>nārem</i>	* <i>neH<sub>2</sub>sm</i>
gen.	OCS. <i>nos-</i>	du. <i>nasós</i>	<i>nāris</i>	* <i>nH<sub>2</sub>os</i>

Prussian has preserved the long vowel in *nozy* 'nose' and the short vowel in *ponasse* 'upper lip', both in the Elbing vocabulary, cf. also Lith. *nasraī* 'jaws'. The East Baltic acute tone must probably be derived from the dual.

1.7. The flexion of the Lith. *ē*-stems differs from that of the *ā*-stems in the nom. sg. ending *-ė* versus *-à* only. The origin of the metatony in the *ē*-stems has not satisfactorily been explained thus far. The usual assumption that *-ė* represents the regular development of \**-iā* is phonetically improbable, does not explain the restriction of the metatony to the nom. sg. form, and requires a considerable number of additional hypotheses [cf. Stang, 1966, 202]. There is no reason to assume that the

metatony originated in the flexion of the original polysyllabic *ē*-stems, of which there are three clear examples: *žvākē* 'candle', *meñtē* 'paddle', *gìrē* 'forest', which can be compared with Latin *facēs* 'torch', Vedic *mánthās* 'churning-stick', *gírīs* 'mountain', OCS. *gora* [cf. Pedersen, 1926, 60–67]. In my view, the metatony originated from the loss of the laryngeal after a lengthened grade vowel in the nom. sg. form of the root noun which is represented in Lith. *arklìdē* 'stable', *avidē* 'sheepfold', *alùdē* 'pub', *pelùdē* 'chaff store', also *žvaigždē* 'star', OCS. *zvězda*, OPr. *umnode* 'bakehouse', Vedic *-dhā* [o. c., 72], Latin *-dēs* [o. c., 75, 77], cf. Gr. *χρή* 'must'. The compositional structure of Lith. *žvaigždē* is the same as that of Avestan *mazdāh* 'God' and can be compared with the formation of the Greek passive aorist and the Germanic weak preterit. Thus, the circumflex tone of Lith. *-dē* has the same origin as the one of Latv. *sāls*, *gùovs*.

Other *ē*-stems resulted from analogic developments. In the case of Lith. *šlovē* 'glory', OCS. *slava*, which cannot be separated from Latin *cluēre* 'be mentioned', I think that we have to start from a form *\*klēuH<sub>1</sub>*, with analogical lengthened grade as in Gothic *qēns* 'wife', PIE. *\*g<sup>w</sup>enH<sub>2</sub>*, or Gr. *ἥπαρ* 'liver', PIE. *\*iek<sup>w</sup>r*. In the case of Lith. *gėrvė* 'crane', OPr. *gerwe*, the original flexion is evident from SCr. *žērāv*, Latin *grūs*: I reconstruct PIE. *\*gerH<sub>2</sub>ōu*, gen. *\*grH<sub>2</sub>uos*. The nominative in *-ē* was created on the basis of the oblique case forms, cf. Latin *-ēs*, gen. *-is*. In Lith. *žėmė* 'earth' we have the vocalism of the original accusative, which is preserved in ORuss. *земь*. Here too, the nominative in *-ē* is apparently based on the oblique case forms, cf. Vedic gen. *jmās*. The zero grade of the root in the oblique cases is preserved in Lith. *gilė* 'acorn', Latin *glāns*, SCr. *žělūd*, which point to PIE. *\*g<sup>w</sup>elH<sub>2</sub>s* 'oak', gen. *\*g<sup>w</sup>lH<sub>2</sub>os*, cf. *\*bherH<sub>1</sub>gs* 'birch', gen. *\*bhrH<sub>1</sub>gos*, Lith. *bėržas*, OPr. *berse*, zero grade in Latin *frāxinus* 'ash tree', also *farnus* with the vocalism of acc. *\*bhrH<sub>1</sub>eǵm*. A final example is Lith. *ùpė* 'river', OPr. *ape* 'brook', Vedic *ápas* 'water', PIE. *\*H<sub>2</sub>ep-*, which shows that the vocalic alternation in the root was productive in East Baltic. The list can easily be extended, cf. Lith. *sáulė* 'sun', *músė* 'fly', *pelė* 'mouse' [Skardžius, 1955, 175], etc.

## 2. Winter's law

Apart from the long vowels which originated from laryngeals, contractions, and PIE. lengthened grade, there is a fourth type of long vowels in Balto-Slavic e. g. Lith. *ėsti* 'eat', *sėdėti* 'sit', *sėsti* 'sit down', *úosti* 'smell', *bėgti* 'run', *obelis* 'apple tree', *pėdà* 'footstep', *púodas* 'pot', *vėdaras* 'stomach', *vėdỹs* 'fiancé', *núogas* 'naked', *úoga* 'berry', *ožkà* 'goat', OCS. *pasti* 'fall', *naglǫ* 'sudden', *agne* 'lamb', *jazǫ* 'I'. The origin of this type has recently been clarified by W. Winter [1978, 439]: "In Baltic,

and Slavic languages, the Proto-Indo-European sequence of short vowel plus voiced stop was reflected by lengthened vowel plus voiced stop, while short vowel plus aspirate developed into short vowel plus voiced stop". This Balto-Slavic "lengthened vowel" has acute tone, unlike the lengthened grade vowels of PIE. origin<sup>4</sup>.

We may wonder if there is a fifth type of long vowel in Balto-Slavic, viz. in secondary derivatives with substitution of acute for circumflex vocalism. This type can hardly be established in Baltic, where metatony became productive in morphological processes when the stress was retracted from a prevocalic \*i [cf. Kortlandt, 1977, 324]. I will therefore limit myself to the Slavic instances which have been adduced by Z. Gołąb [1967]. If we eliminate the words which either have an acute tone of laryngeal origin or do not have a Proto-Slavic acute at all, his list is reduced to four items:

(1) SCr. *kùca* 'house' is related to Russ. *kútať* 'wrap', OPr. *pokūnst* 'guard'. The connection with SCr. *kūt* 'angle', which Gołąb endorses, is unsatisfactory from a semantic point of view. Cognates in other Indo-European languages seem to be lacking.

(2) SCr. *līpa* 'linden', Lith. *liepa* has no cognates outside Balto-Slavic. The connection with *līpti* 'stick' has a taste of popular etymology.

(3) OCS. *sažda* 'soot', Lith. *súodžiai* is now explained by Winter's rule.

(4) SCr. *vrāna* 'crow', Lith. *vārna* is the only positive evidence for Balto-Slavic "mé-tatonie rude", cf. SCr. *vrān* 'raven', Lith. *vařnas*. This pair is strongly reminiscent of Gr. *κόραξ* 'raven', *κορώνη* 'crow', Latin *corvus*, *cornix*, of which it probably is an alteration through the substitution of \**wor-* 'burn' for \**kor-*, Lith. *kárštas* 'hot'. For the suffix cf. *šīřvas* 'grey', *muļvas* 'reddish' next to Russ. *sérna* 'roe deer', Latv. *mēļns* 'black', OPr. *sirwis*, Gr. *μέλας*. We apparently have to start from a Balto-Slavic pair \**worwos* 'black', \**worHnaH* 'crow'. Thus, I conclude that the only source of apophonic long vowels with a Balto-Slavic acute tone is Winter's law.

<sup>4</sup> The acute long vowel of Lith. *grėbti* 'rake', *palėgti* 'lie down', *įsėkti* 'engrave' is evidently analogical, cf. OCS. *greti* 'row', *lešti* 'lie down', *sekyra* 'axe'. On the exceptions to Winter's rule [cf. Kortlandt, 1979c, 60–61] Gercenberg's criticism [1981, 129–140] is not convincing. The apophonic relationship between Lith. *obelis*, Latv. *ābuōls* 'apple', and Russ. *jabloko* shows that the word is of PIE. origin: I reconstruct \**H<sub>2</sub>ebōl*, acc. \**H<sub>2</sub>belm*, gen. \**H<sub>2</sub>blos*. Initial \**b-* became \**p-* in PIE. times already, cf. Vedic *pibati* 'drinks', OIr. *ibid*, with restored reduplication in Latin *bibit*. Note that Latv. *ābuōls* shows the expected reflex of lengthened grade in the second syllable, cf. *darīt* 'do', 1st pl. *darām*. Since Gercenberg misrepresents my views [o. c., 138], I have no reason to go into his objections. Suffice it to say that the acute tone of Lith. *ėras* 'lamb', *ūolektis* 'ell', *ūosis* 'ash tree' is of laryngeal origin and that *dūodu* 'give' relates to *dūoti* as *dedū* 'put' to *dėti*.

### 3. Chronology

Having established the correspondences of the different types of long vowel, we are now in a position to examine their order of appearance. It has become generally accepted that the PIE. lengthened grade vowels constitute the oldest layer. The Greek circumflex tone originated from the loss of the intervocalic laryngeals. It developed from simple hiatus into a tonal feature when it arose in other positions as a result of the Greek accent laws. Since the accent laws are evidently posterior to the rise of long vowels from sequences of short vowel plus laryngeal, I conclude that these sequences had merged with the original lengthened grade vowels before the rise of the circumflex tone. The converse chronology holds for Balto-Slavic, where long vowels from contractions cannot be distinguished from the original lengthened grade vowels. In this branch of Indo-European, the laryngeals were still segmental at the time of Hirt's law [cf. Kortlandt, 1977, 321]. The long vowels which arose from Winter's law merged with the long vowels of laryngeal origin at a stage which was posterior to Hirt's law, as is clear from the broken tone of Latvian *pēds* 'footstep', *nuōgs* 'naked' (ibidem). Elsewhere I have argued that the Proto-Slavic acute was a broken tone, which developed from a glottal stop [e. g. 1975, passim; 1978b, 277]. I have also argued that the rising and falling tone movements which we find in East Baltic and South Slavic are independent developments of Lithuanian [1977, 325], Latvian [1977, 328], and Slavic [1975, 28, 31, 33]. These developments can be compared with the Greek accent laws. The hypothesis that Winter's law is simple lengthening of short vowels before voiced obstruents does not explain why the resulting long vowels merged with the reflexes of short vowels plus glottal stop, not with the earlier long vowels. This is why I have adduced Winter's law as the main piece of evidence for the hypothesis that the reconstructed PIE. voiced stops were in fact glottalic [1978c]. As I have pointed out elsewhere, the latter hypothesis is supported by immediate comparative evidence from Sindhi [1981] and by indirect evidence from every single branch of Indo-European [1978c, 1983]. The alternative view, according to which the glottalization is secondary, requires a detailed chronological analysis, which has not been attempted by its adherents. In particular, it requires the specification of a Balto-Slavic feature X with the following properties:

- (a) X is the reflex of the PIE. laryngeals, but not of PIE. length.
- (b) X developed automatically before the PIE. voiced stops, but not before the voiced aspirates.
- (c) In pretonic syllables X yielded glottalization in Latvian and length in Slavic.
- (d) In newly stressed, originally pretonic syllables X yielded a rising tone in Lithuanian and a falling tone in Latvian [Kortlandt, 1977, 324–328].

(e) In originally stressed syllables X yielded a falling tone in Lithuanian, a rising tone in Latvian, and a variety of reflexes in Slavic: length in barytone forms of paradigms with mobile stress, shortening in paradigms with fixed stress, lengthening of initial vowels before a tautosyllabic resonant, lengthening in disyllabic words in early Czech (e. g. *psáti* 'write'), lengthening in metathesized groups in Upper Sorabian (e. g. *kruwa* 'cow', cf. Polish *krowa* [Dybo, 1963]), rising tone on pleophonic groups in East Slavic, and a short vowel in the second syllable of pleophonic groups in Ukrainian (e. g. *moróz* 'frost', cf. gen. pl. *holív* 'head').

(f) X blocked the progressive accent shift in Slavic [Kortlandt, 1975, 33].

(g) In the first posttonic syllable X attracted the stress from a preceding syllable without X in Lithuanian [Saussure] and yielded shortening in Slavic.

(h) In the second posttonic syllable X yielded length in Slavic, which is reflected in the Slovene neo-circumflex [Kortlandt, 1975, 11].

(i) In final syllables X yielded shortening in Lithuanian [Leskien].

(j) X was not glottalization.

Such an analysis does not seem to be forthcoming.

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