

Wackernagel's explanation of the lengthened grade

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1. *Introduction*

The origin of the lengthened grade in Proto-Indo-European is an important and much discussed problem. The great scholar whose memory we honour with this meeting made an important, if not decisive contribution to the solution of this question. Unhappily it has not received due attention. And in as far as it had influence, it were exactly the wrong elements that were adopted. It was only very recently that its importance was recognised, and that it was elaborated.

2. *Steitberg's theory*

There were mainly two theories to explain the origin of the lengthened grade, let's say the old one and the new one. The old one dates from 1894, the new one from 1896. The latter was that of Wackernagel. The old one is that of Streitberg, which held the field for some forty years. His view, that a stressed vowel was lengthened when in the next syllable a vowel disappeared which led to the loss of the syllable, finds no adherents any longer, I think. Wackernagel was one of the first to reject the theory (1896, 68): "Für die ig. Dehnstufe paßt diese Erklärung nicht, da es in den wenigsten Fällen möglich ist, für die Dehnform eine um eine More reichere Grundform wahrscheinlich zu machen." Perhaps his criticism came too early. I wonder whether his view indicated the transition to a new epoch in Indo-European studies. Few scholars today will be prepared to accept that **ph₁tér* originated from **ph₂téro*. Only Fulk (1986) operates with such monsters, explaining e.g. **b^hréh₂tér* from **b^haraHa-tara-sa*, though this time not in order to explain the lengthened grade. Also, in the case of the *s*-aorist the theory

simply did not work. "Heute ist sie daher fast allgemein aufgegeben" wrote Leumann in 1954, 2. Recent criticism was presented by Szemerényi (1970, 106 f.) and Kortlandt (1975, 84).

3. *Other theories*

Leaving aside the theories which explained the lengthened as expressive or sound-symbolic, there is only Kurylowicz' explanation (1956, 142–165), which operates, as he always did, with morphological analogies. It suffices to refer to Szemerényi's criticism (1970, 107 f.).¹ I think that it is now generally admitted that the lengthened grade must have a phonetic explanation. Szemerényi's own theory I shall discuss after presenting Wackernagel's view.

4. *Wackernagel's explanation*

Wackernagel gave his view in the first volume of his *Altindische Grammatik*, 1896, 66–68. He distinguishes seven categories, which he grouped into three units.

A 1. derivative nouns

B roots in:

2. monosyllabic nouns

3. nouns with primary suffixes

4. the singular of some athematic presents

5. the active of the *s*-aorist

C final syllables

6. the nominative singular type **ph₂tér*

7 the locative type *agná*

As to A (1.), Wackernagel follows Streitberg in assuming that these forms were derived from monosyllabic words, i.e. from 2. It is the type *tāpas-* 'ascetic' : *tāpasá-* 'asceticism', Av. *ahura-* : *āhūīrya-*, **suékuros* : **suēkúrós*. This explanation was worked out by Leumann (1954).

I think that this explanation is not correct. It is improbable that derivations were based on the nominative form (which alone had the long vowel). This crucial point is not discussed by Leumann. His remark (13 f.) that derivations had to be made from **h₂nēr*, and not from **h₂n(e)r-*, is not clear to me. Also it is not clear how the lengthened grade could have been introduced in words (roots) that only had full grade, i.e. the essential point that *e* was replaced by *ē* is unexplained.

Kurylowicz's explanation (1956, 151) through analogy, *i* : *ei* = *e* :

¹ Szemerényi 1970, 108 rejects Schmitt-Brandt's idea of a development **deiws* > **diēws* as "sehr seltsam." The lengthening and the metathesis are phonetically no more strange than that of the Slavic liquidmetathesis. It may be mainly the idea that **diēws* replaces a form **deiws* which was so embarrassing. In my *Origins* I assume that **dein* was the original form.

$x, x = ee > \bar{e}$, is a typical example of his improbable analogies. In this way a long \bar{e} cannot have originated, not even when a phoneme \bar{e} already existed in the language. We referred above to Szemerényi 1970, 107 f. (The terminology 'e-infix' should also be banished, as infixation, and especially this kind of infixation, is extremely improbable for Indo-European.)²

With much hesitation I suggest a quite different explanation. I propose that the long vowel originated, as in the long vowel perfects of Celtic, Latin and Germanic, from reduplication. This must have started with roots beginning with a laryngeal. Schematically a root *HeC-* would have given:

root *HeC-*: deriv. *He-HC-ó-* > *(H)ēCó-*

Note that in this way \bar{o} and \bar{a} could arise as well, depending on the laryngeal ($h_2eh_2Có-$ > *(H)āCó-*).

It is impossible, I think, to demonstrate this explanation from the material: in our oldest material it has been too productive to detect the original forms. (It may be remarked that, as in Indic the type was very productive, and as the Germanic material is very meagre (Darms 1978) and the material in other languages almost non-existent,³ the Avestan material offers the best prospects. As far as I know it has not been collected.)

I see two points that may confirm our hypothesis. One is that forms with (zero grade) *i* or *u* point to *ai*, *au*, not *āi*, *āu* in Avestan. This follows automatically from the forms which I proposed:

root *HiC-*: deriv. *He-HiCó-* > *(H)eiCó-*

(I am not sure what happened to *He-HrC-ó-*. Perhaps it resulted phonetically in *ār-*, which we find in both Indic and Avestan.)

The other point is that our forms explain why the vowel arose "at the wrong side": GAv. *ārəzva-*, not **rāzva-* (Kurylowicz 1956, 150):

root <i>raz-</i> ,	GAv. <i>arəzu-</i> :	deriv. GAv. <i>ārəzva-</i>
<i>*h₃rég-</i>	<i>*h₃rǵu-</i>	<i>*h₃e-h₃rǵu-ó-</i>

From this starting point it is easy to imagine that in one or two languages the formation became productive, while in all others it disap-

² The (PIE) type **deiuos* must be explained from the original paradigm of **diu-* etc.; see 1985, 84.

³ As to the material from other languages retained by Darms (107 ff., 321 ff.), Slavic Russ. *voróna* derives from **uorHnā-*; OCS *vědro* (cf. Lith. *vėdaras*) and Lith. *ožys* (gen. *ožio*) have their long vowel from the Winter-Kortlandt law. The other forms are very doubtful (as Gr. *ōia* 'sheepskin'); the two Hittite examples depend on Eichner's law (*histā-* < **h₂ēstoio-*).

peared completely. The formation may have been rather rare, but its phonetic outcome was 'expressive' and could easily have been spread.

If my explanation is correct, we are not concerned here with a PIE lengthened grade.

We return to Wackernagel's list.

Category 3 clearly derives from 2., so that from 1.-3. only 2. remains. The lengthened grade in monosyllabic words (2.) is attributed to phonetic lengthening of the vowel in monosyllabic forms by Wackernagel.

Numbers 4. and 5. also require a single explanation. Wackernagel thought that here too the length originated in monosyllabic forms.

The length in the last two categories (6., 7.) Wackernagel attributes to "uralte Ersatzdehnung." For the locatives he assumed $-\bar{e}i < -e\bar{i}-i$, $-\bar{e}u < -eu-u$ (with a locative particle $-u$). But for the nominatives he says that in $*ph_2ters$ the vowel was lengthened "gemäß der allgemeinen Neigung für Dehnung eines Vokals vor r -Konsonant." So here two principles are mentioned at the same time: compensatory lengthening, and lengthening before (word-final?) $-r$.

5. Szemerényi's hypothesis

We shall now first look at Szemerényi's theory (1970, 106-111). His theory has always seemed to me most improbable, but I see that Haudry (1979, 28) and Fulk (1986, 62) accept it, so a few remarks should be made. Szemerényi assumes that the long vowel arose from the reduction of a geminate, e.g. $-\bar{e}r < -err$ ($-ers$). This phonetic development is itself well attested, the question is, however, whether we can make it probable that we have geminates in all relevant cases.⁴

First, as to the nominatives, there is no necessity to assume an original $-s$. Then it is not at all evident that the $-s$ would have disappeared (through assimilation or otherwise). There is no evidence for such a development in the prehistory of PIE. The s seems always to have been (phonetically) voiceless in PIE (cf. Skt. *pad-*, *patsú*), except before voiced stop ($*nisdos$ [*nizdos*]); before resonants, which will have been voiced, the s remained voiceless (root $*sreu-$). Word-finally the situation may have been different, but I see no evidence for weakening of final consonants in PIE. - Quite improbable is a development $-os-s > -\bar{o}s$ ($*p\bar{o}s$), but this is not essential to the system.^{5,6}

⁴ At least, this is how I understand it. Szemerényi calls $-ers > -\bar{e}r$ Ersatzdehnung, but says that it went through $-err$, and later gives other forms with geminates. I do not know whether he thinks that the (intermediate) geminate is a necessary condition for the rise of the length.

⁵ Most improbable is the idea that $*uesr$ would have two variants, [$ues\bar{r}$] before consonant and [$uesr$] before vowel which became $uerr > u\bar{e}r$. One reason is that PIE had no

In the same way the locative ending $-\bar{e}i$ would have resulted from (an antevocalic variant) $-eyy$. This again seems most improbable to me. First there is no reason to start from a form $-e\bar{i}-i$ (cf. below section 13). Secondly an antevocalic variant is impossible as PIE did not have words beginning with a vowel. (This point, of course, is not accepted by Szemerényi, and perhaps not generally accepted, but one cannot go on abandoning one's own principles in commenting upon others.) Thirdly, the generalisation of a variant $-eyy$ is most improbable ($-e\bar{i}i$ was much more transparent). Note that $-\bar{e}u$ requires additional hypotheses: $-eui > -ewy > eww$ or (thus Szemerényi) analogy after the i -stems, both rather improbable.

The s -aorist is explained from the 2nd sg. $*b^her-s-s > *b^h\bar{e}r$. That the 3rd sg. would have lost both its $-t$ and its $-s$ is another complication. And if $*b^her-s-m$ would have become $*b^h\bar{e}rm$ (through $*b^herm?$), one wonders how the s could have been restored.

The explanation of $*uikmt-$ 'twenty' from $-ikk-$ < $-idk-$ would imply that there is a lengthened grade of i and u as well. However, there is no evidence for this (see section 8), so that this explanation would rather tell against the hypothesis. (Also OIr. *fiche*, with short i , tells against a PIE \bar{i} .) The explanation of $*mūs$ from $*mus-s$ is both phonetically improbable and in conflict with the facts (see *ibid.*).

Thus I think that Szemerényi's theory consists of a series of improbable assumptions. One gets the idea that in this way anything can be explained.

6. Wackernagel-Kortlandt

Szemerényi's starting points $-er-s > -\bar{e}r$ and $-e\bar{i}-i > -\bar{e}i$ are exactly Wackernagel's solutions. (Szemerényi does not tell us. He may have got the idea independently, or may not have realised that he came to the idea through Wackernagel.) However, he rejects the idea that monosyllabic forms were lengthened (p.110, 2.7.4). Thus, to my mind, he exactly took up the wrong ideas of Wackernagel and rejected the correct one(s).

Wackernagel's theory was taken up by Kortlandt in an appendix to his book on Slavic accentuation (1975, 84 ff.). He accepted the rule that monosyllabic forms were lengthened and accepted the lengthening before $-r$, but rejected the compensatory lengthening, because there is no evidence for $-er-s$ on the one hand, or for $-e\bar{i}-i$ on the other. Instead he proposed lengthening before word-final resonant, i.e. $-er > -\bar{e}r, -ei$

words with initial vowel. Strangely enough, it is taken over by Haudry (1979, 28), who assumes an additional metathesis to $*uers$. The idea is already found in Hirt 1921, 39.

⁶ Schmalstieg 1973 explains the long vowel of the nominative $-\bar{e}r$ from $-er$, which would have become $-\bar{e}$ before consonant; the $-r$ was then restored.

> $-\bar{e}i$. This rule is phonetically probable, and we now have a system of two simple rules which explain the facts without other assumptions.

In the following I shall compare this theory with the evidence. For it is not for historical interest that I discuss Wackernagel's theory, but because I think that the Wackernagel-Kortlandt hypothesis is the best explanation advanced up to now. In the following I shall also consider how the long vowels were phonemicised, and when, that is what the relative chronology of the events was. We shall come across several difficulties, for which at present I have few answers to offer.

7. Long vowels

Before entering into the details, I want to make a short remark on the origin of the oldest long vowels in the PIE languages. It is now generally accepted that many later long vowels derived from a vowel followed by a laryngeal (before consonant). These are post-PIE. This lengthening occurred in all languages except for Hittite when h_2 or h_3 was preserved, and Slavic, where VHC did not result in a long vowel in stressed syllables; see Kortlandt 1988 and Vermeer 1990.

Other long vowels, of course, arose from contraction of two vowels originally separated by a laryngeal (nom. pl. $*eh_2-es > -\bar{a}s$). This development was post-PIE too.

It is mostly assumed that PIE had long vowels resulting from contraction. However, I believe that in these cases, where in new morphological creations two vowels would become adjoined, a laryngeal was inserted, because adjacent vowels were unknown in the language. This is what happens in languages of the PIE type. Thus, the dat. sg. was not $-\bar{o}i$ in PIE, but $-oHei$. This explains why this form resulted in GAv. $-\bar{a}i$, Gr. $-\bar{o}i$, whereas the locative in $-\bar{e}i$ became GAv. $-\bar{a}$, and the nominative has $peith\acute{o}$ in Greek. This gives an easy solution for a problem that is mostly covered up by notations like loc. $-\bar{e}(i)$ against dat. $-\bar{o}i$. (This notation suggests that the $-i$ in $-\bar{e}i$ was lost in PIE. This is in itself a possible solution, if it is added that $-\bar{o}i < -o-ei$ was of later date. The explanation given above, however, follows automatically from the structure of PIE.) (The subjunctives with $-e(H)e-$ are probably post-PIE. In the genitive plural, the o -stems had $-om$ (not $-o(H)om$), the \bar{a} -stems $-h_2-om$, which was mostly replaced by $-eh_2-om$ later. See Kortlandt 1978.)

It may be useful here to remark that augment and reduplication also were always separated from the root by a laryngeal, i.e. (augm.) h_1e-HV- , (red.) $He-HV-$.

Beside the lengthened grade we are discussing here, Rix e.g. (1976, 30) was prepared to assume "selbständige Langvokalphoneme in isolierten Wörtern." I think that this is improbable, and that we have to

look for an explanation with laryngeals. Thus, the word for 'month' **mēns-* was **meh₁ns-*, as is shown by GAv. *mā*, which is to be read /maah/ < **maHas*. We know that Skt. *ātmā* had **HeHt-* because the oblique stem was *tman-* < **HHt-*. Thus, we have to reconstruct two laryngeals for Gr. *ōkús, ōmós* (**HoH-* or the like). This does not mean that there are no difficult cases. For 'nose' see Kortlandt 1985, for 'arm, elbow' idem. It is improbable, however, that we have to explain the last problems by assuming extra phonemes.

Long *ī* and *ū* always resulted from *i, u* + laryngeal; see section 8. (Thus *-īno-*, Rix 1976, 50, was *-iHno-*.) Often this sequence resulted from metathesis of *Hi, Hu*.

Thus, we have the following:

Old IE long vowels originated:

in PIE: *ē, ō* in lengthened grade

later: *VHC > VC* giving *e, ō, ā, ī, ū* (with the exceptions noted above;
in Tocharian *iH, uH* resulted in
yā, wā)

VHV > V̄

Of course, at later dates long vowels originated in the separate languages in various ways.

We shall now discuss the separate categories of long vowels.

MONOSYLLABLES

8. Root nouns

It is clear that the long vowel of root nouns is explained by the rule of monosyllables. Thus we have: **pōd(s), *uōk^w(s), *ǵ^huēr*; Lat. *rēx*, OIr. *rí*; neuter: **kērd*.⁷

8.1 There are problems. One is that a few nouns do not show lengthened grade. Works like Gr. *phléps, kréks* are hardly old. The type Skt. *tvák*, Av. *spaš* is very rare. A different matter is perhaps the word for 'night', for which a nominative **nok^wt-s* is posited (and a gen. **nek^wt-s*). As regards this word, it could be observed that it is not a root noun, as a root **nek^wt-*, ending in two stops, is improbable. However, this does not solve our problem, because both the nominative and the genitive were monosyllabic (**né/ók^wts*). It is improbable that the final consonant cluster prohibited the lengthening, as the lengthened grade of the *s*-aorist requires lengthening in e.g. 2nd, 3rd sg. **dēik-s *dēik-s-t*. It is supposed that this word, with ablaut nom. *-o-*, oblique cases *-e-*, is representative of the static inflection. Therefore the solution must pro-

⁷ Szemerényi 1970, 110 argues that **kērd* would have become **κερ* in Greek. But the chronology may have been different: if the *-d* was dropped before the operation of Osthoff's law, there is no problem.

bably be found in this ablaut. Perhaps the pervasive full grade was generalised. (Note, however, that in the static verbal paradigms the lengthened grade was retained or generalised.)

8.2 Another problem is that the nouns with vocalic *i* or *u* did not get \bar{i} , \bar{u} . Specht (1932) advocated that *i* and *u* were lengthened in monosyllables. He adduced (leaving aside very uncertain material) (in his notation): *uīs* 'strength', *sūs* 'swine', *ġ^hpūs* 'fish', *pūr* 'fire', *drūs* 'tree' and *mūs* 'mouse'. (He mentioned also particles like *nū*, \bar{u} , on which see below.) For the first four words we now know that they had a laryngeal.⁸ As to Gr. *drūs*, a laryngeal is possible, there is no counterevidence, and the form is not necessarily PIE. Only for 'mouse' there seemed to be indications for a short *u*. Skt. *muṣnāti* 'to steal' would be cognate and Skt. *muṣkā-* 'testicle' was supposed to be 'little mouse'. But the connection is uncertain, and there is positive evidence for a laryngeal in the Slavic acute intonation of **mýšb* (SCr. *mīš*, Sln. *mīš*); cf. Lubotsky diss. § 2.12.

Specht explained the short *i* of **duis* as due to an original **duist* (NHG *Zwist*). This is highly improbable. But I would not consider a single adverbial form as decisive. Sanskrit monosyllabic stems such as *íd-* 'refreshment', *ís-* 'strength', *dvís-* 'hate', *níd-* 'blame', *vís-* 'settlement', *kṣud-* 'hunger', *dyut-* 'splendour' he explains by a rule that two following consonants (the second being the nominative ending *-s*) blocked the lengthening. As we saw, this rule is not correct in our hypothesis, as appears from the *s*-aorist.

Two solutions for the short *i* and *u* can be advanced. One is that nominatives with zero grade in the root originated only after the length had arisen. This seems a possibility to me (compare section 19 on chronology).

The other possibility is that *i* that *u* as opposed to *e* and *o* were simply not lengthened. This seems probable, as there is no certain instance of lengthened *i* or *u*, or of an ablaut *i/ī*, *u/ū*. (*nū* may have had a laryngeal – Russ. *nýně* has acute intonation which points to a laryngeal – and the short forms may be shortenings.)

i and *u* are not often found before word-final resonant. I only know of the neuters in *-ur*, traditionally $-\underline{u}r$, and $-\underline{u}l$, e.g. **peh₂ur* 'fire' and **seh₂ul* 'sun'. These sequences are mostly realised as $-\underline{u}r$, so that they give no information. In any case there is no evidence for lengthening. The accusatives in *-im*, *-um* have a short vowel. Note that these forms end in *-m*, which seems to prohibit lengthening. In any case there

⁸ For 'pig' the laryngeal is shown by Toch. B *swāññe* (adj.) < **suH-*; Hilmarsson 1987, 153.

is no evidence for long *i* or *u* before final resonant. This confirms that *i* and *u* were not lengthened.⁹

8.3 Next may be mentioned that in some nominative structures one might expect lengthening. I see the following categories:

a) Schindler brilliantly reconstructed the old nominative of the neuter *s*-stems as **men-s* (1975). This form is monosyllabic (as was the genitive **mn-es-s*). The solution will be that this nominative had been replaced by **men-os* when length was phonemicised. This agrees with the fact that in my chronology the introduction of *-eR-* from the oblique cases with the change of *-eR-* > *-oR-* preceded the rise of the lengthened grade. – On **kreuh₂-s* see sub b).

b) In my *Origins* (1985) I reconstructed for the hysterodynamic nominative type *CéC-ōR*, *CC-ēR* an older nominative *CéC-R*. We saw under a) that these forms date from before the lengthening. (Also they were not monosyllabic, as the *-R* was resonant, which must have been (phonetically) vocalic.)

As to the later *ā*-stems, the form *CéC-h₂* existed in my view down to the separate languages. Here the explanation must be that the laryngeal behaved as a (vocalic) resonant. (I stress that this was a phonetic fact; there was no phonemic opposition between *H* and *H̥*; see my note 2 in 1988 b). This agrees with Schindler's suggestion that the type **kreuh₂-s* was not replaced by **kreuh₂-os* because the laryngeal was vocalic.

These considerations lead me to reject *r/n*-neuters with lengthened grade, type ***iēk^wr*. For here the *-r* was vocalic. Essential is, of course, that the evidence for a long vowel is very limited (cf. 1985, 4 ff.). – For this reason I cannot believe that Eichner's reconstruction of Hitt. *mehur* (1972), and the sound law *ēh₂* > *ē*, which is based on it, are correct.

⁹ I don't think that the absence of lengthening of *i* and *u* is an objection against the theory defended here. If, as suggested in the text, *i* and *u* did not occur in the positions where vowels were lengthened, there is no problem. If they did occur in such positions, it should be pointed out that the absence of lengthened *i* and *u* must be explained by every theory about the origin of the lengthened grade. Therefore the argument cannot be used against a particular theory. (For, as stated above, the lengthened grade must be explained from a phonetic lengthening under certain conditions.)

The Slavic jers perhaps show that *i* and *u* were extra-short vowels (where a phonetic lengthening did not result in a length opposition). "Les voyelles fermées sont en principe plus brèves que les voyelles ouvertes, ..." (Vaillant, *Gr. comp.* I 125). Shevelov (*Prehistory* 436) – who doubts that the jers were 'ultra-short' – gives an interesting parallel: "When *o*, *e* were narrowed (and/or lengthened) [in Ukrainian] ..., the jers still were far from being *o*- and *e*-type vowels and were closer to *u* and *i* respectively. The latter however did not undergo any narrowing and/or lengthening, ..." A well known example is the lengthening of stressed *e* and *a* in Lithuanian, where *i* and *u* were not lengthened.

A last, and perhaps the most important, remark is that the status of *i* and *u* in PIE as vocalized semivowels was quite different from that of *e* and *o*.

8.4 A further point to be mentioned is that there are other monosyllabic forms that do not show length. Thus, many pronominal forms, **h₁me*, **tue*, **so*, **tom*, **toi*; the negation **ne*.

The prohibitive negation must for this reason be reconstructed as **meh₁*.

Several of the forms mentioned here end in a vowel. Perhaps in that case the vowel was not lengthened. (One might consider the analogy of non-monosyllabic case forms in *-om*, *-oi*.) Both Kortlandt and Lubotsky suggest to me that these forms may have been clitics.

8.5 The difficult question of the acc. **diēm* may be mentioned here. We expect **dieum* [*dieum̥*]. I think that it is phonetically improbable that *dieum* developed into **diēm*, with loss of *u* before *m* with compensatory lengthening. Compensatory lengthening is further unknown in (the prehistory of) PIE. Note also that in Greek the sequence *u* + labial led to *i* + labial (*éēipon* < **h₁e-ue-uk^w-om*), not to compensatory lengthening, which is frequent in Greek.

Therefore I think that *u* was lost in **diēm*, after long vowel before labial. It is improbable that *-eum* had this remarkable development; it is much more probable that an exceptional sequence like *-ēum* was responsible for this development.

It has been proposed that *dieum* was monosyllabic (Hirt 1921, 39; again as a sandhi variant). We have objected above to such sandhi variants (section 5 and n.3). Also one might point to **h₁neum* 'nine', where the *-n* is always treated as vocalic. The only alternative which I see is that the long vowel was introduced from the nominative, but this is without parallel. Therefore it seems best to assume that the length arose in a monosyllabic form, in spite of the objections mentioned. (It is, as far as I know, the only phonetic development which can be deduced for PIE. I think that it is very strange that we are not able to surmise more developments dating back to the period before PIE – which is by definition the final stage of the common language.)

The word for 'cow' must have had the paradigm **g^weh₃us*, *-um*, *g^wh₃ous*. It must have got a long vowel analogically, **g^wēh₃us*, and the accusative will have had the same long vowel. Though the laryngeal in this position was lost very early, this development will have been post-PIE, so that **g^wōum* > *g^wōm* arose only in the separate languages. Cf. Kortlandt 1985, 1.6.

9. The *s*-aorist

We already saw that the lengthened grade of the *s*-aorist can be explained from the 2nd and 3rd sg. injunctive forms, which were monosyllabic, type **dēik-s-s*, *-s-t*. Of course, the aorist indicative/injunctive had secondary endings only, i. e. nonsyllabic endings in the 2nd and 3rd

singular. The fact that the lengthened grade is only found in the indicative/injunctive active, while all other forms have full grade, is a strong confirmation of this explanation, as it predicts that the long vowel originated in the injunctive. But the evidence is much more striking.

Kortlandt (1987) has pointed out that in the injunctive the original distribution seems to be largely preserved in Vedic. In the 1st sg. (active) we find in the indicative almost only lengthened grade (10 : 3), but in the injunctive almost only full grade (4 : 1). In the dual and plural lengthened grade is predominant in the indicative (14 : 6), full grade in the injunctive (17 : 6). (The 2nd and 3rd sg. always had a long vowel.)

Kortlandt (1984, 1.3 and 1.4) thinks that the difference between 1st and (2nd and) 3rd sg. can also be seen in Balto-Slavic. Serbo-Croat has:

1st sg. *dāh, līh* < **doHs-*, **leHis-*

3rd sg. *dā, lī* < **dōs-*, **lēis-* < **dōHs-*, **lēHis-*

and Lithuanian

1st sg. fut. *dúosiu* < **doHs-*

3rd *duōs* < **dōs-* < **dōHs-*

The laryngeal disappeared after long vowel (resulting in circumflex intonation, whereas a laryngeal caused acute intonation). The Lithuanian future would continue an *s*-aorist injunctive.

This means that in PIE the injunctive had:

**deiksm*

**dēiks(-s)*

**dēikst*

**deiksmē*

**deikste*

**deiksnt*

In the indicative the length may have been generalised already in PIE. On the other hand, this would mean that this state of affairs would have been preserved down to Vedic times, which seems rather improbable. Therefore one might think that the indicative did not yet have the length in PIE.

The spread of the lengthened grade will be discussed in the next section.

10. *The Narten presents*

In her famous article for the Kuiper volume Johanna Narten (1968) established that some presents show lengthened grade in the singular and full grade in the plural, while the endings had zero grade, wherever possible. The last point is visible only in the 3rd plural, which had *-nti*

(not *-énti*). She termed this inflection proterodynamic, perhaps in honour of Kuiper. As this term refers to a mobile accent, and as now a static inflexion has been recognised in the noun, we should better call it 'static', as the essential thing is that the stress remains on the root. Historically we have a (stressed) full grade root, some forms of which were lengthened.

We should perhaps mention the fact that the evidence we have for the (3rd) plural is very limited. From the roots that have active forms: *takṣ-*, *stu-*, *mṛj-*, *daś-* and *śās-*,¹⁰ the last form is irrelevant as full and lengthened grade cannot be distinguished (as *eH* and *ēH* fell together), and from *daś-* all forms have *dāś(a)-*. *stu-* and *mṛj-* have zero grade in the plural (*stuvānti*, *mṛjānti*). So only *takṣ-* remains, which provides *tákṣati*, *ataṣma*, *ataṣta* in the Rigveda. Avestan has no plural forms of the verb. So these are the only forms that establish the type, but they are the only ones to go by.¹¹

The Wackernagel-Kortlandt hypothesis assumes that here, as in the *s*-aorist, the lengthened grade originated in the 2nd, 3rd sg. inj. One might suggest that the evidence points this way. We have:

RV (a) <i>staut</i> (3×)	but <i>stoṣi</i>
GAv. <i>tāšt</i> (1×)	and YAv. <i>tāšti</i> (2×)

But as there are not other relevant forms we cannot draw certain conclusions from it.

We now have to consider two questions. The first is why the lengthened grade spread only to the singular in the present, whereas in the aorist it spread to the whole indicative. This problem was solved by Insler (1972, 61), who observed that this development conforms to "the general tendencies of the Vedic verb system to characterize active athematic present inflection by ablaut differences, but to mark active aorist inflection by the predominant absence of any alternating vocalism." Thus, in the athematic root aorist the full grade of the singular was generalized (*ákarma*, *ákarta*).¹²

The second problem is why in the static paradigm the lengthened grade was generalized, and in the normal, 'mobile' paradigm the full

¹⁰ The root **ed-* did not have static forms, as the long vowel of Balto-Slavic is due to Winter-Kortlandt's law, as is shown by the acute intonation, Lith. *ėdmi*. A long vowel would not have given an acute.

¹¹ The alternative theory of Insler 1972, that the plural had lengthened grade as well from old, was refuted by Kortlandt 1987. Also Insler's theory cannot explain the distribution of the forms discussed by Kortlandt.

¹² Insler himself rejected this explanation, because in the 3rd pl. *ákran* the zero grade was preserved. Kortlandt 1987 solved this by pointing out that this preservation was due to the ending *-en* < **-ent* (as opposed to **-sur* for **sat-* < **-snt* in the *s*-aorist.)

grade. For in the paradigms with normal ablaut, the 2nd, 3rd sg. inj. were monosyllabic just as well; they were identical in structure with the static forms: $CéC-s, -t > CéC-s, -t$.

We have the following situation:

static	$CeCm$	mobile	$CeCm$
	$CēCs$		$CēCs$
	$CēCt$		$CēCt$
	$CeCme$		$CCme$
	$CeCte$		$CCte$
	$CeCnt$		$CCent$

Apparently the ablaut $CeC-/CC-$ was so widespread and strong, that it resisted transformation (and the introduction of a third ablaut form), whereas there was no such constraint in the static inflexion. (One could think that e.g. *mārjmi mṛjānti* was an instance where the singular got lengthened grade, and the plural retained its old form, but this would imply the existence of a third type, at one time, which is not likely.)

FINAL SYLLABLES

11. *The nominative singular*

The nominative singular (of the hysterodynamic type) had $-ōR, -ēR$. It is generally assumed that the long vowel derives from a short one, $-oR(-), -eR(-)$. I have argued in my *Origins* (1985, 151 ff.) that $-oR(-)$ replaces a zero grade, as mostly the root syllable had stressed full grade e ($CéC-ōR$), and that $-eR > -ēR$ originated from the accusative stem ($CC-ér-m$).¹³ I have adduced reasons why it is improbable that this nominative had an $-s$ (cf. section 5 above) and I will not repeat them here.

If the lengthening was limited to following resonant (r, l, n, i, u), the long vowel before s and t must be analogical. It seems that before m there was no lengthening (cf. $-om$, acc. sg. and neuter, and gen. pl. ending) so that $-ōm$, which is very rare, must be analogical too. Phonetically it is unproblematic that m blocked the lengthening.

The explanation is unproblematic as regards the lengthening.

12. *The third plural perfect ending*

Important evidence is provided by the third plural perfect ending (cf. Beekes 1985, 153). Skt. $-ur$, Av. $-arāš$ continue $-ṛ-s$. There is evidence for $-ēr$ in Latin $-ēre$, Av. $-āire$, and perhaps in Phrygian (*dak*)- $ar-en < *-ēr-ent$ (where $-ar$ could also continue $-ṛ$).¹⁴ (Latin has an added

¹³ Additional evidence is provided by the Gothic type *bandi*, which I discussed in a lecture in Liege in 1987 (Beekes 1990).

¹⁴ Oettinger's explanation (1979, 343) of the Hittite ending as containing the static

-i, as in the 1st and 2nd sg.) Therefore, the ambiguous forms are most probably explained from either $-r$ or $-\bar{e}r$, so that we don't have to assume a third ablaut form ($-er$), which would be most implausible. Thus, Av. $-arā < *-r$, Hitt. $-ir < *-\bar{e}r$. There is no form which must be derived from $-er$.

These forms can be explained simply: $-\bar{e}r$ from $-er$ in the unreduplicated perfects ($*uid-\bar{e}r$) and $-r$ in the reduplicated form ($Cé-CC-r$).

This form is important as $-\bar{e}r$ must derive from $-er$ without $-s$. There is an unclear $-s$ in $-rs$, but it is only found in Indo-Iranian and it is clearly a post PIE addition. (If one assumes that $-ers$ became $-err (> -\bar{e}r)$, one would also expect that $-rs$ became $-rr$ (and lost its $-s$).

13. The locative singular

The locative singular of the proterodynamic (PD) inflexion, i.e. that of most i - and u -stems, had $-\bar{e}i$, $-\bar{e}u$. This third major category of lengthened grade is again explained without any problem from $-ei$, $-eu$, if a vowel before final resonant was lengthened. No auxiliary hypotheses are necessary.

The idea that these forms go back to $-e\bar{i}i$, $-e\bar{u}i$ is most improbable. In the first place, $-e\bar{u}i$ is not likely to undergo any phonetic change. In the second place, if $-e\bar{i}i$ was not maintained (be it phonetically or analogically), we would expect that the i was lost, so that it resulted in $-ei$. But a development to $-e\bar{i}i > -\bar{e}i$ or directly to $-\bar{e}i$ with compensatory lengthening is much less likely. (We noted above that an antevocalic variant $-e\bar{i}i$ is impossible, as PIE did not have words beginning with a vowel.) In the third place such forms would be supported by the fact that the HD inflexion had identical forms, $-er-i$, $-en-i$. In the fourth place these forms would have been identical with the original dative of the PD inflexion, and thus would have been supported by them. For $-ei-ei$, $-eu-ei$ are probably remade for $-\bar{e}i-i$, $-\bar{e}u-i$, with zero grade of the ending. (It is possible, however, that the PD inflexion, being that of the neuters, did not have a dative originally. A dative may have been made only later, when the PD inflexion also got masculine-feminines. That may have been at the post-ablaut stage (stage III-IV), so that $-ei-ei$ was formed directly, with the HD ending, and that these forms did not replace older ones that conformed to the zero-grade ablaut (stage I; see section 19 for the chronology).) In the fifth place, the HD locative had $-eR(i)$, which means that in the locative where there *is* evidence for $-i$, there is no lengthening.

13.1 However, a serious problem is provided by the fact that there

suffix $-eh_1-$ is improbable, as it assumes that this suffix would be found only in the 3rd plural, whereas it can simply be explained as an ablaut form for which there is other evidence.

are endingless locatives in *-eR*, where we find no length. What we see in historical times is that *-eRi* wins from *-eR*, and later *-eRi* is replaced by *-Ri*. The general opinion is that *-eR* is the oldest form, and that *-i* was added later. This would mean that we would expect *-ēR* instead of *-eR*. But it may not have been that simple.

In 1985, 109 ff. I studied the locative types and arrived at the following picture:

(dat. PD	<i>-eu-i</i>	HD	<i>-u-ei</i>)
loc.	<i>-ēu</i>		<i>-eu(-i)</i>

But the situation is more complicated. I cannot undertake to collect and discuss the facts here and must limit myself to a few remarks.¹⁵

Beside the forms in *-eRi* we have both *-eR* and *ēR*. The last form is found only in the PD *i-* and *u-*stems (*-ēi*, *ēu*), and in GAv. *-(m)am* which goes back to *-ēn*.

The endingless forms with short vowel in Vedic are nearly limited to the *n*-stems. But there is also evidence for **-eu* (Skt. *-o*, LAv. *-ō*, *-vō*, *-ava*). Forms of the type Skt. *uṣar-búdh-* are compounds, and the first element must not be a locative (but an obliquus). With *s*-stems there is more: Gr. *χθές*, Skt. *hyáh*; *sadyáh* and *sa-dívaḥ*; Gr. Dor. *αἰές*. The detail of the first forms is in discussion, beside *αἰές* there is *αἰῶ* < **αιος-α*. (Further there is *parút* 'last year', Gr. *πέρουςι*, which does not concern us as it has zero grade.)

The coexistence of *-en* and *-ēn*, *-eu* and *-ēu* is unexplained. I can only make the following suggestion. It has been proposed long ago that these locatives in *-en* consisted of a particle **en*, identical with the adverb/preposition **h₁en* 'in' added directly to the root (the majority of these forms are *r/n*-neuters). The idea originated from Bartholomae, BB 15, 29 and was accepted by Hirt 1927, 48 f. Of course, this would explain why we find the endingless locative only with *n*-stems. This would again shift our problem, this time to the adverb **h₁en* (see below). (Also, it would mean that *-ēn* would be analogical.)

One could consider the possibility that the type *-en* was younger than *-eni*. One might point to two things. First the *ā*-stems had *-eh₂i*. However, that there are no forms in *-eh₂* or *-ēh₂* does not surprise. Then the *o*-stems have *-oi*, and they took their endings from the HD inflexion. But here again, the zero ending was hardly appropriate, and the one with lengthened stem was quite impossible. So they do testify to locatives in *-i* in the HD inflexion, but they cannot be used against the endingless form.

¹⁵ Quite unacceptable are the theories of Shields 1979, based on Schmalstieg's monophthongisation theory, which I cannot accept.

Another possibility that could be considered is that the lengthening did not occur before *n*, only before *r*, *l*, *i*, *u* (we excluded *m* earlier). The price for this is that the long vowel nominative originated only before *r*, *i* and *u*, the last two being rather rare, though probably less so in PIE. Words in *l* are very rare. The *n*-stems thus would have their nominative by analogy. This would not seem impossible to me. In any case the *r*-stems seem very old.

Lastly, Kortlandt suggests that the type *-eR* goes back to an older form *-eRt*; the *-t* was lost, but prohibited the lengthening.

13.2 This brings us finally to the old adverbs, where we find forms in *-eR* without lengthening, some of which look like locatives and have form with and without *-i*.

The latter are: **h₁en(i)*, **per(i)*, **uper(i)*. I cannot undertake to discuss these forms here. Two remarks must suffice. There are several adverbs in *-i* (**h₂mb^hi*, *h₁e/opi*, *h₁e/ob^hi*, *pre/oti*), so the *-i* may have spread from one form to another. The second point is that the form **h₁ni*, e.g. in Skt. *ni-já-* 'innate', Av. *ni-zānta-* etc., points to the presence of the *-i* in this form already at the first ablaut stage (rise of the zero grade): **h₁éni/h₁ni*. In the forms in *-i*, of course, we don't expect lengthening.

Lengthened *e* or *o* do not occur in adverbs, as far as I see, neither with monosyllables (**h₂ed*, *h₂en*, *h₂eu*, *h₁eg^h(s)*, *kóm*), nor with forms in *-R* (**h₂en*, *h₂eu*, *h₁(e)nter*, *spter*, Gr. *ἄνευ*).¹⁶

I have no explanation to offer for the absence of lengthening here. One might again think of clitics.

PROBLEMS

14. *The locative in -oi*

The locative of the *o*-stems in *-oi* is a recent formation (as are all *o*-stem forms). If this is why there was no lengthening, the *o*-stems originated after the rise of the lengthened grade.

15. *The dative ending -ei*

Among the exceptions to the rule is the dative sg. ending *-ei*. In form it is, of course, identical to the loc. sg. *-ēi* < **-ei*. (The problem becomes even more strange if there was a locative in *-ei*.)

A solution would be to assume that the ending dates from after the rise of the lengthening. Given the apparent ablaut *ei/i*, this would require a secondary ablaut. Compare Kortlandt's idea, in Beekes 1985, 197 f.

¹⁶ The only adverb I found is Lat. *ōlim*, Skt. *ārāt*.

16. *Pronominal -oi*

The nominative plural in *-oi* is never lengthened. Mostly it concerns monosyllabic forms. We noted above (section 8.4) that monosyllabic pronouns are never lengthened. Perhaps they did not obey the rule of lengthening before final resonant either.

17. *The vocative*

The vocative in both the HD and the PD inflexion ends in *-eR*. As the vocative is mostly a form of the nominative, this identity is remarkable:

nom. PD	-us	HD	-ōr
voc.	-eu		-or

In my theory (1985) the latter type had *-r* in the nominative at an older stage. So it seems probable that we have to start from *-u* and *-r* respectively, i.e. *-R* in both cases.

In Sanskrit and Greek the vocative has initial stress; *pítar*, *πάτερ*. This is in contradiction with the ablaut: we rather expect **ph₂tér*. One could assume that an unstressed variant at a later stage got initial stress.

Another possibility would be to start from the old form of the nominative, which I assume for both types, i.e. *CéC-R*, for here we have the initial stress.

Kortlandt (apud Beekes 1985, 101) proposed to connect the vocative of the consonant stems with that of the *o*-stems, where we find *-e*. According to my theory, the *o*-stems originated from the consonant stems, so they will have taken the *-e* from there. In the case of nom. sg. **deiu* the vocative would have been **déiu-e*, which is actually the *o*-stem form, Skt. *déva*, Lith. *dievè*. The fact that the unstressed *e* had not become *o* could be explained by assuming that it was an independent particle: **déiu é*.

In a form like **ph₂t-r* the *-r* might have been lost, after which **ph₂te* was reshaped into **ph₂ter*. I tried to demonstrate (1985, 106f.) that the Indo-Iranian ending *-e* < **-ai* of the *ā*-stems contains an *-i* which developed in *CeC-h₂*. (With the *ā*-stems in Balto-Slavic the laryngeal would have been maintained *before* the *-e*; or the *-e* was changed into *-a*, taking over the colour of the full grade *ā*; 1985, 102.)

The particle *e* could be identical with the *e*, *ē* in Lat. *edepol*, *ēcastor* (Ernout-Meillet s.v.v.; cf. Pokorny 281 s.v. 2. *ē*) and be an ablaut form of the vocative particle *ō*.

It is possible, then, that the vocative *C(e)C-eR* is of late date, from after the rise of the lengthened grade.

One might consider the possibility that in original

nom.	<i>deiu</i>	later	<i>diēu</i>
voc.	<i>deiu</i>		<i>deiū</i>
acc.	<i>dieum</i>		<i>dieum</i>

the vocative was only reshaped into *deiū*, when no length occurred.

18. *The 'proterodynamic perfect'*

In 1973 I posited a 'proterodynamic perfect' with an ablaut \bar{o}/e . I adduced evidence from about twelve forms or categories. At present I am rather sceptical about most of them. Only Gr. μέμηλε, ἄωρτο, γέγωνε and the OIr. \bar{o} -perfects could remain.¹⁷

But this is a rather heterogeneous lot, and incidental explanations seem more probable than the assumption of a category. μέμηλε has \bar{e} as distinct from the \bar{o} of the other forms. For ἄωρτο I now accept an original imperfect ἄωρτο (1973, 92 f.), as was recently argued by Eva Tichy (1983, 364 ff.); this was also Wackernagel's view.

The idea of an ablaut \bar{o}/e beside o/\emptyset in the normal perfect was based on the Narten presents. But these derive from forms with stressed e throughout the paradigm. In the perfect we would need stressed o and e , and – in the present theory – monosyllabic forms in the singular. But there is no evidence for other endings then $*-h_2e$, $-th_2e$, $-e$, so lengthened grade is not to be expected.

A different matter are the OIr. \bar{o} -perfects (on which see Kortlandt 1986, 254).

The Germanic and Latin long vowel perfects, which have \bar{e} , may derive from reduplication of roots beginning with a laryngeal (Kortlandt, priv. comm.).

19. *The chronology*

From the foregoing something can be said about the relative chronology. If my idea is correct that the nominative $C\acute{e}C-R$ was replaced by $C\acute{e}C-oR$ which became $C\acute{e}C-\bar{o}R$, it is clear that the lengthening occurred after the zero grade ablaut and after the qualitative ablaut. Combined with the chronology which I gave 1985, 157, we get:

	possible in stressed – unstressed syllable	
I rise of the zero grade (quantit. ablaut) (unstressed $e > \varphi$)	\acute{e}, \acute{o}	– \emptyset
II rise of the o -grade (qualit. ablaut) (unstressed, analogical $e > o$)	\acute{e}, \acute{o}	– \emptyset, o

¹⁷ μήδομαι probably had $*meh_1d-$, εἶωθα goes back to $*suoh_1d-$; Beekes 1988. $\bar{e}s-$ 'to sit' may have reduplication, as does ἄνωγα < $*h_1e-h_1og-$, Rix 1976, 204.

III rise of the lengthened grade ($e, o < \bar{e}, \bar{o}$)	$\acute{e}, \acute{o}, \acute{e}, \acute{o}$	$-\emptyset, o, \bar{o}$
IV post-ablaut period	$\acute{e}, \acute{o}, \acute{e}, \acute{o}, \acute{R}$	$-\emptyset, o, \bar{o}, e, \bar{e}$

It is not quite certain that III and IV must not be inverted, i.e. that beside a stressed \acute{e} an unstressed e could occur which was lengthened ($\acute{e}-\bar{e}$); but I see no positive evidence for it.

The lengthened vowels had become phonemes in PIE. Cf. nom. sg. $-os$: nom. sg. $-\bar{o}s$; voc. sg. $-er$: nom. sg. $-\bar{e}r$; dat. sg. $-ei$: loc. sg. $-\bar{e}i$. We must ask how this happened.

If the rules given are correct, we have a phoneme \bar{o} when e.g. $*népōt(s)$ got its long vowel, for here it is not before final resonant.

Another possibility is that a final resonant disappeared, e.g. $-\bar{e}i > -\bar{e}$ or $-\bar{o}n > -\bar{o}$. It is quite possible that this was indeed the crucial development, but there is no evidence that it is necessary to put this development in PIE.

A third possibility is that from a monosyllabic form a longer form was derived, with retention of the length of the vowel: $C\bar{e}C$ giving $C\bar{e}C-X$. This must have happened in PIE, given a form like $*suēkurós$.

Another possibility is that a new form was created, such as the locative in $-eR$, the vocative in $-eR$, the dative in $-ei$ where lengthening did not (no longer) occur, through which an opposition $-eR$: $-\bar{e}R$ arose.

Of course, if in one category an opposition arose, the long vowels were phonemicized.

It is quite possible that the lengthening in monosyllables and that before final resonant date from different periods.

20. Conclusion

In conclusion, I think that the Wackernagel-Kortlandt hypothesis provides the best explanation for the origin of the lengthened grade. The forms with lengthened grade are easily derived from it. But it cannot be denied that there are several forms where we would expect long vowels where they are not found. It is, of course, possible that there were limitations to the operation of the rules, but I have not been able to find them, unless the lengthening before n , and before m , i.e. before nasals, was not phonetic.

It need not be stressed that if we have found the explanation of the lengthened grade, this is of great importance for Indo-European studies. "In der Aufhellung der Dehnstufe erblicke ich einen gewaltigen Fortschritt in der Entwicklung unserer Anschauungen vom indogermanischen Ablaut," and of the history of the Indo-European languages generally. This is what I would like to say about the theory proposed by the scholar we honour these days. However, the quotation is from Hirt (1921, 46) and refers to Streitberg's theory ... This is to teach us modesty.

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University of Leiden
 Department of Comparative Linguistics
 P.O. Box 9515
 NL-2300 RA Leiden

Robert S. P. Beekes