A 'lengthy' problem

Towards a phonetic explanation of
the Proto-Indo-European long vowels

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Abstract

The Proto-Indo-European long vowels *$\bar{e}$ and *$\bar{o}$ occupy a remarkable position within the phonemic system. Although these vowels are phonemic, they are limited to very specific morphological categories. This distribution has been explained by several theories, of which there are three which propose a phonetic origin for these long vowels and that nowadays find supported by various scholars, viz. Wackernagel's lengthening in monosyllables, Szemerényi's Law, and Kortlandt's lengthening before word-final resonant. These three theories have in common that they derive the long vowels from their short counterparts *e and *o, whereas they differ from each other in the phonological environments under which the short vowels would have become long. It is, however, still controversial which theory is the most likely to be correct, since all theories have counterexamples. This thesis examines the question which of the three phonetic theories on the origin of the Proto-Indo-European lengthened grade can be proven correct or incorrect.

This question will be addressed by discussing the evidence and counterevidence of the nominal system and comparing the counterexamples to the three theories. By attempting to provide alternative explanations for the counterevidence, as well as discussing the strengths and weaknesses of existing alternative explanations, it is possible to examine which theory or theories can be kept up and which one(s) must be rejected.

It will be concluded, that monosyllabic lengthening probably works for the nominal system, that Kortlandt's lengthening before word-final resonant can only work when it is reformulated (i.e. leaving out the nasals as a conditional factor), and that Szemerényi's Law is best to be given up.

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Contents

Abbreviations and symbols

LANGUAGES

Akk.	Akkadian		OLat.	Old Latin
Alb.	Albanian		OLith.	Old Lithuanian
Arc.	Arcadian		ON	Old Norse
Arm.	Armenian		OP	Old Persian
Av.	Avestan		OPol.	Old Polish
CLuw.	Cuneiform Luwian		OPr.	Old Prussian
Cret.	Cretan		OR	Old Runic
Crim. Go.	Crimean Gothic		OS	Old Saxon
CS	Church Slavic		Osc.	Oscan
Cypr.	Cyprian		OSw.	Old Swedish
Delph.	Delphian		OW	Old Welsh
Dor.	Doric		PAlb.	Proto-Albanian
Du.	Dutch		PAnat.	Proto-Anatolian
Go.	Gothic		PCl.	Proto-Celtic
Gr.	Greek		PGm.	Proto-Germanic
Hebr.	Hebrew		PGr.	Proto-Greek
Hitt.	Hittite		Phr.	Phrygian
HLuw.	Hieroglyphic Luwian		PIE	Proto-Indo-European
Ion.	Ionic		PIH	Proto-Indo-Hittite
Khot.	Khotanese		PIIr.	Proto-Indo-Iranian
Lat.	Latin		PIr.	Proto-Iranian
Latv.	Latvian		PS	Proto-Semitic
Lesb.	Lesbian		PSl.	Proto-Slavic
Lith.	Lithuanian		QIE	Quasi-Proto-Indo-European
Luw.	Luwian		Ru.	Russian
Lyc.	Lycian		RuCS	Russian Church Slavic
MDu.	Middle Dutch		SArab.	South Arabic
MHG	Middle High German		SCr.	Serbo-Croatian
MIr.	Middle Irish		SerbCS	Serbian Church Slavic
MW	Middle Welsh		Skt.	Sanskrit
Myc.	Mycenaean		SPic.	South-Picene
OAv.	Old Avestan		ToA	Tocharian A
OCS	Old Church Slavic		ToB	Tocharian B
OE	Old English		Umb.	Umbrian
OFri.	Old Frisian		Ved.	Vedic
OHG	Old High German		YAv.	Young Avestan
OIr.	Old Irish		W	Welsh

GRAMMATICAL ABBREVIATIONS

abl.	ablative		m.	masculine
acc.	Accusative		mid.	middle
adj.	adjective		n.	neuter
c.	common (gender)		nom.	nominative
comp.	comparative		obl.	oblique
dat.	dative		PD	proterodynamic
du.	dual		pf.	perfect
f.	feminine		pl.	plural
FG	full grade		PN	personal name
gen.	genitive		ppp.	passive past participle
HD	hysterodynamic		prt.	preterite
ins.	instrumental		ptc.	participle
LG	lengthened grade		sg.	singular
loc.	locative		voc.	vocative

SYMBOLS

*X	diachronically reconstructed form		>>	analogical development
X*	synchronically reconstructed form		C	consonant
**	impossible form		V	vowel
#	beginning/end of the word (m.m.)		V̄	long vowel
>	developed into		R	resonant {r, l, m, n, i, u}
<	developed from		N	nasal

AUTHORS AND WORKS

Aesch.	Aeschylus		Hom.	Homer
Ar.	Aristophanes		KS	Kashyap-Saṁhitā
Arist.	Aristoteles		Ov.	Ovid
AV	Atharvaveda-Saṁhitā		Pl.	Plautus
Br.	Brāhmaṇa		RV	Rigveda
Eur.	Euripides		ŚB	Śatapatha Brāhmaṇa
H.	Hesychius		Soph.	Sophocles
Hdt.	Herodotus		TS	Taittirīya-Saṁhitā
Hes.	Hesiod		Verg.	Vergil

OTHER ABBREVIATIONS

h.l.	hapax legomenon		SL	Szemerényi's Law
m.m.	mutatis mutandis		v.l.	vario lectio

1 Introduction

1.1 The lengthened grade within Proto-Indo-European

The long vowels *$\bar{e}$ and *$\bar{o}$ which can be reconstructed for Proto-Indo-European have a special status within PIE morphology. The vowels are phonemic (cf. near minimal pairs such as nom.sg. *$ph_2t\acute{e}r$ and voc.sg. *ph_2ter 'father'), but limited to very specific morphological categories. These categories include the following:

A Roots:
   1. The nom.sg. of root nouns: *$u\bar{o}k^{w}s$ 'voice', *$\acute{k}\acute{e}r(d)$ 'heart';[1]
   2. The nom.sg. of some proterodynamic nouns: *$g^{w}\bar{e}n(h_2)$ 'woman';
   3. The (indicative active of the) s-aorist: Ved. 3sg. *ávāṭ* 'carried' < *$u\bar{e}\acute{g}^{h}$-s-t;
   4. The 'static' presents: Ved. *tā́ṣṭi* 'carpenters' < *$t\bar{e}t\acute{k}$-, *-staut* 'praised' < *$st\bar{e}ut$-, *kṣṇáuti* 'sharpens' < *$ksn\bar{e}u$-;
   5. Some ind.act. forms of the root aorist: *$g^{w}\bar{e}m$- (ToB *śem*, Lat. *vēnit*, Go. *qemun* 'came'), *$l\bar{e}\acute{g}$- (ToB *lyāka* 'saw', Lat. *lēgit*, Alb. *mb-lodhi* 'collect');

B Final syllables:
   6. The nom.sg. of the hysterodynamic inflection: *$ph_2t\acute{e}r$ 'father', *$h_2\acute{e}\acute{k}m\bar{o}n$ 'stone', *$n\acute{e}p\bar{o}t(s)$ 'grandson', *$h_2\acute{e}us\bar{o}s$ 'dawn';
   7. The neuter collectives: *$ud\acute{o}r$ 'water(s)', *$men\bar{o}s$ 'thoughts';
   8. The acc.sg. in *-$\bar{e}m$: *$di\acute{e}m$ 'god', *$g^{w}h_3\acute{e}m$ 'cow';
   9. The loc.sg. of the proterodynamic inflection: *-$\bar{e}i$, *-$\bar{e}u$;
   10. The ending 3pl.pf. *-$\bar{e}r$ (Lat. *-ēre*, Av. mid. *åŋhāirē* 'they sit' < *$\bar{a}s$-$\bar{a}r$-ai);

C   11. Nominal derivatives, i.e. *vr̥ddhi*-derivatives: *$su\acute{e}\acute{k}ur\acute{o}$- (Skt. *śvā́śurá*- adj. 'belonging to the father-in-law', MDu. *swager*, MHG *swāger* m. 'brother-in-law'), *$h_2\bar{o}ui\acute{o}m$ n. 'egg' (YAv. *aēm*, Gr. ᾠόν, Lat. *ōvum*, OW *ui*, Crim. Go. *ada* pl., ON *egg*, OHG *ei*).

This distribution of the PIE lengthened grade (LG) vowels requires an explanation. The problem has been the subject of debate for over a hundred years and can meanwhile be considered a 'lengthy' problem. What follows below is a short overview of some of the proposed theories.

1.2 Previous theories

The first theory which attempted to explain the origin of the LG is by Streitberg (1894). He proposed that stressed short vowels underwent compensatory lengthening when in the next syllable a vowel was lost, e.g. *$ph_2t\acute{e}r$ < *$ph_2t\acute{e}ro$. Even though Wackernagel fiercely criticised this proposal only two years later (1896: 68), it was still the predominant view for some decades.[2] However, nowadays the theory is rejected by most scholars (cf. Beekes 1990: 33f.).

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[1] The reconstructions for which no attestation is given here will be discussed further on in this thesis.
[2] Cf. also Kortlandt's criticism (1975: 84).

Kuryłowicz's analogical explanation of *i, ei : e, x*, in which *x = ee > ē* is refuted by Szemerényi (1970: 107f.) and Beekes (1990: 34f.) and finds no longer general acceptance either.

Rasmussen proposes that the original nom.sg. ended in *-z*, after which *VC(C)-z > *V:C(C)z > *V:C(C)s*, followed by *V:CCs > *VCCs* (Rasmussen 1978: 74-9; 1989: 139-42, 251-3). It suffices to refer to Kümmel's criticism (2015: 282).

Schmalstieg 1973 explains the nom.sg. *-ēr* from *-er*, in which *-er* would have become *-ē* before a consonant with subsequent restoration of the stem consonant *-r*. While such a development is not inconceivable, it is difficult to find evidence which independently supports the idea that PIE had anteconsonantal variants with lengthening of the vowel.

1.3 Current theories

In present-day comparative linguistics it is generally accepted that the LG has a phonetic explanation (cf. already Leumann 1954, as cited in Beekes 1990: 34). Currently, three approaches are predominant in the field and find support by various scholars: Wackernagel's lengthening in monosyllables, Szemerényi's Law (SL), and Kortlandt's lengthening before word-final resonant. It is, however, still controversial which theory is the most likely to be correct.

1.3.1 Wackernagel's monosyllabic lengthening

Jacob Wackernagel explained the LG in the monosyllabic nom.sg. of root nouns (see A1 above) by phonetic lengthening of short vowels in monosyllables. He thought that also in the *s*-aorist and present forms (A3-4) the length originated in a monosyllabic form. Kortlandt (2010: 132; 2015) suggests that this explanation also applies to some LG forms in the root aorist (A5).

1.3.2 Szemerényi's Law

In 1880, August Schleicher (apud Delbrück 1880: 49-50) came up with the idea that lengthening in nominal forms originated in formations which had lost a final *-s* in the nominative and *-i* in the locative when preceded by a sonorant. Wackernagel (ibid.) accepted this, as well as Szemerényi (1970: 106-11; 1999: 116), who assumed that the long vowel arose from the reduction of a geminate, which originated by the loss of final *-s*, i.e. *-ēr < *-err < *-ers*. The geminates are assumed as an intermediate stage in order to explain why also the *s*-stems have a LG in the suffix. Then, the ending *-ē/ōs* would go back to *-e/os-s*. However, it is, unclear whether Szemerényi came to this conclusion independently or not (cf. Beekes 1990: 37), since his solutions *-er-s > *-ēr* and *-ei̯-i > *-ēi* are similar to Wackernagel's. Anyhow, the proposed developments are nowadays usually referred to as Szemerényi's Law.

In addition to these developments, Nussbaum (1986: 129f.) suggested that *-or-h_2* also resulted in a suffix with LG (> *-ōr*) (§4.3.3.5). Jasanoff 1989 elaborated this idea by reconstructing a form *g^wēn(h_2)* (see A2 above). In 1997, he explained the 3pl.pf. *-ēr* from *-ers* by SL (Jasanoff 1997: 127).

1.3.3 Kortlandt's lengthening before word-final resonant

The length in the HD nom.sg. and PD loc.sg. (B6 and B9) Wackernagel explained by two

different principles, which presumably contradict each other (cf. Beekes 1990: 36; Kortlandt 1975: 85). On the one hand, he assumed "uralte Ersatzdehnung", which is Szemerényi's explanation. On the other hand, however, he explains the lengthening in the nominative "gemäss der allgemeinen Neigung für Dehnung eines Vokals vor *r*-Konsonant." This would imply that only asigmatic nominatives in *-r* were lengthened in the suffix, whereas other instances with LG in the suffix are analogical.

Kortlandt (1975: 84ff.) accepts the lengthening before *-r* but outrightly rejects the compensatory lengthening. Instead, he extends the former idea by suggesting that the vowel was phonetically lengthened before word-final resonants. Together with Wackernagel's monosyllabic lengthening, Kortlandt's lengthening before word-final resonant forms the basis of the Leiden School model for the origin of the PIE lengthened grade (cf. Kümmel 2015: 283f.).[3]

1.4 Research question

From the sections above it can be observed that the phonetic theories on the lengthened grade all have in common that the PIE long vowels *$\bar{e}$* and *$\bar{o}$* are derived from their short counterparts *e* and *o*, whereas they differ from each other in the phonological environments under which the short vowels would have become long. Regarding the three explanations which are nowadays supported, the problem can be formulated into the following research question:

<u>Which of the three theories on the origin of the PIE LG can be proven correct or incorrect?</u>

1.5 Methodology

In order to address this question, the methodological approach should be clarified first. Two remarks can be made:

First, the theories are partly overlapping: on the one hand, SL and Kortlandt's lengthening before word-final resonant are contradicting each other (e.g. *$ph_2t\acute{\bar{e}}r$* either from older *$ph_2t\acute{e}rs$* or *$ph_2t\acute{e}r$*). This means that *a priori* either SL or lengthening before word-final resonants cannot be correct. On the other hand, some of the evidence in favour of monosyllabic lengthening is ambiguous: it is possible that a monosyllabic form ends in a resonant or may have been affected by SL, in which case it is impossible to determine which development caused the long vowel.

Second, and not less important, is that the three theories all have counterexamples. Therefore, in order to examine the correctness of one of the theories, the strength of a theory mostly lies in its falsification rather than its confirmation. In other words, not the supporting examples but the counterexamples are decisive. Hence, one should be mostly concerned with proposing alternative explanations for the counterevidence in order to prove whether one of the

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[3] Strictly speaking, the term 'resonant' is not correctly used here, since resonants only refer to PIE *r*, *l*, *m*, and *n*, whereas Kortlandt (ibid.) also includes word-final *i* (and implicitly *u*; he only gives Ved. *sákhā* < *-$\bar{o}i$* as an example). Therefore, the term 'sonorant' would better cover the respective phonemes, but for the sake of convention I will continue using the term 'resonant' in this thesis.

theories is correct or not.

This is also the main approach of this study: I will not only give the evidence which supports the three theories, but will also compare the theories with the counterevidence.

However, due to spatial constraints, not every morphological category can be taken into account, unfortunately. Only the formations within the nominal system will be treated in this study. From the nominal forms, also the *vṛddhi*-derivatives (see C11 above) are disregarded from the discussion. The reason for this is understandable: as has been remarked before, the *vṛddhi*-type has become too productive to discover a phonetic distribution (cf. Beekes 1990: 35; 2011: 181f.).

Leaving out the verbal system and the nominal derivatives necessarily means that the correctness of one of the theories cannot be demonstrated categorically, since counterevidence to a particular theory may be present in the morphological categories which are not discussed. Therefore, every conclusion regarding the correctness is preliminary in this study. However, drawing conclusions on which explanation may be incorrect is certainly possible within the methodological framework of this study: if a phonetic theory ultimately collapses on the basis of the items in the nominal system, it cannot work for the verbal system and other morphological categories either.

1.6 Structure

This thesis is organized as follows: chapter 2 treats all the evidence of nominal forms with a LG. Wherever relevant, I will make remarks on the etymology of particular forms and theories on the prehistory of inflectional types. Chapter 3 largely consists of a list of the evidence where a long vowel is absent, but expected in the framework of one the three phonetic explanations. In chapter 4 the counterevidence is discussed by evaluating the strengths and weaknesses of several theories. These theories provide alternative explanations for the counterexamples, aiming to uphold either monosyllabic lengthening, or Szemerényi's Law, or lengthening before word-final resonants, as was made apparent above.

2 Evidence

2.1 Introduction

In the following chapter an overview of the nominal evidence with a LG is given. The chapter consists of two parts. In the first paragraphs (§2.1 - §2.6), several kinds of LG nominative formations will be discussed, i.e. nominative singulars of root nouns, HD and PD inflection, neuter collectives and static neuters. This part is the most abundant one regarding the number of types. The last paragraph (§2.7) will be devoted to LG formations of the locative singular.

2.2 Nominative singular of root nouns

Root nouns have a nominative singular that is recognizable for its monosyllabic shape. Following Kümmel (2015: 280), the material can be categorized into three groups: forms with and forms without *-s*, and unclear forms.[4]

2.2.1 Forms with *-s*

*$h_2\acute{e}ps$ 'water; river' is only directly attested as YAv. *āfš* f., but Ved. nom.pl. *ā́pas* may also have taken over the vocalism from the nominative.[5] Osc. acc.sg. *aapam*, and *aapas* (gen.sg. or acc.pl.) may also belong here, if the etymology is correct, since their meaning is uncertain.

*$p\acute{o}ds$ 'foot' survives in three branches as a nominative, i.e. Ved. *-pā́t* m., Gr. πῶς, Go. *fotus*, OE *fōt*, OHG *fuoz*. Lat. *pēs* may continue *-ē-, but can also be explained by Lachmann's Law (< *ped-s*). A LG is also seen in Umb. dat.pl. *-pursus* < *$p\bar{o}d$-.[6] For a detailed discussion of the paradigm, cf. Kloekhorst (2014: 152-3, 161), who reconstructs *e*-vocalism (*$p\bar{e}ds$) for the original nominative.

*$u\acute{o}k^w s$ 'voice' (Ved. *vā́k*, Av. *vāxš*, Lat. *vōx* f.). Gr. ὄψ with a full grade is a late form, and can, just as ToA *wak* and ToB *wek*, be explained as analogical from the oblique forms (cf. Hom.Gr. acc.sg. ὄπα, gen.sg. ὀπός).

*$di\acute{e}us$ 'sky, day' is only attested with a synchronic LG as Ved. *dyáus*,[7] whereas Gr. Ζεύς can be explained by Osthoff's Law. The long vowel in the accusative *$di\acute{e}m$ (Ved. *dyā́m*, Gr. Ζῆν) is either explained by Szemerenyi's Law (*$di\acute{e}um$ > *$di\acute{e}mm$ > *$di\acute{e}m$, cf. Schindler 1973), of which the latter development is paralleled in Lat. *Iuppiter* > *Iūpiter*, or by Stang's Law (*$di\acute{e}um$ > *$di\acute{e}m$, cf. Pronk 2016 for a critical evaluation), but Beekes (1985: 83-5) argues that the long vowel in the accusative was analogically taken over from the nomina-

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[4] Kümmel's distinction between *distinctive* lengthened grade (i.e. LG marking in the nom.sg. vs. other ablaut grades in oblique forms) and *possible* LG ("Narten", with LG throughout the paradigm) is only made on the basis of the root *$h_3r\acute{e}\acute{g}$- 'ruler' (Ved. *rā́ṭ*, *rā́j-*, Lat. *rēx*, *rēgis*, OIr. *rí*), as reconstructed by Gonda (1956) to the Greek verb ὀρέγω 'to stretch' Following Scharfe 1985, the forms are better connected to the *n*-stem Gr. ἀρηγών 'helper' (= Ved. *rā́jan-* 'king', cf. §2.3.6.2), which requires a root *$h_2reh_1\acute{g}$-. In that case, this distinction becomes redundant.

[5] The vocalism of the nom.pl. is secondary anyway, since *o*-grade or LG (both yielding *ā*) are unexpected in IIr.

[6] Reflected in *dupursus* 'biped' < *du-$p\bar{o}d$-, *peturpursus* 'quadruped' < *$k^w etur$-$p\bar{o}d$-.

[7] The vocalism of nom.du. *dyā́vā* and nom.pl. *dyā́vas* is likely to have been taken over from the nom.sg.

tive by lengthening before word-final resonants, ultimately reflecting a HD *u*-stem. He assumes the following development:

	(1)		(2)		(3)		(4)
nom.sg.	*dei-u*	>>	*di-ēu*	>>	*di-ēu(s)*		*di-ēus*
acc.sg.	*di-eu-m*		*di-eu-m*	>>	*di-ēu-m*	>	*di-ēm*
gen.sg.	*di-u-ós*		*di-u-ós*		*di-u-ós*		*di-u-ós*

Beekes' scenario has the advantage that it can explain how the formation *deiuo-* (e.g. Ved. *devá-*, Lat. *deus*, Lith. *diẽvas* 'god') can easily have been derived from this root, i.e. by a thematization of the original nominative *dei-u*.

Evidence which may be old, but is not attested outside Greek includes Hom.Gr. κύκλωψ 'Cyclops' < *pḱu-klōp-s* 'cattle-thief' (following Thieme's etymology, cf. Thieme 1951: 177-78), and Gr. πρώξ f. 'dewdrop' < *prōḱ-s*.

2.2.2 Forms without *-s*
Asigmatic nominatives of root nouns can occur with neuter or non-neuter gender. Since neuters never have a marker *-s*, these will be given separately.

2.2.2.1 Non-neuters
dʰuór 'door' (Alb. *derë* < PAlb. *duōrā*, pl. *dyer* < *duōres* (cf. Kümmel 2015: 290[16])) shows a form with lengthened grade only in Albanian, as the other IE branches are built upon *dʰuor-* or *dʰur-* and are often dual or plural formations;

-gʷʰén 'slayer' (acc.sg. *-gʷʰen-m*, gen.sg. *-gʷʰn-é/ós*):

	Ved.	Av.
nom.sg.	-hā́	-ǰā
acc.sg.	-háṇam	-ǰanəm
voc.sg.	-han	
gen.sg.	-ghnás	(-ǰanō)

Although only attested in Indo-Iranian as second member compound forms, the ablaut reveals its relative antiquity. For attested forms, cf. for instance Ved. *vṛtra-hán-* m. 'Vṛtra-slayer' (nom.sg. *-hā́*, acc.sg. *-háṇam*, voc.sg. *-han*, gen.sg. *-ghnás*), OAv. *vərəθram.ǰā* 'winning, winner' nom.sg., YAv. *vərəθrǎ.ǰā* nom.sg., *vərəθrā.ǰanəm* acc.sg., *vərəθrāǰanō* gen.sg. 'winning';[8]

h₂nḗr 'man' (OAv. *nā*, Hom.Gr. ἀνήρ, Osc. **niir**, and SPic. **nír** m.);

h₂stḗr 'star' (Hom.Gr. ἀστήρ m., Lat. *stēlla* f.). Within PIE the formation may originate as a *ter*-stem from the root *h₂h₁s-* 'burn', i.e. *h₂h₁s-tér* (cf. Kloekhorst 2013: 117; Mallory/Adams 2006: 129; Pinault 2007: 273), or the word was borrowed from PS *ʕaṭṭar-* '(star) goddess, Venus' (cf. Akk. *ištar*, Hebr. *ʕaštōreṯ*, SArab. *ʕṭtr*) (Kroonen 2013: 478), after which it was fit into the PIE inflectional system;

ḱuón 'dog' (Ved. *śvā́*, YAv. *spā*, Hom.Gr. κύων, Lith. *šuõ*, ToB *ku*, OIr. *cú* m.).

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[8] Other compounded adjective forms include Ved. *aruśa-hā́* nom.sg. 'killer of the black', *amīva-hā́* nom.sg. 'destroying pain', *nṛ-hā́* nom.sg., *nṛ-ghn-é* dat.sg. 'killing men'.

2.2.2.2 Neuters

*$d\acute{o}m$ n. 'house' (Hom.Gr. δῶ, Arm. *tun*, cf. also Gr. δῶμα n. 'house, temple');

*$\acute{k}\acute{e}r(d)$ n. 'heart' **(**Hom.Gr. κῆρ (obl. καρδ-), Hitt. *ker* (*ke-er*) (obl. *kard(i)-*), OPr. *seyr*). A long vowel is also seen in the derivative Ved. *$h\acute{a}rdi$*;

*$m\bar{e}ms$ n. 'meat': Most branches reflect a thematicized neuter *$m\bar{e}ms$-o-* (Ved. *$m\bar{a}\d{m}s\acute{a}m$* n. 'meat', YAv. *$m\mathring{a}\eta h\partial m$* 'meat, board', Go. *mimz*, *mims*, OCS *$m\d{e}so$* 'meat') or collective *$m\bar{e}ms$-h_2-* (Lat. *mēnsa* 'table', Lith. *mėsà* 'meat'), but Ved. *$m\acute{a}s$* n. 'id.' reflects athematic *$m\bar{e}ms$* (cf. also the compounds *$m\bar{a}\d{m}s$-pacanyā* adj.gen.sg.f. 'used for cooking meat' (RV 1.162.13), but thematic *$m\bar{a}\d{m}sa$-bhikṣām* acc.sg.f. 'desire for meat' (RV 1.162.12)).[9] A derived formation *$m\bar{e}ms$-ro-* is seen in Gr. μηρός 'shank', Lat. *membrum* 'limb, member' with Osthoff's Law, but alternatively the forms continue *mems-ro-* with a short vowel.

If one assumes that in PIE only SL operated – and not monosyllabic lengthening or lengthening before word-final resonants – the form *$d\acute{o}m$ must have analogical LG, since neuters had no nom.sg. in *-*s*. Then, the question remains what the model and motivation for introducing the LG was, since athematic neuters have zero marking and a form *$d\acute{o}m$ would have worked without problems (cf. Gr. ἕν n. < *$s\acute{e}m$: εἷς m./f. < *$s\acute{e}m$-*s*, §4.3.1.1.2).

The *-*s* in *$m\bar{e}ms$ must then also have been a later restoration, since it would have been lost by SL.

2.2.3 Unclear forms

*$Hr\bar{o}s$(-s) (Lat. *rōs*, gen. *rōris* m. 'dew'), cf. also Ved. *rása-* m. 'juice (of plants), liquid, essence', Lith. *rasà* f., Ru. *rosá* f. 'dew'. Since the root ends in *-*s*, the presence of a case marker *-*s* cannot be determined;

*$p\bar{o}lH$- in Gr. πῶλος m./f. 'foal' < *$p\bar{o}lH$-o-, W *ebawl* < *$h_1e\acute{k}uo$-$p\bar{o}lH$-o-, Alb. *pelë* 'mare' < *$p\bar{o}lH$-neh_2-, cf. Kroonen (2013: 158). A connection with Arm. *ul* 'small goat' < *$p\bar{o}lo$-, *amul* 'infertile' < *n-$p\bar{o}lo$- is doubtful on semantic grounds;

*$s\acute{o}mo$- 'one': OCS *samъ* 'self, alone' probably reflects a thematicized form of the original nominative singular *$s\acute{o}m$ (cf. Beekes 2011: 209f.). Since this form is not directly attested, the presence or absence of *-*s* cannot be determined with certainty. Cf. also §3.1 and §4.3.1.1.2 for *$s\acute{e}m$ n. with FG.

2.3 Hysterodynamic nominative singular

The largest sub-category of LG-formations consists of nouns with a primary suffix which has LG in the nom.sg., and full grade or zero-grade elsewhere, i.e. nouns with hysterodynamic inflection (in *-$\bar{e}C$ or *-$\bar{o}C$).

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[9] Beekes (2010: 947) considers Ved. *$m\acute{a}s$* as a nasalless form from *$m\bar{e}s$- for which he has no explanation, but in view of Ved. *kṣā́s* 'earth' < QIE *$d^h\acute{g}$-$\acute{o}m$-s the loss of the nasal may be a regular pre-Vedic development. The retention of the nasal in the compound *$m\bar{a}\d{m}s$-pacanyā* must then be explained differently: for instance by assuming that the loss of the nasal in *$m\acute{a}s$* and *kṣā́s* only occurred in monosyllables and not if it was part of a compound.

2.3.1 *t*-stems

2.3.1.1 *-*ōt*

méh₁nōt 'month' is continued as Go. *menoþs*, OHG *mānōd* < PGm. *mēnōþ-*, and probably
also as Go. *mana*, OHG *māno* < PGm. *mēnan-* m. 'moon', in which the original nomina-
tive *mēnō* < *méh₁n-ōt* was reanalyzed as an *n*-stem (a development that is mirrored by
PGm. *nefan-* 'nephew, cousin' << *nép-ot-*, for which see below). Lith. *ménuo* 'month'
may also continue *méh₁nōt*, since word-final dental stops have been lost in Proto-Balto-
Slavic, cf. abl.sg. *-tōd* in Lith. *tuõ* 'hence, therefore', and n. *tod* > OCS *tъ* 'that'. Alt-
hough word-final *-s* is likely to have been retained, a reconstruction *méh₁n-ōs* would
work for the Lithuanian form as well, since parallel formations in *-ōs* are not attested in
Baltic and the gen.sg. *ménesio* reflects a stem *meh₁n-es-*;

népōt(s) 'grandson' (Ved. *nápāt*, YAv. *napā̊*, *napā̊sə (t-)*, OP *napā*, OHG *nefo*, *nevo*, Lat.
nepōs, *-ōtis*, OLith. *nepuotis*, Alb. *nip* (< PAlb. *nepō*), OIr. *nia* (< *nefūt-*)). The sigmatic
nominative *népōts* can easily have been secondarily introduced in Indo-Iranian and Latin.

2.3.1.2 *-*ēt*

All evidence comes from Celtic:

OIr. *fili* 'seer' < *uel-ēt-* may well belong here. Also attested as a nominative is OIr. *file* 'id.'
< *uel-et-* with a short vowel in the suffix, which can be explained as a younger creation by
levelling from forms with *-e-* in the paradigm, cf. gen.sg./gen.pl. *filed*, acc.pl. *fileda*;

OIr. *óegi* 'guest' < *oigʰ-ēt-* may be related to Hom.Gr. οἴχομαι 'go (away), die', in which the
root would reflect *h₃eigʰ-*. The root etymology is not without problems, however (cf.
Beekes 2010 s.v. οἴχομαι).

Although the suffix is commonly reconstructed as *-ēt-* (for *fili*, cf. Beekes 1994: 9; Mataso-
vić 2009: s.v), Peter Schrijver (p.c.) suggested to me that *fili* rather reflects *uel-iēt-*: since the
acc.pl. *fileda* did not lose its *-e-* by regular Pre-OIr. syncope, it cannot be explained why it
was retained otherwise than assuming an extra element which contained a feature that pala-
talized the preceding consonant (= *i*). Starting from a stem *uel-iet-* rather than *uel-et-*, one
can account for the preservation of *-e-* in *fileda* by arguing that it was the *-i-* of the suffix
-iet- which was syncopated instead. It is, of course, attractive to explain the form *óegi* simi-
larly. The origin of *-iet-* is likely to be post-PIE, which makes the type no longer relevant for
the discussion on the origin of the PIE LG.[10]

2.3.2 *s*-stems

2.3.2.1 *-*ōs*

h₂éusōs 'dawn' (Ved. *uṣā́s*, OAv. *ušā̊*, Hom.Gr. ἠώς, Lat. *aurōr-a*);

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[10] Two arguments for a post-PIE origin come to mind: first, a suffix *-iēt-/-iet-* is unknown outside Celtic. Sec-
ond, a connection to the verb OIr. *fil-* 'is' < *uel-ie-* may suggest that *fili* was created as a *t*-stem derived from
the stem *uel-ie-*. Subsequently, a secondary nominative in *-iēt-* was made (Peter Schrijver p.c.). Such an origin
may also apply to OIr. *óegi*, although I cannot think of a verb that is closely related to this formation.

$u\acute{e}idu\bar{o}s$ ptc.pf. 'knowing' (Ved. $vidv\acute{a}n$, OAv. $v\bar{\iota}duu\mathring{a}$, Hom.Gr. εἰδώς, obl. εἰδότ-,[11] Go. $weitwoþs$ n. 'witness', in $galiuga\text{-}weitwods$ 'false witness' < PGm. *$w\bar{\iota}tw\bar{o}þa\text{-}$);

*$\text{-}i\bar{o}s$ comp. (Ved. $vasy\bar{a}n$, OAv. $va\acute{s}ii\mathring{a}$, YAv. $va\dot{n}h\mathring{a}$ 'better' < *$h_1u\acute{e}s\text{-}i\bar{o}s$, Lat. $maiior, \text{-}\bar{o}ris$ (Pl.), Hom.Gr. μέζων 'greater' < *$m\acute{e}\acute{g}\text{-}i\bar{o}s$).

Possibly old as well may be Hom.Gr. γέλως m. 'laughter' (< *$gelh_2\bar{o}s$) (acc. γέλω < *$\text{-}os\text{-}m$), ἱδρώς f. 'sweat' (< *$suidr\bar{o}s$) (acc. ἱδρῶ), Lat. $s\bar{u}dor$, gen. $\text{-}\bar{o}ris$ m. 'sweat' (< *$suoid\bar{o}s$), $c\bar{a}seus$ m. 'cheese' (if from *$kH\mu\bar{o}s$, cf. Schrijver 1991: 252). It is uncertain whether Hom.Gr. αἰδώς f. 'shame' (< ?*$h_2eis\text{-}d\text{-}\bar{o}s$) (gen. αἰδοῦς, acc. αἰδῶ), and ἔρως m. 'love' (no etymology, dat.sg. ἔρῳ is an o-stem) are archaic.

2.3.2.2 *$\text{-}\bar{e}s$

This class consists of adjectives that became productive in post-PIE times. Two examples from the same root that may be old are *$h_1su\text{-}men\bar{e}s$ 'having a good mind' and *$dus\text{-}men\bar{e}s$ 'having a bad mind'.

$h_1su\text{-}men\bar{e}s$ 'having a good mind' (Ved. $su\text{-}m\acute{a}n\bar{a}s$, YAv. $hu\text{-}man\mathring{a}$ 'with good courage to fight',[12] Gr. εὐμενής (Aesch.), Myc. $e\text{-}u\text{-}me\text{-}ne$);

$dus\text{-}men\bar{e}s$ 'having a bad mind' (Skt. $dur\text{-}m\acute{a}n\bar{a}s$ 'in bad spirits, sorrowful', OAv. $du\check{z}\text{-}man\mathring{a}$,[13] Gr. δυσμενής (Eur.) 'evil minded, hostile'[14]). The Sanskrit form may alternatively be a later innovation in view of its late attestation, however.

In Greek the adjectives in *$\text{-}\bar{e}s$ became productive, cf. Hom.Gr. ἀ-δεής 'fearless', ἀληθής 'true, real', ἀκραής 'epithet of the wind', ἀολλής 'all together', ἀν-αιδής 'shameless', διηνεκής 'uninterrupted, exact', ἐν-αγής 'under a curse or pollution', θεουδής 'godfearing', νηλεής 'inescapable', ὁμηγερής 'gathered together', Gr. οὐρανο-στεγής 'bearing the sky' etc., as well as in Indo-Iranian. This productivity can be explained by simple proportional analogy.

Before reconstructing this analogy, an observation that can be made beforehand is that the adjectives in *$\text{-}\bar{e}s$ are all compounded adjectives, whereas corresponding s-stem nouns have full grade in the suffix (e.g. Ved. $sv\text{-}\acute{a}p\bar{a}s$ adj.nom.sg. 'well-working' vs. noun $\acute{a}pas$ n. 'work' from *$h_3ep\text{-}$, cf. Lat. $opus$). The Vedic compounded adjectives of the type $sv\text{-}\acute{a}p\bar{a}s$ are clearly not derived from their synchronic simplex counterparts, viz. Ved. $ap\acute{a}s$*, in view of the different accentuation (i.e. on the suffix). Therefore, in Vedic the compounded adjectives in $\text{-}\bar{a}s$ were derived from neuter nouns in $\text{-}as$, not from simplex adjectives in $\text{-}\acute{a}s$. Perhaps the analogy may have worked as follows:

Ved. $m\acute{a}nas$, $su\text{-}m\acute{a}n\bar{a}s$: $\acute{a}pas$, X, in which X = $sv\text{-}\acute{a}p\bar{a}s$.

At a later stage, i.e. after the productivity of compounded adjectives in *$\text{-}\bar{e}s$, simplex adjectives could arise by decompounding in the Indo-European daughter languages (e.g. Gr.

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[11] Mycenaean obl. /-woh-/ < *$\text{-}uos\text{-}$ indicates that the t-stem is secondary, e.g. Myc. $te\text{-}tu\text{-}ko\text{-}wo\text{-}a_2$ /t^{h}et^{h}uk^{h}woha/ nom./acc.pl.n. 'finished' < *$d^he\text{-}d^hug^h\text{-}uos\text{-}h_2$. However, a perfect participle in *$\text{-}u\bar{o}t$ is found in Celtic: OIr. $bib\text{-}du$ m. 'enemy', OW $bibid$ h.l. < PCl. *$bib\bar{u}dw\bar{o}t\text{-}$ < PIE *$b^heud\text{-}$ 'strike', cf. OE $b\bar{e}atan$.

[12] No nom.sg. attested: acc.sg. $hu\text{-}mana\dot{n}h\partial m$, gen.sg. $hu\text{-}mana\dot{n}h\bar{o}$, nom./acc.sg.n. $hu\text{-}man\bar{o}$, nom.pl.m. $hu\text{-}mana\dot{n}h\bar{o}$.

[13] Only oblique forms attested: OAv. gen.sg. $du\check{z}\text{-}mana\dot{n}h\bar{o}$, YAv. $du\check{s}\text{-}mana\dot{n}h\bar{o}$, dat.sg. $du\check{s}\text{-}mana\dot{n}he$.

[14] In Homer only attested in the plural: nom. δυσμενέες, acc. δυσμενέας, gen. δυσμενέων, dat. δυσμενέεσσι(ν), δυσμενέσιν.

ἠνεκής from διηνεκής 'uninterrupted, exact', cf. Beekes 2010: 333).

In short, the only good example for PIE forms in *-ēs is the adjective *-menēs, since an identical formation is attested both in Greek and Indo-Iranian, whereas all the other adjectives in *-ēs may be later creations within the separate branches.

2.3.3 *i*-stems

2.3.3.1 *-ōi

*se/okʷHōi 'fellow' (Ved. *sákhā* (acc.sg. *sákhāyam*, dat.sg. *sákhye*), YAv. *-haxā* (acc.sg. *-haxāim*, dat.sg. *haše*), cf. Lat. *socius*). Since the form with LG is not found outside Indo-Iranian, it remains uncertain whether the situation in Indo-Iranian is a direct continuation of the situation in PIE;

*bʰeidʰōi 'persuasion'[15] is only found in Greek as Πειθώ (Hes.). Just as for *sokʷHōi in Indo-Iranian, the rest of the paradigm has generalized root ablaut, but is archaic in the suffix: acc.sg. Πειθώ (Hdt.) (<< *-ō̃ < *-oa < *-oia < *-oim),[16] voc.sg. Πειθοῖ (Ar.), gen.sg. Πειθοῦς (Aesch.), dat.sg. Πειθοῖ (Aesch.). The word is probably an innovation;

*bʰeidōi (Gr. φειδώ f. 'saving, thrift, sparing') and *(s)ueh₂gʰōi (Hom.Gr. ἠχώ f. 'sound, noise (also personified)' may also be innovations;

Hittite formations in *-āiš, in which the final *-š may be secondary:

  *h₂urtōis: Hitt. ḫurtāiš (ḫur-ta-iš, ḫu-u-ur-ta-iš, ḫur-da-a-iš) c. 'curse';[17]
  *seh₂klōis: Hitt. šāklāiš (ša-ak-la-iš, ša-ak-la-a-iš, ša-a-ak-la-a-iš) c. 'custom';[18]
  *seh₂gōis: Hitt. šāgāiš (ša-ga-i-[i]š, ša-ga-a-iš, ša-ga-iš, ša-ka-eš, šaʔ-ga-eš) c. 'sign';[19]

2.3.3.2 *-ēi

In 1973, Beekes argued that the original nominative of Hom.Gr. πόλις, πτόλις f. 'city, community' must have been in *-ēis. Some forms in the paradigm have a stem πολη- (gen.sg. πόληος, dat.sg. πόληϊ, nom.pl. πόληες, acc.pl. πόληας),[20] which brings up the question where the -η- comes from. He suggested that it could not have been the PD loc.sg. in *-ēi that influenced the whole paradigm, as nom.sg. -ις, gen.sg. -ηος is a *category*, not a single word (Beekes 1973: 242).[21] Therefore, as he concludes, it must have been the nominative in *π(τ)όλη- that served as a model for the rest of the paradigm. The reason to replace the nominative in

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[15] The appellative of the goddess is attested from Hesiod on, whereas the common noun meaning 'persuasion' is first found in Classical Greek.
[16] The accentuation in the accusative is analogical after the nominative, cf. Beekes (1972: 49).
[17] A derivative from ḫuu̯art-ⁱ / ḫurt- 'to curse'.
[18] Cognates from the root *seh₂k- include Lat. *sacer* 'sacred', MW *hagr* 'ugly' and perhaps ToB *sākre* 'happy'.
[19] Cognates include Lat. *sāgīre* 'have a good nose, perceive keenly', Go. *sokjan* 'search'.
[20] In Greek this stem is attested next to πτόλι- (nom.sg. πτόλις, πόλις, acc.sg. πτόλιν, πόλιν) and πολε- (gen.sg. πολέος, dat.sg. πτόλεϊ, πόλει, nom.pl. πολεῖς, πολέες, acc.pl. πολέας, πόλεας, gen.pl. πολέων, dat.pl. πολέσι(ν), πολέσσι(ν)).
[21] Another example of this type is Hom.Gr. μάντις 'seer, prophet', gen.sg. μάντηος (κ 493, μ 267), Att. -εως. Perhaps, starting from a stem *μαντη- would explain why -τ- did not assibilate to **μάνσις (Beekes 1973: 244), but alternatively the word is from a north-Greek dialect, or the form has analogical -τ- from the oblique stem *mn-tei-, or from related formations, such as Hom.Gr. μαντεύομαι 'predict, consult an oracle', and μαντοσύνη 'faculty of prophecy'. Although these formations are derived from μάντις, their creation may have been prior to the assibilation of *-ti- > -σι-, which makes the problem a matter of relative chronology. Another argument supporting an analogical origin of μάντις is the root vocalism: since the original paradigm *mén-ti-s, gen. *mn-téi-s (Lat. *mentis*, Ved. *mati-*) would have yielded **μέντις, **ματέις, the -ν- in μάντις is likely to have been analogically restored in the oblique stem.

*-ēis into -ις from the PD inflection was that *-ēis would have regularly yielded
*-eis and would have been identical to the plural ending -εις < *-eies. This spread of -η- from
the nominative must then have occurred before Osthoff's Law. However, as Beekes admits,
the problem remains that there is no other evidence attested for PD *i*-stems in alphabetical
Greek (1973: 242[15]).[22] For an allegedly similar development, see below on YAv. *dańhuš*
(§2.3.8.2.2).

2.3.4 *l*-stems

$h_2$ébōl 'apple' (Lith. *obuolỹs*, Latv. *âbuõls*);
sh_2ēl or *seh_2l* 'salt' (Lat. *sāl*, MIr. *sál*, Latv. *sãls*, ToA *sāle*, ToB *sālyiye*).

Concerning the word for 'salt', Kortlandt (1985: 118-9) states that Latv. *sãls* rather continues
PIE *$sēh_2$-l-s* with loss of the laryngeal after a long vowel, as seen in Latv. *gùovs* 'cow' <
$g^wéh_3$-u-s, for which see below. This long vowel in *$sēh_2$-l-s* would be analogical after
diēus (see above) according to Derksen (2015: 548f). However, for two reasons it is more
attractive to assume a pre-form *sh_2-ēl* with LG in the suffix than a form *$sēh_2$-l-s*: first, Latv.
gùovs can also be explained from *$g^wh_3éus$* rather than *$g^wéh_3us$* (cf. §2.4). Second, for a re-
construction *$sēh_2$-l-s*, it is necessary to posit a new morphological structure *CēC-C-s* for a
pre-stage of Latvian, for which there is no other evidence than *sãls* and *gùovs*. A reconstruc-
tion with PIE *a*, such as Piwowarczyk's explanation of Lat. *sāl* < PIE *sals* by SL (Piwowar-
czyk 2015: 272), is unlikely in view of (1) the marginal status of this phoneme (Lubotsky
1989), and (2) the mobile accent as found in Hom.Gr. acc.sg. ἅλα, gen.sg. ἁλός, which points
to an original ablauting paradigm (*sh_2-él-m*, *sh_2-l-ós*).

Another formation in *-ōl* might be Lat. *sōl* 'sun', which may then continue *sh_2uōl* (?), as
the other IE branches point to *$séh_2$ul*, gen. *sh_2uéns* (cf. Beekes 1983; Schindler 1975a: 10).
In view of the fact that this word is neuter in Indo-Iranian and Gothic, a form *sh_2uōl*, if it
existed, may have originally been a neuter collective (as a bunch of rays), but Beekes objects
that this is improbable (1983: 7). Alternatively, Lat. *sōl* continues older *saul < *$séh_2$ul* by a
sporadic monophthongization conditioned by *-l* (cf. Kortlandt apud Beekes 1983: 6). If cor-
rect, the word for 'sun' does not belong here.

A possible second example in *-ēl*, viz. Hitt. *šu-ú-e-el* n. 'thread' < *$séuh_1$-el-*, has been
explained as secondary for *šu-ú-i-il* by Rieken (1999: 475, 478f., cf. also Kloekhorst 2008:
777).

2.3.5 *m*-stems

$d^h(é)ǵōm$ 'earth'[23] (Ved. *kṣā́s*, YAv. *zā̊*, Hom.Gr. χθών, Hitt. *tēkan*, OLith. *žmuõ* 'man');
$ǵ^hiōm$ 'winter' (YAv. *ziiā̊*, Hom.Gr. χιών, ON *gói*, *gœ*).

Regarding 'earth', Kloekhorst (2008 s.v.) suggests that Hitt. *tēkan* reflects a neuter *$d^heǵ$-m*.
However, in Hittite vocalic *-m* usually yields *-un*, cf. 1sg.prt.-ending *-un* in e.g. *esun* 'I was'
< *$h_1és$-m*. Therefore, *tēkan* can hardly reflect *$d^heǵ$-m*, and the suffix *-an* must instead go
back to *-ōm*. A suffix *-om* with short vowel is also impossible, as a form *$d^heǵ$-om* would

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[22] the Mycenaean script is too ambiguous to distinguish PD *-is*, gen. *-eios* <-i, -e-jo> from the πόλις-type gen.sg.
in -ηος, since *-ēios* would also have been spelled <-e-jo>.
[23] Not with *-ǵ^h*- on the basis of the stem Ved. *jma*-, which regularly continues a non-aspirated velar stop
(Kloekhorst 2014b: 62ff.).

have yielded **$tagūn$ (cf. $kūn$ < *$\acute{k}óm$ 'this (acc.sg.c.)') (Kloekhorst ibid.).

Concerning 'winter', the nom.sg. *$\acute{g}^hi$-$ōm$ is probably secondary for *$\acute{g}^hei$-$ōm$ in view of the stems *$\acute{g}^hei$-m-r- (Hom.Gr. χειμέριος, Lat. *hībernus* < *$heimrinos$ 'hibernal') and *$\acute{g}^hei$-m-n- (Ved. *hemantá*- m., Hom.Gr. χεῖμα n., χειμών m., Lith. *žiemà* f. 'winter') with full grade.

2.3.6 *n*-stems

2.3.6.1 *-$ēn$

*$b^hud^hmēn$ 'bottom' (Gr. πυθμήν, cf. Skt. *budhná*- and OHG *bodam*, cf. Kroonen (2013: 82));

*$h_2uks\acute{e}n$ 'young bull; ox' (Ved. *ukṣā́*, OAv. *uxšā*, Go. *auhsa*, OHG *ohso*, ToB *okso*).[24] The Tocharian form points to *-$ōn$, but a reconstruction with *$ē$ is based upon Ved. acc.sg. *ukṣā́ṇam* (RV 1.164.13 *ukṣáṇam* must then be secondary) and the fact that the zero-grade in the root may be reconciled with a hysterokinetic accent pattern (nom.sg. *CC-$\acute{e}R$, acc.sg. *CC-$\acute{e}R$-m);

*$mosg^h\acute{e}n$ 'marrow' (Khot. *mäsjā*, cf. Ved. acc.sg. *majjā́nam*, OPr. *musgeno*, RuCS *moždeni* pl. 'brains'). The Brugmann reflex in Ved. *majjā́nam* < *$mosg^h$-on-m may alternatively point to a nom.sg. in *-$ōn$, as the suffix vocalism of the accusative usually coincides with that of the nominative. The Balto-Slavic forms must then be built upon the oblique stem, cf. the locative *$mosg^h$-$\acute{e}n$-i;

*$poh_2im\acute{e}n$ 'herd' (Hom.Gr. ποιμήν, Lith. *piemuõ*);[25]

*$u(e)rsēn$ 'male animal' (YAv. *arša* 'male', Gr. ἄρσην, Ion., Lesb., Cret. ἔρσην);

*$urh_1\acute{e}n$ 'lamb' (Ved. *úrā*, Hom.Gr. ἀρήν, Arm. *gaṙn*).

2.3.6.2 *-$ōn$

*$h_1\acute{e}h_1tmōn$ 'breath, soul, self' (Ved. *ātmā́*, OFri. *ēthma*, OHG *ātmo*);

*$h_2\acute{e}\acute{k}mōn$ 'stone; sky' (Ved. *áśmā*, YAv. *asma*, Gr. ἄκμων, Lith. *akmuõ*);

*$h_2iuHōn$ adj./m. 'young (man)' (Ved. *yúvā*, YAv. *yuua* 'youth')[26]

*$h_2reh_1\acute{g}ōn$ 'helper' (Ved. *rā́jā* 'king', Hom.Gr. ἀρηγών 'helper');

*$h_3\acute{e}rōn$ 'eagle' (Go. *ara*, OHG *aro*, cf. Hitt. *ḫāraš* < *$ḫāran$-$š$, Hom.Gr. ὄρν-ῑς, ὄρν-εον n. 'bird');

*$\acute{k}leumōn$ 'rumour' (Go. *hliuma* m. 'hearing', ToB *klyomo* 'noble');

*$meh_2kōn$ 'poppy' (Hom.Gr. μήκων, OHG *maho*, *mago* << PGm. *$mōhō$, cf. Kroonen (2011: 311-4; 2013: 371));

*$stéh_2mōn$ (Gr. στήμων 'the warp in the upright loom, thread', Lith. *stuomuõ* 'stature, trunk, piece of linen for a shirt, shirt without sleeves, stem of a plant with leaves and branches'), cf. Go. *stomin* dat.sg. 'confidence, substance', and with different gender: Ved. *sthā́ma* n. 'position', Lat. *stāmen* n. 'warp in weaving'. It cannot be excluded that (some of) the formations are post-PIE;

*$tet\acute{k}ōn$ 'carpenter' (Ved. *tákṣā*, OAv. *tašā*, Hom.Gr. τέκτων).

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[24] The color of the laryngeal is based upon the idea of a connection with *h_2ueks- 'to grow' (Kiehnle 1979).

[25] Lithuanian *-uõ* is not informative, since there is only one living category in *-uõ*, obl. *-en*- (gen. *piemeñs*, cf. *akmuõ*, gen. *akmeñs*), continuing both stems in *-$ēn$ and *-$ōn$. The Lith. forms in *-mė* (*dėmẽ* 'attention, consideration', *žymẽ* 'mark, sign', etc.) do not directly go back to PIE *-$mēn$, but are analogically created to inherited forms in *-$mēn$ (Pronk 2014: 324f.).

[26] Probably not *-$ēn$ in view of Ved. acc.sg. *yúvānam*, YAv. *yuuānəm* < *-on-m.

2.3.7 *r-stems*

2.3.7.1 **-ē/ōr*
*deh₂iuér 'husband's brother' (Hom.Gr. δᾱήρ, cf. Ved. acc.sg. *deváram*, OE *tācor*, *tācur*[27]);
*h₂eusēr (Hom.Gr. ἀήρ 'mist', cf. Ved. voc.sg. *uṣar*, loc.sg. *usrí*);
*suésōr 'sister' (Ved. *svásā*, YAv. *xᵛaŋha*, Lat. *soror*, obl. *sorōr-*, OIr. *siur*, (O)Lith. *sesuõ*, Arm. *kʿoyr*).

I follow Kloekhorst's reconstruction **ǵʰes-r* rather than **ǵʰésōr* for Hitt. *keššar* 'hand' in view of the geminate *-šš-* (Kloekhorst 2008: 471).

2.3.7.2 **-tē/ōr*
*bʰréh₂tēr 'brother' (Ved. *bhrā́tā*, cf. Hom.Gr. φρήτρη, Go. *broþar*);
*dh₃tér 'giver' (Ved. *dātā́*, acc. *-áram*, Gr. δοτήρ);
*dʰugh₂tér 'daughter' (Ved. *duhitā́*, Hom.Gr. θυγάτηρ, (O)Lith. *duktẽ*, Go. *dauhtar*). If Kloekhorst (2011) is right, HLuw. acc.sg. *tuatra/i-n* and Lyc. *kbatra* 'id.' reflect a stem **dʰuégh₂tr*, that can be identified as the PIH nominative form. This implies, that the lengthened grade in this form came about after the split with Anatolian;
*(H)ienh₂tēr 'wife of husband's brother' (OLith. *jentė*), cf. Hom.Gr. εἰνατέρες, Skt. *yātar-*, Lat. *ianitrīcēs*, CS *jatry*);
*meh₂tēr 'mother' (Ved. *mātā́*, Hom.Gr. μήτηρ, OLith. *mótė*, OHG *muoter*);
*ph₂tér 'father' (Ved. *pitā́*, OAv. *ptā*, *patā*, Hom.Gr. πατήρ, Go. *fadar*).

Old formations in **-tor* are hard to identify in view of the productivity in Indo-Iranian. The few formations with parallels outside Indo-Iranian also have forms in **-tēr*:
'giver' in Ved. *dā́tā** (acc.sg. *dā́tāram* < **-tor-m*, also *dātáram* < **-ter-m* to a nom.sg. *dātā́* 'id.' < **deh₃tér*), Hom.Gr. δώτωρ < **déh₃tōr* (cf. δοτήρ), Lat. *dător* (with zero grade of the root).
'creator' in Ved. *janitā́*, nom./acc.du. *janitā́rā* 'progenitor' (cf. *jánitā* 'father' with root accent), Ion./Dor.Gr. γενέτωρ 'creator' (cf. Gr. γενετήρ 'begetter' (Arist.)), Lat. *genitor*, *-ōris* 'father, creator' < **ǵénh₁-tōr*.

2.3.8 *u-stems*

2.3.8.1 **-ēus*
This category consists of Greek nouns in -ευς and presents important difficulties (Beekes 1973: 230), which can be summarized as follows:
1) there are no inherited words in -ευς, except Ζεύς, but plenty words in -ευς of non-IE origin;
2) hysterodynamic Iranian cognates in *-āuš* correspond to Greek formations in -υς rather than -ευς (OAv. *-bāzāuš* ~ Gr. πῆχυς 'arm').

Concerning the first point, Beekes pointed out in one of his earlier articles (1973: 230), that the words in -ευς may originally have had a long vowel in view of the inflection of e.g. βασιλεύς, gen.sg. -ῆος (<**-ēu-os*), in which the oblique forms have generalized **-ēu-* of the nominative in **-ēus*. In a later article (Beekes 2008: 53f.) he gives a different explanation by proposing a Pre-Greek (non-IE) sound change, viz. that -η(ϝ)- in the oblique represents older

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[27] From PGm. **taikwer-* < **daiHuer-*. For Gm. *-k-* < **-H-* cf. Kroonen (2013: 506).

monophthongized *-αιϝ-, whereas -ευς would go back to *-αυ+ς with umlaut and loss of intervocalic yod.[28] This second explanation rules out the possibility that non-Indo-European words in Greek adopted the PIE inflection pattern in *-ēus, which is the case in the first scenario. Thus, this would mean that Greek words in -ευς do not go back to PIE *-ēus.

The second point may be explained by suggesting that the Iranian forms do not come from *-ēus, but either from *-ŏ̄us or *-us. See §2.3.8.2.2 for a discussion of the Iranian material.

2.3.8.2 *-ōu(s)

The material largely consists of two groups: (1) evidence from Greek and (2) evidence from Iranian, but (3) there are small pieces of evidence from other branches as well.

2.3.8.2.1 *Evidence from Greek*

*dmōus 'belonging to the house (?)' in Hom.Gr. δμώς, gen.sg. δμωός 'slave, servant'. Other evidence for a *u*-stem derivative of the word for 'house' does not have a long vowel in the suffix: Lat. *domus*, gen.sg. *domūs* f., OCS *domъ* m. 'house', Arm. *tanu-tēr* 'lord of the house'. The connection with Ved. *dámūnas-* m. 'master of the house, lord' is uncertain, however;

*ph₂trōus is attested as the amphikinetic *u*-stem Gr. πάτρως, gen.sg. -ωος / -ω m. 'male relative; father's brother, uncle', of which traces are found in Lat. *patruus*, Skt. *pitṛvyá-* (Br.), YAv. *tūiriia-*, OE *fædera*, OHG *fatureo, fetiro* < PGm. *fadurwjan-* m.;

*meh₂trōus in Hom.Gr. μήτρως m. 'male relative of the mother, maternal uncle, grandfather'. The form is not necessarily of PIE date, since it can be analogical after Gr. πάτρως;

*ǵlHōus in Hom.Gr. γαλόως, gen.sg. γαλόω, dat.sg. γαλόῳ f. 'husband's sister' (with -o- due to metrical diectasis). Greek may point to a stem *γαλ-αϝ-ο- < *ǵlh₂-eu-o-, but see Beekes 2010 s.v. γαλόως for a discussion. Cognates are Lat. *glōs* < *ǵloh₂-*, OCS *zъlъva* < *ǵlh₂-uh₂-*. Alternatively, the Greek form can also be analogically created after μήτρως. If correct, the feminine gender of γαλόως may then have been changed on the basis of its semantics.

As *-ōus would have given Gr. -ους, the attested type in -ως must be secondary. Beekes (1972: 41f.) argues that the nominative was remodelled after the accusative in -ων (< *-ōm < *-ōum), but in my opinion it is perhaps easier to assume that the final -ς is a later (post-Osthoff's Law) addition.

Szemerényi's proposal (1977: 56) to analyse -ως in πάτρως (and μήτρως etc.) as a compound member related to Lat. *avus*, Hitt. *huhha-*, CLuw. *hūha-* 'grandfather' < *h₂euh₂-/*h₂uh₂-[29] is hard to ascertain, since there is only one vowel that can be compared.[30] Moreover, if Hom.Gr. μητρυιά f. 'stepmother' is related to μήτρως,[31] the -υ- in μητρυιά would re-

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[28] The different developments would be conditioned by the vocalic vs. consonantal *u*, according to Beekes (ibid.).

[29] I follow Kloekhorst, who reconstructs a root noun *h₂euh₂-/*h₂uh₂- to account for the geminate -hh- in Hittite and non-geminate -h- in Luwian (2008: 352f.).

[30] Szemerényi reconstructed an element *awos 'grandfather; uncle' without a laryngeal (1977: 53), which does not fit the Anatolian evidence. However, in laryngealistic terms, starting from an o-grade form may probably work (*h₂ouh₂- > *o(ϝ)α- > *ω-). The compound must then be a relatively young (post-Mycenaean) formation (after digamma-loss and contraction of *οα).

[31] However, this is semantically not without problems, since it is not straight-forward how a meaning 'stepmother' would have developed from 'male relative of the mother', if μητρυιά is formally derived from μήτρως.

flect the zero grade of this morpheme. Since a zero grade root *h_2uh_2- would have yielded *υα- (just as the suffix *-ih_2 gives PGr. *-ia), it is formally impossible that the element -υ- continues this root in μητρυιά. Another counterargument is that in Szemerényi's proposal Skt. *pitṛvyá*- m. 'father's brother' < *$ph_2truió$- cannot be the masculine formal counterpart to μητρυιά, since Sanskrit excludes a laryngeal. To my mind, the connection is formally and semantically too attractive to reject, which would imply that neither Greek nor Sanskrit continues a compound with *h_2euh_2-. Therefore, the element -ω- in πάτρως likely to represent a PIE LG suffix *-$ōu$-.

2.3.8.2.2 *Evidence from Iranian*

The material has been discussed elaborately by Beekes (1985: 85-90) and is briefly addressed by Kümmel (2015). Since the material is complicated, it is necessary to discuss full paradigms. The following three forms may be candidate for a nom.sg. in *-$ōu(s)$:

*-$b^heh_2ǵ^h\breve{o}us$ '(upper) arm'

	Ved.	Av.
nom.sg.	*bāhúṣ*	OAv. -*bāzāuš*, YAv. *bāzuš*
gen.sg.		YAv. -*bāzuuō*, *bāzāuš* (< *-*aoš*)
nom./acc.du.	*bāhávā*	YAv. *bāzauua*

The reconstruction of the nom.sg. with a long vowel in the suffix, as reconstructed by Kümmel (2015), hinges entirely on Avestan. The form -*bāzāuš* is found in compounds such as OAv. *darəgō.bāzu*- adj. 'having long arms' (= Ved. *dīrgha-bāhu*-), whereas *bāžuš* is the simplex formation. A compounded gen.sg. -*bāzuuō* is found in *auruša.bāzuuō* and the simplex gen.sg. *bāzāuš* must be read as *bāzaoš*. It cannot be excluded that the difference in vocalism between simplex and compounded forms is old, since such a distribution is well-known for PIE (πατήρ vs. εὐπάτωρ). Outside Indo-Iranian also *u*-stems are found: Gr. πῆχυς m. 'forearm, arm, ell', OE *bōg*, OHG *buog* < PGm. *$bōgu$- m. 'shoulder', ToA *poke* 'arm'. On the basis of these forms I would suggest that at least the suffix of the nominative cannot have been *-$ēus$, since this would have been preserved in Greek as -ευς by sound law and no inherited stems in *-$ēus$, except Ζεύς, are attested (§2.3.8.1).[32] Choosing between *-$ōus$ or *-us, it is still hard to tell what the original nominative was, since no acc.sg. is attested: either the accusative stem may have been introduced into the nominative, or may have taken over the long vowel from the nominative. In other words, if the accusative stem had a short vowel (*-$av-am$ > Av. *-aom), it would be strange why the accusative would not have taken over the vocalism of the original nominative in *-$ōu(s)$. An example with such an accusative stem is the following word:

PIIr. *$dasyāus$(?) (OAv. *dax́iiu*-, YAv *dax́iiu*-, *daŋhu*- f. '(inhabibant of a) country, people', OP *dahyu*- f. 'country, province, district'):[33][34]

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[32] An analogical remodelling (*-$ēus$ >> -υς) is doubtful, since there is no clear motivation for such a development. Moreover, it would be unclear why Ζεύς was preserved as such, since it did undergo several other remodellings, cf. acc. Ζῆν >> Ζῆνα, Δία, and gen. Δι(ϝ)ός >> Ζηνός.

[33] Reconstruction from Kümmel (2015: 292), which is *$dasyāw$-š* in his own notation.

[34] Although the word is probably non-IE, its inflectional type is relevant for the discussion of the LG.

	OAv.	YAv.	OP
nom.sg.		*daŋhuš*	*dahyāuš*
acc.sg.	*daḱiiūm*	*daḱiiūm, daŋhaom*	*dahyāum, dahyāuuam*
gen.sg.	*daḱiiə̄uš*	*daŋhə̄uš*	
dat.sg.		*daŋhauue*	
loc.sg.		*daŋhuuō, daŋhō, daŋhauu-a*	
nom.pl.		*daŋhāuuō*	*dahyāuua*
acc.pl.		*daŋhūš, daŋhāuuō*	*dahyāuua*
gen.pl.	*daḱiiunąm*		
acc.du.		*daḱiiu, daiŋhu*	

In spite of a synchronic long vowel in OP *dahyāuš*, Beekes (1985: 89f.) argues that Avestan preserves the older paradigm, since it would be unlikely that the long vowel of a nom.sg. in *-ōus* > -āuš* would not have introduced its long vowel into the accusative (Av. -aom < *-av+am*).

On the one hand, the gen.sg. forms in *-ə̄uš* reflect a PD ending. If the ending is archaic, the paradigm may originally have been PD as well: PIr. nom.sg. *das-yu-š*, acc.sg. *-yu-m*, gen.sg. *-yau-š*, nom.pl. *-yāv-ah < PIE *-iu-s, *-iu-m, *-ieu-s, *-iou-es*. If correct, the acc.sg. *daḱiiūm* then reflects the older formation in *-iu-m*, whereas *daŋhaom* must be analogical.[35] The long vowel in the Old Persian singular forms would then originate in the plural stem, after which it was introduced into the singular. This back-formation in OP is understandable in view of the Avestan semantics: the definition of a country or region (sg.) may have been that it consists of 'people' (pl.).

On the other hand, however, the gen.sg. *-ə̄uš* may also be analogical after the acc.sg. ending *-aom < *-au-m*, which had a FG in the suffix too. In that case it is far from certain that the Avestan nom.sg. form continues the old ablaut in the suffix. Therefore, I cannot decide whether the LG in the OP nom.sg. ending *-āuš* is archaic or not.

néḱőus 'corpse' is reconstructed by Kümmel (2015) on the basis of internal reconstruction of Avestan, cf. YAv. nom.sg. *nasuš*, acc.sg. *nasāum, nasūm*, gen.sg. *nasāuuō*.[36] Kümmel states, that *nasuš* is an analogical form, arguing that a distribution of -uš, acc.sg. -āum represents the default formation and only appears in Young Avestan, whereas Old Avestan has nominatives in *-āuš*, such as *-bāžāuš* and *hiϑāuš* 'association, companionship' (2015: 292 and n. 19). First, however, OAv. *hiϑāuš* is a completely isolated formation, which makes it hard to say anything about its antiquity. Secondly, Beekes (1985: 88) argues, that such an argument is unlikely, since there would be no reason to replace a regular pattern of nom. *nasāuš* : acc. *nasāum* with an irregular one. Therefore, YAv. *nasuš* would continue the original nominative. Moreover, De Vaan (2000: 525f.; 2003: 377) showed that the spelling of acc.sg. *-āum* in *nasāum* is a scribal error for *-aom < *-avam*, which implies that the accusative does not reflect *-āvam*.[37] If correct, only the oblique case continues a syn-

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[35] This is supported by the view that the stem *daŋhu-* is perhaps secondary for *daḱiiu-* anyway, cf. De Vaan (2003: 417, 568f., 614).

[36] Cognates include Hom.Gr. νέκῡς (with secondary long -u-, cf. Beekes 2010 s.v.), acc.sg. νέκῡν, gen.sg. νέκυος, OIr. *éc* 'death' < *nḱ-u-*, ToB *enkwe*, ToA *onk* 'man' (< 'mortal') < *nḱ-u-o-*.

[37] The ending *-āum* would have been secondarily taken over from the voc.sg. *aṣ̌āum* (< *ártāu̯am*), since this form is often found in the vicinity of *nasāum* (De Vaan ibid.).

chronic LG, which can be explained from original *o*-grade with Brugmann's Law (gen.sg. *nasāuuō* < *-ou-es*). In view of these considerations, a nom.sg. *nék̑ṓus* probably did not exist in PIE.

2.3.8.2.3 *Remaining evidence*

Evidence from Hittite may be the word for 'birth-chair', that is attested both with common and neuter gender: nom.sg.c. *ḫarnāuš* (*ḫar-na-a-uš*) < *-ōu-s* and nom./acc.sg.n. *ḫarnāu* (*ḫar-na-a-ú*) < *-ōu* (cf. acc.sg.c. *ḫarnaun* (*ḫar-na-ú-un*) < *-ou-m* and gen.sg. *ḫarnuu̯aš* (*ḫar-nu-u̯a-aš*) < *-u-os*). Kloekhorst (2008: 310) reconstructs HD *h₃ér-nōu* with common gender, that either got an *-s* in the nom.sg.c. to mark the common gender, or was reanalyzed as a neuter due to the absence of *-s*.

In Slavic a form *gerh₂-ōu* is reflected in SCr. *žȅrāv* 'crane'. For the stem, cf. Lith. *gérvė* < *gerh₂-u-*, Lat. *grūs* < *grh₂-u-* (cf. also Kortlandt 1985: 120).

A possible example from Phrygian might be the PN nom.sg. *Vasous* (< *-ōu-*), also spelled as *Vasus* (cf. Phr. gen.sg. *Vasos* (< *u̯as-u̯-os*)), see Ligorio/Lubotsky (2018: 1820). A root etymology is difficult, however.

2.4 Proterodynamic nominative singular

gʷéh₃us or *gʷh₃éus* 'cow' (Ved. *gáuṣ*, OAv. *gāuš*, Latv. *gùovs*, Dor. βῶς). Other evidence (Hom.Gr. βοῦς, ToA *ko*, ToB *keᵤ*, OS *kō*, Du. *koe*, OHG *kuo*) may also continue a short vowel.

Dor. βῶς is clearly built on the acc.sg. βῶν. For the long vowel in the acc.sg. *gʷh₃ḗm* (Ved. *gā́m*, OAv. *gąm*, Hom.Gr. βῶν,[38] Dor.Gr. βῶν) see §4.3.3.6 and Pronk (2016: 29ff.), who supports Beekes's proposal that the long vowel comes from the nom.sg. (parallel to *diḗus*, acc. *diḗm* 'god', cf. §2.2.1).

Since the Doric form is secondary, only for Baltic and Indo-Iranian the lengthened grade formation needs to be explained. For Latv. *gùovs* Kortlandt (1985: 118; cf. also Derksen 2015: 536) starts from a reconstruction *gʷéh₃us*, for which he assumes that in Baltic a laryngeal was lost after a long vowel, yielding a non-acute tone in the Latvian form.[39] The LG would then have been analogically introduced after other *u*-stems, (cf. Beekes 1990: 42), such as *diḗus* 'god', and cf. also Dor. acc.sg.f. νᾶ̃ν 'ship' < *neh₂-ēm* < *-ēu-m*. However, reconstructing a proto-form *gʷh₃éus* is an easier way to explain the Latvian as well as Indo-Iranian form (cf. Latv. *sàls* 'salt' in §2.3.4, for which the same argument applies):[40] the oblique stem *gʷh₃-eu-* may then have been introduced into the nominative, after which the vowel was lengthened, either due to a phonetic explanation (1. monosyllabic lengthening (*gʷh₃-éu-s > *gʷh₃ḗu-s), 2. lengthening before word-final resonant (nom. *gʷh₃-éu > *gʷh₃ḗu >> *gʷh₃ḗus) or 3. SL (*gʷh₃-éu-s > *gʷh₃-éu̯u̯ > *gʷh₃ḗu >> *gʷh₃ḗus)), or the aforementioned analogy.

The PIE stem is reconstructed as *gʷou-* by Kümmel 2015 (after e.g. Schindler 1973:

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[38] Attested in H 238.

[39] Kortlandt argues that this development is also found in Balto-Slavic verbal forms (1985: 114-117, cf. also Beekes 1990: 43).

[40] The synchronic LG in Indo-Iranian may also continue *gʷóh₃us* with Brugmann's Law.

148ff.), but there are several arguments that favor a reconstruction with a laryngeal, e.g. the circumflex accent in Gr. βοῦς that points to an original hiatus, reflecting an older laryngeal (*g^wéh₃us or *g^wéh₃us) (cf. Beekes 2010 s.v.), and the formally and semantically probable link with the PIE root *g^weh₃-, cf. Gr. βόσκω 'to feed, tend' (Lubotsky 1990: 133f.).

On the basis of these considerations the following conclusions can be drawn:

(1) Greek requires a form with an intervocalic laryngeal (*g^wéh₃us or *g^wéh₃us);

(2) Baltic and Indo-Iranian are the only branch for which a formation with a LG is compelling (*g^wéh₃us or *g^wh₃éus);

(3) methodologically a reconstruction *g^wh₃éus is more preferable than *g^wéh₃us.

This implies that (i) a reconstruction *g^wéh₃us must probably be rejected, (ii) Greek reflects *g^wéh₃us, and (iii) Indo-Iranian and Baltic reflect *g^wh₃éus. Since the Greek form can hardly be explained by analogy (the acc.sg. is *g^wh₃ém, not **g^wéh₃um), it is likely to be inherited, reflecting an older PD *u*-stem nom. *g^wéh₃-u, gen. *g^wh₃-éu-s. Therefore, the reconstruction *g^wh₃éus is probably a secondary formation, and need not reflect the original PIE situation.

*g^wén(h₂) 'woman' (OIr. poet. *bé*, Go. *qens* 'wife', ON *kván*, *kvæn* 'woman, wife' < PGm. *kwēni-). With a short vowel: Ved. *jani-*, OIr. *ben*, acc.sg. *bein* (<*g^wén-h₂-m), Go. *qino*, OHG *quena* 'woman, wife' < PGm. *kwenōn-.

In 1989, Jasanoff argued that the original nominative in Old Irish must have been the poetic form *bé*, that stands outside the paradigm. The form would then go back to Pre-OIr. *g^wen < PIE *g^wēn(-h₂) with regular loss of the final laryngeal in *-VRH# already in Late-PIE (1989: 140). The non-poetic form is *ben*, which forms a paradigm with acc.sg. *bein*, gen.sg. *mná* (< *g^wén-h₂-m, *g^wn-éh₂-s, cf. Ved. *jani-*, gen.sg. *gnā́s*). He argues that the form *ben* is secondary and goes back to a preform *g^wen-ā, that would have been introduced analogically to the other forms in the paradigm and replaced the older nominative *bé*, that lost its feminine suffix marker already before that introduction. The loss of the laryngeal as *-VRH# > *-V̄R# would then be a product of Szemerényi's Law, for which it has been proposed that this development took place in the neuter collectives as well (cf. §2.5 and §2.8).

However, the preform of OIr. *bé*, *g^wen, can reflect a short vowel in PIE as well. Consequently, on the basis of Old Irish only there is no need to introduce a form with LG yet.

The problem becomes more complicated when one takes the Germanic material into account. In Germanic there is evidence for a lengthened grade formation *kwēni-, but the question is why this form is an *i*-stem and not a *h₂*-stem, if *kwēni- reflects the older nominative with LG. The form can alternatively be explained as a *vṛddhi*-derivative that arose within Germanic, as LG-formations became productive in this branch (cf. Kroonen 2013: 316). Therefore, one may have doubts about the antiquity of the form *kwēni-, and about the need to posit a nominative *g^wén(h₂), as the evidence in favour of this form can also be interpreted differently.

2.5 Neuter collectives

PIE had two ways of forming neuter collectives: either by suffixation with *-h_2 (not *-eh_2, cf. Beekes 1994), or by a lengthened grade vowel of the suffix without ending (*-$\bar{o}C$). This section lists the forms of the latter type. The material is categorized by a twofold distinction: by stem-ending (1. *-$\bar{e}i$/-$\bar{o}i$ (only in Hittite), 2. *-$\bar{o}n$, 3. *-$\bar{o}r$ (/*-$\bar{e}r$?), 4. *-$\bar{o}s$, 5. *-$\bar{o}u$ (only in Hittite)), as well as by semantics (first certain collective meanings, then less certain ones).

2.5.1 Stems in *-$\bar{e}i$/-$\bar{o}i$

*udnḗi: Hitt. nom./acc.sg.n. *utnē* (*ut-ne-e*) 'land(s)' < *ud-$nēi$ (obl. *utni*- < *ud-ni-), perhaps cognate with Luw. *wattaniya*- 'land' < *$uéd$-en- and more distantly Arm. *getin* 'ground, land' < *$uedenV$. Although no direct parallels outside Anatolian are known, Kloekhorst (2008 s.v.) remarks that the formation is probably old, since the inflection of nom./acc. *-$nēi$: obl. *-ni- is rare;

*$h_3$ésth$_1$ōi: Hitt. nom./acc.sg.n. *ḫaštāi* (*ḫa-aš-ta-a-i*, *ḫa-aš-ta-i*, *ḫa-aš-da-i*, [*ḫ*]*a-aš-da-a-i*), pl. *ḫaštāi* (*ḫa-aš-ta-i*, *ḫa-aš-ta-a-i*, *ḫa-aš-ta-a-e*, *ḫa-aš-ta-e*, *ḫa-aš-da-i*, *ḫa-aš-da-a-i*) 'bone(s)', cf. Gr. ὀστέον < *h_3esth_1-ei- with a similar stem formation;

*lutōi: Hitt. nom./acc.sg.n. *luttāi* (*lu-ut-ta-i*, *lu-ud-da-a-i*) 'window(s)';

*s-$h_3$ng^{h}uōi(?): Hitt. nom./acc.pl.n. *šankuāi* ([*ša-a*]*n-ku-ua-a-i*, *ša-an-ku-ua-i*) 'nails';

*tlh$_2$ōi: Hitt. nom./acc.sg.n. *zalḫāi* (*za-al-ḫa-a-i*) 'vessel used in rituals'.[41]

In non-Anatolian IE the collective of *i*-stems is found with the suffix *-ih_2, cf. §4.3.3.5.

2.5.2 Stems in *-$\bar{o}n$

*h_3n(é)h_3mōn 'names': YAv. *nāmąm* pl., *nāmāni* pl., Ved. *nā́mā* pl., *nā́māni* pl., Go. *namō* sg. (pl. *namna*). The IIr. forms with -*i* < *-h_2 can be easily explained as innovations (Beekes 2011: 206, and see also *sédmōn* below). The Gothic form need not be old as the nominative can be remodelled after the oblique cases of the productive *n*-stems, which is corroborated by the zero grade of the root (< *h_3nh_3mōn). Av. -*ąm* can both go back to *-$\bar{o}n$ and *-mn-h_2, and the example below shows that both endings may have been present in Indo-Iranian, since Vedic has two reflexes;

*sédmōn: Ved. *sádmǎ* pl., *sadmāni* pl. 'seat'. The form *sádma* with short vowel may continue *-mn-h_2 with Kuiper's Law, whereas *sadmāni* is ambiguous: it either continues *-$mōn$+h_2, but it can also go back to *-mn-h_2+n+h_2,[42] the latter more preferable in view of *sádma*;

*d^heh$_1$mōn perhaps in OAv. *dāmąm* 'creatures', but it may alternatively reflect *-mn-h_2, as mentioned above. For the stem, cf. §3.5.1.3.

The Gothic neuters in sg. -$\bar{o}$, pl. -$\bar{o}na$ (< *-$\bar{o}n$, *-$\bar{o}n$ + eh_2) may also belong here,[43] e.g.

  augō, pl. *augōna* 'eye(s)'
  ausō, pl. *ausōna* 'ear(s)'
  barnilō, pl. *barnilōna* 'young child(ren)'
  hairtō, pl. *hairtōna* 'heart(s)'

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[41] Due to its meaning it is hard to ascertain that the formation is originally a collective. For the root, cf. Lat. *tulī*, ppp. *lātus* 'carry'.

[42] The *n* in the collective must then have been restored.

[43] The plural -$\bar{o}na$ is evidently secondary (cf. Beekes 1981: 275).

kaurnō, pl. *kaurnōna* 'kernel(s)'
sigljō, pl. *sigljōna* 'seal(s)'
þairkō, pl. *þairkōna* 'eye of a needle'

Semantically less certain:

*sék^wmōn: YAv. *haxmąm* 'fellowship', cf. Ved. *sákman* loc.sg.;

Uncertain is whether OAv. *an-afšmąm*, *afšmānī* '(non-)verse' is old, since a PIE etymology is difficult.

2.5.3 Stems in **-ōr*[44]

*h₁eiōr 'days': OAv. *aiiārə̄* pl., YAv. *aiiąn* pl., related to Go. *air*, ON *ár*, OE *ǣr*, OHG *ēr* adv. 'early' < PGm. **airi*, and more distantly to Hom.Gr. ἄριστον n. 'breakfast' < **h₂eieri-h₁d-to-*;

*h₃ersōr: Hitt. *ḫaršār* nom./acc.pl.n. (*ḫar-ša-a-ar*, *ḫar-ša-ar*) 'heads, people, fronts, beginnings';

*ḱ(e)nsuōr in OAv. acc.pl.n. *sax^vārə̄* 'word, speech';

*k^wéḱmōr 'sign(s)' in Hom.Gr. τέκμωρ sg.n. 'goal, end; sign; proof', with a zero grade Gr. τέκμαρ 'sign, mark; goal, end'. Since τέκμωρ is exclusively Homeric, whereas τέκμαρ only post-Homeric, one of the forms is probably secondary, cf. Nussbaum 2014a;

*uth₂ṓr: Hitt. nom./acc.pl.n. *uttār* (*ut-ta-a-ar*, *ud-da-a-ar*) 'word, speech; thing, case; story; reason';

Some examples of mass nouns:

*puh₂ōr 'fire' is often reconstructed for ToA *por*, ToB *puwar* (cf. Adams 1999 s.v.), but the Tocharian formation may alternatively be identical to Gr. πῦρ, Umb. *pir*, ON *fúrr*, which would then continue **puh₂r* < **ph₂ur*. Along these lines ToA *ysār*, ToB *yasar* 'blood' might then be explained as well (< **h₁esh₂r*, not **h₁esh₂ōr*);

*skṓr 'excrement' in Gr. σκῶρ, gen. σκατός n. 'muck, excrement', Hitt. *zakkar* (*za-ak-kar*) n.sg. 'excrement, dung', *za-aš-ga-r*°/tskar/ in *zašgaraiš* n. 'anus';

*udṓr 'water(s)': Ved. *udā́* pl., Hom.Gr. ὕδωρ sg., Umb. **utur** acc.sg., Go. *wato* sg. (gen. *watins*), OHG *wazzar* sg., Lith. *vanduõ* sg., and Hitt. nom./acc.pl.n. *u̯idār* (*ú-i-ta-a-ar*, *ú-e-da-ar*, *ú-e-da-a-ar*).

Semantically uncertain, but neuter:

*h₁eh₂mōr 'day': Arm. *awr* sg. and Myc. *a-mo-ra-ma* /āmōr-āmar/ 'day after day'. For the Mycenaean formation, cf. Cypr. ἀματι-ἀματι 'id.', as well as Hom.Gr. ἦμαρ, Dor., Arc. ἆμαρ, -ατος with zero grade of the suffix, and Hom.Gr. ἡμέρα with full grade of the suffix;

*h₃nōr in Arm. *anurǰ* 'dream' < **onōr-i̯o-*. For the formation, cf. Hom.Gr. ὄνειρος 'god of dreams, dream' < **h₃n-er-i̯o-*, and Lesb. ὄνοιρος, Cret. ἄναιρον < **h₃n-r̥-io-*. Also cf. Hom.Gr. ὄναρ < **h₃én-r*.

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[44] There are two possible but uncertain examples with *ē*-vocalism: Lat. *sevērus* 'severe, strict' (Pl.) is analysed by Nussbaum (1998: 525) as an *o*-stem adjective **seg^h-u̯ēr-o-* derived from a collective **seg^h-u̯ēr* 'steadfastness, toughness', but it is not clear to me how the reconstructed meaning can be equated with collective semantics. Hitt. *ḫa-aš-du-e-er* nom./acc.sg.n. 'twig(s)' might be another example, but the form may alternatively continue a compound **h₃esth₁-g^wer-* (Lubotsky apud Kloekhorst 2008 s.v. ^(GIŠ)*ḫašduer-*).

Formally uncertain:

*$h_1(e)itōr$ 'way(s)': ToA sg. *ytār*, ToB sg. *ytārye* < *h_1i-*tōr*, but Lat. sg. *iter* (gen.sg. *itineris*) is uncertain: a reconstruction nom.sg. *h_1i-*tér*, gen.sg. *h_1i-*tn-és* implies that it was the singular form that had a long vowel in the suffix, for which De Vaan remarks that this would be unique for a neuter noun, and prefers Rieken's proposal of original *$h_1éi$-*tr*, gen.sg. *h_1i-*tén-s* (cf. Kloekhorst 2008: 489; De Vaan 2008: 311, both with further lit.). Rieken's reconstruction implies that the form *h_1i-*tōr* as reflected by Tocharian would represent the original collective;

*$k^w(e)tuór$ num. 'four': Go. *fidwor*, Lat. *quattuor*, cf. Ved. *catvár-i* n. < *-*ór-h₂*, OCS *četyre* < *-*ōr-es*. Gothic precludes a zero-grade, whereas Latin is not entirely straight-forward. Beekes (1987: 217) argues that *$k^w etuór$ cannot be a neuter plural (collective), and rather reflects an original nom.sg., which was reanalysed as a collective.[45] For instance, as Indo-Iranian is a branch where the neuter plural in *-*ōC* is synchronically attested as such, one would expect the form *$k^w tuór$ to have been preserved there. Instead, one finds Av. *caθβarō*, n. *catura* for expected *$caθβārə$. Another argument is from Germanic: as the final syllable of the Gothic form is not shortened (cf. Go. *swistar*), *fidwor* goes back to *$k^w etuór$+C, which may be a Germanic innovation. Beekes (ibid.) thinks that *$k^w etuōr$-h₂ (> *$k^w eþuōr-a$ > *fidwor*) is unlikely to be the pre-form, as the formation did not acquire (at least at a later stage) the normal neuter ending Go. -*a* (< *-*ā*). If the above is true, the form *$k^w etuór$ is not relevant for the discussion on collective formations.

2.5.4 Stems in *-*ōs*

The rather certain examples are mostly found in Avestan:

*$leukōs$ (OAv. *raocā̊s-čā*, YAv. *raocā̊* pl. 'lights' (*raocah-*));

*$menōs$ (OAv. *manā̊s-čā* pl. 'thoughts, minds' (*manah-*));

*$neb^hōs$ (OAv. *nabā̊s-čā* pl. 'sky, air' < *'clouds' (*nabah-*));

*$uek^wōs$ (YAv. *vačā̊s* pl. 'speech, talking' (*vačah-*));

*$ḱleuōs$ (OAv. *sravā̊*, *sravā̊s-čā* pl. 'words, fame' (*sravah-*), Ved. *śrávāṃs-i* pl. 'fame, praise, honour, reputation'), cf. Gr. κλέος sg. 'rumour, fame, renown, reputation';

*$tieg^wōs$ (?) (YAv. *iθiiejā̊* pl.n. 'danger' (*iθiiajah-*, *iθiiejah-*)), cf. Ved. *tyájas-* 'danger, alienation'. No cognates outside Indo-Iranian;

*$h_2edōs$ 'grain (dried stuff)': although Lat. *ador*, -*oris* n. 'coarse grain, spelt, barley' has a short vowel, a long vowel is attested in *adōreus* 'pertaining to/consisting of spelt, barley'. The form either reflects *-*ōr* or *-*ōs*, the latter being preferred in view of the connection with Go. *atisk* 'grainfield', Arm. *hat* 'grain' < *h_2ed-(e)s-. For the root, cf. Hitt. *hāt-ⁱ/hat-* 'dry up, become parched', Gr. ἅζομαι 'dry up'.

For other examples a true collective meaning is unclear, and the Latin forms may perhaps reflect an amphidynamic nominative singular in *-*ōs* instead:

*$b^h(e)lh_1tōs$ (ToB *pilta*,[46] ToA *pält* sg. 'leaf, metal');

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[45] Cf. the article (Beekes 1987) for a full discussion of the semantics of 'four' as a singular form.
[46] An alternant noun, i.e. masculine in the singular, and feminine in the plural.

*$h_3rd^h\bar{o}s$, -os- 'height, uprightness' (Lat. *arbor*, -oris (Pl.), nom.sg.f. *arbōs* (Verg., Ov.) 'tree'). Other cognates reflect a stem *h_3rd^h-uo- (Lat. *arduus*, Skt. *ūrdhvá-* 'tending up-wards, high', Gr. ὀρθός 'upright', OIr. *ard*);

*$\acute{k}el\bar{o}s$ 'cover, covering' (Lat. *color*, *colōs* (Pl.) m. 'colour'). The masculine gender may be secondary in Latin, cf. *$kruh_2\bar{o}s$ below. This also goes for Lat. *arbor*, as discussed above, and *sopor* (see below);

*$kruh_2\bar{o}s$ 'blood' (Lat. *cruor*, -oris m. 'bloodshed'). A neuter *s*-stem is found in Gr. κρέας and Skt. *kravíṣ-* 'raw meat' < *$kreuh_2$-s-;

*$suep\bar{o}s$ 'sleep' in Lat. *sopor*, -ōris m. 'sleep, sleepiness' (Pl.). However, De Vaan (2008) explains the *-ōr*-inflection by analogy: the nom.sg. *sopor* may also reflect *$suep$-$\underset{\circ}{r}$, and may have introduced *-ōr*- into the oblique from other forms with nom. *-or*, obl. *-ōr*-.

2.5.5 Stems in *-$\bar{o}u$

The examples are neuter formations in Hittite, but do not have a clear collective meaning:

*$d^h n\acute{o}u$ (Hitt. nom./acc.pl.n. *tanāu* (^{GIŠ}*ta-na-a-ú*) 'a kind of tree'). For the stem, cf. OHG *tanna* f. 'fir' < PGm. *$dan\underset{\circ}{u}\bar{o}$- and perhaps Skt. *dhánuṣ-* 'bow', but the etymology is not very solid;

*$h_2\acute{e}r\acute{g}n\bar{o}u$ might be the correct reconstruction for Hitt. nom./acc.sg.n. *ḫargnau* (*ḫar-ga-na-ú*) 'palm (of hand), sole (of foot)', though the Hittite form does not have plene spelling. For the reconstruction of the root, cf. Kloekhorst (2006: 93f; 2008: 308).

Although the examples are not very strong, it cannot be excluded that the type in *-$\bar{o}u$ is in-herited as a collective marker. However, in non-Anatolian IE *u*-stem collectives usually have *-uh_2 with a zero grade in suffix and ending, cf. §4.3.3.5. This means that either in non-Ana-tolian IE the *u*-stem collective marker *-$\bar{o}u$ has been replaced with *-uh_2, or that the type in *-$\bar{o}u$ is originally not a collective in PIE, or that *-$\bar{o}u$ is a Hittite innovation.

2.6 Static neuters in *$C\acute{e}C$-C

The type of inflection with nom./acc.sg.n. *$C\acute{e}C$-C, gen.sg. *$C\acute{e}C$-C-s has been postulated by Eichner (1973) and has been recently defended by Oettinger (2015). In addition to Eichner's original proposal concerning *-(ue)r/n-stems as belonging to this type, Oettinger suggests that neuter *s*-stems of this type existed as well. Detailed criticism of the acrostatic type with *ē/e*-ablaut is given by Kloekhorst (2014a), in which most of the material is elaborately discussed and need not be repeated here in its entirety. Therefore, I will limit myself to a few remarks on the basic points of the problem.

Eichner (l.c.) proposed that Hitt. *mēḫur*, gen. *mēḫunaš* 'time' derives from *$m\acute{e}h_2$-ur, gen. *$m\acute{e}h_2$-un-s by connecting Lat. *mātūrus* 'mature', *mānus* 'good' from a root *meh_2- 'to be the right time'. For this idea the assumption has to be made that the *ē/e*-ablaut was levelled in Hittite. Along the same lines, he reconstructs *$b^h r\acute{e}\underset{\circ}{u}$-$\underset{\circ}{r}$ for Gr. φρέᾱρ 'well' < *φρήϝαρ and *$\underset{\circ}{i}\acute{e}k^w$-$\underset{\circ}{r}$ for Gr. ἧπαρ, Av. *yākarə* 'liver'. Kloekhorst objects, that Eichner's proposal is not watertight on every aspect (2014a: 141ff.): for instance, it is not clear why Eichner recon-structs the strong cases with *ē*-vocalism and the weak cases with *e*-vocalism, since in no lan-

guage such a distribution is attested.

The forms for which the $\bar{e}/e$-ablaut is refuted by Kloekhorst (l.c.) are the following:[47]

*$i\acute{e}k^w$-$r̥$ (Gr. ἧπαρ, Av. *yākarə* 'liver'): the form *yākarə* is a scribal error for *yakarə*, ἧπαρ may have its vocalism from other body parts (κῆρ, ἧτορ, σπλήν) (cf. Szemerényi 1956: 191), but more importantly, the paradigmatic alternation between Lat. *iecur*, obl. *iociner-* and the mobile accentuation found in Skt. *yákr̥t*, gen. *yaknás* point to PD *$i\acute{e}k^w$-r, gen. *iok^w-$\acute{e}n$-s, as Kloekhorst argues.

However, apart from being an *ad hoc* solution, it must be objected that a good model or motivation for the analogical long vowel in Greek is not so easy to find: regarding the model, at least Gr. κῆρ and σπλήν are quite different in morphological shape from ἧπαρ, which make them rather unlikely to be have been a model. However, the form ἧτορ 'heart' has some potential to serve as a model: it must be observed that both Gr. ἧπαρ and ἧτορ are neuter *r/n*-stems and have an identical inflection, disregarding the different outcomes of the vocalic *$r̥$. In my opinion, Gr. ἧπαρ may perhaps be a blended form from ἧτορ < pre-Hom.Gr. *$\acute{e}t$-$r̥$ < *$h_1\acute{e}h_1t$-$r̥$ and unattested *$h\acute{e}p$-$r̥$. The analogy would then have worked as follows:

*$h\acute{e}p$-$r̥$ >> *$h\acute{\bar{e}}p$-$r̥$ > ἧπαρ

*$\acute{\bar{e}}t$-$r̥$ > ἧτορ

The analogy requires the assumption that it took place at a stage in which the final *r was still vocalic in both words. This is not a problem, since it is thought that the vocalic *$r̥$ in epic Greek was only eliminated at a relatively late (but pre-Homeric) stage (Van Beek 2013: 314). Regarding the motivation for such an analogy, one may perhaps think of a semantic connection: the heart and liver were closely related in Greek, since they were both considered to be very sensitive to human emotions by the Greeks (cf. the Prometheus myth, and Power/Rasko 2008). It must however be noted that this analogy is only designed to explain the long vowel in ἧπαρ, and is not supported by any other comparative evidence. Therefore, such an analogy remains somewhat uncertain.

*$b^h r\acute{e}u̯$-$r̥$ (Gr. φρέᾱρ 'well' < *φρήϝαρ): a zero grade is found in Go. *brunna*, ON *brunnr*, which is not possible in Eichner's own terms if the original paradigm had $\bar{e}/e$-ablaut. Therefore, a PD reconstruction *$b^h r\acute{e}h_1$-ur, obl. *$b^h r h_1$-uen- would fit the evidence better.[48]

*$m\acute{e}h_2$-ur as reflected by Hitt. *mēḫur* 'time'. Kloekhorst expresses his criticism towards the traditional etymology by using three arguments (2014a: 245ff.). First, he observes that the basic meaning of *mēḫur* is '(recurring) time period' rather than Eichner's interpretation "passende, rechte Zeit". Second, as Kloekhorst argues, the root *meh_2- is only attested in the Italo-Celtic branch (cf. Lat. *mātūrus*), which may point to a substratum origin. Third, the evidence in favour of Eichner's Law (cf. n. 50 below) can be interpreted differently, according to Kloekhorst. Therefore, he proposes a reconstruction *$m\acute{e}ih_2$-ur, with a root as

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[47] Only the first four forms are reconstructed by Eichner as such. The other reconstructions are from Kloekhorst along Eichner's line of thought. The reconstruction *$b^h \acute{e}r$-men- is from Villanueva Svensson (see Kloekhorst 2014a: 150).

[48] The *h_1 is reconstructed on the basis of the non-colouration in Arm. *albiwr* 'source' < Pre-Arm. *$br\bar{e}wr$, since for Greek a reconstruction with *h_2 would have worked as well (Kloekhorst 2014a: 144[20]).

seen in Skt. *minắti* 'diminish', Gr. μείων 'smaller'. For the semantics Kloekhorst compares the Hittite meaning 'a period of time that is ticking away' with 'minute' << Lat. *minuō* 'diminish'.

However, regarding Kloekhorst's second argument, another reflex of the root **meh₂-* is perhaps Go. *maiza* comp. 'more' < **méh₂is-on-*. Kroonen (2013: 35) argues that the root is inherited, since it may have been preserved as the comparative and superlative marker **-mh₂(on)-* > PGm. **-uman-*, cf. Go. *auhuma* 'higher'. If the root **meh₂-* as reflected in Germanic is the same **meh₂-* as seen in Lat. *mātūrus*, the argument is better disregarded from the discussion, pace Kloekhorst.

*séh₂-ur in Hitt. *šēḫur* 'urine'. Being formally similar to *mēḫur*, Eichner's reconstruction **séh₂-ur* is largely based on the etymology of *mēḫur*. However, Kloekhorst remarks that the root **seh₂-* does not mean 'verunreinigen, besudeln; beschmieren': Hitt. *šāḫ-ⁱ* means 'to clog, stuff, stop, block, fill in, plug up' and reflects **seh₂-* 'to stuff up'.[49] As an alternative etymology he connects the root **seikʷ-* (Ved. *sec-* 'pour (out)', SerbCS *sьcati* 'to piss', OHG *sīhan* 'filter, strain'), in which *šēḫur* would continue **seikʷ-ur*. In order to account for the reflex *-ḫ-* (**seikʷ-ur* should have given Hitt. ***sēkur*), he suggests borrowing from an Anatolian language where PAnat. **gʷ* (< PIE **kʷ*) yielded *-ḫu-*, e.g. Palaic. As he argues, a borrowing is understandable in view of the semantics (tabooistic reasons). See below for the probability of this scenario.

*h₂éḱ-ur in Hitt. ^NA₄*ḫekur* 'rock-sanctuary': since the form functions as a sumerogram and does not show inflection, the word is not an inherited formation.

*pér-ur in Hitt. *peru* 'stone' < pre-Hitt. **perur* with dissimilation. The Hittite form can also reflect a short vowel **per-ur*.

*Pér-r in Hitt. *É-er* 'house', obl. *párn-* < **Pér-n-*. Again, the form may also continue a form **Pér-r* with a short vowel.

*bʰér-men- in OCS *brěmę*, Ru. *berémja*, SCr. *brème* 'load, burden' < PSl. **bèrmę* and Ved. *bhárman*. However, the Vedic word is a *hapax* and the Slavic form points to a root-final laryngeal **bʰérH-mn*, which is then related to Skt. *bhárīman-* 'support'.

Kloekhorst's criticism of the acrostatic *ē/e*-ablauting paradigm can be summarized as follows:

1) Eichner's assumption that **ḗ* was specific for the direct cases and **é* for the indirect cases is not supported by the data.
2) Not in any language is the *ē/e*-ablaut synchronically attested within the same paradigm.
3) The instances where the direct cases *may* point to radical **ḗ* can also point to a full grade **é* (**pér-ur/**pér-ur* and **Pér-r/**Pér-r*).
4) The words for 'day' and 'brother' have radical stress throughout in Ved. *áhar*, *bhrā́tā* and point to original acrostatic inflection, but no trace of a lengthened grade (***Hḗǵʰ-*, **bʰrḗh₂tēr*) can be found in the daughter languages.[50]

One year later, Oettinger (2015) proposed that 1) Eichner's traditional etymology of Hitt. *šēḫur* from **séh₂-ur* can still be kept up; and that 2) the Indo-European languages provide

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[49] Cf. Gr. ἅμεναι 'satiate oneself', Lat. *satis* 'enough', ToB *soy-* 'be satiated'.
[50] In Eichner's reasoning we would have expected to find traces of **bʰrḗh₂tēr* by the non-colouring of the long vowel before a laryngeal, i.e. Eichner's Law. However, not in any language such forms are found (cf. Kloekhorst 2014a: 150).

evidence for $\bar{e}/e$-ablauting s-stems too.

For Hitt. *šēḫur* (~ CLuw. *dūr* 'urine'), Oettinger follows Rieken (1999: 450f.), who connects the form to CLuw. *ši(ḫu)wa-* (<*še-e-wa*> acc.sg.n.), *šiḫuwaḭ(a)-* (<*ši-e-ḫu-wa-en-zi*> adj.nom.pl.c.) 'bitter, sour', *ši(ḫu)wāl* 'dagger', all going back to a root *seh_2-* 'scharf sein, stechend sein' (Oettinger 2015: 259). Second, he follows Gamkrelidze/Ivanov 1995 in reconstructing an adjectival form *sh_2ur-ó-* > *$suh_2ró$-* > *$s\bar{u}ró$-* 'flüssig-sauer', which was derived from this root *seh_2-*, on the basis of ON *súrr*, OE, OHG *sūr* 'sour', Lith. *sū́ras*, Latv. *sũrs* 'salt, salty, bitter', and OCS *syrъ* 'damp, fresh' (Oettinger l.c.). Therefore, as he concludes, a reconstruction *$s\acute{e}h_2$-ur* is justified by the Anatolian evidence and not contradicted by the outer-Anatolian material. Hence, the form *$s\acute{e}h_2$-ur*, gen. *$s\acute{e}h_2$-un-s*, as well as the $\bar{e}/e$-inflection type may be of PIE origin (Oettinger 2015: 261).

Based on the conclusion that this inflection type existed in the proto-language, he reconstructs nom./acc.sg.n. *$n\acute{e}b^h$-s*, gen. *$n\acute{e}b^h$-s-s* 'cloud(s)' on the basis of HLuw. *tipas* 'sky, heaven'. The form Hitt. *ne(-e)-pí-iš* would continue *$n\acute{e}b^h$-es* or *$n\acute{e}b^h$-es* and CLuw. *tappaš* would point to *$n\acute{e}b^h$-e/os*, according to Oettinger. For the *e* in the suffix *-es-* he follows Melchert's idea that it arose by anaptyxis in post-PIE times (ibid.).

In order to explain the long vowel *-í-* in OIr. *síd* 'fairy mound, peace' < *$s\acute{e}d$-os*, Oettinger subsequently reconstructs an older nom.sg. *$s\acute{e}d$-s* 'domicile, seat'. On the basis of MW *hedd* m./f. 'peace' < *sed-* he argues that the $\bar{e}/e$-ablauting paradigm was preserved in Insular Celtic (*$s\acute{e}d$-s*, gen. *$s\acute{e}d$-s-s*) (Oettinger 2015: 262ff.).

Although Oettinger's proposal is semantically not impossible, the connections have some formal as well as methodological problems:

a) concerning Hitt. *šēḫur*, the initial *s-* of the root *seh_2-* now has two reflexes in CLuw. (*d-* in *dūr* vs. *š-* elsewhere), which Oettinger does not discuss.[51]

b) For HLuw. *tipas*, Hajnal (1995a: 63) remarks that HLuw. *-i-* can reflect pretonic short *e* as well: the Luwian form would then continue a stem *neb^h-és-* (cf. also HLuw. *i-sà-nu-wa/i-* 'to seat, settle' < *h_1es-néu-*). This suggestion is not discussed by Oettinger. Instead, he is quite explicit about HLuw. *-i-*, for which only a reconstruction *$\acute{e}$* would be possible here (Oettinger 2015: 261f.). However, I do not see why HLuw. *tipas* could not continue *neb^h-és-*: the methodological advantage of reconstructing *neb^h-és-* rather than *$n\acute{e}b^h$-s* is that the Luwian form is explained from a morphological category that is already well-established, i.e. the neuter *s*-stems of the type *men-os* (after Schindler 1975b), and that no new category is introduced.

c) Oettinger explains the suffixal full grade in OIr. *síd* < *$s\acute{e}d$-os* by the assumption that the corresponding loc.sg. was originally *sd-és* (just as in the same way a loc.sg. *nb^h-és* would have existed to *$n\acute{e}b^h$-s*): the stem of the gen.sg. *$C\acute{e}C$-s-s* would have been replaced by *CeC-és-* on the basis of the suffix in the loc.sg. *CC-és*. Subsequently, the stem *CeC-és-* was generalized throughout the paradigm. After that, the *o*-grade in the nom./acc.sg. *$s\acute{e}d$-os* arose by weakening of *-es* in unaccented position.

In my opinion this scenario is highly unlikely, since Oettinger now breaks with his own set of rules: assuming that in addition to an acrostatic paradigm *$C\acute{e}C$-s*, gen. *$C\acute{e}C$-s-s* there was a loc.sg. *CC-és* with suffixal accent makes the paradigm not acrostatic, i.e. mo-

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[51] The problem of the initial consonants is recognized by Kümmel (2011: 432), but he offers no solution either.

bile, by definition. Importantly, positing a loc.sg. *CC-és* for the acrostatic paradigm is not based on direct evidence: it is only reconstructed in order to explain the presence of the full grade in the suffix of *sḗd-os*.

Because of the aforementioned methodological inconsistencies, we must look for other kinds of explanations, such as comparative evidence. In addition to OIr. *síd*, the form Lat. *sēdēs* 'seat, abode' also has LG root vocalism. However, the Latin form is ambiguous, since it is unclear whether the suffix *-ēs* reflects an *s*-stem (< *-ēs*) or an *ē*-stem (< *-eh₁*- + *-s*). An argument in favor of the latter option was proposed by Kuiper (cf. Schrijver 1991: 376): Skt. *sadhás-tham* n. 'seat, abode' and *sádhiṣ-* n. 'id.' would point to a stem *sed-H-(e)s-* with a laryngeal (with a secondary *s*-stem).This may suggest that Lat. *sēdēs* is a *h₁*-stem too.

However, as Schrijver admits (ibid.), there are some difficulties to overcome: Latin would reflect a LG stem *sēd-eh₁*-, whereas Sanskrit has FG *sed-h₁*-. At any rate, the argument to connect OIr. *síd* and Lat. *sēdēs* – both allegedly continuing an *s*-stem with LG root vocalism – is not compelling. Therefore, Schrijver proposes that the stem *sēd-eh₁*- may be secondary: in Latin a merger of an original root noun *sēd-* and a *h₁*-stem *sed-eh₁*- may have taken place, yielding Lat. *sēdēs*. The reason for this merger may have been that the inflection of the root noun and the *h₁*-stem only differed in the nom.sg. after the laryngeals were lost and acc.sg. *-ēm* was shortened to *-em* (i.e. nom.sg. *sēds* vs. *sēdēs*, but acc.sg. *sēdem* in both cases). Of course, a similar merger may have taken place in the prehistory of Old Irish, here of the same root noun *sēd-* and the *s*-stem *sed-(e)s-* (cf. Gr. ἕδος, Skt. *sádas-*), yielding the form *síd*. This is an easier and methodologically more preferable solution than assuming that the vowel difference between OIr. *síd* and MW *hedd* is old. Since the cost of Schrijver's scenario is that the semantic difference between *sēd-* and *sed-eh₁*- would be obscure (Schrijver l.c.), his proposal remains uncertain.

A second approach to explain Lat. *sēdēs* is that one could think of Lachmann's Law, starting from *sed-h₁-s-* > *sēd-h₁-s-* (with subsequent generalized FG of the suffix *-eh₁*-). However, this approach leaves OIr. *síd* unexplained, since the form excludes a laryngeal (< *sēd-os*).

Thirdly, in an unpublished article, Lubotsky suggests that the long vowel in Latin may be the result of Kortlandt's rule of *d* > *h₁*, which would have led to alternations within the paradigm (*sed-es-*, *sed-s-* > *sed-es-*, *seh₁-s-*). Subsequently, the lost *d* would have been restored independently in the daughter languages: in Sanskrit before the laryngeal (*sádhiṣ-* < *sedh₁-s-* << *seh₁-s-*) (Skt. *sadhás-* must then have analogical *-dh-*), whereas in Latin after the laryngeal (*sēd-ēs* << *seh₁d-s-* << *seh₁-s-*). However, this scenario requires an additional analogical remodelling to explain the long vowel in Lat. *-ēs*, which here cannot directly reflect a PIE form with *h₁*-suffix. In short, Lubotsky's scenario can explain all formations (OIr. *síd*, MW *hedd*, Gr. ἕδος, Skt. *sádas-*, *sádhiṣ-*, *sadhás-*, Lat. *sēdēs*) from an original ablauting *s*-stem (acc. *sd-és-m*, gen. *sd-s-és*), of which the forms reflecting a laryngeal are explained by the sound change *d* > *h₁* with subsequent post-PIE analogical restoration of *d*. In this proposal there is no reason to posit an acrostatic paradigm *sḗd-s*, gen. *sḗd-s-s* on the basis of OIr. *síd* and MW *hedd*.

Apart from the formal problems with the reconstructions *$n\acute{e}b^h$-s* and *$s\acute{e}d$-s*, explaining HLuw. *tipas* and OIr. *síd* from static neuter *s*-stems with *ē/e*-ablaut is largely based upon the assumption that Eichner's reconstruction of the static *ē/e*-inflection type for *r/n*-stems is correct. Now that for *r/n*-stems most of the evidence in favor of this type can be better explained differently,[52] the probability that PIE had static neuter *s*-stems with *ē/e*-ablaut becomes doubtful.

On the other hand, Oettinger (2015: 258[4], following Kümmel 2011: 432) is correct that Kloekhorst's assumption of Hitt. *šēḫur* as a Palaic loan, where PAnat. *g^w > -ḫu-*, would be *ad hoc*. This makes Kloekhorst's etymology of *šēḫur* from *$seik^w$-ur* uncertain. However, I prefer a proposal that is *ad hoc* (Kloekhorst's) over a proposal with formal problems (Rieken-Oettinger's).

Having discussed all the evidence that is used in favour of reconstructing an acrostatic *ē/e*-ablaut inflection pattern, we can draw some conclusions from the material. In addition to Kloekhorst's objections (1-4, see above), to my mind the following points can be added:

5) Only very few words can be reconstructed for this inflectional type, which makes the probability that the *ē/e*-ablauting paradigm existed in the proto-language rather fragile in any case.
6) For all the etymologies for which this type of inflection is proposed, an alternative explanation is available.
7) Methodologically it is to be preferred to explain the creation of a linguistic form as young as possible. Therefore, one should not posit an inflection type for PIE if one cannot explain the evidence otherwise, certainly if the etymologies are formally weak. Having seen the evidence of alleged *ē/e*-ablauting forms, this idea specifically applies to the arguments used in favour of a static *ē/e*-ablauting paradigm for PIE. General criticism to this methodology is formulated by Kortlandt as follows (2012):

> "While the necessity of a strict chronological ordering is commonplace among philologists, there appears to be a general tendency for historical linguists to date prehistoric developments as far back in time as they possibly can. (…) The attractiveness of projecting a variety of formations back in time lies in the freedom it allows the investigator to choose between different reconstructions in accordance with his theoretical preconceptions. The history of Indo-European reconstruction can to a large extent be seen as a gradual limitation of this freedom. It is therefore advisable to be cautious when a new theory enlarges rather than restricts the number of possible reconstructions."

Thus, although formulated as general criticism regarding methodology, in relation to the *ē/e*-ablauting formations Kortlandt's criticism specifically implies that the evidence from the IE daughter languages with LG, allegedly supporting a reconstruction of acrostatically inflected neuter nouns with *ē/e*-ablaut, need not be of IE date and may in fact reflect secondary formations, which were created in the separate languages.

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[52] Only Gr. ἦπαρ remains a difficult form to explain, if one is not willing to accept the analogies, as discussed above.

In short, on formal (Kloekhorst 2014a) as well as methodological grounds (Kortlandt 2012) there appears to be no compelling reason to reconstruct an acrostatic inflection type with $\bar{e}/e$-ablaut for Proto-Indo-European.

2.7 Locative singular

Apart from the nominative, the locative is the other morphological category within the nominal system of Indo-European where LG formations are frequently found. A characteristic feature of the locatives with a long vowel is that these most often lack suffix marking, and are therefore usually called 'endingless' locatives. The evidence can be divided into two groups: proterodynamic locatives (with subdivisions by stem class) and locatives of root nouns. Much fewer different types of locatives are attested in the IE daughter languages than the number of types for the nominative singular, which therefore results in a shorter treatment of the attested forms.

2.7.1 Proterodynamic loc.sg.

2.7.1.1 *i*-stems
The *i*-stem ending *-$\bar{e}i$ is preserved in Vedic (-$\bar{a}$), Avestan (-$\bar{a}$), and Germanic (Go. -*ai*, Old Runic -*ai*):
Ved. *agnā́* m. 'fire, Agni' < *h_1ng^w-$n\acute{\bar{e}}i$ (*agní*-),[53] cf. Lat. *ignis*, Lith. *ugnìs* 'fire';
OAv. *ištā* f. 'will' (*išti*-) < *h_2is-$t\bar{e}i$, cf. Lith. *(j)ieškóti* 'seek', OHG *eiscōn* 'claim, demand';
YAv. *gara* (v.l. *garō*) m. 'mountain' (*gairi*-) < *g^wrH-$\bar{e}i$, cf. Ved. *girí*- m., OCS *gora* f. 'id.';
    Lith. *girià* f. 'woods'; Gr. βορέας m. 'north wind'.

In Gothic, probably the feminine *i*-stems in dat.sg. -*ai* continue the inherited ending *-$\bar{e}i$, cf. *qenai* 'woman' (*qens*), *ga-runai* 'concourse' (*ga-runs*), whereas the masculine forms, e.g. Go. *gasta* 'guest' (*gasts*), and *staþa* 'place' (*staþs*) < PGm. *gasti-, *staþi-, have an analogical ending -*a* (< dat.sg. *-$\bar{o}i$) which was adopted from the *o*-stems (Boutkan 1995: 247).
    Perhaps one can adduce OR -*ai*, e.g. *winai* (Årstad stone 300 AD), *faþai* (Charnay clasp 550-600 AD), but due to expected monophthongization, Boutkan considers -*ai* as problematic, i.e. possibly secondary (Boutkan 1995: 236, 246).

2.7.1.2 *u*-stems
The ending *-$\bar{e}u$ is continued in Indo-Iranian (Ved. -*au*, Av. -$\bar{a}u$, -*au*) and Germanic (Go. -*au*, OR -*iu*, -$\bar{o}$).

One example with clear cognates is the word for 'son':
*suH-$n\bar{e}u$ (Skt. *sūnáu* m. (*sūnú*-), Go. *sunau* dat.sg.m. 'son').

More evidence is given by branch:

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[53] Also *agnáu* is attested.

Indo-Iranian:

Ved. *aktáu* 'at night' (*aktú-*) < *ng^{wh}-t-ếu*, OAv. *xratāu* m. 'plan' (*xratu-*), OAv. *vahāu* adj.loc.sg.n. 'good' (*vahu-*), YAv. *vaŋhāu* 'id.', OAv. *prtau* m./f. 'passage' (*prtu-*).

Germanic:

Go. *handau* 'hand', OR *kunimudiu, hakuþō*, meaning uncertain (with *-ō* < *-æu* < *-ēu*, cf. Kortlandt 2010: 206-7; Boutkan 1995: 256-7).

2.7.1.3 *n*-stems

A good example is OAv. *cašmąm* 'eye' < *-mēn* with assimilation of the final nasal to the preceding *-m-* (for preserved non-final *-n-*, cf. du. *cašmaini* < *-men-h₁*).

2.7.1.4 *m*-stems

According to Kloekhorst (2008: 858), Hitt. *tagān* 'earth' (most often <*da-a-ga-a-an*>) reflects *d^hg^hốm* with a long vowel,[54] since *$d^hǵ^h$óm* would have yielded **tagūn* (cf. acc.sg.c. *kūn* < *$ḱóm$* 'this').

2.7.1.5 *r*-stems

Though not synchronically a locative, Gr. νύκτωρ adv. 'at night' (Hes.) < *nog^{wh}tōr* may originally have been an endingless locative in view of its semantics. For the stem, cf. Hom.Gr. νυκτερίς, -ίδος f. 'bat', Gr. νύκτερος adj. 'nightly', and Lat. *nocturnus* 'of the night'. The form might also have an analogical origin, since it is parallel to the word for 'day', cf. Myc. *a-mo-ra-ma* /āmōr-āmar/ 'day after day' (§2.5.3).

2.7.1.6 *s*-stems

ON *í gær*, OSw. *ī gār* 'yesterday' < *$d^hǵ^h$ēs*. See §3.2.6 for related forms with short vocalism.

2.7.2 Loc.sg. of root nouns

$sēmi$ 'half', probably reflecting older *$sēm$* (Ved. *ásāmi-* 'not half, completely', Hom.Gr. ἡμι-, Lat. *sēmi-*, OE *sam-*, OHG *sāmi-*);

OAv. *dąm* 'house' < *$dēm$*. Strictly phonologically the quality of the vowel cannot be determined exactly (*$dēm$* or *$dōm$*), but on the basis of *$sēmi$* one can rather safely argue for *ē*-vocalism;

Hitt. *šēr* in *še-e-er=ši-i* 'above him', which Kloekhorst (2008: 745) reconstructs as an endingless locative *$sēr$*. Perhaps a formal variant *$séri$* with FG is reflected by CLuw. *šarri* 'above, up'.

OIr. *ís* 'below' probably reflects an original locative plural, if from *$pēd-su$* 'at the feet'. The LG vocalism is explained by Matasović (2009: 131) as spread from the original nom.sg. *$pēd-s$*, but in my opinion the LG may alternatively have originated in the corresponding loc.sg. *$pēd$*. This form is not directly attested as such, but OIr. *ís* may indirectly support the hypothesis that a loc.sg. *$pēd$* did exist at some point in time.

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[54] Alternatively *$d^hǵốm$*, cf. §2.3.5, n. 23.

3 Counterevidence

This chapter is intended to be a survey of the counterevidence to the three phonetic explanations for the origin of the IE lengthened grade. Just as in the previous chapter, only evidence of nominal formations will be given.

3.1 Nominative singular forms without LG

Regarding monosyllabic lengthening, there appears to be counterevidence among nominative singular forms. The examples include the following, categorized by branch:

PIE examples:[55]

*h₃dont(s) (Ved. *dán*, acc. *dántam*, gen. *datás* 'tooth'), cf. Gr. ὀδών (Soph.), ὀδῶν (Hdt.), Go. *þunþus* (< *tunþus**), ON *tǫnn*, OE *tōð*, OFri. *tōth*, OHG *zan(t)*;

*h₃est n. 'bone' (Lat. *os*, gen.sg. *ossis*, Av. *as-ca* < *-*kʷe*, gen.sg. *astō*, MW *as-curn*, *as-cwrn*), cf. Hitt. *ḫaštāi/ḫašti-*, Ved. *ásthi*, Hom.Gr. ὀστέον;[56]

*nókʷts (Ved. *nák*, Lat *nox*, Gr. νύξ, Go. *nahts*, OS, OHG *naht* f. 'night');

*preḱs 'question' (Lat. *prex* f. 'prayer', W *rheg* 'gift; curse' < PCl. **φrek-*). Skt. *prā́ś-* f. 'dispute, questioning, statement or assertion in a debate or lawsuit' (AV) may preserve the original vocalism (with generalized LG).

*-séd-s 'sitter' (Ved. *adhma-sát* m. 'Tischgenosse, companion at a meal', Lat. *-ses*, obl. *-sid-* (e.g. *ob-ses* 'hostage, surety', *prae-ses* 'guardian, custodian'));

*spéḱs 'watcher' (Ved. *spáṭ* m. (acc.sg. *spáśam*, nom./acc.pl. *spáśas*), YAv. *spaš* m. (acc.sg. *spasəm*, nom.pl. *spasō*), Lat. *-spex* in *haruspex* m. 'priest who inspects sacrificial animals' organs', *au-spex* 'augur');

*tuéḱ(s) (Ved. *tvák* m., cf. Hitt. nom./acc.sg.n. *tuekkan* 'form, skin').

Vedic examples:

véṣ m. 'bird' < **h₂uéis*;

víṭ f. 'settlement, dwelling-place, house, community, tribe, people' (*víś-*) < **u̯iḱ-(s)*.

Latin examples:

nex f. 'violent death, murder' < **neḱs*, cf. OAv. *nas-*, Gr. νέκες (H.);

grex m./f. 'flock, herd'. Perhaps related to Khot. *haṃ-grīs-* 'gather, assemble', Gr. γάργαρα n.pl. 'heaps, lots (of people)'.

ops f. 'power, ability' < **h₃eps*;

stips f. 'small offering of money, alms' < **stips*;

vas, gen.sg. *vadis* m. 'surety' < **u̯odʰs*;

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[55] Kümmel (2015: 280) gives **kʷséps* 'night', which is not attested in the nom.sg., however (e.g. Ved. ins.sg. *kṣapā́*, gen.sg. *kṣapás*, YAv. gen.sg. *xšapō*, dat.sg. *xšape*). For other forms which he gives, viz. **h₂melḱs* 'milk' and **morḱs* 'border', I did not find relevant evidence either (for instance, YAv. *marəza-* m. is an *o*-stem).

[56] Either Vedic and Greek reflect a stem **h₃esth₁(-i-)*, or the Vedic form can be explained as generalized from the collective **h₃est-h₂*. In the latter scenario Greek and Hittite share an *i*-suffix.

au-ceps m. 'bird-catcher' and other formations in *-ceps* (*forceps*, *manceps*, *princeps* etc.) <
     **kh₂p-*, cf. RuCS *xapati* 'seize, snatch';
Not necessarily old are formations in *-fex*, e.g. *artifex* 'craftsman', *opifex* 'id.' *aurifex* 'gold-
     smith', as these may have been directly derived from the verbal root (*faciō*) in Pre-Latin
     times.

Greek examples:
ἄλοξ, -κος f. 'furrow' < *h₂uolks;
ἕν n. 'one' < *sém;
ὄνυξ m. 'nail' < **h₃nog^{wh}s*;
ἐπί-τεξ f. 'close to delivery' < **tek-* 'bring forth';
φλέψ f. 'vein': an IE etymology is doubtful, since the form stands isolated.

3.2 Endingless locatives with FG

In addition to the IE locative types **-eC-i* (Ved. *pitári*) and **-ēC* (§2.7), there was a third type
in **-eC*. This endingless locative with a short suffix vowel is attested in several Indo-Euro-
pean languages, but especially in Vedic. The evidence is mostly limited to Vedic *n*-stems in
**-en*, but there is also evidence for **-eu*, **-em*, **-er*, **-es*, and **-ot*. The forms in **-eR* can be
considered as an argument against Kortlandt's lengthening before word-final resonant. Alt-
hough the *s*-stems and *t*-stems are not true counterarguments to Kortlandt's theory, the evi-
dence is given for the sake of completeness.

3.2.1 *n*-stems
Since in Vedic a form in *-an* often coexists with one in *-ani*, this latter form is given as well:

Ved. *sákman* n. 'fellowship' (*sákman-*) < **sek^w-men*;
Ved. *āsán* n. 'mouth, face', also *āsáni* (*āsán-*) < *h₁eh₃-os-en / *h₁eh₃-es-en, cf. Lat. *ōs* n.;
Ved. *śīrṣán* n. 'head, top' < **k̑rh₂-s-én*;
Ved. *jánman* n. 'birth, origin' < **g̑enh₁-men*, cf. Lat. *germen* n. 'germ, offshoot' < *genmen;
Skt. *yūṣán* n. 'soup, broth, stock' (TS) (*yūṣán-*) < *iuHs-én, cf. gen.sg. *yūṣṇáḥ* (RV), Lat. *iūs*,
     Lith. *jū́šė*, SCr. *júha* (< **iouHs-*);
Skt. *héman* 'winter' (KS, TS+) < **g^heimen*, cf. Av. *zaen-* m., Hom.Gr. χεῖμα n., χειμών m.;
Hom.Gr. αἰέν adv. 'always' < *h₂ei-u-én, cf. Hom.Gr. αἰών, -ῶνος m./f. '(life)time, eternity'.

Two examples with masculine gender:
Ved. *tmán* m. 'breath, soul', also *tmáni* (*ā́tman-/tmán-*) < *h₁h₁t-mén;
Ved. *mūrdhán* m. 'head, summit' (*mūrdhán-*) < **mlh₃d^h-én*.

3.2.2 Heteroclitic stems
Ved. *udán* n. 'water', also *udáni* < *ud-én, cf. Hom.Gr. ὕδωρ;
Ved. *áhan* n. 'day', also *áhani* and *áhar* < **Heg̑^h-r/n-*, perhaps related to ON *dægr*, *dægn*, OE
     dōgor, *dōger* n. 'a full day' < PGm. **dōger/na-* with irregular correspondence of **d^h* ~ *H;
Ved. *ū́dhan* n. 'udder', also *ū́dhani* < **h₁euHd^h-r/n-*, cf. Gr. οὖθαρ;
Ved. *ū́dhar* n. 'frost, cold', also *ū́dhani* < **h₂uh₁-d^her/n-* (?), cf. Av. *aod-r-* 'id.'.

3.2.3 *u*-stems

YAv. *aŋhuuō* m. 'lord' (*aŋhu-*) < *$h_2$ns-eu*, cf. Hitt. *ḫassu-* 'king';

YAv. *bāzuuō* m. '(upper) arm' < *-$b^h eh_2 ǵ^h eu$*;

YAv. *gātuuō* m. 'way, road' (*gātu-*) < *$g^w eh_2$-teu*, cf. Ved. *gātú-*;

YAv. *zaṇtuuō* m. 'region' (*zaṇtu-*) < *$ǵenh_1$-teu*, cf. Ved. *jantú-*;

YAv. *daṅhuuō, daṅhō, daṅhauu-a* m. '(inhabibant of a) country, people' (*daṅhu-*) < PIIr. *dasyau*.[57]

For all Avestan forms, cf. De Vaan (2003: 364-370).

3.2.4 *m*-stems

Ved. *kṣám* f. 'earth', also *kṣámi* < *$d^h ǵ$-ém*. Of this stem a formation with long vowel exists as well, viz. Hitt. *tagān*, for which see §2.7.1.4. Cf. also the *n*-stem Ved. *jmán* 'id.' < *$d^h ǵ$-m-én*;

Hitt. *andan* adv. 'within, inside', Gr. ἔνδον adv. 'inside, at home', usually explained as a compound from of *$h_1 en$ + an endingless locative *dom* 'house' (cf. Beekes 2010 s.v.). A formation without final nasal is found in Hitt. *anda* 'in(to), inwards', OLat. *endo* 'in, on, to' < *-do*. If the analysis of the former two forms (Hitt. *andan*, Gr. ἔνδον) as *$h_1 en$-dom* is correct, the latter two forms (Hitt. *anda*, OLat. *endo*) must be separated from them, since these lack a final nasal.

3.2.5 *r*-stems

YAv. *duuarə* 'door' < *$d^h uer$*. However, it is debated whether this form is authentic (Kellens 1974: 385f.), and the vocalism can be analogical after the acc.sg. *duuarəm*.

3.2.6 *s*-stems

Gr. χθές adv. 'yesterday' < *$d^h ǵ^h és$*, cf. Lat. *heri*, Alb. *dje* < *$d^h ǵ^h esi$*, ON *í gær*, OSw. *ī gār* < *$d^h ǵ^h ēs$* (cf. §2.7). However, the Greek form can alternatively be explained as a PD genitive *$d^h ǵ^h$-es-s* (Van den Oever apud Kloekhorst 2014b: 45). A formation with *-i-* is found in Ved. *hyás* 'id.', usually reconstructed as *$d^h ǵ^h iés$* or *$ǵ^h diés$* (Mayrhofer 1986: 822), but which Van den Oever (apud Kloekhorst ibid.) compares to Hom.Gr. χθιζός 'of yesterday', reflecting *$d^h ǵ^h$-di-os* with the root *dei-* 'day'. If all correct, none of the forms belong here.

Also with the root *dei-*: Ved. *sadyás* 'in one day' < *sm-di-és* and Ved. *sa-dívas* 'id.; straightaway, at once' < *sm-di-u-es*;

Gr.Dor. αἰές adv. 'always' < *$h_2 ei$-u-és*, cf. the petrified acc.sg. αἰῶ 'id.' < *αιϝοσ-α.

3.2.7 *t*-stems

A possible example of a *t*-stem locative may be Hitt. *šīu̯at* 'at the day' < *diéu-ot*, for which Kloekhorst argues that it replaced older *diu-ét* (Kloekhorst 2013: 123).

3.2.8 Root nouns

Perhaps Ved. loc.sg. *ráṇ* f. 'happiness' (ins.sg. *ráṇā*, dat.sg. *ráṇe*), but the word does not have an IE etymology.

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[57] For YAv. *-uuō* and *-ō*, cf. Beekes 1998.

3.3 Vocative singular

The vocative in Indo-European has FG of the suffix and no ending in most stem classes. Just as the locative in *-eR* (§3.2), this formation is important evidence against Kortlandt's lengthening before word-final resonant.

3.3.1 Root nouns (cf. §2.2 for cognates)
*-$g^{wh}én$ 'slayer' (Ved. *vr̥tra-han* 'Vr̥tra-slayer (epithet of Indra)');
*$\acute{k}uon$ (Hom.Gr. κύον 'dog');
*$dieu$ (Ved. *dyàus*, Gr. Ζεῦ 'sky and thunder god'), but perhaps an old HD *u*-stem, cf. §2.2;
*h_2ner (Hom.Gr. ἄνερ 'man').

3.3.2 PD *i*-stems (cf. §2.7 and §3.5.1.1 for cognates)
*$pot-ei$ (Ved. *pate*, *dámpate* m. 'lord (of the house)');
*h_1ng^w-nei (Ved. *agne* m. 'fire, Agni');
*$(s)\acute{k}euk-ei$ (Ved. *śuce* adj. 'shining, bright, pure' (*śúci-*)), for the reconstruction of the root, cf. Lubotsky (1988: 30);
*$\acute{g}^hel(H)-ei$ (Ved. *hare* adj. 'pale, yellowish', m. 'yellow horse' (*hári-*));
*$mn-tei$ (Ved. *mate* n. 'thought'), cf. Lat. *mentis*.

3.3.3 HD *i*-stems (cf. §2.3.3.1 for cognates)
*b^heid^hoi (Gr. Πειθοῖ (Ar.) f. '(goddess of) persuasion').

3.3.4 *u*-stems (cf. §2.7 and §3.5.1.2 for cognates)
*$suHneu$ (Ved. *sūno* m. 'son').
*$menieu$ (Ved. *manyo*, Av. *mainniō* m. 'spirit')

3.3.5 *n*-stems (cf. §2.3.6.2 for cognates)
*$h_2reh_1\acute{g}on$ 'helper' (Ved. *rā́jan* m. 'king').

3.3.6 *r*-stems (cf. §2.3.7.2 for cognates)
*d^hugh_2ter (Ved. *duhitar*, Hom.Gr. θύγατερ, OLith. *dúkter* f. 'daughter');
*meh_2ter (Ved. *mātar*, Hom.Gr. μῆτερ f. 'mother');
*ph_2ter (Ved. *pitar*, Hom.Gr. πάτερ m. 'father');
*deh_2iuer (Gr. δᾶ̃ερ m. 'husband's brother');
*$suesor$ (Gr. ἔορ f. 'sister');
*$déh_3tor$ (Hom.Gr. δῶτορ 'giver');
*$\acute{g}énh_1tor$ (Ved. *janitar* m. 'progenitor').

3.4 Dative singular

Another category which does not show lengthening before word-final resonants is the dat.sg. ending in *-ei*. This ending is found in e.g. Indo-Iranian and Mycenaean (Ved. *-e*, OAv. *-ōi*, YAv. *-e*, Myc. <*-Ce*> /-ei/):

*diuéi (Ved. divé, Myc. di-we /diwei/ 'Zeus');
*h₂nérei (Ved. náre, OAv. narōi m. 'man');
*sé/ókʷHiei (Ved. sákhye, YAv. haše m. 'fellow').

See §2.2 and §2.3.3.1 for more cognates.

3.5 Genitive in *-eR-s

The genitive in *-eR-s is well-known evidence against Szemerényi's Law. The evidence is given by stem class:

3.5.1 PD gen.sg.

3.5.1.1 i-stems
*pot-ei-s (Ved. pátes, OAv. patōiš m. 'lord' (paiti-));
*gʷrH-éi-s (Ved. girés, YAv. garōiš m. 'mountain' (gairi-)), cf. OCS gora f. 'id.'; Lith. girià
    f. 'woods'; Gr. βορέας 'north wind';
*h₁ngʷ-néi-s (Ved. agnés m. 'fire, Agni'), cf. §2.7.1.1;
*h₂u-éi-s (Ved. véṣ m. 'bird' (ví-)), cf. Lat. avis;
*h₃egʷʰ-ei-s (Ved. áhes m. 'snake'), cf. Hom.Gr. ὄφις, gen. -ιος, -εος, -εως;[58]
*bʰuH-rei-s (Ved. bhúres, OAv. būrōiš adj. 'abundant' (būiri-)), cf. Lith. būrỹs m. 'crowd'.

Another Avestan form without a direct parallel in Vedic is Av. aṣ̌ōiš f. 'reward' (aṣi-) < QIE
*h₁er-tei-s;

3.5.1.2 u-stems
*suH-nou-s (Lith. sūnaũs, OCS synu, Ved. sūnós, Go. sunaus m. 'son');
*kret-e/ou-s (Av. xratə̄uš m. 'intelligence' (xratu-)), cf. Ved. krátu- m. 'power', Gr. κρατύς
    adj. 'strong';
*gʷh₃-éu-s (Ved. góṣ, OAv. gə̄uš f. 'cow');
*men-i-éu-s (Ved. manyós, OAv. mainə̄uš m. 'spirit').

3.5.1.3 n-stems
*h₃n-men-s (OIr. anm(a)e 'name' (nom.sg. ainm));
*dʰeh₁-men-s (YAv. dāmą̄n n. 'creature, creation' < *dāmą (dāman-)), cf. OAv. dāman-
    'place, abode', Ved. dhā́man- 'id.', Gr. ἀνά-θημα 'votive (temple-)offering; ornament';
*sekʷ-men-s (OAv. haxmə̄ŋg n. 'community' (haxman-)), cf. Ved. loc.sg. sákman;
*kʷekʷḱ-men-s (?) (OAv. cašmə̄ŋg 'sight' (cašman-)), cf. Ved. cakṣ- 'see'.

Only Old Irish and Avestan preserve the original form *-en-s: the Gothic ending -ins (cf.
hairtins n. 'heart', gumins m. 'man') is perhaps not from *-ens, but may reflect analogical
*-en-e/os (cf. Boutkan 1995: 278ff.).[59]

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[58] Also connected to Lat. anguis, OHG unk, Lith. angìs 'id.', in which Ved. áhes would reflect *h₂ngʷʰ-ei-s.

3.5.1.4 Heteroclitic stems

h₂reh₁ǵ-en-s (OAv. *rāzə̄ṇg* 'instruction' (nom./acc.sg.n. *rāzarə̄*));
h₂ei-en-s (YAv. *aiiąn* 'day' (v.l. of *aiiq*) (nom./acc.sg.n. *aiiarə*));
sh₂-uén-s (OAv. *xᵛə̄ṇg* 'sun' (nom./acc.sg.n. *huuarə̄*), YAv. *hū*).

3.5.2 Root nouns

dém-s (Gr. δεσ- in δεσπότης 'lord of the house', OAv. *də̄ṇg* 'house' in *də̄ṇg patōiš* gen.sg. 'master of the house', Ved. *dam-* and *dan* in *dámpati-*, *patir dan* 'lord of the house', *śíśur dán* 'child of the house', *dáṃ supátnī* 'having a good lord/husband of the house').

The form *dém-s* is in addition to Szemerényi's Law also a counterargument to monosyllabic lengthening.

3.6 Thematic endings *-om*, *-oi*, *-oms*

Within the thematic inflection there is counterevidence too:

(1) First, the ending *-om*, as used for the acc.sg.m., nom./acc.sg.n., and gen.pl., does not show lengthening before a word-final resonant (cf. Ved. *-am*, Gr. *-ον*, Hitt. *-an*, Lith. gen.pl. *-ų*, OCS gen.pl. *-ъ*);

(2) Neither does the ending *-oi*, which is used for the loc.sg. (cf. Ved. *-e*, Gr. *-οι*);[60]

(3) Thirdly, the acc.pl. ending *-oms* does not show the result of SL as **-ōm* (cf. OAv. *-ə̄ṇg* (e.g. *maṣ̌iiə̄ṇg* 'mortals'), YAv. *-ə̄*, *-ą* (e.g. *zastə̄* 'hands', *haomą* 'haomas'),[61] Gr. *-ους*, Go. *-ans*). Although the vowel length cannot be determined in the attested forms (*-oms* or *-ōms*), the evidence shows that the *-s* is present, contrary to the expected result if SL has operated.

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[59] However, a sequence PIE *-Vns* (whether or not from older *-Vms*) does yield *-Vns* in Gothic, as can be seen in acc.pl. *-ans* < *-oms* (see §3.6). It is therefore possible that the outcome of pre-Gm. gen.sg. *-en-e/os* and *-en-s* merged into Go. *-ins*.
[60] The nom.pl. of the pronouns also has the ending *-oi*, but see n. 75 below.
[61] For the distribution between these allomorphs, cf. Martinez & De Vaan 2014: 14, 56.

4 Discussion

4.1 Introduction

In this chapter, it is examined whether one or more of the phonetic explanations can account for the evidence and counterevidence. In order to realize this objective, the discussion has a twofold approach:

(1) In §4.2, an overview of the three theories on the LG will be given by determining whether the data, as collected in the previous chapters, is to be considered evidence or counterevidence for each of the theories, i.e. (a) monosyllabic lengthening, (b) Szemerényi's Law, and (c) lengthening before word-final resonants. In other words, the summary below shows what the advantages and disadvantages of each theory are.

(2) In §4.3, attempts will be made to give alternative explanations for the counterevidence, in order to discover which counterevidence can be explained away and which theory can or cannot be saved. This aim will be attained by discussing existing theories from the literature and proposing ideas of my own.

4.2 Overview

Wackernagel's monosyllabic lengthening:
Pros:
1) Explains many root nouns, since these are monosyllabic and have LG in the nom.sg.;
2) Explains the LG in the locative of root nouns, for these forms are monosyllabic as well;
3) May also explain some of the static neuters in *$C\acute{e}C$-C, if the type exists at all.

Contras:
1) Cannot explain nominative singular forms with FG, §4.3.1.1;
2) Cannot account for the gen.sg. *déms, §4.3.1.2.

Kortlandt's lengthening before word-final resonant:
Pros:
1) Explains asigmatic nominatives, except the ones in *-ōt and *-ē/ōs, §4.3.2.5;
2) Explains the endingless neuter collectives in *-ēC/-ōC;
3) Explains the endingless locatives in *-ēC of all stem classes.

Contras:
1) Cannot explain the endingless locatives with FG in *-eR, §4.3.2.1;
2) Cannot explain the vocative singular in *-eR, §4.3.2.2;
3) Cannot explain the dative singular in *-ei, §4.3.2.3;
4) Cannot explain the thematic endings *-om (acc.sg., nom./acc.sg.n., gen.pl.) and *-oi (loc.sg., nom.pl.), §4.3.2.4.

Szemerényi's Law

Pros:

1) Explains asigmatic nominatives, except the ones of h_2-stems (cf. §4.3.3.2);

2) Explains accusatives in *-ēm, but see §4.3.3.6 for an evaluation;

3) Explains the endingless neuter collectives in *-ēC/-ōC, but see §4.3.3.5 for an evaluation;

4) Explains the endingless locatives of *i*-stems in *-ēi.

Contras:

1) Cannot explain the PD gen.sg. in *-eR-s, §4.3.3.1;

2) Cannot explain the thematic acc.pl. in *-oms, §4.3.3.3;

3) Cannot account for endingless locatives in other stem classes than *i*-stems, §4.3.3.4.

4.3 Discussing the counterevidence

4.3.1 Against Wackernagel's monosyllabic lengthening

4.3.1.1 Nom.sg. forms without LG

The material can be divided into two groups: neuters and non-neuters (animates). Regarding the non-neuters, Pronk (2016: 28[16]) suggests, that the examples showing a FG can be easily explained as a regularization of the original ablauting paradigm. For instance, the full grade in the nominative may then have originated in the disyllabic acc.sg. *CeC-m.[62] Evidently, neuter formations cannot be similarly explained, as a result of which for each separate example an analogy should be proposed. First the animate forms will be discussed, then the neuters.

4.3.1.1.1 *Non-neuters*

For most of the relevant forms the explanation above is sufficient. However, some formations need some discussion:

nók^wts 'night' has been extensively discussed by Kloekhorst (2014a: 156f.; 161). He observes that the paradigm *nók^wts*, gen. *nék^wts* as postulated by Schindler 1967, who interpreted Hitt. *nekuz* in *nekuz mēḫur / mēḫuni* 'at night, in the evening' as a genitive, is not synchronically attested anywhere in the Indo-European languages, since for each language only one ablaut grade is attested. For *nekuz* Kloekhorst (l.c.) proposes a different interpretation as reflecting a locative *neg^wh-t-i*, since *nekuz* is also attested without *mēḫur / mēḫuni*. The attestations in the IE languages indeed point to *ó/é-ablaut within the paradigm, but the original distribution of the ablaut cannot be independently established.[63] Although it is true that most branches point to a nom.sg. *nók^wts*, the *o*-grade can be the result of a late regularization of the ablauting paradigm, as Kloekhorst argues (ibid.): from an original HD paradigm the direct cases in *nég^wh-t-* may have been generalized in Hittite

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[62] *CeT-m in Pronk's notation (ibid.), since the examples which he gives all have a root-final obstruent. This, however, does obviously not work for Ved. *véṣ*.

[63] Additional arguments against a static *ó/é-ablauting paradigm for this root may be (1) the mobile accentuation in Greek (νύκτ- vs. νυκτ-´), and (2) possible cognates which show a zero-grade in the root (*nk^w-t-), for instance Ved. *aktā́-* f. 'night' (§2.7.1.2) and PGm. *unhtwōn-* f. 'morning, dawn' (Go. *uhtwo*, ON *ótta*, OE *ūht(a)* m. 'last part of the night' (< *unht(w)a(n)-), OHG *ūhta*).

(cf. *nekuz*),[64] whereas in non-Anatolian IE it was the oblique stem *nog^{wh}-t- (e.g. gen.sg. *nog^{wh}-t-és << *ng^{wh}-t-és, in which *o represents an unaccented full grade which automatically turned into *o) which was levelled, yielding a new nom.sg. form. Therefore, it is uncertain that the nom.sg. of the word for 'night' was *$nók^wts$ in early PIE, i.e. at the stage before the rise of the LG;[65]

tuék(s) 'form, skin' shows difficult problems. For a full comprehension of the material the paradigms are given below:

	Ved.	Hitt.
nom.sg.	*tvák*	*tuekkan* n.
acc.sg.	*tvácam*	*tuekkan* n.
gen.sg.	*tvacás*	*tuggaš*
abl.sg.	*tvacás*	*tuggaz* c.

Vedic can reflect both *tuek* or *tueks*, whereas for Hittite Kloekhorst (2008 s.v.) reconstructs an asigmatic nom.sg. *tuek* to explain the shift to the neuter gender in the direct cases. This explanation does not solve the absence of the LG in the monosyllabic nominative, however;

Ved. *vés̩* m. 'bird' is used by Kümmel (2015: 287) as counterevidence, but has been explained by Beekes (1985: 81f.) as a secondary nominative, since a reconstruction *$h_2uéis$ cannot account for Lat. *avis* f. and Arm. *haw* < *$h_2éuis$. Beekes assumes that original *$h_2éuis$, acc. *$h_2uéi-m$ > acc. *vayam* gave a new nom.sg. *vay-s* > *vés̩*;

Ved. *vít̩* f. 'settlement, dwelling-place, house, community, tribe, people' (stem *vís̩*-) cannot be old either, since other branches show ablaut in the root: Lat. *vīcus* 'village, block of houses' (OLat. *ueicus, uecus, uecos*) < *u̯eiḱ-o- 'settlement', Hom.Gr. οἴκα-δε, οἶκόνδε , Delph. ϝοίκαδε 'homeward';

*h_2uolks 'furrow' is given by Kümmel (2015: 280) as a counterexample, which is usually thought to be reflected in Gr. ἄλοξ, -κος f. 'furrow', and the verbal forms Lith. *velkù*, OCS *vlĕkǫ*, Av. *varǝk-* 'to draw'. However, Beekes (2010: 73) rejects this connection due to formal problems: the absence of -υ- in ἄλοξ is strange from an IE point of view, especially because αὖλαξ is attested (if from a zero grade *αϝλακ- < *$h_2u̯l̥k$-). Moreover, there are semantically related formations with initial εὐ- (εὐλάκᾱ 'plough'), initial ὀ- (ὀλοκεύς), and -χ- instead of -κ- (αὐλάχα 'plowshare') that look formally too similar to be unrelated. In view of these problems a PIE etymology is unlikely, and subsequently the Greek form cannot be used as solid counterevidence;

ὄνυξ m. 'nail' < *$h_3nog^{wh}s$. The nom.sg. is a relatively late attestation (from Arist.) and can easily have been backformed from the oblique (acc.sg. ὄνυχα (Eur.), gen.sg. ὄνυχος (Aesch.), dat.sg. ὄνυχι (Eur.)) or from the more frequent plural (ὄνυχες (Hes.), ὄνυχας (Hes.), ὀνύχεσσι (Hom.));

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[64] That only *nekuz* – and no direct case form – is found is probably a matter of coincidence (Kloekhorst l.c.).

[65] Kroonen's proposal (2013, cited in Kloekhorst 2014a: 161), in which he connects the word for 'night' to PGm. *dunkra-[65] and Hitt. *dankui-* 'dark' < *d^hng^w- from a pre-form *d^hneg^w-t- > Late-PIE *neg^w-t-, is difficult in view of Hom.Gr. νύχ- (ἔννυχος 'nightly', νύχιος 'id.', νυχεύω 'to spend the night') and the non-geminate spelling in Hitt. *neku-^{zi}* 'to become evening', since the latter forms require a root *neg^{wh}- (Kloekhorst 2008: 602).

ἐπί-τεξ f. 'close to delivery' (< PIE *tek- 'bring forth') is either explained from a bahuvrīhi compound with a primary meaning 'with the delivery approaching', or from a hypostasis of dat.sg. ἐπὶ *τεκ-ί with a back-formed nom.sg. (Beekes 2010 s.v.). In both scenario's the nom.sg. need not be old.

4.3.1.1.2 *Neuters*

Two forms given in §3.1, *h_3est n. 'bone' and Gr. ἕν 'one' < *sém are neuters and should be discussed.

*h_3est 'bone' is attested in its monosyllabic form as Lat. *os*, whereas Av. *as-ca* and MW *as-curn*, *as-cwrn* are non-monosyllabic forms.

The first problem is Latin: it is uncertain whether Lat. *os* regularly continues *h_3est or not, cf. De Vaan (2008: 436f.). If not, the form must be analogical, and may have acquired a different ablaut grade than the original form which it replaced.

The second problem concerns the compounded formations. It is hard to explain the absence of the LG from the extensions as seen in Avestan and Middle Welsh: although these extensions make the forms disyllabic, it is doubtful that it was the compounded form of 'bone' which was generalized. Besides, it presupposes that in PIE an alternation between simplex *$h_3\bar{e}st$ and compounded *h_3est- existed, for which there is no further evidence. However, in view of the Hittite form *ḫaštāi/ḫašti*-, as well as Gr. ὀστέον, there was apparently an ablauting formation (derivative?) with an *i*-suffix, which raises the question whether a disyllabic formation *h_3est-i- may have been responsible for the short vocalism as found in the monosyllabic forms. However, I cannot think of a motivation why such a generalization of ablaut would have taken place, since a system of e.g. nom./acc. *$h_3\bar{e}st$, gen. *h_3st-es vs. *i*-stem *h_3est-i- would have been without problems.

Gr. ἕν n. 'one' < *sém may perhaps be explained by a similar analogy as Beekes (1985: 165) suggested for *h_1su-menes > Gr. εὐμενές (cf. §2.3.2.2). This neuter adjective form *-menes would have been created secondarily from the noun *menos, gen. *menesos:

	masculine		neuter	
nom.sg.		(-men-ēs)	-men-os	(-men-es)
acc.sg.		(-men-es-m)	-men-os	(-men-es)
gen.sg.	-men-es-os		-men-es-os	

He argues (ibid.), that first the masculine and neuter genitive form of the adjective were taken over from the noun without change, since there was no reason for remodelling. Second, the masculine nominative and accusative would then have been created on the basis of the oblique stem *-menes-. Subsequently, the neuter form *-menos would have become *-menes by generalization of the stem.

Applying Beekes' analogy of εὐμενές to the form ἕν < *sém, one must first assume that *sém is the result of analogy too. It means that the oblique stem *sem- (or *hem- (cf. Myc. dat.sg. *e-me* /hemei/), depending on chronology) was introduced as a neuter form, either by creating a separate neuter that was distinct from the masculine form *sōm, or by replacing a neuter formation of which its shape cannot be discovered anymore.

In short, the form ἕν < *sém may be secondary after a generalization of the oblique stem

sem-. This analogy is perhaps paralleled by the creation of the neuter adjective form *-men-es*. The model for its creation would have been the oblique stem, and the motivation for the analogy may have been the lack of a separate neuter that was recognizably different in shape from the masculine *sōm* (both the masc. and neut. were monosyllabic so both would have had LG). Therefore, Gr. ἕν may not be a useful counterexample to monosyllabic lengthening.

4.3.1.2 Gen.sg. *déms*

The short vocalism of *déms* 'of the house' cannot be due to the fact that the form is only attested as part of a syntagm: the evidence in Vedic shows that *déms* could stand either before or after the noun that governed it (*dámpati-* vs. *patir dan*, §3.5.2). Hence, the order of the syntagms in which *déms* could be used was not a fixed order. I have no other explanation to offer than suggesting that perhaps the accent in *dámpati-* might not necessarily reflect the PIE state of affairs (Frits Kortlandt p.c.). If monosyllabic lengthening was restricted to accented forms only (cf. the absence of length in monosyllabic pronouns, Beekes 1990: 48), the gen.sg. *déms* might have acquired secondary accentuation after the rise of the LG.

The form is also an argument against SL, for which see §4.3.3.1.

4.3.2 Against Kortlandt's lengthening before word-final resonant

4.3.2.1 Locative singular in *-eR*

In providing an explanation for the endingless locative in *-eR* as a counterargument, Beekes (1990: 47f.) discusses three theories on the possible origin of this type of locative. Two of them are based upon the observation that the majority of the evidence of the endingless forms with a short vowel are Vedic forms in *-an* < *-en*. The third theory comes from Kortlandt (apud Beekes, ibid.).

The first theory is from Bartholomae (cf. Beekes ibid.), who suggests that these locatives contained a particle *-en* which should be equated with the adverb *h₁en* 'in'. This would of course explain the forms in *-an*, but not Ved. *údhar*, *kṣám*, and Hitt. *andan*, Gr. ἔνδον (§3.2).

The second theory is by Beekes (1990: 48), who proposes the idea that the lengthening did not operate before nasals but only before *r, l, i, u*. The argument for this distribution comes from the nominative: the nominatives in *-(t)ē/ōr* are very archaic, nominatives in *-l* are very rare, and *i-* and *u*-stems are rather rare. In that case, the nominative of the *n*-stems and rare *m*-stems would have an analogical long vowel suffix, as Beekes remarks. However, not only the nom.sg. must then be analogical, also the neuter collective in *-ōn* and OAv. loc.sg. *cašmąm* < *-mēn* and Hitt. loc.sg. *tagān* < *dʰǵʰṓm* would then have an analogical LG in the suffix.[66]

The third theory (Kortlandt) states that the locative type *-eR* goes back to an older formation in *-eRt*, in which *-t* represents the original instrumental ending as reflected in Hittite *-t*. Apart from Beekes (ibid.), this theory has not caught much attention of scholars, and has never been discussed in the literature more elaborately. Therefore, Kortlandt's idea will be discussed here.

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[66] An analogical origin of the neuter collective ending *-ōn* is not impossible, since there is also *-ōs*, which does not have a phonetic origin in Beekes-Kortlandt's model.

Kortlandt (2010: 40) suggests that in the non-Anatolian IE languages the ins.sg. suffix *-t* developed into three allomorphs:

(1) *-t* > *-d* ['t] / V_
(2) *-t* > *-h_1* [ʔ] / en_
(3) *-t* > *-ø* / T_
(The numbers do not refer to a chronological order of developments.)

He suggested that *-t* was lost after obstruents, glottalized after vowels, and turned into *-h_1* after the full grade suffix *-en-* of the *n*-stems or *r/n*-stems. I will henceforth refer to this theory as the First Locative theory. In a later article (Kortlandt ms.), he changed the second condition into the position after a resonant, i.e. (2) *-t* > *-h_1* [ʔ] / R_. I will call this the Enhanced Locative Theory.

In the following I will describe the Enhanced Locative Theory, i.e. Kortlandt's present formulation, and look for arguments in order to discover if the theory stagnates at some point or not. If it does, I will turn to Kortlandt's First Locative Theory and apply the same method in order to see whether this theory is helpful.

(a) Kortlandt's Enhanced Locative Theory

The conditions for the distribution of the Enhanced Locative Theory would be mostly based on (i) phonetics, but there is also some (ii) comparative evidence, according to Kortlandt.

(i) What would connect these three allomorphs, is that they all would have been glottalized in final position: *-V^{ʔ}t*, *-R^{ʔ}t̚*, and *-T^{ʔ}t̚* ([t̚] = dental stop with no audible release). That the glottalized feature survived as *h_1* [ʔ][67] after a resonant and not after stop would be because of an intrusive vowel due to the more sonorous *-R-* (Frits Kortlandt p.c.). In other words, *-R^{ʔ}t̚* > *-R_ə^{ʔ}t̚* > *-R_ə^ʔ-ø*, in which [_ə^ʔ] merged with *h_1* [ʔ], whereas *-T^{ʔ}t̚* would have lost its glottalized feature without a trace (> *-T^ʔ-ø* > *-T-ø*), since there was no epenthetic vowel. According to Kortlandt, these developments are understandable purely from a phonetic point of view.

(ii) Regarding the comparative evidence, Kortlandt assumes *-d* and *-h_1* in order to explain why these endings survive as the ablative and instrumental markers in non-Anatolian IE respectively, and also why the marker *-h_1* is not found in Anatolian.[68] For the first development, cf. also OLat. 3sg. *-d* in **fhefhaced** < *-t*. The third change of *-t* to zero is proposed on the basis of two pieces of evidence:

1) the retention of the LG in the Vedic root aorist, i.e. 3sg.aor.ind.act. *akrān*, *asyān*, *āraik*, *acait*, *aśvait*, *adyaut* (from *krand-* 'cry', *syand-* 'move, flow', *ric-* 'leave', *cit-* 'perceive', *śvit-* 'become bright, white', and *dyut-* 'flash, shine');

2) Endingless locatives in a short vowel *-eR*, allegedly continuing *-eRt* (Kortlandt apud Beekes 1990: 48).

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[67] Cf. Kloekhorst 2004 for evidence in favor of [ʔ] for *h_1*.
[68] A discussion and examples of *d* > *h_1*, known as the "Kortlandt-effect", are given in e.g. Lubotsky 2013 and Garnier 2014.

Short comments on each point will be given below.

1) The LG in the Vedic root aorist

The main aim of Kortlandt's idea is to explain why in most cases the root aorist in Vedic has FG in the root (3sg. *ágan* 'came' < *-g^wemt*, whereas Lat. 3sg. *vēnit*, Go. 1pl. *qemun*, ToB 3sg. *śem* < *-g^wēm-* with LG), but why in these six examples above the LG is preserved. An observation is that the roots of these forms all end in a stop. Following Kortlandt's theoretical framework, in non-Anatolian IE, the 3sg. marker *-t* would then have been lost in the aorist forms of these roots. According to Kortlandt, the loss of the 3sg. marker *-t* after obstruents would be the reason why the LG was retained in these root aorist forms, whereas in roots not ending in an obstruent the LG was eliminated (Kortlandt 2010: 136; 2015; cf. also Beekes 1990: 42-5 for an overview).

However, the matter is complicated, since firstly, the six forms are usually analyzed as sigmatic aorists rather than root aorists (cf. Kümmel 2012: 88), and secondly, the change of *-Tt* > *-Tø* – with subsequent analogical loss of the LG in forms in *-t* – may also be an inner-Indo-Iranian development. For the origin of the LG in verbal forms is beyond the scope of the present study, I cannot go into this problem in detail here.

2) Endingless locatives in *-eR* from *-eRt*

There is a clear method to test whether Kortlandt's Enhanced Locative Theory can be falsified, i.e. by the use of comparative evidence: as Kortlandt has currently formulated his theory, endingless locatives in *-eR* can only occur in non-Anatolian IE languages, since *-t* would not have been lost before the split of Anatolian and the other IE languages. Hence, if a locative *-eR* can be found in Anatolian, it can therefore be used as a counterargument. I think that such a counterexample is Hitt. *andan* adv. 'within, inside', which is usually related to Gr. ἔνδον adv. 'inside, at home', OIr. *and* and would reflect *h_1n-dom*, an adverb followed by an endingless locative of 'home' (Beekes 2010: s.v.).

In view of this counterexample there are two kinds of approaches: either one rejects Kortlandt's idea immediately, or one looks for different explanations for this particular form. Choosing for the last approach gives at least two new options:

1) one might assume that lengthening before *-m* was an analogical, rather than a phonetic process. One may consider the ending *-om* (§4.3.2.4), but all instances of *-ōm* must then be analogical;[69]
2) the etymology of *andan* as reflecting *h_1n-dom* is incorrect. A first objection against the etymology may be the absence of the need to use an adverb *$h_1$en* if the locatival meaning is already expressed by *dom*. Second, I am not aware of other examples of locatives preceded by *$h_1$en*. If correct, there would be no parallel for the use of *$h_1$en* + locative. An attempt to provide an alternative etymology maybe connecting Hitt. *andan*, Gr. ἔνδον to Hitt. *anda*, Lat. *endo* (§3.2.4), in which they are petrified inflected forms of a certain root, of which Hitt. *andan*, Gr. ἔνδον would reflect the original accusative in *-om*. Pairs such as Hitt. *āppa* : *āppan* 'behind, afterwards', *katta* 'downwards' : *kattan* 'below, underneath',

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[69] I.e. *$d^h(é)ǵōm$ 'earth', loc.sg. *$d^hǵ\acute{o}m$ (§2.7.1.4), *$ǵ^hiōm$ 'winter' (§2.3.5), *$dōm$ (§2.2), loc.sg. *$dēm$ (§2.7.2) would then have analogical LG, if some of these were not lengthened due to monosyllabic lengthening.

ḥanza : *ḥanzan* 'in front' may corroborate the view that the analysis of *andan* as *$*h_1$en-dom* is incorrect.

Thus, the second option implies that Hitt. *andan* is not decisive counterevidence to the Enhanced Locative Theory. This means that we should look for additional weaknesses.

As can be seen, the idea that the locatives in *-eR* go back to a form which lost its final *-t* (alledgedly from *-eRt*) does not match with the conditions for which Kortlandt proposed that *-t* was lost to zero (allegedly from *-eTt*). This can be seen as a criticism to this theory, since now only the verbal forms are left to be used as evidence in favor of Kortlandt's third development *-t > *-ø / T_.

As a consequence of this mismatch, two separate analogical remodellings are required as an additional assumption in order to keep up the idea that the locative in *-eR* did lose a final *-t*:

1) the zero ending must have analogically spread from *t*-stems or root nouns in *-VT* to stems in *-VR*, i.e. *-VTʰt > *-VT-ø >> *-VR-ø;

2) the instrumental ending in root nouns in *-T* (e.g. *ped-* 'foot') must be secondary, for instance. This is not a problem for Ved. ins.sg. *padā́*, since *-ā* can be equated with the *o*-stem ending *-oh_1;

3) most important of all, the instrumental *-t > *-ø* must have been reanalysed as a locative. From a typological perspective, reanalysis of case forms is well-known. One which rather resembles Kortlandt's idea may have occurred in the prehistory of the Vedic and Slavic pronominal system: Ved. *téna*, OCS *těmь* ins.sg. 'by this' go back to a locative form *toi* followed by additional elements. However, it must be remarked that this typological parallel works the other way around (loc. >> ins.) compared to Kortlandt's theory (ins. >> loc.).

What was the motivation for the first analogical remodelling? Why would an ins.sg. in *-eR-h_1* (which would be the regular form in Kortlandt's Enhanced Locative Theory) be given up for *-eR* by analogy? I cannot provide good answers to these questions. To my mind, Kortlandt's suggestion that a locative in *-eR* goes back to earlier *-eRt* would only work if *-eRt > *-eR* was an archaism, and not the product of another analogy.

In short, Kortlandt's Enhanced Locative Theory meets two difficulties: the counterevidence Hitt. *andan*, and the mismatch between the phonological environments of the endingless locative in *-eR* (for which *-eRt* is necessary) and the root aorist forms (for which *-eTt* is required). It goes without saying that the high number of required assumptions make the idea rather unattractive.

(b) Kortlandt's First Locative Theory

Since the formulation of the Enhanced Locative Theory apparently does not work, we might have a look at Kortlandt's previous formulation. As was pointed out above, the First Locative Theory only differs from the Enhanced one in the condition of the change *-t > *-h_1 [?]. Kortlandt claimed that this change took place when positioned after the full grade suffix *-en-* of the *n*-stems or *r/n*-stems. Following this formulation, in the alleged change of ins. *-eR-t > loc. *-eR* the resonant *R* may then represent anything but *n*, since *-en-t*

would have yielded *-*enh₁*.

There is at least one disadvantage of this formulation: since most forms of the locatives in *-*eR* are formations in *-*en*, still the majority of the evidence would then be analogical. One must then assume that for instance the *u*-stems or *m*-stems could stand as a model for the analogical spread of *-*eu* and *-*em* to the *n*- and *r*/*n*-stems. This formulation is in any case an improvement compared to the Enhanced Locative Theory, where all locatives in *-*eR* would have been analogical. However, my criticism as expressed above is applicable here as well: Kortlandt's theory that loc. *-*eR* < ins. *-*eRt* works best if all forms, including the ones in *-*en*, are archaisms rather than being (partly) the product of analogy.

To sum up, Kortlandt's Enhanced Locative Theory (in which *-*t* > *-*h₁* / *R*_) is too problematic to be kept up in view of formal difficulties. His earlier formulation of that theory, i.e. the First Locative Theory (in which *-*t* > *-*h₁* / *en*_), has some potential to actually work, since here not all evidence of locatives in *-*eR* would be the result of analogy. Still, the forms in *-*en*, which represent the bulk of the evidence, would be analogical, which makes the theory not the most satisfactory solution.

4.3.2.2 Vocative singular

Just like the locative in *-*eR* (§4.3.2.1), the vocative in *-*eR* also presents serious counterevidence to Kortlandt's lengthening before word-final resonant. In order to not directly reject his idea, Kortlandt proposed a theory to account for the vocative. This theory was first formulated in 1985 (apud Beekes 1985: 101) and was also discussed in a later article (Beekes 1990: 49f.).

The idea states that a nominative/vocative in *CéC-R* becomes *CéC* by loss of the final resonant in the vocative. For instance, to an unstressed form *p(e)h₂tr* there was a voc.sg. *ph₂t-e*, consisting of the lexical stem after the loss of the resonant followed by the vocative ending *e* as found in the *o*-stems. At a later stage, the stem-final consonant was restored on the basis of e.g. the acc.sg. *ph₂térm*, by which *ph₂t-e* became *ph₂te-r*.

Although this theory looks highly far-fetched and entirely hypothetical at first sight, it is important to judge the idea on its own merits: first the idea will be examined on typological grounds, after that on comparative grounds, and finally on methodological grounds.

Typological parallels

Here, the question should be addressed whether a scenario such as Kortlandt's takes place in languages of the world at all. If it turns out to be that there is a typological parallel for a proposed linguistic phenomenon, the likeliness of the proposal can be determined. In this case, we must look for examples in which either a final resonant is lost before a pausa, or analogically restored. According to Beekes, there is a clear example which can be used as a parallel (1985: 106f.; 1990: 49): in the IIr. *h₂*-stems the voc.sg. ending is -*e* < *-*ai*. This final *-*i* in the reconstructed ending must be analogical from -*i* < *-*h₂*, since the development *h₂* > *i* did not take place after a vowel. It is therefore conceivable that the -*i* developed in the nom.sg. *CeC-h₂* (Beekes ibid.). This analogical development can only be explained as a restoration of the

stem suffix which took place at a PIIr. stage, since it cannot have been restored before the Indo-Iranian vocalization of the laryngeals to *-i.[70]

Comparative evidence

Beekes (1985: ibid.) remarks that that there would be factual evidence from Vedic to support Kortlandt's hypothesis: Skt. *vr̥kī́-* f. 'she-wolf' < *ulkʷ-ih₂- and *tanū́-* f. 'body, self' < *ten-uh₂- or *tnh₂-uh₂- have a nom.sg. *vr̥kī́s, tanū́s* and voc.sg. *vŕ̥ki, tanu* respectively. In the vocative the final resonant would then have been lost (*-iH > *-i) as a general rule of the vocative, for which it must then be assumed that the loss happened at an early PIE level.

However, the argument is problematic for two reasons:
(1) First, it must be questioned whether laryngeals count as resonants, as the present theory is formulated as resonant loss, which usually does not regard to laryngeals. One can preferably reformulate the conditions by replacing 'resonant' with a term which also covers the laryngeals. It would then still be difficult to examine which formulation is correct, since the only examples which Beekes presents have a final laryngeal.
(2) Secondly, the evidence can alternatively be explained as the result of Kuiper's Law, i.e. laryngeal loss before a pausa (Kuiper 1955). Following Kuiper's formulation, this development would have operated in pre-Vedic times and is then not necessarily of PIE date. Therefore, the Vedic examples are not decisive evidence.

This is not the whole story, however. Five years later, Beekes (1990: ibid.) observes that Ved. *pítar*, Hom.Gr. πάτερ have initial stress, which contradicts the general PIE ablaut rules, since a form *ph₂tér with suffix accent is expected. According to Beekes, there are two possible solutions: either the original vocative was unaccented and the initial accent is a later innovation, or the accent comes from the nom.sg. *CéC-R with initial accent. The former solution is corroborated by the fact that most vocatives do not have accent in Vedic (§3.3 and Whitney 1869: 29). The latter option is difficult for *pítar*, since the nom.sg. is not attested with a structure *CéC-R.

There is one more thing to add: pace Beekes (ibid.), the formulation of the theory implies that a form such as *déiu-e (Ved. *déva*, Lith. *dievè*) cannot be the original vocative of a noun *deiu (§2.2.1), and must then be a secondary formation based on the *o*-stem nom.sg. *deiuos (Ved. *devas*, Lith. *diẽvas*, Lat. *deus*, *dīvus*). The reason would be that final *-u should have been lost, yielding *dei-e >> *dei-e-u, cf. Ved. *sūno* < *suHn-e-u.

Methodological arguments

Regarding methodology, it is important to emphasize that Kortlandt's scenario on the vocative is not primarily designed to explain the absence of length in the vocative singular suffix: it is in the first place an attempt to connect the vocative of the consonant stems in *-eR with the voc.sg. ending *-e of the *o*-stems.[71] Since according to Beekes the *o*-stems originated in the consonant stems (see §4.3.2.4 below), the *o*-stem vocative marker *-e must then also have originated there (cf. Beekes 1990: 49). Therefore, Kortlandt's 'vocative theory' has two advantages: it connects the two vocative markers *-e and *-eR-ø and accounts for the absence of

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[70] Also in the oblique cases of the *h₂*-stems an unexpected *-y-* is found, cf. Ved. gen. *-āyās*, dat. *-āyāi*, loc. *-āyām*. Beekes argues that the spread of *-i- to the vocative from the oblique is unlikely (1985: 102-6).
[71] It is unlikely that *-e is an ablauting variant of *-o of the *o*-stems, cf. Beekes 1985: 101, 184ff.

length in *-eR*. This is methodologically attractive, since two seemingly unrelated problems can be now explained from one system.[72]

To sum up: although the comparative evidence, which was discussed by Beekes, does not directly support Kortlandt's 'vocative theory', the typological as well as methodological arguments are stronger and may rather endorse the idea.

4.3.2.3 Dative ending *-ei*

A notable exception to Kortlandt's lengthening before word-final resonant is the dat.sg. ending *-ei*. An explanation which was given by Kortlandt (apud Beekes 1985: 197; 1990: 48) may be that the dative ending would be the result of a secondary ablaut remodelling. It has been argued that the PD paradigm was originally restricted to neuters, i.e. inanimate nouns, whereas the HD paradigm was used for animates (Beekes 1985: 167-71). The PD paradigm has a dative with the structure *CC-éC-i*, which is identical with the HD locative, as can be established on the basis of Myceanaean and Hittite (Kloekhorst fthc., building on Beekes 1985: 125, cf. also Hajnal 1995b). The dative is a specifically animate case, since it is used for the indirect object, which generally only animate nouns can be used for (cf. Neu 1979: 190[36]). This has led to the thought that PD nouns did not originally have a dative at all. As Kloekhorst argues by the use of internal reconstruction (2013: 125f., fthc., already Beekes 1985: 201ff.), the PD and HD inflection may be younger offshoots of an original single mobile inflection paradigm. In this paradigm the locative *CC-éC-i*, as found both in PD and HD inflected nouns, could be used for the indirect object. This situation is reminiscent of the dat.sg. ending -ι that is found in Greek as a result of case syncretism.

Having seen the considerations above, the question must be addressed what the model, as well as the motivation for the secondary ablaut remodelling in this early paradigm may have been.

Regarding the model, Beekes and Kortlandt suggest that the full grade vowel in the gen./abl./erg. in *CC-C-és* may have been introduced into the locative case in *CC-éC-i*, in which only animates taking the HD inflection could form a full grade variant *-ei* from an original zero grade *-i* (Beekes 1985: 197f.; cf. also Kloekhorst fthc.). The relatively late origin may account for the absence of the LG, according to Beekes. However, this explanation still does not explicitly state how the full grade vowel was transferred from the suffix to the ending (*CC-éC-i* >> *CC-C-éi*). To my mind, the PD gen./abl.sg. *CC-éC-s* is necessary to include in the argument in order to make a proportional analogy possible. One may then think of the following process:

	inanimate	animate	
gen./abl./erg.	*CC-éC-s*[73]	*CC-C-és*	
loc.	*CC-éC-i*	X	(X = *CC-C-éi*)

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[72] Kortlandt's vocative theory is somewhat reminiscent of Schmalstieg's explanation of the PIE LG (§1.2), since they both assume restoration of the final stem consonant. An important difference between them is that Kortlandt's vocative theory is methodologically more attractive, since for Schmalstieg's proposal it is hard to find independent evidence, as was remarked in §1.2.

[73] An argument that the neuters also used the ablative case as an ergative comes from the pronouns, cf. Lat. *quod* 'what' (Kortlandt 2010: 40f.).

Regarding the motivation, it must be questioned why it would have been necessary to mark the locative case in a better way, when it was used in the function of the dative. The reason for this may have been that the dative was possibly used as a non-canonical subject marker when the verb was in the perfect (Kortlandt 2010: 102; cf. Beekes 1985 ibid.). By this analogy the dative case in *CC-C-éi* would then have obtained the same structure as the ergative in *CC-C-és*, the latter being the other animate agent marker.

In short: according to Beekes and Kortlandt, the dative ending *-ei* would have been a relatively recent formation, i.e. created after the LG. The situation of the dative and ergative both being agent markers may have been the motivation for the analogy, viz. a loc.sg. *CC-éC-i* changing into *CC-C-éi* after the agent/ergative *CC-C-és* (animate) and *CC-éC-s* (inanimate), resulting in an identical structure of the ergative forms.

4.3.2.4 Thematic endings *-om*, *-oi*
The absence of lengthening in the endings *-om* (acc.sg.m., nom./acc.sg.n., and gen.pl.) and *-oi* (loc.sg.) can be explained as relatively recent formations: Beekes argues that the *o*-stem declension is a more recent innovation after the rise of the LG (1985: 191ff.; 1990: 48; 2011: 216). This idea is based on independent arguments, i.e. other arguments than the absence of a long vowel. For instance, the relatively late origin of the *o*-stems is corroborated by the absence of ablaut alternations within *o*-stem paradigms.[74] Therefore, the endings *-om* and *-oi* are no genuine counterexamples to Kortlandt's lengthening before word-final resonant.[75]

4.3.2.5 Stems in *-ōt* and *-ē/ōs*
Kortlandt's model does not account for the LG in *t*-stems and *s*-stems. Therefore, Beekes (1990: 45) argues that the long vowel is analogical here.[76] This is a relatively easy solution, requires only few assumptions, and is therefore methodologically attractive. Note that also for SL it is thought that these clusters have a secondary LG (§4.3.3.1.2, §4.3.3.6, and Piwowarczyk 2015).

4.3.3 Against Szemerényi's Law

4.3.3.1 Genitive in *-eR-s*
This genitive type in *-eR-s* presents important counterevidence to SL. In order to account for the absence of SL in this form, two kinds of explanations have been given in recent literature: (1) a sound law (e.g. Kümmel 2015) and (2) analogy (e.g. Villanueva-Svenson 2011).

4.3.3.1.1 *Syncope from *-eR-e/os*
One approach is to assume a sound change, which is done by Kümmel (2015: 282): he sug-

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[74] One may remark that the gen.pl. ending *-om* also occurs in athematic paradigms. However, according to Kortlandt (1978) this ending originated in the *o*-stems and is therefore recent in the athematic paradigms.

[75] Pronominal *-oi*, which is mostly found in monosyllables, is disregarded in this study. Since pronouns often have accented forms next to clitic (unaccented) forms within the IE languages (cf. Gr. ἐμέ vs. με), it cannot be excluded that accent or clisis was a determining factor in causing lengthening. Because examining whether accent indeed had a correlation with lengthening is beyond the scope of the present study, the pronouns are left out of the discussion. Cf. also Beekes 1990: 49.

[76] This would apply to nominatives in *-ōt* and *-ē/ōs*, as well as collectives in *-ōs*. The nominative in *-ēt* is probably a post-PIE innovation, §2.3.1.2.

gests that "apparent counterexamples like *$déms$ 'of the house', or forms in *-(m)ens, *-éjs (…) are not really problematic, since they can be the result of a more recent syncope (loss of the unaccented vowel of the ending *-e/os) and can thus be explained by a different relative chronology". In other words, as he elaborates (ibid.), this means that e.g. PIE nom./acc.sg.n. *$dóm$, gen.sg. *$déms$ would go back to *$dóm-s$, gen. *$dém-es$ before SL operated.

Apart from being methodologically *ad hoc*, there are three serious problems regarding the comparative evidence:

1) Kümmel is not explicit in determining the exact conditions for this syncope. Hence, a reason for the preservation of the gen.sg. *-e/os, whether regular or not, is unclear too. It presupposes that the gen.sg. zero grade ending -s has a different origin than *-e/os in the relation to the origin of PIE ablaut, but there is no other reason than Kümmel's syncope to assume this;

2) counterevidence from the nom.pl. *-es requires an additional explanation why e.g. *ph_2-tér-es did not undergo this syncope. If analogical restoration is involved, the reason would remain unclear why **-s in *ph_2-tér-es > **ph_2-tér-s >> *ph_2-tér-es would have been analogically restored to *-es, since a form **ph_2-tér-s was not ambiguous in the paradigm;

3) if the gen.sg. *-s was originally the same ending as the nom.sg. *-s (< erg.), it is expected that the nom.sg. originally had the *-e/os ending too, followed by the syncope to *-s and the absence of SL. This is, of course, not in agreement with the evidence. This counterargument requires accepting the theory that PIE had an older ergative alignment system, which is partly established on the basis of independent arguments (cf. Uhlenbeck 1901; Pedersen 1907: 148ff.; Vaillant 1936: 98-9; Beekes 1985: 172ff.; Kortlandt 2010: 91ff.; Kloekhorst fthc.).

Except for the second point, the counterevidence points to fewer full grades after the rise of ablaut than the number of full grades in the attested IE daughter languages, instead of more. Kümmel's presupposed syncope does not agree with the evidence and must therefore be rejected.

4.3.3.1.2 *Analogical remodelling to *-eR-s*

Villanueva-Svenson argues that from a methodological point of view analogical remodelling of the genitive in *-eR-s is the easiest assumption (2011: 6[4]). Piwowarczyk accepts this idea and adduces that this genitive type may have been remodelled to the other consonant stems (2015: 272). The question is how such an analogy works in detail, as well as what the exact model and motivation for restoration was. First the possible models will be discussed, after that the motivation.

<u>Model</u>
Two kinds of models come to mind: (i) either a genitive formation in *-s where *-s was not lost due to SL, (ii) or levelling, i.e. the introduction of the stem from a case form in *CC-éR-.

(i) The first model
    There may be two candidate formations: (a) a static genitive in *$CéC$-R-s or (b) a PD genitive of a stem with a suffix not ending in a consonant which would trigger SL, i.e. *CC-éC_1-s (C_1 = not a SL-triggering consonant).

(a) A model with a static form is difficult, since the ablaut of the stem does not match. In other words, it would be unclear why the PD genitive in *-eR-s would not have taken over the zero grade suffix of the static form.

(b) A model with *CC-éC$_1$-s depends on the formulation of SL: which consonants are part of the condition? The consonants which did not trigger SL can then be equated with the *C$_1$ in the model above. This question is addressed by Piwowarczyk (2015: 274), who argues that at least the cluster *-VTs# was not part of SL: just as *-VRs# > *-V̄R#, we expect *-VTs# > *-V̄T# rather than *-VTs# > *-V̄s#, the latter development allegedly in Gr. πῶς 'foot' (Hesych.) < *pód-s. Therefore, he concludes that the long vowel in πῶς was a post-PIE development. For our model *CC-éC$_1$-s, this means that *C$_1$ may have been, for instance, a dental stop (= *t*-stem), since dental stops would not be a conditional factor for SL. However, not a single *t*-stem is attested for a proterodynamic paradigm (with a gen.sg. *-ét-s).[77] This makes the model rather hypothetical, since the analogy cannot be supported with comparative evidence.

An alternative would be to assume that the endings *-eis and *-eus did not take part in SL. If these endings were preserved, it provides a model for the restoration of *-eR-s > *-ēR >> *-eR-s. This idea can be considered part of Piwowarczyk's so-called 'minimal' (i.e. restricted) account of SL (2015: 272): only *-VRF# > *-V̄R# (F = /s, h$_2$/, R = /r, l, m, n/). However, although this restricted formulation works for the material that we have, it remains unexplained why the PD loc.sg. in *-ēR – §2.7, if from older *-eRi – has LG in the first place. Moreover, it requires the assumption that several formations have an analogical long vowel:

α) the nom.sg. forms of HD *i*-stems (e.g. type Ved. *sákhā*), §2.3.3;
β) the nom.sg. forms of HD *u*-stems (e.g. type OAv. *-bāzāuš*), §2.3.8.2;
γ) the Hittite collectives in *-ēi/-ōi (e.g. type *ḫaštāi*), §2.5.1;
δ) the Hittite collectives in *-ōu, §2.5.5.[78]

In view of these difficulties, it can be concluded that this first model probably does not work.

(ii) The second model

In this model a case form in the PD paradigm with the stem *CC-éR- must be found to make the restoration of the genitive to *-éR-s possible. The question is which case form had this stem, combined with an ending which would not be lost by SL. I think that most PD case forms meet problems: the accusative and locative are ruled out for their mismatching stem *CéC-R-m and *CC-ḗR respectively; the instrumental *CC-éR-h$_1$ contains a laryngeal which should have disappeared by SL (cf. Piwowarczyk 2015: 270), and the dative *CC-éR-i is a counterargument to SL too in view of the locative (cf. §4.3.3.3 below). Perhaps, one might consider an ins.sg. in *CC-éR-t, if one accepts Kortlandt's proposal

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[77] An alternative solution with the suffix *-ih$_2$- instead of *-t- is problematic as well, since *h$_2$ is thought to be a conditional factor for the operation of SL (cf. Piwowarczyk 2015: 270).

[78] Whether this type belongs here depends on whether one accepts this type or not, since the etymologies are weak.

that the ins.sg. ending *-h_1 goes back to *-t, which is found in Hittite (§4.3.2.1), cf. Kort-landt (2010: 40).

<u>Motivation</u>
Regardless of the model which cannot be easily established, it must be questioned whether there was a motivation to restore the *-s in the genitive in the first place. If the analogy was levelling the motivation may seem obvious, but Beekes raises an important objection (1985: 151f.): "If the ending -s was restored in the genitive, one would have expected the same in the nominative." In other words: why would the last change of the development *-$éR$-s > *-$éR$ >> *-$éR$-s have occurred in the PD gen.sg., but not in the HD nom.sg. *-$\bar{V}R$, if the HD nominative and PD genitive both go back to the same form in *-VRs? I have no solution to offer to this problem.

4.3.3.2 The asigmatic nom.sg. of h_2-stems
Szemerényi's Law can to a certain extent be regarded as "designed" to explain asigmatic nominatives with a LG suffix from sigmatic ones. However, Beekes (1985: 152) remarked that the nom.sg. of h_2-stems was asigmatic – but without a LG suffix – and uses it as an argument against SL: the h_2-stems would prove that there were asigmatic nominatives anyway, and therefore there would be no need to explain all asigmatic nominatives in *-$\bar{e}R$ from sigmatic ones in *-eR-s. Piwowarczyk (2015: 272) counters this criticism by stating that the nom.sg. of h_2-stems may have originated in the collective: he argues that the dual of h_2-stems is formed with the suffix *-ih_1, which is also found in neuter formations (*-eh_2-ih_1 > IIr. *-ai > Ved. -e, cf. Nussbaum 1986: 130ff.). The correlation between the suffix of the h_2-stems and neuter gender in the dual can be understood as *-h_2- representing an original neuter collective, according to Piwowarczyk (building on Nussbaum). I disagree with the last part of this argument: there is a demonstrable correlation of the neuter gender and the h_2-stems, but this correlation does not necessarily imply causality. In other words: a development *collective > h_2-stems* need not have taken place purely on the basis of the comparison with the 'neuter type' dual ending. Besides, arguing that the h_2-stems are a secondary creation implies that the ablauting paradigm of both HD and PD nouns (*-h_2-/-eh_2-),[79] as well the ablaut in the PD ih_2-stems (*-ih_2-/-ieh_2-) should then be completely secondary too.[80] There is no independent evidence for this, and the ablaut even looks rather archaic. For now, it suffices to refer to Luraghi's criticism towards this problem (2009: 5ff.).

4.3.3.3 Loc.sg. of non-i-stems
According to Szemerényi's formulation (Szemerényi 1970: 106-11), only in the i-stems a development *-ei-i > *-eii > *-$\bar{e}i$ took place, after which the other stem classes adopted the suffix vowel by analogy. A development *-ei-i > *-eu-i > *-euu > *-$\bar{e}u$ by sound law already requires additional assumptions, and it would only work for the u-stems: in the n- and m-stems it seems phonetically impossible that, for instance, *-en-i yielded *-$\bar{e}n$ by regular sound change.
     Beekes (1990: 37, 46-8) gives several additional arguments against Szemerényi's proposal:

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[79] The only known PD h_2-stem is *g^wen-h_2- 'woman', §2.4.
[80] Type Ved. *devī́*, gen. *devyā́s* f. 'goddess', Lith. *martì*, gen. *marčiōs* 'bride', Gr. τραπέζα, gen. τραπέζης 'table'. Cf. also the participles in *-ont-ih_2: Ved. *bhárantī*, Hom.Gr. φερούσα, OCS *nesǫšti* ptc.nom.sg.f. 'carrying'.

1) there is counterevidence in the locative of the HD stems, cf. loc.sg. *-er-i, *-en-i. The -i is unlikely to have been restored, since there is no trace of the expected lengthening either, i.e. **-ēR-i;

2) there is counterevidence in the dative of the PD stems, since this form was *-eR-i (cf. Beekes 1985: 109ff.);

3) if *-ei̯-i > *-ei̯i̯ was a phonetic development, it is much more likely that in *-ei̯i̯ the less sonorous *i̯ was lost, yielding *-ei, rather than *i being lost (whether or not first becoming an intermediate *i̯);

4) if *-ei̯-i > *-ei̯i̯ was an analogical development, it is rather improbable that the variant *-ei̯i̯ was generalized, since *-ei̯-i is much more transparent. In other words, there would be no motivation for generalizing *-ei̯i̯;

5) the proposal *-ei̯-i > *-ei̯i̯ requires the assumption that PIE had words starting with a vowel, since *-ei̯i̯ would have originated in antevocalic position (Piwowarczyk 2015: 271, 273). Independent evidence for this hypothesis is hard to ascertain, especially since after the discovery of the laryngeals many instances of *V(R)C-roots can be explained by roots with an initial laryngeal (*He(R)C-). The problem whether PIE had words with an initial vowel is then probably a matter of Occam's razor: if no other argument than *-ei̯-i > *-ei̯i̯ can be found for this hypothesis, it is best to assume that PIE did not have roots starting with a vowel.

4.3.3.4 Thematic acc.pl. *-oms

As was pointed out in §4.3.2.4, the o-stems are probably a relatively recent innovation, cf. also Winter (1969: 209). Therefore, the ending *-oms need not be a true counterexample to SL.

4.3.3.5 Collective *-ōC

In 1986 Nussbaum extended SL by explaining the collective type in *-ōC and the type in *-h₂ from one system (1986: 129f.). He argued that the final laryngeal may have been lost after a resonant with compensatory lengthening of the preceding vowel (e.g. *-or-h₂ > *-ōr). This idea has become widely accepted among scholars. In 2014, he redefined the theory, arguing that the morphology of the collectives could be used for mass nouns, yielding a meaning with a sample of the mass, the so-called 'delibatives' (Nussbaum 2014b).[81] This theory is, of course, an attempt to account for the many 'collectives' in *-ōC which in fact have the semantics of mass nouns.

However, these ideas are problematic for a morphological reason. The ablaut in the suffix of the collectives in *-h₂ does not agree with the suffix ablaut of the type in *-ōC: the latter represents o-grade, if from *-or-h₂, whereas the former always has zero grade of both the suffix and the ending: *dr-u-h₂ 'wood' (ToB obl.pl. ārwa, OCS n.pl. drъva), OAv. vohū adj.nom./acc.pl.n. 'good' < *h₁u̯es-u-h₂, and YAv. zaraϑuštri < *-i-h₂ (§2.5.5).

In view of this problem it becomes increasingly doubtful whether the collectives in *-h₂ and *-ōC can both be explained from a single type. Nussbaum does not address the problem of the ablaut mismatch, however. Consequently, since the hypothesis that the collectives

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[81] E.g. beer (mass noun) >> a beer (portion, i.e. delibative), cf. Nussbaum (2014b: 278).

in *-ōC are the result of a loss of *-h_2 is problematic, it becomes less probable that a sound change *-VRh_2# > *-$\bar{V}R$# took place in pre-PIE times.[82][83]

4.3.3.6 Accusative singular in *-ēm
The last category to be discussed is the accusative singular. For PIE, two *u*-stem nouns can be reconstructed with an acc.sg. form in *-ēm, i.e. *diḗm (Ved. dyā́m, Gr. Zῆν m. 'Zeus') and *$g^w h_3$ḗm (Ved. gā́m, OAv. gąm, Hom.Gr. βῶν, Dor.Gr. βῶν f. 'cow'), and Dor. acc.sg.f. νᾶ̃ν 'ship' < *neh₂-ēm, cf. §2.2.1 and §2.4 respectively. As addressed in §2.2.1, it is the question whether this long vowel is either the product of a sound law or the result of analogy. Several explanations have been offered: either it was SL (Schindler 1973), Stang's Law (Stang 1965), or an analogical origin (Beekes 1985). Regarding the explanation by SL (*diéum > *diémm > *diḗm, m.m. for 'cow'), in my opinion there is an argument which can be used against this proposal.

In order to fully comprehend this argument, we must briefly review Piwowarczyk's main point (2015) first (cf. also §4.3.3.1.2). He argues that Gr. πῶς is unlikely to be the regular outcome of SL by a change *pód-s > *pós-s > *pṓs, since it is not parallel to the rigid description of SL as formulated by Szemerényi himself. It should have been the following development instead (Piwowarczyk 2015: 274):

*pód-s > *pód-d > *pṓd   *-VTs# > *-VTT# > *-$\bar{V}$T#
parallel to   *-VRs# > *-VRR# > *-$\bar{V}$R#

He concludes, that if in pre-PIE a sound change equal to SL operated, the cluster *-VTs# did probably not take part in this change.

Along the same lines, a similar argument can be formulated for the acc.sg. in *-ēm. Rather than a change *-Vum# > *-Vmm# > *-$\bar{V}$m#, the following development is expected:

*diéu-m > *diéu-u > *diḗu   *-Vum# > *-Vuu# > *-$\bar{V}$u#
parallel to   *-VRs# > *-VRR# > *-$\bar{V}$R#

Therefore, it can be concluded that it is unlikely that the origin of the LG in these two accusative forms is due to SL. This argument does not favor an alternative scenario in particular (for which see §2.2.1), but merely disfavors the explanation by SL.

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[82] Since the other piece of evidence for this proposed sound change, *g^wēn 'woman' < *g^wen-h_2, can be explained alternatively (§2.4), no evidence in favor of this change is at our disposal anymore.
[83] An alternative solution for the collectives in *-ōC was offered by Schindler 1975b (cf. also Beekes 1981: 280), who proposed that these formations were collective in number but singular in inflection. The reason why PIE would have had two markers for the collective, *-ōC and *-h_2, remains unclear with this explanation, however.

5 General conclusions

The present study attempted to answer the question which of the three phonetic theories on the origin of the Proto-Indo-European lengthened grade, viz. monosyllabic lengthening, Kortlandt's lengthening before word-final resonant, and Szemerényi's Law, could be proven correct or incorrect. The overview of the evidence and counterevidence of the nominal system as presented in chapter 2 and 3, and the discussion of the counterevidence in chapter 4 lead to the following conclusions:

Evidence
Among the root nouns (§2.2), the nominatives occur both with (§2.2.1) and without *-s (§2.2.2). For the non-neuters (§2.2.2.1), there is no way to determine due to which phonetic explanation the forms have a long vowel, since they are monosyllabic (monosyllabic lengthening?) and all of them end in *-n or *-r (< *-VR or *-VRs?). As is stated in §2.2.2.2, the neuter formations must have analogical LG, if in PIE no other sound change than SL operated by which long vowels were created, since here the long vowel cannot be due to the loss of an earlier *-s.

Concerning the hysterodynamic nominative, there is evidence for t-stems, s-stems, and stems in a resonant. It is likely that t-stems and s-stems have an analogical LG, since this assumption is necessary for Kortlandt's lengthening before word-final resonant, and likely for SL, as we have seen in §4.3.3.1.2 and §4.3.3.6.

The two nominative forms with a proterodynamic inflection can be either considered secondary ('cow') or uncertain ('woman'), as discussed in §2.4.

With regard to the neuter collectives (§2.5), the situation is complicated. First, not all evidence has straight-forward collective semantics, as some of them are mass nouns (r-stems), singular in number (n-stems: YAv. *haxmq̣m*, OAv. *an-afšmq̣m*, *afšmānī*; r-stems: Arm. *awr*, *anurǰ*), or abstract nouns (s-stems: ToB *pilta*, Lat. *sopor*). Second, evidence for i-stems and u-stems all come from Hittite, but the u-stems consist of weak etymologies. Third, the Indo-Iranian forms reflecting *-ōn may alternatively reflect *-mn-h_2, which means that the only more certain evidence for *-ōn is from Gothic. Fourth, one may wonder whether all evidence for the s-stems comes from Indo-Iranian, since all the other s-stem forms (perhaps except Lat. *ador*) may alternatively be explained from amphidynamic nominatives.

As discussed in §2.6, the evidence for a static neuter type in *CéC-C, gen.sg. *CéC-C-s is not compelling. Kloekhorst 2014a shows that all the material can be explained alternatively, but two uncertain cases remain: attempts to explain the long vowel in Gr. ἧπαρ and to provide an etymology for Hitt. *šēḫur* are all *ad hoc*, although not impossible. It is doubtful whether these two examples suffice to posit a new inflectional type in PIE, since these forms do not show synchronic ē/e-ablaut either. Since Oettinger's arguments (2015) for static neuter s-stems have been shown not to be conclusive either, it is best to assume that PIE did not have an acrostatic inflection type with ē/e-ablaut.

The acc.sg. in *-ēm of the u-stems (cf. §2.2 and §2.4) can be explained by SL, Stang's Law, or by analogy, which makes the formation not decisive for SL.

For the loc.sg. in *-ēC there is evidence for s-stems and stems in a resonant (§2.7). Again, for the monosyllabic locatives of root nouns it cannot be determined whether the long vowel

is due to monosyllabic lengthening or lengthening before word-final resonants. SL is not likely to have operated in the examples of the root nouns, since the roots end in *-r*, *-m*, and *-d*, and must have analogical LG following Szemerényi's formulation.

Having discussed all the evidence from the nominal system with a LG,[84] we can now sum up the results for the counterevidence. Each phonetic theory will be treated separately by following the order of items as presented in chapter 4.

Monosyllabic lengthening
The counterevidence was presented in two groups: (1) nom.sg. forms where a LG is expected but a FG is found; (2) the gen.sg. *déms* to which the same applies.

   Most formations can be explained from generalizations of the older ablauting paradigm (§4.3.1.1). For the non-neuter nominatives such a levelling may have taken place on the basis of the disyllabic accusative *CeC-m*. The neuters, consisting of two counterexamples ('bone' and 'one'), are more difficult to explain: as seen in §4.3.1.1.2, for 'one' it is possible to posit a model and a motivation for replacement, whereas for 'bone' a motivation is hard to establish. The short vowel in the gen.sg. *déms* is also hard to account for, but it may be the accentuation which is related to the absence of the expected LG (§4.3.1.2).

   It can be remarked that all counterevidence to monosyllabic lengthening consists of individual counterexamples, rather than morphological categories. Since a morphological category would be more difficult to account for than individual items – as several analogical processes might have occurred in the prehistory of a separate word, whether or not in a specific branch – monosyllabic lengthening has a chance to be correct.

Kortlandt's lengthening before word-final resonant
There is counterevidence from several categories: (1) the locative in *-eR*, (2) the vocative, (3) the dative, and (4) the thematic endings *-om*, *-oi*.

   (§4.3.2.1) Regarding the locative, three possible origins for *-eR* were discussed. The third, and most elaborately discussed one, is Kortlandt's hypothesis that *-eR* reflects an older instrumental form in *-eRt*. We have seen that there are two formulations of this theory, viz. the First Locative Theory and the Enhanced Locative Theory. The latter requires a very high number of assumptions of analogical remodellings, and also has to account for a counterexample (Hitt. *andan*). The former requires less assumptions, but still, most of the evidence (forms in *-en*) would then be analogical. All in all, Kortlandt's hypotheses on the origin of this locative type are not the most satisfactory solutions to explain the absence of the LG. In contrast to Kortlandt's theory, there is also the first (Bartholomae) and second (Beekes) theory. Bartholomae's attempt only explains the *n*-stems and requires analogical extension to other stem classes, for which a motivation is difficult to establish. Beekes' idea concerns a different formulation of the environment under which the lengthening in final syllables would have originated (no lengthening before nasals, only *r*, *l*, *i*, *u*). This is now a serious option that is left, which may solve the issue without rejecting Kortlandt's lengthening before word-final resonant altogether. The only cost of Beekes' idea is that every long vowel before a nasal (except the ones in monosyllables, viz. *dṓm*, *sṓm*, *-gʷʰḗn*, *ḱuṓn*) would then be analogical.

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[84] Except the nominal derivatives, as was pointed out in §1.1.

(§4.3.2.2) The absence of the LG in the vocative is explained by Kortlandt too, by stating that an original unaccented form lost its final resonant before a pausa (*$p(e)h_2tr$ > *$p(e)h_2t$), after which the vocative particle *e – first being a separate morpheme – became an ending, yielding *ph_2t-e with subsequent restoration of the final stem consonant (>>*ph_2te-r). As has been shown, there is typological evidence from Indo-Iranian which may support this hypothesis, and methodologically it is also attractive since it explains why the vocative has two markers (*-e in the o-stems and *-eC-$ø$ in the athematic stems). Thus, the vocative in *-eR can probably be explained as a secondary formation which was created after the rise of the LG and need not be counterevidence to Kortlandt's lengthening before word-final resonant.

(§4.3.2.3) The dative in *-ei can also be considered secondary. Kortlandt states that the form is analogical on the basis of the agent/ergative *CC-C-$és$, since the dative (originally an animate locative) was also used as an agent when the verb was in the perfect, resulting in an identical structure of the ergative forms. Therefore, the dative does not present serious counterevidence.

(§4.3.2.4) The thematic endings *-om and *-oi are explained as relatively recent too.

To sum up, all morphological categories, except the locative in *-eR, can be considered as secondary formations. For the locative this means either that Kortlandt's formulation of the conditions for lengthening are not correct, or that the correct theory for the locative has not yet been established. The alternative of rejecting Kortlandt's lengthening before word-final resonant is accepting that the lengthening was restricted to liquids and semi vowels and did not operate before nasals, which is Beekes' second theory on this locative type.

Szemerényi's Law
Evidence against SL comes from six categories: (1) the genitive in *-eR-s, (2) the asigmatic nominative of h_2-stems, (3) the locative of non-i-stems, (4) the acc.pl. *-oms, (5) the collective in *-$ōC$, and (6) the accusative in *-$ēm$.

(§4.3.3.1) The genitive is explained by either assuming a sound change (syncope of *-eR-e/os > *-eRs), or analogical remodelling. These attempts have both been shown to be problematic: besides the fact that positing a syncope is *ad hoc*, there is counterevidence from the nom.pl. (*$ph_2téres$), as well as the nominative singular. Regarding the analogical remodelling, it is difficult, if not impossible, to find a working model and plausible motivation. Therefore, I have no other solution than maintaining that the genitive is problematic to SL.

(§4.3.3.2) Beekes argues, that since SL appears to be designed to explain s-less nominatives, the asigmatic nominatives of h_2-stems prove that there is no need to explain asigmatic nominatives in *-$ēR$ from *-eR-s. As has been shown, Piwowarczyk's objection that the nom.sg. of h_2-stems originated as a collective is not without problems, since methodologically a development *collective > h_2-stems* is not compelling, whereas materially the ablauting paradigm of the h_2-stems and ih_2-stems (*-$(i)h_2$-/-$(i)eh_2$-), which looks archaic, must then be secondary, but there is no other evidence for this. This suggests that Beekes' argument is still valid, which would imply that methodologically the nominatives in *-$ēR$ need not go back to sigmatic *-eR-s.

(§4.3.3.3) With regard to the locative type in *-$ēR$ in other stem classes than i-stems, Beekes refutes Szemerényi's proposal of *-$ei̯$-i > *-$ei̯i̯$ > *-$ēi$ for several reasons: first, counterevidence in the HD locative and PD dative (*-eR-i) shows that SL did not operate here.

Second, a development of *-$e\underset{.}{i}$-i > *-$e\underset{.}{i}\underset{.}{i}$ is phonetically less likely than *-$e\underset{.}{i}$-i > *-ei. Third, there is no motivation to generalize *-$e\underset{.}{i}\underset{.}{i}$ instead of *-$e\underset{.}{i}$-i, since the latter is more transparent. Fourth, the development implies the existence of *$V(R)C$-roots, which is difficult to ascertain. Hence, I can only insist on Beekes' conclusion that the locative in *-$\bar{e}R$ is problematic to SL.

(§4.3.3.4) Just like the thematic endings *-om and *-oi, the acc.pl. *-oms can be explained as a relatively recent formation.

(§4.3.3.5) As has been observed in the material (§2.5), many items of the collective type in *-$\bar{o}C$ do not have proper collective semantics. On the basis of the semantics, it is doubtful whether the collective type in *-$\bar{o}C$ can be equated with the type *-h_2, which is done by Nussbaum 1986. Nussbaum's idea also has formal problems, since there is an ablaut mismatch: the type in *-h_2 always has zero grade of the suffix and ending (*-ih_2, *-uh_2), whereas the collective type in *-$\bar{o}C$ would always have o-grade, if the type continues older *oC-h_2. Since the prehistory of the type in *-$\bar{o}C$ remains uncertain now, it becomes more difficult to determine whether it was a lost morpheme or phoneme which did or did not cause the long vowel in these formations. In other words, the aforementioned considerations make it doubtful that SL (*-VRh_2# > *-$\bar{V}R$#) operated in the collectives.

(§4.3.3.6) Concerning the acc.sg. *-$\bar{e}m$, it has been pointed out that the explanation by SL is *a priori* unlikely.

In short: the above-discussed categories, except the acc.pl. *-oms, all speak against Szemerényi's Law. Since it is implausible that for each separate category a new explanation could be established which would save SL, the law is best given up.

From the sections above it can be observed that monosyllabic lengthening probably works for the nominal system, that Kortlandt's lengthening before word-final resonant can only work when it is reformulated (viz. leaving out the nasals as a conditional factor), and that SL must probably be rejected.

Of course, a thorough scrutiny of the verbal system and other categories may lead to a different picture, in which, for instance, monosyllabic lengthening would turn out to be problematic. The last word has not been spoken on the origin of the Proto-Indo-European lengthened grade.

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