The origin of the Proto-Indo-European nominal accent-ablaut paradigms

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In this paper, I will discuss the origin of the different nominal accent-ablaut paradigms that can be reconstructed for (late) Proto-Indo-European, and argue that new insights into several peculiarities of the Hittite nominal case system may have interesting consequences for this topic. In order to do so, it is important that we first have a good understanding of the nature and development of Proto-Indo-European ablaut and its correlation with accent.

The inner-Proto-Indo-European development of ablaut: Brugmann

As is well known, virtually every morpheme in Proto-Indo-European contains a slot that can be filled either by one of the vowels **e*, **o*, **ē*, or **ō*, or by no vowel at all, **Ø* (zero).[1] It was already Brugmann (1897) who makes the following interesting statement on the Proto-Indo-European ablaut system: "Fragt man nach dem Ursprung des uridg. Ablautes, so ist also wahrscheinlich, dass er der Hauptsache nach durch lautgesetzliche Wirkung entstand" (1897: 483). He adds to this, however, that "es von vorn herein klar [ist], dass nicht ein einziges Lautgesetz diesen Ablaut geschaffen hat, sondern eine grössere Anzahl, und dass diese in verschiedenen Perioden gewirkt haben, so dass in dem, was wir den uridg. Ablaut nennen, mehrere, in verschiedenen Zeiträumen entstandene Schichten übereinander liegen. In den älteren Schichten wird sich aber jedesmal schon manches durch Formübertragungen verschiedner Art verschoben haben, ehe der neue ablautwirkende Factor in Thätigkeit kam" (1897: 484). As we see, Brugmann assumes that the shaping of the Proto-Indo-European ablaut system lies in several sound laws that have worked in different time periods. Moreover, he states that it is well possible that in the periods between these sound laws several "Formübertragungen", i.e. morphological processes have taken place that may have blurred the regularity of the sound laws. According to Brugmann, there are three basic ablaut patterns, which he explains by assuming three different sound laws.

1. The first pattern Brugmann recognizes is the alteration between *e*-grade and *Ø*-grade, about which he states: "Man erkennt leicht, dass die Abstufung [i.e. the alteration between **e* and **Ø*] zum grössten Teil auf mehr oder minder weitgehender Reduktion sonantischer Elemente schwachtoniger Silben beruht, auf Lautverlusten, durch die bald Silben gekürzt worden, bald auch Silben verloren gegangen sind: z. B. 1. Plur. **imés* ai. *imás* 'imus' aus **eimés*, vgl. **éimi* ai. *émi* 'eo', **smés* ai. *smás* 'sumus' aus **esmés*, vgl. **ésmi* ai. *ásmi* 'sum'" (1922: 138-9). In other words, Brugmann explains the *e/Ø*-ablaut in these word pairs by assuming that in a pre-stage of Proto-Indo-European each morpheme within a given word contained a vowel, but that at a certain point in time a sound law applied due to which only the accented vowel of the word was retained, and the unaccented vowels were lost.

2. The second pattern treated by Brugmann is the alteration between *ĕ* and *ŏ*, about which he states: "Bei dem qualitativen Ablaut, der Abtönung, handelt es sich zunächts um den Wechsel *é* : *o* und *ḗ* : *ō*. Gr. φρέν-ες φρήν : ἄ-φρονες ἄ-φρων; arm. *anjink-k'* 'Seelen, Personen' : *mi-anjunk'* 'Mönche'. Gr.

[1] It is often claimed that PIE also knew the vowels **a* and **ā* (e.g. Tichy 2000: 25, Meier-Brügger 2002: 76, Fortson 2004: 60-1, Clackson 2007: 34-6, Weiss 2009: 40-1), and that we therefore also must reconstruct an **a/ā*-ablaut (e.g. in the word for 'salt', nom.sg. **sā́l(-s)*, acc.sg. **sál-m*, gen.sg. **sal-ós*, cf. NIL: 586-90) and an **a/Ø*-ablaut (e.g. in the root 'to give', **$h_1$ai- / *h_1i-*, cf. LIV^2: 229). Nevertheless, it is usually assumed that **a* "does not normally alternate in regular ablaut with **e* or **o*" (Weiss 2009: 41), and I will therefore not take these vowels into account here. In fact, I myself do not see any good reason for reconstructing the vowels **a* and **ā* for PIE (cf. Lubotsky 1989): the word for 'salt' should in my view rather be reconstructed as a hysterokinetic noun nom.sg. **sh$_2$-él*, acc.sg. **sh$_2$-él-m*, gen.sg. **sh$_2$-l-és*, whereas the root for 'to give' can be reconstructed as **$h_2$ei-* (cf. Kloekhorst 2006: 118[17]).

πατέρ-ες πατήρ : εὐ-πάτορες εὐ-πάτωρ; ai. *pitár-as* : *tvát-pitāras* [...]. Es ist darnach klar, dass mit dem Zurücktreten des Tons die Umfärbung von *ĕ̄* zu *ŏ̄* im Zusammenhang stand" (1922: 145-6). In other words, Brugmann assumes that in these words **o* and **ō* are the result of a loss of accentuation of original **e* and **ē*. Moreover, he states: "Die *ŏ̄*-Formen sind aus der lautgesetzlichen Stellung im Satz vielfach in andere Stellungen übergegangen, z. B. hat im Griech. πόδες altes *πέδες (lat. *pedēs*) verdrängt" (1922: 145). This means that Brugmann assumes that in all cases where we find an **ŏ̄* in an accented position, this is the result of an analogical development, like, for instance, the introduction of **o*-grade in a morpheme that originally contained an **e*-grade.[2]

3. The third pattern mentioned by Brugmann is the alteration between short and long vowels, **e* and **o* vs. **ē* and **ō*, about which he states: "In den Bereich des quantitativen Ablauts, der Abstufung, gehört auch die Entstehung der Dehnstufe bei den leichten Basen. Diese erscheint besonders im Nom.sg., [...] im *s*-Aorist, [...] und in Präsentien [...]" (1922: 144). In other words, Brugmann notes that the distribution of the lengthened grade is remarkably limited. He therefore assumes that "solche Längen aus Kürzen entstanden [sind]" (1922: 144), i.e. are the result of some specific sound laws by which original short **e* and **o* were lengthened to **ē* and **ō*.

At first sight, especially the explanation for pattern 1 and pattern 2 seem to contradict each other. According to the sound law that would be responsible for pattern 1 all unaccented *e*'s would be lost, whereas according to the sound law that would be responsible for pattern 2 all unaccented *e*'s would turn into *o*. In order to solve this contradiction, we must assume, as Brugmann himself already noted, that both sound laws took place in different periods. Moreover, we must assume, again as Brugmann himself already noted, that in the intermediate period several analogical developments have taken place that yielded the input for the sound law that caused pattern 2.

The development of ablaut within Proto-Indo-European: the Beekes-Kortlandt chronology

It is on the basis of such considerations as Brugmann's that Beekes and Kortlandt have formulated a relative chronology of developments that explains the ablaut system as attested in late Proto-Indo-European.[3] I will in the following exemplify this chronology with the use of the paradigm of the word for 'mind', which in late Proto-Indo-European inflected as nom.-acc.sg. **mén-os*, gen.sg. **mén-es-os* (Skt. *mánas*, *mánasas*, Gr. μένος, μένεος), but which has been traced back by Schindler (1975a: 259-64) to an early PIE inflection nom.-acc.sg. **mén-s*, gen.sg. **mn-és-s*.

Sound Law 1

Massive vowel reduction: all vowels that in a pre-Proto-Indo-European stage were accented became **e*,[4] whereas all unaccented vowels were lost. After this sound law has taken place, all words contained only one morpheme that contained an accented *e*-grade, whereas all other morphemes were in zero-grade: nom.-acc.sg. **mén-s*, gen.sg. **mn-és-s*.

Intermediate period A

After Sound Law 1 has ceased to operate, we sometimes find spread of the vowel **e* to unaccented morphemes. In the case of **mén-s*, **mn-és-s*, the vowel **e* of the suffix spread to the nom.-acc.sg. form, yielding **mén-es*. Moreover, the zero-grade form of the gen.sg. ending is replaced by its full grade form in analogy to hysterodynamic paradigms, yielding gen.sg. **mn-és-es*.

[2] Or an accent shift by which an **o* secondarily became accented. Such a shift can be assumed for explaining, for instance, the accented **ó* in the verb 'to know': 1sg. **uóid-h_2e*, 2sg. **uóid-th_2e*, 3sg. **uóid-e*. This verb must then be regarded as the result of an accent shift from earlier **uoid-h_2é*, **uoid-th_2é*, **uoid-é*, possibly by analogy with the root accentuation of the athematic root present (**$h_1$és-mi*, etc.) or the stative (**ḱéi-h_2*, etc.).

[3] Beekes 1985: 157; Kortlandt 2001; cf. also Kloekhorst 2013: 118-9.

[4] That is, they became a vowel that in the end developed into **e*. Since in the stage directly following Sound Law 1 we are effectively dealing with a language with only one phonemic vowel (note that **i* and **u* are just vocalic variants of earlier **y* and **w*), this vowel phonetically probably was [ə].

Sound Law 2
All unaccented **e*'s are weakened to **o*.[5] The regular outcome of **mén-es*, **mn-és-es* is then **mén-os*, **mn-és-os*.[6]

Intermediate period B
After Sound Law 2 has ceased to operate, we again find some regularizations. For instance, in the case of **mén-os*, **mn-és-os*, the accented *e*-grade of the nom.-acc.sg. form is generalized throughout the paradigm, yielding **mén-os*, **mén-es-os*. The vowels **e* and **o* are now really separate phonemes, which means that also **o* can now spread to accented morphemes.

Sound Law 3
In some environments, short **e* and **o* are lengthened. There is still some debate on the exact conditions of these lengthenings, but it seems now generally accepted that, for instance, the long **ē* in nom.sg. **ph$_2$-tḗr* 'father' is the outcome of an earlier short **e*, which underwent lengthening either because it stood before a word-final resonant (thus Beekes 1985: 152) or because it stood before a word-final sequence **-rs* that was reduced with compensatory lengthening (so-called Szemerényi's Law).[7]

Consequences for the nominal accent-ablaut paradigms
In Kloekhorst 2013, I have argued that Beekes and Kortlandt's chronology as given above can help elucidate the internal developments of the Proto-Indo-European nominal accent-ablaut paradigms. In most recent handbooks, five of such nominal accent-ablaut paradigms are reconstructed, two of which are static, the other three being mobile ('kinetic') ('R' = root, 'S' = suffix, 'E' = ending):[8]

	acrostatic I			acrostatic II			proterokinetic			hysterokinetic			amphikinetic		
	R	S	E	R	S	E	R	S	E	R	S	E	R	S	E
nom.	*ó*	-	-	*ḗ*	-	-	*é*	-	-	-	*ḗ*	-	*é*	*ō*	-
acc.	*ó*	-	-	*ḗ*	-	-	*é*	-	-	-	*é*	-	*é*	*o*	-
obl.	*é*	-	-	*é*	-	-	-	*é*	-	-	-	*é*	-	-	*é*
loc.	*é*	-	-	*é*	-	-	-	*ḗ*		-	*é*	*(-i)*	-	*é*	*(-i)*

Static paradigms
The two static paradigms that are usually reconstructed are called 'acrostatic', which means that they are regarded to have been accented on their root throughout the paradigm, whereas the other morphemes are all unaccented and in zero-grade. In the paradigm that is called 'acrostatic I' it is assumed that the root showed an **ó/é*-ablaut, whereas in the paradigm that is called "acrostatic II" the root is assumed to have shown **ḗ/é*-ablaut.[9]

[5] Since at this stage Proto-Indo-European had a two-vowel system, it is likely that the phonetic rendering of **o* was something like [ɐ]. Only after **h$_2$* started to have a colouring effect on neighbouring **e*'s, lowering them to [a], the other two vowels, **e* [ə] and **o* [ɐ], were pushed to the position of [ɛ] and [ɔ], respectively.
[6] Note that in print, Schindler (1975a: 266) claimed to be agnostic about the origin of **-o-* in **mén-os*: "Eine sichere Deutung der *o*-Qualität [of *mén-os*] läßt sich freilich nicht geben, und ich verzichte auf Spekulationen darüber". In the discussion after the presentation of this paper at the Marburg Arbeitstagung several colleagues confirmed, however, that in class Schindler did teach the idea that the **-o-* in *mén-os* was the regular outcome of an earlier unaccented **-e-* that was transferred from the suffix syllable of the oblique stem **mn-és-*.
[7] Szemerényi 1962: 13.
[8] E.g. Meier-Brügger 2002: 203-20, Fortson 2004: 107-10, Clackson 2007: 79-86. Note that Meier-Brügger in his overview of paradigms states that in the acrostatic paradigm the locative has the structure **CC-éC* (2002: 216), whereas in the paradigm of **nok^w-t-*, **nek^w-t-*, his main example for an acrostatically inflected noun, he cites a locative form **nék^w-t* (2002: 218), i.e. according to the structure **CéC-C*.
[9] Eichner 1973: 68, 91[33]; Schindler 1975b: 4-8.

In Kloekhorst 2014a, I have reviewed all the available evidence for these paradigms and have argued for several adaptations of these reconstructions. First, I have found no indisputable evidence in favor of the existence of a PIE **ó/é*-ablauting acrostatic paradigm. The words that undeniable do show an ablaut between *o*-grade and *e*-grade in the root (**pod- / *ped-* 'foot', **iok^{w}-r/n- / *iek^{w}-r/n-* 'liver') are in fact mobile.[10] Second, in my treatment of the acrostatically inflected nouns that thus far were seen as showing **ḗ/é*-ablaut in their root, I have found no indisputable evidence in favor of the presence of a lengthened grade **ē* in any of the forms of their paradigms.[11] Instead, all evidence rather points to the presence of a single ablaut grade, namely **e*. I have therefore concluded that we can reconstruct only one static paradigm, which had the following structure:

static

	R	S	E
nom.	*é*	-	-
acc.	*é*	-	-
obl.	*é*	-	-
loc.	*é*	-	

Examples are, for instance, the word for 'mother' (nom.sg. **méh$_2$-tr*, acc.sg. **méh$_2$-tr-m*, gen.sg. **méh$_2$-tr-s*) and the word for 'time' (nom.-acc.sg. **méih$_2$-ur*, gen.sg. **méih$_2$-un-s*).

Mobile paradigms

In most handbooks, three mobile paradigms are reconstructed: a proterokinetic, a hysterokinetic, and an amphikinetic one. In Kloekhorst 2013, I have called attention to the fact that a fourth mobile paradigm can be reconstructed as well, namely on the basis of the Hittite word for 'hand', nom.sg. *keššar*, acc.sg. *kiššeran*, gen.sg. *kišraš*, which can only reflect a paradigm of the structure nom.sg. **CéC-C*, acc.sg. **CC-éC-m*, gen.sg. **CC-C-és*.[12] Moreover, I have in that same article[13] explained that although all these four paradigms can be reconstructed for the latest stage of Proto-Indo-European, we can on the basis of internal reconstruction, using Beekes and Kortlandt's relative chronology of the internal development of ablaut (as also given above), argue that the hysterokinetic and the amphikinetic paradigms are in fact younger offshoots of the *keššar*-paradigm that have undergone morphological generalizations.[14] This means that for the earliest stage of PIE we only need to

[10] I regard these as secondary offshoots of originally mobile paradigms with only one accented *e*-grade per form. In the case of the word for 'foot', I reconstruct early PIE nom.sg. **péd-s*, acc.sg. **péd-m*, gen.sg. **pd-és*, dat.sg. **pd-éi*, etc. (note that gen.sg. **pd-és* may be attested as such in Skt. *upabdá-* 'noise of going', which may reflect an old univerbation of the collocation **h$_1$upo pdés* 'under the foot', p.c. A.M. Lubotsky). In Intermediate Period A the vowel of the stem was generalized, yielding gen.sg. **ped-és*, dat.sg. **ped-éi*, etc., which through Sound Law 2 regularly developed into **pod-és*, **pod-éi*. When through Sound Law 3 the vowel of the nom.sg. form was lengthened because it stood in a monosyllable, we arrive at the late PIE paradigm nom.sg. **pḗd-s*, acc.sg. **péd-m*, gen.sg. **pod-és*, dat.sg. **pod-éi*, which to my mind can account for all attested forms in the IE daughter languages. In the case of the word for 'liver', I reconstruct an early PIE proterodynamic paradigm nom.-acc.sg. **iék^{w}-r*, gen.sg. **ik^{w}-én-s*, loc.sg. **ik^{w}-én-i*, etc. In Intermediate Period A, the root vocalism was generalized, yielding gen.sg. **iek^{w}-én-s*, loc.sg. **iek^{w}-én-i*, which through Sound Law 2 regularly yielded gen.sg. **iok^{w}-én-s*, loc.sg. **iok^{w}-én-i*. It is this late PIE paradigm that is most faithfully reflected in Lat. *iecur*, *iocineris*. For a detailed treatment of these words, cf. Kloekhorst 2014a: 151-61.

[11] The word for 'time' that is usually reconstructed as **mḗh$_2$-ur*, **méh$_2$-un-s* must in my view in fact have been **méih$_2$-ur*, **méih$_2$-un-s*; the word for 'well' that is sometimes reconstructed as **b^{h}rēu̯-r̥*, **b^{h}réu̯-n-s* (Eichner 1973: 68) must in fact have been **b^{h}réh$_1$-ur*, **b^{h}rh$_1$-uén-s*; the long **ē* as found in Gr. ἦπαρ 'liver' must be secondary, whereas the Av. form *yākar* 'id.' is a mistake. See Kloekhorst 2014a for an extensive treatment of all these and other acrostatic nouns.

[12] Cf. already Beekes 1985: 56 and Kloekhorst 2008: 471-2.

[13] On the basis of Beekes 1985.

[14] The scenario sketched in Kloekhorst 2013 runs as follows. In Early PIE, there was only one type of mobile paradigm for animate nouns, namely the *keššar*-type: **CéC-C*, **CC-éC-m*, **CC-C-és*. In Intermediate Period A,

reconstruct two mobile paradigms, a proterokinetic one (which from now on I will call 'proterodynamic', since this is the term as it was originally coined by Pedersen 1926: 24)[15] and the *keššar*-paradigm (which from now on I will call 'hysterodynamic')[16], which had the following structures:

	proterodynamic		
	R	S	E
nom.	*é*	-	-
acc.	*é*	-	-
obl.	-	*é*	-
loc.	-	*é*	

	hysterodynamic		
	R	S	E
nom.	*é*	-	-
acc.	-	*é*	-
obl.	-	-	*é*
loc.	-	*é*	

Examples are, for instance, the word for 'fire' (proterodynamic: nom.-acc.sg. **péh$_2$-ur*, gen.sg. **ph$_2$-uén-s*) and the word for 'hand' (hysterodynamic: nom.sg. **ǵ^{h}és-r*, acc.sg. **ǵ^{h}s-ér-m*, gen.sg. **ǵ^{h}s-r-és*).

Correlation between paradigms and gender

In his treatment of the proterodynamic and hysterodynamic paradigms, Beekes (1985: 167) states that "[w]hen we look at the distribution of the gender of the two types, it appears that there is an overall distribution. [...] There are hardly any HD [= hysterodynamic, A.K.] neuters, whereas most classes of the PDI [= proterodynamic inflection, A.K.] consist of neuters". The same distribution has been observed by Viti (2015), who gives the following lists of the different noun classes that are found with a proterokinetic, hysterokinetic, or amphikinetic inflection (2015: 117-20):

Proterokinetic:
1. Feminine nomina actionis in *-ti-* (e.g. **ǵenh$_1$-ti-s / *ǵnh$_1$-téi-s* 'birth').
2. Feminine stems in **-h$_2$* or **-ih$_2$* (e.g. **g^{w}én-h$_2$ / *g^{w}n-éh$_2$-s* 'woman').
3. Neuter stems in *-r/n-* (e.g. **h$_1$ésh$_2$-r / *h$_1$sh$_2$-én-s* 'blood').
4. Neuter stems in **-uer/uen-* (e.g. **péh$_2$-ur / *ph$_2$-uén-s* 'fire').

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some of these nouns introduced the root shape of the nom.sg. form (including the accentuation) into their acc.sg. form, yielding the paradigm **CéC-C, *CéC-eC-m, *CC-C-és*. Because of Sound Law 2, this latter paradigm developed into **CéC-C, *CéC-oC-m, *CC-C-és*. At this stage we had two types of paradigms, namely the *keššar*-type, and the type with the acc.sg. form **CéC-oC-m*. In Intermediate Period B, some nouns introduced the stem of the acc.sg. into the nom.sg. form. Whenever this happened in *keššar*-type paradigms, the result was **CC-éC, *CC-éC-m, *CC-C-és*. Whenever it happened in paradigms with the acc.sg. of the shape **CéC-oC-m*, the result was **CéC-oC, *CéC-oC-m, *CC-C-és*. Because of Sound Law 3, the vowel of the suffix in the nom.sg. forms of these latter two paradigms was lengthened to **CC-ḗC* and **CéC-ōC*, respectively. We now arrive at the situation as attested in Late PIE, namely that we have three paradigms: the *keššar*-type, **CéC-C, *CC-éC-m, *CC-C-és* (i.e. the type that resisted the morphological generalizations that took place in Intermediate Period A and B), the hysterokinetic type, **CC-ḗC, *CC-éC-m, *CC-C-és* (i.e. the type that resisted the morphological generalization that took place in Intermediate Period A, but did take part in the morphological generalization that took place in Intermediate Period B), and the amphikinetic type, **CéC-ōC, *CéC-oC-m, *CC-C-és* (i.e. the type that took part both in the morphological generalization taking place in Intermediate Period A, and in the one that took place in Intermediate Period B). It should be emphasized that this scenario perfectly explains (1) why the *keššar*-type is attested only in the word for 'hand' – because as a word denoting a basic body part it belongs to the core of a language (nr. 48 on the Swadesh list), and therefore was an often used word that was able to resist morphological generalizations; (2) why the hysterokinetic type is attested in only a small group of words that primarily consists of kinship terms ('father', 'daughter') – because these, too, belong to the core of a language (be it less than 'hand'), and therefore are also often used words that were able to resist the first morphological generalization; and (3) why the amphikinetic type is the normal type – because the words that show this type (e.g. 'dawn', 'king', 'eagle') belong much less to the core of a language, therefore were less often used and as a consequence were more easily subject to morphological generalizations.

[15] Cf. also Kuiper 1942: 4.

[16] Cf. also Kloekhorst 2013: 111-6.

5. Neuter stems in *-l/n-* (e.g. **seh$_2$-ul / *sh$_2$-uén-s* 'sun').
6. Neuter stems in *-n-* (e.g. **h$_3$éng^w-n / *h$_3$ng^w-én-s* 'butter').
7. Neuter stems in *-men-* (e.g. **h$_3$néh$_3$-mn / *h$_3$nh$_3$-mén-s* 'name').
8. Neuter stems in *-s-* (e.g. **mén-(o)s / *mn-és-s* 'mind').[17]

Hysterokinetic:[18]
1. Kinship terms in *-r-* (e.g. **ph$_2$-tḗr / *ph$_2$-tér-m / *ph$_2$-tr-és* 'father').[19]
2. Nomina agentis in *-r-* (e.g. *dh$_3$-tḗr / dh$_3$-tér-m / *dh$_3$-tr-és* 'giver').
3. Masculine *n*-stems (e.g. *h$_2$uks-ḗn / h$_2$uks-én-m / *h$_2$uks-n-és* 'young bull').
4. Possessive adjectives in *-s-* (e.g. **h$_1$su-men-ḗs / *h$_1$su-men-és-m / *h$_1$su-mn-s-és* 'well-disposed').

Amphikinetic:[20]
1. Perfect active participles (e.g. **uéid-uos- / *uid-us-és* 'who knows').
2. Masculine or feminine *r*-stems (e.g. **suésor- / *suesr-és* 'sister').
3. Masculine *n*-stems (e.g. **d^{h}ǵém-on- / *d^{h}ǵm-n-és* 'human').
4. Masculine *men*-stems (e.g. **h$_1$éh$_1$t-mon- / *h$_1$h$_1$t-mn-és* 'breath').
5. Masculine *u*-stems (e.g. **néḱ-ou- / *nḱ-u-és* 'dead').
6. Masculine or feminine *s*-stems (e.g. *h$_2$éus-os- / *h$_2$us-s-és* 'dawn').
7. Forms in *h$_2$* (e.g. **pént-oh$_2$- / *pnt-h$_2$-és* 'path').
8. Feminine *m*-stems (e.g. **d^{h}ég-om- / *d^{h}ǵ-m-és* 'earth').

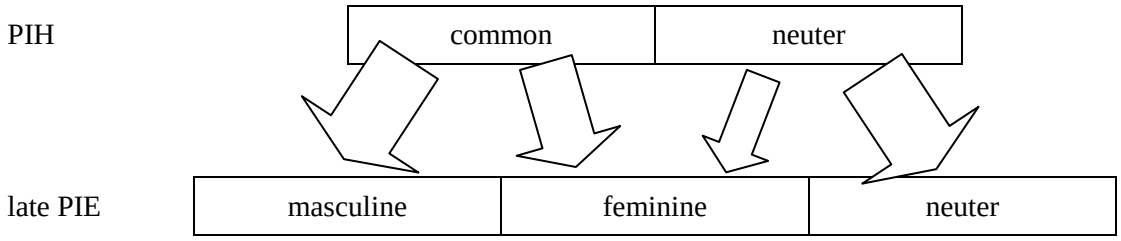
To these can be added the list of hysterodynamically (i.e. *keššar*-type) inflected nouns:

keššar-type:
1. The feminine word for 'hand' (**ǵ^{h}és-r / *ǵ^{h}s-ér-m / *ǵ^{h}s-r-és*).[21]
2. The common gender word for 'border' (**h$_1$ér-h$_2$ / *h$_1$r-éh$_2$-m / *h$_1$r-h$_2$-és*).[22]
3. The masculine and feminine forms of 'large' (**méǵ-h$_2$(-s) / *mǵ-éh$_2$-m / *mǵ-h$_2$-és*).[23]
4. Feminine nouns in **-uh$_2$-* (e.g. **déng^h-uh$_2$(-s) / *dng^h-ueh$_2$-m / *dng^h-uh$_2$-és* 'tongue').[24]

In principle, all noun classes that inflect according to the hysterokinetic, amphikinetic or the *keššar*-type inflection (and which can be seen as the offsprings of a single, originally hysterodynamic inflection) are of masculine or feminine gender (or of common gender when only attested in Anatolian),[25] i.e. non-neuter, and thus confirm Beekes' and Viti's observations. Furthermore, the

[17] Viti uses the example "**h$_3$óh$_1$-s / *h$_3$h$_1$-és-os*" 'mouth' here, but the reconstruction of this noun is difficult, cf. Kloekhorst 2008: 166-7.
[18] To which can be added: 5. The masculine *u*-stem **di-éu- / *di-u-és* 'sky' (cf. also footnote 32).
[19] Viti gives **d^{h}ugh$_2$-ter-* 'daughter' as an example, but cf. Kloekhorst 2011 for the possibility that this word originally was hysterodynamic according to the *keššar*-type: nom.sg. **d^{h}uégh$_2$-tr*, acc.sg. **d^{h}ugh$_2$-tér-m*, gen.sg. **d^{h}ugh$_2$-tr-és*.
[20] Viti also cites "9. The noun in diphthong of the "sky" (M): NOM **dyéw-s* [...] vs. GEN **diw-és*", which I would rather interpret as hysterokinetic, cf. footnote 32; and "10. Collective nouns in *-r/n-* as NOM **wéd-or-* "waters" vs. GEN **ud-n-és*", which to my mind did not exist as such (cf. Kloekhorst fthc. and Kloekhorst 2014b: 308[1157], where it is argued that Hitt. *u̯idār* in fact reflects a preform **ud-ṓr*).
[21] Beekes 1985: 53-6; Kloekhorst 2008: 471-2; Kloekhorst 2013: 111-5.
[22] Kloekhorst 2008: 246-7.
[23] Cf. Beekes 1985: 8, 17-9; Kloekhorst 2014b: 45-6.
[24] Cf. Beekes 1985: 39-43 for this reconstruction. According to Beekes (2011: 201) the same structure applies to the **-iH-* suffix that creates feminines (nom. **CéC-iH(-s)*, acc. **CC-iéH-m*, gen. **CC-iH-és*) like in Skt. *vṛ̥kī́-* 'she-wolf'. In Viti's view (2015: 117), these suffixes rather inflected mesostatically (i.e. with the accent on the suffix throughout the paradigm).
[25] The status of a few neuters that seem to inflect hysterodynamically is not fully clear. Hitt. *ḫaštai-* 'bone' is a neuter word, but shows an amphikinetic inflection: nom.-acc.sg. *ḫaštai* < **h$_3$éstH-ōi*, gen.sg. *ḫaštiaš* < **h$_3$éstH-i-os* << **h$_3$stH-i-és*. Beekes (1985: 167) states that *ḫaštai-* cannot be an old formation (the original noun was **h$_3$est-H-* instead) and is therefore irrelevant. But even if the formation of *ḫaštai-* is old, it need not be very probative. Since some of the other Hittite diphthong stem nouns show confusion regarding their gender (e.g. *ḫarnau-* 'birthing chair', which is attested both with common gender forms (nom.sg.c. *ḫarnāuš*, acc.sg.c.

majority of the noun classes that inflect proterodynamically are of neuter gender, and thus fit Beekes' and Viti's distribution as well. Yet, for the proterodynamic inflection type we also find several noun classes of non-neuter gender, namely feminines in *-*ti*-, *-h_2- and *-*i*h_2-, which therefore form real exceptions. For the feminines in *-h_2- and *-*i*h_2-, Viti (2015: 118) points to the fact that they contain the element *-h_2-, which can be equated with the nom.-acc.pl.n. ending *-h_2. This implies that these feminines originally were collectives that belong to neuter paradigms, and I therefore agree with Viti when she states that the "common occurrence [of the feminines in *-*(i)*h_2- and the neuter nouns] with the proterokinetic accent paradigms seems to be not a matter of chance" (ibid.). For the feminines in *-*ti*-, Beekes (1985: 100, 171) refers to Winter (1969: 215) who states that *-*ti*-stems "are made up to a large extent of verbal abstracts and thus of inanimate nouns". This implies that Beekes assumes that the correlation between inflection and gender does not apply to the late Proto-Indo-European three-gender system (masculine / feminine / neuter), but rather to an earlier two-gender system (animate / inanimate). Since it nowadays seems to be more and more accepted that the feminine gender was a post-Anatolian innovation of Core-Proto-Indo-European, and that early Proto-Indo-European (i.e. Proto-Indo-Hittite) must have had a two-gender system comparable to the one found in Anatolian (common vs. neuter gender),[26] it is fully cogent that an investigation into the possibility of a correlation between inflection types (which clearly stem from the earliest Proto-Indo-European stages) and gender should focus on the earlier two-gender system, and not the later three-gender system.
The exact details of to the rise of the feminine gender in post-Anatolian times are still unclear, but I think most scholars would agree that late PIE feminines seem to go back to both original common gender words (e.g. Gr. χείρ (f.) = Hitt. *keššar* (c.) 'hand') and to forms that originally belong with the neuter gender (feminines in *-h_2), cf. the following scheme:



Because of the ambiguitiy of the late PIE feminine category, a research into the correlation between inflection types and gender should not take the feminine into account, but only look at the inflection of the late PIE masculine and neuter gender nouns. When we look in this way at the lists given above, we see a perfect distribution: the proterodynamic inflection only contains neuter nouns, whereas the hysterodynamic inflection (i.e. the hysterokinetic, amphikinetic, and *keššar*-type inflections) only contains masculine nouns. This distribution may be translated for early Proto-Indo-European (Proto-Indo-Hittite) as a perfect correlation between, on the one hand, hysterodynamic inflection and common gender, and, on the other, between proterodynamic inflection and neuter gender. Since it is often assumed that the Anatolian two-way gender system reflects an earlier opposition between

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ḫarnaūn), and with neuter gender forms (nom.-acc.sg.n. *ḫarnāu*)), it cannot be excluded that the gender of *ḫaštai*- 'bone' is the result of confusion as well. It may well be that the noun originally was common gender, but that nom.sg. *$h_3$éstH-ōi* was reinterpreted as a neuter form because it was asigmatic (cf. Weitenberg 1995 for the correlation between common gender and a sigmatic nom.sg. ending, see also footnote 32). A similar scenario may explain Hitt. *utnē* 'land, country', which is a neuter word but shows a hysterokinetic inflection (nom.-acc.sg. *utnē* < **(H)ud-nḗi*, gen.sg. *utniaš* < **(H)ud-ni-ós*). Perhaps here, too, the original common gender nom.sg. form **(H)ud-nḗi* was reinterpreted as a neuter because it was asigmatic. As a parallel for the shift of gender on the basis of formal characteristics, cf. the case of *tēkan* 'earth', which originally must have been a common gender amphikinetic noun (**d^hégǵ-ōm / *d^hégǵ-om-m / *d^hǵ-m-és*), but which synchronically in Hittite is a neuter noun. It is commonly assumed that the formal merger of nom. **d^hégǵ-ōm* and acc. *d^hégǵ-om-m* into Hitt. *tēkan* caused a reinterpretation of this word as being of neuter gender, since only in neuter gender words the nominative and accusative forms are identical to each other (Schindler 1977: 31). Viti (2015: 120) also cites Hitt. *uitār* < **uédōr* as an example of an amphikinetic noun, but this reconstruction is incorrect, cf. footnote 20.

[26] Oettinger 2013/2014: 153-6; Melchert fthc.

animates (= common gender nouns) and inanimates (= neuter gender nous),[27] I will use these terms from now on.[28]
Although the material is scanty, the static inflection does not seem to have a preference for a specific gender. Of the six nouns that to my mind can be securely reconstructed as acrostatically inflected,[29] four are of neuter (= inaminate) gender (**Hég^h-r / *Hég^h-n-s* 'day', **méih$_2$-ur / *méih$_2$-un-s* 'time', **Pér-r / *Pér-n-s* 'house', **pér-ur / *pér-un-s* 'rock') and two are of common (= animate) gender (**b^{h}réh$_2$-tr / *b^{h}réh$_2$-tr-m / *b^{h}réh$_2$-tr-s* 'brother', **méh$_2$-tr / *méh$_2$-tr-m / *méh$_2$-tr-s* 'mother').
We can conclude that in early Proto-Indo-European, nouns could be inflected in only two ways, namely according to an accentually static paradigm or according to an accentually mobile paradigm. The static inflection was the same for animate and inanimate nouns, but in the mobile inflection there was a difference: animates inflected hysterodynamically, whereas inanimates inflected proterodynamically.[30]

The nominal accent-ablaut paradigms in early Proto-Indo-European
We have now reduced the six late PIE nominal accent-ablaut paradigms to only three early PIE ones: a static one (which could be both of animate and inanimate gender), a proterodynamic one (inanimate gender), and a hysterodynamic one (animate gender).

	static (inanim./anim/)			proterodynamic (inanim.)			hysterodynamic (anim.)		
	R	S	E	R	S	E	R	S	E
nom.	*é*	-	-	*é*	-	-	*é*	-	-
acc.	*é*	-	-	*é*	-	-	-	*é*	-
obl.	*é*	-	-	-	*é*	-	-	-	*é*
loc.	*é*	-	-	-	*é*		-	*é*	*(-i)*

It is interesting to see that in all three paradigms all forms show only one morpheme that is accented and at the same time shows **e*-grade, whereas all other morphemes are unaccented and show zero-grade. These paradigms can therefore be regarded as the direct result of Sound Law 1, which means that we have now come to the deepest level of Proto-Indo-European that can be reached through an analysis of the ablaut system as was done by Brugmann, Beekes and Kortlandt.

[27] Cf. e.g. Meier-Brügger 2002: 190-1.
[28] Note that Viti (2015: 120) remarks that some words that in late PIE are masculine or feminine amphikinetic nouns but have "inanimate referents" and thus seem to contradict the idea that this category should ultimately go back to the animate gender, "denote high individuated entities such as the earth, sky and dawn, which in the ancient IE languages were often personified and deified".
[29] Cf. the treatment of the static inflection in Kloekhorst 2014a.
[30] Thus already Beekes 1985: 171. Note that Viti's conclusions on the correlation between accent-ablaut classes and gender is rather different. According to her, we are dealing with a correlation "between the prosodic prominence of the right-accented hysterokinetic and amphikinetic paradigms and the lexical prominence of their referents" (2015: 122), in which "prosodic prominence" refers to the idea that "hysterokinetic and amphikinetic paradigms maximally deviate from the PIE default left-accentuation", and "lexical prominence" refers to the idea that "the referents of hysterokinetic and amphikinetic nouns rank higher in animacy and specificity than the referents of the other accent paradigms" (2015: 122-3). According to her, this "morphological explanation [...], whereby different accent paradigms are associated with different lexical classes" should be preferred over the "traditional phonological explanations for PIE accent paradigms, relating to sound change and indemonstrable syncope" (2015: 128). Viti's conclusions do not do justice, however, to the fact that within the acrostatic class animate nouns can be found, nor to the fact that it is nowadays rather generally accepted that the feminine gender was a relatively recent, post-Anatolian innovation. Moreover, Viti's conclusions are in fact nothing more than a restatement of the observation that there is a correlation between accent-ablaut paradigms and gender; they do not *explain* these correlations.

The endings

Thus far, we have only talked about the basic outline of the nominal ablaut-accent paradigms. The next thing that we need to do, is to reconstruct the shape of the endings. I will only take the singular endings into account.

Nominative

In the nominative of animate nouns we usually find the ending **-s*, e.g. in **di$_{1}$éus* 'sky-god' (Gr. Ζεύς, Skt. *dyáus*, Hitt. *šīuš*), **h$_{2}$euis* 'bird' (Lat. *avis*, Skt. *vís*), and in adjectives like **sueh$_{2}$dus* 'sweet' (Skt. *svādús*, Gr. ἡδύς). We also find many words with a zero-ending, especially in hystero- and amphikinetic nouns: **ph$_{2}$tḗr* 'father' (Skt. *pitā́*, Gr. πατήρ), **h$_{2}$ék$^{\prime}$mōn* 'stone' (Gr. ἄκμων, Lith. *akmuõ*). It is in the literature often assumed that these forms derive from older forms with an ending **-s* (**ph$_{2}$térs*, **h$_{2}$ék$^{\prime}$mons*), in which the sequence **-VRs#* through an assimilation **-VRR* yielded PIE **-V̄R* (Szemerényi's Law).[31] Apart from the fact that there are many counter-examples to this proposed sound law (e.g. proterodynamic gen.sg. forms in **-eR-s* which do not undergo this development, e.g. Av. *x^{v}ə̄ŋg* 'sun' < **sh$_{2}$uéns*), Keydana (2014) has argued that phonetically the proposed development is improbable. Moreover, there are several animate nom.sg. forms that show an unambiguous zero-ending, the best example of which is the word for 'hand', nom.sg. **ǵ^{h}és*r (Hitt. *keššar*, Gr. χείρ), but compare also the nom.sg. form of **h$_{2}$*-stems, **°C-(e)h$_{2}$* (Skt. *-ā*, Gr. -η, Lat. *-a*, Goth. *-a*). Beekes (1985: 152) has therefore proposed that the hystero- and amphikinetic nom.sg. forms like **ph$_{2}$tḗr* and **h$_{2}$ék$^{\prime}$mōn* have always had a zero-ending, and that the long vowel in their suffix is the result of a sound law **-VR# > *-V̄R#*. Whatever be the correct interpretation of these latter forms, it is clear that PIE knew two nom.sg. endings for animate nouns, namely **-s* and **-Ø*.[32]

Genitive

There are usually three allomorphs reconstructed for the gen.sg. ending, namely **-s*, **-os* and **-es*. It is generally assumed that **-s* was the ending used in the stative and proterodynamic paradigms (**CéC-C-s* and **CC-éC-s*, respectively). This means that both **-os* and **-es* should go back to the hysterodynamic paradigm. Yet, this paradigm can originally only have had one form, and in view of the development of the ablaut system as described above it is likely that this ending was **-és*, with an accented *e*-grade. The ending **-os* must then have come about from originally stative or proterodynamic words in which, during Intermediate Period A, the ending **-s* was replaced by the hysterodynamic variant **-es*, with *e*-grade but without the corresponding accent: **CéC-C-es* and **CC-éC-es*. When then Sound Law 2 took place, the unaccented ending **-es* automatically turned into **-os*: **CéC-C-os* and **CC-éC-os*. Yet, the original distribution between accented **-és* vs. unaccented **-os* has not been preserved in any of the IE languages. Instead, each language has generalized either **-es* or **-os*,[33] with **-s* having been retained in some specific categories only (e.g. in Skt. proterodynamic *i*- and *u*-stems).

Both in Sanskrit and in Greek, the genitive in **-(e/o)s* also had an ablative function.[34] Since typologically it is common that a genitive function develops out of an earlier ablative function instead of the other way around,[35] it is likely that the ablative function is original.[36] In the following, I will therefore use 'ablative' to refer to the case in **-(e/o)s*.

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[31] Szemerényi 1962: 13.

[32] In Hittite, we see a wide-spread sigmatization (cf. Weitenberg 1995) of animate nom.sg. forms: nom.sg. *ḫasterza* 'star' < **h$_{2}$stḗr* + *-s*, nom.sg. *ḫāraš* 'eagle' < **h$_{3}$érōn* + *-s*. If this spread of **-s* as the marker of the animate nom.sg. in Hittite is the continuation of a PIE phenomenon, it would show that nom.sg. forms that in PIE have an ending **-s* originally may have been endingless. This would help explain, for instance, the noun for 'sky-god': if the **-s* in its nom.sg. form is secondary, the paradigm **di$_{1}$éu*, **di$_{1}$ém* < **di$_{1}$éum*, **diués* could be regarded as regularly hysterokinetic: **di-é$_{1}$u*, **di-éu-m*, **di-u-és*.

[33] Only in Latin do we find both **-es* (OLat. *-es*, Class.Lat. *-is*) and **-os* (OLat. *-os*, *-us*), cf. Weiss 2009: 202. As far as I am aware, no linguistic distribution between the two is known.

[34] Cf. Whitney 1896: 104, Kühner & Gerth 1898: 388-404.

[35] Cf. e.g. ModEng. *of*, which nowadays is used to indicate possession, but which originally only meant 'away, away from' (cf. OED *s.v.*), or ModHG *von* 'of' that also originally meant 'from here' but is nowadays more and more used to replace the genitive case (cf. Kluge 1999 *s.v. ab*). Cf. also Lander 2009: 591, who states that one of the most common grammaticalization processes for genitives is an extension of an original ablative meaning.

Dative and i-locative

In most handbooks, the dat.sg. ending is reconstructed as *-*ei*, both for the proterodynamic and the hysterodynamic paradigm.[37] This is undoubtedly based on Sanskrit, where the dat.sg. ending is -*e* < *-*ei* for both proterodynamic and hysterodynamic nouns. In Greek, however, the dat.sg. ending is always -ι (although outside Attic an ending *-*ei* is attested as well, cf. Rix 1992: 154 and below). Also in Sanskrit an -*i* is found, namely in the loc.sg. case. It therefore is usually assumed that *-*ei* is the ending of the dat.sg. and *-*i* the ending of the loc.sg. and that in Greek the dative forms have been replaced by original locatives. Semantically, this makes sense as well. The Skt. dative in -*e* is "the case of the indirect object – or that toward or in the direction of or in order to or for which anything is or is done (either intransitively or to a direct object)" (Whitney 1896: 95), whereas the Skt. locative in -*i* "is properly the *in*-case, the case expressing situation or location", but is also "used to denote the place of rest or cessation of action or motion (*into* or *on to*)" (Whitney 1896: 101). In Greek, the dative in -ι has both the function of indirect object and of a locative (and then "bezeichnet [...] den Ort, wo ein Gegenstand sich befindet oder wohin er gelangt, sowie den Zeitpunkt, zu dem etwas geschieht", Kühner & Gerth 1898: 404-5).[38] On the basis of a comparison of the Sanskrit and Greek systems, it is therefore cogent to assume that the Greek case in -ι is the result of a syncretism of an earlier dative in *-*ei* and a locative in *-*i*.

In Hittite, we also find a single case that has both dative and locative meaning,[39] namely the dative-locative case, the ending of which is usually cited as -*i*.[40] Yet, it has recently become clear that the dative-locative in fact uses two different endings, namely -*i* (spelled °*Ci*), which phonologically represents a short, unaccented /-i/ (e.g. *pa-aḫ-ḫu-e-ni* = /pah^{w}:éni/ 'fire'), and -*ī* (spelled °*Ci-i*, with consistent plene spelling), which phonologically represents a long accented /-ī́/ (e.g. *ki-iš-ri-i* = /kiːsːrī́/ 'hand').[41] Interestingly, the ending /-i/ can etymologically only reflect PIE *-*i* (so /pah^{w}:éni/ < ***peh*$_2$*-uén-i*) but not *-*ei*, since this should have yielded **-*e* (***peh*$_2$*-uén-ei* should have yielded ***pa-aḫ-ḫu-e-ne*), whereas, conversely, the ending /-ī́/ can etymologically only reflect PIE *-*éi* (so /kiːsːrī́/ < ***ǵ*^{h}*s-r-éi*) but not *-*í*, since this would have yielded **-*ī́* (***ǵ*^{h}*s-r-í* should have yielded ***ki-iš-ri(-i)*, with inconsistent plene spelling).[42] The distribution is clear: whenever in Hittite the dat.-loc. ending is accented, it is -*ī* < *-*éi*, and whenever it is unaccented, it is -*i* < *-*i*.

This brings about a problem: if the Hittite dat.-loc. case represents a syncretism of the PIE dative in *-*ei* and locative in *-*i*, how is it possible that the one ending was generalized in accented position and the other in unaccented position? Should we not rather expect the complete generalization of either the *-*ei* or the *-*i* (as happened in Greek)?

Also in Mycenaean Greek we find both PIE endings, *-*ei* (which has yielded the endings /-ei/, spelled -*e*) and *-*i* (which has yielded the ending /-i/, spelled -*i*), being used in what synchronically can be regarded as a single case, which is called dative, but which in fact has dative-locative function. According to Beekes (1985: 117-25), who gives an overview of all Mycenaen dat.sg. forms that thus far were attested, the following distribution between the endings /-ei/ and /-i/ can be found: /-i/ is predominantly found in *s*-stems, whereas /-ei/ is found with all other stems.[43] Since within this sample the *s*-stem forms are the only well preserved proterodynamically inflected nouns, whereas all other

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[36] To be sure, the genitive function must have been present in late PIE already. Yet, the full shift to a genitive function only as can be observed in languages like Hittite (but see Hoffner & Melchert 2008: 254 for rare cases of an ablatival genitive in Hittite) must be due to language specific developments, probably because in these languages new ways of expressing the ablative function were created (in Hittite by creating a new ablative, namely in -*z* < *-*t-i*, i.e. the instrumental *-*t* to which locatival *-*i* was added).

[37] Tichy 2000: 66, Meier-Brügger 2002: 198, Fortson 2004: 105, Clackson 2007: 90-1, Weiss 2009: 199. These handbooks do not make explicit whether they reconstruct *-*ei* for the static paradigm as well.

[38] It also has instrumental function, but this is irrelevant for the present discussion.

[39] Cf. Hoffner & Melchert 2008: 257-62 for the semantics of the Hittite dat.-loc. case.

[40] Vanséveren 2006: 133-4; Hoffner & Melchert 2008: 69, 74; Rieken 2011: 45; Van den Hout 2011: 17.

[41] Kloekhorst 2014b: 444-50.

[42] Cf. Kloekhorst 2014b: 442-67

[43] Thus also Rix 1992: 154: "Im Myken. ist -*e* [-*e̯i*] die Normalendung (*di-we po-me-ne* att. Διί ποιμένι), außer bei -*s*-Stämmen (*we-te-i* = att. ἔτει)".

forms were probably hysterodynamically inflected, Beekes assumes that the ending /-i/ is specific for the proterodynamic inflection, whereas /-ei/ is specific for the hysterodynamic inflection.
The distribution in Mycenaean would thus correspond exactly to the one found in Hittite, where the unaccented ending /-i/ < *-*i* is specific for proterodynamically inflected nouns (*paḫḫueni* < *peh_2-uén-i*), whereas the accented ending /-ī́/ < *-*éi* is specific for hysterodynamically inflected nouns (*kišrī* < *$ǵ^h$s-r-éi*). On the basis of the Mycenaen material, Beekes (1985: 125) reconstructs the following case forms for the PIE dative and locative:

	proterodynamic	hysterodynamic
dat.	**CC-éC-i*	**CC-C-éi*
loc.	**CC-éC-i*	**CC-éC-i*

I fully agree with this reconstruction: it does not only account for Mycenaean, but it is also the only way that the synchronic distribution between Hitt. dat.-loc. /-i/ < *-*i* and /-ī́/ < *-*éi* can be explained.
This reconstruction has several implications, however. First, it implies that the dat.sg. forms of proterodynamic nouns as found in Skt., e.g. dat.sg. *mánase* 'mind', are recent creations, replacing earlier *mánasi* < **mén-es-i* << **mn-és-i*. This seems to me a trivial development. If in the proterodynamic paradigms originally the dative and locative had a single shape, **CC-éC-i*, whereas in the hysterodynamic inflection the dative was formally distinct from the locative, **CC-C-éi* vs. **CC-éC-i*, it is not surprising that the proterodynamic nouns took over the hysterodynamic dat. ending **-ei* in order to better mark their dative forms as well.
Second, it implies that for late PIE the dative and locative of the proterodynamic inflection were homophonous, which at first sight may seem odd. Yet, if it is true, as was argued above, that at an early PIE stage the proterodynamic inflection was specifically used with inanimate nouns, whereas the hysterodynamic inflection was used with animate nouns, this fact becomes more understandable. If we assume that the original function of the dative case was to mark the indirect object,[44] it becomes logical that the inanimate nouns did not have a separate dative case, since "[p]rototypically, the semantic nature of Recipients [= indirect objects, A.K.] requires that the referent be animate [...], as inanimate entities are not capable of genuine reception (i.e. becoming Possessors)" (Kittilä & Ylikoski 2011: 34). We may therefore assume that originally, proterodynamic nouns did not have a dative at all, and that only after the original animate-inanimate opposition became less rigid and/or the dative case received a broader semantic usage,[45] the proterodynamic nouns needed a dative as well. This was apparently provided by the original locative case (**CC-éC-i*), yielding the system as reconstructed by Beekes above. Yet, this system was unstable, and it therefore developed either into a system in which the dative and locative cases merged into a single case (like in Greek and Hittite, with different kinds of reshufflings of the endings), or into a system in which the dative of the proterodynamic nouns was formally differentiated from the locative by taking over the ending of the hysterodynamic dative (like in Sanskrit).
As is well known, in Sanskrit, the locative case of hysterodynamic nouns shows a peculiar feature: although it belong to the hysterodynamic paradigm, it in fact shows a structure that rather looks proterodynamic, e.g. *pitári* < **ph_2-tér-i* 'father'. It is to my mind unthinkable that these forms are of a secondary character. If, for some reason, an original hysterodynamic locative in the paradigm of 'father' was absent or needed to be replaced, and an analogy with the proterodynamic locative needed to be made, I would expect that the analogy would have been based on the other oblique cases of the paradigm (like dat.sg. *pitré*) and could only have yielded a form ***pitrí* < virtual **ph_2-tr-í*.[46] The

[44] In Sanskrit, the dative case also marks a goal, which is typologically a common semantic extensions of cases that mark the role of indirect objects, cf. e.g. Næss 2009: 578.
[45] For instance, to mark a goal, cf. the preceding footnote.
[46] Cf. the existence of loc.sg. *rā́jñi* which has secondarily replaced original (Rig-Vedic) *rā́jani*, by analogy with oblique cases like gen.sg. *rā́jñas* and dat.sg. *rā́jñe*. Note that all forms have generalized the full grade of the root and root accentuation, but must go back to the following PIE forms: loc.sg. **$h_2rh_1ǵ$-én-i*, gen.sg. **$h_2rh_1ǵ$-n-és*,

structure **CC-éC-i* of the hysterodynamic loc.sg. therefore must be old. Apparently, the proterodynamic (= inanimate) and the hysterodynamic (= animate) loc.sg. forms originally were identical in shape: **CC-éC-i*.
Another peculiar thing is that both the locative **CC-éC-i* and the dative **CC-C-éi* use the same formant, namely **i*. Taken together with the fact that the proterodynamic and hysterodynamic locative cases are identical, we seem to be dealing with an original situation in which for all mobile inflected nouns, regardless of their animacy, there was a locative of the shape **CC-éC-i*, and that it were only the animate nouns that could 'derive' from this locative a separate dative case with the shape **CC-C-éi*, because only animate nouns could occur in the role of indirect object. What I exactly mean with the verb 'derive' will be treated later on: at the level of Proto-Indo-European it amounts to forming a full grade variant, **-ei*, of an original zero-grade ending, **-i*.
We may schematize the early PIE connection between, on the one hand, the dative and the *i*-locative, and, on the other, animacy, as follows:

	proterodynamic (inanimate)	hysterodynamic (animate)
dat.	--	**CC-C-éi*
i-loc.	**CC-éC-i*	

Allative and endingless locative
In Hittite, an all.sg. case in *-a* (when unaccented) and *-ā* (when accented) is attested. There is some debate about the origin of this ending, but to my mind the equation between Hitt. *parā* 'forward' and Gr. πρό, Skt. *prá* 'id.' proves that the ending reflects PIE **-ó*.[47]
In view of the development of ablaut as treated above, it is awkward to find an accented **-ó*. Yet, just as Hittite has generalized the accented gen.sg. ending **-ós* at the cost of the original ending **-és*, we may assume that the ending **-ó* has in Hittite spread at the cost of an original ending **-é*. To my mind, this ending **-é* may still be found in the acc.sg. forms of the personal pronouns **h_1m-é* 'me' and **tu-é* 'you'. This implies that these forms originally were allative forms, which is unproblematic since cross-linguistically allatives often extend their function to becoming accusatives.[48] We may therefore assume that **-é* originally was the accented variant of the allative ending, and **-o* its unaccented counterpart.
Just as the ablative endings **-és* and **-os* stand beside a zero-grade ending **-s*, we may expect that the allative endings **-é* and **-o* also had a zero-grade variant. I want to propose that this zero-grade variant was in fact the ending **-Ø* as attested in the endingless locatives of e.g. Hittite and Sanskrit (note that in Sanskrit, locatives can also have an allative function, cf. Whitney 1898: 102-3). If we would follow through the analogy with the abl. endings **-és*, **-os* and **-s*, this would mean that the ending **-é* originally should have belonged to the hysterodynamic paradigm (**CC-C-é*), whereas the ending **-Ø* originally belonged to the proterodynamic paradigm (**CC-éC-Ø*) and the static paradigm (**CéC-C-Ø*). The ending **-o* would then have been the result of a transfer of the hysterodynamic ending **-e* to the proterodynamic paradigm (**CC-éC-e*) or static paradigm (**CéC-C-e*) at Intermediate Period A, after which Sound Law 2 took place, according to which unaccented **-e* regularly turned into **-o*, yielding **CC-éC-o* and **CéC-C-o*, respectively (cf. the description of the development of the PIE ablaut system above).

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dat.sg. **h_2rh_1ǵ-n-éi* (cf. Scharfe 1985 for the connection between Skt. *rā́jan-* 'king' and Gr. ἀρηγών 'helper, protector', which points to a reconstruction **$h_2$reh_1ǵ-en-*).
[47] Thus Dunkel 1994, Kloekhorst 2008: 161. Other scholars reconstruct **-h_2e*, with Hitt. *-ă̄* reflecting thematicized **-o-h_2e* (Jasanoff *apud* Weiss 1994: 147[44], Melchert 1994: 51-2, 325, although I myself would expect PIE **-o-h_2e* to have yielded Hitt. ***-aḫ(ḫ)a*), or **-eh_2* (Kim 2010).
[48] Heine 2009: 467. Compare also the fact that the PIE accusative in **-m* originally may have had an allative meaning, as can still be seen in the usage of the 'accusative of direction', e.g. Lat. *Romam* 'to Rome' (cf. also below).

A peculiar phenomenon is that in Sanskrit, the endingless locatives of hysterodynamic nouns have a proterodynamic structure, e.g. *tmán* 'self' < *h_1h_1t-mén-Ø*. To my mind, this form cannot have been the result of an analogy and therefore must be old.
The fact that the endingless locative of the hysterodynamic inflection is identical in shape to the corresponding form of the proterodynamic inflection, **CC-éC-Ø*, but is different from the hysterodynamic allative, **CC-C-é*, is reminiscent of the situation of the *i*-locative (proterodynamic and hysterodynamic **CC-éC-i*) and the dative (hysterodynamic **CC-C-éi*). I therefore assume that the endingless locative and the allative have a similar relationship with each other as the *i*-locative and the dative. Apparently, both inanimate and animate nouns could make a locative in **-Ø*, **CC-éC-Ø*, but only animate nouns were able to derive from this case a separate allative of the shape **CC-C-é*. Just as the dative case **CC-C-éi* was confined to animate nouns because of its semantics (the role of indirect objects is only possible with animate entities), we may assume that the allative of the shape **CC-C-é*, too, had a specific semantic role that was confined to animate nouns. It then becomes attractive to assume that it originally expressed the vicinal goal.[49]
If these considerations are correct, we may schematize the early PIE connection between, on the one hand, the allative and the endingless locative, and, on the other, animacy, as follows:

	proterodynamic (inanimate)	hysterodynamic (animate)
all.	--	**CC-C-é*
Ø-loc.	**CC-éC-Ø*	

Instrumental
In Kloekhorst 2014b: 103-5, I have argued that in Hittite we find three variants of the instrumental ending, namely *-t*, *-it* and *-et*, which are distributed as follows. The ending *-t* is the original zero-grade ending,[50] whereas *-it* and *-et* are the full grade endings, the former of which is the secondarily unaccented variant (Hitt. *-it* < pre-Hitt. unaccented **-et*),[51] and the latter of which is the accented variant (Hitt. *-et* < pre-Hitt. accented **-ét*).[52] This latter ending is also found in the Skt. pronominal abl. forms *mát* 'from me' and *tvát* 'from you'.[53] Just as with the other cases, the original distribution seems to have been that **-t* is found in static and proterodynamic paradigms, whereas **-ét* is found in

[49] Cf. Kittilä & Ylikoski 2011: 31-5, who argue that locatival cases that express the semantic role of Goal are prototypically used with inanimate entities (because Goal implies both direction to and eventual coincidence with that entity: 'John went to London'), whereas cases that express the semantic role of Vicinal Goal are prototypically used with animate entities (because Vicinal Goal implies only direction to and not eventual coincidence with that entity: 'John went to Mary'). As an example of a language that knows such a distinction, Kittilä & Ylikoski (2011: 39-41) give Hungarian, where the semantic role of Goal is expressed by either the illative case in *-ba* ('(in)to') or the sublative case in *-ra* ('(on)to'), but the role of Vicinal Goal is expressed by the allative case in *-hoz* ('to (the vicinity of)').
[50] E.g. in *išḫanta* /ɨshːánt/ 'blood' < *h_1s-$h_2$én-t*.
[51] E.g. *genzuit* /géntsuit/ 'lap' < *ǵénh$_1$-su-et*.
[52] E.g. *ḫūmantet* /hōməntét/ 'all, every' < *$h_2$eiu-u̯n̥t-ét* (cf. Kloekhorst 2014b: 535-6) or *patet* /padét/ 'foot' < **pod-ét*. For the assumption of accentuation on the ending in these forms, cf. their corresponding oblique cases dat.loc.sg. *ḫūmantī* /hōməntɨ́/, gen.sg. *ḫūmandāš* /hōməntáš/ and dat.loc.sg. GÌR-*i* /padɨ́/, gen.pl. *patān* /padán/.
[53] Although Sanskrit did not know an opposition between word-final *t* and *d*, these forms are often cited *mád* and *tvád*, respectively, undoubtedly on the basis of the presence of a *d* in the OLat. thematic abl.sg. ending *-ōd* (> Class. Lat. *-ō*). Yet, since word-final **t* regularly yielded OLat. *-d* (e.g. 3sg.opt. **$h_1$siéh$_1$t* > OLat. *sied* 'he be', Weiss 2009: 155), we cannot on the basis of Sanskrit and Latin decide whether we should reconstruct the ending with a **t* or a **d*. Hittite, however, offers an argument in favor of **-t*. Since within Hittite, the ablative in *-z*, which can only reflect pre-Hittite **-ti* and not **-d$^{(h)}$i*, can be seen as a derivation of the instrumental in *-(e/i)t* (addition of the locative particle / ending **-i*), it univocally shows that the latter ending goes back to **-(e)t* with a **t* (cf. Kloekhorst 2008: 799). In the following I will therefore consequently reconstruct **-t* for the instrumental.

hysterodynamic paradigms.[54] Yet, this is not the whole story: there is one instrumental form in Hittite that, as I now believe, may change this picture.
In the paradigm of the Hittite word for 'hand', *keššar*, we find an instrumental that in Old Hittite texts is spelled *ki-iš-šar-ta* and *ki-iš-šar-at*. Phonologically, these forms can only stand for /kiʂ:árt/, which by direct transposition yields a preform **ǵʰs-ér-t*.[55] This proterodynamic looking structure is remarkable since the other oblique cases of the word for 'hand' are all clearly hysterodynamic (gen.sg. *kišraš* < **ǵʰs-r-ós*, dat.-loc.sg. *kišrī* < **ǵʰs-r-éi*, all.sg. *kišrā* < **ǵʰs-r-ó*). To my mind, there is no way of explaining the proterodynamic structure of instr. **ǵʰs-ér-t* by analogy, and I therefore cannot but assume that it is original. This idea is strengthened by the fact that, as we have remarked above as well, the Hittite paradigm for 'hand' is extremely archaic, since it is the only word in which the original early PIE hysterodynamic paradigm has remained unaltered.
As a consequence, I assume that the original shape of the instrumental of hysterodynamic nouns was in fact **CC-éC-t*, and that the ending **-ét* as attested in Hittite *-et* and the PIE pronouns **h₁mét* and **tuét* is a relatively recent creation in analogy to the abl.sg. ending **-és*.

The early PIE paradigms
On the basis of all considerations above, we can reconstruct the following paradigms for early PIE: a static one (being used both with inanimate and animate nouns), a proterodynamic one (being used only with inaninimate nouns) and a hysterodynamic one (being used only with animate nouns). The dative and the allative case were only used by animate nouns because of their specific semantics. The instrumental, *i*-locative and *Ø*-locative were identical in shape for the proterodynamic and hysterodynamic paradigms, and therefore are given here as being shared by both paradigms.

	static (inanim./anim.)	proterodynamic (inanim.)	hysterodynamic (animate)
nom.	**CéC-C(-s)*	**CéC-C*	**CéC-C(-s)*
acc.	**CéC-C(-m)*	**CéC-C*	**CC-éC-m*
abl.	**CéC-C-s*	**CC-éC-s*	**CC-C-és*
instr.	**CéC-C-t*	**CC-éC-t*	
dat.	**CéC-C-i*	--	**CC-C-éi*
i-loc.	**CéC-C-i*	**CC-éC-i*	
all.	**CéC-C*	--	**CC-C-é*
Ø-loc.	**CéC-C*	**CC-éC*	

One step further: internal reconstruction
Thus far, all argumentations have been based on forms and patterns that are attested in the IE daughter languages themselves (and in which evidence from Hittite has played a crucial role). The next step I want to take will include arguments that are more based on internal reconstructions of the Proto-Indo-European linguistic material. I am aware that these are by definition more shaky than arguments based on the comparison of attested languages, but I believe firmly that internal reconstruction is an inherent part of the Comparative Method, and therefore is a legitimate way to pursue a deeper understanding of any given language, also a reconstructed one.

[54] The other IE languages show an instrumental ending **-(e)h₁*. Since this ending is unattested in Anatolian (note that Widmer 2005: 2002 reconstructs Hitt. *nakkī-* 'heavy, important' as deriving from an old instrumental **(H)noḱ-i-h₁* 'with weight', with an ending **-h₁*, but I find this account unconvincing, cf. Kloekhorst 2014b: 467-8), there seems to be a complementary distribution: Anatolian **-(e)t* vs. **-(e)h₁* as found in the other IE languages. Kortlandt 2010: 41 therefore assumes that after Anatolian has split off from PIE, word-final **t* in certain postconsontal environments regularly yielded **h₁* (through a stage **d*, cf. the development of word-final **t > d* as witnessed in Latin), which was then generalized to the full grade as well, giving rise to the new instr. ending **-(e)h₁*.
[55] Kloekhorst 2014b: 422.

Connection between instrumental and ablative

Kortlandt (2001: 6-7) has argued that the instrumental in *-*t* and the ablative in *-*(e)s* are related to each other. According to Kortlandt, the *-*s* of the ablative reflects an older **t* that at a pre-PIE stage has been assibilated because of a following vowel **i* (which was lost because of Sound Law 1, according to which all pre-PIE unaccented vowels were reduced to zero). As support for this pre-PIE sound law, Kortlandt refers, for instance, to "the perfect participle, cf. Gr. *eidót-*, fem. *iduĩa* < *-*us-ih*$_2$ < *-*ut-ih*$_2$ 'knowing', Vedic neuter *-vát* besides *-úṣ-*" (Kortlandt 2001: 6).[56]

The concept that the abl. ending *-*(e)s* derives from the addition of an element (**i*) to the instr. ending *-*t* has a good parallel in how the Anatolian ablative is formed. This ending, Hitt. *-(ā)z*, Luw. *-āti*, Lyc. *-edi* < PAnat. *-*(o)ti*, is usually seen as a derivative of the instrumental ending *-*t* (Hitt. *-(e/i)t*, cf. above), to which an **i* (= the locative ending?) has been added.[57]

Both phonetically and structurally I find Kortlandt's suggestion attractive, and I therefore accept it. It has several interesting consequences, however. If the abl. in *-*(e)s* is really derived from the instr. in *-*t*, and if the instr. in *-*t* indeed had a single shape for both the proterodynamic and hysterodynamic paradigm, viz. **CC-éC-t*, this situation is reminiscent of the relationship between the dative **CC-C-éi* and the *i*-locative **CC-éC-i* (which has a single shape for both the proterodynamic and hysterodynamic paradigm as well), and of the relationship between the allative **CC-C-é* and the *Ø*-locative **CC-éC* (which, too, had a single shape for both the proterodynamic and the hysterodynamic paradigm). In the case of the dative and the allative, it was argued that we may see these cases as having been derived from the *i*-locative and *Ø*-locative, respectively, and that, because of their semantics (marking the indirect object and the vicinal goal, respectively), they could only be used with animate nouns. If the relationship between ablative and instrumental were fully parallel to the relationships between dative and *i*-locative and between allative and *Ø*-locative, we would have to assume that the ablative case, too, was originally confined to animate nouns.

As far as I am aware, it does not make sense from a typological point of view to assume that the ablative case was originally confined to animate nouns: the general semantics of ablatives (indicating the source from which) does not necessarily interfere with animacy. If we want to assume that the ablative originally was specific for animate nouns only, we have to come upt with an additional scenario, which may be envisaged as follows. At an initial stage, there was only a single instrumental case in *-*t*, which could be used both with inanimate and with animate nouns (a situation comparable to English, cf. 'he was killed *by* knife' and 'he was killed *by* John'). Later on, an additional instrumental case specific for animate nouns was created (cf. the situation in German where the instrumental semantics are differently expressed with inanimate and with animate nouns: 'er wurde getötet *mit* einem Messer' vs. 'er wurde getötet *vom* Johann'). If we assume that this new case was formed in pre-PIE times by adding an element **i* to the instrumental ending *-*t*, and that at a later stage, this **i* caused assibilation of the *-*t* and was lost because it was unaccented, it would ultimately end up as the PIE ending *-*(e)s*, for which we then can assume that it was confined to being used by animate nouns. The next assumption would have to be that after a while, this specifically animate instrumental also acquired ablatival meaning (cf. German *von*, which means both 'by' and '(away) from'), due to which it became the case that we call ablative. At an even later stage, this ending also acquired possessive meaning, and therefore is usually called a genitive as well (cf. German *von*, which also means 'belonging to').

If this scenario is accepted, we can schematize the relationship in early PIE times between, on the one hand, the "ablative" in *-*(e)s* and the instrumental in *-*t*, and, on the other, animacy, as follows:

[56] Note that Kortlandt's pre-PIE reconstruction of *-*us-ih*$_2$ as "*-*ut-ih*$_2$" cannot be correct in this way. It should in fact have been *-*wVt-yVh*$_2$, since the assibilation of **t* is supposed to have taken place in pre-PIE times, i.e. the period before the massive reduction of unaccented vowels had taken place.

[57] To be sure, the **i* that is added to the PAnat. abl. *-*(o)ti* cannot have anything to do with the **i* that according to Kortlandt was added to the instr. ending *-*t* in pre-PIE times. The latter is a pre-PIE vowel that later on disappeared because of Sound Law 1, whereas the former is a PIE vowel that must have resulted from a pre-PIE consonant **y*.

	proterodynamic (inanimate)	hysterodynamic (animate)
"abl."	--	**CC-C-és*
instr.	**CC-éC-t*	

This implies that the proterodynamic (inanimate) variant of the ablative in **-(e)s* originally did not exist, but was created only at a relatively recent stage, when **-(e)s* acquired real ablatival semantics.

The ergative hypothesis

It has been argued by several scholars that at a certain pre-stage Proto-Indo-European was an ergative language. There are several reasons for this assumption.

1. The nominative and accusative of the inanimate nouns have one and the same form. According to Uhlenbeck (1901), this means that these forms originally had neither nominative nor accusative value, but must have had a more general function. He therefore proposes that, somewhere in its prehistory, PIE must have been an ergative-absolutive language, and that the inanimate nom.-acc. forms originally were absolutives.[58]

2. The nom.sg. case of animate nouns is usually marked with the ending **-s*, whereas the acc.sg. forms of inanimate nouns have no ending. This is atypical for nominative-accusative languages, where it usually is the nominative that is unmarked whereas the accusative is specifically marked as such. In ergative-absolutive languages, however, it is usually the absolutive that is unmarked, whereas the ergative case has a specific marking. Uhlenbeck (1901) therefore assumes that the nom.sg. in **-s* is in fact the old ergative case.

3. The animate nom.sg. ending **-s* is formally identical to the abl. ending **-(e)s*. According to Vaillant (1936), this is an extra argument for the interpretation of the animate nom.sg. forms in **-s* as old ergatives, since in many ergative-absolutive languages the function of the ergative is expressed by the ablative case.[59] This idea neatly fits the assumption that **-(e)s* originally may have been the specifically animate instrumental, since cross-linguistically instrumentals very often mark agents as well.[60]
The animate nom.sg. forms in **-Ø* must then be regarded as continuing old absolutives (Beekes: 1985: 173), which is the reason why the *s*-less nom.sg. of the hysterodynamic nouns, **CéC-C*, is formally identical to the nom.-acc.sg. of the proterodynamic nouns, **CéC-C*: they are both old absolutives.

4. The pronominal ending of inanimate nom.-acc.sg. forms is **-t* (often cited as **-d*, e.g. **tod*, **k^wid*, which in fact are **tot*, **k^wit*, cf. footnote 53), which is formally identical to the instr. ending **-t*. According to Vaillant (1936: 102), this fact can be explained by assuming that inanimate nouns used the instrumental as ergative, which is typically so for ergative-absolutive languages. For the semantics, compare Pedersen (1907: 152), who paraphrases a sentence like "der baum tödtet das thier", with an inanimate subject, as "durch den baum thiertödten", in which the use of the preposition "durch" equals the instrumental case, as opposed to "der bruder tödtet das thier", with an animate object, which he paraphrases as "des bruders thiertödten", with a genitive (= ablative) case.

[58] Although Uhlenbeck uses the term "Passivus" for what nowadays would be called an 'absolutive' (besides "Aktivus" for what is now termed 'ergative').
[59] In order to illustrate why this is the case, Vaillant (1936: 94) paraphrases the Chechen sentence *as jāz-dieš d-u jaina* 'I wrote a book' as "par moi – écrit – est – livre".
[60] Cf. Narrog 2009: 598-9.

A counter-argument against the hypothesis that PIE goes back to an earlier ergative-absolutive language could be that the animate nouns know a specific accusative case, which is understandable in a nominative-accusative language, but less so in an ergative-absolutive language. Vaillant (1936: 98-9)[61] argues, however, that the acc. in *-*m* in fact is an old lative (a value still visible in e.g. Lat. *Romam* 'to Rome') that was used only with animate nouns.[62] In his view, a sentence like "Dieu crée l'homme" can then in its ergative construction be paraphrased as "de la parte de Dieu (ablatif-ergatif) il y a création envers l'homme (latif)" (Vaillant 1936: 99).

Reconstructing beyond early PIE

If we take the above considerations into account, we can assume that the early PIE paradigms as reconstructed above go back to the following paradigms:

	static		mobile	
	static (inanim./anim.)		proterodyn. (inanim.)	hysterodyn. (animate)
abs.	**CéC-C*		**CéC-C*	
acc.	**CéC-C-m*		--	**CC-éC-m*
"abl."	**CéC-C-s*		--	**CC-C-és*
instr.	**CéC-C-t*		**CC-éC-t*	
dat.	**CéC-C-i*		--	**CC-C-éi*
i-loc.	**CéC-C-i*		**CC-éC-i*	
all.	**CéC-C*		--	**CC-C-é*
Ø-loc.	**CéC-C*		**CC-éC*	

Although the scheme above follows the traditional rendering of the PIE accent-ablaut paradigms (with a distinction between proterodynamic and hysterodynamic), I think that we can in fact arrange the forms in a more economical way, namely as follows:

		static	mobile
core cases	abs.	**CéC-C*	**CéC-C*
	instr.	**CéC-C-t*	**CC-éC-t*
	i-loc.	**CéC-C-i*	**CC-éC-i*
	Ø-loc.	**CéC-C*	**CC-éC*
specifically animate cases	acc.	**CéC-C-m*	**CC-éC-m*
	"abl."	**CéC-C-s*	**CC-C-és*
	dat.	**CéC-C-i*	**CC-C-éi*
	all.	**CéC-C*	**CC-C-é*

[61] With reference to Finck 1907: 280.

[62] Kortlandt 1983: 322 compares this use of an old lative with animate nouns to Spanish constructions like *la madre quiere a su niño* 'the mother loves her child', litt. 'to her child'.

According to this scheme, we are in fact only dealing with two original accentual classes, namely a class of nouns that show an accentually static inflection, and a class of nouns that show an accentually mobile inflection. Each noun, whether it was inanimate or animate, could form four core cases, namely absolutive, instrumental, *i*-locative, and *Ø*-locative. The absolutive had in both inflections the same shape, **CéC-C*, but the latter three cases were formed differently in the two inflections: they had the basic shape **CéC-C-C* in the static paradigm, but the shape **CC-éC-C* in the mobile paradigm. When a noun was animate, it could form four additional cases, which because of their semantics were specific for animate nouns, namely accusative, "ablative" (originally the specifically animate instrumental), dative (marking the indirect object), and allative (marking the vicinal goal). In the static paradigm, these all had the basic shape **CéC-C-C*, whereas in the mobile paradigm the accusative had the shape **CC-éC-C*, and the other three cases the shape **CC-C-éC*.
Note that this analysis boils down to saying that the proterodynamic and hysterodynamic inflection originally were one and the same, but that for pragmatic, semantic reasons, inanimate nouns could only use a limited set of cases, which were of the shape **CéC-C* and **CC-éC-C*, whereas animate nouns could use these cases, too, but also an additional set of cases that were of the shape **CC-C-éC*.

Further thoughts
Since within the accentually mobile inflection, the accusative **CC-éC-m* had the same basic shape as the core cases instrumental, *i*-locative and *Ø*-locative, it seems attractive to me that this case originally was a core case as well, presumably having a lative function. This would mean that its specialization to the specifically animate accusative case may have been relatively recent.
If, as Kortlandt assumes, the "abl." **CC-C-és* derives from an earlier form in **-t-i* that consists of the instrumental to which an element **i* is added, it becomes an interesting possibility that this **i* is the cause of the difference in accentuation between "abl." **CC-C-és* and instr. **CC-éC-t*. If we assume that in pre-PIE all morphemes still contained a vowel, the "ablative" **CC-C-és* would go back to pre-PIE **CVC-VC-́Vt-i*, whereas the instrumental **CC-éC-t* would go back to **CVC-́VC-Vt*. The difference in accentuation between the two could then be explained as the result of a single accent rule, for instance one according to which the accent falls on the penultimate syllable.[63]
This makes it attractive to assume that a similar rule underlies the accentual differences between dative **CC-C-éi* and *i*-loc. **CC-éC-i*, and between all. **CC-C-é* and *Ø*-loc. **CC-éC*. This would imply that the dative and allative originally contained an element as well, that caused the accent shift: pre-PIE dat. **CVC-VC-́Vy-V* vs. pre-PIE *i*-loc. **CVC-́VC-Vy*, and pre-PIE all. **CVC-VC-́V-V* vs. *Ø*-loc. **CVC-́VC-V*. Although there is no way to determine what this element looked like, it may be attractive to assume that it is identical to the element **i* as postulated for the "ablative". This gives way to assuming that in pre-PIE the specifically animate cases are marked by a single element, a system that is known from other languages as well, like Basque.[64] If this is correct, the typologically awkward existence in early Proto-Indo-European of two distinct accentually mobile accent-ablaut classes, namely the proterodynamic and hysterodynamic paradigm, can be seen as the ultimate result of a pre-PIE situation in which specifically animate cases were marked by adding an element to cases that are neutral to animacy, a situation that is typologically much more common.

Conclusions
We have seen that the commonly reconstructed accent-ablaut paradigms for late Proto-Indo-European (acrostatic I, acrostatic II, proterokinetic, hysterokinetic, and amphikinetic) can be argued to go back to only three early PIE paradigms, namely a static one (nom.sg **CéC-C(-s)*, acc.sg. **CéC-C(-m)*, gen.sg. **CéC-C-s*), a proterodynamic one (nom.-acc.sg. **CéC-C*, gen.sg. **CC-éC-s*), and a hysterodynamic, i.e. *keššar*-type, one (nom.sg. **CéC-C*, acc.sg. **CC-éC-m*, gen.sg. **CC-C-és*). The

[63] Although this rule certainly cannot be the rule that underlies the accentuation of pre-PIE in general since it does not account for, for instance, the static paradigm. I am planning on discussing the origin of the PIE accentuation on a different occasion.
[64] In Basque, the endings of animate nouns contain an extra formative, *-gan-*, which is absent from inanimate nouns. Compare, for instance, the following case forms of the toponym *Irun* and the proper name *Miren*, respectively: loc. *Irun-en* vs. *Miren-gan*; abl. *Irun-dik* vs. *Miren-gan-dik*; all. *Irun-a* vs. *Miren-gan-a*. Cf. Creissels & Mounole 2011: 168-9.

latter two paradigms of these show a remarkable distribution: the proterodynamic paradigm is originally confined to inanimate nouns, whereas the hysterodynamic paradigm is confined to animate nouns.
On the basis of an analysis of the case endings of the singular, in which especially several new insights into the Hittite nominal system (namely that the dat.-loc.sg. ending has two shapes, *-i* < **-i* and *-ī* < **-éi*; that the all.sg. ending *-a* goes back to PIE **-o*; and that the archaic instr.sg. form *kiššarta* reflects **ǵʰs-ér-t*) are used, we can reconstruct a system in which several cases are specific for animate nouns only (dat.sg. **CC-C-éi*, all. *CC-C-é*), whereas other cases are identical in shape for both the proterodynamic and the hysterodynamic paradigm (*i*-loc. **CC-éC-i*, *Ø*-loc. **CC-éC*, instr. **CC-éC-t*). Moreover, there seems to be a derivational relationship between some cases (dat. **CC-C-éi* ~ *i*-loc. **CC-éC-i*; all. **CC-C-é* ~ *Ø*-loc. **CC-éC*).
When these insights are combined with the theory that the abl. ending **-(e)s* originates from an extension of the instrumental ending **-t*, and with the theory that PIE at a prestage was an ergative language, we can reconstruct an original nominal system in which only two accent classes existed, namely an accentually static and an accentually mobile one, and that all nouns, regardless of whether they were animate or inanimate, could use a certain sets of cases (absolutive, *i*-locative, *Ø*-locative, instrumental), but that there also existed a set of cases that were confined to animate nouns (accusative, dative, allative, "ablative"), cf. the following scheme:

		static	mobile
core cases	abs.	**CéC-C*	**CéC-C*
	instr.	**CéC-C-t*	**CC-éC-t*
	i-loc.	**CéC-C-i*	**CC-éC-i*
	Ø-loc.	**CéC-C*	**CC-éC*
specifically animate cases	acc.	**CéC-C-m*	**CC-éC-m*
	"abl."	**CéC-C-s*	**CC-C-és*
	dat.	**CéC-C-i*	**CC-C-éi*
	all.	**CéC-C*	**CC-C-é*

It was moreover suggested that the specifically animate cases "ablative", dative, and allative may in pre-PIE times have been derived from the core cases instrumental, *i*-locative, and *Ø*-locative, respectively, by adding, in pre-PIE times, an element after the core cases, which in PIE-proper results in a shift of accentuation, namely from the suffix to the ending. If this is true, the existence of a separate proterodynamic and hysterodynamic inflection in Proto-Indo-European can be seen as the ultimate result of an earlier, very plain system in which animate nouns could use a set of endings that could not be used by inanimates simply because animate entities are capable of taking certain semantic roles that inanimates are not.

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