North-West Indo-European

First draft

Carlos Quiles, Fernando López-Menchero
North-West Indo-European

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Carlos Quiles, Fernando López-Menchero

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ACADEMIA PRISCA

Carlos Quiles has written the draft of all articles and approved the final manuscript.

Fernando López-Menchero has corrected the initial draft of Laryngeal loss and vocalism in North-West Indo-European, written the whole section Laryngeal reflexes in North-West Indo-European, and corrected the initial draft of The three-dorsal theory.

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Preface

This monograph is an evolving collection of papers relevant to the reconstruction of the language of a close community of speakers, demonstrated by recent genetic studies to be related to the peoples that expanded with the Yamna culture into central Europe, its transformation into the East Bell Beaker culture, and its subsequent expansion into central, west and northern Europe.

What was initially described by Krahe as an Old European community based on studies of European hydronymy, and what was described through comparative grammar as a North-West Indo-European group of dialects – sharing common lexical and grammatical traits –, is now more clearly defined as an ancient Indo-European proto-language that expanded at least twice from two small regions during the third millennium: from the North Pontic steppe to the Carpathian basin in the first half, and from the Danube to the rest of Europe in the second half.

Its definition and reconstruction is important not only for the reconstruction and classification of European languages that derive from this parent language, but for a better definition of Graeco-Aryan proto-languages, and of the parent Late Proto-Indo-European language.
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I. North-West Indo-European

A common North-West Indo-European (NWIE) group is being increasingly accepted in the literature (Oettinger 1997, 2003; Adrados 1998; Mallory and Adams 2007; Mallory 2013; Beekes 2011). Genetic research indicates that there was an Indo-European-speaking community in close contact in the East Bell Beaker group, evolved from western Yamna migrants ca. 2500 BC. This group expanded successfully in a short period into wide territories of western, northern, and eastern Europe, territories whose languages later evolved into Celtic, Italic, and Germanic, and probably Balto-Slavic (or its substrate language, ‘Temematic’), thus allowing for certain innovations to spread between these languages (Harrison and Heyd 2007; Mallory 2013; Quiles 2017).

The Bell Beaker territory is to some extent coincident with the one identified of Old European hydronymy (Krahe 1964; Krahe 1949; Nicolaisen 1957), a quasi-uniform name-giving system for water courses that shows Indo-European water-words and suffixes following rules of Late Proto-Indo-European word formation (Adrados 1998).

Fragmentary languages probably belonging to this group are Lusitanian (sometimes linked with Celtic) and Venetic (sometimes linked with Italic). Dubious is the nature of proposed substrate languages, like Belgian, Sorothaptic, Pre-Celtic Irish, or Pictish. Probably unrelated, from a Palaeo-Balkan group, are Messapian and Illyrian.

Proto-Romance reconstruction, albeit quite similar to Latin (Hall 1983), is obviously an artifice, not equal to Old Latin, since the development of Romance languages happened in the wide territories where Vulgar Latin was spoken in Antiquity. Romance languages were influenced by local, regional, inter-regional, or international contacts, so that they cannot be traced back to a single ancestral language without help from historical records and internal reconstruction. However, given the close community where the original
North-West Indo-European homeland must have formed (most likely in the Upper Danube, between modern Southern Germany and Budapest), we can assume that most reconstructed changes for North-West Indo-European happened during a period of a close western Yamna–Classical Bell Beaker community, before its sudden European expansion.

The reconstruction of North-West Indo-European (like the reconstruction of Late Proto-Indo-European and Proto-Indo-Hittite) should therefore not be considered a mere theoretical exercise, but a pragmatic approach to the phonetic reconstruction of a real language, spoken by a close community of people that lived during the mid-3rd millennium in a relatively small region of central Europe. During and after their expansion, close ties were kept between vast regions of the Bell Beaker culture – in contrast to the relationship with neighbouring cultures, like the Corded Ware culture – which further supports its close ethnolinguistic identification.

Table 1. Abbreviations of Proto-Indo-European language stages and dialects, with names used in this work and reference to older works, including approximate date guesstimates.

<table>
<thead>
<tr>
<th>Abbr.</th>
<th>Guesstimates</th>
<th>Name</th>
<th>Alternative names</th>
</tr>
</thead>
<tbody>
<tr>
<td>EIE</td>
<td>Early Proto-Indo-European</td>
<td>Early Indo-European; Indo-Uralic</td>
<td></td>
</tr>
<tr>
<td>PIH</td>
<td>5000-4000</td>
<td>Proto-Indo-Hittite</td>
<td>Indo-Hittite; Middle Proto-Indo-European</td>
</tr>
<tr>
<td>LIE</td>
<td>4000-3000</td>
<td>Late Proto-Indo-European</td>
<td>Late Indo-European; Classical Indo-European; Inner Indo-European; Core Indo-European</td>
</tr>
<tr>
<td>CIE</td>
<td>4000-3500</td>
<td>Common Indo-European</td>
<td></td>
</tr>
<tr>
<td>DIE</td>
<td>3500-3000</td>
<td>Disintegrating Indo-European</td>
<td></td>
</tr>
<tr>
<td>NIE</td>
<td>3500-3000</td>
<td>Northern Indo-European</td>
<td></td>
</tr>
<tr>
<td>NWIE</td>
<td>ca. 3000-2500</td>
<td>North-West Indo-European</td>
<td></td>
</tr>
<tr>
<td>OEu</td>
<td>ca. 2500-2000</td>
<td>Old European</td>
<td></td>
</tr>
<tr>
<td>SIE</td>
<td>3500-2500</td>
<td>Southern Indo-European</td>
<td>Graeco-Aryan</td>
</tr>
<tr>
<td>BIE</td>
<td>ca. 3000-2500</td>
<td>Balkan Indo-European</td>
<td></td>
</tr>
<tr>
<td>PGk</td>
<td>ca. 2000</td>
<td>Proto-Greek</td>
<td></td>
</tr>
<tr>
<td>PII</td>
<td>ca. 2000</td>
<td>Proto-Indo-Iranian</td>
<td></td>
</tr>
</tbody>
</table>
Figure 1. Stages of Proto-Indo-European evolution. IU: Indo-Uralic; PU: Proto-Uralic; PAn: Pre-Anatolian; PToch: Pre-Tocharian; Fin-Ugr: Finno-Ugric. The period between Balkan IE and Proto-Greek could be divided in two periods: an older one, called Proto-Greek (close to the time when NWIE was spoken), probably including Macedonian, and spoken somewhere in the Balkans; and a more recent one, called Mello-Greek, coinciding with the classically reconstructed Proto-Greek, already spoken in the Greek peninsula (West 2007). Similarly, the period between Northern Indo-European and North-West Indo-European could be divided, after the split of Pre-Tocharian, into a North-West Indo-European proper, during the expansion of Yamna to the west, and an Old European period, coinciding with the formation and expansion of the East Bell Beaker group.
Schleicher’s Fable

<table>
<thead>
<tr>
<th>North-West Indo-European</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>óu̯i̯s ɛ̯kˈy̯ɔs-kʷe.</td>
<td>The sheep and the horses.</td>
</tr>
<tr>
<td>óu̯i̯s ʃo̯sɪ̯m ʊ̯l̥n̥á n̥e̯ est</td>
<td>A sheep that had no wool</td>
</tr>
<tr>
<td>ɛ̯kˈy̯ons dɛ̯d̥o̯r̥k̥e.</td>
<td>saw horses;</td>
</tr>
<tr>
<td>tom ɡʷr̥u̯ú̯m ʊ̯ɔ̯ɡʰɔ̯m ʊ̯e̯ɡʰɔ̅nt̥m̥,</td>
<td>one pulling a heavy wagon,</td>
</tr>
<tr>
<td>tom mɛ̯ɡ̥a̯m bʰɔ̯r̥om̥,</td>
<td>one carrying a big load,</td>
</tr>
<tr>
<td>tom dʰgʰmɔ̅n̥m ɔ̯k̥u̯ bʰɛ̯r̥ɔ̅nt̥m̥.</td>
<td>one carrying a man quickly.</td>
</tr>
<tr>
<td>óu̯i̯s ɛ̯kʰy̯ɔbʰɔ̅s ʃe̯u̯kʷe̯t̥:</td>
<td>The sheep said to the horses:</td>
</tr>
<tr>
<td>“kɛ̥r̥d ą̯ɡʰn̥ut̥ɔ̯r̥ mo̯i̯,</td>
<td>“My heart pains me,</td>
</tr>
<tr>
<td>dʰgʰmɔ̅n̥m ɛ̯kˈy̯ons ą̯ɡɔ̅nt̥m̥ ʊ̯i̯d̥n̥t̥e̯i.”</td>
<td>seeing a man driving horses.”</td>
</tr>
<tr>
<td>ɛ̯kˈy̯ɔ̅s ʃe̯u̯kʷe̯t̥: “kʃ̥né̯u̯, օ̯i̯!</td>
<td>The horses said: “Listen, sheep!</td>
</tr>
<tr>
<td>kɛ̥r̥d ą̯ɡʰn̥ut̥ɔ̯r̥ nɔ̯s ʊ̯i̯d̥n̥t̥bʰɔ̅s:</td>
<td>Our hearts pain us when we see this:</td>
</tr>
<tr>
<td>dʰgʰmɔ̅n̥, pɔ̥t̥i̯s, օ̯i̯ʃ̥is ʊ̯l̥n̥a̯m</td>
<td>A man, the master, makes the wool of the sheep</td>
</tr>
<tr>
<td>sɛ̥bʰe̮i gʰw̥ɔ̮r̥m̥ ʊ̯ɛ̥s̥t̥r̥ɔ̮m̥ kʰɔ̅n̥e̯u̯t̥i.</td>
<td>into a warm garment for himself.</td>
</tr>
<tr>
<td>óu̯i̯om-kʷe ʊ̯l̥n̥a̯ n̥e̯ est̥i”.</td>
<td>And the sheep has no wool.”</td>
</tr>
<tr>
<td>Tod keklu̯q̥子弟 օ̯i̯s ą̯ɡr̥om bʰu̯ɡ̥e̯t̥.</td>
<td>Having heard this, the sheep fled into the plain</td>
</tr>
</tbody>
</table>

A recitation of the text is available at [https://youtu.be/6ne-xvC0TU](https://youtu.be/6ne-xvC0TU).

Certain potentially controversial selections have been made:

- As in other tonal languages\(^1\), stress accent has been placed on heavy syllables during recitation, and these are marked in bold.

---

1 Just like Mandarin Chinese, PIE must have had both stress and pitch accent. Both were important, since some syllables must have had more prominence than others, and high pitch seems to have been more prominent – vowel length appears in most Anatolian words on PIE stressed syllable (DeLisi 2013). As a rule of thumb – as e.g. in the reconstructed Ancient Greek pronunciation, in Arabic, or in the Sezer stress pattern in Turkish –, syllable weight (the length of the syllable) marks the stress of words in this rendition of the fable. Whenever possible, then, syllables that include a long vowel or a diphthong (CVV) and those with more than one consonant (CVCC) are stressed. If in conflict, those with a combination of both (CVVCC) are probably the stressed ones.
• For laryngeals and vocalism, see below. For \( ^\ast y\̄nā < ^\ast h_{2/3}y\̄h_{1}-neh_{2} \), two possible results in NWIE were \( ^\ast y\̄nā / ^\ast uhlānā \). Because of O.Ind. \( ārṇā \), a pronunciation \( ^\ast y\̄nā \) is selected.

• For *ekyōns, probably from an older **ekyō-m-s formed by the accusative singular ending *-m and plural ending *-s, cf. *-ms in Anatolian (Kloekhorst 2008). An older form for ‘horse’ is found in Anatolian **eku-m-s, cf. Hitt. ekku- (Kortlandt 2013) – the likely general development in LIE (and certainly in NWIE) has been selected, though.

• *dedōrke carries the accent on the root, as usually reconstructed following Indo-Iranian examples (Kümmel et al. 2001). The alternative *dēdorke is also possible. The more commonly reconstructed term for the fable, *woide, originally a perfect of *weid-, ‘see’, had already by LIE adopted a slightly different meaning, ‘know’, potentially from a previous ‘state derived of having seen’ (†).

• The accusative *tom has been used, instead of the nominative *so, because they are the objects (acc. *ékyōns) seen. However, the use of nominative *so would also be right, especially from a historical point of view, when it was not yet inflected – like uninflected *i instead of *jōs- (Kortlandt 2010).

• *mēgā has been declined following LIE and NWIE examples, although it has been proposed that it was indeclinable in earlier times (Pooth 2017).

• For *dīghon-: There seems to be a trend toward simplification of the initial phoneme in this cluster in NWIE, hence the pronunciation *gōhmon-, cf. O.Lat. hemō (Osc. humuns, Umbr. homonus), Gmc. *gum-an-, Bal. *ʒmō (O. Lith. žnuó, O. Pruss. smoy). A different reduction is found in O.Ir. duine < *don-jos, probably from metathesised form *gdon-jos < **g\^h\^mon-jos.

 o The other common LIE word used to translate ‘man’ in the fable, *ner-, is not used here because of its more specialised use in NWIE as ‘manly, strong’ mainly in archaisms, cf. Italo-Celtic *ner- (as Lat. nertōsus, O.Ir. nert), Gmc. *ner- (OHG Nerthus), Bal. *ner-/nor- (Lith. Nertēti, O.Pruss. nertien).

• Obliques in -bh- have been used, following the Italo-Celtic and Graeco-Aryan examples, against -m- found in Germanic and Balto-Slavic, which is potentially influenced by a common substrate to both languages (see below). The pronunciation of *bh- in *yidētbhōs seems to be compelled by the preceding *-
t- to be in *-pʰəs or *-ɸəs, although an effort is made to pronounce it in a phonemically correct way.

- Aorists are reconstructed without augment in é-, proper of Graeco-Aryan (Meier-Brügger 2003).
- Nominative *kērd is reconstructed with a *-d at the end, although it was possibly mute (Ringe 2006).
- Middle-passives are reconstructed in *-r, following the generalised belief of its older nature – as a primary ending in Anatolian and Tocharian –, and its reconstruction for Italo-Celtic, as well as remains with impersonal value in Germanic.
- For present stem *kʰnēu-/*kʰnu- ‘hear’, cf. O.Ir. ro-cluinethar, Toch. B kalnem, A kālniñe, and also Skt. śṛṣṭi, Av. surunaoiti. For verbal stem *klu-, frequently used when reconstructing the fable, the original meaning appears to be ‘be named, be renown’, cf. Av. sruiiē, ‘be famous’, Lat. clueō, ‘be named, be famous’, S.Picene kduiū, ‘be named’ (Kümmel et al. 2001). The optional imperative suffix *-dhī is not used.
- Voiced consonants at the end of syllable (such as *-d, *-gʰ-, etc.) are pronounced voiced, because LIE or NWIE did not have final obstruent devoicing as a rule (Byrd 2010). However, there are certain known cases of regressive assimilation, such as *DT→*TT, hence *tod in the last sentence may be more exactly pronounced as *tot-kekluyōs.
- We have selected the form *ágrōs (Ringe 2006; Nikolaev 2009) over the more ‘traditional’ *agrōs.
II. Laryngeal loss and vocalism in North-West Indo-European

Carlos Quiles, Fernando López-Menchero

The loss of Proto-Indo-European laryngeals is often described as multiple independent processes within each branch and proto-language.

However, there are striking similarities in the merging, colouring, vocalisation, and deletion processes that suggest a common period of laryngeal evolution.

In this paper we examine the potential evolutionary stages of laryngeals in the Common Indo-European period – after the separation of Proto-Anatolian –, and in early branches, with special emphasis on North-West Indo-European phonetic reconstruction.
II.1. Laryngeals

Today, the reconstruction of consonantal sounds to explain what was reconstructed before as uncertain vocalic *schwa indogermanicum* or *schwa primum* is firmly accepted in Indo-European (IE) studies in general, and there is a general agreement on where laryngeals should be reconstructed (Keiler 1970).

Even the number and quality of those laryngeals is today a field of common agreement, although alternative number of laryngeals and proposals for their actual phonemic value do actually exist. Reconstructed laryngeals are valid only for the oldest reconstructible stage using comparative grammar, *i.e.* Middle Proto-Indo-European or Proto-Indo-Hittite (Kloekhorst 2016; Schmidt 2011; Jasanoff 2003) ii, and potentially also Indo-Uralic (Hyllested 2009; Kloekhorst 2008).

These laryngeals are in most cases notated as *h₁*, *h₂*, *h₃* but sometimes also with their assumed realization *hₐ*, *hₑ*, *hₒ*, or phonetic inventory, *ʔ/*h, *χ*, *ʕ*. A more traditional representation is found in *a₁*, *a₂*, *a₃*, or *e₁*, *e₂*, *e₃*. Sometimes, a vocalic quality is assumed, *Aₑ*, *Eₑ*, *Oₑ*.

Their evolution during Late Proto-Indo-European (LIE), after the separation of Anatolian, is often assumed as a *loss* or *deletion* with certain common outputs in the daughter branches or proto-languages (Adrados 1998; Bomhard 2015; Koch 2013). However, it has also been stated that the three laryngeals might have survived until the final phase of LIE (Rasmussen 1999). A certain support is found for the survival of laryngeals until after the separation (Cogwill 1960), but the general view is that they disappeared completely, leaving only indirect traces in historical languages (Sanker 2015).

As Clackson (2007) sums up: “Particularly puzzling is the paradox that laryngeals are lost nearly everywhere, in ways that are strikingly similar, yet apparently unique to each language branch. We can of course assume some common developments already within PIE, such as the effect of the laryngeals *h₂* and *h₃* to change a neighbouring *e* to *a* or *o*, but the actual loss of laryngeals must be assumed to have taken place separately after the break-up of the parent language (...) it would have seemed a plausible assumption that the retention of *h₂*, and possibly also *h₁* and *h₃*, is an archaism of Anatolian, and the loss of the laryngeals was made in common by the other languages.”

---

ii Proposed first by Sturtevant (1942), the condition of Anatolian as an archaic language “sister” to Indo-European is still rejected by some scholars (Joseph 2000; Kazaryan 2017).
Chronologically, there is no commonly agreed scheme as to the maintenance of laryngeals in daughter languages. Whereas there is some common ground whereby laryngeals were lost by the time when Late Indo-European languages were written down (Rasmussen 1999; Sukač 2014), its survival has been supported for certain late proto-languages, e.g. for Slavic as late as Charlemagne’s times (Kortlandt 1975).
II.2. Laryngeal evolution

II.2.1. Late Indo-European

In the vocalic inventory of the current Proto-Indo-European reconstruction, the following simplified evolution paradigm is widespread (Beekes 2011; Meier-Brügger 2003; Ringe 2006; Adrados, Bernabé, and Mendoza 2010):

<table>
<thead>
<tr>
<th>CIE</th>
<th>DIE</th>
<th>NWIE</th>
<th>PGk</th>
<th>PII</th>
</tr>
</thead>
<tbody>
<tr>
<td>*iHC</td>
<td>*ihC</td>
<td>*iC</td>
<td>*iC</td>
<td>*iC</td>
</tr>
<tr>
<td>*uHC</td>
<td>*uhC</td>
<td>*uC</td>
<td>*uC</td>
<td>*uC</td>
</tr>
<tr>
<td>*oH</td>
<td>*oh</td>
<td>*o</td>
<td>*o</td>
<td>*a</td>
</tr>
<tr>
<td>*eh₁</td>
<td>*e₁</td>
<td>*e</td>
<td>*e</td>
<td>*a</td>
</tr>
<tr>
<td>*eh₂</td>
<td>*e₂</td>
<td>*e</td>
<td>*e</td>
<td>*a</td>
</tr>
<tr>
<td>*eh₃</td>
<td>*e₃</td>
<td>*e</td>
<td>*e</td>
<td>*a</td>
</tr>
<tr>
<td>*Hi</td>
<td>*i</td>
<td>*i</td>
<td>*i</td>
<td>*i</td>
</tr>
<tr>
<td>*Hu</td>
<td>*u</td>
<td>*u</td>
<td>*u</td>
<td>*u</td>
</tr>
<tr>
<td>*Hoᵲ</td>
<td>*o</td>
<td>*o</td>
<td>*o</td>
<td>*a</td>
</tr>
<tr>
<td>*h₁e</td>
<td>*e</td>
<td>*e</td>
<td>*e</td>
<td>*a</td>
</tr>
<tr>
<td>*h₂e</td>
<td>*a</td>
<td>*a</td>
<td>*a</td>
<td>*a</td>
</tr>
<tr>
<td>*h₃e</td>
<td>*o</td>
<td>*o</td>
<td>*o</td>
<td>*a</td>
</tr>
</tbody>
</table>

A differentiation of Late Indo-European in an early, Common Indo-European (CIE), and a late, Disintegrating Indo-European (DIE) stage is necessary.

After the separation of Proto-Anatolian ca. 4200-4000 BC, Common Indo-European developed probably in the eastern Volga-Don region of the Pontic-Caspian steppes, in the late Khvalynsk (and possibly Repin) groups, ca. 4000-3300 BC (Anthony 2007; Quiles 2017).

---

iii On the *h₂o problem, see De Decker (2014).
In this Common Indo-European phase, trends observed in the last stage of Proto-Indo-Hittite as shown by Proto-Anatolian might have included the following:

- Potential uvular-to-pharyngeal shift of $^*h_2$, $^*h_3$ (Weiss 2016).
- Early merging and deletion processes (Kloekhorst 2006; Bomhard 2004):
  - PIH $^*h_1R$- and $^*h_3R$ → CIE $^*hR$
  - PIH $^*VHC$ → CIE $^*VC$
  - PIH $^*Ho$- → CIE $^*ho$-

An auxiliary vowel was probably inserted often in certain positions, which can be reconstructed for all branches alike: $^*Ch_1C$ → $^*Ch_1°C$, $^*Ch_2C$ → $^*Ch_2°C$, $^*Ch_3C$ → $^*Ch_3°C$.

**II.2.3. Disintegrating Indo-European**

By Disintegrating Indo-European we assume a period of a Northern-Southern dialectal division and internal Southern dialectal split (between Palaeo-Balkan and Pre-Indo-Iranian groups), in which the whole community remained still in contact, allowing for the spread of innovations like a generalised vocalisation of the auxiliary vowel and the merging of laryngeals (Adrados 1998; Bomhard 2015; Koch 2013).

This linguistic scheme is compatible with the spread of the Repin culture ca. 3300 BC westward into the north Pontic steppe, and eastward as a group that would develop the language ancestral to Tocharian (Anthony 2007; Quiles 2017). The time to most recent ancestor of eastern Yamna lineages show that Palaeo-Balkan and Pre-Indo-Iranian groups were already developed in this common early Yamna stage, in the late Khvalynsk culture, while the common western European lineages had yet to split.

A generally agreed absence of a common Proto-Indo-European $*-a$ (Lubotsky 1989) contrasts with the unstable vocalic system of this period.

The evolution CIE → DIE can therefore be represented as follows:

- Colouring of $*-e$- by laryngeals (but long $*\ddot{e}$ more stable → uncoloured, “Eichner’s law”).
- Loss of laryngeals after and before low vowels.
- $^*h_1$, $^*h_2$, $^*h_3$ → $^*h$ (with vocalic allophone $^*h$), i.e. probably the voiceless laryngeal fricative /h/ (Szemerényi 1967; Collinge 1970; Bomhard 2004).
• \(*HC\rightarrow *C\) in all dialects but for Palaeo-Balkan languages (Greek, Phrygian, and probably Armenian). In this old branch, they are retained as colourised vowels (Bernabé 1975), but there are exceptions (Hinge 2007).

• \(*CH^0C \rightarrow *CH\circ C \rightarrow *ChV\rightarrow *CVC\), with the first phase more common in PIH, and the last one common in the dialectal split phase (see below).

• \(*-Hs\) potentially evolving into geminated \(*-ss\) in Anatolian and Greek (Ledo 2002).

• Metathesis of \(*CHIC\) to \(*CIHC\).

• Eichner’s law.

• Pinault’s law \(*-VCH\rightarrow *VC\) - (Pinault 1982).

• \(*-ERH \rightarrow *\tilde{E}R\). The Saussure effect (Nussbaum 1997; Yamazaki 2009; van Beek 2011) accounts for some irregularities in the outcome of laryngeals (especially with \(*-h_2\), but not limited to it) whereby CIE dialects do not show an usual reflection of the inherited sequence. It “reflects something that happened, or failed to happen, already in the proto-language” (Lubotsky 1997):
  o \(*HR\circ\rightarrow *R\circ\).
  o \(*oRH-C\rightarrow *oRC\).

• \(*CIHV\rightarrow *CI\circ V\).

• \(*-CR\circ HV\rightarrow *-CR\circ IV\) in compounds.
  o In the group \(*CRHV\), a vowel can appear before the resonant, as the laryngeal disappears. That vowel is usually coincident with the vocalic output that a resonant alone would usually give in the different dialects, so it can be assumed that generally \(*CRHV \rightarrow *C(V)RV\), although exceptions can indeed be found (Woodhouse 2011). A common example of parallel treatment within the same dialect is Greek \(pros/paros \rightarrow *pros/p^\prime ros\) (Adrados, Bernabé, and Mendoza 2010).

• \(*(-)CHV\rightarrow *(-)CV\) in all CIE branches, but with some showing innovations such as aspiration before \(h_2\), sonorants germination, etc.

• \(*CEHI\rightarrow *CEI\).

• \(*CEHE\rightarrow *CEE\).

• \(*-EH \rightarrow *\tilde{E}\), with special cases for the group \(*HEH\) in Palaeo-Balkan languages (Bernabé 1975).
• *RHC- → *RVC-, or “Beekes’ law”, with laryngeal in anlaut vocalised in most languages, and the resonant becoming consonantal.

II.2.4. Late Indo-European dialects

Some laryngeal reflexes reached DIE dialects differently, but still with some apparent contacts. They must have happened during the westward expansion of the Yamna culture.

• Loss of word-initial laryngeals *H→ ∅, but for Palaeo-Balkan languages, which appear to show a general output *H°→ *Hə→ e, a, o.

• *CHC → *CHəC → Western DIE *ChaC → NWIE *CaC, as found in Italo-Celtic (Schrijver 1991; Zair 2012), Germanic (Ringe 2006), and Tocharian, and also in Armenian (Mondon 2008) and Albanian. Alternative fate was laryngeal loss in certain environments *CC (Byrd 2010).
  o In Proto-Greek, CIE *CHəC evolved into *CaC, *CeC, *CoC depending on the nature of *H.
  o Eastern DIE *ChiC evolved into Indo-Iranian *CiC.

• DIE *CRHjV- → NWIE *CRjV-, as found in Italo-Celtic *CaRjV, cf. Lat. cariēs < *krh2-jē- (Schrijver 1991), also found in Greek and perhaps Sanskrit.

• DIE *HjV- → NWIE *JV- as found in Italo-Celtic (Schrijver 1991; Zair 2012), Germanic(Ringe 2006), Tocharian, and also in Indo-Iranian, Armenian, and Albanian (Zair 2012).

• DIE *RHC- → NWIE *RəC-, as found in Italo-Celtic (Zair 2012), cf. Lat. lābāre (Schrijver 1991), and Germanic (Beekes 1988).

• DIE *HIC- → NWIE *IC-, as found in Italo-Celtic (Schrijver 1991; Zair 2012), Germanic (Ringe 2006), and Tocharian, as well as Albanian, Indo-Iranian.

• DIE *CEHR̥- → NWIE *CER-, with an unclear intermediate development, but necessarily parallel in Italo-Celtic, Germanic, and Indo-Iranian (Zair 2012).

• DIE *CIHR̥- → NWIE *ClJR̥- in Italo-Celtic, Indo-Iranian (Schrijver 1991; Zair 2012).

• DIE *-IH → NWIE *-Ī as found in Italo-Celtic and Germanic, as well as Albanian and Indo-Iranian. Vocalization in Greek-Armenian and Tocharian.
  o CIE *-ih₂ ending in auslaut had an alternative form *-j°h₂, DIE *-ih/-jəh, which could produce *-Ī, *-jə, alternating forms that are found even within the same dialect.
• Dybo’s rule in North-West Indo-European: short vowels as output of *\textit{CHIC}-, or *\textit{CIHC}-, with long vowels remaining when stressed, but shortened in pretonic syllables, as found in Proto-Italic, Proto-Celtic and Proto-Germanic (Zair 2012; Garnier 2015).

The contentious Osthoff’s law, which affected all DIE branches but for the eastern territories (languages ancestral to Tocharian and Indo-Iranian), must have been a general trend after the start of the Yamna expansion, \textit{i.e.} after ca. 3100 BC.

When *\textit{H} is in a post-plosive, prevocalic position, the consonantal nature of the laryngeal values is further shown *\textit{CHVC} → *\textit{C\#VC}; that is more frequent in PII, \textit{cf.} *\textit{pl\text{\'}th\text{\'-}} → Ved. \textit{pr\text{\'}th\text{\'-}}; it appears also in the perfect endings, \textit{cf.} Gk. \textit{oistha}. This development might have happened in North-West Indo-European, and later devoiced to *\textit{CVC}. 

II.2.5. Laryngeal remnants in early Indo-European proto-languages?

II.2.5.1. Glottal stops

Apparently a reflect of consonantal laryngeals is found between non-high vowels as hiatuses (or glottal stops) in the oldest Indo-Iranian languages, in Homeric Greek (Lindeman 1987), and potentially in Germanic (Connolly 1980). However, there is not enough evidence to explain such irregularities by laryngeal remains instead of by the more obvious licence in metric (Kümmel 2014).

*-iH/*-j°H

In old compositions, some final short vowels are found as heavy syllables, cf. Skt. deví etu, or vocat. vṛ̥ki, tanu (Lindeman 1987; Beekes 1982): “The Vedic phrase devyètu, i.e. devi etu is best understandable if we suppose that devi ‘goddess’ still contained the laryngeal form *dewih (with *-ih<*-ih2) at the time of the formulation of the verse in question. In the phase *-ih it was possible for the laryngeal simply to disappear before a vowel” (Meier-Brügger 2003). Other common example used is *wṛ̥kih.

The laryngeal survival in Proto-Indo-Iranian is then controversial, with limited support found for a preservation in intervocalic position in the Gāϑās and in the Vedas (Gippert 1996), which is controversial (Kümmel 2014; Beguš 2015).

It is not justified, though, why it must represent a sort of unwritten laryngeal, and not an effect of it, i.e. a laryngeal hiatus or glottal stop, from older two-word sandhīs that behave as a single compound word.

Interesting is also that they are in fact from words already alternating in CIE *-ih2/*-j°h2, or DIE *-ih/-jəh, which reflect different syllabification in Indo-Iranian vs. Greek and Tocharian, whilst “[t]he source of the difference is not fully understood”(Fortson 2010).

In line with this problem is that the expected case of *-aH stems is missing, what makes it less likely that Indo-Iranian examples come from a common hypothetic PII stage in which a word-final *-H had not still disappeared, and more likely that it was a frozen remain (probably of a glottal stop) in certain formal expressions.

In fact, it has long been recognised that the treatment of word-final laryngeals shows a strong tendency to disappear (so e.g. in Hittite), and most of the time it appears associated with morphological elements (Adrados, Bernabé, and Mendoza 2010).
They should then be considered – like the hiatuses or glottal stops found in Hom. Gk. and Germanic compositions – probable ancient reminiscences of a frozen formal language. These examples were possibly glottal stops, remains of the old merged CIE laryngeal *h, i.e. *dewih, *wē̄kih, etc.

*-aH

The sandhi variant in *-aH is found in Greek and Old Church Slavonic (Meier-Brügger 2003; Ringe 2006): In both “clear traces are missing that would confirm a PIE ablaut with full grade *-eh₂- and zero grade *-h₂- (…) That is why it appears as if the differentiation between the nominative and vocative singular in this case could be traced to sandhi-influenced double forms that were common at a time when the stems were still composed of *-ah₂, and the contraction *-ah₂- → *-ā- had not yet occurred.”

This has been rejected (Szemerényi 1999): “The shortening of the original IE ending -ā to -ā is regular, as the voc., if used at the beginning of a sentence or alone, was accented on the first syllable but was otherwise enclitic and unaccented; a derivation from -ah with the assumption of a prevocalic sandhi variant in -a fails therefore to explain the shortening.”

**Laryngeal hiatus**

The Rig Veda preserves many words that could be interpreted as though some remnant of a laryngeal, probably a glottal stop, was still present between vowels, a phenomenon called laryngeal hiatus. For example, Skt. vaḥaś ‘wind’ must sometimes scan trisyllabically as *va’atas, O.Av. va.ata-, which come from earlier pre-PII *weh₂tos or PII wāhata- < CIE *h₂weh₂-t- → DIE *we(h)ntos → NWIE *wentos; cf. Lat. ventus, Welsh gwynt, PGmc. *windaz; but Proto-Toch. *wyentē < *wēntos.

Compare also potential examples Ved. *ca-kar-ha (the *h still preserved in the period of the activity of Brugmann’s law), or Ved. nāus < *nahus. Such finds would support a vocalisation of CIE *ŋ, *ŋ → PII *a earlier than the loss of laryngeal (or glottal stop) in that environment.

**II.2.5.2. *CRHC**

The group *CRHC is explained differently for the individual dialects without a general paradigm, with dialectal outputs explained as (Beekes 2011; Meier-Brügger 2003):
**CR°hC** into Proto-Tocharian **CRaC**, Italo-Celtic **CRāC**, Proto-Armenian **CRaC**, *i.e.* an output similar to **CHC** in these dialects, which points either to an ancient trend (NWIE **CR°hC**), or to an assimilation of the group to the output of **CHC**.

- Germanic **CR̥C**. There is difficulty reconstructing the potentially old Northern variant **-HC- *-aC-** (Müller 2007), among them the scarcity of surviving traces of laryngeals (Fortson 2010).
- Balto-Slavic **CVRC/CR̄C**, with the same vocalic output as **CR̥C**, and distinction by accentuation (Darden 1990), which would mean a merging of the laryngeal posterior to the vocalisation of sonorants.

In Proto-Greek, the original laryngeal determined the vocalic output: *e.g.*

\[ *\mathfrak{r}_1 \rightarrow *\mathfrak{r}^{°}_1 \rightarrow *\mathfrak{r} \]

A common example of the different dialectal outputs of the **CRHC** model in PIE **gyh₁-tó-** ‘created, born’:

- Vedic *jātá-* < PII *jātó-* < *jahtó-* < *g'yhtó-, which would mean that the laryngeal merged after the evolution CIE *ŋ* → PII *a*.
- CIE *gn³h₁tó-*, *cf.* for the same intermediate grade PGk *gnētó-* < *gn΄h₁tó-, but Armenian *cnaw* < *gn³htó-.*

An ancient Northern LIE alternating *gnhtó- / *gnhtó- (or *gn³htó-) could then be proposed, based on a) the older DIE trend to the development of **CHC** in NWIE, and b) the output of **CR̥HC** in Tocharian, Italo-Celtic, Armenian, and maybe Germanic and c) the natural pronunciation of the voiceless vowel *h₁ in a vocalic position in Northern LIE.

Common Germanic (and more difficultly Balto-Slavic) examples would then be potentially explained through hypercorrection of such **CR°C- or CRaC- outputs, which would have been later unified with the **CVRC- output of the more common **CR̥C-compounds. To support such an ancient generalised model, then, requires an ad-hoc explanation for daughter languages, that becomes unnecessary if laryngeal retention is assumed, and thus NWIE **gnhtó- is proposed, accepting the common early trend in European languages to a vocalization as *a, as found in the group **CHC.**
The palma rule in Latin, which in turn seemed to have distinct developments depending on whether CIE *CRH^C- sequences were accented or not (Höfler 2017), points more strongly to the unstable nature of compounds including sonorants, but this does not discard the survival of merged laryngeal remains in North-West Indo-European, either.

However, there are multiple examples of such compounds which do not fit in any dialectal scheme, though; changes of outputs from reconstructed forms with resonants are found even within the same dialects.

A common explanation of certain alternating forms found even in the same dialect is based on late dialectal morphological and analogical changes (Adrados, Bernabé, and Mendoza 2010): “The different solutions in this case depend solely on two factors: a) if there are one or two auxiliary vowels to facilitate the pronunciation of this group; b) the place where they appear.” So e.g. a group *CR^hC could be pronounced in DIE with one vowel, *CRʰhC or *CʰRhC, or with two, *CʰRhʰC, *CʰRhʰC, or *CRʰhʰC.

Compounds with sonorants like *CŘC, *RŘV, *TRV, and *SMV among others are known to behave differently even within the same languages and proto-languages (Adrados, Bernabé, and Mendoza 2010). It is only natural that DIE or NWIE groups that should be traced back to *CRV and *VRC could similarly show unstable outputs that confound any attempt to obtain a stable sound law. That ‘instability’ solution could account for all variants found in the different branches, and within them.

Different outputs are proposed for *CRH groups before certain vowels (Lubotsky 1997): “It is clear that the “short” reflexes are due to laryngeal loss in an unaccented position, but the chronology of this loss is not easy to determine. If the laryngeal loss had already occurred in PIIR., we have to assume that PIIR. *CruV subsequently yielded CurvV in Sanskrit. The major problem we face is that the evidence for the phonetically regular outcome of *CriV and *CruV in Indo-Iranian is meager and partly conflicting.”

II.2.5.3. Cogwill’s law
The contentious Cogwill’s law seems to be a late, independent development reconstructed for three Proto-Germanic forms, whereby *h₃ and possibly *h₂ would turn into Proto-Germanic *k when directly preceded by a sonorant and followed by *w. This would need an evolution CIE *h₃ʰw → *gʰw that remains only in Germanic, and is as such a poor explanation of these few peculiar developments.
II.3. Laryngeal reflexes in North-West Indo-European

Assuming a common North-West Indo-European community and language, we can establish these common developments, from which to derive changes in daughter proto-languages Italo-Celtic, Pre-Germanic, and potentially Pre-Balto-Slavic, or alternatively its Temematic substrate (Holzer 1989).

II.3.1. Initially before consonant or resonant

Initially before PIE consonants or resonants laryngeals are lost. This is the result in most historic languages, except in Greek, Armenian and Anatolian, where they are preserved with some limitations in all of them.

- **PIE** $^*_h1rūdʰr̥̄s$ → **NWIE** $^*_rudʰr̥̄s$, ‘red’; *cf.* Gr. ἐρυθρός, Lat. ruber, Goth. raufs.
- **PIE** $^*_h1smóś(i)$ → **NWIE** $^*_smóś(i)$, ‘we are’.
- **PIE** $^*_h1imóś(i)$ → **NWIE** $^*_ímóś(i)$, ‘we go’.
- **PIE** $^*_h2iṭu̯- uHen^-$ → **NWIE** $^*_júwōn ‘young’, cf. Lat. iuuenis, O Ind., yávan-.
- **PIE** $^*_h2sṭer^a$ → **NWIE** $^*_sṭēr ‘star’, but *cf.* Gr. ἀστήρ.
- **PIE** $^*_h3mēn̥g̥mi / *h3mēn̥ghoh₂$ → **NWIE** $^*_mēn̥g̥mi / mēn̥gh₂, ‘I piss’.
- **PIE** $^*_h3r̥néumi$ → **NWIE** $^*_r̥néumi$, ‘I move’.
- **PIE** $^*_h1úpo$ → **NWIE** $^*_úpo$, ‘under’.
- **PIE** $^*_h2supēlos$ → **NWIE** $^*_upēlos$, ‘evil’.
- **PIE** $^*_h2wēsoh₂$ → **NWIE** $^*_wēsā, ‘I stay’.
- **PIE** $^*_h1pjōh₂$ → **NWIE** $^*_pjō, ‘I reach’.
- **PIE** $^*_h3bʰruHs$ → **NWIE** $^*_bʰr̥ūs, ‘eyebrow’.

II.3.2. Initially before vowel

- **PIE** $^*_h₁ésmi$ → **NWIE** $^*_ésmi, ‘I am’.
- **PIE** $^*_h₁ómHsos$ → **NWIE** $^*_ómsos, ‘shoulder’.
- **PIE** $^*_h₁édsi$ → **NWIE** $^*_édsi, ‘you eat’.
PIE *h₁ónɡʷ-olʿ → NWIE *ónɡʷōl ‘coal’.

PIE *h₁eiti → NWIE *eiti, ‘goes’.

PIE *h₁óimos → NWIE *óimos, ‘march’.

PIE *h₁egóh₂ → NWIE *egō, ‘I’.

PIE *h₁óɡʷiš → NWIE *óɡʷiš, ‘worm, snake’.

PIE *h₂énes → NWIE *ánus, ‘grandmother’.

PIE *h₁órsos → NWIE *órsos, ‘tail’.

PIE *h₂égeti → NWIE *ágeti, ‘bears’.

PIE *h₂ógmos → NWIE *ógmos, ‘track’.

PIE *h₃enos → NWIE *ónos, ‘load’.

PIE *h₂eɪu̯ós → NWIE *aɪu̯ós, ‘lifetime-lasting’.

PIE *h₃éu̯íš → NWIE *óu̯íš, ‘sheep’.

PIE *h₂óɪu → NWIE *óɪu, ‘vital energy’.

PIE *h₂épos → NWIE *ópos, ‘work’.

PIE *h₃ólh₁ne₂ → NWIE *ólnā, ‘elbow’.

PIE *h₃éidos → NWIE *óidos, ‘tumor’.

PIE *h₃ókʷo- → NWIE *ókʷos, ‘eye’.

II.3.3. Special cases: initial vocalization

PIE *h₂i₁h₂sje₂ → NWIE *óisjā, ‘rudder’.

PIE *h₂uH₁i- → NWIE *áuís, ‘bird’.

PIE *h₂n₁h₂e → NWIE *ána, ‘on’.

PIE *h₂rgtóm → NWIE *árgtóm.

II.3.4. Double initial laryngeals

PIE *h₁h₂etmos → NWIE *átmos, ‘breath’.

PIE *h₂h₃imi → NWIE *őimi, ‘I believe’.

PIE *h₁h₂etmén → NWIE *ātmén, ‘spirit’.

PIE *h₃ēh₃smi → NWIE *ősmi, ‘I open’.

PIE *h₃h₂sís → NWIE *ōusis, ‘ear’.

PIE *H₁h₂dmi → NWIE *ādmi, ‘I dry’.

PIE *H₁₁H₂ujom → NWIE *őuijom, ‘egg’.

PIE *H₁h₂ōh₁dhh₁e → NWIE *u̯ ōdē, ‘I push’.

PIE *sk₁h₂olos → NWIE *sk₁ōlos, ‘stumbling’ (noun).

PIE *sk₁h₂ōh₁dhh₁onom → NWIE *u̯ ṭonom, ‘pushing’.

PIE *sk₁h₁onom → NWIE *sk₁ōnom, ‘splitting’.

PIE *somh₂ōs → NWIE *somós, ‘same’.

PIE *réth₂onti → NWIE *rētonti, ‘they run’.

II.3.5. Internally before a vowel

PIE *d₁h₁ent → NWIE *d₁ent, ‘they placed’.

PIE *sth₂ent → NWIE *stant, ‘they stood’.

PIE *dh₂ent → NWIE *dont, ‘they gave’.

PIE *h₂yoh₁d₁h₁ējoh₂ → NWIE *yōd₁ējō, ‘I push’.

PIE *sk₁h₂olos → NWIE *sk₁ōlos, ‘stumbling’ (noun).

PIE *h₂yoh₁d₁h₁onom → NWIE *yōd₁onom, ‘pushing’.

PIE *sk₁ēh₂onom → NWIE *sk₁ēnom, ‘splitting’.

II.3.6. Internally before vowel, after resonant

PIE *mélh₂esi → NWIE *mēlesi (not *mēlasi), ‘you grind’.

PIE *stēn₁h₂esi → NWIE *stēnesi (not *stēnasi), ‘you resound’.
II.3.7. Second position in compounds

PIE *neu₂ognh₁ós → NWIE *neu₂ognós ‘newly born’.

PIE *kʷékh₁om → NWIE *kʷékh₁om ‘wheel’.

II.3.8 Internally after a vowel

PIE *h₁réh₁poh₂ → NWIE *rēpō, ‘I creep’.

PIE *Hréh₃doh₂ → NWIE *rōdō, ‘gnaw’.

PIE *meh₂tér → NWIE *mātēr, ‘mother’.

PIE *meh₂is → NWIE *māis, ‘more’

PIE *pēh₂smi → NWIE *pāsmi, ‘I heed’

PIE *prēh₂tis → NWIE *prātos, ‘sale’.

PIE *dʰidʰéh₁mi → NWIE *dʰidʰémi, ‘I put’.

PIE *gígnh₁H₂ei → NWIE *gīgnāi, ‘I am born’.

PIE *stistėh₂mi → NWIE *stistāmi, ‘I stand’.

PIE *didēh₃mi → NWIE *dīdōmi, ‘I give’.

PIE *h₃néh₃₄mŋ → NWIE *nōmŋ, ‘name’.

PIE *prnéh₂mi → NWIE *prnāmi, ‘I sell’.

PIE *soh₁déjoh₂ → NWIE *sōdējō, ‘I settle’.

PIE *dhoh₁mós → NWIE *dʰōmós, ‘thesis, opinion’.

PIE *stóh₂nom → NWIE *stānom, ‘place’.

PIE *stóh₂los → NWIE *stōlos, ‘table’.

II.3.8.1. Special case: Osthoff’s law

PIE *h₂yuēh₁ytos → NWIE *yéntos, ‘wind’

PIE *meh₁msóm → NWIE *mēmsóm, ‘meat’.

II.3.8.2. Special case: Stang’s law

PIE *pipēh₃imi → NWIE *pipōmi, ‘I drink’. Extended to other forms:

PIE *pipēh₃iti → NWIE *pipōti, ‘he drinks’.
II.3.8.3. Special case: laryngal metathesis

PIE **sp_i̯ Hutós → *sp_i̯uHtós → NWIE *sp_i̯ūtós, ‘spat’ (part.).

PIE **b_h2utós → *b_uh2tós → NWIE *b_i̯ūtós, ‘been’.

PIE **siHutós → *sjuHtós → NWIE *sjūtós, ‘sewn’.

PIE **lh3itós → *lih3tós → NWIE *lītós, ‘poured’.

PIE **ph3lós → *pih3lós → NWIE *pīlós, ‘having drunk’.

PIE *ph3i̯tós → NWIE *pītós, ‘drunk’.

PIE *pHutós → NWIE *pūtós, ‘cleaned’.

PIE *liHtós → NWIE *lītós, ‘poured’.

PIE *g"Hiyós → NWIE *g"īyós, ‘alive’.

II.3.9. Internally between two consonants

PIE *ph₂tér̥ → NWIE *patēr, ‘father’.

PIE *kh₂tós → NWIE *katós, ‘sharp’.

PIE *mh₂déh₁i̯oh₂ → NWIE *madējō, ‘I am wet’.

PIE *h₂yoₐh₁ód₃h₁tós → NWIE *yoḍ₃atós, ‘pushed’.

PIE *pr₃nh₂mós(i) → NWIE *prnamós(i), ‘we sell’.

PIE *dhid₃h₁mós(i) → NWIE *dḥid₃amós(i), ‘we put’.

PIE *stísth₂mos(i) → NWIE *stístamos(i), ‘we stand’.

PIE *didh₃mos(i) → NWIE *didamos(i), ‘we give’.

PIE *st₃h₂tós → NWIE *statós, ‘stood’.

PIE *peph₃tē → NWIE *pepatē, ‘keep drinking’ (2nd pl.).

II.3.9.1. Special case: concave syllable between two consonants

PIE **sh₁déh₁joh₂ → NWIE *sedējō, ‘am seated’.

PIE **lh₁góm → NWIE *legóm, ‘I collected’.

PIE **lh₁b₃h’om → NWIE *lab₃h’om, ‘I caught’.
II.3.10. Internally between consonant and resonant or between two resonants

II.3.10.1. Generalised Saussure effect

Some examples are affected by the “Pinault’s law” (Byrd 2015).

PIE *tór₇₁mos → NWIE *tóm, ‘hole’.

PIE *k₁m₁h₂-rós → NWIE *klamrós, ‘weak’.

PIE *gémh₁ro- → NWIE *gémros, ‘son-in-law’.

PIE *(s)porHnós → NWIE *pornós, ‘feather’.

PIE *pélh₁u → NWIE *pélu, ‘much’.

PIE *bhóh₁₂jom → NWIE *bʰó̰jom, ‘leaf’.

PIE *h₂ér₇₃u → NWIE *áryar, ‘grain’.

PIE *miH₁to → NWIE *mīto, ‘decreases’.

PIE *kʷrih₂tor → NWIE *kʷrátor, ‘was bought’.

PIE *dʰ₁u₁lis → NWIE *dʰ₁lis, ‘soot’.

PIE *bʰ₇₁u₁ĵeto → NWIE *bʰu₁ĵeto, ‘becomes, begins’.

PIE *lēgh₂trom/ *lēh₂trom → NWIE *lōutrom, ‘bath’.

PIE *sk₁h₂tis → NWIE *skéltis, ‘splitting’.

PIE *skʰ₂joh₂- → NWIE *skjō, ‘I split’.

PIE *térh₂joh₂ → NWIE *térjō, ‘I rub’.

PIE *sokʰ₂jós → NWIE *sokʷjós, ‘allied’.

PIE *megh₂jós → NWIE *megjós, ‘bigger’.

PIE *kʰ₁jó- → NWIE *kanjós, ‘recent’.

PIE *gʰ₁jeto (=*gigneto) → NWIE *gnajeto, ‘is born’.

PIE *sth₂jēh₁m → NWIE *staём / *stēm, ‘I would stand’ (aor.).

PIE *sth₂i₁nt → NWIE *stajɪnt / *stint, ‘they would stand’. 
PIE *dh3iēh₁m → NWIE *dajēm / *djēm, ‘I would give’ (aor.).

PIE *dh₂ih₁nt → NWIE *dajínt / *dint, ‘they would give’.

PIE *h₂yoḥ₁dʰh₁jóm → NWIE *wodʰajóm / wodʰjóm, ‘I pushed’ (aor).

II.3.10.2. Special case: Retention of laryngeal
PIE *h₂énh₁mos → NWIE *ánhmos, ‘breath, soul’, cf. Toch. A āṅcām (obl. āṁ-), B āṅme PToch *āṅc(ā)me 'self, soul', Lat. animus, Osc. anaṁūm, O.Ir. animm, O. Fris. omma.

PIE *kerh₂srom → NWIE *kerhsrom.

PIE *temh₁sreh₂es → NWIE *temhşrās, cf. O. Ind. tamisra, Lat. Tenebrae.

Compare also e.g. PGmc. *temHs- → OHG demar, ‘twilight’, but there are also reasons to reject such reconstruction in favour of PIE *temHosó-, as O.Ind. *tamasá-, ‘dark-colored’ (Müller 2007).

II.3.10.3. Special case: Internal vocalisation
PIE *sh₂neh₂mi → NWIE *sánāmi, ‘I satiate’.

PIE *térh₁dʰrom → NWIE *téredʰrom ‘auger’, cf. Lat. terebra, Gr. τέρετρον, O. Ir. Tarathar.

cf. PIE *kritis → NWIE *kartús, ‘strong’.

II.3.11. Blocked laryngeal with a resonant
The regular reflex of *CR̥HC in Italo-Celtic is *CR₃C no matter which laryngeal is involved. The ē of Italic (cf. Lat. plēnus, Umb. plener) and partially Celtic (cf. Corn. luen, Bret. leun) is likely an especial dissimilation not to confuse the word with *plānōs. Analogy with the corresponding perfect is the common explanation for other results different from ā, as found in certain participles; cf. nōtus, sprētus, crētus, etc. An alternative, less likely explanation would be the continuity of the old three-laryngeal division into the Italic stage (Bolotov 2012).


PIE *gu₃ht₂ós → NWIE *gu₃htós / *gu₄tós, ‘born’, cf. Lat. gnātus, Umb. natine, O.Ir. cned, Gaul cintu-, PGmc *kundáz, PBal. *ʒnōta-.


PIE *py₄h₂yós → NWIE *py₄hyos / *py₄h̥yos, ‘first’; PToch. *pärwe, PSlav. *përvь.

II.3.11.1. Special case: Laryngeal lost by generalised Saussure effect
For example, in cases of *Cred.HRC such as:

- *HRoC → *RoC in Proto-Greek; in NWIE the general rule is laryngeal loss for any vocalism:

- *CoRHC → *CoRC:
  o PIE *kölHnis → *NWIE kólnis ‘hill’.
  o PIE *sólH₂yō- → *sólūyo- ‘all, the whole’.

II.3.11.2. Special case: With brief resulting vowel
PIE *py₄H₃tis → NWIE *py₄tis, ‘fern’.

PIE *köl₂meh₂ → NWIE *kāmnā, ‘leg’.
II.3.11.3. Special case: Lost laryngeal in a compound
PIE *komp₁h₁nōs → NWIE *komp₂nōs, ‘extremely full’.

II.3.11.4. Special case: Palma rule
PIE *p₁h₂mēh₂ → NWIE *p₁mā, ‘palm’.
PIE *p₁h₂sēh₂ → NWIE *p₁sā, ‘mantle, covering’.
PIE *(s)p₁h₃sēh₂ → NWIE p₁h₃sā, “winged animal, sparrow’.

Similar cases:
PIE *h₂ȝ₁h₁-neh₂ → NWIE *ȝ₁nā / *uhlānā, ‘wool’, cf. O.Ind. āṛṇā-.
PIE *p₁h₂ūgōh₂ → NWIE *plūgō, ‘I beat’.
PIE *g₁h₂tōm → NWIE *g₁lōm (not *ghlōtōm), ‘gold’.
PIE *m₁h₂dhh₁os → NWIE *m₁dōs, ‘mild’.
PIE *sk₁h₂₃tōs → NWIE *skltōs (not *sklītōs), ‘split’ (part.).
PIE *pr₁nh₂énti → NWIE *prnánti, ‘they sell’.

II.3.12. Final position before a vowel
PIE *u₁ōidh₂e → NWIE *woida, ‘I know’.
PIE *u₁ōid-th₂e → NWIE *woista, ‘you know’, but cf. Gr. οἶσθα, O. Ind. vettha.

II.3.12.1. Special case: vocalization of a laryngeal appendix
PIE *ste-stoh₃h₂e → NWIE *stēstōya, ‘I am standing’.
PIE *d₁e-d₁h₁h₂e → NWIE *d₁ēd₁ōjā, ‘I have put’.
PIE *de-doh₃h₂e → NWIE *dēdōyā, ‘I have given’.

II.3.13. Final position after a vowel
PIE *dīg₃h₂ → NWIE *dīg₁ā, ‘goat’.
PIE *h₁roh₁₂yēh₂ → NWIE *rōyā.
PIE *hēh₁₂seh₂ → NWIE *āsā, ‘altar’.
PIE *g₁ēneh₂ → NWIE *g₁ēnā, ‘woman’.
PIE *déikoh₂ → NWIE *dēikō, ‘I show’.

PIE *wɨkʷoeh₁ → NWIE *yɨkʷō, *yɨkʷo, ‘with (the) wolf’.

II.3.14. Final position after a consonant or a resonant

PIE *pleh₁jōsh₂ → NWIE *plējōsa, ‘more’.

PIE *megh₂ → NWIE *méga, ‘big’.

PIE *Hith₂ → NWIE *īta, ‘so’.

PIE *h₁ǘdʰh₂ → NWIE *ǘdʰa, ‘then’.

PIE *h₂nēh₃monh₂ → NWIE *nōmona, ‘names’.

PIE *yɨkʷih₂ → NWIE *yɨkʷī, ‘she wolf’.

PIE *yɨh₂dih₂ → NWIE *yɨhdī/*yɨhdjā, ‘root’.

PIE *bh₂mēsḍʰ → NWIE *bh₂mēsḍʰa, ‘we speak’.

PIE *bh₂yēsḍʰ → NWIE *bh₂yēsḍʰa, ‘we two speak’.

II.3.15. Kortlandt effect

PIE **úddʰ̣₁h₁r → *úh₁dʰ₁h₁r → NWIE *údʰ̣r, ‘udder’.

PIE *dēdr(H)is → NWIE *dēris, ‘separation’, cf. Gr. δῆρις ‘dispute’, O. Ind. venu-dāri-.

PIE *tr̥dtós → NWIE *tr̥htós (<**tr̥h₁tós) ‘pierced’.

PIE **mēdmi → *mēh₁mi → NWIE *mēmi, ‘I measure’.

PIE *h₂éh₁dmi → **h₂eh₁dmi → NWIE *āmi, *ādmi, cf. *āidhō ‘I burn’.

PIE *g̣h₁éh₂yṛ → **g̣h₁éh₂yṛ → NWIE *g̣h₂yṛ, ‘emptiness’.

PIE *bh₁dtrós → **bh₁dtrós → NWIE *bh₁dtrós, ‘trunk’.

II.3.15.1. Exceptions

PIE *penkʷėdkn̥th₂ → NWIE *pengōdkn̥ta, ‘fifty’, but cf. O. Ind. pañcāśat-<*penkʷéh₁kn̥th₂.

PIE *h₂ed → NWIE *ad, ‘at, to’, but cf. O. Ind. ā < *h₂eh₁.

PIE *Hud → NWIE *ud, ‘outside’.
II.3.16. Consonantal change
PIE *piph₃oh₂ → NWIE *pibō, ‘I drink’.

II.3.17. Martinet’s rule
PIE *h₃ésteh₂? → NWIE *kóstā, ‘rib’.
PIE *dʰ₁Hjoh₂ → NWIE *dʰákjo, ‘I do’.
II.4. In search for a stable paradigm

II.4.1. A more conservative model for laryngeal loss

Some authors tend to support an independent, quite late dialectal loss of laryngeals. Some examples include:

- Kortlandt supports the presence of distinct laryngeals in Central and Satem Indo-European, and a single glottal stop in Balto-Slavic. “The loss of the laryngeals after a vocalic resonant is posterior to the shortening of pretonic long vowels in Italic and Celtic” (Kortlandt 2007).
- “As a rule, the laryngeals were disposed of only after the Proto-Indo-European era” (Meier-Brügger 2003).
- “The current picture of laryngeal reconstruction necessitates repeated loss of laryngeals in each language branch” (Clackson 2007).

Clackson compared this independent loss of laryngeals to the Maltese and Modern Hebrew examples, languages isolated from Semitic into an Indo-European environment for centuries. That is indeed a plausible explanation: that all IE branches, after having split up from a Common Indo-European language, would have become independently isolated, and then kept in close contact with (or, following the Maltese example, surrounded by) non-IE languages without laryngeals. Then, every change in all branches could be explained by way of diachronic and irregular developments of vowel quality. After all, “(…) the comparative method does not rely on absolute regularity, and the PIE laryngeals may provide an example of where reconstruction is possible without the assumption of rigid sound-laws.”

However, the most likely historical development of Indo-European-speaking communities is described as stepped expansions into different regions, and with different population admixtures, both of which were likely to bring about important linguistic changes.

II.4.2. Linguistic, archaeological, and genetic data

The most probable assumptions then, taking into account historical developments, is that the different common stages of laryngeal loss might have happened in the following manner:
• It seems that the original nature and position of laryngeals in Indo-Hittite may be reconstructed – apart from Anatolian data – with the help of Proto-Uralic (Hyllested 2009), presupposing a common earlier Indo-Uralic stage (Kloekhorst 2008). If such an ancient Indo-Uralic community can be identified as coincident with the Early Indo-European stage (Kortlandt 2002), it should then correspond with the historical-cultural community formed by the development of early Khvalynsk and Sredni Stog cultures from a common steppe population, at the end of the 6th millennium BC. Attempts to reconstruct the earliest possible Proto-Indo-European phonology are common nowadays, but probably lack the necessary data to obtain reliable reconstructions.

• Following this linguistic model, an Indo-Hittite-speaking eastern Pontic-Caspian steppe region, represented by the early and late Khvalynsk culture, would leave the North Pontic steppe region, and more precisely the early Sredni Stog culture and heirs late Sredni Stog and Kvitjana, as Uralic-speaking. Laryngeals seem to have begun their deletion process during this common period, including the dialect ancestral to Anatolian (Kloekhorst 2006; Kortlandt 2003-2004), split probably ca. 4500-4000 BC. This time is coincident with the expansion of the eastern Pontic-Caspian steppe to the west with the (Pre-Anatolian-speaking) Suvorovo-Novodanilovka chiefs who dominated over the north-west Pontic steppe region.

• Secondly during the common CIE period ca. 4000-3300 BC, including Northern and Southern dialectal differentiation (Adrados 1998). The colouring and lengthening of vowels, as well as the merging of laryngeals in a common *h (Bomhard 2004), were probably coincident with the disintegration of the CIE-speaking community, which happened at the end of this period.

• During the DIE period ca. 3300-2800, the main early Yamna migrations happened. A western group speaking the Northern dialect migrated first eastward – Pre-Tocharian into Afanasevo –, then westward – pre-NWIE speakers to the North Pontic steppe, and later into the Carpathian Basin. The eastern groups speaking Southern dialects migrated to the west – Palaeo-Balkan speakers – or stayed in the steppe – like the Pre-Indo-Iranian-speaking Poltavka culture, which also migrated to the east ca. 2800-2600 BC. Linguistic and cultural contacts are attested (probably ca. 3100-2800) between pre-NWIE and Palaeo-Balkan groups.
in the west, and between Pre-Tocharian and Pre-Indo-Iranian groups in the east, which allowed for certain common developments between such disparate dialects (Adrados 1998).

- Other changes may have arisen after the split, from around the mid-3rd millennium BC, e.g. during the westward migration of North-West Indo-European-speaking Yamna migrants as the Classical East Bell Beaker folk (Harrison and Heyd 2007; Mallory 2013). This would include alternating outputs of some groups in dialects of the same branches, and potential frozen laryngeal remnants reconstructed for proto-languages. For some, the European expansion of Late Indo-European dialects represents already a post-laryngeal period of the language (Koch 2013).

While there are reasons to support remnants of the DIE merged laryngeal in later periods, there seems to be no strong argument for the survival of DIE merged *h into later proto-languages, and still less to support the maintenance of the generalist, abstract differentiation into three laryngeals in DIE and later stages of Proto-Indo-European.

Typologically it is already quite difficult to accept that both models of full laryngeal loss – a common development or similar independent phonetic changes – are equally likely. A common evolution seems a priori more likely than multiple independent events, as an explanation for the similar development attested in IE languages. All ancient Indo-European languages derived from CIE had lost the merged laryngeal before their first recording, all with similar outputs. Even the potential laryngeal remnants (laryngeal hiatuses or glottal stops) must have been lost in an early period as productive outputs of laryngeals – since they are found only rarely as frozen remains, presupposed behind certain forms in old compositions of ancient dialects.

An almost complete loss of laryngeals during the Late Proto-Indo-European stages fits into a coherent timeline within the known dialectal evolution. With that a priori assumption, we limit the need for unending ad hoc sound-laws for each dialectal difference involving a sonorant, which would in turn need their own exceptions. Following Clackson’s (2007) reasoning (see above), we need only “rigid sound-laws” that account for CIE and DIE developments, with irregularities being explained assuming dialectal variation due to either internal evolution or language contact.

Therefore, we would dispense with unnecessary hypotheses of the comparative method, offering the most conservative approach to the reconstruction.
II.5. Conclusion: An evolutionary view of laryngeal PIE

A unitary, immoveable, ‘Brugmannian’ Proto-Indo-European was developed for decades, where all differences between branches were attributed to dialectal exceptions in the vocalism of the parent language. That concept was changed for another one, represented by the widespread acceptance of a ‘laryngeal’ Proto-Indo-European – thanks especially to the Hittite decipherment.

However, the simplistic view – already present more than seventy years ago – of a unitary, abstract, atemporal parent language, from which all other branches would have split at the same time, has changed little. The field has changed one simple concept by another, slightly more correct. But the main error remains: immobility.

Phonetics seems to be often the subject of change in the field: first the satem-centum distinction, then to shared isoglosses, then from vocalism to laryngeals, including the gradual acceptance of the archaic nature of Anatolian.

With this paper, we propose that what is often described as infinite independent events of laryngeal loss, intertwined with multiple independent exceptions, be exchanged for general rules of stepped laryngeals loss, coupled with a reasonable number of exceptions for each dialectal period.
III. The three-dorsal theory

Carlos Quiles, Fernando López-Menchero

The evolution of the velar system in the attested Indo-European dialects gave rise initially to the three-dorsal theory, which was immediately – and has been since then – rejected by an important part of Indo-Europeanists.

Nevertheless, this artificial reconstruction, based on the centum-satem distinction, remains a prevalent hallmark of the most common handbooks on Proto-Indo-European reconstruction used in university courses around the world.

In this paper we examine the reasons in favour of a two-dorsal system and against the reconstruction of a series of palatalised velars, illustrating it with the history of the development of both theories, highlighting the weak finds that seem to be the strongest link to an original system of three velars.
III.1. Introduction

PIE phonetic reconstruction is strongly tied to the past: acceptance of traditional distinction of three series of velars is still widespread today in handbooks and articles on PIE and IE proto-languages alike.

Direct comparison in early IE studies, informed by the centum-satem isogloss, yielded the reconstruction of three rows of dorsal consonants in Late Indo-European by Bezzenberger (1890), a theory which became classic after Brugmann included it in the 2nd Edition of his Grundriss. It was based on vocabulary comparison: so e.g. from PIE *
\( \text{kɒtɒm} \) ‘hundred’, there are so-called satem (cf. O.Ind. \( \text{šatám} \), Av. \( \text{satəm} \), Lith. \( \text{šimtas} \), O.C.S. \( \text{sto} \)) and centum languages (cf. Gk. -\( \text{katón} \), Lat. centum, Goth. hund, O.Ir. cet).

To explain the phonetic differences between both groups, a series of labiovelars \(*k^w\), \(*g^w\), and \(*g^w^h\), and another of palatovelars \(*k^l\), \(*g^l\), and \(*g^l^h\), were reconstructed with the plain velar series. These sounds underwent a characteristic phonetic change in both dialectal groups, whereby three original “velar rows” became two in all attested Indo-European dialects. After that original belief, then, the centum group of languages merged the palatovelars \(*k^l\), \(*g^l\), and \(*g^l^h\) with the plain velars \(*k\), \(*g\), and \(*g^h\), while the satem group of languages merged the labiovelars \(*k^w\), \(*g^w\), and \(*g^w^h\) with the plain velars \(*k\), \(*g\), and \(*g^h\).

The reasoning for reconstructing three series was very simple: the easiest and most straightforward solution for the parent PIE language was that it had all three rows reconstructed for the proto-languages, which would have merged into two rows depending on their dialectal (centum vs. satem) situation – even if no single IE dialect shows three series of velars. Also, for a long time this division was identified with an old dialectal division within the Indo-European-speaking territory, especially because both groups appeared not to overlap geographically: the centum branches were to the west of satem languages. Such an initial answer should be considered unsound today, at least as a starting-point to obtain a better explanation for this ‘phonological puzzle’ (Adrados, Bernabé, and Mendoza 2010).

Many Indo-Europeanists still keep a distinction of three distinct series of velars for the parent Indo-Hittite language (and mostly unchanged for the Late Indo-European language), although research has constantly supported that the palatovelar series were most likely a late phonetic development of certain satem dialects, later extended to others.
This belief was formulated quite early in the development of the velar series by Antoine Meillet (1894), and has been followed by many linguists since then, such as Hirt (1899), (1927), Lehmann (1952), Georgiev (1966), Bernabé (1971), Steensland (1972), Miller (1976), Allen (1978), Kortlandt (1980), Shields (1981), etc.

The general trend is to reconstruct labiovelars and plain velars, so that the hypothesis of two series of velars is usually identified with this theory. Among those who support two series of velars there is, however, a minority who consider the labiovelars a secondary development from the pure velars, and reconstruct only velars and palatovelars, such as Kuryłowicz (1935), already criticised by Bernabé, Steensland, Miller, and Allen. Still less acceptance had the proposal to reconstruct only a labiovelar and a palatal series by Magnusson (1967).
III.2. In support of two series of velars
Arguments in favour of only two series of velars include:

III.2.1. Allophones
In most circumstances palatovelars appear to be allophones resulting from the neutralisation of the other two series in particular phonetic circumstances. Their dialectal articulation was probably constrained, either to an especial phonetic environment (such as the Romance evolution of Latin \( k \) before \( e \) and \( i \)), or to the analogy of alternating phonetic forms.

However, it is difficult to pinpoint exactly what the circumstances of the allophony are, although it is generally accepted that neutralisation occurred after \( *s \) and \( *u \), and often before \( *r \) or \( *a \); also apparently before \( *m \) and \( *n \) in some Baltic dialects. The original allophonic distinction was disturbed when labiovelars were merged with plain velars. This produced a new phonemic distinction between palatal and plain velars, with an unpredictable alternation between palatal and plain velars in related forms of some roots (those originally with plain velars) but not others (those originally with labiovelars). Subsequent analogical processes generalised either the plain or palatal consonant in all forms of a particular root. Those roots where the plain consonant was generalised are those traditionally reconstructed as having plain velars in the parent language, in contrast to palatovelars.

III.2.2. Complementary distribution
The reconstructed palatovelars and plain velars appear mostly in complementary distributions, what supports their explanation as allophones of the same phonemes. Meillet (1902) established the contexts in which there are only velars: before \( *a, *r \), and after \( *s, *u \); while Georgiev (1966) clarified that the palatalisation of velars had happened before \( *e, *i, *j \), and before liquid or nasal or \( *u + e, i \), offering statistical data supporting his conclusions. The presence of palatalised velar before \( o \) is then produced because of analogy with roots in which (due to the ablaut) the velar phoneme is found before \( e \) and \( o \), so the alternation \( *k/e/*ko \) would have been levelled to \( *k/e/*k/o \).

III.2.3. Labiovelars in satem dialects
There is residual evidence of various sorts in satem languages of a former distinction between velar and labiovelar consonants:
• In Sanskrit and Balto-Slavic, in some environments, resonants become *iR after plain velars but *uR after labiovelars.

• In Armenian, some linguists assert that *kʷ is distinguishable from *k before front vowels.

• In Albanian, some linguists assert that *kʷ and *gʷ are distinguishable from *k and *g before front vowels.

This evidence shows that the labiovelar series was distinct from the plain velar series in Late Indo-European, and could not have been a secondary development in the centum languages. However, it says nothing about the palatovelar vs. plain velar series. When this debate initially arose, the concept of a phoneme and its historical emergence was not clearly understood, however, and as a result it was often claimed (and sometimes is still claimed) that evidence of three-way velar distinction in the history of a particular Indo-European language indicates that this distinction must be reconstructed for the parent language. This is theoretically unsound, as it overlooks the possibility of a secondary origin for the distinction.

III.2.4. Natural evolution

The palatovelar hypothesis would support an evolution *kʲ → *k of centum dialects, i.e. a move of palatovelars to back consonants, which is clearly against the general tendency of velars to move forward its articulation and palatalise in these environments. A trend of this kind is unparallelled and therefore typologically a priori unlikely (although not impossible), and needs that other assumptions be made.

III.2.5. Statistics of velars

The plain velar series is statistically rarer than the other two in a PIE lexicon reconstructed with three series; it appears in words entirely absent from affixes, and most of them are of a phonetic shape that could have inhibited palatalisation.

Common examples include:

*ι̯uk-ôm ‘yoke’, cf. Hitt. iukan, Gk. zdugón, Skt. yugá-., Lat. iugum, O.C.S. igo, Goth. juk.


According to Clackson (2007), “The paradigm of the word for ‘yoke’ could have shown a palatalizing environment only in the vocative *yug-e, which is unlikely ever to have
been in common usage, and the word for ‘stranger’ ghosti- only ever appears with the vocalism o.”

**III.2.6. Differences among satem dialects**

Alternations between plain velars and palatals are common in a number of roots across different satem languages, where the same root appears with a palatal in some languages but a plain velar in others.

This is consistent with the analogical generalisation of one or another consonant in an originally alternating paradigm, but difficult to explain otherwise:

*ak-/ok- ‘sharp’, cf. Lith. akūotas, O.C.S. ostrú, O.Ind. asrís, Arm. aseln, but Lith. asrūs.

*akmon- ‘stone’, cf. Lith. akmuō, O.C.S. kamy, O.Ind. āsma, but Lith. āsmens.


*bhleg- ‘shine’, cf. O.Ind. bhárgas, Lith. balgans, O.C.S. blagū, but Ltv. blâzt.

*ghe rdh- ‘enclose’, O.Ind. grhá, Av. gǝrd̂a, Lith. gardas, O.C.S. gradu, Lith. zardas, Ltv. zârdas.

*su ekros ‘father-in-law’, cf. O.Sla. svekry, O.Ind. śvaśru.

*peku- ‘stock animal’; cf. O.Lith. pẽkus, Skt. paśu-, Av. pasu-.


It could be argued, as does Clackson (2007), that “such forms could be taken to reflect the fact that Baltic is geographically peripheral to the satem languages and consequently did not participate in the palatalization to the same degree as other languages.”

**III.2.7. Alternation**

There are different pairs of satemised and non-satemised velars found within the same language.

The old argument proposed by Brugmann (and later copied by many dictionaries) about “centum loans” is not tenable today. For more on this, see Szemerényi (1978) Mayrhofer (1952), or Bernabé (1971). Examples include:

*selg-, ‘throw’, cf. O.Ind. srjâti, sargas
*kau/-keu-, ‘shout’, cf. Lith. kaũkti, O.C.S. kujati, Russ. sova (as Gk. kauax); O.Ind. kauti, suka-.

*kleu-, ‘hear’, Lith. klaũstė, slove, O.C.S. slovo; O.Ind. karnas, sruti, srośati, śrňoti, sravas.

*leuk-, ‘light’, O.Ind. rōkas, rušant-.

### III.2.8. Number of satemisation trends

The number and periods of satemisation trends reconstructed for the different branches are not coincident.

Thus, Old Indian shows two stages:

1. PIE *k → O.Ind. s.
2. PIE *kʷe, *kʷi → O.Ind. ke, ki; PIE *ske, *ski → O.Ind. c (cf. cim, candra, etc.).

In Slavic, three stages are found:

1. PIE *k → s
2. PIE *kʷe, *kʷi → *č (*čto, *čelobek)
3. PIE *kʷoi → *koi → *ke gives *ts (as Sla. *tsená)

### III.2.9. Generalised palatalisation trend

In most attested languages which present aspirates as a result of the so-called palatovelars, the palatalisation of other phonemes is also attested (e.g. palatalisation of labiovelars before e, i), which may indicate that there is an old trend to palatalise all possible sounds, of which the palatalisation of velars is the oldest attested result.

It is generally believed that satemisation could have started as a late dialectal ‘wave’, which eventually affected almost all PIE dialectal groups. The origin is probably to be found in velars followed by e, i, even though alternating forms like *gen/gon caused natural analogical corrections within each dialect, which obscures still more the original situation. Thus, non-satemised forms in so-called satem languages would be non-satemised remains of the original situation, just as Spanish has feliz and not *heliz, or fácil and not *hácil, or French facile and nature, and not *fèle or *nûre as one should expect from its phonetic evolution.
III.2.10. Palatalisation not defined by dialectal branch or territory

The existence of satem languages like Armenian – related to Greek, a centum one –, or Balto-Slavic, a North-West Indo-European language, as well as the presence of Tocharian, a centum dialect, in Central Asia – a satem territory –, and Albanian, a satem language in the Balkans, a centum territory.

The traditional explanation of a three-way dorsal split requires that all centum languages share a common innovation that eliminated the palatovelar series, due to the a priori unlikely move of palatovelars to back consonants (see above). Unlike for the satem languages, however, there is no evidence of any areal connection among the centum languages, and in fact there is evidence against such a connection – the centum languages are geographically non-contiguous.

Furthermore, if such an areal innovation happened, we would expect to see some dialect differences in its implementation (cf. the above differences between Balto-Slavic and Indo-Iranian), and residual evidence of a distinct palatalised series. In fact, however, neither type of evidence exists, suggesting that there was never a palatovelar series in the centum languages. Evidence does however exist for a distinct labiovelar series in the satem languages (see above.)

III.2.11. Prevalence of velar systems

A system of two gutturals, velars and labiovelars, is a linguistic anomaly, isolated in the Indo-European occlusive subsystem – there are no parallel oppositions $b^w$-$b$, $p^w$-$p$, $t^w$-$t$, $d^w$-$d$, etc. Only one feature, their pronunciation with an accompanying rounding of the lips, helps distinguish them from each other. Such a system has been attested in some ancient Indo-European languages. A system of three gutturals – palatovelars, velars and labiovelars –, with a threefold distinction isolated in the occlusive system, is still less likely.

In the two-dorsal system, labiovelars turn into velars before $*$-$u$, and there are some neutralisation positions which help identify labiovelars and velars. Also, in some contexts (e.g. before $*$-$i$, $*$-$e$) velars tend to move forward its articulation and eventually palatalise. Both trends led eventually to centum and satem dialectalisation.
III.3. In support of three series of velars

Those who support the model of the threefold distinction in PIE cite evidence from Albanian (Pedersen 1900) and Armenian (Pisani 1948), that they seem to treat plain velars differently from the labiovelars in at least some circumstances, as well as the fact that Luwian could have had distinct reflexes of all three series.

It is disputed whether Albanian shows remains of two or three series (Ölberg 1976; Kortlandt 1980; Pänzer 1982), although the fact that only the worst and one of the most recently attested (and neither isolated nor remote) IE dialect could be the only one to show some remains of the oldest phonetic system is indeed very unlikely. Clackson (2007), supporting the three series: “Albanian and Armenian are sometimes brought forward as examples of the maintenance of three separate dorsal series. However, Albanian and Armenian are both satem languages, and, since the *kj series has been palatalised in both, the existence of three separate series need not disprove the two-dorsal theory for PIE; they might merely show a failure to merge the unpalatalised velars with the original labiovelars.”

Supporters of the palatovelars cite evidence from Luwian, an Anatolian language, which supposedly shows a three-way velar distinction *k’ → z (probably [ts]); *k → k; *k” → ku (probably [k’’]), as defended by Melchert (1987). So, the strongest argument in favour of the traditional three-way system is that the distinction supposedly derived from Luwian findings must be reconstructed for the parent Indo-Hittite language. However, the underlying evidence “hinges upon especially difficult or vague or otherwise dubious etymologies” (Sihler 1995); and, even if those findings are supported by other evidence in the future, it is obvious that Luwian might also have been in contact with satemisation trends of other Late Indo-European dialects, that it might have developed its own satemisation trend, or that maybe the whole system was remade within the Anatolian branch, which is still poorly understood.

Also, one of the most difficult problems which subsists in the interpretation of the satemisation as a phonetic wave is that, even though in most cases the variation *k/k may be attributed either to a phonetic environment or to the analogy of alternating apophonic forms, there are some cases in which neither one nor the other may be applied, *i.e.* it is possible to find words with velars in the same environments as words with palatals.
Compare for example *okˈtō(u), eight, which presents *k before an occlusive in a form which shows no change – to suppose a syncope of an older **okˈitō, as does Szemerényi, is an ad hoc explanation. Other examples in which the palatalisation cannot be explained by the next phoneme nor by analogy are *syekru- ‘husband’s mother’, *akmōn ‘stone’, *peku ‘cattle’, which are among those not shared by all satem languages.

Such unexplained exceptions, however, are not sufficient to consider the existence of a third row of ‘later palatalised’ velars (Bernabé 1971; Chen and Wang 1975), although there are still scholars who come back to the support of the hypothesis of three velars. So e.g. Tischler (1990), reviewed by Meier-Brügger (2003): “The centum-satem isogloss is not to be equated with a division of Indo-European, but rather represents simply one isogloss among many…examples of ‘centum-like aspects’ in satem languages and of ‘satem-like aspects’ in centum languages that may be evaluated as relics of the original three-part plosive system, which otherwise was reduced every-where to a two-part system.”

Newer trends to support the old assumptions include e.g. Huld (1997), in which the old palatal *k/ is reconstructed as a true velar, and *k as a uvular stop, so that the problem of the a priori unlikely and unparallelled merger of palatal with velar in centum languages is theoretically solved.
III.4. Conclusion

As it is clear from the development of the dorsal reconstruction, the theory that made the fewest assumptions was that an original Proto-Indo-European had two series of velars. These facts should have therefore shifted the burden of proof, already by the time when Meillet (1894) rejected the proposal of three series; but the authority of Neogrammarians and well-established works of the last century, as well as traditional conventions, probably weighted (and still weight) more than reasons.

More than half century ago we had already a similar opinion on the most reasonable reconstruction, that still today is not followed, as American Sanskritist Burrow (1955) shows: “The difficulty that arises from postulating a third series in the parent language, is that no more than two series (…) are found in any of the existing languages. In view of this it is exceedingly doubtful whether three distinct series existed in Indo-European. The assumption of the third series has been a convenience for the theoreticians, but it is unlikely to correspond to historical fact. Furthermore, on examination, this assumption does not turn out to be as convenient as would be wished. While it accounts in a way for correspondences like the above which otherwise would appear irregular, it still leaves over a considerable number of forms in the satem-languages which do not fit into the framework (…) Examples of this kind are particularly common in the Balto-Slavonic languages (…). Clearly a theory which leaves almost as many irregularities as it clears away is not very soundly established, and since these cases have to be explained as examples of dialect mixture in early Indo-European, it would appear simplest to apply the same theory to the rest. The case for this is particularly strong when we remember that when false etymologies are removed, when allowance is made for suffix alternation, and when the possibility of loss of labialization in the vicinity of the vowel u is considered (e.g. kraviṣ-, ugrā-), not many examples remain for the foundation of the theory.”
IV. The Corded Ware substrate hypothesis

Carlos Quiles

The common traits found between Indo-Iranian and Balto-Slavic – not related to each other – and between Balto-Slavic and Germanic – not more related between them than to Italo-Celtic –, have puzzled Indo-Europeanists for more than a century.

While common substrate vocabulary and isoglosses have been proposed, there is no coherent picture to date of their actual relationship.

In this paper we connect recent genetic investigation with the potential substrate language common to the three branches, represented by Corded Ware culture groups of the North Caspian region, central Europe, and Scandinavia. Furthermore, we argue that populations of the Corded Ware culture may have spoken Uralic proto-languages.
IV.1. Different communities with a common origin

Both European cultures (mainly of R1b-L51 subclades) and eastern Pontic-Caspian steppe cultures (mainly of R1b-Z2103 subclades) underwent an evolution represented by their absorption into populations of Corded Ware lineages (represented mainly by R1a-Z645 subclades). This evolution happened roughly at the same time, so it could be argued that these northern-eastern European peoples of the Corded Ware culture happened to speak similar dialects that could have influenced their adoption of Indo-European languages.

In Europe, North-West Indo-European communities speaking Pre-Germanic merged with peoples from the Battle Axe culture during the Dagger Period of the late Nordic Neolithic (ca. 2400-1700), while Pre-Balto-Slavic probably merged with Corded Ware cultures in the Únětice or Mierzanowice/Nitra cultural regions (ca. 2300-1600). In the steppe, Graeco-Aryan dialects spoken in the eastern Yamna and Poltavka cultures were replaced by peoples of Abashevo origin forming the Potapovka and Sintashta cultures (ca. 2100-1800 BC). Because both dialects, a Northern and a Southern IE one, already developed quite differently, evolved in a similar manner, their changes may be explained by a common Corded Ware substrate language.

The nature of this proposed substrate language may thus be a priori non-Indo-European, Pre-Indo-European, or Indo-European.
IV.2. Uralic as the language of the Corded Ware culture

It has been classically proposed that a Mesolithic language of eastern Europe is to be identified with a Uralic community, and a date ca. 4000 BC has been proposed for the common reconstructible Proto-Uralic language (Parpola 2012; Kortlandt 2002). Furthermore, Finno-Ugric has been shown to have developed in close contact with Proto-Indo-Iranian (Kallio 2002).

A common Indo-Uralic (Kortlandt 2002; Kloekhorst 2008) community is probably to be traced back to the formation of early Sredni Stog and early Khvalynsk cultures at the end of the 6th millennium, and their development as Uralic and Indo-European respectively is traced to their independent evolution during the Eneolithic in the Pontic-Caspian steppe, west and east of the Don River, respectively (Quiles 2017).

Recent genetic investigation has shown that the expansion of the third Corded Ware horizon was closely related to the cultures of the north-west Pontic steppe, heirs of the early Sredni Stog culture. This is therefore to be related to the expansion of the main Proto-Uralic dialects.
IV.3. Indo-Iranian and Balto-Slavic

It has been argued that similarities found in Indo-Iranian and Balto-Slavic languages – like the peculiar phonetic *ruki* development, a similar satem trend in both groups (Meier-Brügger 2003) – suggest a sort of west-east *continuum* between both languages, with certain features running through them (Mallory and Adams 2007).

From a linguistic point of view, the characteristic palatalization of the consonant system in Proto-Uralic - including palatalised *ć*, *ś* (and postalveolar *ć*, *ś*) alongside plain velar *k* and dental *s* –, is compatible with the similarly transposed velar and sibilant system adopted for Late Indo-European dialects by Balto-Slavic and Indo-Iranian speakers, thus explaining the strongest phonetic connection between these dialectally diverse Indo-European languages. Differences in the Baltic and Slavic satemization processes also point to an early split of the North-West Indo-European dialect ancestral to both, before or during its assimilation by different Uralic-speaking communities of late Corded Ware cultures.

The potential satem influence argued to be behind certain phonetic developments of Anatolian (especially Luwian) and certain Paleo-Balkan languages can also be posited to be the result of adoption of these traits during the crossing of territories of the Sredni Stog / Corded Ware horizon, during the migration of Indo-Hittite and Late Indo-European speakers respectively, although they most likely represent independent satemisation processes (see above).

This model supports thus the reconstruction of two series of velars: the traditional reconstruction of dorsovelars and labiovelars (Lehmann 1952), which is usually ignored in common textbooks in favour of the older reconstruction of a third series of palatovelars (Bomhard 2015); but also Martinet’s glottalic consonants (Gamkrelidze and Ivanov 1995).

The developments of Proto-Finno-Ugric *ō, ė* - → Proto-Ugric *ā, ā* – merging with original *a, ā* – (Häkkinen 2009) could be related to the phonetic changes found between Late Indo-European and Proto-Indo-Iranian, i.e. *ō, ė* → *ā*. That would suggest that the easternmost part of the domain, including probably the Abashevo-Balanovo cultures, spoke Proto-Ugric or a related Finno-Ugric language, at roughly the same time as the assimilation of the (Pre-Indo-Iranian-speaking) Poltavka population happened within the Sintashta and Potapovka cultures, ca. 2100 BC.
Balto-Slavic and Indo-Iranian share a special position among Indo-European languages regarding their rather conservative nominal case system. It has been argued that languages with more second language speakers lose nominal cases (Bentz et al. 2015). It has also been shown that forces driving grammatical change are different (stronger) than those driving lexical change (Greenhill et al. 2017). These natural human trends would explain the higher simplification of the declension system in Late Indo-European dialects of west and south-east Europe, compared with the conservation of the original system by speakers of Uralic dialects, known for their large set of grammatical cases. At the same time, the greater stability of lexicon would support the close relationship of European languages of the North-West Indo-European group.

On the other hand, this could also give support to the theory that Late Proto-Indo-European had in fact a simpler nominal system, derived from a still simpler one of Middle Proto-Indo-European (Adrados, Bernabé, and Mendoza 2016). In this case, Indo-Iranian and Balto-Slavic morphological differences would be later innovations. However, that would need an explanation as to how Uralic speakers adopting Late Proto-Indo-European added complexity to the language, instead of simplifying it.
IV.4. Germanic and Balto-Slavic

A western Corded Ware substratum could also be argued to be the origin of certain common isoglosses found between Germanic and Balto-Slavic.

According to Kortlandt (2016), the similarities between both dialects must be due to a common Indo-European substrate, since there is no reason to assume early contacts between Germanic and Balto-Slavic. In terms of the “Temematic hypothesis”, which favours a satem or Indo-Slavonic group, Germanic and Temematic would share common western Corded Ware isoglosses, and only later would Proto-Balto-Slavic – already separated from Proto-Indo-Iranian – absorb Temematic as a substratum language.

On the other hand, the expansion of East Bell Beaker peoples must have happened in different waves: one to the east, through Moravian and Bohemian groups into Polish lands and north European lowlands; and one to the west, including Middle Elbe/Saale and Dutch groups, which later migrated into southern Scandinavia, maybe absorbing some common linguistic traits in their north-eastern migration through the European lowlands.

Especially important is the peculiar dative plural in *-m- shared by Germanic and Balto-Slavic, which can’t be explained by late influences. Because of that, Kortlandt (2016) has argued that LIE dative plural *-mus must have been replaced by the ablative ending *bhos in Italo-Celtic and Indo-Iranian (where *-bhios may reflect the attachment of *-os to the instrumental forms in *-bhi-). Nevertheless, on one hand there is a general consensus that the original form behind Sla. *-mъ and O.Lith. -mus (maybe influenced by Old Prussian) must have come from a dative-ablative plural *mos (cf. PGmc *-maz), and not from *-mus as suggested by Georgiev (1966) and Kortlandt (Halla-aho 2006). Similarly, the common instrumental in *-mi- behind Germanic and Balto-Slavic forms contrasts with the rest of the Late Indo-European domain, which shows *-bhi-.

The Uralic declension system of genitive in *-n-, locative in *-n- (with three-way systems in later periods), as well as the lative in -ŋ, may have influenced the change of dative-ablative and instrumental forms in *-bh- → *-m-. Judging from samples of potential Indo-Uralic cognates, the correspondence between Proto-Indo-European and Uralic forms has been tentatively reconstructed by Kroonen (2015) as follows: PIE *d – PU *ŋ; PIE *bh – PU *ŋi; PIE ghw – PU *ŋ; PIE ghw – PU *uŋ. Interesting in this respect may also be the Livonian dative in -n, only partially stemming from the Uralic genitive in *-n, and which has strong links to the Latvian dative in *-m- (Seržant 2015).
It could then be hypothesised that North-West Indo-European had the old dative-ablative and instrumental forms in *-\textipa{h}b- during the initial migration of East Bell Beaker groups into Corded Ware territories of the northern lowlands. There, the declension system would have undergone a slight phonetic change (adapted to the somehow similar Uralic case system), e.g. ins. sg. *-\textipa{h}i → *-\textipa{y}i, ins. pl. *-\textipa{h}is → *-\textipa{y}is, and (maybe by assimilation with the other two forms) dat.-abl. pl. *-\textipa{h}os → *-\textipa{y}os. Such a change would obviously need an additional, \textit{ad hoc} explanation for the change *-\textipa{y} to the reconstructed common *-\textipa{m}-. An explanation may be found in the lack of the phoneme /\textipa{y}/ in the definitive phonetic system adopted, thus compelling for the eventual adoption by the next generations of speakers of a different phoneme, /\textipa{m}/, already present in the declension system (in the accusative singular ending), and – in contrast with /\textipa{n}/ – without the possibility of confounding these forms with the accusative plural in *-\textipa{n}s. This (now fully Indo-European) substrate language of north-central European Bell Beakers would have later influenced western groups during their migration into Scandinavia through the northern lowlands, and they would have remained as a part of the eastern Bell Beaker groups that later formed the Únětice and the Iwno-Mierzanowice cultures.

Witness to this intermediate substrate may also be the common forms of Indo-European origin found in Germanic and Baltic, and to some extent in Slavic, limited to social phenomena and especially to technical terms for wooden tools and utensils (Kortlandt 2016).

The same substrate could be argued to be behind certain traits common to Germanic, Balto-Slavic, Uralic, and other Eurasian languages (Klesment et al. 2003) – although many are constrained to Balto-Slavic and Uralic, which probably developed late in neighbouring territories.

The Germanic passive ending in *-\textipa{i}, in contrast with the original PIE ending in *-\textipa{r}-, may also be related to a common loss of the middle-passive endings in both Germanic and Balto-Slavic (or in the substrate language). It would have then been remade later with the common primary ending *-\textipa{i}, during the development of a Germanic community in Scandinavia after the Dagger Period, and only traces of the ending *-\textipa{r} with an impersonal value are left in Germanic.

Supporting the presence of an intermediate Indo-European substrate before the formation of a Pre-Germanic community would be the lack of a strong phonetic influence from
Uralic, as found in Indo-Iranian and Balto-Slavic. Its development in Scandinavia during the unification represented by the Dagger Period must have been influenced by different regional cultures.
IV.5. Common traits and other substrate hypotheses

Common traits between Germanic, Balto-Slavic, and Indo-Iranian, not coincident with other Indo-European branches, are quite difficult to find. After all, any Uralic traits common to the three branches may be related to an original Indo-Uralic community.

One such example is found in the reconstructed IE *manu-, ‘man’, cf. O. Ind. mán-, Avestan Manuš-čiora-, Gmc. *mann-, Sla. *môžь (< **mon-gio-?, with suffix similar to Lith. žmo-g-ûs, ‘man’). It has its parallel in PU *mańć-, ‘man’, cf. Hu. magyar, Finn. mies, Khanty mańí, Mansi mânčî. Its connection with an Indo-Uralic word may be made through a potential PToch *mänśu-, ‘prince’, as reconstructed by Adams, although this etymology (from Toch. A măskît, B māńczûkse) is dubious at best, and such a frozen use could have been influenced by the Indo-Iranian expansion in the region. The natural use of the word ‘man’ to describe an ethnic group would place it in a good position to survive in superstrate languages replacing the Uralic languages of cultures remaining in close contact with Uralic-speaking peoples. The lack of such an essential word – also strongly connected to basic mythological cosmology – in the other attested Indo-European dialects is difficult to justify.

Many of the Indo-Iranian substrate words and word forms described by Lubotsky (2001), most of them probably of non-Indo-European origin, may have been in fact of Uralic origin: “as is well known, Uralic has heavily borrowed from Indo-Iranian, but I agree with those scholars who believe that many of the apparent early borrowings rather reflect an etymological relationship between Uralic and Indo-European”.

Kroonen’s agricultural substrate hypothesis relates the substrate vocabulary and noun inflection traits to a Middle Eastern language, potentially related to Proto-Semitic (Kroonen 2012), which he has only recently related to the adoption of the language of the Funnelbeaker culture in Scandinavia (Iversen and Kroonen 2017), presupposing that Corded Ware peoples spoke Indo-European dialects. However, the same substrate could be argued to have influenced the third Corded Ware horizon, from the interaction of Balkan and steppe communities in the north-west Pontic steppe, since it is known that there is a strong genetic and cultural (and thus probably linguistic) connection of Balkan Chalcolithic cultures to Neolithic Anatolian farmers.

This is compatible with the idea that no words for domesticated animals can be reconstructed for Proto-Uralic, safe for dog (Pereltsvaig and Lewis 2015). Hence peoples
from the western steppe (mainly late Sredni Stog and Kvitjana cultures) might have borrowed them during the formation of the Third Corded Ware Horizon (through the influence of Trypillian, GAC, and Baden cultures), and they would have expanded with initial migration to the north-west.

That substrate, common to the western Uralic dialects spoken by Corded Ware groups across northern Europe, would have then been assimilated to different degrees by both Pre-Germanic and Balto-Slavic communities absorbing Corded Ware groups – and even Pre-Greek communities because of contacts in the Balkans –, as the examples in Kroonen (2012) show.
V. Conclusion

There is an ever-growing ground for the support of an intermediate European branch between Late Proto-Indo-European and European proto-languages.

Genetic studies are showing that the concept of Indo-European migrations is real, and it has also shown that closely related communities expanded over huge areas where ancient European languages were later attested. This gives strong support to an actual ancestral language spoken by a community of people – in contrast with the ‘constellation analogy’ of (Clackson 2007) –, and that these reconstructed branches evolved within small territories – unlike Latin in the Roman Empire. Both facts point strongly to the possibility of reconstructing a real, uniform language, unifying previous concepts such as the North-West Indo-European group, the Italo-Celto-Germanic community, Italo-Celtic, the fragmentary languages classified as of “Pre-Celtic” nature, or the language behind Old European hydronymy.

Immobility and conservatism have unexpectedly seized the field (Adrados 2007): from the nineties we have seen a decline in the theory which proposes at least two strata of Indo-European (with the archaisms of Hittite barely mentioned), with the most commonly used manuals barely presenting the effects of gradual dialectalisation – and this only related to Hittite phonetics.

The field keeps moving forward in the study of individual languages, but the general theory is paralysed, so that in fact dialectal studies are actually based on false theoretical assumptions.
References


Byrd, Andrew Miles. 2010. Reconstructing Indo-European Syllabification, Linguistics Faculty, University of California, Los Angeles.


Halla-aho, Jussi. 2006. Problems of Proto-Slavic Historical Nominal Morphology On the Basis of Old Church Slavic, Faculty of Arts, University of Helsinki, Helsinki.


Pisani, Vittore. 1948. La palatalizzazione armena.


