

0 The vantage point of Old English phonology

If one looks at the sheer bulk of literature on Old English (OE) palatalization, it seems to have been given a gloss of final finish, the inputs and outputs identified, some of the contentious issues mentioned, but conveniently disregarded, left in want of explanation or simply glossed over due to theoretical blinkers or absence of data.

The data are well-known. As the chances of new manuscripts being discovered in the hope of further data extraction are almost non-existent, one must turn to analysing the old data with a new set of assumptions. One of these issues concerns the palatalization of * γ (gamma) in pre-historic Old English, a Germanic phoneme with several reflexes in Old English: **g**, **x**, **ƿ**, **j**, **ɰ**, **ɰɰ**.¹ Historically, palatalization intersects and interacts with breaking and *i*-umlaut, which gives a convenient point of reference for any analysis.

The gamma is claimed here to have been a velar approximant in pre-Old English. The account of palatalization that follows cannot, under any account, claim to have the same scope of coverage, or account for every anomaly recorded in the last century. It relies on well-rehearsed data with a wish for reconsideration along a new set of assumptions. No new theoretical background is introduced either.

1 Palatalization (traditional view and its problems)

The palatalization of * γ is part of a web of interrelated changes, some aspects of which need reinterpretation. It is generally assumed that OE developed a tendency for adjusting the place of articulation of its velar consonants to the

¹ As usual, reconstructed data are shown with an asterisk (e.g., ***j**), ungrammatical data with double asterisks (****j**). The lesser known (traditionally employed) letters with etymological disambiguation used here are <ǰ> **j**, **ɰ** (after nasals), <č> **tʃ**, <ǰǰ> **ɰɰ**. I will refrain from using theoretically and notionally laden terms like phonemes (e.g., /**j**/) or allophones (e.g., [j] from /**ƿ**/).

only inherited palatal consonant from Germanic, the approximant *j and the front vowels *i, *e, *æ. This assertion seems unproblematic: the palatal approximant and the front vowels all share the same *i*-prosody (Hogg 2011), or I prime in some of the modern approaches. This melody is responsible for fronting the velar in the direction of the palatal, pre-palatal or alveolar places of articulation. This is the anterior place of articulation.

It is difficult to ascertain when this process started. Views differ. For Hogg (2011), as well as the bulk of traditional literature, the principal changes affecting the consonantal system of OE were operative in the pre-historic period (starting from ca. 500 CE, the time of the first settlements, until c. 700 CE, for which there is little or no significant textual evidence). However, there is evidence that this may have started considerably earlier, perhaps in late West Germanic or one of its Anglo-Frisian dialects from which OE developed (e.g., Daunt 1939). The velar consonants inherited from Germanic are *ɣ, *k, *x and *ŋ.²

The reflexes of k as tʃ (*kinnuz > *ċin(n)* 'chin') are generally unproblematic. Palatalized consonants are not usually systematically distinguished in the manuscripts, although there are attempts at this in some dialects with the help of diacritics or different letters for the palatalized and unpalatalized sounds, or vowel diacritics (<e> or <i>) placed after the problematic consonants: e.g., *fiſceas* 'fish' PL for *fiſas*, *giefan* 'give' for *jevan*. There is, however, disagreement over which vowels could produce

² Little is said in the literature about the phonetic changes in quality of the velar nasal. Those who believe in the taxonomic approach using phonemes, the notion of contrast and allophones will probably concede that the velar nasal was invisible to palatalization as it was not a phoneme (there were no minimal pairs with it, its distribution was predictable). This is why OE *þing* is claimed to originate in Germanic *þengaz (not **þeŋgaz). There is little doubt that *þengaz could ever have contained anything but a velar nasal. Of course, its absence is due to theoretical considerations, but this does not exclude the possibility that it was also palatalized (sub-phonemically). As a matter of fact, it too must have undergone fronting given that OE *þing* was *θindʒ* (according to all authorities). This stage was probably preceded by the palatal stage *θinj, before palatals become pre-palatal (or post-alveolar). But then no decisive evidence can be adduced to the effect that OE *þing* was not actually *θinj (with a palatal nasal and a palatal stop) at least at some point, as the distinction between the palatal vs pre-palatal (or post-alveolar) places or articulation of stops (and preceding homorganic nasals) is beyond retrieving given the standard notion of contrast.

progressive palatalization and how far this process could reach. Generally: the likelihood of progressive palatalization increases with the height of the front vowel (*æ is sometimes claimed not to be able to palatalize progressively: so, both *bæc* and *bæċ* 'back' have been argued for, e.g., Hogg (2011) versus Campbell (1959)). Regressive palatalization, however, seems unfailing (even before *æ, as in *çæf* 'chaff'), see (1).

(1) *Palatalization in OE* (exemplified with *k)

a. regressive

pre-OE (before palatalization)	OE
* <i>kinn-</i>	<i>çin</i> 'chin'
* <i>keusan</i>	<i>çēosan</i> 'choose'
* <i>kæster</i>	<i>çæster</i> 'city'
* <i>sōkjan</i>	<i>sēçan</i> '(be)seech'
* <i>wayγj-</i>	<i>weċg</i> 'wedge'
* <i>hlaxxjan</i>	<i>hlihhan</i> 'laugh' (with late palatalization by yod, see below)

b. progressive

* <i>dīk</i>	<i>dīç</i> 'ditch'
* <i>fræk</i>	<i>frēc</i> 'bold' (<i>frēc</i> for Hogg 2011)
* <i>bæk</i>	<i>bæċ</i> 'back' (<i>bæc</i> for Hogg 2011)

Palatalization seems to have depended on the following phonological factors:

- (i) melody of the consonant undergoing the change (continuant as opposed to non-continuant/stop, evident in the differences between *γ, *χ, on the one hand, and *k, on the other),
- (ii) height of the front vowels (*i as opposed to *e and *æ) and
- (iii) inhibiting influence of back vowels following the consonant undergoing the change (*līç* 'body' NSg vs *līcum* DP1, *līca* GP1, in the latter with the back vowel keeping the consonant non-palatalized).

The palatal approximant *j always produces palatalization. It and the front vowel *i are the strongest palatalizing agents.³

In addition, there was analogical pressure exerted on some of the phonologically regular forms of the paradigm consisting of alternating palatalized and non-palatalized consonants (or, in the case of *ɣ, even by competing palatalized forms: cf. *secġ* 'man NSg', with **ɖʒ** instead of expected *seġe* with **j**, under the preponderance of forms with *secġ-* (*secġe*, *secġes*, *secġas*, etc.) where **ɖʒ** is phonologically regular.

The general consensus is that the velar fricative *ɣ had a number of reflexes (allophones) in OE: **g**, **ɣ**, **j**, **ɖʒ**, **ɖɖʒ** and **x**. The distribution of the allophones is not immediately relevant here, but it seems that **ɣ** cannot be treated in one massive generalization (or if it can, then some of the questions on when some of the changes occurred must be disregarded). There is every indication that one cannot speak of the 'palatalization of the voiced velar fricative'. It seems rather that one must speak of the palatalization of *g (possibly even *gg) and *ɣ. In other words, the voiced velar fricative split into several distinct segments based on the environment, which went down their own paths. So, the voiced velar fricative and the voiced velar stop were just among the many segments that were fed into the rule of palatalization yielding different outputs. Before we proceed to tackle the question of *ɣ and *g, let us see what traditional textbooks (e.g., Hogg 2011) have on this: *k > *c, *x > *ç, *ɣ > *j, *j (where *j is the result of the palatalization of the *g, which in turn is a development of *ɣ).

At a later stage, in a process known as assibilation, *c > tʃ and *j > ɖʒ. Hogg (2011) allows for a possible interim stage of *ɣ > *j (a voiced palatal non-sibilant fricative). It is difficult to imagine how such a distinction between the approximant *j and *j could be preserved (or distinctive for that matter). Hogg's choice was probably motivated by the wish to preserve (if only in theory) the obstruent element of the original sound in the new palatal sound,

³ The question of which of these two is the stronger one can be decided if we look at West Germanic Gemination: every consonant (excepting **r**) in a light syllable is doubled when it was followed by **j**, e.g., ***bruɣjan** > *bryġan* **ɖɖʒ** 'to bridge'. The strength of the palatal is showcased by the fact that all West Germanic languages have this gemination. The process doesn't happen before **i** (***ɣift** > *Gift* 'poison' in German with a velar stop).

which was ultimately given up, yielding the palatal approximant *j. Hogg (2011, 7.15), based on Hogg (1979: 103f), concedes that original (Germanic) *j and *j (Hogg's *j) from palatalized *ȳ merged soon, "if the two were ever distinct."

There are other problems as well. The voiceless velar fricative *x seems only to have been palatalized if followed by *j, having first brought about the breaking of *æ (*hlihhan* with <hh> ç: < *hleaxxjan < *hlæxxjan). So, if this *is* palatalization, it followed breaking and must be regarded as late palatalization by j. Hogg (2011) does not list a single example where *x would have been progressively palatalized by *i (the strongest palatalizing vowel). This is for a reason, as the velar (or 'dark') quality of *x counteracted the palatal influence of *i, which was thus broken before *x (e.g., *meohs* 'manure' < *miuxs < *mixs). So not only is *x unable to undergo progressive palatalization by *i, it is strong enough to withstand the palatalization of *j (cf. *hlihhan* in which breaking happened first, suggesting that at the time of breaking the fricative must have been velar, not palatal).

In addition, it is very difficult, if not impossible, to determine whether the palatalization of word-initial *x ever took place as there is no other rule of OE against which it could be gauged. The quality of <h> in *heofon* 'heaven' as *ç must remain conjectural. It does seem, however, that historical *x ultimately yielded h (rather than a palatal/post-alveolar fricative or a palatal approximant) or was lost depending on dialect.

The conditions seem so complex that Hogg (2011, 7.16, n.3) is forced to assert that "it may well be worth entertaining the possibility that the situation was by no means as clear-cut as the presentation [...] suggests, and that there *was rather more variation in the palatalization of stops* [my italics] than has been suggested, most especially in medial position."

Before we tackle the moot question of the voiced velar fricative, two further OE developments must be mentioned: breaking and *i*-umlaut.

2 Breaking

Breaking is a change that affected the front vowels *i, *e, *æ (both short and long) when these were followed by the velars *x, *l, *r, *w. Interestingly, *l and *r can only break preceding vowels if they are followed by another

consonant (including themselves: *steorra* 'star' < **sterra*, *eall* 'all' < **æll*), that is if they are in word-internal coda position (rather than word-final coda: *wæl* 'choice' < **wæll*, *bær* 'he bore it' < **bærr*, where breaking fails). As opposed to the laterals, **x* can cause breaking by itself, and **w* cannot be followed by a consonant, nor can it be found word-finally for historical reasons (it had been absorbed into the nucleus at an early stage). Many interpretations have been given for breaking. A rehearsal of these is not relevant here.

Hogg (2011, 5.16) regards this as the addition of a transitional glide to the original vowel which later developed into a non-syllabic back vowel of the same height as the original vowel undergoing breaking. Later in his analysis this is identified as the addition of *w*- (or labial) prosody to the original vowel or, in other terms, the leftward control of *w*-prosody of a back consonant over a sequence of a front vowel and this back consonant (Hogg 2011, 5.93). The results of breaking are quite heterogeneous across the OE dialects, see (2) for some examples.

(2) *Breaking*

a. pre-OE **æ*

seah < **sæx* 'he saw'

eall < **æll* 'all'

heard < **hærd* 'hard'

b. pre-OE **e*

feoh < **fex* 'cattle'

eolh < **elx* 'elk'

steorra < **sterra* 'star'

hweowol < **hwewol* 'wheel'

c. pre-OE **i*

meohs (*meox*) < **mixs* 'manure'

niowul < **niwul* 'prostrate'

yrre/ierre < **eorri* < **irri* 'anger' (with *i*-umlaut and later changes)

3 I-umlaut

I-umlaut seems to be the opposite of breaking. Using Hogg's (2011) terminology we can say that this change involves the addition of I (or palatal) prosody to back (and some front) vowels. Both short and long back vowels were affected. Based on spelling we can surmise that the addition of I-prosody involved complete absorption of this palatal element into the affected sound rather than the addition of a non-syllabic front vowel although there are archaic <ui> spellings (similarly to breaking, cf. above), whose interpretation is a moot question. The sounds responsible for the change are *i and *j. The non-low front vowels are unproblematic: *i cannot undergo the change (or undergoes it vacuously), *e had already been raised in Common Germanic (*beripi > *biripi > OE birp 'carry' 3SgPInd), there are no relevant examples for *ē due to historical reasons (it had been lowered and backed to ā), *æ: escapes the change (OE dāed < *dāedi 'deed') for no obvious reason, *a is generally mutated to æ, but sometimes even to e (depending on the environment, sometimes haphazardly, e.g., æfnan/efnan 'perform' < *afnjan). The details are not relevant here. Some examples are given in (3).

(3) I-umlaut

trymman < *trummjan 'strengthen'

dēp < *dōp < *dōip 'he does'

gāet < *gāti < *gaiti 'goat' Pl

menn < *mænni < *manni 'man' Pl

4 Ordering

I-umlaut produced a new set of front vowels from back vowels: y(:), œ:, æ:, e/æ. Yet, there is no palatalization. We can say that palatalization and i-umlaut are in a counter-feeding relationship: i-umlaut could theoretically apply to the velar consonants, but it does not as it comes later, see (4).

(4) *I-umlaut after palatalization*

cemban < **kambjan* 'comb' (***ċemban*, cf. (*un*)*kemp(t)*)

cǣġ < **kāγjo* 'key' (***ċǣġ*)

gyldan < **yuldjan* 'gild' (***ġyld*)

gǣlan < **γāljan* 'hinder' (***ġǣlan*)

Yet, vowels produced by breaking were subject to *i*-umlaut suggesting that breaking happened before *i*-umlaut, see (5).

(5) *Breaking before i-umlaut*

nīhst/nīehst (umlaut) < **nēaxist* (breaking) < **nǣxist* 'next'

ċirran/ċierran (umlaut) < **ċearran* (breaking) < **kærrjan* 'turn'

byrhto/bierhto (umlaut) < **beorxito* (merging with **eo*) < **biurxito* (breaking) < **birxito* 'brightness'

wyrþ/wierþ (umlaut) < **weordīþ* (merging with **eo*) < **wiurdīþ* (breaking) < **wirdīþ* 'honour'

In addition, it seems that breaking happened before palatalization because vowels produced by breaking provide the environment for palatalization (see (6)).

(6) *Breaking and palatalization*

ġeald < **jeald* < **jæld* < **γæld* 'yield' PSg

ċeald < **ċeald* < **kæld* 'cold'

Strictly speaking, breaking is impossible to date with certainty with respect to palatalization as breaking does not produce back vowels that could prevent palatalization (or front vowels dissimilar from those front vowels from which the broken vowels develop). The first half of the diphthong that develops in breaking is still a front vowel (<*ea*>, <*eo*>, <*io*>). Crucially, both palatalization of the velars and breaking precede *i*-umlaut.

5 Limits and limitations of *ɣ

The discussion on breaking in 4 made no mention of the voiced velar fricative *ɣ. The literature seems unanimous in treating breaking as the influence of velar continuants on preceding front vowels (given the relevant constraints). This is why *k has no breaking effect on front vowels (as opposed to *l, *r, *x, *w). The voiced velar fricative *ɣ is missing from the data. It did not participate in breaking for all intents and purposes.

The voiced velar fricative is curiously absent from another process as well. The palatalization of *ɣ resulted in j in OE. Hogg (2011), as we have seen, concludes that the palatalized *ɣ may first have been a voiced palatal (non-sibilant) fricative, which merged with the original *j from Germanic (what is more, there may never have been a difference between the two in his own admission). If this is so, the state of affairs could not be more perplexing: original (primary) Germanic *j causes *i*-umlaut as opposed to secondary *j.⁴

5.1 *i*-umlaut and the voiced velar fricative (part 1)

Hogg (2011, 5.74, n.2) identifies three major exceptions to *i*-umlaut. One of these is the palatalized velar fricative: in words like *dæg* 'day' (< **day*) there is no umlaut (***deġ*; if such forms *are* found, they are the result of second fronting and have nothing to do with the spread of *i*-prosody, given that this late fronting happens across the board). Hogg (2011, 5.86), as well as Hogg (1979), has to concede that "the evidence clearly conflicts, and even if the further evidence of palatal diphthongization is taken into consideration [...] there is no immediately obvious solution."

⁴ In historical linguistics a number of notational solutions present themselves, none of which is able to answer satisfactorily the question of why two allegedly identical segments do not produce the same result. It may be recalled that in the West Saxon dialect of OE there are two *ǣ*'s: *ǣ*¹ from Germanic **ā* (< Indo-European *ē*), which is not the result of *i*-umlaut (e.g., *dǣd* 'deed', German *Tat*) and produces palatalization, and *ǣ*² which comes from pre-OE **ā* (which itself comes from **ai*) via *i*-umlaut (e.g., *gǣt* < **gāti* 'goat' Pl) and is not able to produce palatalization (***ġǣt*). This can be handled by rule-ordering, opacity conditions or anything else given the right theoretical approach. The problem of the two *ǣ*'s, however, is different from the palatalized velar fricative and *j. There seems to be no solution (rule based or otherwise) for its absence in *i*-umlaut. By comparison, the absence of palatalization in *kin* (as opposed to its presence in *chin*) can be explained with reference to rule ordering (and a later rule that unrounds *y* to *i*).

Let us take a well-behaved example. For *trymman* 'strengthen' the reconstructed form is **trummjan* (< *trumjan* with West Germanic Gemination). Even if one contests the synchronic plausibility of a triple consonant in **trummjan*, the **j* is there for a reason (it must be allowed to emanate *i*-prosody when the process of *i*-umlaut is actuated). The rest is straightforward. The **j* is ultimately lost to High Vowel Deletion in recorded OE yielding *trymman*.

Some other possibilities are available: it could be argued that the second <m> in *trymman* is the result of **m* spreading into the vacated position left after the loss of **j* (through compensatory lengthening). This solution does not contest the existence of West Germanic Gemination (a process well-documented in the various West Germanic dialects), but rather views the sequence **mmj* synchronically improbable for pre-OE. If the **j* was retained in OE, the likelihood of synchronic (rather than merely reconstructed) **trumjan* is more plausible, compared to the preconsonantal geminate of **trummjan*. Whether the **j* in **mmj* is deleted after *i*-umlaut or the geminate **mm* is simplified to **m* before **j* (with subsequent spreading of **m* into the vacated position left upon deletion of **j*), one still has a geminate in OE. The result seems to be the same, but the repercussions would be different.

Another possible analysis would be to say that one is dealing here with **trumimjan* (a palatalized geminate from where the palatal feature could begin to spread). This would open up a totally new perspective on OE palatalization, an issue that cannot be pursued here (but see Daunt 1939).

Let us now look at an impossible example: *byrgan* 'bury' is derived traditionally from **buryjan*. The word exemplifies *i*-umlaut. Traditional analyses are forced to retain **j* right up until *i*-umlaut. The devil is in the detail: how can the cluster **yj* survive up until the time of *i*-umlaut? We know that there should have been palatalization here (to **burjan*) given that palatalization comes before *i*-umlaut.

But is this **j* the original Germanic palatal approximant or the new one produced by Palatalization? If it is original, we must accept that the cluster **ryj* was simplified to **rj* with the loss of **y* (from which *i*-umlaut follows straightforwardly). Alternatively, we may claim that the voiced velar fricative was palatalized before **j* (as it ought to have been, given standard

assumptions). The cluster is now ***rjj** and we are forced to say that it is the second (original) ***j** producing *i*-umlaut. The synchronic plausibility of a ***rjj** cluster (or ***rj:** or ***rjj**, with the palatal approximant showing the place of the original velar fricative) is still highly questionable at any stage of OE.

If we say that the original ***j** was absorbed into ***ɣ** (which is a plausible enough analysis of palatalization), we are left with ***j** of the second kind, one that cannot produce *i*-umlaut in any account. Even if we accept the possibility that we are dealing with *both* ***j¹** and ***j²** (giving ***burj¹j²an**) from a diachronically engineered point of view, the problem is merely aggravated. All this is still begging the questions of what really happened phonologically.

It must be more than a coincidence that traditional explications of *i*-umlaut begin with examples of the *trymman*-kind (i.e., non-velars followed by ***j**). Looking at *byrgan* if we allow cluster simplification into the equation (***ryj** > ***rj** or ***rjj** > ***rj**), we have a solution that works (the only one that works for that matter). The problem with the velar fricative is not restricted to the verbal classes, similar examples can be found in the nominal system (as in the class of *jō*- and *ja*-stem nouns).

If we accept this, we don't necessarily have to accept that *mm* in OE *trymman* can only be the result of labial melody spreading into the position vacated by ***j** after *i*-umlaut had run its course (overly simplistically: ***trumjan** > (gemination in West Germanic) ***trummjan** > (geminate simplification before a consonant in OE) ***trumjan** > (*i*-umlaut) ***trymjan** > (loss of yod) ***trym_an** > (compensatory lengthening yielding recorded OE) *trymman*). The phonological plausibility of ***mmj** in pre-OE (well until *i*-umlaut was set off) is supported by the fact that such clusters are not unusual in languages, e.g., Italian *scimmia* 'monkey' (with phonetic **mmj**). The melodic differences between labials and velars (and the relative strength of the labials as opposed to the velars) are well-accounted for cross-linguistically. In OE then a labial (geminate) before yod is more plausible than a **ɣ** before yod in a language where such sequences were (ultimately) resolved.

5.2 *I*-umlaut and the voiced velar fricative (part 2)

Rather perplexingly, the palatalized voiced fricative is not always capable of producing *i*-umlaut. This always happens if the voiced velar fricative was

palatalized progressively by a front vowel. In cases like *dæg* **dæj** 'day' (< **dæγ*) or *weg* **wej** 'way' (< **wey*) **j** is the result of * γ absorbing the I melody from the preceding vowel. In cases like this there is no *i*-umlaut: ***deġ*, ***wiġ*. It seems the palatalization of the gamma is later than *i*-umlaut (the new yod does not mutate the preceding vowel regressively although the original yod does: *clæg* 'clay' < **klāja*), which means that ***j** cannot both be the result of palatalization *and* produce *i*-umlaut. However, other data (see (4) above) show that palatalization was *earlier* than *i*-umlaut, which would imply that the yod in *dæg* should, after all, have produced *i*-umlaut. This is a conundrum that can only be solved by assuming that the results produced by the front vowels and the original yod were different to the one produced by yod coming from the gamma (in which case *i*-umlaut fails).

An interesting situation arises when there is a postvocalic * γ followed by the Germanic ***j**, e.g., **kāγjo* > **kāγjo* > *cæg* **kæ:j** 'key' with *i*-umlaut of **ā*. The conclusion must be that ***γj** coalesced into ***j** which then proceeded to cause *i*-umlaut of the stem vowel. It is theoretically possible that the cluster ***jj** was simplified to ***j** after heavy syllables and the ***j** that remained was the one capable of producing *i*-umlaut.⁵

The problems raised in 5.1 persist: how could the ***γj** cluster survive until *i*-umlaut given that palatalization of velars was earlier than *i*-umlaut? By the time we arrive at *i*-umlaut, the * γ should long have been lost leaving behind a ***j** that can be analysed as either ***j**¹ or ***j**². It behaves like ***j**¹ (original Germanic yod). Note that traditional accounts must show pre-OE *cæg* as **kāγjo* (or less traditionally as **kāγ'jo*, but certainly not ***kāγ'o*, ***kājo* or ***kājjo*) to ensure that there is an original palatal approximant in the word for *i*-umlaut to work as originally construed. Note that showing the historical word as **kājjo* would be tantamount to both denying its Germanic stem and admitting that palatalized gamma *was* capable of producing *i*-umlaut.

⁵ In the traditional literature the high vowels *i* and *u* are lost after heavy syllables in word-final open syllables (known as high vowel deletion): e.g., *hēafod* < **hēafdu* 'heads', *fēt* < **fēti* 'feet', *lār* < **lāru* 'teaching'. The rule is also invoked for the Germanic yod, which is lost after heavy syllables as well (*trymman* < **trymmjan* 'strengthen'), but not after light ones (*nerġean nerjan* < **narjan* 'save').

Colman (1986) argues that syllable structure may be involved: if *j is tautosyllabic with the preceding vowel (as in *dæg*) there is no *i*-umlaut. If *j is heterosyllabic, there is *i*-umlaut (as in **kāy*§*jo*). Even if **kāyjo* was **kājo* after *j had coalesced with *γ, this *j would have been heterosyllabic in pre-*OE* at a time before high-vowel deletion applied after heavy syllables to produce *cāēg*. If this is accepted, we must entertain the possibility that *j from *γ, *pace* Hogg, was capable of producing *i*-umlaut.

5.3 The voiced velar fricative and breaking

The voiced velar fricative is not only problematic as regards *i*-umlaut. There is another problem: *γ does not break front vowels. The consensus classifies it as a velar continuant. As such it should be able to break preceding front vowels, similarly to dark *l, *r, *x and *w (as opposed to *k, which never can). So there is no evidence for breaking whatsoever: **wey* is found as *weg* **wej** (***weog*) in recorded *OE*, **dæy* as *dæg* **dæj** (***deag*), **dræyan* as *dragan* (***dreagan*).⁶ One could argue that we are dealing again with a difference between *γ's in word-final coda position, as opposed to word-internal coda position. Recall that, with the exception of *x, the velar continuants l and r can only break the preceding vowels if they are covered (i.e., if they are in word-internal coda). If *x and *γ only differ in voicing, they should pattern together, which they obviously do not (a word-final *γ cannot break front vowels, as opposed to *x). Hogg (2011), as well as Hogg (1979), has to admit that the reason for this remains uncertain.

What about the voiced velar fricative in word-internal coda? It seems they did not cause breaking here either: e.g., **reyn* > *reġn* 'rain' (**reogġn*), **fæyr* > *fæġr* 'fair' (***feagġr*), *bregdan* 'brandish' (***breogdan*), *riġnan* 'rain' (***reogġnan*/***riogġnan*), *mægden* 'maiden' (***meagden*), **sægd* 'said' (***seagd*), etc. What happened instead is palatalization. In contrast to the palatalization of *k, which for some analysts was more restricted (see

⁶ Claiming that ***dreagan* should be the result of breaking before the velar fricative rests on the shared feature of *velarity* of the voiced velar fricative and the voiceless velar fricative (**slēan* (after loss of h and compensatory lengthening) < **slæahan* < **slæuhan* < **slaxan* 'slay'). The voiced velar fricative is anything but identical in its behaviour to its supposed voiceless counterpart.

discussion in 1), the voiced velar fricative only escaped palatalization if a back vowel followed: e.g., *stīgan* 'ascend' (***stīġan*). Interestingly, not even here do we find breaking (***stēogan*) suggesting that **ɣ* developed here to *g* (or a kind of *ɣ* that was not a velar fricative). OE dialects are surprisingly uniform in the treatment of **ɣ*. there is no evidence for any kind of breaking before the voiced velar fricative.

5.4 The velar consonants of OE

The distribution of Germanic **ɣ* has been amply discussed from several perspectives. Data suggest that **ɣ* must have split into a number of environmentally conditioned realisations. The system of obstruents was not evenly distributed in OE (cf. Hogg 2011, among many others). As far as the velar consonants are concerned, we have already seen that **χ* and **ɣ* did not behave identically with respect to breaking and palatalization. It also seems certain that there was no intervocalic, word-initial (before a front vowel) or word-final **g* (as opposed to **k*, or its expected development, which could occur in all of these positions). The question, for some, revolves around what the phoneme was from which the historical allophones of OE could be derived: was it **g* or **ɣ*?

If we assume that it was **g*, one could expect it to pattern together with **k*. This, however, does not derive the right results: the palatalization of **g* would be expected to yield **ɔʒ** word-initially (cf. pre-OE **kinn* > *ċinn*), but this is never the case (**giƿ* > *ġiƿ*, ***ċgiƿ* 'if'). Word-finally *g* does not devoice to *k*, but rather to *χ* (e.g., *bēag*, alongside *bēah* 'ring', *burg*, alongside *burh* 'city', ***bēac*, ***burc*).

The only positions in which the voiced velar consonant behaves as a stop is the post-nasal position (e.g., **saŋgjan* > *senġ(e)an* with <*ġ*> **ɔʒ** and <*e*> as a palatal diacritic).⁷ There is every likelihood that the Germanic **ɣ* was always a stop in this post-nasal environment. As can be seen, this is the only position where the palatalization of **g* yields a sound which is parallel to **tʃ* (the palatalized reflex of **k*).

⁷ And possibly in geminates (*frogga* 'frog', *dogga* 'dog'), but this is irrelevant now.

There is another reflex of the voiced velar consonant. As a result of West Germanic Gemination, the voiced velar consonant is found as ***ddz**. If this sound was ***g**, we have, for example, ***wagjaz** 'wedge' > ***waggjaz** (by West Germanic Gemination) and ultimately *wecg* **weddz** in OE. If the consonant is assumed to have been ***ɣ**, we have ***wayjaz** > ***wayyjaz** > *wecg*. The OE **ddz** reflex may be explained as fortition affecting the geminate ***ɣ** after palatalization: ***wayyjaz** > ***wayyj** > ***wajj** > ***wejj** > *wecg*. The fortition (assibilation) of the palatal approximant to **dz(:)** is well-attested cross-linguistically.⁸

The voiced velar consonant is found as **g** before back vowels (and, after *i*-umlaut, before front vowels that originate in back vowels), e.g., *gān* 'go', *guma* 'man', *gold* 'gold' (with original back vowels), *gyldan* 'gild', *gǣt* 'goats' (with front vowels by *i*-umlaut).

All in all, the voiced velar consonant is different to both ***k** and ***x** (and the behaviour of these is different with respect to each other too). This is why it is difficult to pinpoint a single pre-OE phoneme (apart from Indo-European ***gh**) from which all the historical allophones could be derived in traditional taxonomic or generative analyses. The diachronic preference for ***ɣ** stems primarily from the fact that the voiced fricative was palatalized to ***j** (except after the special environments after the velar nasal or possibly in gemination). A synchronic analysis that insists on ***g** has its roots in the realization that a system with ***ɣ**, but no ***g** is considered highly marked (but not impossible, as witnessed by Modern Greek and Dutch, cf. Hogg 1979, Moulton 1972). Perhaps a change of perspective along these lines is needed.

6 The velar fricative (from obstruent to approximant)

Even though historically the Germanic ***ɣ** may have been phonetically (and phonologically) a fricative (deriving from an Indo-European aspirated stop), no account has ever suggested that by the pre-OE period this may have changed as a consequence of the reinterpretation of the fricative. The

⁸ Gothic and North Germanic also exemplify a similar phenomenon (known as Holtzmann's Law). Germanic *jj* and *ww* sequences are found as *ddj* and *ggw* in Gothic, and as *ggj* and *ggw* in North Germanic (Gothic *twaddjē* 'of two', *triggws* 'true', with the corresponding Old Norse forms *tueggia* and *tryggr*, all from Gmc. **twajj-* and **triww-*).

insistence of the traditional literature on OE to treat the voiced velar fricative on a par with the voiceless fricative or the voiceless stop stems from the fact that this change in manner of articulation didn't receive the right light in the literature. After all, we can only see what we want to see. The voiced fricative, as we have seen, has been suggested to have undergone a change from *ɣ to *ɟ or *j in pre-OE. The voiced palatal non-sibilant fricative *j then merged with the existing palatal approximant *j by the earliest of OE manuscripts.

The ɣ may have been reanalysed as a velar approximant **ɥ**, a change from obstruent pronunciation to approximant, or more precisely semi-vocalic/glide. Ladefoged & Maddieson (1996) claim that the velar approximant (for which they use **ɥ**) is very rare in the world's languages. They claim it occurs in Axininca, where it contrasts with the bilabial approximant and the palatal approximant.⁹ Even if a language has no two-fold or there-fold contrasts involving the approximants, it may still have a velar approximant phonetically, whose presence (**ɥ**) can be analysed at the phonemic level by claiming that it is an allophone of **g**. All in all, the reality of a velar approximant will still hold. Basbøll (2005: 238) claims that in Danish [j] is phonetically an approximant, but phonologically (based on its phonotactics) it is a fricative. Similarly, [v] is classified as a voiced fricative (/v/), but it is often articulated without friction (i.e., as a labial approximant [ɸ]).

The velar approximant can still be argued to be a non-syllabic vowel-like sound on a par with **j**, **w**, **ɥ** and a few others (Ladefoged & Maddieson 1996: 323). As far as the choice of symbols is concerned it must be noted that the voiced velar approximant is interchangeably shown as either **ɥ** (see above) or ɣ (e.g., Basbøll 2005). Whatever the symbol, the velar approximant seems to be rare. This fact may stem from its propensity to undergo changes to a less marked segment.

Basbøll (2005: 377, n34) in his treatment of Danish phonology says in connection with stem-final **g** that forms like *rigt* 'rich' [ʁi:ʔ] (neuter, singular

⁹ The question of contrast is theoretically biased, of course. Modern English has no aspirated voiceless stops phonemically, but it does not prevent one from stating phonotactic facts about the language (such as that there is no aspiration after tautosyllabic fricatives: e.g., *spit*, *astute*, *Kaftan*). Aspiration may be invisible at one level of analysis, but it may well be visible at another.

indefinite) can be pronounced either as [ˈki:ʔd̥] or [ˈkiŋd̥]. There are obsolete pronunciations, too, with the velar approximant [ɣ], an old realisation of syllable-final |g| (note that |g| shows a morpho-phoneme). This ɣ is called 'soft g' by Basbøll. It is worth continuing with Danish (historical) parallels because the similarities with OE are striking. Basbøll (2005: 212) says that the glides in some dialects correspond to the ɣ in older Danish standards according to the following rule: 'soft g' becomes [ɣ] (/v/) after back vowels and /r/, [ɹ] /j/ after front vowels, and [j] (/j/) after /l/ (This latter [j] shows a more fricative like pronunciation of the palatal approximant in word-final position. Even if this is phonetically relevant, we are still dealing with /j/. Sometimes it was replaced by zero (during the 20th century) (p. 218, n31). The words *galge* 'gallows' (with a 'more recent l') and *balje* 'tub' (with an 'original l') are now perfect rhymes ([aljə]). (p. 238)

7 The velar approximant in pre-OE

Given the discussion above, let us entertain the idea for novelty's sake that the non-sibilant voiced velar fricative *ɣ was reinterpreted as a velar approximant. Velar approximants seem to be relatively rare. It is possible that this approximant (at least in some of the positions in which it occurred) was dropped (lenited to zero) leaving behind a vacated position that could now be encroached upon by spreading melody. Let us look at the positions in which the velar approximant was found (ɣ will be used, not ɥ, as there is only a notational difference between the two).

The velar approximant, if found before back vowels, must at some prehistoric stage of OE undergone fortition to g (e.g., *gān* 'go', *guma* 'man', *gold* 'gold'). The more exact conditioning of this must remain conjectural at this point (but see below).

Before front vowels and after front vowels (if no back vowel followed), it underwent lenition and was lost. Its position was retained, however, and the I-prosody of the preceding or the following front vowel could control this empty position. This meant that the vacated position could now be filled with palatal (or I) melody. This must have been very similar to compensatory lengthening (which can happen both leftwards and rightwards, cf. Wetzels & Sezer 1986). The difference was that not the entire melody of

the front vowel, but only its dominant palatal melody spread into the vacated position. This gives (7). Note that the palatalization of *k can be explained in a similar fashion, the difference being that here there was no lenition of *k, as a consequence of which the palatal melody was merged with that of *k's own melody resulting (ultimately) in a pre-palatal (post-alveolar) affricate. For expository purposes let us suppose that the lenition of the velar approximant to zero leaves an empty position. This empty position as a 'gap' in pronunciation was never a reality, it is only an abstraction to show a link in the supposed diachronic stages of changes involving the velar approximant.¹⁰

(7) *Lenition and spreading of palatal melody*

(a) pre-vocalic velar approximant

*yivan > *_ivan (lenition of ʏ) > *jivan (spread of palatal melody) =

OE *ġifan jivan* 'give'

*yeldan > *_eldan (lenition of ʏ) > *jeldan (spread of palatal melody) = OE *ġeldan jeldan* 'yield'

*yæf > *_æf (lenition of ʏ) > *jæf (spread of palatal melody) =

OE *ġæf/ġeaf jæf* 'gave'

*bælyi > *bæl_i (lenition of ʏ) > *bælji (spread of palatal melody) =

*belji > (i-umlaut) > *belj (loss of i) = OE *belġ belj* 'wine-skin'

(b) post-vocalic velar approximant

*wīʏ > *wī_ (lenition of ʏ) > *wīj (spread of palatal melody) =

OE *wīġ wi:j* 'war'

*weʏ > *we_ (lenition of ʏ) > *wej (spread of palatal melody) =

OE *wēġ wej* 'way'

*wæʏ > *wæ_ (lenition of ʏ) > *wæj (spread of palatal melody) =

OE *wæġ wæj* 'way'

*fæʏr > *fæ_r (lenition of ʏ) > *fæjr (spread of palatal melody) =

OE *fæġr fæjr* 'fair'

¹⁰ It is possible that what is claimed in a traditional analysis to be the palatalization of the gamma is in fact unrelated to the palatalization of k. The palatalization of the gamma is simply a reaction to the inherent weakness (and lenition) of the velar approximant. Which 'palatalization' precedes which must remain conjectural.

This explains why there could never have been breaking in any of the examples in (7b). The *ɣ was lenited to zero and lost at a very early stage, at a stage predating the well-known prehistoric sound changes of OE. The gamma problem disappears: there is no velar fricative to cause breaking of the front vowels when that process becomes active. By that time, there is no longer a velar fricative here. There is no ad-hoc solution and recourse to exceptionhood is no longer required. The palatalized *ɣ did not merge early with the original Germanic *j, it was identical with it (the emptied slot was encroached upon by the palatal melody, which was identical with the Germanic *j).

Contra Hogg (2011) and earlier literature, we can now claim that *j from *ɣ did partake in *i*-umlaut: *buryjan > *bur_jan (loss of gamma) > *burjjan (rj < *rjj) > *byrjan = OE *byrgan* 'bury' (we saw in 5.1 that *buryjan is impossible to maintain given the well-known assumptions about pre-OE phonology). Similarly: *kāɣjo > *kājo (after simplification of *jj after heavy syllables) > *kājo > cæġ **kæj** 'key'. (Absence of *i*-umlaut in words like *dæg* is tackled below.)

The early date of the spread of palatal melody is shown by the fact that when new front vowels became available (with the operation of *i*-umlaut), the spreading of the palatal melody was no longer possible given the fact that by that time the fortition of *ɣ to *g had taken place (cf. *yuldjan > *guldjan (fortition before back vowels) > *gyldjan (*i*-umlaut) > *gyldan* 'gild' (loss of *j after heavy syllables) > ***jyldan* **jyldan**). At this post-*i*-umlaut stage palatalization of the velars was no longer an active rule of OE (all velars escaped it, including the voiced velar stop).

The fact that the original Germanic palatal approximant and the new one ensuing after spread of palatal melody are spelt in the same way (<g>, usually disambiguated as <ġ> in standardised texts) lends further (if indirect) support to the set of changes spelt out above (cf. *geong* **jung** 'young' and *gæf* **jæf**). There is further orthographic support: in late glossaries, as well as in Kentish, spellings with <i> are common: e.g., *deġ* or *dei* (for **j** from *ɣ), *iung* or *geong* (with an <e> diacritic, and other compromise spellings like <weiġ>).

We now come to the question of word-final *ɣ after back vowels. This was the only position in which *ɣ survived into OE, to be affected by word-

final devoicing: e.g., *bēah* x 'ring' (alongside *bēag*), *burh* x 'city' (alongside *burg*).

That the above line of reasoning can be maintained comes from the environment in which two back vowels straddle a *ɣ: e.g., *dragan* 'draw', *boga* 'bow', *dugub* 'valour', *iugub* 'youth'. OE holds little information (we have no phonological evidence with which the gamma intersects). In Middle English, however, we see that either a **w** develops between the back vowels or in case both are back high, they undergo contraction: *drawen* 'draw', *bowe* 'bow', *douth* (as found in *doughty* 'valour'), *youth* (from OE **uwu** in the last two examples, found as **u**: <ou/ow> in Middle English).

These examples may provide some proof for the supposition that *ɣ was lenited between back vowels, too and the vacated position was occupied by U (labial melody). This seems a natural consequence of the inherent phonetic weakness of *ɣ and the presence of U in the back vowels of OE, which could spread once the gamma was deleted. However, the consequences of these data for OE, as well as those that concern word-final *ɣ's and the fortition of word-initial *ɣ's before back vowels (*guma*, *gān*) cannot be discussed here.

8 The velar approximant in the class of strong verbs

The class of strong verbs in OE continues an Indo-European morpho-phonological pattern of 6 classes (plus an additional, seventh one with the originally reduplicative verbs). The patterns are established based on the vowel changes (ablaut) and the characteristics of the following consonants or consonant clusters. The third Class of strong verbs has two consonants after the stressed vowel, the first of which is generally a nasal or a liquid (see (8) below).

(8) Class 3 of strong verbs in OE with sonorants

<i>Infinitive</i>	<i>Pret Singular</i>	<i>Pret Plural</i>	<i>Past Pple</i>
<i>helpan</i>	<i>healp</i>	<i>hulpon</i>	<i>holpen</i> 'help'
<i>beorgan</i>	<i>bearh</i>	<i>burgon</i>	<i>borgen</i> 'protect'
<i>bindan</i>	<i>band</i>	<i>bundon</i>	<i>bunden</i> 'bind'
<i>singan</i>	<i>sang</i>	<i>sungon</i>	<i>sungen</i> 'sing'
<i>swimman</i>	<i>swamm</i>	<i>swummon</i>	<i>swummen</i> 'swim'

Crucially for us, the first consonant of the cluster in Class3 can also be a non-sonorant continuant, namely x and γ (or j , depending on the environment), see (9).

(9) *Class 3 of strong verbs in OE with γ and x*

<i>Infinitive</i>	<i>Pret Singular</i>	<i>Pret Plural</i>	<i>Past Pple</i>
breġdan	bræġd	brugdon	brogden 'move'
streġdan	stræġd	strugdon	strogden 'strew'
feohtan	feaht	fuhton	fohten 'fight'

The feature of continuancy could offer itself as a basis for including the velars into this category of verbs if it were not for the nasals. All in all, the third class of strong verbs shows that x , γ (j), alongside l , r and the nasals (m , n , η) must have been considered sonorant enough by the speakers of OE to be included in this class. *Breġdan* is found as *braid* 'plait' today having ϵj , which can be traced to OE $\langle e\dot{g} \rangle$.

9 Some of the consequences of palatal spreading

We have seen that the lenition of $*\gamma$ and the rightward spreading of palatal melody creates sequences that appear to form diphthongs: ij , ej , $\ae j$. Colman (1983) argues that it is impossible for new diphthongs to develop out of these sequences. Her arguments are theoretical. She would only allow new diphthongs to be formed if they were phonotactically possible in the language in the first place, that is vocalisation and diphthongisation would only be possible if the result was a merger with an already existing diphthong. Hogg (2011) is more accommodating in this respect, but only treats front vowel + w sequences.

The vowel + j sequences can be treated as diphthongs, however, and if we accept this, we do not expect the same phonotactic restrictions to operate between the two halves of the diphthong as they would in a heterosyllabic sequence of vowels. We must keep in mind that these sequences of front vowels and $*j$ are now regarded to have been formed very early in pre-OE *after* the First Fronting of Germanic $*a > *æ$ in pre-OE and *before* *i*-umlaut. So, we have an answer to why the yod in *dæġ* is the result of palatalization but

does not cause *i*-umlaut (as there is no *i*-umlaut inside diphthongs, as we will see soon).

A (falling) diphthong can be regarded to be a sequence of a syllabic and a non-syllabic (approximant) sound that obey phonotactic restrictions: not every vowel can be followed by an approximant. If any vowel is followed by any approximant we are not justified in calling these diphthongs.

In the predecessor of Southern Standard English, Received Pronunciation (RP), for example, the palatal approximant could only be preceded by **e**, **a** and **ɔ** (as in *name*, *nigh* and *boy*), the labio-velar approximant **w** only by **a** and **ə** (as in *cow* and *low*). It is for these reasons that we say a phonetic sequence **ej** (as in *name*) is phonologically /eɪ/, /eĵ/, /eĵ̃/, /eĵ/ (or any other device we may want to use; see discussion in Szigetvári 2016).

OE diphthongs seem to satisfy this requirement from a synchronic point of view: only front vowels can be found before **j**, that is, we have the diphthongs **ij**, **ej**, **æj** (other combinations are ruled out: ****uj**, ****oj**, ****ɔj**). We have evidence from Middle English that **ej** and **æj** behaved differently to **e**, **æ** + a sequence of any other consonant (cf. *cat* vs *day*, *way*): **ej** and **æj** eventually merged in Middle English (as in *way* and *day*), but the distinction between **æ** (or **a**) and **e** in non-pre-glide positions persisted (as in *lad* vs *led*, *sand* vs *send*, etc.).

If **ij**, **ej**, **æj** are diphthongs and not a sequence of a front vowel + **j**, we do not (necessarily) expect *i*-umlaut to have worked on them, and this is exactly what we see: the vowels **e** and **æ** are not affected (*dæg* > ****deg**, *weg* > *wig*).

There is further evidence from OE. The (long) diphthong <ēa> **æp** (or **æa**) from Germanic ***au** underwent a series of changes: one of these is the fronting of the first half of the diphthong to ***æ** (known as Anglo-Frisian Brightening). An additional change lowered the second half of the diphthong in a process known as diphthong height harmony, hence OE **æp**. However, there was another change (restoration of *a*) which reversed the effects of first fronting (***æ** > ***a**) before back vowels (e.g., *dæg* 'days' SgNAcc vs *dagas*, *daga*, *dagum* 'day' PlNAcc Gen Dat). However, the change never affected the diphthong **æp** (which is never found as ****ap**, ****a:** or any likely development

of the two vowels: *hēafod* **hæavod** 'head' with no restoration of *a*, from pre-OE **hæavud*, from Germanic **haufuð*).

So, we can safely say that restoration of *a* bypassed the diphthong **æp* exactly *because* it was a diphthong, a sequence of two tautosyllabic segments (not a sequence of two heterosyllabic vowels seen in *dagum*). The same can be said for the diphthongs **ej** and **æj**. The first half was not affected by *i*-umlaut because the vowel and **j** were tautosyllabic. This is to be contrasted with vowel + heterosyllabic **j** seen in pre-OE **kājo* > *cæġ* 'key' (from **kāγ'o* < **kāγjo*). It is only heterosyllabic **j** that can cause *i*-umlaut.¹¹

The last question is whether we have evidence for contrastive diphthongal length exemplified by words like *dæġ* vs *cæġ*. A distinction between long and short diphthongs has been argued for on a number of occasions in the last century. However, the arguments are too convoluted to be presented and the environments different to the ones discussed here. It is highly unlikely that a system could uphold for too long a minimal, phonologically contrastive distinction between **æj** and **æ:j**, for example. Unfortunately, no convincing phonological (or metrical) arguments can be presented in defence of this distinction. This may be for a reason: the two entities cannot be distinguished phonologically. The length in *cæġ* is simply etymological.

In a similar vein, etymological (comparative) considerations force us to claim that *fēng* 'caught' had a long vowel in OE. However, there is no synchronic phonological (or metrical) argument for this. The word must have contained a long vowel in Germanic and West Germanic (otherwise it would be *fing* in OE), but there is no proof that *fēng* had a long vowel in (pre-)OE apart from, of course, etymological considerations.

Let us look at some representative words mentioned in this analysis with some of the sound changes they exemplify (10). The chart also shows the relative diachronic ordering of the major rules discussed (as is usual in a historical analysis).

¹¹ It is due to a series of diachronic coincidences that there were no inherited Germanic or West Germanic tautosyllabic vowel + **j** sequences in OE. These were lost early in Germanic, West Germanic or pre-OE (prior to *i*-umlaut): **ai* > **ā* in pre-OE, **ei* > **ī* in Common Germanic. Sequences like *ui* did not exist, **oi* merged with **ai* in Common Germanic (given standard reconstructions).

(10) Representative OE words with the sound changes discussed

pre-OE (data reconstructed)							OE	
(ɣ = voiced velar approximant)	lenition of ɣ before front and after front vowels; palatali- zation of k	breakin- g	reanalysis of V + j sequences as diphthongs (phase I)	i-umlaut	loss of i/u/j after heavy syllables (high vowel deletion)	fortitio- n of ɣ word initially ¹²	reanalysis of V + j sequence s as diphthon- gs (phase II) ¹³	tradition- al editorial (etymolo- gical) spelling
dæɣ	dæj		dæj̆					dæg
wey	wej		wěj̆					weg
weyes	wejes		wěj̆es					weges
kāɣjo	kājo			kāju	kāj		kāj̆	cæg
buryjan	burjan			byrjan				byrgan
kambjan				kembjan	kemban			cemban
ɣān						gān		gān
ɣevan	jevan							ġ(i)efan
drayan								dragan
kæf	čæf							čæf
bæaɣ								bēag
mixs		miuxs						meohs
sterra		steorra						steorra

10 Conclusion

The argumentation presented here has attempted to look at a problem which has perplexed those working with OE phonology. The voiced velar fricative may have been a red herring for too long. It certainly did not sit well with breaking and *i*-umlaut. The analysis developed here is just the first step towards a more fully-fledged account of the behaviour of the velar fricative

¹² cannot be ordered at the moment with respect to the rest

¹³ must postdate *i*-umlaut

turned velar approximant in (pre-)OE. Some repercussions of the argumentation are followed up here, the rest are reserved for later research.

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Attila Starčević

Eötvös Loránd University, School of English and American Studies,

English Linguistics Department

starcevic.attila@btk.elte.hu