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Proto-Germanic *ai* in North and West Germanic

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Abstract: Proto-Germanic (PGmc.) *ai* in stressed syllables shows varied outcomes in Germanic languages (*ā, ē, ei*), with many of these developments being conditioned by different phonological contexts. This article presents a reconstruction that unifies this variation by assuming that the monophthongisation spread over ‘Germania’ in two waves with different scopes and directions. The first wave expanded from north to south and was primarily limited to the contexts before *-h* and *-r*. A second wave, affecting the remaining instances of PGmc. *ai*, did not reach Old High German and Old West Nordic. The whole process covered the time between 400 and 900. The monophthongisation of PGmc. *ai* does not reflect any structural contrast among the Germanic languages, but the results had a differentiating impact on their vowel systems. The presented reconstruction is consistent with the information from runic inscriptions. It supposes a geographical configuration of tribes in a post-Migration setting.

Keywords: Proto-Germanic, **ai*, monophthongisation, Old Frisian, Old Saxon, Old English

1 Introduction

The development of Proto-Germanic (PGmc.) *ai* in stressed syllables is rather varied in the attested Old Germanic languages (*ā, ē, ei*), and it is conditioned by widely varied phonological contexts. Monophthongisation was completed before the first attestations of Old English (OE; 7th century), e.g. *stān* ‘stone’ < PGmc. **stain-*, and is also found in the earliest Old Saxon (OS; 9th century), Old Low Franconian (except for some specific phonological contexts; OLF = Old Dutch; 10th century) and Old Frisian (OF; 12th century) – all three *stēn*. In contrast, Old (West) Nordic (ON), Old High German (OHG), and to a lesser degree Old Low Franconian, retain the diphthong to varying degrees, cf. ON *steinn*, OHG *stein* ‘stone’, OLF *leidon* ‘to lead’ < PGmc. **laidjan*. These divergent developments of PGmc. *ai* contributed to the subsequent emergence of the individual Germanic languages.

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According to Stiles (1995: 198–200) and Bremmer (2008: 287), the diverging development of PGmc. *ai* in Old Frisian and Old English is among the oldest differences between these two representatives of the North Sea Germanic dialect group. Recently, Kortlandt (2008) has postulated that monophthongisation of *ai* to *ā* was a common Anglo-Frisian development but that Frisian later fronted this *ā* to *æ* under certain phonological conditions (De Vaan 2011). This would imply that these two languages split up much later in time than assumed by Stiles and Bremmer (Kortlandt 2008: 270–271). Nielsen (2001: 516), in turn, concludes that “[...] the monophthongisation of Gmc. *ai* [...] took place independently in each of the three languages [Old Saxon, Old English and Old Frisian].”

A quite different approach is taken by Voyles (1992: 104,141,169,190,205) who tries to date the developments, considering what he calls “areal changes”, developments that cover various Germanic dialects, without them being part of a common pre-stage (Voyles 1992: 4). Voyles signals an early monophthongisation in only a few phonological contexts in Old Nordic around 450 AD. He gives no dates for Old English and Old Frisian, but he assumes that the development to *ā* may be a shared feature. He also assumes a shared development for Old Saxon and Old High German, with the monophthongisation spreading from Old Saxon into Old High German in the 7th century. The reconstruction proposed in this article is in line with these observations, but will go further by integrating all the developments into 3 related areal changes: two waves of monophthongisation and a gradual assimilation of the two components of the diphthong *ai*.

Another intriguing point in the development of PGmc. *ai* is the position of Dutch. All Germanic dialects with a diversified development of PGmc. *ai*, i.e. North Germanic, Frisian and High German, evince phonological conditioning for the diversification based on the (semi-)consonants, e.g. Old High German has *ē* before *r*, *h*, and *w* but otherwise *ei* (see the detailed overview in the subsequent section). Frisian does not only develop *ā* < PGmc. *ai* before *r*, *h* – as in Old High German – but also before *g* and velar vowels in the following syllable. In Dutch, however, the preservation of the diphthong *ei* is conditioned by the palatal (semi-)vowels *i*, *j*. In all other contexts, Dutch has *ē* (Bree 1987: 100). The impact of the following *i*, *j* is generally interpreted as *i*-mutation in the Germanic languages. However, a typical feature of Dutch is the lack of *i*-mutation effects on long vowels (Buccini 1995), which makes it surprising that *i*-mutation would suddenly play a role in conditioning the monophthongisation of PGmc. *ai* in Dutch. According to recent views on the history of Dutch, its origins are attributed primarily to language contact between ‘Anglo-Frisian’ in the coastal regions and some form of inland Franconian (Buccini 2003; De Vaan 2012). The *i*-mutation does not play a role in conditioning the monophthongisation of PGmc. *ai* in either of them.

This article offers a new, holistic interpretation of the development of PGmc. *ai* in the North and West Germanic languages, which unifies the observed variation both between and within the various Germanic branches. The reconstruction presented here builds upon the principles of language change as observed in dialectology, such as the gradual and diversified spread of changes in different phonological contexts ('waves'). Moreover, it takes into account the inferences that can be made about the earliest history of Germanic languages from runic evidence and early attested place-names.

This paper is organised as follows. Section 2 briefly sketches the developments of PGmc. *ai* in the various Germanic dialects as sketched in the handbooks. In Subsection 3, I present my two-wave model. Section 4 probes both the runic and early place-name evidence which can be used to support this model. Section 5 discusses two languages with complex and diversified developments: Old Frisian and Old Saxon. Section 6 gives a diachronic synopsis which is fine-tuned to the insights gained from Sections 4 and 5. Section 7 will offer a discussion and conclusion.

A few remarks on the technicalities and spelling conventions are in order prior to the analysis proper. Vowels are generally not treated in a strict phonological way and are therefore spelled in italics, such as *ā* and *ē*, which appear as products of the monophthongisation of PGmc. *ai*. The phonetic details of these two (and other) sounds can vary. It must be assumed that in many languages *ē* had the sound value [ɛ:] for some time rather than [e:]. Also the *ā* may vary in time and space from [æ:] to [ɑ:] or even [ɔ:]. The italic characters *æ/ǣ* are used in the historical-linguistic way as sounds close to [ɛ(:)]. Only when phonetic or phonological details are at stake, is a more precise description provided, respecting the IPA conventions. Transliterations of runic inscriptions are given in bold typeface, while <...> can be used to refer to the purely graphematic representation level. In order not to overload the text with “*”, I have chosen to apply “*” only to full words which are not attested. That various sounds, phonemes or pronunciations are reconstructions is inherent to the topic.

As to the designation of the languages, several conventions will be applied which need a brief commentary here. It must be emphasised that these names do not function as benchmarks in any ideological or theoretical sense but are only used for practical purposes. I use the terms Old English, Old Frisian, Old Low Franconian, Old Saxon, Old High German and Old Nordic as generic labels, without being specific about the time frame, to refer to the historical stages of the English, Frisian, Dutch, German and Scandinavian languages. In general, they refer to the oldest attested forms of these languages, apart from the often scant runic attestations. Note that Old Low Franconian is here considered to be a continental West Germanic variety. The language of the

Dutch coastal regions was a North Sea Germanic variety in the Early Middle Ages. The current varieties of Holland, Zeeland and Flanders are the product of inland Franconian being adopted by speakers of these North Sea Germanic varieties (De Vaan 2012).

The common language that the Old Germanic dialects derive from is called Proto-Germanic (PGmc.), without any subdivision into ‘Common Germanic’, ‘North-West Germanic’, etc. These subtleties are not relevant to the present discussion, because I operate with absolute datings and not with periodization labels. The following terminology is applied to refer to the specific language forms as attested in the runic attestations. I use ‘Early Runic’ for the language in Scandinavia in the period 200–500 AD, which is a form of Germanic very close to (late-)Proto-Germanic, attested in inscriptions from the area that is nowadays North Germanic speaking territory (Nielsen 2000: 295). The later stages will simply be referred to as Old Nordic. In England, the runic inscriptions cover a time from ca. 400–1000 AD (Page 2006: 21), which overlaps the period of otherwise written Old English sources, starting in the 7th century. For the early runic attestations from England, I use the term ‘Anglo-Saxon (runes)’. For Frisian, there is a wide gap between the language of the runic inscriptions from the 6th to 9th century, which I will call ‘Runic Frisian’ (Versloot 2014a, 2016) and Old Frisian, which is only attested after 1250. The term Proto-Frisian is sometimes used for earlier, reconstructed stages of the language. There are no relevant inscriptions corresponding to the Old Low Franconian or Old Saxon language area. The language of the inscriptions from the Continent, mostly from the present-day High German language area, is called ‘Continental Runic’ (Findell 2012a).

2 The development of PGmc. *ai* in Old Germanic dialects

This section provides a brief overview of the development of PGmc. *ai* in the individual languages. PGmc. *ai* has different reflexes in the various Germanic dialects. This study concentrates on the stressed syllables. In addition, there are a few other contexts where *ai* appeared in PGmc., which are of marginal interest in this paper. Unstressed PGmc. word final *-ai* was monophthongised, a development that can in Early Runic be dated to the period between ca. 200 and 500 AD, where PGmc. *ai* became *-ē* (Boutkan 1995: 42,361). Old Nordic attests to a monophthongisation to *ā* in secondary stressed syllables (Nielsen 1983: 162), while Old Frisian shows the result of a shortening to *æ* in stressed syllables

before consonant clusters (De Vaan 2011: 309–312; Hoekstra and Tigchelaar 2014: 188; Kümmel 2014a: 38). These developments, though important for the individual languages, stay beyond the scope of this article.

2.1 Nordic

There is a contrast between *ei* in Old West Nordic (OWN) and *ē* in Old East Nordic (OEN), but both branches show *ā* before PGmc. *r*, *h*: Icelandic *steinn*, *tár*, Danish *sten*, *tå*, ‘stone, toe’ < PGmc. **staina-*, **taihwō-*. The *ā* becomes *ǣ* as a result of *i*-mutation: Icelandic *læra*, Danish *lære* < PGmc. **laizjan* (Heusler 1967: 26). Note also that the monophthongisation almost only took place before *r* deriving from PGmc. *r* (e.g. ON *sár* < PGmc. **saira-*). In contrast, monophthongisation was rare before *r* deriving from PGmc. *z* (e.g. ON *meira* ‘more’ < PGmc. **maiza-*), indicating that the rhotacism of PGmc. *z* must have occurred sometime after the time of monophthongisation.¹ Still, there are exceptions, such as ON *læra* ‘to learn’ < PGmc. **laizjan* (cf. Gothic *laisjan*). PGmc. *ai* becomes *ǣ* before PGmc. *w* (Heusler 1967: 27), but *i*-mutation could be involved in most of the examples as well.

2.2 English

PGmc. *ai* always becomes *ā* in Old English, which in turn developed into *ǣ* when affected by *i*-mutation, e.g. *stān*, Modern English *stone* < PGmc. **staina-*, *lǣdan*, Modern English *to lead* < PGmc. **laidjan*.

2.3 Frisian

Old Frisian splits PGmc. *ai* into *ǣ* (> *ē*) and *ā*. This split is lexically (almost) the same in all Frisian varieties (Århammar 1969: 109, 114). This makes the lexical

¹ It is sometimes assumed that /r/ was uvular [r] in PGmc., but that the /r/ < /z/ was an apical trill [r], which is the standard realisation in the more archaic Germanic varieties. A uvular /r/ in PGmc. would fit nicely and make ‘velarity’ a uniform phonological trigger. In a word such as Proto-NW Germ. **lairjan* < PGmc. **laizjan*, the /r/ must have been an apical trill. However, [r] can be a trigger for monophthongisation as well. Denton (2003) analyses the whole complex, presenting synchronic phonetic arguments and concludes that /r/ was an apical trill from the very beginning in Germanic, a sound that can phonetically be responsible for the ‘velar’ effects, such as in the monophthongisation process of PGmc. *ai* or in Old English ‘breaking’. I will henceforth use the term ‘velar’ in quotation marks.

distribution of *ē* and *ā* an outstanding marker of Frisian: it most likely antedates the colonisation of the North Frisian Islands (7th/8th century) and it sets Frisian apart from the other North Sea Germanic languages, i.e. Old English (always *ā*) and Old Saxon (always *ē*). The exact phonological conditioning for the two developments has long been unclear, but recently De Vaan (2011) has come out in support of an earlier hypothesis by Siebs that *ā* appears before PGmc. *r*, *h*, *g* and velar (semi)vowels, e.g. *stēn* ‘stone’ < PGmc. **staina-*, *āga* ‘to owe’ < **aig-*. There are, however, quite a few exceptions to this rule, such as *rāp* ‘rope’ < PGmc. **raipa-* with unexpected *ā*, *sēr* ‘wound’ < PGmc. **saira-*, with unexpected *ē*, and there are some doublets, e.g. *āth* ~ *ēth* ‘oath’ < PGmc. **aiþa-*, *lāre* ~ *lēre* < PGmc. **laizō-* ‘teaching’. The *i*-mutation always turned a potential *ā* into *ē*, such as in *lēra* ‘to learn’ < PGmc. **laizjan*. In contrast to Old Nordic, Frisian shows no difference in the behaviour of PGmc. *ai* before *r* < PGmc. *z* or *r*, e.g. *ērest*, *ārist* ‘first’ < PGmc. **airist-*, *lāre*, *lēre* ‘doctrine’ < PGmc. **laizō-*, which implies that the merger of the two types of *r* had already taken place. The results of an in-depth analysis are presented in Subsection 5.1.

2.4 High German

High German has *ei* in roughly the same words as West Nordic but *ē* before *r*, *h*, *w*: *Stein* ‘stone’, *mehr* ‘more’, *Zehe* ‘toe’, *See* ‘sea’ < PGmc. **staina-*, **mair*, **taihwō-*, **saiwi-* (Braune and Reiffenstein 2004: § 43 & 44). Note that the phonological context for monophthongisation to *ē* is the same as the Nordic context for monophthongisation to *ā/ǣ*.² Old High German is the only Old Germanic language where the monophthongisation is partly captured in the earliest attestations. Braune and Reiffenstein (2004: §44) date it to the 7th century.

2.5 Dutch

Dutch, too, testifies to a split development of PGmc. *ai*. It developed into a monophthong *ē* in most instances, but when followed by *i* or *j* it was not

² I would like to thank Michiel de Vaan for directing me to this fact. His discussion of *ai* in Frisian made me aware of the common factor of ‘velarity’ for Old Frisian and Old Nordic, and his remark concerning Old High German was the missing link in my understanding of the developments. He also commented on an earlier version of this paper. I would further like to thank Elżbieta Adamczyk (Wuppertal, Germany), Stephen Laker (Fukuoka, Japan), Patrick Stiles (London, UK) and two anonymous reviewers for valuable remarks and suggestions for the content of this paper.

monophthongised and appears as *ei*: *steen* ‘stone’, *leiden* ‘to lead’ <PGmc. **staina-*, **laidjan*. In Dutch, *i*-mutation seems to block monophthongisation. However, when the consonantal conditions that work in Old High German and Old Nordic compete with *i*-mutation in Dutch, monophthongisation is applied, as in Modern Dutch *leren* <PGmc. **laizjan* ‘to learn’ and not **leiren*, cf. German *lehren* (Bree 1987: 100). Hollandish dialects show a few instances of retention of the diphthong *ei* before alveolar consonants: *vleis* ‘meat’, *scheiden* ‘to separate’ <PGmc. **flaisk-*, **skaip̃an*, (Bree 1987: 103). Flemish, on the other hand, went through a stage with only monophthongs, as evidenced by Flemish Middle Dutch *cleen*, Standard Dutch *klein* ‘small’ <PGmc. **klaini-*.

Apart from this alternation between Dutch *ei* and *ē*, Hollandish dialects have *ā* or *ō* in a few words, such as *aak* ‘type of tree’ (cognate of Standard Dutch *eik* ‘oak’) <PGmc. **aik-* and *toon* ‘toe’ (Standard Dutch *teen*) <PGmc. **taihwō-* (cf. OF *tāne*). These words are generally considered to be Ingvæonic relics (Miedema 1970; De Vaan 2011).³ Note that some of these words have parallels with *ā* in Frisian, though others do not. The details of the development of PGmc. *ai* in Dutch coastal dialects deserves a separate treatment, but is marginally mentioned in the discussion of Frisian in Subsection 5.1. The complicated evidence from North Sea Germanic relics in these dialects does not provide independent support for my reconstruction of events that will be presented in Section 3.

2.6 Saxon/Low German

Old Saxon generally shows *ē* in all contexts. Hofmann suggested a split into two different *ē*-phonemes, parallel with Old Frisian, but this idea is rejected by Nielsen (2001: 515–516) and Krogh (1996: 283). Apart from *ē*, other reflexes of PGmc. *ai* are found in some Old Saxon texts, namely: *ā*, *æ* and *ei* (Gallée 1910: 70–74). The *ā*, *æ* represent more open vowels than the common Old Saxon reflex

³ A reconstructed **aikō* (Philippa et al. 2003) implies an OF **āke*. Griepentrog (1995: 17–23) shows that the word was originally a root noun PGmc. **aiks*, which follows from attestations in Old Nordic and Old English. In this case, one may expect OF **ēk* or **āk* (see Subsection 5.1). The word is only attested in the dat.sg. as <eke> in Old Frisian, and the *ē* is confirmed by evidence from all modern Frisian dialects (Stiles 1995: 186). In Dutch coastal dialects (former Frisian speaking regions) it appears as *aak*, denoting another tree species. Griepentrog (1995: 22) mentions the transition to the *ō*-stems in Old Saxon and Old Low Franconian and possibly also Old High German. Old Frisian is more likely to stay on the side of Old English. Modern Dutch has an unexpected *eik* instead of **eek* (but *eekhoorn* ‘squirrel’). The Dutch form is explained through analogy with the adjective ‘oaken’ PGmc. **aikina-*, with *i* in the following syllable (Bree 1987: 101).

$\bar{e}$ and resemble in this respect Old Frisian and Old English $\bar{a}$. The ei is the common reflex in Old High German. There are no lemmas that only appear with $\bar{a}$, $\bar{æ}$ or $ei < PGmc. ai$; words are always attested with regular $\bar{e}$ as well. The implication of these few exceptions are discussed in Subsection 5.2.

Given the wide variety of developments of PGmc. ai in the various Germanic dialects, it comes as no surprise that these developments – to the best of my knowledge – have not been treated as one process up till now.

3 The two-wave model

3.1 The geographical spread of the monophthongisation

Despite the differences between individual Germanic dialects, various common patterns emerge from a comparison of the developments described in Section 2:

1. In every language with a split development of PGmc. ai , the same group of contexts pops up, even in Old Low Franconian: monophthongisation is the rule before r , h , and often w . The common feature of h and w is that they are both velar: $h = [\chi]$, $w = [w]$. The velar $h = [\chi]$ is also in Old Frisian a conditioning factor for the monophthongisation to $\bar{a}$, alongside the voiced velar $g = [\gamma]$, rounded back vowels, such as u and $\bar{o}$, and w following a consonant.
2. The $\bar{a}$, by whatever condition, is found in a contiguous region of geographically adjacent languages, basically around the North Sea: Old Nordic, Old English, Old Frisian and some reflexes in Old Saxon as well as in modern western Dutch dialects, relics from the earlier North Sea Germanic language in the Dutch coastal zone. On the other hand, $\bar{e}$ prevails in the south: Old High German, Old Saxon, Old Low Franconian. In Old Frisian and Old East Nordic, $\bar{e}$ competes with $\bar{a}$.
3. In languages with partial monophthongisation, High German and West Nordic, there is always a monophthong in the ‘velar’ context but not in the other contexts: OHG *stein* ~ *sēr*; ON *steinn* ~ *sár* ‘stone, sore’. The same ‘velar’-criterion marks the difference between $\bar{a}$ and $\bar{e}$ in Old Frisian and Old East Nordic. The monophthongisation is restricted to the ‘velar’ context in High German and West Nordic and this fact can be taken as an indication that it reflects the oldest stage of the process. This implies that also in Old Frisian and Old East Nordic, the monophthongisation in ‘velar’ contexts, i.e. to $\bar{a}$, was most likely older than in other contexts. For Old East Nordic this is widely acknowledged, based on evidence from the younger runic inscriptions (Bandle 2012: 65, 66).

4. In the light of the complete monophthongisation of PGmc. *ai* in Old English, Old Frisian and Old Saxon and the observed impact of ‘velar’ contexts, the Old Low Franconian situation with lack of monophthongisation before *i,j*, presents the ultimate form of the ‘velarity’ condition: Old Low Franconian has monophthongisation in all contexts but the most non-‘velar’ one, namely, instances with palatal *i,j* in the next syllable. That ‘velarity’ is the decisive feature here is inferred from the observation that a directly following *r*, *h*, or *w* nullifies the impact of non-velar *i,j* in the next syllable. The incidental retention of *ei* before alveolar consonants in Hollandish fits into the same ‘velarity’ scale.

These observations lead to the following interpretation: the monophthongisation is oldest in ‘velar’ contexts. Languages with two different monophthongs (Old Frisian and Old East Nordic $\bar{a}$ and $\bar{e}$, some marginal reflexes in Old Saxon) went through two stages of the monophthongisation process, where $\bar{a}$ represents the product of the first stage. The ‘velarity’ condition was most restricted in Old Nordic and Old High German, somewhat more extended in Old Frisian, and totally absent in Old English with unrestricted monophthongisation to $\bar{a}$. In Old Low Franconian, only the extreme mirror-context of ‘velarity’, i.e. the *i*-mutation context, blocked monophthongisation.

3.2 The phonological dispositions towards monophthongisation

Monophthongisation of *ai* can be accomplished in two ways: mutual assimilation of the two elements [a] and [i], where the outcome is a kind of phonetic compromise [e:] of [ɛ:], or either of the two elements disappears or is absorbed while the other element shows compensatory lengthening. Regarding the second scenario, only the loss of the second element of PGmc. *ai* is at stake, hence *ai* > $\bar{a}$.⁴ Monophthongisation is a widespread phenomenon in many languages. French, for instance, shows monophthongisation through the assimilation of Old French *ai* > *ei* (12th century) > *ɛ* (13th century) (Allières 1988: 38,39), and English witnesses a near-monophthongisation of Middle English *ai* to [ei], as in *day*, *eight*, through an intermediate stage of assimilation, [ɛi] (Ekwall 1975: 18).

⁴ Slavic exhibits a series of monophthongisations of Proto-Indo European diphthongs where the first element was lost, such as PIE *ei* and *oi* > Old Church Slavonic *i*, PIE *au* > Old Church Slavonic *u* (Fortson 2010: 423).

A realisation [ai] of the diphthong in PGmc. is widely supported by runic evidence (cf. Section 4) and the comparative method. The attested Old Germanic languages that retain a diphthong, at least in some contexts (West Nordic, Old Low Franconian, Old High German), have *ei*, probably representing [ɛi].⁵ This suggests a gradual development [ai] > [æi] > [ɛi], where a monophthongisation at the stage of [ai] leads to [a:] = $\bar{a}$, but [æi] and [ɛi] will lead to [ɛ:] > $\bar{e}$. A direct transition directly from *ai* > $\bar{a}$, as in Old Norse and Old English, suggests the absorption scenario. However, an assimilation scenario is possible as well for the [ai] > [a:] transition. The ‘velar’ context may have triggered a transition of [ai] > [ar] > [æ] > [aɛ] > [aæ] > [a:]. One step in a similar shift is visible in Scots [a'e] in e.g. *tied* (Wells 1982: 405; in the morpheme or syllable *auslaut*). Such a scenario still presumes the transition of [ai] > [ɛi] for those varieties that show monophthongisation to $\bar{e}$.

A point that is frequently raised, is the relation between the fronting of *a* in the diphthong *ai* and the so-called Anglo-Frisian fronting of short *a*. Various authors want to connect these two and consider the difference between OE *stān* ‘stone’ < **ai* and *read* ‘red’ < **æu* against OF *stēn* < **æi* and *rād* < **au* a reason to assume different chronologies for fronting and monophthongisation in the two North Sea Germanic languages (see for discussions and further references e.g. Stiles (1995: 197–200), Kortlandt (2008)). I want to mention two examples, which show that this link is not a necessity. Unstressed PGmc. word final *-ai* was monophthongised to $\bar{e}$ in Early Runic (between ca. 200 and 500 AD), without any general fronting of short *a* (Boutkan 1995: 42,361). The other example can be observed synchronically in my personal Dutch: I tend to pronounce the short /a/ in the diphthong /au/ as [a]: [au], while a single short /a/ sounds rather [a] or [ɔ]. Stroop (1998: 33) describes the raising of short /e/ [ɛ] in Modern Dutch towards [e] in isolation but its lowering to [æ] or even [a] in the diphthong /ei/. Altogether, I see ample reasons to free the discussion about the chronology of sound changes in Old English and Old Frisian from this link between vowels in isolation and diphthongs.

The shift in the phonetic realisation of the diphthong is the most problematic and speculative part of this theory. That basically ‘everything goes’ is illustrated by the development of Middle Dutch /ei/ in 20th century North Hollandish dialects (Figure 1). The map shows monophthongisation of Middle

⁵ This diphthong is often rendered as [ɛi], rather than [ɛi]. One often finds [i] as the second element of the diphthong in descriptions of English pronunciation (e.g. Wells 1982: 308). According to my own perception of Dutch <ei>, which I find confirmed in Cohen et al. (1971: Fig. 11; cf. p.72), the second element is indeed not the extremely closed [i]. This may of course vary across speakers and language varieties.

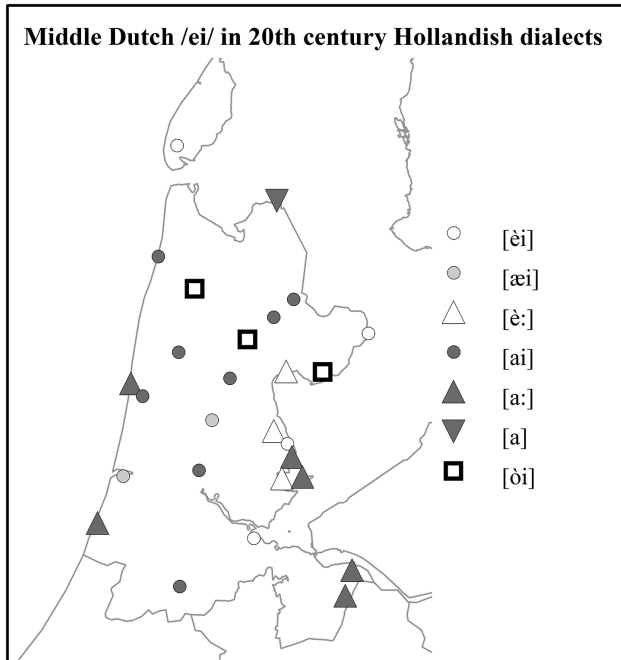


Figure 1: The development of Middle Dutch /ei/ in 20th century Hollandish dialects in North Holland.

Data taken from (Goeman et al. 1980), item ‘meisje’ (girl)

[è] = [ɛ], [ò] = [ɔ]

Dutch /ei/ to [a:] and [ɛ:] on the one hand and dissimilation to [ɔi] on the other in close geographical vicinity. The geographical adjacency of forms suggests both [a:] < [ai] as well as [a:] < [ɛ:] < [ɛi]. There are obvious theoretical advantages in reconstructing a gradual development [ai] > [æi] > [ɛi] in early Germanic, but the underpinning of this development with the attested runic data is problematic. Some, although ambiguous, evidence comes from the Continental Runic inscriptions and will be discussed in Subsection 4.4. The topic will be taken up again in Subsection 6.1.

3.3 The two waves of monophthongisation

The observation that *ai* is older than *ei* and that monophthongisation in ‘velar’ contexts is older than in the other ones implies that the monophthongisation started in ‘velar’ contexts and in the north, where the outcome was *ā*. As Old Saxon shows only scarce reflexes of *ā* and Old High German not at all, this ‘velar’

monophthongisation cannot have reached the south before the transition *ai* > *æi* had taken place there. A second wave of monophthongisation in ‘non-velar’ contexts produced *ē* everywhere, also in the north, such as in Old Frisian and Old East Nordic. From these facts, the following relative chronologies can be established:

‘North’: 1) *ai* > *ā* in velar contexts; 2) *ai* > *æi*; 3) *æi* > *ē* in other contexts (Old Frisian Old East Nordic).

‘South’: 1) *ai* > *æi*; 2) *æi* > *ē* in velar contexts (Old High German); 3) *æi* > *ē* in other contexts (Old Saxon, Old Low Franconian).

These chronologies can be the result of the following scenario of two waves of monophthongisation, crossing the spread of assimilation in the diphthong:

- 1) a first wave of monophthongisation in ‘velar’ contexts, spreading from north to south;
- 2) a second wave of monophthongisation, only affecting some languages in the ‘centre’;
- 3) the simultaneous spread of *ai* > *æi* from south to north.

The two waves of monophthongisation cross chronologically with the assimilation of the diphthong *ai* > *æi* which moves from south to north. The reconstructed developments and geographical configurations can be captured in the following schematic chart.

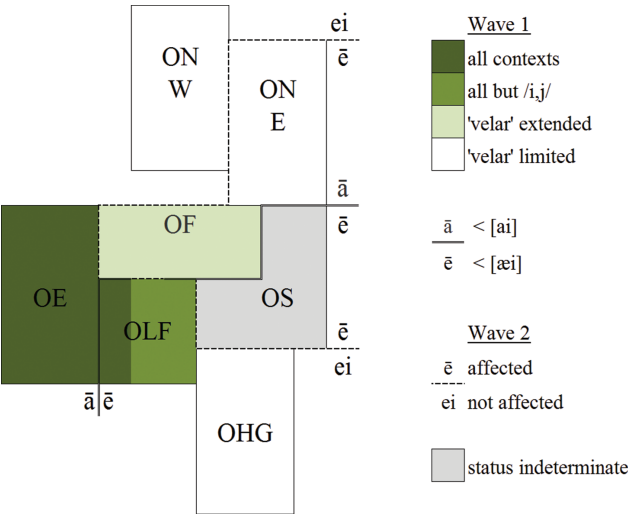


Figure 2: The monophthongisation of PGmc. *ai* in two waves, under a south-north trend of *ai* > *æi*. Old Saxon is a ‘black box’ here, cf. discussion Subsection 5.2.

This first monophthongisation was limited to the ‘velar’ context and resulted in $\bar{a}$ in the north (Nordic, Frisian, Anglo-Saxon) and $\bar{e}$ in the south (Franconian, Saxon, High German). This contrast reflects the northern advance of the $ai > \bar{a}$ transition: the realisation [ai] developed into $\bar{a}$ in Nordic and the North Sea Germanic languages, while the south already shows the more closed realisation [æi], producing [æ:] or [ɛ:] > $\bar{e}$. Subsequently, the transition [ai] > [æi] > [ɛi] proceeded towards the north. The monophthongisation trend spread to more contexts, but this second wave did not affect all languages: Old Low Franconian, Old High German and West Nordic were not subject to this stage of the process, while Old Frisian, Old Saxon and Old East Nordic were affected. PGmc. *ai* had in the meanwhile turned into $\bar{a}$ everywhere and the result of monophthongisation was now [ɛ:] > $\bar{e}$. In Old English and Old Saxon, the two waves of monophthongisation cannot be separated properly. In Old English, the second wave came so quickly after the first one that the south-north movement of $ai > \bar{a}$ did not reach England before that time. Old Saxon witnesses to exactly the reverse situation of Old English. The transition $ai > \bar{a}$ was basically already completed before the first wave of monophthongisation entered the region and monophthongisation almost always led to $\bar{e}$ (at least in the dialects that underlie the major Old Saxon texts). Old Frisian, which is situated between those two languages, shows both $\bar{a}$ and $\bar{e}$, providing evidence for the theory that there were indeed two subsequent waves of monophthongisation. There is some marginal variation in Old Saxon that can be interpreted in the same way, as will be discussed in Subsection 5.2. The configuration in the North-Sea Germanic languages – Old English, Old Frisian and Old Saxon – indicates that the two waves were almost simultaneous in this central region. In the north, the time gap between them was larger and hence the resulting patterns were more clear-cut.

4 Runic evidence and dating

The aim of this section is to investigate evidence from runic attestations, mostly before the year 800 and from place names from the Low Countries and the western Saxon regions, where runic evidence is absent. The runic attestations allow a dating of the monophthongisation of PGmc. *ai* in some cases. Otherwise, the attested linguistic facts should at least be reconcilable with the proposed scenario.

4.1 Nordic runes

The notion of two waves of monophthongisation is well established in Nordic philology. Haugen (1982: 200) dates the first wave ($ai > \bar{a}$) to the 6th or 7th

century and the second wave (OEN *ei* > *ē*) to the 10th century. The 10th century applies to Denmark, while the process spread only gradually northwards into Sweden and parts of Norway even until the 16th century (Bandle 2012: 65, 66, Sandøy 1993: 114). The Early Runic inscriptions from Scandinavia offer a somewhat earlier dating for the first wave than the one mentioned by Haugen, as can be seen in Table 1. The table presents the attestations of the verb *faihan* ‘to do’ with PGmc. *ai* before /h/, which is relatively well attested in Early Runic from Scandinavia:

Table 1: The development of PGmc. *ai* before *h* in Early Runic.

Inscription	<i>faih-/fāh</i>	Date
60. Vetteland	faihido	Stone, no archaeological date / c. 160-470 AD
63. Einang	faihido	Stone, between ca. 160-440 / c. 160-400 AD
73. Rö	fahido	Stone, no archaeological date / c. 160-400 AD
131. Åsum	fahi	Bracteate-type C (IK 11), between ca. 440-560 / Phase 1, c. 375-475 AD
128. Väsby	f[a]hidu	Bracteate-type F (IK 241,2), between ca. 440-560 / Phase III, c. 520-570 AD
67. Noleby	fahi	Stone, no archaeological date; linguistic date 400-600 / c. 375-570 AD

Legend: the numbering is taken from Krause (1966), the first dates are from the Kiel Rune Project (Marold and Zimmermann), behind ‘/’ from Imer (2011: 175). The *Noleby* stone can be dated to the period between ca. 400 and 600 based on linguistic features: it has the word **toje** [k]a = ‘give I’, with a monophthong from earlier /au/, which is an innovation from the transitional period towards Old Norse (Ralph 2002: 710); the use of the *jar*-rune for /j/ instead of /a/, which is still rendered by the *ans*-rune, is an archaic feature (Haugen 2004: 65).

This word is relatively frequent (6 attestations), unambiguous in its interpretation, and the archaeological dating provides a consistent picture: one instance with <ai> is dated before 440 AD, two instances with <a> to ca. 400 AD or later. Table 1 indicates that in the position before *h*, PGmc. *ai* had been monophthongised in Early Runic by ca. 440 AD. There is even evidence pointing to an earlier dating of the process, namely, the *Nydam II*-inscription. It reads **ah̄ti**, which is interpreted as being derived from PGmc. **aih-ti-z* f. ‘possession’ and is dated ca. 250–320 AD (Looijenga 2003: 157).⁶ In both circumstances, the monophthongisation is earlier

⁶ Boutkan (1995: 361) signals the possibility of dialectal differences in the timing of the monophthongisation in unstressed word-final syllables. Such differences are of course also possible in this case, where the forms with **ai** in Table 1 originate in south-west Norway and the

than the date given by Haugen. I will henceforth operate with the year 400 AD (see Nielsen 2000: 165 for a similar conclusion). It is noteworthy that the Rø inscription contains **s[a]ir-** ‘wound’ next to **fahido**, potentially indicating a gradual spread of the monophthongisation to the various phonological contexts: first before /h/, later before /r/.

4.2 Anglo-Saxon runes

Anglo-Frisian runes exhibit a set of three additional runes which reflect changes in the phonology (Parsons 1996; Looijenga 2003: 121, Waxenberger 2013). One of these runes is the so-called *āc*-rune, meaning ‘oak’. The name of the rune comes from PGmc. **aik-* (cf. footnote 3) and it testifies to the monophthongisation of PGmc. *ai* > OE *ā*. The oldest attestation of the *āc*-rune in Anglo-Saxon runes is from the first half of the 7th century (Waxenberger 2013: 36–39). This provides a *datum-ante-quem* of ca. 600 for the monophthongisation. The *Skanomodu*-inscription, which is generally considered to be of Frisian origin, contains the *āc*-rune and is dated as early as the late-6th century (Looijenga 2003: 308).⁷

A very interesting inscription is the one from *Caistor-by-Norwich* found on a bone (astragalus) from a roe-deer, leaving little doubt about its interpretation. It reads **raīhan** ‘roe’, OE *rāha* < PGmc. **raiha-*. The word is especially interesting for two reasons:

- 1) the word contains the ultimate monophthongisation context, i.e. before /h/;
- 2) the word is written with a digraph.

This very archaic word form is dated to ca. 425–475 (Waxenberger 2013: 45, also; Page 2006: 179–180, 229). Both Looijenga (2003: 67, 139) and Page (2006: 18, 229) consider a Scandinavian origin for the inscription, because of the single-barred **h**. However, Page makes it clear that the single-barred **h** is also found in other inscriptions from England, such as *Watchfield* (see also Looijenga 2003: 137). On account of the original location, the inscription

others in Sweden. The form **ah̄ti** is from Jutland (DK). Grünzweig (2004, in: Marold & Zimmermann) considers an entirely different interpretation of the word, which would eliminate this specific problem in the argumentation.

⁷ An interpretation of the *Loveden Hill* inscription, where a monophthongised PGmc. *ai* would be rendered by the *ans*-rune goes against the whole interdependency between the monophthongisation of *ai* and the introduction of the *āc*-rune. See Waxenberger (2013: 43, 44) for a further discussion of the *Loveden Hill* inscription

from Caistor-by-Norwich is by default affiliated with the Anglo-Saxon language. Moreover, a Scandinavian origin is explicitly unlikely because of the conclusion reached in the previous section that Early Runic already had monophthongs before /h/ by the year 400.

Therefore, I conclude that the language of the Anglo-Saxons still had a diphthong in all contexts in the middle of the 5th century. With 600 as a datum-ante-quem, the monophthongisation of *ai* > *ā* in Proto-Old English must have taken place in the late 5th or the 6th century, before the *i*-mutation, which affected *ā* < PGmc. *ai*.

4.3 Frisian runes

Most of the Frisian runic inscriptions are from the 8th century, and so they are essentially contemporaneous with the earliest attestations of Old English and Old High German.⁸ Old Frisian is in the heart of the crossing ‘waves’ of the hypothesis and shows, contrary to Old English and Old Saxon, contrasting outcomes of the monophthongisation process of PGmc. *ai*: *ē* and *ā*. The Frisian runes are not always easy to interpret. They contain 5 to 7 instances of words with PGmc. *ai*, depending on the interpretation. An exhaustive analysis of the Runic Frisian vowel system, including the developments of PGmc. *ai*, leads to the following interpretation (see Versloot 2014a for a detailed discussion of the interpretation of all instances). Runic Frisian had a long /a:/ < PGmc. *au*, which was phonetically probably somewhat retracted, [ɑ:], as in **adujislu** ‘Audgisl (PN)’ (*Westeremden A*). In ‘velar’ contexts, Runic Frisian testifies to a long vowel /æ:/, probably phonetic [a:] or [æ:] (henceforth [a:]). This /æ:/ is attested e.g. in **āh** (*Westeremden B*) ‘has’ < PGmc. **aih*- (Versloot 2014a: 43–45, see also; Looijenga 2003: 312–314 for a discussion of the entire inscription). These two vowels merged into /a:/ in all later varieties of Frisian, including the attested Old Frisian. There are possibly two representations of PGmc. *ai* in ‘non-velar’ contexts. One is a monophthong /ɛ:/, e.g. **u[n]mædit** (*Rasquert*) ‘not-mad’(?) < PGmc. **maidid-*, the other is a diphthong /ai/: **aib** (*Oostum*) ‘Eeb’, interpreted as a personal name, equivalent to late-Old Frisian <eeb> (*Oosterhout* 1964: 50) and a runic inscription from southern Germany (**aebi**, *Schwangau*).⁹

⁸ Many of the Frisian inscriptions are so-called *terp*-findings, discovered during the commercial excavation of mediaeval dwelling mounds. The archaeological context is lost, which makes them difficult to date accurately. Several objects dated to the 8th century may just as well come from the 7th century. (p.c. Egge Knol, Groninger Museum).

⁹ Even if one leaves the interpretation of **aib** and **aebi** as a name open, but considers them as the same etymon, an etymology with PGmc *ai* is the most likely interpretation.

Taking all this evidence into account, I conclude that Runic Frisian had completed the first wave of the monophthongisation, resulting in /æ:/, which remained for the time being a distinct sound, merging with /a:/ < PGmc. *au* only at a later stage, while the second wave of the monophthongisation, resulting in /ɛ:/, was still on its way in the 8th century, testified by the double attestation of **u[n]mædit** and **aib**. The hypothesis about the transition of *ai* > *æi* as a pre-stage to the monophthongisation to *ē* is not confirmed by the Frisian runes; one would expect to see a spelling ***æib** or ***aeb**. All key-attestations are from the 8th century, which means that they do not provide information about the dating of the first wave. The emigration of Frisians to the North Frisian Islands in the 7th and 8th century forms a *datum-ante-quem* for the monophthongisation of the first wave (see Subsection 5.1).

4.4 Continental Runic inscriptions and Old High German

Aside from the Frisian sources, there exist ten more southerly Continental Germanic inscriptions with potential reflexes of PGmc. *ai* (Findell 2012b; Looijenga 2003). One of them seems to be of Langobardic origin (*Aquincum*, Findell 2012a: 366, where also other origins are considered) and there are various interpretations of the text (Findell 2012a: 74,75). Two words contain- <e> (**feha** ‘coulourful (?)’, *Weingarten I*; **klef** ‘sticked to (?)’, *Neudingen-Baar*), three spell <ai>, three <ae> and one <äi> (**ailrun** ‘Ailrūn’ (PN), *Pforzen I*, which is not certain: (Findell 2012a: 447). The most secure case is the word ***wrait**, the past tense of ***writan**, ‘to write’. It appears twice with <ai>, **urait**, once as **wraet**. Note that all instances do not yet show the High German Consonant Shift.

Looijenga (2003: 262,268) discusses the interpretation of <ae> in terms of the monophthongisation of PGmc. *ai*, interpreting the <ae> as the beginning of this process, as in **aergu[n]p** *Aergu(n)p* (PN), a nom.sg. fem. *jō*-stem with *ai* before *r*. This does not explain the appearance of <ae> in non-monophthongisation contexts, such as in **wraet** ‘wrote’ and **aebi** ‘Aebi’ (PN), (cf. the Frisian Oostum inscription: **aib**). Findell (2012a: 94, 2012b: 50) concludes that the spelling **ae** “cannot be united or fitted into any model of the monophthongisation”. It does not fit the evidence from early Old High German glosses and names in Latin charters with a correlation between the spelling <ae> and monophthongisation contexts in Old High German (Braune and Reiffenstein 2004: §§ 43–44). The spelling <ae> represents [ɛ:] < PGmc. *ai* in the 8th century. The spelling <e> becomes dominant in these contexts from the late 8th century

onwards.¹⁰ The monophthongisation itself is supposed to have taken place before 700. In § 44. *Anm.*4 of the Old High German Grammar (Braune and Reiffenstein 2004) it is mentioned that spellings with <e> appear also beyond the well-known monophthongisation contexts, such as in <sten> ‘stone’, <flesc> ‘meat’. The phenomenon, which is not rare (“nicht selten”), could be interpreted in a way that the inclination towards monophthongisation had a broader scope and that the modern distribution in High German emerged only gradually from the original situation with some form of allophonic variation with a geographical component. A few words ‘survived’ from this broader scope of monophthongisation in Old High German: *wēnag* ‘few’, Modern *wenig*, *bēde* ~ *beide* ‘both’, *zwēne* ‘two’. If this is the case, the runic instances with <ae> could indeed represent the beginning of monophthongisation, also in words such as **wraet**, which did not survive in later stages of the language. See also Findell (2012a: 21,22,80,81) for extensive considerations on the Continental Germanic material with further references.

However, my competing hypothesis is that **ae** marks the beginning of the assimilation between /a/ and /i/: *ai* = [ai] > *æi* [æi], a development leading to Old High German, MDu (= Middle Dutch) and ON <ei>. My reconstruction of events uses a general transition from *ai* > *æi* before the monophthongisation in Old High German (and Old Saxon and Old Low Franconian), because the reflex of monophthongisation is *ē* < *æi* and not *ā* < *ai*. This interpretation implies that we can expect <ae> in every context, which is confirmed by the attested forms, such as in the mentioned instance of **wraet** and **aebi** (Findell 2012b: 49). All relevant inscriptions are dated between the early 6th century and the beginning of the 7th century. There may be a contrast between the first and the second half of the 6th century according to some datings, with **ai/aī** being the oldest stage and **ae** the younger (Looijenga 2003: 268). However, this interpretation is very fragile. Other datings leave a chronological contrast undecided, but that does not falsify the hypothesis that the 6th century witnessed the transition from *ai* > *æi*. In my interpretation, the development to *æi* = **ae** should be dated to the 6th century and forms a prerequisite for the later transition from *æi* > *æ* > *ē*. The spelling **ae** does not mark a monophthong as such.

¹⁰ I checked some fragments from Abrogans and Vocabularius Sancti Galli, two 8th century southern texts, and further Isidor, Reichenau Glossary, Mon(d)see Fragments from the early 9th century (Sonderegger 1974: 69), as edited in Braune et al. (1979). The former group, from the 8th century, shows indeed a correlation between <ae> in monophthongisation contexts and <ai> in non-monophthongisation contexts, while the latter group shows <e> and <ei> respectively.

The discontinuity between the runic spelling <ae> and the same spelling in Old High German, where it positively marks æ , can be explained by the influence from Latin. In mediaeval Latin, the spelling <ae> was an established digraph with a fixed sound value, which could not be used for anything like [æi]. Then the digraph <ai> was still the best approximation. This may explain why the 8th century Old High German sources from monasteries show the spelling <ai>, even when it possibly sounded [æi]. Only later, when the first element was further raised, did the spelling <ei> become a useful alternative. Braune and Reiffenstein (2004: § 44) sketch the spread of the transition from <ai> to <ei>, starting off in Franconian and completed there at least before ca. 750, subsequently spreading towards the south to be completed there by ca. 800.

This assimilation of the diphthong has to be separated from the actual monophthongisation in only a few contexts in Old High German. The alleged form **klef** ‘sticked to (?)’ (*Neudingen-Baar I*; Findell 2012b: 48,49) is unclear in reading and interpretation. To assume that the form derives from PGmc. **klaib-* (3rd sg.pret.) is problematic not only because of the vowel but also because of the consonant: Old High German does not have monophthongs before /b/ or /f/, and neither Old High German nor Continental Runic have <f> for PGmc. **b* (Findell 2012a: 249,256,257), so there are reasons independent of my two-wave model to consider it as an inconclusive item here.¹¹ Findell (2012b: 49) gives another instance of monophthongisation in the context before *h* (= wave 1 in my theory) from the same 6th century for the Continental Runic: **feha** ‘colourful (?)’ in *Weingarten I* from the very south of Baden-Württemberg.¹² This monophthong contrasts with the spelling <ae> in **aergu[n]p** in the same inscription, which testifies to another monophthongisation context, i.e. before *r*. Findell (2012a: 93) mentions the possibility that the monophthongisation proceeded gradually, which complies with the model proposed here, and first covered the context before *h* and only later the context before *r*. This matches the developments observed in Old Nordic and Old Frisian, where the monophthongisation is regular before *h* but variable before *r*, e.g. ON *meira*, *sár*, OF *lêre* ~ *lāre*, and the observation that the oldest attestations of Old High German from ca. 700 show some instances of <ai> before *r* (Braune and Reiffenstein 2004: 44). An instance of monophthongisation before *r* from a 7th century Merovingian coin

¹¹ The options are: 1) it should be read entirely differently, 2) its provenance lies more to the north, in the Old Saxon area, where both the vowel and the consonant would fit.

¹² Findell (2012b: 49) gives various interpretations, most of them with PGmc. *ai*. He ranks it under the “possible, though less certain, witnesses”.

showing the name *Geroaldo* < **Gaira*- can be added. This attestation comes from Gondorf near Trier, located in the middle of Germany (Findell 2012a: 20) where the monophthongisation probably came from.

Altogether, there is some evidence that the monophthongisation of what is called here wave 1 is on its way in Continental Runic around 600, first before *h* and later before *r*, matching the observation that in the context before *r* diphthongs are still sometimes found around 700. The transition *ai* > [æi] that is used here to account for the outcome $\bar{e}$ < $\bar{æ}$, instead of $\bar{a}$ which is found in the north, could be dated to (the middle of) the 6th century. Important in this dating scheme is that the monophthongisation before *h* took place prior to the consonant shift of PGmc. *k* > *h* in word internal positions, which is dated to the 7th/8th century (Sonderegger 1974: 157), cf. HG *Zehe* ‘toe’ < PGmc. **taihwō*- vs. *Zeichen* < PGmc. **taikn*- ‘token’.

To sum up: The Continental Runic and the early Old High German attestations cannot be easily reconciled in one smooth reconstruction. However, if one is willing to accept a contrast between runic <ae> = [æi] against early Old High German/Latin <ae> = [ɛ:], based on Latin spelling conventions, Continental Runic provides support for – or is at least not contradictory to – the two-wave model:

- the transition *ai* > $\bar{æ}$ i takes place in the 6th century and facilitates $\bar{æ}$ [ɛ:] as the outcome of the monophthongisation process instead of $\bar{a}$;
- monophthongisation in the context before *h* takes place before the Consonant Shift; the runic evidence suggests the late 6th century;
- monophthongisation in the context before *r* seems to go back to the 7th century and to have proceeded from north to south;
- in Old High German, this $\bar{æ}$ changes into $\bar{e}$ not later than the beginning of the 8th century;
- the transition from early Old High German <ai> (= $\bar{æ}$ i) > *ei* comes from the north in the 8th century (Franconian).

4.5 Onomastic evidence from the Low Countries

Due to the absence of runic evidence for PGmc. *ai* from the Low Countries, a closer look at the attested place-names may shed some light on the dating of the monophthongisation process. Gysseling (1960a: 79) dates the entire transition of “*ai* > *ei* > $\bar{e}$ ” to the 8th century, based on evidence from that century with the spellings <ai> (726), <ei> (776) and <e> (745). The process is supposed to have been completed before the year 800.

A careful examination of the data (Gysseling 1960b) concerning the suffix *-*haim*, however, reveals a somewhat different picture. The <ai> spelling

appears in the name *Marithhaim*, a place in Guelders, which is not the core Low Franconian territory. It is also the only attested instance of <ai> in the Low Countries. The oldest attestation of a place name in **-haim* is *Machingahem* (Modern: *Makegem*) from 690, although it should be kept in mind that it is attested in a 10th century copy (*Diplomatica Belgica*). Limiting the search in Gysseling's data to the actual core of the Low Franconian language region (Holland: 2 present-day provinces; Zeeland; Utrecht; Flanders: 2 present-day provinces in Belgium and parts of Nord and Pas de Calais in France; Brabant: 5 present-day administrative units without any attestations) in the timeframe 690–800, results in identifying 5 places in *-heim* and 4 in *-hem*, while none in *-haim* or *-ha(a)m*. The place names in *-heim* are all from sources in Germany (Echternach, Fulda), while the ones in *-hem* are from 'local' sources. My conclusion, different from that of Gysseling, is that only the monophthongised form is local and is found in the earliest onomastic material, i.e. from 690 onwards.

The suffix *-ha(a)m* appears in historical Flanders in the 9th century in 13% of the cases (only compared with *-hēm*; in total n=90), without any statistically significant regional sub-division. The absence of this suffix in the 8th century is not statistically significant either, given the low frequencies. Gysseling (1962: 12) considers these spellings to be a reflex of Romance influence, but it is not confined to the regions that were later to be Romanised (the current French departments Nord and Pas de Calais).¹³ A form with *ā* is corroborated by the place name *Haamstede* in Zeeland.¹⁴ I assume that these spellings reflect a form *-hām* in the south-west of the Dutch language area.

This evaluation procedure was also applied to the Low German regions: Gelderland, Overijssel, Drenthe, Lower Saxony and Westphalia (Gysseling 1960b).¹⁵ From the period up to 900, nine places in the corpus show *-heim* and 8 have *-hem*. However, 6 instances with *-heim* are from an archive in Lorsch, in the middle Rhine region, and may reflect High German influence. Two of the remaining three are from Werden. The only instance with <ai> in the corpus that is Low Franconian or Low German in origin is the earlier-mentioned *Marithhaim* (Modern *Merm*) from the year 726 (but in a 10th century copy). All the other mentioned Low German instances are from around AD 800.

¹³ The assumption of French influence on names in the 9th century seems to be an anachronism, given the fact that romanisation in the region had started by then only in the very south of the region (Ryckeboer 1997: 183ff.).

¹⁴ De Vaan (2017) proposes a different etymology of the *haam-* element, with a PGmc. short *a*.

¹⁵ Tiefenbach (2010: 490–497) does not contain any relevant old example with *-hēm*.

It can be concluded that the toponyms from the Low German regions point to the year 800 as a *datum ante quem* for the monophthongisation of PGmc. *ai*.

5 The ‘mixed’ developments in Frisian and Low German

5.1 The position of Old Frisian

In order to verify and enhance the understanding of the distribution of $\bar{e}$ and $\bar{a}$ in Old Frisian, a set of 105 lemmas with a fairly certain etymology with PGmc.¹⁶ *ai* was analysed.¹⁷ The vowel was most likely shortened before a consonant cluster in thirteen of them, such as in OF *flæsk* ‘flesh’ (Mod. West Frisian *flêsk* < Early Mod. WF *flesk*, Wangerooge East Frisian *flask*) and *fætt* ‘fat’ < PGmc. **faitida-* (Mod. West Frisian *fet*, Wangerooge Frisian *fat*) (De Vaan 2011: 309–312; Hoekstra and Tigchelaar 2014: 188; Kümmel 2014a: 38,39). In some of these forms, such as *fætt* or OF *aththa* ‘civil servant’ < PGmc. **aiþiban*, a consonant cluster only arose after syncope of the middle vowel, indicating that syncope antedated monophthongisation in Proto-Frisian and certainly *i*-mutation. There is most likely an *i*-mutation factor in the next syllable in 29 forms, which always led to $\bar{e}$ in Old Frisian. Just as in Old English, the *i*-mutation is most likely younger than the $\bar{a}$ < PGmc. *ai* (see discussions about dating in Section 4). 31 of the remaining 62 lemmas are only attested with $\bar{e}$ in Old Frisian, 20 only with $\bar{a}$ and 11 appear both with $\bar{a}$ and $\bar{e}$. De Vaan mentions the following contexts for Old Frisian $\bar{a}$ ¹⁸:

1. before Proto-Frisian *-Cu-*, *-CwV-*, *-Cō-*;
2. before the velar fricatives *-g-* and *-h-*;

¹⁶ This section relies partly on a discussion in Versloot (2014a).

¹⁷ The dataset was compiled from: De Vaan (2011), Spenter (1968), Löfstedt (1928, 1931). Whether a word with *ai* followed by a consonant cluster had a long or a short vowel in Old Frisian, was decided using evidence from modern dialects, e.g.: OF *marra* ‘more, bigger’ is *mea*r in Mod. West Frisian and *moo* in Wangerooge Frisian (an extinct East Frisian dialect, attested in the 19th century: Ehrentraut (1849, 1854), Ehrentraut and Versloot (1996). Both modern varieties show the regular continuation of an Old Frisian long $\bar{a}$ and therefore the word was considered to have a long vowel, despite the double consonant.

¹⁸ It should be kept in mind that De Vaan (2011: 393) considers the split between $\bar{a}$ and $\bar{e}$ to be the result of a partial fronting of $\bar{a}$, which in his account was blocked in the two mentioned contexts.

Words complying with rule 1 show $\bar{a}$ in 68% of the cases in my dataset ($n=20$; words with both vowels are scored as half). Rule 2 is effective in 79% of the lemmas ($n=7$), but it should be kept in mind that in three lemmas the $\bar{a}$ can just as well be explained based on rule 1. The overall percentage $\bar{a}$ among the lemmas without *i*-mutation is 41, which is substantially lower than the percentages 68 and 79 for the two mentioned contexts for monophthongisation to $\bar{a}$. Despite the high predictive power of the rules, they together explain only 19 out of the 31 items (61%) with (also) $\bar{a}$ in my dataset. The other 12 items are found in other phonological contexts. In Old Norse and Old High German, also *r* and (directly following) *w* trigger monophthongisation. One finds $\bar{e}$ before a following *w* in Frisian, except in $\bar{a}$ -‘law’ (in *asega* ‘law speaker’) which appears next to $\bar{e}$ (*we*) ‘law’.¹⁹ Before $r < \text{PGmc. } r \text{ or } z$ there is (also) $\bar{a}$ in 7 out of 10 lemmas and, moreover, in 5 out of 9 lemmas with *k*. In all these instances, the impact of the following consonant and the vowel in the next syllable may interact. The result of this interaction is shown in Figure 3.

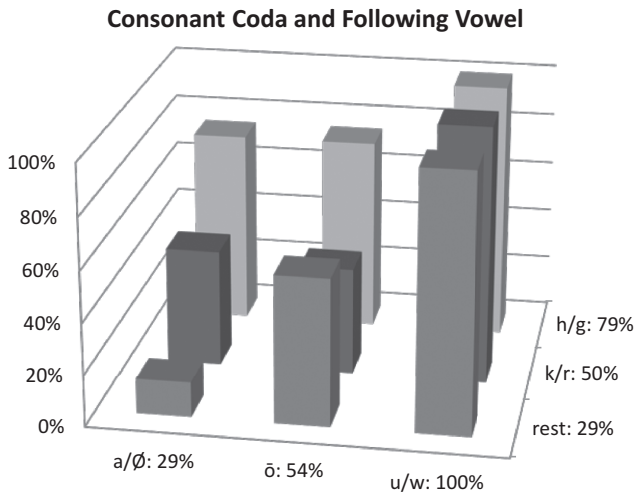


Figure 3: The trend towards monophthongisation to $\bar{a}$ in a corpus of 62 (Old) Frisian lemmas with PGmc. *ai* without *i*-mutation.

Legend: The graph shows the interaction of the quality of the following consonant with the quality of the (semi-)vowel in the following syllable. Lemmas with both $\bar{e}$ and $\bar{a}$ are counted as half. Compare e.g. Labov (1981: 280–284, 301) for theoretical considerations about such ‘gradual’ sound laws.

¹⁹ As the word was feminine in Old Frisian, it seems to go back to **aiwō-*, where the *-ō* could be held responsible for the development *ai* > $\bar{a}$ rather than the *-w-*. Old Frisian lost non-initial *w* in most instances: compare OE nom.sg. *cneo(w)* dat.sg. *cneowe* ‘knee’ to OF *knē* (both case forms).

Figure 3 demonstrates that both the consonantal impact of *h*, *g* and a following *u*, *w* in the next syllable are on their own (almost) sufficient triggers for the monophthongisation of PGmc. *ai* to *ā*. A following *k*, *r* (<PGmc. *r* or *z*) and *ō* have a moderate impact on the monophthongisation. Note that the combination of these two factors does not enforce each other. This additional analysis refines some of the conclusions by De Vaan, reformulating his rules:

1. Monophthongisation of PGmc. *ai* > *ā* is (nearly) categorical before Proto-Frisian *-g-*, *-h-* and *-Cu-*, *-CwV-*;
2. Monophthongisation of PGmc. *ai* > *ā* is common before *-k-*, *-r-* and *-Cō-*.

The characterisation of the phonological context that triggered Old Frisian *ā* as ‘velar’ is confirmed by this refinement.

An analysis of lemmas in the database with an alternation between long *ā* and *ē* reveals a geographical bias in the Old Frisian manuscripts, which is confirmed by the evidence from modern dialects: forms with *ā* are more common in the west, forms with *ē* in the east, including the Insular North Frisian dialects, e.g. Old West Frisian *bākne* (dat.sg.), *ārist* ‘beacon, first’, Old East Frisian *bēken*, *ērost*, Mod. West Frisian *beaken*, *earst*, *meast* ‘beacon, first, most’ (<OF *ā*) ~ Wangerooge Frisian *eerst*, *meist* (<OF *ē*), cf. Insular North Frisian (Föhr) *biike-*, *iart*, *miast*.²⁰ The word ‘rope’, West Frisian *reap*, Wangerooge Frisian *rooep* is attested in Old East Frisian as *rāp*, but appears in the Insular North Frisian dialect of Föhr as *riap* <OF **rēp*. The word does not contain any of the

An early loss of *w* could form an explanation for the lacking monophthongisation to *ā*. However, Runic Frisian still seems to show *w* in some instances; compare acc.sg. *i* ‘yew’ (*Britsum*) <PGmc. **iwarz*, loc.sg. *iwi* (*Westeremden B*) <**iwi*, which makes this explanation less likely, unless one evokes paradigmatic levelling from forms with early loss of *w*.

20 One of the words generally mentioned as an *ā-ē* pair is the nom.sg.masc. form of the numeral ‘one’: *ēn/ān*, e.g. Bremmer (2009: 67). This is independent from the acc.sg. of the same paradigm with a shortened vowel before a consonant cluster, *ān(n)e* <Proto-Frisian **ain-ne* <Proto-Germanic **ain-anōn*. The nom. sg. masc. form *ān*, however, seems to be a ghost form. The form <*an*> only appears once as a nom. sg. masc. form, in the Second Emsingo Manuscript from ca. 1450, Section 5.1: “[...] *hwersa hir an mon anna otheme mortheth* [...]” ‘whenever here a man kills another one’. The Third Emsingo Manuscript, also from ca. 1450, has *an* once as a dat.sg., while the form is found twice as an acc.sg. (instead of *an(n)e*) in the Fivelgo Manuscript (Sjölin 1970: 134) from the second quarter of the 15th century. These instances are all relatively late and from the Ems region. They rather represent a form with a short vowel that developed from the acc.sg. form through schwa-apocope. This form was generalised as the general masculine form after the loss of different case forms in the modern Ems Frisian dialect of Saterland: *aan*, just as in Mainland North Frisian *aan*, *āan* (etc.) that is supposed to be derived from Ems Old East Frisian through migration. The vowel qualities in the modern varieties reflect an OF /*a*/ that was later lengthened. Conclusively, one may say that an Old Frisian form nom. sg. masc. ***ān* is a ghost word. (Thanks to Rolf Bremmer and Anne Popkema for providing me with the Emsingo examples.)

aforementioned triggers for $\bar{a}$. It is attested as a Frisian relic word in Holland: *roop*, attesting also there to a former $*r\bar{a}p$.

To sum up: the lemmas with pan-Frisian OF $\bar{a}$ comply almost 100% with the rules as reformulated above from De Vaan. Instances with OF $\bar{a}$ beyond these contexts are more common in the west (= closer to Old English with $\bar{a}$). Even further to the (south) west, in Dutch coastal dialects, we find several instances with $\bar{a} < \text{PGmc. } ai$ in words that have only $\bar{e}$ in all attested varieties of Frisian, e.g.: *aak-* ‘oak’, OF $\bar{e}k-$; *Haam(stede)* (prov. Zeeland), Old Frisian *hēm* ‘home’; *haal* ‘afterbirth’, Insular North Frisian (Föhr) *hialing* < OF $*h\bar{e}l-$ (but cf. De Vaan 2017).

The two processes, the monophthongisation of PGmc. *ai* and the assimilation of the diphthong from $[ai] > [æ]$, may have spread through the language (phonological) context-by-context and even lemma-by-lemma, as is visualised in Figure 3, in line with what Kiparsky (2003: 314) describes as ‘lexical diffusion’.²¹ One can observe a similar diffusion in the context before *r* in Old Nordic, with *meira* ~ *sár*. Also in Old High German the monophthongisation seems earlier before *h* than before *r* (Findell 2012b: 93; cf. Subsection 4.4). Part of these doublets and exceptions to the rules may be the result of paradigmatic levelling. The earlier mentioned sound-‘laws’ for the monophthongisation certainly produced a lot of intra-paradigmatic variation with alternation of $[a:]$ and $[ε:]$. The pair *cleth* (nom.sg.) < PGmc. $*k lai\bar{p}az/-iz$ ~ *clathar* (nom.pl.) < PGmc. $*k lai\bar{p}(a)z\bar{o}$ ‘cloth(es)’ in the Old Frisian Codex Hunsingo (Hoekstra 1950: 195) may echo this earlier alternation. The word *hāmu* ‘home’ < PGmc. $*haim\bar{o}$ (loc.sg.) seems to be attested in the *Westeremden B* inscription, with the same vowel as *āh* ‘(he) owes’ < PGmc. $*aih-$, with $\bar{a}$ (= $[a:]$) before PGmc. $\bar{o}$ and *h*, while Old Frisian only shows the variant with $\bar{e}$: *hēm* < PGmc. $*haima-$ (nom.acc.sg.) (Versloot 2014a: 44). Also the pair of *ēth-/āth-* ‘oath’ can be explained from earlier paradigmatic alternation (Versloot, forthcoming).

Conclusions regarding relative chronology and geography:

1. The rules for monophthongisation to $\bar{a}$ work fairly well when considering the Proto-Germanic quality of the unstressed syllables, such as in *tāne* ‘toe’ < PGmc. $*taihw\bar{o}-$ or *frāse* ‘danger’ < Proto-Frisian $*frās\bar{æ}$ < PGmc. $*frais\bar{o}n$. This points to an early date of monophthongisation to $\bar{a}$.

²¹ The west-east cline in the stock of words with OF $\bar{a}$ can be interpreted in three ways: 1) a more narrow rule, more similar to the Nordic situation, was gradually extended while moving to the west, to become unconditioned when reaching Great Britain; 2) wave 1 came from the west and gradually faded away towards the east; 3) the development of $ai > \bar{a}$ was earlier in the east than the west. The limited data hamper a definite answer.

2. This early date is confirmed by the general application of *i*-mutation, also in a word such as OF *lēna* ‘to borrow, to lend’ <PGmc. **laih(w)njan*, with both *h* and *w* a strong candidate for *ā*.
3. The monophthongisation to *ā* was stronger in the west than in the east and seems to have been even stronger further south-west along the present-day Dutch coast, including some words with *ā* in other contexts than the ones reformulated from De Vaan. This suggests that there was a continuum from monophthongisation of *ai* > *ā* in wave 1 in the fairly strict ‘velar’ conditions in East Frisian, extending to more and more words and phonological contexts towards the west, through West Frisian and the North Sea Germanic idioms of Holland and Zeeland to the exceptionless monophthongisation in Old English.

To sum up, one can conclude that Old Frisian has predominantly *ā* triggered by ‘velar’ contexts which must be early and can be assigned to the first wave, while *ē* is the product of monophthongisation in the second wave. This suggests that between the two waves, the *ai*-*æi*-isogloss moved over Frisia. The analysis of Runic Frisian indicates that the values of the two sounds from these two waves, which later in Old Frisian appear as <a> and <e>, were initially [a:] and [ɛ:]. Runic Frisian *ā* [a:] <PGmc. *ai* probably merged with *ā* [a:] <PGmc. *au* before the beginning of the earliest Old Frisian attestations in the 12th century.²²

The two-wave model sheds more light on a long-standing problem in the history of Frisian, raised by Hofmann (1964). Frisian consists of 4 groups of dialects, which show contrasts in their phonological systems going back to the time at least before the year 1100: West Frisian, Ems East Frisian with Mainland North Frisian, Weser East Frisian and Insular North Frisian. The North Frisian dialects are the result of migration: the North Frisian Islands were settled by Frisians in the 7th and 8th century, and the North Frisian Mainland in the 10th and 11th century (Århammar 2001a). Hofmann noticed that, except for Insular North Frisian, the vowel systems of all Frisian dialects can be deduced from one reconstructed stage of Proto-Frisian, which entailed the operation of

²² It should be noticed that even when the Old Frisian manuscripts use the spelling <e>, the reconstruction of the 13th century Old Frisian vowel system suggests a sound value [ɛ:] rather than [e:] as the outcome of wave 2 (Hofmann 1964). The merger of Runic Frisian [a:] <PGmc. *ai* with [a:] <PGmc. *au* before 1200 is in fact an assumption. Secured is only that no modern Frisian dialect evinces different developments according to the origin of the /a:/.

monophthongisation and unrounding of *i*-mutated vowels. Insular North Frisian cannot be deduced from the same common stage.

The main contrast between the reconstructed long vowel system of Insular North Frisian on the one hand, and the other Frisian varieties on the other, comes from the developments of PGmc. *ai* (wave 2), $\bar{o}$ + *i*-mutation, and $\bar{e}^1$ and $\bar{e}^2$. In Insular North Frisian, $\bar{o}$ + *i*-mutation merges with $\bar{e}^2$ but $\bar{e}^1$ merges with *ai*. In the other Frisian dialects, $\bar{e}^1$ merges with $\bar{e}^2$ and $\bar{o}$ + *i*-mutation, while the product of PGmc. *ai* (and *au* + *i*-mutation) remains a separate phoneme.²³ Hofmann proposed the following relative order of developments, following a thorough structuralist analysis: 1) *i*-mutation, 2) delabialisation, 3) monophthongisation of PGmc. *ai* and *au* (Hofmann 1964: 182–185).²⁴ In his view, Proto-Insular North Frisian already had *i*-mutation, but did not yet have monophthongisation or delabialisation. This hypothesis has so far only been acknowledged by Århammar (1995: 75). Other scholars place the monophthongisation before *i*-mutation and delabialisation (e.g. Versloot 2001: 767–768; Nielsen, 2001: 515,516; Kortlandt, 2008: 270,271). Nielsen's main counter-arguments to Hofmann's hypothesis are: "(1) the early runic Fr. attestation of $\bar{a}$ < Gmc. *au*. [...] and (2) the fact that Gmc. *ai* has two reflexes distributed on virtually the same words in all Fr. dialects, which suggests that the phonemic split must be Common Fr. [...]".

Both Hofmann and his opponents operate with the monophthongisation of PGmc. *au* and *ai* as one process, under the assumption that developments in vowel systems are symmetrical. The *Skanomodu* runic text from the late 6th century with $\bar{a}$ < PGmc. *au* and the largely common lexical distribution of $\bar{a}$ < PGmc. *ai* in all Frisian dialects, are strong evidence for early completion of the monophthongisation process before the departure of Frisians from the southern North Sea littoral, i.e. in the 7th/8th century.

However, if we desert the assumption that the monophthongisation of PGmc. *ai* and *au* was a monolithic process, the positions of Hofmann and his opponents can be reconciled. Consider the following reconstructed order of events:

1. PGmc. *au* > Runic Frisian [ɑ:], OF $\bar{a}$,
2. PGmc. *ai* in 'velar' contexts > Runic Frisian [a:], OF $\bar{a}$,

²³ See for a transparent overview and comparison of all Frisian and Old English varieties Kümmel (2014b: 246).

²⁴ His reconstruction holds on the premises that a vowel system may not be too crowded because it otherwise will lead to mergers in the system (Hofmann 1964: 180).

3. PGmc. *ai* in other contexts > late-Runic Frisian [ɛ:], OF *ē*, next to attested *ai* (**aib**).

Stage 1 and 2 have to be common-Frisian, the first because of the runic evidence, the second and the first because of the shared lexical distribution. Stage 3 is dialect-specific and marks the contrast between Proto-Insular North Frisian on the one hand, and the other dialects on the other. In Hofmann's reconstruction, the divergent developments of PGmc. *ē*¹, *ē*² and the delabialisation (Insular North Frisian *ȳ*, *y* > *i*, *i*, other dialects *ȳ*, *y* > *ē*, *e*) took place after the migration of the Island North Frisians and before stage 3.

In this way, both Hofmann's crucial point (PGmc. *ai* > Proto-Frisian [ɛ:] post-dates delabialisation) and the objections against Hofmann's reconstruction are acknowledged. This reconstructed order of events fits well into the two-wave model. The timing is supported by the external evidence:

- Stage 1, PGmc. *au* > Runic Frisian *ā*, is attested by the late 6th century *Skanomodu*-inscription;
- Stage 2, PGmc. *ai* > Runic Frisian [a:], corresponds to wave 1 in the two-wave model and was dated to the 6th century in Old English, to the 6th/7th century in Old High German;
- The emigration of the Island North Frisians has an archaeological dating to the 7th/8th century;
- The delabialisation of mutated (long) vowels can be dated to the 8th century (Gysseling, 1962: 17);
- Stage 3, PGmc. *ai* > Runic Frisian [ɛ:], corresponds to wave 2 in the two-wave model and is possibly only partly attested in the Runic Frisian material of the 8th century.

Wave 2 is shared by Old Frisian, Old Saxon and Old East Nordic, and this wave of monophthongisation may just as well have taken place in the new homeland of the Island North Frisians in the 8th century.²⁵ It is only wave 1 (*ai* > *ā*) that has a specific conditioning for all Frisian varieties and should therefore be dated before the emigration of the Insular North Frisians in the 7th/8th century. This

²⁵ It is attractive to assume a synchronic dating for the monophthongisation of PGmc. *ai* in a non-'velar' context in Insular North Frisian and Danish as Hofmann (1964: 181) suggests as well. However, there are loanwords in Insular Nfr. from Danish that were borrowed with the diphthong *ai* and were not monophthongised in Insular North Frisian, suggesting that the monophthongisation in Insular North Frisian was still older than in Danish, e.g. Nfr. *skaas* < ON *skeið*, instead of **skias*, cf. *skias* 'to separate' < PGmc. **skaiþjan* (Nfr. examples from the Föhr-Amrum dialect; so: Århammar 1995: 85, 90). Phonological parallels show that the ON *ei* in this word was treated as Old Frisian *ei* and *ai* from sources other than PGmc. *ai*,

leads to the following reconstruction of the chronology of phonological developments in Frisian and the migration of its speakers:

- 1a) before ca. 600: monophthongisation of PGmc. *au* > /a:/ (= [a:])
- 1b) before ca. 600: monophthongisation of PGmc. *ai* in velar contexts > /æ:/ (= [a:])
- 2) late 6th/early 7th century: *i*-mutation; /a:/ and /æ:/ + *i*-mutation > /ɛ:/
- 3) 7th/8th century: colonisation of the North Frisian Islands by Frisians
- 4a) 8th century: delabialisation of *i*-mutated long vowels /ø:/ and /y:/
- 4b) 8th/9th century: monophthongisation of the remaining /ai/

Alternative reconstructions assume a monophthongisation of PGmc. *ai* as one event, with a subsequent split into a fronted and a retracted variant, similar to the retraction of *æ* and *ǣ* in Old English (Campbell 1977: 60–62): one is from Kortlandt and recently presented in De Vaan (2011: 313), the other is put forward by Kümmel (2014a: 40,41). The chronology by Kortlandt/De Vaan has various flaws. One that explicitly relates to the questions of relative chronology is the fact that it supposes a common Anglo-Frisian raising of PGmc. *ē*¹ > *ǣ* > *ē*, which does not fit the observation that this sound develops in Insular North Frisian in a different way than in the other Frisian dialects (let alone the dialectal variation in Old English). Kümmel prefers to reconstruct the sound value [æ:] < PGmc. *ai* with later retraction in velar contexts. In his view, the monophthongisation of PGmc. *ai* runs parallel with the monophthongisation of PGmc. *au* (6th century). This implies a tight series of Proto-Frisian long vowels, with the following Proto-Germanic origin: /e:/ < *ē*², /ɛ:/ < *ē*¹, /æ:/ < *ai*, /a:/ < *au*. An early monophthongisation of PGmc. *ai* in all contexts in both approaches would still leave the structural problems of the Insular North Frisian long vowel system for which Hofmann's reconstruction brought a possible solution, unsolved.²⁶ See further the discussion in Section 7.

such as *ai* + *j*, e.g. Nfr. *ai* 'egg' - or *eg*, e.g. Nfr. *braanj* 'brain' < **bregen* (Århammar 2001b: 755). It should be noted that various other loanwords from Danish show the expected sound *ia*/*ii* in Insular Nfr., such as *wiafte* < ON *weifita* 'to wave' or *stiike* < ON *steikja* 'to roast'. These words could also have been borrowed after the monophthongisation in Nfr. and Danish.

26 In my reconstruction, including the evidence from Runic Frisian (Versloot 2014a: 50–53), there are /e:/ < *ē*², /ɛ:/ < *ē*¹, [a:] < *ai* + 'velar', [a:] < *au*, the latter two with a common allophone [æ:] in *i*-mutation contexts. The separation of [a:] and [a:] is based on the runic evidence and was a weak distinction, as evinced by their merger in all later varieties of Frisian. This also somewhat tight series of vowels only arose after the implementation of *i*-mutation around 700 and was solved already before 900. It does not presuppose a long-standing separation of /e:/,

5.2 The position of Old Saxon

Old Saxon has *ē* from PGmc. *ai* in nearly all the instances. Even if Old Saxon indeed went through two more or less separate waves of monophthongisation, the details of the process remain largely hidden because of the identical outcome of the two waves. The oldest regular attestations of Old Saxon come from the 9th century (Gallée 1910: 3) and there are no older runic inscriptions from the region that offer any additional information (cf. Section 4). The onomastic material contained one interesting instance, i.e. *Marithhaim* from 726, containing a word which would fit wave 2. Given the fact that Old Saxon shows *ē* in all contexts, the diphthong had probably already arrived at the stage of [æi] when the first wave of monophthongisation reached it.

Even when most of the words show *ē* in Old Saxon, there are some words with <a> and <æ>, such as *lāro* ‘doctrine’ or *hælagō* ‘holy’ but also words with <ei>, e.g. *beidero* ‘both (gen.pl.)’. The <æ> represents a more open vowel than the default <e>, so an <æ> will be treated here together with an even more open sound, represented by <a>, in contrast to the default <e>. The forms with <a> and <æ> resemble the developments in Old Nordic and Old Frisian (and Old English), whereas the forms with <ei> look like Old High German forms. The development of PGmc. *ai* > *ā* is limited to ‘velar’ contexts in Old Nordic and Old Frisian and is supposed to be early because it took place before the transition of *ai* > *æi*. The words in Old Saxon containing <a> and <æ> could therefore reflect the first wave of monophthongisation.

The analysis of 27 tokens from 20 lemmas enumerated in Gallée (1910: 70–74) indeed reveals a preference for <a> or <æ> in ‘velar’ contexts, while the words with <ei> are restricted to ‘non-velar’ contexts.²⁷ Some examples are: *æschiaðh*, OF *āskiath* ‘demand’, *saragmuod* ‘sorrowful’, ON *sár* ‘sore’, against: *beidero*, OF *bēthe*, Dutch *beide*; *meinda* ‘meant’, OF *mēna*, early-Middle Dutch *meinen/meenen*. Some instances are difficult to judge, e.g. the forms *gast* and *halogen* in the Palatine Baptismal are attributed to Anglo-Saxon influence; the word *saragmuod* fits ON *sár*, but Old Frisian shows *sēre*; some words, such as

/ɛ:/ and /æ:/ as in Kümmel’s theory, which could only be solved after the split-off of the Insular North Frisian branch, but must go back to a very early date, given the fact that the ‘velarity’ condition only works well for a very archaic, basically Proto West Germanic stage of the unstressed syllables.

²⁷ All examples found in Gallée were checked in Tiefenbach (2012), which led to the exclusion of some examples with <ei> as they can be ascribed to Old High German influence. Onomastic evidence was largely omitted, mostly because of its etymological ambiguity.

æschiaðh, have a cognate with *ā* in Old Frisian but do not fulfil the ‘velarity’ criterion. In the following counting, both <a> and <ae> spellings are considered as ‘velar’ realisations. Conditioning contexts are those which either fulfil the velarity conditions as found in Old Frisian or otherwise have an Old Frisian cognate with *ā* (Table 2):

Table 2: The distribution of deviating spellings for PGmc. *ai* in Old Saxon.

	‘velar’	‘non-velar’
<a,æ>	8	4
<ei>	0	5

Legend: The table is based on 18 items with a fairly clear etymology and without the suspicion of being Old English affected. This contrast is statistically significant: Fisher’s Exact Test, 2-sided, $p = 0.029$.

Gallée (1910: 74) mentions that personal names with <a> and <æ> are frequently found in sources from Corvey in Engrian, on the border of West- and Eastphalia. Eastphalian and Engrian sources show more North Sea Germanic features in general (Klein 1990: 201,202). The ‘Anglo-Frisian’ *ā* <PGmc. *ai* matches this trend. However, the 27 instances with <a> and <æ>-spellings cannot be particularly assigned to eastern locations, using the locations of the sources as found in Tiefenbach (2010).

The amount of evidence is too limited (only 27 tokens) for firm conclusions to be based on it alone. However, the two-wave model offers an adequate interpretation for most of these deviating spellings. If we try to interpret these findings, we may assume that the monophthongisation of PGmc. *ai* in Old Saxon took place in two waves as well, just as in Old Frisian and Old Nordic, but that the two waves were very close in time. The process started in velar contexts at a time when the [ai] > [æi]-wave had not yet reached every corner of the Old Saxon area and in some Old Saxon regions the realisation of PGmc. *ai* was still [ai] – most likely in Eastphalia and Engria. This resulted in words with *æ* and *ā*. In other parts of the Old Saxon language area – and soon everywhere – the realisation of PGmc. *ai* was [æi] or [ɛi] and the resulting monophthong was *ē*. Gradually, the process affected more and more contexts, also the non-velar ones, as part of the second wave. This second wave lost momentum and did not reach Old High German at all. Its fading power could fit as an explanation for the remaining <ei>-spellings in Old Saxon.

6 Synopsis

6.1 Phonological synopsis

The conditions for the operation of wave 1 have been described as ‘velar contexts’. Ranking the contexts by extent and relative geographical position, we gain a coherent and nearly contiguous distribution as in Table 3.

Table 3: Synopsis of the phonological conditioning of wave 1.

Language	h	r	w	g,Cu/w	k,Cō	Ca	Ci/j
Old Nordic	<i>ā</i>	<i>ā/æ</i>	<i>æ</i>				
Old Frisian	<i>ā</i>	<i>ā/ē</i>		<i>ā</i>	<i>ā/ē</i>		
Old English	<i>ā</i>	<i>ā</i>	<i>ā</i>	<i>ā</i>	<i>ā</i>	<i>ā</i>	<i>ā > æ</i>
Old Low Franconian	<i>ē</i>	<i>ē</i>	<i>ē</i>	<i>ē</i>	<i>ē</i>	<i>ē</i>	
Old High German	<i>ē</i>	<i>ē</i>	<i>ē</i>				

The context before *h* is the one where the monophthongisation is applied most consistently and in most languages. The monophthongisation before *r* is weaker, with quite some notable exceptions in Old Nordic and Old Frisian. There are indications that the monophthongisation before *r* was applied somewhat later than before *h* in Old High German. A similar order is suggested for Old Nordic by the Early Runic Rō-stone inscription. Such details are lacking for Old Frisian, but the variation of *ā/ē* before *r* in Old Frisian can be interpreted in such a way that the monophthongisation before *r* was only gradually implemented and ultimately overtaken by the transition of *ai > æi*. Old English, Old Saxon (not in the table) and Old Low Franconian have the most widely defined contexts for monophthongisation: roughly in the middle of ‘Germania’ and on the border of the *ai/æi*-isogloss at the time of wave 1. This can also be interpreted in a more dynamic way in the sense that wave 1 and wave 2 are chronologically adjacent/continuous in that region.

Another outstanding feature is the similarity between the ‘velar’ contexts and the ones for ‘breaking’ and retraction of the fronted *a* in Old English. Breaking and retraction take place before *l*, *r*, *h*, and *w*, while fronted back vowels are restored before *a*, *o*, and *u* in the next syllable (Campbell 1977: 54, 60). There is also some overlap with the contexts for Old Frisian breaking: /χt/ *riucht* < **reht* ‘right’, /Cw/ *siunga* < **singwan* ‘to sing’. A third parallel set of phonological contexts are the phonological blocking environments for primary *i*-mutation in various Upper High German varieties: *h*, *h + C*, *l + C*, *r + C*, *C + w*

(Braune and Reiffenstein 2004: § 27). All these contexts, apart from *r* which has a very particular influence on its surrounding, have [-palatal] and hence *velarity* as a common phonological feature.

To sum up: the evidence testifies to one more or less gradual phonological scale, confirmed by other phonological processes in Old Germanic languages, causing a gradual application of monophthongisation in terms of spatial dimensions and with traces of a gradual application along the same phonological scale in the languages where monophthongisation was applied.

Especially the data from Old Saxon and Old Low Franconian – even though they show $\bar{e}$ in most cases – provide information about the actual direction and speed of the transition $[ai] > [\text{æ}i]$. Starting off in Old High German in the middle of the 6th century, the transition spread northwards. Wave 1 can be dated back to the 6th century, relying on the evidence from Old Frisian. Assuming that the monophthongisation was contemporaneous in Old Low Franconian, it is implied that $[\text{æ}i]$ had by then reached large parts of the Low Countries, except for the actual coastal zone, which shows $\bar{a} < ai$ in relic words. Old Frisian was already affected by the transition $[ai] > [\text{ɛ}i]$ when it went through the second wave in the 8th century. The $\bar{a}$ - and $\bar{x}$ -relics in Old Saxon names point in the direction of south-east Old Saxon (Eastphalia). The picture emerging from these distributions is one of the spread of $[\text{æ}i]$ from the south, down through the Rhine-valley, affecting the Old Low Franconian and south-western Old Saxon, but leaving south-eastern Old Saxon, Old Frisian and the Dutch coastal strip untouched for some time. The geographical spread of $[\text{æ}i]$ is illustrated in Figure 4.

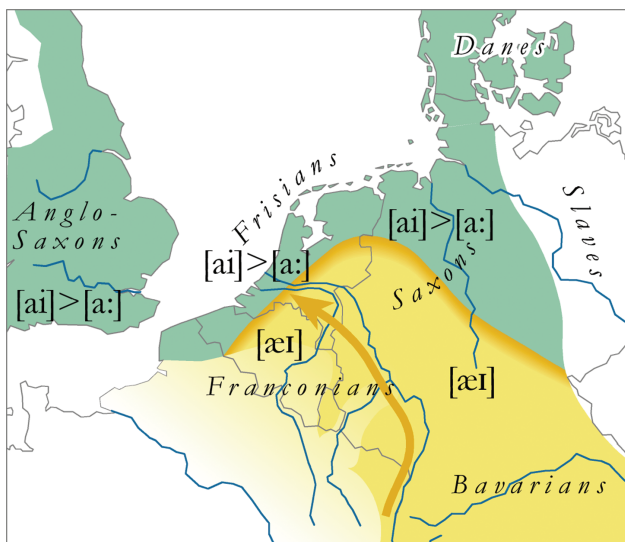


Figure 4: The spread of $[\text{æ}i] < [ai]$ in the 6th century.

Theoretically, rather than constituting a discrete ‘wave 3’ (*ai* > *æi*), this part of the whole process of monophthongisation may have been phonetically of a more gradual nature. The reconstruction of the Runic Frisian vowel system shows that the monophthongisation product of PGmc. *ai* in the first wave produced an ‘*a*’-like sound, which did not directly merge with the *ā* < PGmc. *au*. For Old Saxon, both the spellings <*a*> and <*æ*> in ‘velar’ contexts are attested, suggesting the phonetic value [æ:] rather than [a:]. For Old High German, the reconstructions point to [ɛ:] as the first stage of monophthongisation. For Old Nordic or Old English, there are no indications of a quality different than [a:]. This results in a gradual distribution of [ɛ:] in the south (Old High German), [æ:]/[a:] in the intermediate zone with Old Saxon (in relics) and Old Frisian, and [a:] in the north (Old Nordic) and west (Old English). It was only the later phonologisation of the product of wave 1 that led to /e:/ or /a:/, e.g. in Old Saxon vs. Old Frisian.²⁸

6.2 Diachronic and diatopic synopsis

A diachronic reconstruction can be attempted from the runic and early textual evidence, acknowledging the dating of attestations as indications of *data ante* or *post quem*. Table 4 builds upon the attested evidence and provides a chronological reconstruction. Forms which can neither be secured through runic evidence in the form of parallel attestations nor *datum ante quem* or *datum post quem* indications are put in [...]. The changes in the consonantal structure are only indicative and based on datings in the handbooks. Forms with monophthongisation appear green

Table 4: Synopsis of the developments of PGmc. *ai* in the main Old Germanic dialects.

	300–400	400–500	500–600	600–700	700–800	800–900	900–1000
ON	taihwō - stainaz	tāhwō - stainaz	tāhwō - stainar	tā - stainn	tā - stæinn	tā - steinn	tā - stēn
OE	taihwō - staina	taihwō - staina	[tāhu - stān]	tā - stān	tā - stān	tā - stān	tā - stān
OF	taihwō - staina	[taihwō - staina]	[tāhu - staina]	tā - stæin (ē)	tāna - stēn (æi)	tānæ - stēn	tāne - stēn
OS	taihwō - staina	[taihwō - staina]	[taiha - stain]	[tēha (ā)-stæin]	[tē - stēn (æi)]	tē - stēn	tē - stēn
OHG	taihwō - staina	taihwō - staina	tæiha - stæin	tæha - stæin	zæha - stein	zēha - stein	zēha - stein

²⁸ The entire process can be easily analysed within a structuralist framework, with Germ. *e^l* as the key factor. In Old English and Old Frisian, *e^l* was a rather fronted vowel [ɛ:], while in OS and Old High German it was a more central [a:]. The monophthongisation product of PGmc. *ai* takes exactly the opposite phonological position in both groups.

(wave 1: ‘velar’ contexts) or yellow (wave 1 & 2). The red line marks the spread of the transition of *ai* > *æi*.

Comments on the 7 stages:

- 300–400: This is the common-Germanic stage with the original diphthong (blue). The *Frienstedt* inscription attests to the loss of the final *-z* in West Germanic by that time (Schmidt et al. 2010);
- 400–500: The first wave of monophthongisation (green) is attested in the Early Runic inscriptions from Scandinavia in forms of the verb **faihan* ‘to do’; Anglo-Saxon **raiĥan** constitutes a *datum post quem* for the monophthongisation in Old English;
- 500–600: The monophthongisation (wave 1 & 2) in Old English in the 6th century follows from the previous *datum post quem*, the 7th century attestation of the *āc*-rune and the *i*-mutation of the new *ā*, which is dated to the late 6th century (Buccini 1995: 33, 41). For Old Frisian, the common distribution of *ā* < PGmc. *ai* in ‘velar contexts’ in all Frisian dialects makes the colonisation of the North Frisian Islands from the 7th century onwards a *datum ante quem* for wave 1. The **ai**-**ae**-spellings in Continental Runic in the 6th century (may) attest to the beginning of an assimilation of the two elements of the diphthong (red line);
- 600–700: The Old Saxon relics with <a> and <æ> suggest that the assimilation of the diphthong was only on its way in Old Saxon in the 7th century. Wave 1 reaches Old High German not later than by the beginning of the 7th c (**feha**) and progresses from the context before *-h* to other contexts (Findell 2012a: 91). Wave 1, particularly in the context before *-h*, may have been implemented in West Germanic in the period between 450 and 650. The beginning of wave 2 in Old Frisian in the course of this century is impressionistic and relies on the conclusion that in the Dutch coastal region (which was partly ‘Frisian’) place-names indicate an implementation of wave 2 by the end of the 7th c;
- 700–800: The transition of *ai* > *æi* (and > *ei* in the 9th century) cannot be clearly dated in Old Nordic, because of the limited phonological value of the Younger Futhark inscriptions. If the interpretation of Runic Frisian **aib** is correct, the implementation of wave 2 took some time in the Frisian regions. The monophthongisation in Old Saxon follows from the interpolation from Old Frisian and Old High German, and the first Old Saxon attestations from ca. 800 with fully implemented monophthongisation. For the transition *æi* > *ei* in Old High German, see Braune and Reiffenstein (2004: § 44.2,3);

- 800–900: Wave 2 of the monophthongisation was supposedly completed in Old Frisian by 800;
- 900–1000: The monophthongisation in the southern parts of Old East Nordic was completed by the end of the Viking period.

The two examples in Table 4 are typical for the early-monophthongisation context (*taihwō* ‘toe’) and for a ‘non-velar’ context (*staina(z)* ‘stone’). The first traces of monophthongisation of PGmc. *ai* > *ā*, wave 1, are found in Early Runic in the position before *-h* and can be dated to ca. 400. The monophthongisation in other contexts may be a somewhat later development. From there, the tendency spreads to English and Frisian. For English, the process is dated between ca. 450 and the implementation of *i*-mutation in the late 6th century, which applies to all instances of *ā* < *ai*. It is possible that also in Old English, the spread to phonological contexts was gradual (450–600) as in Old High German, although there is no evidence for this.

There is no reason to assume that wave 1 developed substantially earlier in Frisian than in English. The process, which in Frisian was more limited in scope than in English but wider than in Old Nordic, was completed before the departure of Frisians to the North Frisians Islands after ca. 650. For both Frisian and English, the 6th century seems to be the locus. In this same 6th century, the transition of *ai* > *æi* started off in southern Germany. The monophthongisation in Old High German began towards the end of that century as well, at least before *-h*. Old Saxon lacks any explicit dating other than the regular textual tradition from the 9th century which already presents a static situation. The reconstructions suggest that especially the application of wave 1 and the transition of *ai* > *æi* were almost synchronic in Old Saxon and their dating partly different per region/dialect. Therefore ‘(*ā*)’ is mentioned in the 7th century to indicate the earliest application of wave 1 in Old Saxon at a time when the transition *ai* > *æi* was only on its way from the south and wave 1, moving in from the north, somewhat later than in Old Frisian. The core of the developments of wave 2 in Old Saxon must be dated to the 8th century, and their completion before the end of that century, when still some relics with *ei* were left in regions close to the Old High German regions.

7 Discussion and conclusion

It was mentioned in the introduction that several authors concluded that “[t]he monophthongisation of Gmc. *ai* and *au* and the fronting and rounding of the

reflexes of WGmc. *ā* (and Gmc. *a*) took place independently in each of the three languages [Old Saxon, Old English and Old Frisian].” (Nielsen 2001: 516).

Stiles (1995) concluded in his chronologies that the monophthongisation of PGmc. *ai* was an independent process in Old English and Old Frisian. He treats the process in terms of ‘relative chronology’ and does not give any precise dating nor geographical location. Finally, he proposes an alternative model with waves spreading through a dialect continuum (Stiles 1995: 205–207). He does not discuss all developments in detail in his wave model, but in general, the model refers to the situation on the Continent, prior to the departure of the Anglo-Saxons.²⁹ As he considers the monophthongisation in Frisian to be more closely related to the one in Old Saxon than that in Old English (Stiles 1995: 200–201), it may – in his opinion – have taken place after the migration of the Anglo-Saxons.

In Kortlandt’s (2008) chronology of North Sea Germanic developments, the monophthongisation of PGmc. *ai* is an early common English-Frisian development, that took place on the Continent before the 5th century, prior to the emigration of the Anglo-Saxons (Kortlandt 2008: 271,273).

The kind of reasoning, such as applied by Nielsen and Kortlandt, builds on the assumption that *similar or identical developments following language-specific ones are by definition not shared developments* (Versloot 2014b: 24). This stands in sharp contrast to what can be observed in language-geography: lexical, syntactic, morphological and phonological changes spread not only through language continua but even across more distantly related languages, such as in *Sprachbund*-like constellations, where the common origin of developments in adjacent, even unrelated languages seems to be beyond dispute (e.g. Haspelmath 2001). From this I conclude that differences between the, at that time, very closely-related Germanic dialects in a structural-phonological sense should not prohibit the appreciation of the communalities in the monophthongisation process of PGmc. *ai*. This matches what Voyles (1992: 4) describes as “areal changes”.³⁰

²⁹ Confirmed in personal communication between Patrick Stiles and this author.

³⁰ The developments as sketched by Voyles are pretty straightforward for most Germanic dialects. For Frisian, his reconstructed course of events is rather complicated (Voyles 1992: 169–170). He assumes – for reasons not clear to me – that the monophthongisation in Frisian started in open syllables. The development to Old Frisian *ā* is therefore split into two different stages, where most of the instances of *ā* are a result of the retraction of *ǣ*, which complies with Kortlandt’s and Kümmels’s theories.

Another assumption that has prohibited a comprehensive view on the development of PGmc. *ai* is the postulated monolithic nature of the sound changes: the monophthongisations of PGmc. *ai* in Old English and Old Frisian are often considered to be two independent processes because of their different outcomes (e.g. Campbell 1977: 53).³¹ Also here, language-geography offers various counterexamples, one of the most prominent being the High German Consonant Shift, which is everything but monolithic in phonological conditioning and geographical spread and still considered as one process.

The reconstruction in the present paper builds upon principles that have typological parallels in language change in more recent and better attested periods, and unifies and reconciles various observations on older Germanic languages. It builds upon a wave-like spread of phonological changes with a gradual implementation on the phonological and lexical level. This contrasts with more static, structuralist reasoning, such as that PGmc. *au* and *ai* should have become monophthongs at the same time (e.g. Århammar 1995: 75, following Hofmann 1964), or that the monophthongisation of PGmc. *ai* in various Germanic languages can only be taken as one process if the outcome is structurally the same. The various phonological conditioning contexts for the monophthongisation of PGmc. *ai* in all Germanic dialects were brought together into one phonetically meaningful scale, with parallels in other developments in early Germanic (cf. Subsection 6.1). The different dates of the monophthongisation in the various Germanic dialects are brought together in a logical chrono-geographical configuration (Subsection 6.2).

The approach adopted in the present study matches a post-Great Migration distribution of the Germanic peoples. Placing the Anglo-Saxons somewhere east of the Frisians, between Old Nordic and Old Saxon, would totally disturb the gradual dialect-geographical picture of Figure 2. Kortlandt's (2008) chronology must be rejected. His reconstruction of developments, which posits a common "Anglo-Frisian" monophthongisation of PGmc. *ai* > *ā* in the period before the Great Migrations, lacks any positive support from early linguistic evidence and is contradictory to the evidence from **raīhan** (*Caistor-by-Norwich*-inscription) and – if well interpreted – from the Frisian *Oostum* inscription **aib**. Kümmel's (2014a) reconstruction, with an early overall monophthongisation in Frisian of *ai* > *æ* runs into various problems: the very dense vowel system, Hofmann's solution for the Insular North Frisian vowel system (both discussed

³¹ This idea is implicitly followed by Kortlandt, when he restores the 'Anglo-Frisian' hypothesis by assuming that English and Frisian had an earlier common stage with the same product of monophthongisation.

in Subsection 5.1), the potential counter evidence from **aib**, and finally the timing of the retraction to $\bar{a}$, which requires a pretty archaic stage of the language with preserved post-consonantal *-w-* in unstressed syllables, such as in PGmc. **gaidwa-* > OF *gād* ‘need’, or *-hw-* in PGmc. **taihwō-* > OF *tāne* ‘toe’ (cf. Ins. North Frisian *tuan* < Proto-Insular North Frisian **tān-*). Kümmels line of argumentation is built on the development of shortened PGmc. *ai*, which can appear either as *a* or *e* in Modern Frisian dialects, from which he concludes a Proto-Frisian $\text{æ} < \bar{\text{æ}} < \text{PGmc. } ai$. I agree with Kümmel that the first wave of monophthongisation produced a sound different from the monophthongisation of PGmc. *au*, hence $[\text{a:}]$ against $[\text{a:}] < \text{PGmc. } au$. A more detailed analysis of the words with short $\text{æ} < \text{PGmc. } ai$ shows that most of them do not qualify for a monophthongisation in wave 1 and are therefore unlikely to represent the order $ai > \bar{\text{æ}} > \text{æ}$. A closer scrutiny of the shortened instances in Frisian exceeds the scope of this article.

The situation in Dutch deserves some further consideration. Old Low Franconian proper attests to a strong monophthongisation tendency with $\bar{e}$ except in the most non-velar context, i.e. when followed by *i* or *j* in the next syllable but not when *r*, *w* or *h* is the coda consonant. We can observe a similar interaction of the coda consonant and the quality of (semi-)vowels of the following syllable as in Frisian. The Flemish region has monophthongisation without exception, just as near-by Old English. The main contrast between Old English and Old Low Franconian is that most of the Lower Rhine region – but not the coastal strip – may already have been affected by the transition $[\text{ai}] > [\text{æi}]$ at the moment of monophthongisation, while Old English and Old Frisian were not. The incidental relic words with $\bar{a}$ and $\bar{o} < \bar{a}$ in the coastal region of Holland and Zeeland and the Flemish place-names in *-ham* imply that this region still had $[\text{ai}]$ (just as Old English and Old Frisian) when the first wave of monophthongisation affected the region.

Altogether, I conclude that the monophthongisation of PGmc. *ai* was a gradual process that covered 500 years and spread over the Germanic speaking regions in two waves. Even when somewhat fragmentary, the process can be traced using runic evidence and onomastic and dialectal relic items. The controversy whether it was an independent development or a common innovation becomes superfluous: the waves take place over a continuous time span and spread over contiguous geographical areas, without being monolithic in application or contemporaneous in every place. This matches the dialect-geographical reality that we know from later phonological developments, such as the diphthongisation of PGmc. $\bar{i}$ and $\bar{u}$ in the Late Middle Ages (König 2001: 146,147). The proposed model also solves some other problems, such as the varied lexical distribution in Old Frisian and the emergence of the

specific Insular Frisian vowel system, the <a> and <æ> spellings in Old Saxon and the curious phonological conditioning of the distribution of *ē* and *ei* in Dutch.

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