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The Chronology of Final Devoicing and the Change of *z to *r* in Proto-Norse

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Abstract

The inflection of strong verbs in Old Norse shows that its predecessor, Proto-Norse, must have undergone a process of final devoicing. This paper is an attempt to describe in some detail the sound change of final devoicing and to clarify its absolute and relative chronology. Special focus is placed on the relationship between final devoicing and the first phase of rhotacism, i.e. the change of *z to *r*, and potential consequences that this may have on determination of the sound value of the *algiz*-rune (𐌵 = **z/r**). An investigation of direct evidence from runic inscriptions and an analysis of the relative chronology with *a*-syncope and other sound changes leads to the conclusion that final devoicing was not yet in effect in the oldest group of inscriptions, but had been carried through by A.D. c. 600, most likely in the sixth century. After this time, the *algiz*-rune is unlikely to have represented a voiced sibilant.

Keywords: Proto-Norse, Old Norse, final devoicing, sound change, relative chronology, syncope/apocope, *algiz*-rune

Introduction

It is commonly assumed that the predecessor of Old Norse (hereafter ION), Proto-Norse (hereafter PN), was affected by final devoicing, a sound law which turned voiced consonants into unvoiced ones in word-final position. The main evidence for this change comes from the inflection of strong verbs in Old Norse, where we find alternations of the following kind:

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Class I: ON *stíga* ‘climb’, 3rd sg. pret. *sté*; ON *hníga* ‘to sink down’, 3rd sg. pret. *hné*

Class II: ON *súga* ‘to suck’, 3rd sg. pret. *só*; ON *fljúga* ‘to fly’, 3rd sg. pret. *fló*

Class III: ON *binda* ‘to bind’, 3rd sg. pret. *batt*; ON *springa* ‘to spring, burst’, 3rd sg. pret. *sprakk*

Class V: ON *mega* ‘can, may’, 3rd sg. pres. (pret.) *má*

To explain these Old Norse preterite forms, it is necessary to assume a two-step development. The first step is the devoicing of the consonants *-g*, *-g*, and *-d* to *-χ* (a voiceless velar fricative), *-k*, and *-t*, respectively, and the second is the loss ($-\chi > \emptyset$) or doubling (due to the assimilation of a preceding nasal: $nC > CC$, where C stands for any consonant) of the new unvoiced consonant. Examples of the developments are therefore:

Proto-Germanic (hereafter PGmc.) **staig^a* > **staiχ* > ON *sté* (3rd sg. pret.)

PGmc. **sprang^a* > **sprank* > ON *sprakk* (3rd sg. pret.)

PGmc. **band^a* > **bant* > ON *batt* (3rd sg. pret.)

(Note that superscript ^a here, e.g. in **staig^a*, indicates a single vowel **-a* which has been lost at an early stage in word-final position.)

This explanation, which requires a period of final devoicing in Proto-Norse, is commonly provided in grammars and handbooks of Old Norse; an overview of the relevant literature on the issue is available in Ralph 1980, 2 f. The two cases *barg* ‘concealed’ and *svalg* ‘swallowed’, which appear to have escaped this development, are convincingly explained as functionally motivated retentions by Ralph (1980, 8 f.; similarly Sturtevant 1956). While there is general agreement that final devoicing did indeed take place in Proto-Norse, details are less clear, in particular regarding the chronology of events. In the following, I will attempt to describe the process of final devoicing in Proto-Norse in some detail and discuss its absolute chronology and that relative to other sound laws, especially the first phase of rhotacism in which **z* became *r*.

Affected sounds

The Old Norse verbal forms given above serve to demonstrate that both voiced stops and voiced fricatives in Proto-Norse were affected. So far, we have seen evidence for final devoicing in the following three cases:

-d > -t
 -g > -k
 -g > -χ

From a systematic point of view, we would then expect final devoicing also in the following cases:

-ð > -þ
 -b > -f
 -b > -p

(On *-z > -s, see below.)

However, the expected devoicing in these cases does not seem to have left any traces in Old Norse and can therefore not be proven to have been in effect. This is because in Old Norse, the contrasts between old *ð* and *þ* and between old *b* and *f* were neutralized after a vowel (Heusler 1932, 49 f.). Examples for words ending in PN *-b* are lacking (ibid., 54).

Besides studying the evidence of Old Norse, scholars have also examined the corpus of runic inscriptions in an attempt to find direct traces of final devoicing. This has proved difficult as the material from the relevant period is sparse, and the linguistic interpretations are often disputable.

Runic evidence

As far as I can see, there is no evidence at all for final devoicing in the very earliest inscriptions. The best piece of evidence is **alugod** on the early Værløse fibula (KJ 11, A.D. c. 200). If the form is indeed a vocative—one of multiple possible interpretations presented by Krause and Jankuhn (1966, 34)—it speaks against final devoicing at this time. But the form has also occasionally been regarded as West Germanic (Antonsen 1975, 75, cf. García Losquiño 2015, 69–72; cf. also Looijenga 2003, 163 f., who provides an overview of proposed etymologies and decides in favor of a West Germanic male personal name) or has even been completely rejected as evidence in this matter (Ralph 1980, 4 f.). The sequence **adag** on the Vimose buckle (KJ 24; archaeologically dated to A.D. 210–60), if taken as a personal name *A(n)dag* (Krause and Jankuhn 1966, 60), must, like **alugod**, either be regarded as a vocative or a West Germanic form (cf. Ilkjær, Lerche Nielsen and Stoklund 2006 for a summary of proposed interpretations).

The material from the bracteate period is somewhat richer. Relevant forms are:

alawid Skodborg bracteate (B-type), IK 161

uulald Eskatorp/Väsby bracteate (F-type), IK 241 (cf. **uulald** Overhornbæk II-A, IK 312)

? **hag** Ølst bracteate (C-type), IK 135 (*hag(ala)?*)

? **lapop** Halskov bracteate (C-type), IK 70 (cf. **lapodu** Trollhättan-A, IK 189), cf. Düwel and Nowak (2011, 385) and Heizmann (2011, 545)

The material from this corpus is problematic, with many inscriptions presumably garbled and some lacking any meaningful linguistic interpretation whatsoever. However, it can be noted that as both the *d*- and the *g*-rune occur in word-final position, there do not appear to be any grounds to claim that final devoicing was already in effect in this period. The most important piece of evidence is **alawid** on the Skodborg bracteate. If taken at face value, it would indicate that there was as yet no final devoicing. The interpretation of **alawid** as a personal name appears to be generally accepted, although the etymology of **-wid** remains unclear (Findell 2012, 137; I do not accept Findell's idea that the sequence **jalawid** might simply be a fourth, abbreviated repetition of **aujaalawin** plus **d** as a paratextual marker since the status of the final *d*-rune would remain unclear). The form **hag** on the Ølst bracteate might show the lack of final devoicing for *g*; however, it is entirely possible that this is an abbreviated spelling (*hag(ala)?*) and that *g* was not actually in word-final position (cf. Axboe 2011, 285, for more examples of abbreviations in bracteate inscriptions). The bracteates cannot be precisely dated, but Axboe's remarks on their grouping and chronology (2011, 288) would suggest that the Skodborg and the Ølst inscriptions, which he places in the late H2-group and the early H3-group, respectively, belong to roughly the middle of the bracteate period, perhaps around A.D. 500 (cf. also Birkmann 1995, 56 and 72). The only potential example for final devoicing in the bracteate period is **lapop** on the Halskov bracteate, taken as positive evidence for the sound change by Krause (1971, 90). However, I hesitate to use it to draw any linguistic conclusions as it occurs amidst a long and mostly unintelligible inscription. A major concern is that the sequence directly following **lapop** is not interpretable. This lack of context makes it questionable whether the word is correctly segmented and interpreted. If **lapop** were indeed an example of final devoicing, it would be significant from a chronological point of view, as the bracteate belongs to Axboe's H1-group, i.e. the earliest bracteate period (Axboe 2011, 288 and 291). Furthermore, it should be kept in mind that the contrast between old *ḁ*

and *p* was later neutralized in some contexts, cf. above; but **laþop** is not likely to be a forerunner of this merger, as the so-called weakening of *p* > *d*, which was responsible for the neutralization, is dated to about the tenth century according to Heusler (1932, 50).

The evidence from the period of the older futhark, although sparse, suggests on the whole that final devoicing had not yet occurred – with only one (uncertain) piece of evidence that would seem to indicate an earlier occurrence. It is noteworthy that clear evidence is available only for *-ð*; for *-g* it is much less certain, and data for final *-b* seem to be missing altogether.

The data is even more sparse for the so-called transitional period, here loosely defined as the period between the Early Runic era and the Viking Age (A.D. c. 500–750). (I follow H. F. Nielsen 2000 in using the term Early Runic for the language of the oldest inscriptions in the period A.D. c. 200–500, for the reasons explained there, especially pp. 31–33.) Unfortunately, the available data from this period is very difficult to evaluate. The following is a list of relevant forms:

ma Setre comb (KJ 40), dating: A.D. c. 575–700, perhaps later (Egil Bakka, quoted in Grønvik 1987, 9 and 174 f.); A.D. c. 620? (Birkmann 1995, 142)

gaf, bariutip Stentoften stone (KJ 96), dating: A.D. c. 590? (Birkmann 1995, 142); A.D. 600–650 (H. F. Nielsen 2000, 95)

lat, ob Eggja stone (KJ 101), dating: A.D. c. 650 (Birkmann 1995, 142); A.D. c. 650–750 (Bjorvand 2010, 210)

The most relevant, but perhaps also the most controversial of these forms, is **ma** on the Setre comb. This is identified by Grønvik as corresponding to ON *má*, the 3rd sg. pres. (pret.) of *mega* ‘can’. If so, it would constitute direct evidence that not only final devoicing, but also the loss of voiceless *-χ* with compensatory lengthening had already been completed by around A.D. 600.¹ This would make the language on the Setre comb very progressive; it would already appear to be essentially Old Norse. Of course, all of this depends on whether or not we accept Grønvik’s 1976 interpretation of the first part of this rather enigmatic inscription as corresponding to *Hall-mær má una* ‘May Hallmær be content!’ (Grønvik 1987, 21 f.; a revised interpretation of **hal mar** and of the particular meaning but not the form **ma** is given on pp. 23 f.).

¹ Nedoma (2010, § 44.1b [p. 123]) explains the opposition ON *má* vs. *megum* as a result of Verner’s Law, but that cannot be right as the root is Proto-Indo-European **magh-* (Rix et al. 2001, 422) > PGmc. **mag-*, cf. Gothic *mag* ‘I can’, *magum* ‘we can’.

The two forms **gaf** and **bariutip** on the Stentofte stone appear to show the final devoicing of *-b* > *-f* and *-d* > *-p*. The first case, **gaf**, is fairly clear evidence of final devoicing, as we are in fact dealing with a PGmc. **b* (**geba-*). As etymological *b/b* and *f* are otherwise kept apart (cf. **haborumr**, **bariutip** vs. **-wulafa**, **-wulafn** etc. on the Blekinge stones, KJ 95–98), there is no reason for doubt. The second case, **bariutip**, is less clear, as we cannot be certain whether this verbal ending had a voiced or a voiceless consonant in Proto-Germanic: The various Old Germanic languages in fact point to a Proto-Germanic doublet **-id̥*, **-ip̥* (< Proto-Indo-European **-e-ti*; cf. Old High German *nimit* vs. Old English *nimeþ*), similar to the situation in the second person (doublet **-is*, **-iz*; cf. Krause 1971, 42, note 2, and Boutkan 1995, 310 f.). As Old Norse has the voiced variant in the 2nd pers. sg. *-r* < **-iz* (which implies former root accent), it seems more likely that the third person ending reflects **-id̥*.² Therefore, although the form **bariutip** is likely to be a case of final devoicing, it is not compelling evidence.

The form **lat** (= ON *land*) on the Eggja stone has been considered evidence of final devoicing by Grønvik (1985, 71 f.), and although this has been doubted by some scholars, it does result in a consistent picture given the occurrence of **galandē** on the same stone. It is noteworthy, however, that this does not correspond with the usual views regarding the chronology of final devoicing and *a*-syncope (see below), according to which the nominative and accusative singular of neuter nouns (with an original ending **-aⁿ*) should in no way be affected by final devoicing. (Superscript *n* here indicates that the vowel was originally followed by a nasal and is itself likely to have become nasalized.) An alternative is to assume that the spelling with **t** is an early instance of the practice common to the younger futhark in which **t** was used for both /d/ and /t/ (Krause and Jankuhn 1966, 229); cf. **asmūt** ‘Ásmund’ on the Sölvesborg stone (DR 356, from the second half of the eighth century according to Krause and Jankuhn 1966, 220, note 2). However, /d/ – /t/ and /g/ – /k/ appear to be otherwise kept apart on the Eggja stone (as far as it has been convincingly interpreted).

Finally, **ob** on the Eggja stone has been regarded by Krause (1971, 41) as evidence against final devoicing. According to Krause, the word should be identified with an Old Norse verbal particle *of* (< **uþa*), meaning ‘over’. Grønvik separates this from the enclitic verbal particle ON *of*, which serves synchronically as a filler in Old Norse but may originally have had

² Old High German shows, however, that the second and third person forms do not necessarily need to be parallel, as that language has *-s* < **-s* in the 2nd pers. sg. (suffix accent) and *-t* < **-d̥* in the 3rd pers. sg. (root accent).

perfective meaning (Heggstad et al. 2008, 464, s.v. *of C.*). If so, the lack of final devoicing would be rather surprising, considering that the Eggja inscription is usually dated somewhat later than those from Setre and Stentoft. But if **ob** is indeed an enclitic, or even a prefix (labeled as such by Grønvik [1985, 74]; cf. also Bjorvand 2010, 219), this raises doubts as to the occurrence of a word boundary after **ob**. It may then be that **obkam** is not a sequence of two words but a prefixed verb *ob-kam* ‘came ... over’, in which case the conditions for final devoicing would not be met. Because of this possibility, I do not consider **ob** on the Eggja stone to provide strong counterevidence of final devoicing.³

Direct evidence thus indicates—although data are admittedly very thin—that final devoicing has not yet occurred in the oldest inscriptions, but has taken place by A.D. c. 600. Most of the examples are for the devoicing of fricatives, but with **lat** there is one—although not entirely certain—case for the devoicing of a stop.

Relative chronology

A different approach to dating the sound change is through relative chronology. The relative chronology of final devoicing and other sound laws has been studied in detail in the research literature, cf. the overview by Ralph (1980, 5–9). For the present purpose, it suffices to state that final devoicing must have occurred after $*ai\chi > *\bar{a}\chi$, but before both apocope of unstressed $*-a^n$ and assimilations of the type $nC > CC$. The reasoning behind this chronological ordering will be explained in the following for each of the three cases.

Moberg (1944, 199–201) has convincingly argued that the change of $*ai\chi$ to $*\bar{a}\chi$ precedes final devoicing. This is because Old Norse shows, for example:

á ‘owns’ < PGmc. $*ai\chi^a$ (cf. Gothic *áih*), *vá* ‘fought’ < $*wai\chi^a$ (cf. Gothic *wáih*)

next to:

sté ‘climbed’ < $*staig^a$, *hné* ‘sank down’ < $*\chi naig^a$.

This is naturally explained, with no need for analogies, if the following order of rules is assumed:

³ Cf. e.g. Gothic *urreisan* ‘to stand up’ < $*uz-risa-$ without devoicing of $-z$ in the prefix, although this evidence is admittedly not conclusive as the assimilation could have preceded final devoicing in (Pre-)Gothic.

1. $*ai\chi > *\bar{a}\chi$
2. $*-g > *-\chi$
3. $*ai\chi$ (i.e. new instances created through rule 2) $> *\bar{a}i\chi > *\bar{e}\chi$ (Noreen 1913, 76)
4. $*-\chi (> *-h) > \emptyset$

In the runic material, there are instances of both older **aih** and monophthongized **ah**. The former occurs in the verbal form **faihido** ‘(I) painted’ attested on the runestones from Vettelund (KJ 60) and Einang (KJ 63; cf. H. F. Nielsen 2000, 165). The two stones cannot be dated archaeologically, but are tentatively assigned to the fourth century by Krause and Jankuhn. The sequence **aih** on the stone from Myklebostad (KJ 77, “um 400”) is often interpreted as a still unmonophthongized preform of ON *á* ‘he owns’ (cf. Gothic *áiþ*). The monophthong is first attested in **fahido** on the stone from Rö (KJ 73, A.D. c. 400) and multiple times on bracteates (cf. H. F. Nielsen 2000, 165, 285). It therefore appears that both the change $*ai\chi > *\bar{a}\chi$ and (by implication) final devoicing have not yet occurred in the very oldest runic inscriptions.

As regards the assimilations, it unfortunately seems impossible to find any clear evidence of the process in the runic inscriptions of the relevant time period. Gutenbrunner’s attempt to do so (1951, 12 and 40) is the only one known to me. But Gutenbrunner’s identification of the personal name *Vōtti* on the Overhornbæk II-A bracteate (IK 312,1) — allegedly an early attestation of the assimilation $nt > tt$ — cannot be maintained as it is based on a speculative interpretation of the sequence **uu*~~tw~~***.⁴ It should also be kept in mind that a nasal can be omitted before a stop in runic orthography, which makes the runic material in general ill-suited for the study of this particular problem. Conclusive evidence is available only in those cases where the newly assimilated consonant cluster has demonstrably caused a lowering of the preceding vowel. The earliest examples of this kind are according to Moberg (1944, 29) from after A.D. 1000.

A more promising attempt to find a chronological upper limit for final devoicing has been made by considering the relative chronology of final devoicing and *a*-syncope. The view that final devoicing precedes *a*-syncope (technically perhaps rather *a*-apocope) had already been expressed by Noreen (1913, 99), and has in more recent times been supported by Grønvik (2010, 127–29; cf. also Boutkan 1995, 333; Bjorvand 2008, 10). The rel-

⁴ The last symbol of the sequence — a stave with three horizontal twigs — may not even be a rune according to Hauck et al. 1985–89, 2.1: 147 f. (IK 312,1).

ative chronology of the two sound changes is established on the basis of the following examples:

PGmc. **band^a* ‘(I/he) bound’ > ON *batt*

PGmc. **bandaⁿ* n. ‘band, fetter’ > ON *band* n.

If syncope was indeed earlier than final devoicing, the two forms should have merged. The fact that they result in different forms in Old Norse must mean that final devoicing took place after the loss of a single Proto-Germanic vowel in word-final position, but before the loss of final **-aⁿ*. The sequence of events was thus:

PGmc.	<i>*band^a</i>	<i>*bandaⁿ</i> n.	
PN (1st stage)	<i>*bant</i>	<i>*bandaⁿ</i>	(final devoicing)
PN (2nd stage)	<i>*bant</i>	<i>*band</i>	(<i>a</i> -syncope)
PN (3rd stage)	<i>*batt</i>	<i>*band</i>	(assimilation)
ON	<i>batt</i>	<i>band</i>	

This is a convincing argument, even if the possibility of analogical restitutions among the nouns cannot be entirely ruled out.⁵ The next step is then to date *a*-syncope. Fortunately, Birkmann has already established the details (1995, 160–86). According to Birkmann (pp. 91–93 and 160 f.), the name or name element **-haukr** on the Vallentuna dice, archaeologically dated to A.D. c. 600, already shows syncope. Further examples can be found in the Blekinge inscriptions (e.g. **-wulaf** on the Istaby stone, KJ 98). On the slightly more recent Eggja stone, syncope is already fully established (e.g. **stain**, **fiskr**). Birkmann concludes that the first phase of syncope, which affected at least *a* after heavy syllables, is certainly to be dated before A.D. 600 (p. 161). Syncope should perhaps be moved back even further in time if **wir** on the Eikeland fibula (KJ 17a, A.D. c. 550) is in fact a contraction of the personal name *Wiwar*, as Grønvik claims (1987, 53–56), although this is not assured (cf. Birkmann 1995, 77). A similar date is given by H. F. Nielsen (2000, 260), according to whom *a*-syncope was in operation in the North “before and around AD 600”.

What limits this argument somewhat is that syncope may have occurred earlier for oral than for nasalized vowels. This is at least the claim

⁵ If so, the form **lat** on the Eggja stone might be the only surviving example of a nominal form with final devoicing. This is uncertain, however, and it seems preferable to operate without analogy unless it is specifically required.

of Noreen (1913, 87). He points out the accusatives **-wulafa** on the Istaby stone (cf. syncopated nom. **-wulafn** in the same inscription) and **hornā** on the Strøm whetstone (KJ 50, around A.D. 600), both with unsyncopated **-a*ⁿ. As the argument presented above concerning **banda*ⁿ involves syncope of a nasalized vowel, this will to some extent raise the chronological upper limit for final devoicing. The material on which Noreen bases this claim is quite thin, however, especially considering that some of it actually concerns the vowels *i* and *u*, rather than *a*. Should syncope of nasalized vowels have occurred later, it could not have been at a significantly later date, as the chronologically close Eggja stone already has full syncope, including of nasalized vowels (cf. acc. **stain** < **staina*ⁿ). It therefore seems to me that Noreen's claim regarding the two stages of *a*-syncope (oral vs. nasal vowels) does not significantly alter the time frame of final devoicing.

Relationship to the change of **z* to *r*

A further point of interest regarding relative chronology is the relationship of final devoicing and rhotacism. As pointed out by Bjorvand (2008, 10) and Grønvik (2010, 127–29), the date of final devoicing has potential consequences for the interpretation of the disputed fifteenth rune of the older futhark, the *algiz*-rune (Ÿ = **z/r**). This rune, which frequently occurs in word-final position, is by some scholars thought to represent a voiced sibilant, while others assume from the earliest inscription that it represents a kind of *r*-sound (see e.g. H. F. Nielsen 2000, 33 f. and 166 f., on the one hand, and Grønvik 2010, 127–29, on the other). The argument advanced by both Bjorvand and Grønvik is as follows: At a time when final voiced consonants are devoiced, we expect a voiced sibilant *-z* to turn into *-s* and merge with old voiceless *-s*. As no such merger occurred, it is argued, the rune can no longer have been a voiced sibilant *z* at the time of final devoicing.

Smirnitskij (1990, 197) is in my opinion correct in pointing out that rhotacism must have been a two-step development, i.e. (1) **z* > *r* and (2) *r* > *r*, and he emphasizes that these two steps need not have occurred at the same time in all the North and West Germanic languages.⁶ To explain

⁶ The alternative view held by some scholars that **z* became *r* directly, with no intermediate stage, implies that **z* existed well into the Viking Age, which is not compatible with standard views on the chronology of sound changes of the period. In my opinion, this alternative view must be rejected solely on the grounds of the form **lausr** < **lausaz* on the Björketorp stone (KJ 97), as a desinence *-sz* (without voicing assimilation) is implausible. Cf. Larsson 2002, 31, for an overview of the relevant literature.

why word-final *-z did not merge with old -s, we are forced to assume that the first phase of rhotacism (*z > r) preceded final devoicing. The second phase of rhotacism, r > r̥, occurred later and is less relevant for the purposes of the present study.⁷

The sound value of r remains unclear (cf. Larsson 2002, 30–33, for a summary of the discussion with literature). The phoneme has sometimes been tentatively compared to Czech ř (Steblich-Kamenskij 1963, 365), a sound best described as an “alveolar trill fricative” (/r̥/) according to the *Handbook of the International Phonetic Association* (1999, 71). Interestingly, the sound ř in Czech has a voiceless allophone in environments of voicing assimilation (ibid.). If PN r was indeed a similar sound, it could also have been affected by final devoicing, although the later merger with r̥ may have obscured this stage.

The argument advanced by Björvand and Grønvik is plausible, but it rests on the assumption that final devoicing must necessarily affect all potential target consonants at the same time. A closer look at similar processes of final devoicing in related Germanic languages suggests that this may not necessarily be the case. In Middle High German, for example, final devoicing appears to have occurred gradually over a considerable length of time (Paul et al. 2007, § L72 [pp. 131–33]). Some of the affected sounds show devoicing as early as the ninth century (-g > -c, -d > -t) – strictly speaking still in the Old High German period – while others show the effect in a consistent manner as late as the late twelfth or thirteenth century (-b > -p, -g > -c/k/ch). This may of course to some degree be a matter of conservative orthography; the time span is so long, however, that it rather suggests a gradual process.

Another Germanic language that might be compared is Gothic. In this language, we observe final devoicing of -b > -f and of -d > -p, but surprisingly not of -g, which is always spelt <g>.⁸ The (apparent) lack of devoicing of -g is unexpected from a systematic point of view. The problem is usually solved by assuming that Gothic -g was affected by final devoicing as well, but the change was simply not expressed in writing

⁷ Larsson (2002, 33–35, 189) dates the earliest steps of the development of r to r̥ to the tenth century (probably earlier in West Nordic), but the merger was not completed in East Nordic until at least the thirteenth century. He concludes that etymological /r/ and /R/ were still largely kept apart in the Viking Age inscriptions, at least in East Nordic (p. 178).

⁸ Strictly speaking, the Gothic data do not prove that Wulfila’s Gothic had a synchronic rule of final devoicing; they prove merely that the rule applied in an unspecified period in the (pre-)history of Gothic (Marchand 1973, 67).

(Braune and Heidermanns 2004, § 65; Krause 1968, 130).⁹ If so, the sound change has indeed affected all voiced fricatives in Gothic, including -z, but not stops (cf. Gothic *bindan* ‘to bind’, 3rd sg. pret. *band*). As regards chronological stages, little can be said due to the fact that our knowledge of Gothic depends so heavily on a single text, the Wulfila bible.

The comparison to final devoicing in Gothic thus leaves some doubts as to whether final devoicing must necessarily affect all potential targets at the same time. If we accept the standard view that final devoicing in Gothic included -g, then the conclusion must be that final devoicing does indeed tend to affect all voiced consonants of a certain phonetic subgroup, e.g. voiced fricatives or voiced stops, but does not necessarily affect all voiced consonants in the language (both stops and fricatives). The case of Middle High German further highlights the possibility that such a process of devoicing can occur in a series of steps over a considerable length of time.

A tendency towards devoicing of consonants in word-final position is also apparent in Old English and Old Saxon, although the spellings in both languages show considerable variation (cf. Brunner 1965, 185 f.; King 1968, 256; Boutkan 1995, 311).

Conclusion

Both direct and indirect evidence suggest that final devoicing occurred before A.D. c. 600 in the North. The direct evidence from Early Runic, although sparse, suggests that final devoicing had not yet occurred. This is further corroborated by multiple attestations of unmonophthongized -aiχ-, which suggest a chronological lower limit for final devoicing somewhere in the Early Runic period, perhaps around A.D. 400. The evidence of the bracteates does not permit any clear conclusions. If one accepts **alawid** on the Skodborg bracteate as evidence, then the chronological lower limit for final devoicing has to be moved to the bracteate period, perhaps to around A.D. 500. The first reasonably clear evidence for final devoicing in runic inscriptions comes from the late sixth or seventh century (Setre, Stentoft, Eggja). The earlier form **laþoþ** (Halskov bracteate) from the bracteate period seems too uncertain to allow any

⁹ It is interesting to note that χ < *g before t is represented by <h> in Gothic, as in *mahta* to *mag* ‘I can’, *ōhta* to *ōg* ‘I fear’ etc. (cf. Marchand 1973, 68). If -g in word-final position were in fact devoiced to -χ, we might expect a parallel spelling <h>. Krause (1968, 132 f.) therefore considers that the sound of Gothic <h> was close to a pure aspirate [h] in all positions, allowing χ to be spelled as <g>.

conclusions to be drawn. Overall, then, the sixth century seems the most likely time period for final devoicing to have taken place. The fifth century is also a possibility, although this requires either disregarding **alawid** and other evidence from the bracteate period, or their very early placement in the respective time frames. The early seventh century as a date for final devoicing is possible only if Noreen's claim that nasalized $*-a^n$ was apocopated later than its oral counterpart is accepted. The date cannot be moved far into the seventh century, however, because of the evidence of the Setre, Stentofte, and Eggja inscriptions, especially considering the fact that the Eggja stone with full syncope clearly marks an upper limit (and several indications support a dating of the Eggja stone to the seventh century; A.D. c. 650 by Birkmann 1995, 142; cf. also Bjorvand 2010, 210 f.).

This time frame is somewhat earlier than the traditional dating to the seventh century (cf. Ralph 1980, 16, with references; Noreen 1913, 95 f., 99, in fact ascribes the devoicing of stops to the eighth century). It is later, however, than in the scenario described by Grønvik (1987). According to Grønvik, *a*-syncope is traceable as early as A.D. 500–520 (1987, 62, 89; questioned by Birkmann 1995, 77), which implies that final devoicing was even earlier. However, Grønvik in a later publication ascribes final devoicing to the sixth century (Grønvik 2010, 127), which accords with the results of the present study.

The following table shows an overview of the sound changes discussed above and their relative chronology (cf. Ralph 1980, 7):

earlier sound changes	loss in Proto-Germanic of single, short vowels in word-final position <ul style="list-style-type: none"> • $*z > R$ • $*aiχ > *āχ$
	<ul style="list-style-type: none"> • final devoicing
later sound changes	<ul style="list-style-type: none"> • $*aiχ > *ēχ$ • apocope of $*-a^n$ • assimilation $nt > tt$, $nk > kk$

If we accept that final devoicing was during its operation a strict rule affecting all potential targets in word-final position, then the date (or time frame) of final devoicing of fricatives is a chronological upper limit for the sound change $*z > R$. Although the comparison to similar processes in other Old Germanic languages has raised some doubts about the strictness of such a rule, it nevertheless seems the most likely scenario for

North Germanic from a systematic point of view. The change $*z >_R$ can thus hardly have occurred later than the sixth century. From about A.D. 600 onwards, then — and this includes the Blekinge inscriptions as well as Eggja — the *algiz*-rune (ǀ) is almost certainly no longer a voiced sibilant *z*. Note, however, that this conclusion does not apply to the Early Runic period, up to A.D. c. 500; as final devoicing cannot be shown to have been in effect so early, we cannot use it to determine the phonetic nature of the *algiz*-rune in the period of the oldest group of inscriptions.

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