

# The Germanic diphthongs in the Continental runic inscriptions

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The following paper is extracted from a larger study of the vocalic systems of dialects recorded in Continental runic inscriptions (Findell 2009), based on a corpus of 90 older futhork inscriptions with find-sites on the Continent, or for which there is some evidence of a Continental origin.

It has been common practice to treat the dialects of the inscriptions as precursors to OHG and OS as we encounter them in mss. of the 8th-11th centuries. Phonologically, the “Continental runic” dialects are presumed to occupy a position in the development from a relatively uniform NWGmc to early OHG and/or OS (see, e.g., Klein 2001: 579-580). It follows that we can look to the inscriptions for evidence for the sound changes which distinguish the later dialects from NWGmc. In this paper I focus on those phonological processes relating to the Gmc diphthongs \*/ai/ au/ eu/.

## The *a*-diphthongs in OHG and OS

Both \*/ai/ and \*/au/ are subject to monophthongisation, unconditionally in OS and conditioned by the consonantal environment in OHG (Braune 2004: §§43-45; Gallée: 1910 §§89-101; Holthausen 1921: §§97-100).

Monophthongisation of \*/ai/ occurs:

1. before /r w h/. Inherited /h/ (< PGmc \*/x/) triggers monophthongisation, but the consonant-shifted reflex of \*/k/ does not: compare, e.g., *ēht* “property” (< PGmc \**aixtiz*), *eih* “oak” (< PGmc \**aikz*).<sup>1</sup>
2. in certain interjections (*sē*, *sē-nu* “behold!” < PGmc \**sai*; *wē* “woe, alas!” < \**wai*). This is not a general rule in final position (compare *zwei* “two” (neut.) < \**twai*; *screi* < \**skrai*, 1.sg.pret. to *scrīan* “cry, moan”);
3. irregularly in other environments, e.g., *wēnag* “miserable, poor, low” (< PGmc \**wainagaz*/\**wainaxaz*). The motivation for monophthongisation in these cases is not clear, but it is evidently not purely phonological, since formally similar words retain a diphthong, e.g., *weinōn* “to cry, wail”.

The OHG reflexes of \*/au/ are monophthongal before /h/ < PGmc \*/x/, and before all dental/alveolar consonants.

Durrell analyses the monophthongisations into two stages: first, the off-glide is lowered to produce “pre-monophthongal” variants [ae ao]. The first element is subsequently raised as part of a general process affecting the first elements of complex vowel-segments in the late 8<sup>th</sup> or early 9<sup>th</sup> century: [ae] > [ɛ:]; [ao] > [ɔ:] (Durrell 1977: 59-63; see also van Coetsem 1975: 11-17).

Penzl (1971: 127-128), on the other hand, argues that the digraphic spellings <ae ao><sup>2</sup> are simply an orthographic device for distinguishing the relatively open products of monophthongisation [ɛ: ɔ:] from the more close /e:/ < PGmc \*/e:/ (\**ē*<sub>2</sub>) and /o:/ < PGmc \*/o:/ (which are diphthongised in later OHG).

## Gmc \*/eu/ in OHG and OS

PGmc \*/eu/ undergoes several allophonic developments conditioned by following vocalics (this model draws on the accounts of Braune 2004: §47; Klein 2001: 583; Krause 1971: 74-76; Nielsen 2000: 105, 229; Ringe 2006: 221):

<sup>1</sup> Unless indicated otherwise, all PGmc reconstructions in this paper are based on Orel (2003).

<sup>2</sup> The <ao> digraph is widespread in Bavarian texts of the 8th and early 9th centuries, but is not found in Frankish or Alamannic (Braune 2004: §45 Anm. 2).

1. an allophone \*[iu] appears before a syllable containing a high front vocalic (\*i i: j/), as part of the general raising of PGmc \*/e/ in this context.
2. \*[iu] is also found before a syllable containing a high back vowel (\*u u:/), but not consonantal \*/w/. It is unclear whether this process is directly connected with the preceding one, or is an independent development. It is certainly attested in OHG and OS, and possibly also in early PNorse,<sup>3</sup> which suggests that it may be common NWGmc.
3. an allophone \*[eo] develops before /a/ throughout NWGmc, and (at least in OHG and OS) before /e/ and /o/.

Following the loss of inflectional \*/-a-/, which triggers change (c), the variants can be considered full phonemes \*/iu eo/ (see Findell 2009, I: 20-24 for more detail).

This pattern is retained in OS and in Frankish dialects of OHG. In the Upper German dialects, however, a secondary process interferes with the inherited distribution of variants: \*/eo/ appears only before /h/ < PGmc \*/x/ or a dental/alveolar consonant. Before labial or velar consonants (including /h/ < PGmc \*/k/ via the second consonant shift), the surface form is always /iu/.

The consonant-conditioned alternation may be explained as blocking of the regular *a*-umlaut (\*/eu/ > \*/eo/) by the labial and velar consonants (Braune 2004: §47). We could alternatively regard it as a secondary raising of inherited \*/eo/ triggered by the labials and velars. This appears to be the model which Penzl (1971: 139-140) and Wright (1906: §56) have in mind.

## Runic evidence for the monophthongisation of \*/ai/

The following sequences are believed to contain reflexes of \*/ai/:

1. Freilaubersheim fibula: **wraet** → *wraet* 3.sg.pret. “wrote” (PGmc \*/wrait).
2. Neudingen-Baar fibula: **klef** → *klēf* < \*/klaif/, 3.sg.pret. to PGmc \*/klībanan (> OS *bi-klīban* “to take root”; OHG *klīban* “to adhere, stick to, be fixed to”) (Fingerlin and Düwel 2002: 110).
3. Neudingen-Baar stave: **urait** → *wraet* 3.sg.pret. “wrote” (PGmc \*/wrait).
4. Pforzen buckle: **aigil** → *Aigil* (PGmc \*/aixa > OS *ēgan*, OHG *eigan* “to have, own”);
5. Pforzen buckle: **ailrun** → *Ailrūn*, with the prototheme either *Ail-* (PGmc \*/ailan > OE *āl* “fire”) (Nedoma 2004a: 168-169, 2004b: 345-346; Wagner 1999: 93-94); or else a derivative of *Agil-* (PGmc \*/agez/\*agan > OE *ege* “fear”, or PGmc \*/agjō > OE *ecg*, OS *eggia* “edge”) (Düwel 1997: 283-284, 1999: 45)).<sup>4</sup>
6. Pforzen ring: **urait** → *wraet* 3.sg.pret. “wrote” (PGmc \*/wrait).
7. Schwangau fibula: **aebi** → *Aebi* (PGmc \*/aibijaz < \*/aibō > Langob. *aib* “district”) (Looijenga 2003: 257).
8. Weingarten fibula I: **aerguþ** → *Aergu(n)þ*, prototheme *Aer-* (PGmc \*/aizō > OS OHG *ēra* “honour”) (Looijenga 2003: 262).<sup>5</sup>
9. Weingarten fibula I: **feha** → *Fēha* (PGmc \*/faixaz I<sup>6</sup> > OS OHG *fēh* “coloured, decorated”) / \*/faixaz II (> OHG *gi-fēh* “hostile”) (Arntz and Jänichen 1957: 128; Krause 1966: 306; Opitz 1987: 200); or *fēha* “colourful thing, i.e., rune” (substantivised adjective < PGmc \*/faixaz I) (Schwab 1998: 418-419, 1999: 13-14).

As noted above, it is a matter of debate whether OHG <ae> represents an intermediate diphthong [ae], a monophthong [ɛ:], or simply a free orthographic variant of <ai>. The same

<sup>3</sup> The sole witness to this is **liubu** (Opedal stone, KJ 76), the reading of which is disputed.

<sup>4</sup> While **ailrun** is the most popular transliteration of the Pforzen inscription, the first two runes are unclear, and plausible alternatives **allrun/alurun** have been proposed (Marold 2004: 227; Pieper 1999: 27-35).

<sup>5</sup> Looijenga’s transliteration is at odds with the more popular **alirguþ** (Arntz and Jänichen 1957: 127; Bammesberger 2002: 119; Krause 1966: 306; Nedoma 2004a: 176; Opitz 1987: 49). Nonetheless, in my view both are plausible.

<sup>6</sup> The designations \*/faixaz I, \*/faixaz II are taken from Orel (2003).

may apply to runic **ae**. Our only clear example (Freilaubersheim **wraet**) is geographically separate from the other *wrait rūna* texts, in the Middle Rhine region. The **ae** digraph occurs in a context where we would not expect monophthongisation in OHG. On this extremely scanty evidence we might tentatively postulate a variation between local orthographic traditions and/or dialects. Our other two (possible) **ae** spellings (Schwangau and Weingarten) are both located deep in UG dialect territory, and so are not amenable to this explanation unless it can be shown that the inscriptions were created elsewhere, or that the carvers were speakers of more northerly dialects.

If Looijenga's transliteration of Weingarten I is correct, then **aergub** has **ae** in a context appropriate for monophthongisation in OHG (before /r/). Schwangau **aebi**, on the other hand, does not. As for the **ai** of Pforzen **ailrun** (if this reading is correct), it is clear that this spelling does not reflect a general regional variation, since **ai** is found on the same object. This form cannot be explained as a "pre-monophthongal" phonetic variant, as it does not appear in a suitable phonetic environment.

Neudingen **klef** appears to contain a fully-developed monophthong in a position where it would not be expected in OHG (3.sg.pret. *kleib*, vs. OS *bi-klēf*). It might be that this inscription reflects a more northerly dialect: the representation of /b/ as **f** (representing a fricative allophone [β] ~ [v]) is more reminiscent of OS and MFrk than UG (Braune 2004: §134). The remainder of the text is difficult to read (**klefilp** is generally favoured, with a variety of interpretations turning on a haplographic treatment of **f**; see Findell 2009, I: 261-262), and gives us no clues which would enable us to identify the dialect with any confidence.

The presence of monophthongisation in Weingarten **feha** is widely accepted, although Nedoma (2004a: 293-297) is sceptical, and suggests several alternatives with **e** representing an inherited monophthong (see also Düwel 1989: 44-45). If we are dealing with a reflex of \*/ai/, the following /h/ provides a context suitable for monophthongisation. Given the range of suggested datings for the Weingarten fibula (estimates range throughout the 6th and 7th centuries), it is conceivable that **feha** is a late 6th or early 7th-century form with an advanced monophthongal realisation; but we would need more substantial supporting evidence to give any weight to such a speculation.

The interpretation of **feha** as a product of monophthongisation requires us to explain the apparent discrepancy between the monograph **e** and the **ae** digraph on the same object. We could posit a differential progress of the monophthongisation before /r/ as against /h/, which would be consistent with Braune's remark that diphthongal forms persist before /r/, but not before /h/ or /w/, in the earliest OHG mss. (Braune 2004: §43 Anm. 1).

With so few data, it is impossible to draw any firm conclusions. The only case where we can be entirely confident that we have a reflex of \*/ai/ represented as something other than **ai** is Freilaubersheim **wraet**, possibly explicable as evidence of a dialect in which unconditioned monophthongisation is underway. Weingarten **aergub** looks promising as a case of consonant-conditioned monophthongisation, but – as has been discussed – if we want to claim that the **ae** digraph represents a monophthong or some intermediate diphthong, we cannot simply ignore Schwangau **aebi**: our three **ae**-spellings all require different explanations. If the alternative reading of the Weingarten example as **alirgub** is correct, then we have only two witnesses which could as well be free variants as anything of real linguistic significance.

## Runic evidence for the monophthongisation of \*/au/

The relevant sequences here are:

1. Iging-Unterigling fibula: **aunr?d** → *Aunrād*(?), prototheme *Aun-* (PGmc *\*aujan* > PNorse *auja* "luck", or the derived adjective *\*aunaz/\*aunuz* "good, prosperous" (> OE *ge-ēan* "pregnant")) (Arntz and Zeiss 1939: 299; Krause 1966: 241-242).
2. Lauchheim fibula: **aonofada** → *Aonofada*; or *Aono fa(ihi)da* "Aono made (the fibula? the inscription?)" (PGmc *\*aujan* "luck", or *\*aunaz/\*aunuz* "prosperous") (see Nedoma 2004a: 194-196).
3. Lauchheim comb: **odag** → *ōdag* "rich, fortunate" (PGmc *\*audagaz/\*audigaz*) (Schwab 1999: 20).<sup>7</sup>

<sup>7</sup> The sign which Schwab transliterates **o** is regarded by other commentators as a **g** (Düwel 1998: 16; Looijenga

4. Mertingen fibula: **aun** → *aun* or *Aun-* (PGmc *\*aujan* “luck”, or *\*aunaz/\*aunuz* “prosperous”) (Babucke and Düwel 2001:170).
5. Nordendorf fibula A: **awa** → *Awa* (PGmc *\*aujan* “luck”).
6. Oettingen fibula: **aujabrg** → *Auijab(i)rg*, prototheme *Auija-* (PGmc *\*aujan*) (Düwel 1991: 280; Findell 2009, I: 129-130, II: 112-114; Nedoma 2004a: 137).
7. Pforzen ivory ring: **aodlip** → *Aodli(n)þ*, prototheme *Aud-* (PGmc *\*audaz/\*audan* > OE *ēad* “prosperity, happiness”; OS *ōd* “happiness” (Nedoma 2004a: 191-192).
8. Weimar buckle: **awimund** → *Awimund*, prototheme *Awi-* (PGmc *\*aujan* “luck”).<sup>8</sup>

In this dataset we have two instances of a spelling **ao** (Lauchheim; Pforzen) and (possibly) one of **o** (Lauchheim), all of which occur in contexts appropriate for OHG monophthongisation (before alveolars, /n/ and /d/). On the other hand, we have **au** spellings before /n/ in Igling-Unterigling and Mertingen.

Schwab’s transliteration and interpretation of **odag** has not found wide acceptance (see n. 8), and I do not consider it reliable. The interpretation of the digraphs as reflexes of *\*/au/* is not controversial, yet the variation between **au** and **ao** has received little attention in the literature. Nedoma (2004a: 191-192) regards Pforzen **aodlip** as either an idiosyncratic spelling or a dialectal/sociolectal variant, rather than an intermediate stage in the OHG monophthongisation. He makes no comment on Lauchheim **ao**. I see no obvious geographical pattern that might indicate dialectal variation, and Nedoma does not explicitly adduce any evidence for a social or economic difference between the two spellings (such as differences in the quality and type of grave goods). The available information about dating is too imprecise for us to account for the variation chronologically.

If there is no positive evidence for a regional, social or chronological distinction between the spellings, we should not rule out the possibilities that (i) **ao** (and Lauchheim **o**, if admissible) indicate that monophthongisation is underway, and **au** in the same contexts is an archaic or conservative spelling; or (ii) **au** and **ao** are free orthographic variants, and **o** is either a misreading or does not represent a reflex of *\*/au/*.

## Runic evidence for the developments of Gmc *\*/eu/*

The most striking feature of this dataset is the predominance of the lexical root *\*leub-* “dear, lovely” (whether as the adjective *\*leubaz*, the derived abstract noun *\*liubīn* (> OHG *liubī* “love”), or as a name-element). The only witnesses which do not involve this root are Mertingen **ieok** and Weimar **þiup/wiuw**, both of which involve speculative and uncertain interpretations.

1. Bad Krozingen fibula A: **leub** → *leub* “dear”.
2. Engers fibula: **leub** → *Leub*.
3. Mertingen fibula: **ieok a-** → *jeoka* “fight”(?) (PGmc *\*jeukō* > Go *jiuka* “quarrel”) (Babucke and Düwel 2001: 169-170).
4. Niederstotzingen strap end: **?liub** → *liub* “dear”.
5. Nordendorf fibula A: **leubwini?** → *Leubwini* (or *leub Wini* “dear to Wini”)
6. Schretzheim capsule: **leuba** → *Leuba*.
7. Schretzheim fibula: **leubo** → *Leubo*.
8. Weimar fibula I: **liub(i)**: → *liubī* “love”.
9. Weimar fibula I: **leob** → *leob* “dear”.
10. Weimar bead: **þiup/wiuw** → *þiup* (Verner’s Law alternant of PGmc *\*þeudjaz* “good”) (?) (Krause 1966: 290; Nedoma 2004a: 314).

None of the witnesses provides us with clear evidence for the umlaut-driven split of *\*/eu/* into */iu eo/*. Weimar I **liub(i)** appears to contain a following high vowel, but the transliteration is questionable; indeed, Arntz’ claim that a final *l* is present is partly motivated by the need to

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2003: 265) or else a paratextual mark (Nedoma 2004a: 272).

<sup>8</sup> The two **aw** spellings (Nordendorf **awa**; Weimar **awimund**) are both believed to represent the name-element *A(u)w(i)-* < PGmc *\*aujan* via WGmc gemination of *\*/w/*. Strictly speaking, the digraph **aw** is not simply an alternate spelling of */au/*, but a contraction of the phonemic sequence */auw/* (see further Findell 2009, I: 133-134).

account for the spelling **iu** (Arntz and Zeiss 1939: 365, 367; Findell 2009, I: 74).

If Weimar **piub/wiuw** is allowable as a witness to /iu/ < \*/eu/ (which is doubtful), the initial *i-* of the following sequence *ida* (interpreted as the FN *Ida*) could provide a conditioning environment, if the umlaut process does not respect word boundaries (that is, if juncture is not a barrier to umlaut).

Mertingen **ieok a-** → *jeoka* appears to contain /eo/ conditioned by /-a/. Weimar I **leob** is isolated on a fibula knobs, the relationship to the co-text being unclear. If this is a zero-suffixed reflex of *\*leubaz*, the underlying \*/-a/ would produce /eo/ (→ Frk *leob-Ø*, vs. UG *liub-Ø*). Weimar I **liub(i)** and **leob** can be reconciled if we accept Arntz' reading of an *i*-rune and if we assign the inscription to a dialect in which UG consonant conditioning is not operative.

The most frequent spelling is **eu**, for which we can propose several possible explanations: (i) it is an orthographic archaism; (ii) it consistently represents one of the alternants /iu/ or /eo/; or (iii) it is a free orthographic variant for both of them.

With the exception of Nordendorf **leubwini?**, every instance of **eu** occurs before an overt or underlying non-high vowel, where the umlaut process would regularly produce /eo/. On the other hand, all of them appear in the root *\*leub-*, with a labial consonant which would regularly yield UG /iu/. We could hypothesise that **eu** is either a free variant with **eo** for /eo/, if the consonant conditioning does not apply; or with **iu** for /iu/, if this conditioning does apply. If, on the other hand, we are dealing with a formulaic word *\*leub-* (see, e.g., Schwab 1998), it may be more resistant than other words to phonetically-motivated respelling.

Almost all of the inscriptions containing reflexes of \*/eu/ come from sites well within UG dialect territory (the exceptions being Engers and Weimar). If all of the **eu** forms can be identified as dialectally UG, and if we accept the hypothesis that the UG consonant conditioning has taken place (as it must, if it is to be interpreted in terms of blocking *a*-umlaut, rather than as a later development of /eo/), then **eu** may simply be a variant spelling of **iu** → /iu/; although if this is the case, we might reasonably ask why **eu** is more frequent.

Conversely, if the **eu** sequences can be assigned to a regional dialect or to a chronological stage in which the UG consonant-conditioned change has not taken place, then **eu** might be an orthographic variant of **eo** → /eo/, which leaves us with the same question about frequency.

A simple solution to this is to hypothesise that **eu** is simply an archaism, as discussed above. Alternatively, we could postulate that the UG consonant conditioning is underway, but that in the dialects of the inscriptions it has reached an intermediate stage, with only the off-glide assimilated by the following consonant. This is not plausible in the “blocking” model of the change (in which /iu/ before a labial or velar is simply an inherited \*/iu/ unaffected by *a*-umlaut); but if UG /iu/ before a labial or velar consonant with a following non-high vowel is a secondary development (i.e., PGmc *\*leub-a-* > pre-OHG *\*leob-a-* > pre-UG *\*leob-Ø* > *\*leub-Ø* > UG *liub-Ø*), then it is conceivable that the off-glide \*/o/ is raised under the influence of the following /b/. In Vennemann's account (Vennemann 1972: 879), the dentals and /h/ are transparent to *a*-umlaut because the back of the tongue is relatively low during their articulation. This implies that the labials and velars involve a relatively high tongue posture which attracts the off-glide (\*[o] > \*[u]). The raised off-glide might in turn exert an assimilatory raising of the on-glide \*[e]. A model of this sort does, however, require us to explain the *iu* spellings as either umlaut forms or “advanced” forms of the UG consonant conditioning.

The Engers witness may be problematic for this hypothesis. The find-site is in Frankish dialect territory and there is no evidence that it originated further south (though the possibility cannot be ruled out). The *eu* spelling in this instance is probably best accounted for as an archaism.

Mertingen appears to be anomalous in any model of UG consonant conditioning. Here we have an **eo** spelling with plausible umlaut-conditioning (if juncture is transparent to umlaut), but with a velar consonant, found well within UG territory. The fibula is an imitation of the “Nordic” type, which was probably manufactured in mid- or southern Germany (Martin 2004: 179 n.45). We can, then, cautiously suggest that the Mertingen inscription may originate in an area in which UG consonant conditioning is not operative, and came south as an import.

The doublet of Weimar I **leob**, **liub(i)** is at odds with UG consonant conditioning (regardless of what model we use), unless we claim that the two examples belong to different dialects and are the work of different carvers. This is certainly possible: Nedoma comments

that this inscription and that on the paired fibula (Weimar II) are the work of multiple carvers and therefore contain multiple texts (Nedoma 2004a: 258), although he does not claim that different dialects are involved. The most straightforward explanation for the forms of Weimar I is as umlaut alternants in a non-UG dialect, as I suggested earlier.

The only case where UG consonant conditioning must be operative is Niederstotzingen **liub** (and even this is open to question, the co-text being unintelligible). If we are to claim that the UG distribution of /iu/ and /eo/ is present in the “runic” period, then we have also to find some other way of accounting for Mertingen **eo** (if we are prepared to accept Düwel’s speculative interpretation). Some hypotheses which would account for the data are:

1. The **eu** spellings represent an intermediate \*/eu/ < \*/eo/ (and UG consonant conditioning is a matter of raising triggered by labials and velars, rather than blocking of *a*-umlaut). Mertingen is an import, or an indicator that the raising process affects labials before it affects velars, or does not in fact contain a reflex of \*/eu/. Niederstotzingen is a later witness, with a fully-developed UG /iu/. Engers is an isolated archaism, or an import from the UG area.
2. The **eu** spellings are archaisms in free variation with **iu** → UG /iu/ : **eo** → Frk /eo/, and UG consonant conditioning on either the “umlaut-blocking” or the “raising” model is operative. Mertingen is an import, or is inadmissible (see 1.).
3. UG consonant conditioning is a later development (and must therefore be explained by the “raising” model rather than the “umlaut-blocking” model), attested only in the relatively late Niederstotzingen example. Then **eu** is an archaic spelling which can stand for any reflex of PGmc \*/eu/.

## Conclusions

For each of the PGmc diphthongs, we have alternations between several graphic representations: \*/ai/ → **ai** ~ **aĩ** ~ **ae** (~ **e?**); \*/au/ → **au** ~ **ao** (with **aw** a related form, and one possible – though doubtful – case of **o**); \*/eu/ → **eu** ~ **iu** ~ **eo**. Of these sets of alternants, the reflexes of \*/au/ come closest to matching the conditions for the changes attested in the later dialects (in this case, monophthongisation); but even here, the small quantity of data limits the strength of our conclusions.

Because the conditions for the OHG monophthongisation of \*/au/ are similar to those governing the UG distribution of the reflexes of \*/eu/, we might look for a common phonetic explanation. The runic data are of limited use for this purpose: reflexes of \*/au/ are attested only before alveolars (where the surface form [ao](?) > [ɔ:] is regular in OHG), while we have reflexes of \*/eu/ only before labials and velars (where the surface form in UG is /iu/). The only reflex of \*/eu/ which cannot plausibly be accounted for as a product of umlaut is Niederstotzingen **liub**. If the \*/eu/ data can be explained without reference to consonant conditioning, and if there is no direct overlap between the consonantal environments of the attested reflexes of \*/eu/ and \*/au/, then we do not have grounds to advance a hypothesis in which their distributions can be viewed as part of a single process. This is not to say that (aside from Mertingen **ieok**) the data are inconsistent with a hypothesis in which \*/eu au/ > \*/[iu au] before labials and velars and \*/[eo ao] before dentals and /h/ in UG dialect territory (\*/eo/ appearing only where it is motivated by umlaut).

The appeal to “archaic” or “conservative” spelling in accounting for the form **eu** is superficially appealing, but it presents us with a dangerously easy way to dispose of anomalies. How are we to evaluate the gap between spoken and written language? Who is enforcing the “conservative” orthography, and by what means? The situation differs from that of manuscript production in the OHG/OS period, which we know to have orthographic conventions which can be transmitted through the institutions of the scriptoria. We have no evidence for the existence of comparable institutions governing the production of runic inscriptions.

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