Martin Findell

Phonological Evidence from the Continental Runic Inscriptions

Ergänzungsbände zum Reallexikon der Germanischen Altertumskunde

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Prefatory note

The material discussed in this book is set out in the catalogue (Part II). Inscriptions are referred to throughout the text by their numbers in this catalogue (e.g., 1. Aalen). Where multiple transliterations are available in the literature, these are reproduced in the catalogue; in the main text, I use my own diplomatic transliteration, unless referring directly to that of a particular author.

Contents

Part II: Catalogue

Abbreviations

Abbreviations for languages and linguistic terms

abl. – ablative
acc. – accusative
act. – active
adj. – adjective
Alam. – Alamannic
Av – Avestic
Bav. – Bavarian
C – consonant
comp. – comparative
CLat – Classical Latin
CRun – Continental Runic (see § 1.1.1)
dat. – dative
dial. – dialect
dim. – diminutive
Du – (modern) Dutch
du. – dual
EFrk – East Frankish
EGmc – East Germanic
ePGmc – early Proto-Germanic
fem. – feminine
FN – female (personal) name
Fris – (modern) Frisian
Frk – Frankish
gen. – genitive
Gk – Greek
Gmc – Germanic
Go – Gothic
Hitt. – Hittite
imp. – imperative
ind. – indicative
inf. – infinitive
inst. – instrumental
It – (modern) Italian
Langob – Langobardic
Lat – Latin
LFrk – Lower Frankish
LG – Low German
LLat – Late Latin
lPGmc – late Proto-Germanic
masc. – masculine
MDu – Middle Dutch
ME – Middle English
MFrk – Middle Frankish
MHG – Middle High German
MLG – Middle Low German
MG – Middle German
MN – male (personal) name
modE – modern (standard) English
modG – modern (standard) German
N – nasal
neut. – neuter
NFris – North Frisian
NGmc – North Germanic
nom. – nominative
Norw – Norwegian
NWGmc – Northwest Germanic
OCSl – Old Church Slavonic
ODan – Old Danish
OGo – Ostrogothic
OE – Old English
OEN – Old East Norse
OHG – Old High German
OLF – Old Low Franconian
ON – Old Norse
opt. – optative
OS – Old Saxon
Osc – Oscan
OWN – Old West Norse
part. – participle
PCelt – Proto-Celtic
pers.n. – personal name
PGmc – Proto-Germanic
PIE – Proto-Indo-European
PItal. – Proto-Italic
pl. – plural
p.n. – place name

PNorse – Proto-Norse
pres. – present tense
pret. – preterite
R – resonant (i.e., liquid, nasal or semivowel)
RFrk – Rhine Frankish
RN – river name
sg. – singular
Skt – Sanskrit
subst. – substantive
T – tenuis (voiceless) obstruent
Toch – Tocharian
UG – Upper German
Umb – Umbrian
V – vowel
Vand – Vandalic
voc. – vocative
W – (modern) Welsh
WFrk – West Frankish
WGmc – West Germanic

Abbreviations for sources

An – Antonsen 1975.
AZ – Arntz and Zeiss 1939.
BR – Braune and Reiffenstein 2004.
BT – Bosworth and Toller 1898.
CIL – *Corpus Inscriptionum Latinarum*.
DOE – *Dictionary of Old English* (University of Toronto).
DR – *Danmarks runeindskrifter* (Jacobsen and Moltke 1941–1942).
Graf – Graf 2010.
Grün – Grünzweig 2004.
IK – *Ikonographische Katalog* (Clavadetscher et al. 1984–1989).
IRF – *Inscriptions runiques de France* (Fischer 2007).
KJ – Krause and Jankuhn (Krause 1966).
L – Looijenga 2003a.
Ma – Martin 2004.
O – Opitz 1987.
OED – Oxford English Dictionary.
RMR – *Runes, Magic and Religion* (McKinnell et al. 2004).
Sch – Schwerdt 2000.
SUR – *Die Sprache der urnordischen Runeninschriften* (Krause 1971).
Vulg. – Vulgate Bible

Part I: Text

1. The Continental runic inscriptions

1.1 General introduction

The object of study for this project is a corpus of 90 runic inscriptions produced on the Continent between the 5th–7th centuries A.D. These inscriptions, all of which (apart from the Kleines Schulerloch cave inscription) contain short texts on portable objects, provide us with some of our earliest data for the dialects from which the German language developed. The period of production occupies a significant position in the history of the Germanic language family, being (according to Klein 2001:579–580) the period in which the more-or-less unified NWGmc continuum broke up into the dialect groups which we classify as the distinct Gmc languages.

The runic inscriptions, then, constitute a body of data representing a set of dialects at some stage of development between a relatively homogeneous NWGmc (itself a daughter of lPGmc), and the dialects attested in mss. which are classified as OHG (attested between the 8th–11th centuries)[1] and OS (attested between the 9th–12th centuries). Some reference will be made to OLF, OFris and other Gmc dialects, as appropriate. Given the distribution of the epigraphical material in what is now southwestern Germany (Map 1), OHG (and especially UG) is of greatest relevance.

My goal is, so far as is possible, to reconstruct the phonological system(s) of the dialects attested in the inscriptions. If a dialect is understood to be, from a phonological point of view, a cluster of regular sound changes relative to the system of a pre- or proto-language, then the dialects of the inscriptions are likely to involve at least some of the sound changes which distinguish OHG and/or OS from NWGmc. Since we have more complete reconstructions of lPGmc than of NWGmc, the former will be our starting point. In § 2, I briefly describe the lPGmc phonological system and identify the major sound changes which produce the daughter systems in OHG and OS. The core part of the study (§§ 3–7) examines closely the epigraphical evidence for

1 The term OHG conventionally covers the set of dialects in which the Second Consonant Shift is active to some extent (§ 2.5.1.2). Within OHG are two major subgroups: UG (Alam., Bav.) and MG (the various Frk dialects) (BR §§ 4–7).

these sound changes. In the final chapter (§ 8), I bring the conclusions of the preceding analyses together in order to give an overview of the vocalic systems attested in the inscriptions.

1.1.1 The dialect(s) of the inscriptions

The choice of a label for the dialects represented in the Continental inscriptions has been a topic of some controversy (see Nedoma 2004a:12; 2006a:110–112). Various authors have described them as "South Germanic", "Continental West Germanic", "*Düdisch*", or "pre-OHG/pre-OS". None of these labels is without problems, and it might be prudent to avoid the use of a single term altogether. It is probably safe to allow that we are dealing with a set of closely-related WGmc dialects, while recognising that a few of the inscriptions (notably 15. Charnay) appear to show EGmc features; some are classified with greater or less certainty as PNorse;[2] and still others, while WGmc, may contain features associated with OFris and/or OE, rather than OHG or OS. Although the notion of an "Anglo-Frisian" dialect unity is now generally rejected, a distinction may be drawn between an "Ingvaeonic" (I would prefer to say "coastal") as against an "inland" group of WGmc dialects (Parsons 1996; 1999:101–109; Stiles 1995). This is not to say that the two are entirely discrete, of course: OS shares features with OFris and OE, although it is more closely related to OHG.

Given the concentration of find-sites in southwestern Germany, we are (probably) mainly concerned with the "inland" dialect group, from which OS and OHG developed. Where there are indications that we may be dealing with features associated with the "coastal" dialects, these are discussed in the text. Inscriptions which are identifiably Frisian from a runological point of view have been excluded from the corpus (§ 1.2.2).

Where it is necessary to use a label to refer to the set of "inland" WGmc dialects represented in the inscriptions, I have opted for the term "Continental Runic" (CRun). This is an intentionally vague label created for the sake of convenience; it does not necessarily imply a discrete or complete linguistic entity.

2 I have followed convention in using the term "Proto-Norse" when referring to the language attested in the early Scandinavian runic inscriptions, in spite of the well-founded objections expressed by, e.g., Antonsen (2003:12–13). The term "Northwest Germanic" I reserve for a reconstructed stage of language.

1.1.2 Chronology and dating

Dating the Continental runic inscriptions to a period between the 5th–7th centuries is not controversial. However, the dating of finds is imprecise: different sources often give widely varying dates for a particular inscription, and in many cases fail to distinguish between the date of a grave and that of an inscribed item's manufacture, or to state explicitly the type of evidence on which the dating is based. I am therefore inclined to treat the matter with caution and avoid using chronology as a criterion for subdividing the corpus. Except where we have a more secure basis for dating, such as a *terminus post quem* gleaned from coin evidence or dendrochronology, I regard all dates as tentative. I shall, however, make reference to the suggested chronologies used in the literature. For further discussion of the problems surrounding the dating of the material, see Hills (1991:31–46); Roth (1981a; 1998).

Nedoma (2004a:183–184) lists the following inscriptions as relatively late: 3. Arlon; 7. Bad Krozingen A; 53. Neudingen-Baar I; 55. Niederstotzingen; 62. Pforzen II; 70. Schwangau; and 90. Wurmlingen. All of these have been assigned dates of c.600 or early 7th century. 76. Stetten stands out as being much later (c.680/690 – see catalogue), a date which in Nedoma's view (*ibid.*) argues against the runic character of this item.

Often in the literature, date-ranges are stated as a given, without further comment. Many datings rely on poorly-justified and questionable assumptions about sound changes. For example, Arntz (1937:8) assigns 65. †Rügen to the 5th century on the basis of a supposed link to the bracteate tradition, namely what he sees as a textual parallel between Rügen **giu** and 27. Geltorf II **gwu** (see entries in § 7.1.1.1). This parallel is at best speculative, and given the questionable authenticity of the Rügen item, the dating rests on very unsteady ground.

Even where we can be more confident of a dating, it is rare for the sources to narrow the date-range down to a period shorter than 50 years. When the entire period of runic activity on the Continent is at most 250–300 years (the earliest finds being c.400; the latest, Stetten c.680–690), and given the disagreements about dating in many cases, it is not possible to establish a clear relative chronology. Nevertheless, beside the list of items normally dated to the 7th century, we can compile a list of those normally dated before c.500. These are 1. Aalen; 49. Liebenau; 78. †Trier; 85–87. †Weser I–III.[3] The corpus also includes a number of bracteates, for which the conventional date-

3 Here again, we are dealing with datings based on a wide range of criteria. The Weser bones, for instance, have been subjected to amino acid and ^{14}C analysis, but these methods produce divergent results which Pieper (1989) attempts to reconcile using art-historical comparisons.

range c.450-c.550 is given: 27. Geltorf II; 33. Heide; 35. Hitsum; 71. Sievern; 72. Skodborg; 73. Skonager III. The remaining inscriptions, comprising the bulk of the corpus, are mostly assigned dates in the 6th century.

1.1.3 Reconstructing and representing PGmc

It is not my intention to become deeply involved in the problems surrounding the phonological reconstruction of PGmc. Individual authors use a variety of conventions in their representation of proto-forms, not least because the phoneme inventory is in dispute. Except where quoting from another source, I follow the reconstructions of Orel (2003). I represent the consonants as */p t k b d g f θ x s z m n l r/ (§ 2.4), the short vowels as */i e a u/, the long vowels as */ī $\bar{e}_1$ $\bar{e}_2$ ō ū/ and the diphthongs as */ai au eu/ (§ 2.2). Antonsen (1972:118) argues that it is impossible to determine whether the two subsystems traditionally labelled "short" and "long" were actually distinguished in terms of quantity, tenseness or a combination of the two. Although I prefer to adhere to the conventions of IPA notation in phonemic representations, I follow Antonsen's practice of marking the long/tense vowels with a macron, rather than commit to the use of the IPA length marker, which would imply that quantity alone is the distinguishing feature of this subsystem. In the text, however, I retain the traditional terms "short" and "long" for the sake of simplicity and in deference to philological convention. The resulting compromise is less than satisfactory, but in a study which is primarily concerned with developments in a phonological system, rather than with phonetic details, its consequences are not significant.

When citing proto-forms for stems or whole words, I use italic script rather than a phonemic representation, in order to avoid making unwarranted assertions about the character of the consonants. Where it is necessary to discuss specific phonetic developments, I use IPA notation for individual segments. Inflected forms are based on the reconstructions of Lehmann (2005–2007) and Ringe (2006). When referring to a nom.sg. *n*-stem in discussions of etymology, I use Orel's citation form in *-ōn*. The actual reconstruction of the *n*-stems is a point of disagreement among my sources; for further discussion, see Findell (2010); Ringe (2006:274–276).

1.1.4 Orthography and phonology: the relationship of grapheme to phoneme

Although this project focuses on forms attested in the epigraphical data, it is inevitably dependent on the tradition of philological work on the Gmc languages, and especially the work on the Continental dialects. In this tradition it is axiomatic that the phoneme is the fundamental unit of the linguistic system; that sound change is regular across a dialect area; and that orthographic variation is phonologically significant in most cases, allowing for such factors as scribal error, the interference of Latin and/or Gallo-Romance orthographic traditions, and analogy. While I have no intention of discarding these axioms, it is necessary to bear in mind the imperfections of the writing system both in principle and in practice. The notion of a "perfect fit" between the graphemic and phonemic systems might have some validity at the point of creation of the writing system (see, for example, Antonsen's (1972) account of the runic vowel graphemes in relation to the lPGmc vowel system); but as spoken language changes over time and as the same set of graphemes is used to represent a variety of dialects, the writing system must either be adapted or become less intimately aligned with the sound system. Especially when dealing with vowels, we may well have a system in which two phonemes have allophones which are sufficiently similar to allow varying graphic representations. If, for example, /a/ has a raised front allophone [æ], and /e/ has a relatively open allophone [ɛ], and the only available graphemes for representing these sounds are <a> and <e>, it is to be expected that the data will show some apparently confusing alternations between the two.

The other issue is that of practice: when we are dealing with a tradition in which orthographic conventions are not rigidly enforced, there will inevitably be a certain amount of "noise" in transmission as individual language users make their own decisions about how best to represent a particular sound or group of sounds. Individuals are prone to idiosyncrasy and error, and may be operating in a culture where errors or incidental variations are not given much importance.

I am not at this stage primarily concerned with making statements about general phonological theory, or with testing particular theoretical models. If linguistics is to consider itself in any way scientific, then its theories must stem from the analysis of real data. When we come to deal with runic inscriptions, often we are faced with difficulties in deciding what the data represent, and it is impossible to read a text without making certain assumptions about how the language works. Nonetheless, I do consider some of the models which have been proposed to explain particular sound changes; and I discuss the matter of what constitutes evidence for or against a hypothesis, and whether such evidence exists in the inscriptions.

1.2 The corpus of runic inscriptions

Although it is well known that the set of runic inscriptions classified as "Continental" or "South Germanic" is concentrated in the region of the upper Rhine and upper Danube, individual authors differ in their view of the extent of that material. As was mentioned in the introduction, we are dealing almost exclusively with inscriptions on portable objects; it follows that the location of a find is not necessarily an indicator of where the object was manufactured, nor where the inscription was produced. Although geographical boundaries have been placed on the corpus (§ 1.2.1), it must be recognised that these boundaries are porous. I have therefore included some items not normally considered part of the "Continental" or "South Germanic" runic corpus. Conversely, some items included in other corpora of Continental material (compare An; AZ; KJ; L; O) are omitted, in most cases on the grounds of intelligibility. A particular inscription is included in the corpus if it meets all of the following criteria:

1.2.1 Geographical and chronological context

The study incorporates material from a geographical area with no fixed western or southern boundaries. I have set as the northern limit of the area the line of the Danevirke. Although this fortification postdates the "runic" period (the earliest phase of construction is dated dendrochronologically to c.737 (Wilson 1978:3–7)), its placement exploits existing natural boundaries (Andersen et al. 1976; Andersen 1998; Wilson 1978). Klein (2001:579) identifies the Eider as the boundary between NGmc and WGmc dialect areas.

The eastern boundary of the study area is the Oder, corresponding to the boundary between archaeologically distinct Germanic groups conventionally identified as *Elb-Germanen* (or *Herminones*, after Tacitus) and *Oder-Weichsel-Germanen* or *Ost-Germanen* (Robinson 1992:17; Waterman 1966:43). Whether this river necessarily marks a boundary between WGmc and EGmc dialect areas is open to question.

All runic inscriptions found within the study area are included in the corpus, unless it can reliably be shown that they are written in non-WGmc dialects (e.g., if they attest the PNorse retention of lPGmc inflectional */-z/). Items conventionally identified as linguistically PNorse or EGmc are included if a WGmc interpretation of the inscription cannot be ruled out. For example, although the word *alu* is well-attested as part of the Scandinavian tradition, it is at least conceivable that a WGmc cognate (loanword?) is contained (or at least understood) in the Continental examples.

Conversely, finds from outside the area will be included in the corpus if there are reasonable grounds for believing that an "inland" WGmc dialect may be represented. Where this is unclear, the item is included and discussed in the appropriate parts of the text.

Several finds from the Low Countries and England have been included, even though they may belong to the "coastal" rather than to the "inland" group of WGmc dialects. Finds from this area are excluded only if they fall outside the time period of the study, or if they contain additional runes which would identify them as Frisian or English (§ 1.2.2).

An item is included if it is datable within the period c.400-c.700 A.D. This period covers all of the material conventionally classed as "Continental" or "South Germanic" (see § 1.1.2).

1.2.2 Content and graphology

An inscription is included only if it can reliably be identified as runic (objects with isolated rune-like carvings are excluded), and if it contains what might conceivably be an intelligible text (even if no interpretations are available). Uninterpretable inscriptions are excluded, as are the fuþark inscriptions from Breza (AZ 8; KJ 5; L VII.10; O 8) and Trossingen (Theune-Großkopf and Nedoma 2006).

The corpus contains only inscriptions written using the 24-letter Older Fuþark. Those using the innovative English and Frisian runes are excluded, as the addition of these runes reflects sound changes peculiar to the "coastal" dialects (Parsons 1996; Stiles 1995).

I have excluded one item from the corpus on the grounds of interpretability: the Bergakker scabbard mount (L IX.7) has been the subject of lengthy debate (see especially Bammesberger and Waxenberger 1999); however, its transliteration and linguistic interpretation remain so controversial that it cannot readily be evaluated for the purposes of this project. This is, admittedly, an *ad hoc* exception to the criteria stated above, but the inclusion of this item would necessitate lengthy discussion yielding very little of value to the aims of the project.

1.2.3 Authenticity

Several runic inscriptions have at one time or another fallen under the suspicion of being modern forgeries, and some of these are almost entirely ignored in the runological literature. I feel it appropriate to include in the corpus those items which are suspect but which have not been rigorously shown to be fakes: for example, the serpentine object from Trier (almost universally dismissed, though on unclear grounds) is included, while the Maria Saaler Berg bone inscription (exposed by the admission of the forger and by subsequent chemical analysis) is not (Düwel 1994c:104–105; Nedoma 2004a:389).

The items whose authenticity is in doubt are marked in the text with a superscript dagger †. I have chosen to include them for the sake of completeness, bearing in mind that attempts have been made in recent years to rehabilitate some of them. By including these items I do not mean to endorse them, but merely to allow that they may be worthy of discussion. They must be treated with caution, and it would be imprudent to allow any arguments about the language of the inscriptions to rely heavily on these witnesses. The arguments for and against authenticity are discussed briefly in Appendix 2.

2. Phonology and runic orthography

2.1 Introduction

The main part of the study takes as its point of departure the vocalic system of lPGmc, as far as it can be reconstructed. In the present chapter, this system will be outlined (§ 2.2), as will the developments which produced the vocalic systems of OHG and OS (§ 2.3). The subsequent chapters will then examine the runic data in detail to search for and evaluate the evidence for these sound changes.

2.2 The vocalic system of lPGmc

As noted above (§ 1.1.3), there is no complete consensus on the proper reconstruction and representation of the PGmc vocalics. In this section I shall outline the phonological system from which the later analyses will proceed.

2.2.1 Short vowels

*/i/ */u/ = *[u ~ o]
*/e/
*/a/

The phonemic status of */i/ and */e/ has been disputed (e.g., by Moulton 1961:6–12); Lehmann (2005–2007 § 2.7.1) argues that they are distinct phonemes because, although their distribution is to a large extent complementary, we have near-minimal pairs such as PGmc **etanan* "eat" vs. **witanan* "know"; and both of them can occur before */a/ and */u/ in following syllables (*/i/ and */e/ are not simply umlaut variants). The 4-member system of short vowels is also accepted by Antonsen (1972:132–133), van Coetsem (1994:46), and Ringe (2006:214, 220–225).

For the purposes of this study, I assume that */i/ and */e/ are separate phonemes, while recognising that they may not always be distinguishable. When

citing proto-forms, I follow Orel's (2003) reconstructions, unless stated otherwise. Orel acknowledges the difficulties in distinguishing between the two phonemes, and admits that some of his own reconstructions are "close to arbitrary" (2003:xii).

Within PGmc, underlying */e/ is raised to */i/ in unstressed positions (except before */r/). This applies only to those cases where a particular syllable may be either stressed or unstressed following the Gmc accent shift, such as the pronouns: PGmc **'ek* ~ **ik* > ON *ek*, OE *ic*, OHG *ih*; PGmc **'mek* ~ **mik* > ON *mik*, OE *mec*, OHG *mih* (Ringe 2006:220). OHG seems to generalise the */i/-forms (*ih, mih, dih*), while OS shows some variation, possibly as a consequence of competing orthographic influences (*ic* ~ *ec, mî* ~ *me* ~ *mik, thic*). On the general development of these phonemes in OHG and OS, see §§ 2.3.3.1–2.3.3.2.

ePGmc stressed */e/ is also raised to lPGmc *[i] before a syllable-final nasal; and before a syllable containing a high front vocalic (van Coetsem 1994:88–93; Ringe 2006:220, 224). Since this is a purely allophonic process, I have retained the representation **e* when citing proto-forms from Orel (2003), e.g., **weniz* "friend", **fenþanan* "find" (compare Ringe's (2006) **winiz, *finþanǫ*).

PGmc */u/ has allophones conditioned by the vowel of the following syllable: */u/ = *[u] before a high vowel, *[o] before a non-high vowel (unless a nasal consonant intervenes).

I have characterised PGmc */a/ as low and central.[1] It is not my intention to endorse any particular theory about the PGmc value of this vowel; we could define it negatively as that vowel which belongs to the short/lax subsystem of the PGmc vowel system and which is distinguishable from the back/round vowel */u/ (→ *[u o]) and the front/spread vowel(s) */i e/ (or */i/ → *[i e]). Antonsen (1972:110; 1975:122–123) posits three umlaut allophones for */a/: *[æ] in a high-front environment; *[ɑ] in a high-back environment; and *[ə] in a combined high-front and high-back environment.

1 According to van Coetsem (1994:82–83), lPGmc */a/ represents a centralised or neutralised reflex of ePGmc */ɔ/. Since the reconstruction of PGmc is not our object here, I do not intend to discuss this proposal further.

2.2.2 Long vowels

*/ī/	*/ū/
*/$\bar{e}_2$/	*/ō/
*/$\bar{e}_1$/	
*/ā/ (< */anx/)	

The evidence of Latin loanwords on the one hand, and of the umlaut effects triggered by non-root vowels on the other, indicates that the PGmc reflexes of PIE */ē ō/ were relatively low; consequently, Antonsen represents them as */ǣ/ and */ɔ̄/ (1972) or */ɒ̄/ (2002), respectively. In my own text, I use the more traditional notation */$\bar{e}_1$ ō/ (compare Lehmann 2005–2007 § 2.2, § 2.7.3; Orel 2003:xii; Ringe 2006:214).

*/$\bar{e}_1$/ (< PIE */ē/) is to be distinguished (at least in terms of its history) from another long/tense mid front vowel conventionally notated */$\bar{e}_2$/. The origin of */$\bar{e}_2$/ and its place in the history of PGmc is a subject of debate which need not concern us in this study (see Antonsen 1972:131; van Coetsem 1994:98–113, 114–118; Connolly 1979; Vennemann 1994b:208–212).

A process of nasal assimilation with compensatory lengthening affects PGmc */i a u/ before */nx/ in the later stages of the proto-language (Antonsen 2002:28; Ringe 2006:149–150, 215–216; see also § 2.4): */inx/ > */īx/; */unx/ > */ūx/; */anx/ > */āx/. The last change produces a long low vowel */ā/, which is not normally treated as part of the phoneme inventory of PGmc as it is a late development (though one which can plausibly be ascribed to lPGmc as it appears in all the dialects, e.g., PGmc **xanxanan* > Go *hāhan*, OE *hōn*, OFris *huā*, OS OHG *hāhan* "hang") and occurs only in this restricted context.[2]

2.2.3 Diphthongs

Conventionally, the lPGmc vowel system contains 3 diphthongs which concern us:

*/eu/ */ai/ */au/

2 Ringe (2006:214, 258) identifies another */ā/ as an alternant with */ai/ in the pres. stem-formant of class III weak verbs. Since no verbs of this class are attested in the inscriptions, I shall not comment further on this point.

A fourth diphthong */ei/ can be reconstructed for earlier stages of PGmc, though since this merges with */ī/ in lPGmc, it is not relevant to the present project (van Coetsem 1994:94–95; Lehmann 2005–2007 § 2.7.4).

Lehmann (2005–2007 § 2.2, § 2.7.3) and Ringe (2006:214) reconstruct a phoneme */eu/ with an umlaut allophone *[iu], while Antonsen (1972) and Moulton (1961) treat them as distinct phonemes, */eu iu/. Antonsen justifies his reconstruction by reference to Scandinavian runic data: Darum V bracteate (An 56; IK 43; KJ 104) **niujil** vs. Opedal (An 21; KJ 76) **leubu** (1972:129–130). Aside from the reading of Opedal **eu** vs. **iu**,[3] these forms are not in contrastive distribution, and can perfectly well represent allophones of a single diphthong selected by the frontness or backness of the following vowel.[4]

2.2.4 On the distinction "front" vs. "back"

In §§ 4–6 I group the non-diphthongal vocalics (i.e., the monophthongs and the semivowels) into 3 sets which I label "back" (*/u ū ō w/), "front" (*/i e ī $\bar{e}_1$ $\bar{e}_2$ j/) and "low" (*/a ā/). In referring to a distinction between "front" and "back", I am employing the terms of traditional philology. Antonsen (1972:132–133) argues that the contrasts of PGmc */i e/ vs. */u/ and */ī $\bar{e}_1$ $\bar{e}_2$/ vs. */ū ō/ are properly characterised by the opposition "spread" vs. "rounded". The basis of his argument is that all of these phonemes have umlaut allophones which differ from the underlying form in terms of frontness/backness, but which preserve the contrastive feature of roundedness: thus, for example, *[y] appears as a front allophone of */u/; although it is front, it retains the contrastive feature of rounding, and so speakers perceive it as underlying */u/, not */i/. The vowel which I have characterised as "low" (i.e., */a/) is in this view neither spread nor rounded, though it has both rounded and unrounded allophones *[ɒ æ].

For the purposes of the current project, the point is moot, since we are concerned only with the practical contrasts between members of the system, whereas Antonsen is approaching the question with the aim of specifying features within a generative phonology framework. My groupings "back",

3 Antonsen's reading here diverges from the more widely-accepted **liubu** (compare, e.g., Krause 1966:175–176; Nielsen 2000:105).

4 A particular author's decision to reconstruct one diphthong */eu/ or two */iu eu/ is not directly related to that author's reconstruction of one or two short front monophthongs, */i/ or */i e/ (§ 2.2.1).

"front" and "low" correspond to the sets of phonemes which, if we were to use Antonsen's features, would be specified as [-spread +rounded], [+spread -rounded], and [-spread -rounded].

2.3 The vocalic systems of OHG and OS

This section outlines the developments of the lPGmc vocalics in the later Continental dialects. The vocalic system is here subdivided on the basis of the contrasts diphthong/back/front/low, the same set of categories used in the core chapters (§§ 3–6). I have avoided subdivision into long vs. short subsystems at this point because we are turning our attention from phonological properties to rune-orthographic evidence, and there is no graphemic distinction between long and short vowels. Furthermore, the sound changes described in this section involve changes in vowel height, but the distinction back/front/low in the non-diphthongal vocalics seems to be relatively stable.

2.3.1 Diphthongs

2.3.1.1 PGmc */eu/

PGmc */eu/ undergoes a number of allophonic (and ultimately phonemic) splits, which are not always clearly distinguished from one another in the literature. They can be outlined as follows:

1. Umlaut variations (subject to restrictions outlined in 2.):

a. Development of an allophone *[iu] before a syllable containing a high front vocalic (*/i ī j/), as part of the general raising of PGmc */e/ in this context (§ 2.3.3.2) (Ringe 2006:221).
b. Development of *[iu] before a syllable containing a high back vowel (*/u ū/; consonantal */w/ does not trigger this change). It is not clear 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,[5] which suggests that it may be common NWGmc (Klein 2001:583; Krause 1971:74–76; Nielsen 2000:105, 229).
c. Development of an allophone *[eo] before /a/, and (at least in OHG and OS) before /e/ and /o/ (BR § 47; Klein 2001:583; Krause 1971:74–76; Nielsen 2000:229). Within PGmc, the allophone *[eo] is parallel to the open allophone of PGmc simplex */u/ → *[o] (§ 2.3.2.1).

5 The sole witness to this is Opedal **liubu**, the reading of which is disputed (§ 2.2.3).

Van Coetsem (1994:47, 94–98) has a different take on the chronology of these variations: in his reconstruction, lPGmc */eu/ first develops the *a*-umlaut allophone *[eo]; the remaining *[eu] is then generalised to *[iu], with *[eu] preserved before a high back vocalic.

If *[eo] is the product of *a*-umlaut, then it must become phonemic after the loss of the conditioning environment (i.e., deletion of unstressed */a/ in final position or before final */z/, common to the background of all the WGmc dialects).[6]

2. Consonant-conditioned variations in OHG:

a. In UG, the variant */eo/ appears only where the following consonant is a dental/alveolar, or /h/ < PGmc */x/. Before labial or velar consonants (including /h/ < PGmc */k/ via Second Consonant Shift; see § 2.3.1.3.1), the surface form is always /iu/.
b. In Frk (and in OS), the umlaut-derived variations described above apply regardless of the consonantal environment.

Braune and Reiffenstein follow Vennemann's explanation (1972:879) that because the dental consonants and /h/ involve a relatively low position of the back of the tongue, they are more amenable to lowering of the back off-glide. Whether or not we accept this, the consonants before which /eo/ appears in UG are the same ones which condition the monophthongisation of PGmc */au/ in OHG (including Frk) (§ 2.3.1.4.1). The consonant-conditioned alternation is conventionally characterised as blocking of the regular *a*-umlaut (*/eu/ > *[eo]) by the labial and velar consonants (Armitage 1911:121 § 275; Braune 1877:557; BR § 47). We could alternatively explain 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.

Whatever the theoretical underpinning of the UG consonant-conditioned variation may be, it produces the following surface patterns:

6 I leave aside the theoretical question of the motivation for phonologisation. For discussion and criticism of the dominant model, in which allophones become phonemes as a consequence of the loss of the conditioning environment, see Liberman (1991). That variants must be phonemic subsequent to the loss of the conditioning factors is not disputed; the argument is therefore not of direct relevance to our present object, namely the reconstruction of a phonemic system at a stage postdating this loss.

*/eu/ + (labial or velar) + (non-high vowel):	Frk *riochan; fliogan; klioban; liob; thiob.*
	UG *riuhhan; fliugan; chliuban; liup; diup.*
*/eu/ + (dental or /h/) + (non-high vowel):	Frk *biotan; siodan; niozan; kiosan; lioht.*
	UG *biotan; siodan; niozan; kiosan; lioht.*
*/eu/ + (labial or velar) + (high vowel):	Frk *liubī.*
	UG *liupī.*
*/eu/ + (dental or /h/) + (high vowel):	Frk 1.sg. *kiusu.*
	UG 1.sg. *chiusu.*

Where the surface form has no following vowel, the presence of /eo/ in Frk is conditioned by underlying inflectional */a/ (*liob, thiob, lioht* < PGmc **leubaz, *þeubaz, *leuxtan*). In the adjectives, the disappearance of the nom.sg.fem. suffix (/-u/ < PGmc */-ō/; see § 2.3.2.3; § 4.4) results in an analogical form based on the masc. form, rather than a preserved /-iu-/ form (i.e., PGmc **leubō* > pre-Frk **liubu* → Frk *liob-Ø*).

The spelling <eu> does appear alongside <iu> in early (8th c.) OHG mss., and Frk pers.ns. in 6th–7th c. Lat mss. show free variation between <eu> and <eo> (BR § 47 Anm. 1). Occasionally, Frk mss. have forms like *liub* alongside regular *liob, liab*. Because they only appear sporadically, these are probably variants influenced by UG orthography, rather than evidence for the spread of UG dialectal forms (BR § 47 Anm. 4).

Both variants undergo further developments during the OHG period: early OHG /eo/ > /io/ > /ie/ = [iə] (BR § 48; Penzl 1971:137–138), merging with the diphthongal reflex of PGmc */$\bar{e}_2$/ (§ 2.3.3.5). /iu/ is monophthongised > /y/ (BR § 49). Since the first of these changes is conventionally dated to the 9th century and the second not until the 10th, they are unlikely to be relevant to this study, though they should not be ruled out absolutely. We have, for example, occasional <u> spellings in early sources which may indicate monophthongal reflexes of /iu/, e.g., *zūhit* 3.sg.pres. to *ziohan* "to draw, pull" (St. Gallen *Abrogans*, late 8th c. (Gibbs and Johnson 2000:27)).

The system in OS is essentially the same as that in Frk (Gallée 1910 §§ 102–108; Holthausen 1921 §§ 101–105). Inherited /eu/ is normally preserved word-finally, or before /w/ followed by a non-high vowel (e.g., *treuwa* "faith"); and the OS sources show some (analogical?) variation in the distribution of variants. Holthausen cites occasional forms with <iu> where we

would expect <eo> ~ <io> (e.g., *sniumo* ~ *sliumo* "quickly" from either the adj. **sliunig* or the verb **sniumjan* (: Go *sniumjan* "hurry"; OHG *sniumen* "to expedite", < PGmc **sneumjanan*)); and (more commonly) the converse (e.g., *liohtean* "to shine", by analogy with *lioht* "light"). As in OHG, the form of nominal and adjectival stems is usually generalised from the nom.sg.(masc.) (e.g., *liof* "dear", dat.pl. *lioƀun*; *thiod* "people", dat.sg. *thiodu*) (Holthausen 1921 § 103 Anm. 2–3).

2.3.1.2 The NWGmc monophthongisation of unstressed */ai/ and */au/

In OHG and OS, as in all of the NGmc and WGmc dialects, the reflexes of PGmc */ai/ and */au/ are monophthongal in unstressed position (e.g., OS *dag-e*, OHG *tag-e* "day" (dat.sg.) < PGmc **dag-ai*). This monophthongisation may belong to the common NWGmc stage: lPGmc */-ai/ > */-ǣ/ > NWGmc */-ē/; lPGmc */-au/ > */-ɔ̄/ > NWGmc */-ō/ (Antonsen 1970:315–316; Syrett 1994:271–276). The problem, as regards the Scandinavian Older Fuþark material, is that for reflexes of unstressed */ai/, we have variation between digraphic **-ai** and monographic **-e**. The only witness to a reflex of unstressed */au/ is on the Vetteland stone (KJ 60) **magoz** → *magōz* "kinsman" (gen.sg.) (< PGmc **magauz*). Both Antonsen and Syrett take the view that monophthongisation has taken place in the period of the earliest inscriptions, and that the (relatively few) digraphic spellings are archaisms.

Although the immediate output of the NWGmc monophthongisation is a long vowel, the quantity of the reflexes in OHG is not entirely clear. Braune indicates that inherited long vowels remain long in unstressed final position in OHG at least into the 9th century (BR §§ 56–58). The cognates in OS are short (Gallée 1910 § 112, § 114; Holthausen 1921 § 150, § 152).

The shortening of unstressed vowels is a tendency attested throughout Gmc, and believed to result from the Gmc accent shift (Birkmann 1995:167; Prokosch 1939:133–140); as to the chronology, Prokosch states that "during the first two or three centuries A.D., … final syllables lost one mora. About five hundred years later a second mora was lost" (1939:133).[7] Since our runic inscriptions were produced in the 5th–7th centuries – that is, in the period during which (according to Prokosch) a general process of mora reduction was underway – the quantity of the monophthongal reflexes of unstressed */-ai/

7 The validity of the hypothesis that PIE had trimoric vowels is disputed, and I do not intend to discuss it here: see Antonsen (2002:254–256); Lane (1963); Prokosch (1939:132–133). That PGmc */-ai/ in unstressed final position regularly produces a short monophthong in the later dialects is not controversial.

cannot be evaluated *a priori*. Given that the runic writing system does not have any means of marking vowel-quantity (except perhaps with a digraph, and there is little, if any, evidence that carvers ever employed such a device), it is unlikely that the inscriptions will shed any light on this problem.

2.3.1.3 PGmc */ai/ in OHG and OS

A further monophthongisation process affects stressed */ai/ in both OHG and OS. The resultant monophthong is conventionally represented *ē* or *ë* in the handbooks.

The "coastal" WGmc dialects also show monophthongisation of */ai/: in OE, /ai/ > /ā/ unconditionally (Campbell 1959 §§ 132, 134). OFris monophthongisation is also unconditioned, but the reflexes show an alternation /ā/ ~ /ē/, which has not been adequately explained (Heuser 1903 § 19; Stiles 1995:200–201).

PGmc */au/ in stressed position is also subject to monophthongisation in OHG and OS (§ 2.3.1.4). The developments of the two *a*-diphthongs are widely regarded as parallel, although any unified theoretical account of these processes must overcome considerable difficulties (§ 2.3.1.4.1).

2.3.1.3.1 Conditions for monophthongisation

Monophthongisation is not phonologically conditioned in OS, though diphthongs (or digraphic spellings, at any rate: <ai, æi, ei>) are retained before /j/ and in a few specific words (including many pers.ns., e.g., *Atalheid*) (Gallée 1910 §§ 89–94; Holthausen 1921 §§ 97–98).

In OHG the monophthongisation is much more restricted, although it is difficult to identify the phonetic motivation for the conditioning (see Durrell 1977; Harbert 1997; Penzl 1971:124–131; Rauch 1999; Schweikle 1964; Vennemann 1972). Since our concern at present is to outline the surface facts in OHG, rather than to evaluate theoretical explanations of the process, I simply follow Braune (BR § 43) and state the conditions for the monophthongisation atomistically:

1. Monophthongisation occurs regularly before /r w h/. Inherited /h/ (< PGmc */x/) triggers monophthongisation, but the consonant-shifted reflex of */k/ does not (§ 2.5.1.2.1): compare, e.g., *ēht* "property" (< PGmc **aixtiz*), *eih* "oak" (< PGmc **aikz*). This implies that the two are phonetically distinct. On the possible velar/uvular character of /r/ in this context, see § 2.5.2.1.1.

2. Certain interjections with proto-forms in */-ai/ have a monophthong in OHG (*sē, sē-nu* "behold!" < PGmc **sai*; *wē* "woe, alas!" < **wai*). This is not a general rule in final position (compare *zwei* "two" (neut.); *screi* 1.sg.pret. to *scrīan* "cry, moan"; *ei* "egg");[8]
3. A number of anomalous forms appear 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 phonological (since formally similar words retain a diphthong, e.g., *weinōn* "to cry, wail").

2.3.1.3.2 Chronology

Braune dates the OHG monophthongisation of */ai/ to the 7th century (BR § 43). He suggests that the process begins in Frk and is part of a more general shift in the north (reflected in the OS data, albeit at a later date). The earliest (8th c.) OHG sources show some instances of preserved /ai/ before /r/ (e.g., pers.ns. *Gairelaigo, Gairoaldo*), but otherwise monophthongs predominate throughout the OHG period.

Schneider (1980:196) cites a 7th-century Merovingian coin from Gondorf as the earliest witness to the change (it bears a Frk MN *Geroaldo* < **Gaira-* < PGmc **gaizaz* "spear"; see Felder 1978:42), while Beck (2001:313–314) claims even earlier evidence in the Malberg glosses, citing forms like *fecho* (< PGmc **faixōn* > Go *bi-faih(o)* "exaction", *gafaihōn* "to take advantage of, defraud" (Lehmann 1986)); *chreo* (< PGmc **xraiwa-* > Go *hraiwa-dubo* "turtledove"; OIc *hræ*, OE *hrāw* ~ *hrǣw* "corpse"; OFris *hrē-raf* "corpse-robbery"; OHG *rēo* "death, grave") (see van Helten 1900:243–244). However, Beck's claim that these examples "belong to those redactions of the Pactus Legis Salicae which represent the Old Frankish linguistic situation of the 6th century"[9]

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8 Some commentators (Durrell 1977:52; Penzl 1971:125) count open juncture among the conditioning environments for monophthongisation, and Durrell proposes a feature specification for juncture in his attempt to provide a general account of the triggering conditions. I am not convinced that this account matches the data: most instances of word-final PGmc */-ai/ appear in unstressed syllables and so are subject to the NWGmc monophthongisation (§ 2.3.1.2), while (according to Braune) only some of the relatively uncommon monosyllables with final (stressed) */-ai/ undergo monophthongisation. Penzl (1971:127) ascribes the diphthong of, e.g., *ei* to derivation from a geminate (PGmc **ajjaz*); but this is not the case in *zuuei* < **twai*, or *screi* < **skrai* (Ringe 2006:265–268, 286).

9 " … gehören … denjenigen Redaktionen des Pactus Legis Salicae an, die altfränkischen Sprachstand des 6. Jahrhunderts repräsentieren"

(2001:314) is misleading: the mss. to which he refers date from the mid-late 8th or early 9th century (Drew 1991:52–53; van Helten 1900:237; Hessels 1880 [2004]:xiv), and there seems no justification for dating the language of the glosses as far back as the 6th (Nedoma 2004a:295; Schmidt-Wiegand 2001:185).

Neither Gallée (1910) nor Holthausen (1921) discusses the chronology of the monophthongisation in OS; since there are only a few traces of the inherited diphthongs, it is probably safe to assume that the process is already advanced in the earliest (9th c.) OS sources.

2.3.1.3.3 Phonetic development

In early OHG sources, the reflex of */ai/ in monophthongisation-triggering environments is frequently written <ae> ~ <ê>. From the 9th century, the usual spelling is <e, (ee, ê)>. From a phonetic point of view, the process occurs in two stages (according to Durrell 1977:59–63): first, the off-glide is lowered to produce a "pre-monophthongal" variant [ae]. The first element is subsequently raised, [ae] > /ē/ (= [ɛ̄]?) as part of a general process affecting the first elements of complex vowel-segments in the late 8th or early 9th century (see also van Coetsem 1975:11–17).

Penzl (1947:178–179; 1971:127–128) argues that the <ae> spelling is simply an orthographic device for distinguishing the relatively open product of monophthongisation (/ɛ̄/ < */ai/) from the more close /ē/ < PGmc */$\bar{e}_2$/ (which by the 9th century undergoes diphthongisation > /ia/; see § 2.3.3.5). In Penzl's account, the monophthongisation process is a matter of increasing palatalisation of the first element, [a] > [æ] > [ɛ], while the second is (concurrently?) lowered to [e], which assimilates to the preceding (and more strongly accented) element, [ɛe] > [ɛ̄]. Sonderegger (1961:271) cautiously favours the interpretation of <ae> in the 8th-century St. Gallen witnesses as an intermediate diphthong [aə].

The later developments of /ɛ̄/ < */ai/ and /ē/ < */$\bar{e}_2$/ show that they are distinct phonemes in OHG; in OS, however, it is generally assumed that the two have merged (Gallée 1910 § 84; Holthausen 1921 § 92; Penzl 1971:128). In the following text, I notate the product of the OHG conditioned monophthongisation as /ɛ̄/ and that of the unconditioned change in OS /ē/. For the products of the NWGmc monophthongisation of the unstressed diphthong, the notation used is NWGmc */ē/ > OHG OS /e/. We cannot be certain of the actual quality of this vowel, but I am not aware of any evidence for distinct open and close mid front phonemes in the unstressed vowel systems of OHG or OS.

It is at least theoretically possible that an allophone with a lowered off-glide *[ae] was already present in lPGmc; this allophone would be a product of *a*-umlaut and/or consonant-conditioned lowering of */i/ before */x/ and */r/ (but not */w/) (van Coetsem 1994:48–49, 118–119).

2.3.1.4 PGmc */au/ in OHG and OS

Like */ai/, the reflexes of PGmc */au/ undergo monophthongisation in OHG and OS, producing a vowel conventionally represented as *ō* in the handbooks.

2.3.1.4.1 Conditions for monophthongisation

In OS, */au/ is monophthongised in all contexts except before /w/; here, as in the case of */ai/, the diphthong is preserved only where supported by a semivowel homorganic with the off-glide.

The OHG monophthongisation is conditioned by following consonants, but the conditions differ from those for the monophthongisation of */ai/. Monophthongisation occurs before /h/ < PGmc */x/ (§ 2.3.1.3.1), and before all dental/alveolar consonants. Attempts to unify the two monophthongisations in a single theoretical account have run into difficulties, not least in attempting to explain why the dentals affect only */au/. It may well be that we are dealing with two entirely distinct processes. For a detailed treatment of the problem, see Durrell (1977).

The similarity of the conditioning environments for the monophthongisation of */au/ and the UG distribution of reflexes of */eu/ (§ 2.3.1.1) seems to have attracted no attention in the literature (see § 8.1.3.1).

2.3.1.4.2 Chronology

According to Braune (BR § 45 Anm. 1), the monophthongisation of */au/ in OHG begins in the 8th century (i.e., somewhat later than the monophthongisation of */ai/). However, since it appears here and there in the earliest OHG sources, we should consider (and empirically evaluate) the possibility that it may appear in the runic inscriptions.

It is possible that the monophthongisations of */ai/ and */au/ are the first stage of a push chain (the "OHG vowel shift"), triggering the diphthongisations of */ō/ and */$\bar{e}_2$/ (§ 2.3.2.3; § 2.3.3.5). This hypothesis has the process

beginning in the north (i.e., in LG territory) and spreading southwards with diminishing effects (Szulc 1987:80–81).

2.3.1.4.3 Phonetic development

As with the monophthongisation of */ai/, there is some evidence for an intermediate stage with lowering of the off-glide, i.e., */au/ > [ao] > [ɔ̄]. The spelling <ao> is widespread in Bav. texts of the 8th and early 9th centuries, but is not found in Frk or Alam. (BR § 45 Anm. 2). Penzl (1971:127–128) interprets the <ao> digraph as an orthographic device for representing the relatively open monophthong [ɔ̄] (in parallel with his treatment of <ae>; see § 2.3.1.3.3).

In contexts where monophthongisation does not occur, the spelling <au> remains the norm until the 9th century, when it gives way to <ou>.

In OS, the reflexes of */au/ are spelled <ô, ao, oa, oo, â> (Gallée 1910 §§ 95–101; Holthausen 1921 §§ 99–100). It is possible – though the evidence is not clear – that the digraphs represent intermediate stages in the process.

2.3.2 Back vocalics

2.3.2.1 PGmc */u/

The PGmc umlaut allophones *[u o] (§ 2.2.1) are phonologised to /u o/ in all of the attested Gmc dialects (BR § 32).

In OHG, the inherited allophonic distribution produces contrasts such as *got* "god" vs. *gutin* "goddess"; *gibotan* "offered" (past part.) vs. *butun* (pl.pret.). Many such contrasts are levelled out by analogy, however (e.g., *gold*, inst.sg. *goldu* ≠ **guldu*; compare MFrk *guld*). Consistent exceptions to the normal pattern also appear (reflecting the status of /u/ and /o/ as full phonemes), e.g. *sumar* "summer" (< PGmc **sumeraz*); and we find alternation in forms of the same word, e.g., *ubar* ~ *obar* "over, above" (BR § 32).

The inherited distribution of /u/ and /o/ is preserved to a large extent in OS (Gallée 1910 §§ 69–78; Holthausen 1921 §§ 86–88). Here too the pattern is disturbed by analogical levelling (e.g., *goldu* inst.sg., following nom.sg. *gold*; *drohtin* ~ *druhtin* "lord"). OS /o/ is occasionally represented as <uo> (e.g., *Thuomas*) or <a> (e.g., *uuarihtio* ~ *uurhteo* "worker"). The latter reflects a more open articulation [ɔ] (particularly preceding /rC/, but also before other consonants) in western dialects (Gallée 1910 § 71). In the context /_rC/, the reflex of PGmc */u/ can also appear as <e>, producing doublets like *hress/*

hers ~ *hross/hors* ~ *hars* "horse" (Gallée is noncommittal on the directionality of the relationships between these variants, but it is clear that they are all ultimately reflexes of */u/ in PGmc **xrussan* (Orel 2003)).

In unstressed syllables, OHG shows considerable spelling variation, which reflects the levelling of the unstressed vowels > [ə]. Braune posits a three-member system /i a u/, in which [e o] are allophones of /a/, but also of the high vowels (BR § 62). Penzl, on the other hand, assumes that early OHG had the full set of vowel phonemes in unstressed syllables (i.e., that there is no distinction to be drawn between stressed and unstressed subsystems in respect of the inherited monophthongs) (Penzl 1971:141).

OS normally preserves the spellings of /u/ and /o/ as <u> and <o> in unstressed syllables, with some variations: inherited /o/ sometimes appears as <a> or <u> (Gallée 1910 § 114; Holthausen 1921 § 152). Gallée describes this as a dialectal feature without going into further detail, though it may simply reflect a levelling of the unstressed vowels. Similarly, we sometimes encounter <o> where we would regularly expect <u>.

In both languages, final /-u/ (whether derived from inherited */u/, */ō/, or */w/) is usually deleted after a long syllable (e.g., OS *hand-Ø*, OHG *hant-Ø* nom.sg. < pre-OS pre-OHG **hand-u* < PGmc **xanduz*), though in some instances it is "restored" analogically (e.g., *uuordu* inst.sg.) (Gallée 1910 § 115; Holthausen 1921 § 153). Short unstressed medial vowels (of all qualities, not only /u o/) are often syncopated after a long stem, e.g., OS *hēlgoda* (< *hēlagoda* "blessed, sanctified") (Gallée 1910 § 138; Holthausen 1921 §§ 137–140). On syncope in the WGmc dialects in general, see also Birkmann (1995:172–175).

2.3.2.2 PGmc */ū/

This vowel does not undergo any change in stressed syllables, although Notker (late 10th/early 11th c.) often writes <uo> before <h, ch>. This spelling also appears occasionally elsewhere (BR § 41). Braune regards it as an orthographic variant with no phonological significance. Penzl (1971:93–95) mentions this variation, but does not comment on it. Variant spellings in OS (also believed to be purely orthographic, as these spellings are neither frequent nor consistent) are <ô, uo, ui>.

In unstressed medial position, the reflexes of */ū/ may be shortened, though the evidence is unclear (see comments in § 2.3.1.2).

2.3.2.3 PGmc */ō/

In "standard" OHG,[10] inherited /ō/ is diphthongised to /uo/ in stressed syllables. This change begins in Alam. in the mid-late 8th century and is complete (with a consistent spelling <uo>) in all the OHG dialects by c.900 AD, whereas earlier texts show variation between <o, ua, uo, oa> (BR §§ 38–39; Szulc 1987:80).

The OS reflex of stressed */ō/ is usually written <ô>, with variants including <oo, uo, ŏ, ů, u, ua, ou> (Gallée 1910 § 86; Holthausen 1921 § 94). Widespread variation between <ô> and <uo>, even within the same ms., suggests that a diphthongisation parallel to that in OHG might be underway, at least in some dialects; it could, alternatively, be an artefact of orthographic practices taken from OHG sources.

According to Moulton (1961:19–20), the diphthongisation of /ō/ is part of a push chain in the OHG phonological system, the "push" coming in this case from the monophthongal reflex of PGmc */au/ = /ɔ̄/ (§ 2.3.1.4.2; see also van Coetsem 1975:4, 31;[11] Szulc 1987:81–82). The phonetic similarity between the two prompts the diphthongisation of /ō/ and the subsequent raising of /ɔ̄/ to occupy the "vacant" position. Moulton proposes a development of [o:] > [oɔ] > [oɑ] > [uo] (1961:20). In effect, the diphthongisation consists of two processes: (i) the development of the second mora into a lowered off-glide ([ɔ] > [ɑ]); (ii) the raising of the entire diphthong, possibly as part of the general raising of the diphthongs in OHG (/ai/ > /ei/; /au/ > /ou/; /eo/ > /io/; /eu/ > /iu/) (Moulton 1961:20).

In medial syllables not bearing primary stress, inherited */ō/ is normally shortened to /o/ in both OHG and OS. Word-finally, PGmc */-ō/ > NWGmc */-ū/ > OHG OS /-u/ (Antonsen 1972:139; Ringe 2006:221).

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10 Braune's description of OHG uses the EFrk dialect of Tatian (9th c.) as an unmarked *Normalalthochdeutsch* variety for reference purposes, while making it clear that no genuine "standard" form of OHG existed (BR § 4).

11 Note that van Coetsem is concerned with the monophthongisation as a development from lPGmc umlaut allophones of the *a*-diphthongs (*[ae ao]); he does not comment on the consonant-conditioned monophthongisations which I have discussed in §§ 2.3.1.3–2.3.1.4.

2.3.2.4 PGmc */w/

OHG mss. normally use digraphs <uu, uv, vu, vv> to represent consonantal /w/, with the letter <w> appearing towards the end of the OHG period. Where /w/ is adjacent to /u/ or is geminated, the orthography varies between <uuu>, <uu> and <u>. OS also tends to use digraphic <uu>, with a single <u> common after a consonant or before /u/ (e.g., *tuelifo* "twelve"; *uundrode* "wondered").

Phonologically, PGmc */w/ develops in a number of ways, depending on its position (BR §§ 106–114):

- Initial /w-/ is generally unchanged. In the clusters /wr- wl-/ it is preserved in OS, but in OHG it is deleted at a stage predating the earliest ms. sources (e.g., PGmc **wrītanan* > OS *wrītan*, OHG *rīzan* "to carve, write").[12]
  In the context /C_u-/, /w/ is sometimes elided (at least orthographically) in OHG (e.g., *huosto* "cough" < **hwuosto* < **hwōsto* < PGmc **xwōstōn*. Braune gives several more examples, in each of which the /-u-/ is a product of the diphthongisation of */ō/ (§ 2.3.2.3).
  Where a stem with initial /w-/ forms the second element of a compound (especially a pers.n.) it is often elided in OHG: e.g., *-old, -olf* (< *-wald, wolf*).
- Syllable-final or word-final /w/ following a vowel normally becomes syllabic /o/ (or occasionally /u/), e.g., OHG *kneo*, OS *knio* nom.sg. "knee" (< PGmc **knewan*); OHG *farota* pret. to *far(a)wen* "to dye, colour".
- In certain words, medial /w/ following an open syllable is syllabicated to form a diphthong (e.g., OHG *sēula*, OS *seola* ~ *siola* "soul" < PGmc **saiwalō*).
- Following a long vowel and preceding another vowel, /w/ is often (though not invariably) preserved in OHG (*grāwēr* "grey" (nsm.), *ēwa* "law",[13] *spīwan* "to spit, spew" vs. *grāēr, ēa, spīan*). Where it follows a long vowel and precedes a consonant, it is deleted in OHG (e.g., early OHG *sēula* ~ *sēla*; *lāta*, 1.sg.pret. to *lāwen* "to betray" (< PGmc **lēwjanan*)).

12 Initial /w-/ in these clusters is preserved in MFrk, with occasional appearances in other dialects, in early mss. (e.g., Alam. *uuerecho* "avenger"). Most of the examples cited by Braune have an anaptyctic vowel.

13 Note that the OS cognate *ēo* does not qualify as a parallel for or counter-example to this phenomenon, as it is a masc. (pre-OS **aiw-Ø* < PGmc **aiwaz*), whereas OHG *ēwa* is a fem. form. The OS reflex of */w/ becomes word-final following the loss of thematic */-a-/, and is therefore syllabicated.

2.3.3 Front vocalics

2.3.3.1 PGmc */i/

In OS, this phoneme is subject to lowering conditioned by the vowel of the following syllable: */i/ > /i/ before a high vowel or semivowel, /e/ before a mid or low vowel (Gallée 1910 § 56; Holthausen 1921 §§ 84–85). There is, nevertheless, a considerable amount of variation, and we find alternants like *lebdin* vs. regular *libdin* 3.pl.pret. "lived" (< PGmc **libēdun*).

The pattern in OHG is less consistent. Under most conditions, reflexes of */i/ appear as <i> (occasionally <ie>), even before a following mid or low vowel (BR § 31). <e> (presumably → /e/) appears before a non-high vowel in the following:

1. some adjectives, e.g., OHG *quec* "alive" (compare the related verb *quicken*);
2. weak verbs of classes 2 and 3, e.g., *klebēn* "to stick";
3. some nouns, e.g., *steg* "footbridge" (< PGmc **stigan*); *lebara* "liver" (< **lib(a)rō*).

Some authors have attributed this lowering of */i/ to *a*-umlaut (e.g., Antonsen 1964:181–184; van Coetsem 1994:88). However, as Connolly (1977:174–176) objects, lowering is the exception rather than the rule in OHG, where it is more frequent than in most of the other Gmc dialects. Proponents of the *a*-umlaut hypothesis are forced to assume a great deal of analogical restoration of */i/. Connolly argues instead that the lowering may be explained by the presence of a PIE laryngeal. For the purposes of this project, there is no need to debate this point.

More lexical items develop /e/ < /i/ during the OHG period (e.g., *lirnēn* ~ *lernēn* "to learn"; *skif* ~ *skef* "ship"). Lowering occasionally occurs before /h/ or /r/ (e.g., *widarbirgi* ~ *widarbergi* "steep, arduous").

In final unstressed position, /-i/ tends to be lowered to /-e/ in both OHG and OS. This process is identifiable in 9th-century sources (BR § 58 Anm. 2; Gallée 1910 § 113; Holthausen 1921 § 184), although in the earlier OHG material and many of the OS sources the contrast of /-i/ and /-e/ appears to be preserved. This lowering may be part of the general levelling of the unstressed vowels (BR §§ 59–60).

After a long or disyllabic stem, final /-i/ is normally deleted (e.g., OHG OS *gast* "guest" < **gasti* < PGmc **gastiz*, vs. short-stem *wini* "friend" < **weniz*).

2.3.3.2 PGmc */e/

According to Braune (BR § 28 Anm. 1–2), inherited /e/ is realised as [ɛ] in OHG, with a distinct *i*-umlaut allophone [e] which merges with the *i*-umlaut allophone of /a/ = [e] (§ 2.3.4.2). This variation results in a phonemic split (/e/ = [ɛ ~ e] > /ɛ, e/) from the 9th century.

In the primary sources, both variants are commonly written <e>, though in some mss. the open allophone appears as <ê> or <ae>. Braune marks the open variant as *ë*, the close one as *e* (e.g., *ërda* "earth" vs. *felis* "rock", *herti* "hard" (< *hart*)).

In both OHG and OS, we find evidence of the raising of PGmc */e/ > *[i] (→ <i>) before a syllable containing a high front vocalic, and before a tautosyllabic nasal (§ 2.2.1; §BR 30; Gallée 1910 §§ 56–63; Holthausen 1921 § 84). Note that the handbooks on the daughter languages state the conditioning factor for this raising as a cluster N+C, rather than as a nasal at the syllable coda.

Additionally, reflexes of PGmc */e/ are raised before a syllable containing /u/ or (usually) before /ww/ (e.g., OHG *miluh*, OS *miluk* "milk" < PGmc **melukz*; OS OHG *triuua* "loyalty, troth" < PGmc **trewwō*). Braune (*loc.cit.*) implies that this change belongs to the early stages of OHG, noting instances of preserved [ɛ] → <e> in the earliest sources, especially before simple /w/ (e.g., pret.part. *gisëwan* "seen" ≠ **gisiwan*). Raising before a high back vocalic is not consistent; and even before a high front vocalic we commonly find cases where [ɛ] is preserved(?) or (more probably) restored by analogy (e.g., OHG *hërza* "heart" has gen./dat.sg. *hërzin*, not the expected **hirzin*). Conversely, analogical <i> (→ [i]) sometimes appears in place of regular <e> (e.g., *bëta* "request" ~ *bita* < PGmc **bedō*).

Occasionally in OS, <o> appears where we would expect <e>, e.g., *worold* for *werold* "world" (< PGmc **wira-aldiz*). Before /r/, inherited /e/ is often lowered to /a/ (e.g., *farahe* dat.sg. to (regular) *fer(a)h* "life" (< PGmc **ferxwan*)) (Gallée 1910 § 57).

OS /e/ often becomes /a/ (or a vowel represented <a>) before /r/: e.g., *farahtlîco* vs. regular *ferahtliko* "wisely" (< PGmc **ferxwt-* (Köbler 2000)).

2.3.3.3 PGmc */ī/

PGmc stressed */ī/ remains unchanged in OHG and OS (and is normally spelled <i> or <î>), although in Notker it is diphthongised to /ie/ before /h/ (e.g., *liehte* vs. the more common *līht* "easy"). <ie>-spellings also occur sporadically in other contexts (BR § 37).

*/ī/ is also preserved in unstressed syllables in OHG (to some extent, at least, and more commonly in UG than in Frk) prior to the levelling of unstressed vowels in later OHG (BR § 57 Anm. 1). In OS, unstressed */ī/ is normally shortened to /i/ and frequently lowered to /e/ (Gallée 1910 § 113; Holthausen 1921 § 133). On the general shortening of unstressed long vowels, see § 2.3.1.2.

2.3.3.4 PGmc */$\bar{e}_1$/

PGmc */$\bar{e}_1$/ unconditionally develops into /ā/ in all the WGmc dialects, as well as in PNorse and ON. Braune does not assign the change to a common NWGmc stage, however. In Frk (as represented in Latin records of pers.ns.), /ā/-variants do not start to appear before the 6th century, and do not become the norm until the 7th, with /ē/ still appearing in the 8th (e.g., *Theudomērus, Dagorēdus*) (BR § 34; Bremer 1886:17–29). Occasional /ē/-forms also appear in OS, e.g., *uuêpan-berand* ~ *uuâpan-berand* "weapon-bearer" (PGmc **wēpnan*) (Gallée 1910 §§ 81–83; Holthausen 1921 §§ 90–91). Felder (1978:26) attributes <E> and <I> spellings on coins to Burgundian or Gothic influence.

2.3.3.5 PGmc */$\bar{e}_2$/

In early OHG sources, the reflex of */$\bar{e}_2$/ is /ē/ (written <e> or <ee>), which later undergoes diphthongisation > /ea, ia/ (9th c.) > /ie/ (10th c.) in stressed syllables (BR § 35, § 53). This diphthongisation is believed to be part of the "OHG vowel shift" (§ 2.3.1.4.2; § 2.3.2.3). The chronology of forms suggests that the diphthongisation can be subdivided into (i) lowering of the second mora, followed by (ii) raising of the first mora and/or of the whole diphthong (Moulton 1961:20). Note that this subdivision parallels that of the monophthongisations of */ai/ and */au/ (§§ 2.3.1.3–2.3.1.4).

Braune also notes some spelling variations, including occasional <ei>, <eia> for /ē/ and /ea/. In the later sources where <ie> is normal, a variant <i> occasionally appears.

The OS reflex of */ē$_2$/ appears as <ê ie>, with a particular ms. favouring one form or the other (Gallee 1910 § 84; Holthausen 1921 § 92). <ia> and <ie> are also attested. Gallée does not discuss chronology; it may be that this phoneme undergoes diphthongisation in some OS dialects, as in OHG; or the variation might result from the influence of OHG scribal practices. Holthausen ascribes the digraphic spellings to Frankish influence.

2.3.3.6 PGmc */j/

According to Braune (BR §§ 115–119), /j/ is always written <i> in OHG mss.; <j> is not used at all. In Notker, consonantal /j/ is indicated by an accent on the following vowel (e.g., *iâr, iúng*, vs. syllabic /i/ in *îo, bîeten, íuuër*). Before a following /i/ or /e/ it is often written <g>, possibly realised as a fricative [j̟]. A similar situation exists in OS: /j/ is normally written <i>, with <g> appearing before a front vowel (Gallée 1910 § 158; Holthausen 1921 § 170).

Frequently (though by no means always), reflexes of PGmc */ij/ or */jj/ appear in OHG as <ii> or <iei>, e.g., *fiiant* "enemy" vs. *fiant* (< PGmc **fijēndz*).

Medial /j/ after a consonant (except /r/) starts to disappear in early OHG, and in 9th-century sources is regularly deleted. Where it does appear, it is usually written <i> before <e u>, <e> before <a o>. <e> here probably represents a lowered [j̟], resulting from assimilation to the following vowel (see BR § 118). This deletion does not normally occur in OS: e.g., PGmc **sebjō* > OS *sibbia*, OHG *sibba* "kinship"; PGmc **skapjanan* > OS *skeppian*, OHG *skepfen* "to shape, form, create".

/j/ is preserved in OHG after /r/ (which is not affected by the WGmc consonant gemination), e.g., *nerian* ~ *nerien* "to nourish, feed, save, redeem, heal" (in sources where postconsonantal /j/ is otherwise absent). In Alam. and Frk dialects, where /r/ undergoes a secondary gemination (unconnected to the WGmc gemination), /j/ is deleted (> *nerren*). Braune argues (BR § 118 Anm. 3) that where this /j/ is preserved it is strengthened to [j], often written <g> (like /j/ before a front vowel – see above).

In final syllables, /-ja/ > /-e/ even in the earliest OHG sources: e.g., PGmc **sundjō* > pre-OHG **sundja* > OHG nom./acc.sg., nom./acc.pl. *sunte*, dat.sg. *suntiu*.

Where /j/ becomes word-final by deletion of following material, it becomes syllabic /i/, even where /j/ is otherwise deleted: e.g., OHG OS *kunni* "kin, tribe, people" (< PGmc **kunjan*) vs. gen.sg. OHG *kunnes* (with /j/-deletion), OS *kunnies* (without).

2.3.4 Low vowels

2.3.4.1 PGmc */a/

OHG shows some variation between <a> and <o> for reflexes of */a/. Braune classifies these /o/-variants into 4 types (BR § 25):

a. Pairs like *halōn* ~ *holōn* "to fetch, call, take"; *mahta* ~ (Frk) *mohta* "power, might"; *rask* ~ *rosk* "quick". Some of these cases can be attributed to older ablaut; others to assimilation; Braune mentions labialisation (in *mohta*?), but does not elaborate.
b. Occasionally <o> appears before nasals and /l/: e.g., *wamba* ~ *womba* "body"; *weralt* ~ *werold* "world" (< PGmc **wira-aldiz*). These <o>-variants probably reflect assimilation to the following consonants.
c. <o> for inherited /a/ is common in weakly stressed function-words, e.g. *joh* "and"; *oh* "but"; *fan(a)* ~ *fona* "from".
d. Deuterothemes in pers.ns. often contain <o> for inherited /a/, e.g., *-bald* ~ *-bold; -walt* ~ *-(w)olt; -bato* ~ *-boto*. For this group, as for group c, weak stress appears to be the motivator (although I note that many of the examples cited by Braune have a following /l/, and so may be connected with group b).

OHG medial /a/ is susceptible to assimilation by the vowels of neighbouring syllables (BR §§ 67–68). The conditioning vowel is usually that of the final syllable (e.g., *heidinisc* "heathen" (adj.) vs. *heidan* "heathen" (subst.); *keiseres* gen.sg. to *keisar* "emperor"), less frequently the preceding stem-vowel (e.g., *hōhona* ~ *hōhana* "from above"; *gicorone* ~ *gicorane* pret.part. "chosen"). Where medial /a/ is affected by *i*-umlaut (§ 2.3.4.2), the product is usually /i/, not /e/.[14] This /i/ may in turn trigger umlaut in the preceding syllable.

In OS, several other changes to /a/ are observable besides *i*-umlaut (Gallée 1910 §§ 50–55; Holthausen 1921 §§ 76–81):

1. Occasionally, /a/ > /e/ before /rC/ (in spite of the tendency of this environment to block *i*-umlaut), e.g., *forthuuerd* "forward" ~ regular *forđuuardas*. In some sources, /a/ is also raised and fronted before /g k/ and sporadically in other contexts, e.g., in pers.ns.*Gêrdeg, Hillidæg* (< *-dag*).
2. /aha/ > /ā/ (→ <â> ~ <aa>): e.g., *gimâlda* < *gimahalda* (pret. to *gimahlian* "to speak") (see § 2.5.1.4.2).

14 On Braune's proposed three-member system of unstressed vowels, see § 2.3.2.1.

3. /a/ assimilates a following nasal before /θ f s h/, producing a lengthened vowel represented <â> or <ô>: e.g., *ôđar* nom.sg., *âthres* gen.sg. "other" (< PGmc **andraz*) (§ 2.5.2.2).
4. /a/ > /o/ in certain consonantal environments (compare group b of the OHG /o/-variants above):
   a. before /nC/ (e.g., *hondscôhe* "gloves").
   b. before /l/+dental (e.g., *hagastoldos* pl. "servants" ~ *-stald-*; pers.ns. *Grimbold, Athalold* (< *-bald, -wald*)).
   c. between /w/ and /r/ (e.g. *andsuôr* "answer" < PGmc **and-swaran*).

2.3.4.2 "Primary" i-umlaut

The other major phenomenon affecting /a/ in OHG and OS is "primary" *i*-umlaut before a syllable containing /i ī j/, e.g., *heri* "army" (< **xariz/*xarjaz*) (BR §§ 26–27, § 51; Gallée 1910 §§ 46–49; Holthausen 1921 § 115; Schweikle 1964). Enclitic personal pronouns may trigger umlaut of /a/ in the preceding word, e.g., *drenk ih* "I drank".

An inherited /i ī j/ in a third syllable can trigger assimilation of an unstressed vowel in the second and consequent umlaut of the stressed vowel in the first: e.g. *apful* "apple" → nom./acc.pl. *epfili*. This is not consistent – e.g., *zahar* "tear" invariably has pl. forms *zahari, zahiri*, without umlaut.

Unmutated forms are found in the earliest OHG glosses, although umlaut is frequent even here (BR § 27; Szulc 1987:84). Before /ht hs/ and /Cw/, umlaut is not evident until the 12th century (e.g., OHG nom.pl. *mahti* (> MHG *mähte*) to *maht* "power, might"; *nahti* gen./dat.sg. (> MHG *nähte*) to *naht* "night"). In UG dialects, /lC/, /rC/, /x/ (< PGmc */k/) and /h/ (< PGmc */x/) also block umlaut (BR § 27; Paul et al. 2007 §§L16, L30).

We often see unmutated forms in deadjectival abstract nouns (e.g. *starchī* ~ *sterchī* "strength" < *stark* "strong"), nouns in *-ida* (e.g., *bigangida* ~ *bigengida* "care"), and adjectives in *-īn* (e.g. *tannīn* ~ *tennīn* "made of pine"). The gen. and dat.sg. of masc. *n*-stem nouns are often unmutated (e.g., *hanin* alongside regular *henin*, to *hano* "cock"), by analogy with the other case-forms; and certain derivational suffixes with /i ī/ appear not to trigger umlaut: *-nissi, -nissa, -līh* (e.g., *irstantnissi* "resurrection"; *langlīh* "long").

The mutated vowel is normally written <e> in OHG and OS mss., with variants <ae ei> also attested. This vowel is conventionally regarded as being phonologically distinct from /ɛ/ < PGmc */e/ prior to the loss of the conditioning environment (9th c.?), but its actual development and phonetic real-