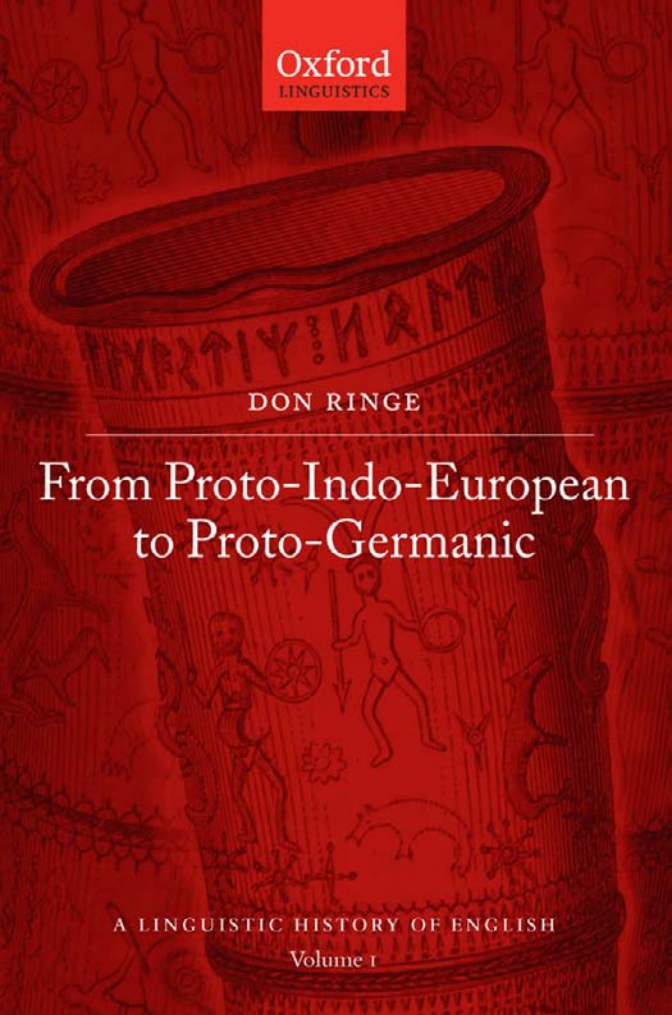
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From Proto-Indo-European to Proto-Germanic
A LINGUISTIC HISTORY OF ENGLISH
Volume 1

A Linguistic History of English

Volume I
From Proto-Indo-European to Proto-Germanic

for Emma and Lucy

From Proto-Indo-European to Proto-Germanic

DON RINGE

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Contents

Abbreviations

abl.	ablative
acc.	accusative
act.	active
aor.	aorist
Av.	Avestan
CP	COMP phrase
cpd.	compound
dat.	dative
dial.	dialectal
du.	dual
fem.	feminine
fut.	future
gen.	genitive
Gk	Greek
Gmc	Germanic
Goth.	Gothic
Hitt.	Hittite
I	INFL
IE	Indo-European
indic.	indicative
inf.	infinitive
inst.	instrumental
intr.	intransitive
ipf.	imperfect
iptv.	imperative
Lat.	Latin
Lith.	Lithuanian
loc.	locative
masc.	masculine
ME	Middle English
MHG	Middle High German
MIr.	Middle Irish
ModHG	Modern High German
mp.	mediopassive
N	noun
neut.	neuter
nom.	nominative
NP	noun phrase
NWGmc	Northwest Germanic
O	object
obl.	oblique
OCS	Old Church Slavonic
OE	Old English
OF	Old Frisian
OHG	Old High German
OIr.	Old Irish
ON	Old Norse
opt.	optative
OS	Old Saxon
pass.	passive
pf.	perfect
PGmc	Proto-Germanic
PIE	Proto-Indo-European
pl.	plural
PNWGmc	Proto-Northwest Germanic
prep.	preposition
pres.	present
pret.	preterite
ptc.	participle
PWGmc	Proto-West Germanic
S	subject
sg.	singular
Skt	Sanskrit
subj.	subjunctive
Toch.	Tocharian
V	verb
Ved.	Vedic
voc.	vocative
WGmc	West Germanic
1, 2, 3	1st, 2nd, 3rd person
1ary	primary
2ary	secondary

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Note on Transcription

Forms of attested languages are given in the system of spelling or transcription which is usual for each; the standard grammars should be consulted on particular points. For (Ancient) Greek, which Indo-Europeanists do not customarily transliterate, I also give a phonemic representation, which is accurate for the Attic dialect *c.*500 BC and a close approximation for the other dialects cited. In my phonemicization of Greek the colon indicates length of the preceding vowel, and lower mid vowels are marked with a subscript hook.

On the spelling of PIE forms see 2.2; on the spelling of PGmc forms see 4.2. In the latter language a subscript hook indicates nasalization of the vowel, and vowels marked with two macrons are trimoric or 'overlong' (see the discussion in 3.2.1 (ii)).

In statements of linguistic change, $<$ and $>$ indicate sound changes (i.e. spontaneous phonological changes); $\leftarrow$ and $\rightarrow$ indicate changes of all other kinds. Shafted arrows are also used in statements of synchronic derivation.

1

General introduction

This volume began as part of a set of handouts for a course in the linguistic history of English at the University of Pennsylvania. It occurred to me that they contained much information considered standard among "hard-core" Indo-Europeanists but largely unknown to colleagues in other subdisciplines, and that they might therefore be made the basis of a useful book. Most of the first draft was written during the academic year 2002–3, when I chaired the School of Arts and Sciences Personnel Committee at Penn, to relax and unwind.

I emphasize that this is not intended to be a traditional handbook in which the focus is always on attested languages. Instead I have tried to give a coherent description of various stages in the prehistory of English and of the changes that transformed one stage into the next. I also wish to emphasize that this book is not intended primarily for traditional 'philologists', though it seems likely that they will find it useful. My intended readership includes especially those who have not undertaken serious study of Indo-European or comparative Germanic linguistics, nor of the history of English, but want reliable information on what specialists in those disciplines have collectively learned over the past century and a half. In attempting to make this information available I have modelled Chapters 2 and 4 in part on the 'grammatical sketches' of unfamiliar languages which were produced in abundance in the middle of the twentieth century, and I have tried to employ terminology that a modern theoretical linguist might be expected to understand. I foresee that my colleagues in historical linguistics will find both tactics disconcerting; but the volume is not primarily intended for them.

Since I have tried to present a coherent account of material that is generally agreed on, the overall picture of the grammar of Proto-Indo-European and the development of Proto-Germanic presented in this volume is relatively conservative. I have included innovative suggestions on a small scale when they seemed necessary, giving references to earlier publications; I hope that I have not forgotten to reference any distinctive views of previous researchers that I have accepted. Conclusions that are almost universally accepted in

the field (such as the reconstruction of three 'laryngeal' consonants for PIE, or—most obviously—sound changes such as Grimm's Law and Verner's Law) have not been referenced. Since this is intended to be a handbook, I have often omitted discussion of alternative opinions.

Though I hope that this volume will prove useful to students and interested non-linguists as well, it seems only fair to warn the reader that I have had to presuppose a considerable amount of prior knowledge in order to keep the work within reasonable bounds. In the following paragraphs I will try to spell out the background that I take for granted.

I expect readers to have acquired a basic grounding in *modern* linguistics, without necessarily being familiar with the details of any one theory. In phonology I presuppose an understanding of the principle of phonemic contrast, familiarity with systems of ordered rules, and an understanding of how surface filters differ from the latter (but not, for example, familiarity with Optimality Theory). In morphology I presuppose a general understanding of case, tense, aspect, mood, and the other traditional inflectional categories, as well as the concepts of productivity and defaults. Though I have little to say about syntax in this volume, what I do say presupposes some version of (post-)Chomskyan syntax.

I also expect readers to have a basic familiarity with the principles of language change. Since this entire volume deals with the undocumented past, the principles and methods of traditional historical linguistics, which were devised to investigate such cases, should be adequate for an understanding of what I say. Like all reputable historical linguists, I subscribe to the uniformitarian principle; in addition, I define 'linguistic descent' as an unbroken series of instances of first-language acquisition by children, and I hold that apparent cases of linguistic descent in the undocumented past should be taken at face value unless there is convincing evidence to the contrary (see e.g. Ringe, Warnow, and Taylor 2002: 60–5). Note especially that I take the regularity of sound change seriously; since investigation of historically documented languages shows that sound change is overwhelmingly regular in statistical terms, it is a serious breach of the uniformitarian principle not to assume the same for prehistory. (Sociolinguistic studies have not altered this picture; see e.g. Labov 1994: 419–543.) Readers who want to understand the consequences of the regularity of sound change are urged to read Hoenigswald 1960, the classic exposition of that subject.

Limitations of space do not permit me to cite full evidence for the standard reconstructions offered here; I often cite only those cognates that support a particular reconstruction most clearly. Examples have also been chosen to illustrate particular points clearly with a minimum of explanation, even

though that limits the range of examples that can be used. But I wish to emphasize that everything said in this volume rests on scientific reconstruction from attested languages using the 'comparative method'. In other words, these conclusions are based on observation and logical inference (mathematical inference, in the case of phonology), not on speculation. Readers who find a scientific approach uncongenial must unfortunately be advised to avoid linguistics altogether.

Finally, though I hope that a knowledge of some ancient (or at least archaic) IE language will not be necessary to make this volume intelligible, there is no denying that it would be helpful. On a technical level, it is impossible, strictly speaking, to judge the correctness of the reconstructions proposed and the developments posited unless one actually knows all the relevant evidence and has memorized the regular sound changes that occurred in the development of numerous IE languages; thus everyone but hard-core specialists must be asked to take at least some of what I say on trust. But even leaving that problem aside, readers who are familiar with any of the older IE languages commonly taught in colleges and universities—Sanskrit, Ancient Greek, Latin, Old English—will naturally find the discussion easier to follow. Even a knowledge of modern German will make the system of nominal cases less mysterious, and a knowledge of Russian will make the concept of aspect more easily intelligible. As a practical matter, studying the structure or history of any language in isolation makes it much harder than it needs to be; human language is a single phenomenon, and an understanding of one instantiation is automatically a partial understanding of every other.

2

Proto-Indo-European

2.1 Introduction

The earliest ancestor of English that is reconstructable by scientifically acceptable methods is Proto-Indo-European, the ancestor of all the Indo-European languages. As is usual with protolanguages of the distant past, we can't say with certainty where and when PIE was spoken; a reasonable guess would be the river valleys of Ukraine in the centuries around 4000 BC, though one can't absolutely exclude a somewhat earlier date, nor a place somewhat further east. The best discussion of the 'IE homeland problem' is still Mallory 1989; it is cautious and not fully conclusive, as is reasonable under the circumstances.

Though there continue to be gaps in our knowledge of PIE, an astonishing proportion of its grammar and vocabulary are securely reconstructable by the comparative method. As might be expected from the way the method works, the phonology of the language is relatively certain. Though syntactic reconstruction is in its infancy, PIE syntax is also relatively uncontroversial because the earliest-attested daughter languages agree so well. Nominal morphology is also fairly robustly reconstructable, with the exception of the pronouns, which continue to pose interesting problems. Only the inflection of the verb causes serious difficulties for Indo-Europeanists, for the following reason.

From the well-attested subfamilies of IE which were known at the end of the nineteenth century—Indo-Iranian, Armenian, Greek, Albanian, Italic, Celtic, Germanic, and Balto-Slavic—a coherent ancestral verb system can be reconstructed. The general outlines of the system are already visible in Karl Brugmann's classic *Grundriß der vergleichenden Grammatik der indogermanischen Sprachen* (2nd edn., 1897–1916); in recent decades Helmut Rix and Warren Cowgill codified and systematized that reconstruction along more modern lines, and the 'Cowgill–Rix verb' is perhaps the standard reconstruction among more conservative Indo-Europeanists. Various versions of the Cowgill–Rix reconstruction can be found in Rix 1976*a*: 190 ff.; Sihler 1995:

442–515; and Rix et al. 2001. Unfortunately it is quite difficult to derive the system of the Hittite verb—by far the best-known Anatolian verb system, and fortunately also the most archaic—from the Cowgill–Rix reconstruction of the PIE verb by natural changes, and even the Tocharian verb system presents us with enough puzzles and anomalies to raise the suspicion that the 'real' PIE verb system was rather different. A good recent exploration of this question is Jasanoff 2003*a*; though Jasanoff's own solutions have not won general acceptance (on the grounds that they are too speculative), he lays out the problems very clearly.

Interestingly, there is by now a general consensus among Indo-Europeanists that the Anatolian subfamily is, in effect, one half of the IE family, all the other subgroups together forming the other half; and it is beginning to appear that within the non-Anatolian subgroup, Tocharian is the outlier against all other subgroups (cf. Winter 1998; Ringe et al. 1998; Ringe 2000; Ringe, Warnow, and Taylor 2002 with references). A probable cladistic tree of the IE family is roughly as at Fig. 2.1.[1]

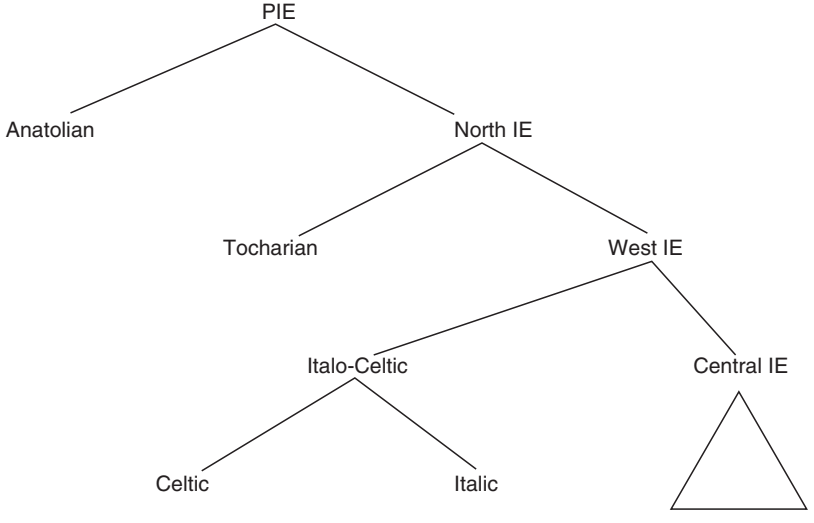


Fig. 2.1

[1] Since this cladistic tree is relatively new, there are no generally accepted names for many of the higher-order internal nodes; the names employed here are simply a stopgap. I call the non-Anatolian subgroups collectively 'North IE' because they seem to have dispersed from a geographical position to the north of the Black Sea; 'West IE' is defined by its position relative to Tocharian, the next most divergent subgroup.

(On the Italo-Celtic subgroup see also Jasanoff 1997.) The 'Central' subgroup includes Germanic, Balto-Slavic, Indo-Iranian, Armenian, Greek, and probably Albanian; its internal subgrouping is still very unclear, though it seems possible that Indo-Iranian, Balto-Slavic, and Germanic were parts of a dialect chain at a very early date.

Note the implications of this phylogeny for the reconstruction of the PIE verb. The Cowgill–Rix verb is a reasonable reconstruction of the system for Proto-West IE, and can even account for most of the Proto-North IE system; it is only for 'PIE proper' that it is clearly inadequate.

That is fortunate for anyone proposing to write a history of English, because Germanic is clearly one of the Central subgroups of the family. In dealing with verb inflection we can reasonably take the Proto-West IE situation as our starting point; while our reconstruction of the verb will therefore be slightly less archaic than the rest of the reconstructed grammar, that is unavoidable, given that the reconstruction of the verb for PIE proper is still very uncertain. That is the solution I have adopted in this book.

The rest of this chapter will present a brief sketch of PIE grammar as reconstructed from the grammars of the daughter languages by standard application of the comparative method. Unfortunately there is no book that presents a comprehensive, up-to-date description of the grammar of PIE according to the consensus of most specialists in any greater detail; perhaps the closest approach is Sihler 1995. Further information about particular topics can be found in the references cited below. For another brief overview see Fortson 2004: 48–153.

2.2 PIE phonology

A complete presentation of what is known about PIE phonology is beyond the scope of this book. Here I present only the main outlines and some of the more interesting quirks. The standard reference is Mayrhofer 1986, to which readers are referred for further information, with references, on every point discussed in this section.

The phonology of PIE was very unlike that of any modern IE language. The system of contrastive sounds can be represented thus:

Obstruents:

bilabial	coronal	palatal	velar	labiovelar
p	t	ḱ	k	k^w
b	d	ǵ	g	g^w
b^h	d^h	$ǵ^h$	g^h	g^{wh}
	s	h_1	h_2	h_3

Sonorants:		High vowels:		Nonhigh vowels:		
y (∼ i)	w (∼ u)	i	u	e	a	o
r (∼ r̥)		ī	ū	ē	ā	ō
l (∼ l̥)						
n (∼ n̥)						
m (∼ m̥)						

There was also a system of pitch accent: one syllable of each phonological word exhibited high pitch on the surface, customarily marked with ′ in reconstructions.

Numerous peculiarities of this system call for comment.

2.2.1 *PIE obstruents*

The palatal, velar, and labiovelar stops are collectively referred to as 'dorsals'. Their exact pronunciation is not reconstructable; all we can say for certain is that the 'palatals' were pronounced further forward in the mouth than the others, and that the 'labiovelars' were pronounced with lip-rounding but were otherwise identical with the 'velars'.[2] That PIE possessed stops of all three types is no longer controversial, since Craig Melchert has demonstrated that the three-way contrast between the voiceless stops *ḱ, *k, and *k^{w} is preserved in Luvian (Melchert 1987); for instance, we find Luvian *ziyar* '(s)he is lying down' < PIE *ḱéyor, *kīsa(i)*- 'to comb' < *kes-, and *kui* 'what?' < *k^{w}íd. A further indication that the triple contrast is not some kind of artefact of the comparative method can be found in a simple constraint on the shape of PIE root-syllables: though a root could not contain oral stops at the same place of articulation both in its onset and in its coda,[3] there were roots which contained both a palatal and a velar (*ḱenk- 'to hang', *kreḱ- 'to strike', *koḱso- 'joint') or both a palatal and a labiovelar (*k^{w}eḱ- 'to catch sight of'), and perhaps both a velar and a labiovelar (post-PIE *kneyg^{wh}- 'to bow').

[2] In any case it is most unlikely that the 'palatals' were really palatal stops; in many IE languages they became velars, and as Michael Weiss pointed out to me many years ago, shifts of palatal stops to velars are at best very rare in the attested historical phonologies of natural human languages. The palatals were also clearly the commonest dorsals (though not by a very wide margin), which suggests that they were typologically the unmarked set, i.e. probably really velars. I have retained the traditional terms, instead of replacing them with 'velars, postvelars, labiopostvelars', to avoid confusion.

[3] Apparently this constraint classed *m with the bilabial oral stops; that is, there were no roots like '*pem-' and '*meb^{h}-', including both a bilabial oral stop and *m. However, *n was not classed with the coronal oral stops, since we must reconstruct *nad^{h}- 'to tie', *newd- 'to push', *ten- 'to stretch', etc. Three clear exceptions to the constraint, *tewd- 'to beat', *tend- 'to cut', and *mems- 'meat', are securely reconstructable; it is of course not surprising that they involve coronal stops and *m. Other apparent exceptions, such as *b^{h}rem- 'to make a noise', either appear to be onomatopoeic or are not securely reconstructable for PIE proper, so far as I am aware.

The 'voiced aspirate' stops were probably breathy-voiced; their reflexes are still breathy-voiced in many modern Indic languages.

The distribution of PIE stops was in some ways idiosyncratic. The voiced bilabial stop *b was unexpectedly rare—perhaps even rarer than *g^{wh}—though a few examples have reflexes in Anatolian and so can be reconstructed even for PIE proper (*leb- 'lick', *$h_2$ébō 'river'; cf. Melchert 1994: 93). Most surprising of all was a series of constraints on the shapes of root-syllables. A root could not contain two voiced stops, nor could it contain both a voiceless stop and a voiced aspirate unless the former occurred in a root-initial cluster with *s. Thus among potential roots with an initial coronal and a final velar, only these could have occurred:

*tek-	*dek-	—
*teg-	—	*d^heg-
—	*deg^h-	*d^heg^h-

(Cf. the actually reconstructable roots *teḱ- 'to produce', *teg- 'to cover', *deḱ- 'to accept', *delǵ^h- 'to be firm', *d^hyeh$_3g^w$- 'to insert, to stab', *d^heg^{wh}- 'to burn'.) The types '*teg^h-, *deg-, *d^hek-' did not occur—though the type *$steg^h$- did (cf. at least *spr̥d^h- 'contest', *$skab^h$- 'to scrape', *$skab^h$- 'to prop', *sperǵ^h- 'to hurry', *$stemb^h$H-[4] 'to prop', *$steyg^h$- 'to step').

Both the supposed typological oddity of a system with voiced aspirates but no voiceless aspirates and the apparent dearth of parallels to the constraints just described have led some scholars to propose a 'glottalic hypothesis', according to which the PIE voiced stops were really ejectives, while the other manners of articulation were voiceless and voiced (perhaps with noncontrastive aspiration; see e.g. Gamkrelidze and Ivanov 1973). But stop systems with a similar set of constrasts are actually attested in some Indonesian languages (Hock 1986: 625–6); moreover, adopting the glottalic hypothesis makes it very difficult to account for the shapes of the oldest stratum of Iranian loanwords in Armenian, which the traditional reconstruction explains with ease (Meid 1987: 9–11). Most mainstream Indo-Europeanists have therefore rejected the glottalic hypothesis, or at least regard it as unproven (cf. e.g. Vine 1988).

The pronunciation of the three 'laryngeals' (symbolized as *h*'s with subscript numerals) cannot be reconstructed with precision, and their position in the chart above should not be taken very seriously; note especially that the first and third laryngeals did not pattern like palatal and labiovelar

[4] It is customary to write '*H' for a laryngeal the precise identity of which cannot be reconstructed—a problem that recurs fairly often, since most daughter languages merged the laryngeals in many environments.

consonants. We can at least be confident that all the laryngeals were obstruents of some kind, because they behaved like obstruents with respect to the syllabification rules (see 2.2.4 (ii)). *h_2 was apparently a voiceless fricative pronounced far back in the mouth, to judge from its reflexes in the Anatolian languages (the only subgroup in which it usually survives as a consonant). *h_3 apparently exhibited lip-rounding, to judge from the fact that it rounded adjacent short *e (see 2.2.4 (i)), though it was not necessarily identical to *h_2 in other respects. About the pronunciation of *h_1 nothing can be said with certainty except that it was an obstruent. It should be clear that 'laryngeals' is an anachronistic misnomer, retained only because it has become standard in the field.

There seem to have been very few constraints on the distribution of *s and the laryngeals, to judge from the reconstructability of such roots and words as *ses- 'to be asleep', *$h_1$yeh$_1$- 'to make', *$h_1$reh$_1$- 'to row', *$h_2$énh$_2$t-s 'duck', *$h_2$éwh$_2$o-s 'grandfather', *$h_3$emh$_3$- 'to swear', *$h_1$éh$_3$s 'mouth', *$h_1$néh_3-mn̥ 'name', *$h_2$weh$_1$- 'to blow', *$h_2$enh$_1$- 'to breathe', *$h_2$wĺ̥h_1-ne-h_2 'wool', *$h_2$erh$_3$- 'to plow', etc. *s was by far the commonest obstruent in the language; *h_2 was perhaps the second most common in a lexical count, though *t may have been commoner in speech because it occurred in so many suffixes and endings.

2.2.2 *PIE sonorants and high vowels*

One of the more unusual features of PIE phonology was the existence of a class of 'sonorants' (or 'resonants') whose syllabicity was determined by rule. They appear to have been underlyingly nonsyllabic; in fact, almost all the syllabic sonorants which are reconstructable for PIE can be derived from underlyingly nonsyllabic segments by the rules discussed in section 2.2.4 (ii) below.

The one clear exception to that generalization involves the high front vocalics. Though most of the short syllabic high vowels can be derived from underlying */y/ and */w/, there were a few examples of syllabic *i in positions where underlying */y/ should have surfaced as nonsyllabic *y; for instance, though nonsyllabic sonorants normally occurred in the context VC__V, where the first vowel was short and C indicates any single nonsyllabic, *i also occurred in that position. A probable example is *néwios 'new' (a derivative of *néwos 'new' with a suffix of unclear function; cf. Rigvedic Skt *návyas,* often scanned as three syllables—i.e., *návias*—and Welsh *newydd* < Proto-Celtic *nowi(y)os < *néwios). The syllabic *i of *néwios contrasted with the *y of *ályos 'other' and *sewyós 'left(-hand)' in the same prosodic environment (cf. Rigvedic Skt disyllabic *savyás* 'left(-hand)' and Welsh *eil* 'other'

without the additional syllable of *newydd*). It seems that the *i of *néwios can only have been an underlying vowel */i/. (Cf. Mayrhofer 1986: 160–1, 168, for discussion and further examples.)

Though I know of no similar syllabification evidence for an underlying vowel */u/, there is another phenomenon which probably reflects PIE */u/. Though nearly all PIE roots contained a nonhigh vowel and were subject to the phonological rules collectively called 'ablaut' (see 2.2.4 (i)), there were a handful of non-ablauting roots, and the most securely reconstructable example is *b^huh_2- 'to become', with invariant *u. Unless we wish to posit a root which never contained a vowel in PIE, we ought to recognize an underlying high vowel */u/ in this root.

If the above analysis is correct, it makes the occurrence of *ī and *ū, which were likewise very rare, somewhat less puzzling: in addition to the (underlyingly nonsyllabic) sonorants, PIE had genuine high vowels, both long and short, though they were rare. As we will see in the next section, many other PIE underlying vowels were also surprisingly rare.

2.2.3 *PIE nonhigh vowels*

The PIE system of nonhigh vowels, simple as it seems on the surface, was probably even simpler underlyingly. The vowels exhibited extensive alternations in morphologically related forms according to the patterns:

$\bar{e} \sim e \sim \emptyset \sim o \sim \bar{o}$
$\bar{a} \sim a \sim \emptyset$

It seems clear that */e/,*/a/ were the underlying segments in most cases, and that the other vowels were derived from them by various phonological rules, which had generally been morphologized to a greater or lesser extent (see 2.2.4 (i)). The system is referred to as 'ablaut'; the alternants of each series are called 'ablaut grades', so that it is customary to speak of 'e-grade, o-grade, zero grade', and so on.

Roots and words which must be reconstructed with underlying */a/ were surprisingly few. This list includes a large proportion of the better examples (not all of which would be reconstructed with */a/ by every Indo-Europeanist): *ar- 'to fit', *ay- 'to give', *ay- 'to be hot', *ayd^h- 'to burn (intr.)', *b^hrag- 'to break', *h_2wap- 'evil', *Hyaǵ- 'to worship', *kan- 'to sing' (of birds), *karp- 'to pluck', *kaw- 'to hit', *kwas- 'to kiss', *$kwath_2$- 'to bubble', *ḱad- 'to fall', *lab^h- 'to take', *lad- 'beloved', *maḱ- 'long', *nad^h- 'to tie', *nas- 'nose', *paw- 'little, few', *plak- 'to be pleasing', *sak- 'holy', *sal- 'to jump', *$skab^h$- 'to prop', *$skab^h$- 'to scrape', *stag- 'to drip', *tag- 'to touch', *war- 'to burn', *swad- 'pleasant, sweet' (or better *$sweh_2d$-?); *$alb^hós$ 'white', *ályos 'other', *átta 'dad',

*awl- 'tube', *b^{h}ágos 'a share', *dáḱru 'tear (i.e. eye-water)', *dayh$_2$wḗr 'brother-in-law', *g^{h}eb^{h}al- 'head', *ǵ^{h}áns 'goose', *kápros 'male (animal)', *kátus 'fight', *kawl- 'shaft', *laywós and *skaywós 'left(-hand)', *pláth$_2$us 'wide', *sáls 'salt', *sámh$_2$d^{h}os 'sand', *sasyóm 'grain', *sawsós 'dry', *smáḱru 'beard', *táwros 'bull', *wástu- 'settlement'. (Cf. Melchert 1994; Ringe 1996; Rix et al. 2001 *passim;* for discussion of a difficult case see Seebold 1967*a* and Stang 1974.) A large proportion of the words which exhibit *a* in the daughter languages can be shown to reflect PIE *h$_2$e, and many other examples are ambiguous (especially those that are word-initial but do not survive in Hittite, Palaic, or the Luvian group, in which word-initial *h$_2$ is reflected by a consonant).

Since long vowels and *o which cannot be derived from underlying */e/ and */a/ were even rarer, it is clear that */e/ was overwhelmingly the most common underlying vowel, and the most common underlying segment, in PIE. Like the fairly large obstruent system, this is reminiscent of the situation in Northwest Caucasian languages, though the PIE system was typologically less extreme.

2.2.4 *PIE phonological rules*

A remarkable amount of the phonological rule system of PIE can be reconstructed. Only the most important rules are discussed here.

2.2.4 (i) *Ablaut and laryngeals* The default underlying vowel */e/ was replaced by *o in a wide variety of morphological environments. Fuller details will be given in the discussion of PIE inflection and derivation (2.3 and 2.4); here I give only a general outline of the system.

Some ablauting nouns exhibited *o in the root-syllable in the 'strong' cases (the nominative, accusative, and vocative), but *e or Ø in the 'weak' cases (the remaining cases of the paradigm, roughly speaking); typical examples include *pód- ~ *ped- 'foot' and *wódr̥ ~ *udén- 'water'. The same pattern reappears in the indicative of some ablauting verb stems, in which the singular active had *o in the root, but the rest of the paradigm had *e or Ø. In Hittite this pattern is characteristic of the most archaic stratum of the 'hi-conjugation' (e.g. *sākki* '(s)he knows', *sekkanzi* 'they know'; *dāi* '(s)he puts', *tiyanzi* 'they put'). In West IE (see above) it had become restricted to the 'perfect' stem; Ø is usual in the weak forms (cf. e.g. *memóne '(s)he remembers', *memnḗr 'they remember'), but see Jasanoff 2003*a*: 32–3, 40–2 for probable relics of e-grade weak forms in Indo-Iranian. For PIE we must reconstruct surface *e in other types of noun and verb stems in exactly the same phonological environments in which the above types exhibited *o; thus it is clear that the o-grade rule had already been morphologized in PIE.

Some types of polysyllabic ablauting nouns and adjectives exhibited *o in the final syllable of the stem in the strong cases when that syllable was unaccented and followed by an overt ending (e.g. in acc. sg. *swésor-m̥ 'sister'); it looks as though *o might have replaced Ø in a position in which the latter had become inadmissible, though the phenomenon is not well understood. The pretonic root-syllables of derived causative verbs also appeared in the o-grade (e.g. in *woséyeti '(s)he clothes (someone)'), for reasons that are likewise not understood. A considerable number of derived nominals, especially thematic nouns, also exhibited o-grade roots.

It is clear from the above that the o-grade rule was triggered by a disjoint set of morphological environments that had no apparent connection with one another. So far as can be determined, underlying */a/ did not undergo this rule.

In all types of ablauting stems an underlying nonhigh vowel was often deleted when it was unaccented on the surface; the same zero-grade rule also applied frequently in derivation. The correlation between lack of surface accent and lack of a vowel was still fairly robust in PIE, and it is clear that lack of accent was the original environment in which the rule applied. However, reconstructable exceptions in both directions—i.e. cases in which the rule unexpectedly failed to apply, on the one hand, and zero-grade syllables which unexpectedly bore a surface accent, on the other—are numerous enough to demonstrate that the rule had already been morphologized in PIE. Instances of unaccented *o have been mentioned above; clear instances of unaccented *e in ablauting nouns include *pedés 'of a foot' (cf. Lat. *pedis*), *néb^{h}esos 'of a cloud' (cf. Homeric Gk *νέφεος* /nép^{h}eos/; Hitt. *nēpisas* 'of the sky'), etc. Instances of accented zero-grade syllables include *h$_2$ŕ̥ḱtsos 'bear' (the animal), *h$_2$wĺ̥h$_1$neh$_2$ 'wool', *septḿ̥ 'seven', *wĺ̥k^{w}os 'wolf', and instances of regularly syllabified */y/ and */w/ in such forms as *mustís 'fist' and *ōḱús 'swift'; instances of *í and *ú that never alternated with *y and *w can, of course, have been underlying high vowels (see the discussion in 2.2.2).

The ablaut pattern of the 'thematic vowel', a largely functionless morpheme that was the stem-final segment in large numbers of verb, noun, and adjective stems, was unique. It underwent the zero-grade rule only when immediately followed by some derivational suffixes (such as *-yó-, which formed adjectives from nouns). Moreover, the e- and o-grades of the thematic vowel appear to have been conditioned by the segment that followed immediately, but differently in verbs and in nominals. In verb stems the e-grade appeared word-finally (i.e. when there was no ending or a zero ending, e.g. in imperative 2sg. *b^{h}ére 'keep carrying!'), before an e-grade subjunctive suffix (see below), and before coronal obstruents (which were very common in verb endings; cf. e.g.

*b^{h}éresi 'you're carrying', *b^{h}éreti '(s)he's carrying', etc.). The o-grade appeared elsewhere, including before *h$_2$ (cf. e.g. *b^{h}éronti 'they're carrying', *b^{h}éromos 'we're carrying', *b^{h}érowos 'the two of us are carrying', *b^{h}éroyd '(s)he would carry', *b^{h}éroh$_2$ 'I'm carrying'). In nominals the e-grade originally appeared only word-finally and before *h$_2$ (e.g. in voc. sg. *swéḱure 'father-in-law!' and neut. collective *werǵéh$_2$ 'work'), while the o-grade appeared elsewhere, including before endings beginning with *e (e.g. in nom. sg. *swéḱuros and *wérǵom, and in dat. sg. *swéḱuroey 'to/for (the) father-in-law'). Thus most forms of thematic nominals exhibited the o-grade of the thematic vowel, and for that reason thematic nominal stems are often called 'o-stems'.

There was at least one phonological rule which lengthened vowels directly: in some ablauting nouns and adjectives and in a few types of ablauting verb stems, the root-vowel was lengthened in the strong cases and the indicative singular active respectively. Thus we are able to reconstruct *h$_1$nḗh$_3$mn̥ ~ *h$_1$néh$_3$mn- 'name', *Hyḗk^{w}r̥ ~ *Hyék^{w}n- 'liver', *mḗh$_1$n̥s ~ *méh$_1$n̥s- 'moon', *mḗms ~ *méms- 'meat', *wḗsu-s ~ *wésu- 'good', *h$_1$ḗd-s-ti '(s)he's eating' but *h$_1$éd-n̥ti 'they eat', *wḗḱ-ti '(s)he wants' but *wéḱ-n̥ti 'they want', *wḗǵ^{h}-s-t '(s)he brought it (in a vehicle)' but *wéǵ^{h}-s-n̥d 'they hauled it', and likewise *nā́s-h$_1$e ~ *nás- 'nose, nostrils', *wā́stu ~ *wástu- 'settlement' (cf. Narten 1968; Schindler 1975*a*: 5–6, 1975*b*: 262; Oettinger 1979: 100; Normier 1980: 254, 262 n. 42; Strunk 1985; Ringe 1996: 70–1).

More often long vowels arose by contraction of adjacent identical vowels or by compensatory lengthening. The latter process will be discussed in section 2.2.4 (iv) below. Two instances of vowel contraction are worth noting here, and both require some explanation. In athematic verb stems the subjunctive mood was marked by suffixing the thematic vowel; for instance, to aorist indicative *g^{w}ém-d '(s)he stepped', *g^{w}m-énd 'they stepped' corresponded subjunctive *g^{w}ém-e-ti '(s)he will step', *g^{w}ém-o-nti 'they will step'. (The subjunctive was the only category in which the thematic vowel had a grammatical function.) The same suffix was used to mark the subjunctive of thematic stems, but in that case the (meaningless) thematic vowel of the stem and the subjunctive vowel contracted into a long vowel; thus to present indicative *g^{w}m̥-sḱé-ti '(s)he's walking (i.e. stepping iteratively)', *g^{w}m̥-sḱó-nti 'they're walking' corresponded subjunctive *g^{w}m̥-sḱḗ-ti (=/-sḱé-e-ti/) '(s)he will walk', *g^{w}m̥-sḱṓ-nti (= /-sḱó-o-nti/) 'they will walk'. The other instance of vowel contraction occurred in the context of a derivational process called 'proto-vr̥ddhi'. The rule seems originally to have worked as follows: an ablauting nominal stem was put in the zero grade, the vowel *e was inserted into it (not necessarily in the same position as its underlying vowel), and an accented

thematic vowel was suffixed. For instance, to form a proto-vr̥ddhi derivative from *dyew- 'sky' one took the zero grade *diw-, inserted *e to give *deyw- (sic), and so derived *deyw-ó-s 'god' (literally 'skyling'). At some point this rule was extended to non-ablauting stems that already contained *e, and the two *e's then contracted into a long vowel; for instance, from *swéḱuros 'father-in-law' was formed *swēḱurós 'male member of father-in-law's household'. This is the historical source of the derivational process called vr̥ddhi in Sanskrit.

The short e-grade vowel *e, but not any of the other vowels in the ablaut system, had distinctive allophones when adjacent to the second and third laryngeals. Next to *h_2 it was *[a], apparently indistinguishable from */a/; next to *h_3 it was *[o], apparently indistinguishable from */o/. Thus *$h_2$éwis 'bird' must have been pronounced approximately as *[xáwis], and *b^hréh$_2$tēr 'brother' approximately as *[b̥ráxtɛːr]; and we can't be certain what underlying vowel the first *[o] of *$h_3$ósdos 'branch' reflects. (But the laryngeal had no effect on the *o of *h_2ḱ$h_2$owsiéti '(s)he's sharp-eared', so far as we can tell, nor on the *ē of *ḗh_2g^{wh}ti '(s)he's drinking'; cf. Beekes 1972; Eichner 1973; Jasanoff 1988*a*; Kimball 1988; Kim 2000.) All the daughter languages, even in the Anatolian subfamily, show the effects of these 'vowel-coloring' rules.

As might be expected, the coloring rules complicate the task of reconstruction considerably, and we are often constrained to rely on indirect inference in reconstructing PIE underlying forms. For example, we are reasonably certain that the etymon of Toch. B *āśäṃ* '(s)he leads', Skt *ájati* '(s)he drives', Gk *ἄγει* /ágei/'(s)he leads', and Lat. *agit* '(s)he drives' should be reconstructed as *$h_2$égeti, with underlying */e/, because a derived noun *$h_2$ógmos 'drive, path of driving' is also reconstructable (cf. Gk *ὄγμος* /ógmos/ 'furrow, swath, path of a heavenly body'), and underlying */a/ is not known to have been subject to the o-grade rule. On the other hand, the first syllable of *meh$_2$tḗr 'mother' participates in no alternations of any kind, and though we are fairly certain that the word contained *h_2 (because of the parallel with *ph$_2$tḗr 'father' and *d^hugh$_2$tḗr 'daughter'), we do not really know whether the vowel immediately preceding it was */e/ or */a/. If it was really somehow derived from a 'nursery word' of the *mama*-type, */a/ is actually more likely, as Michael Weiss observed to me many years ago.

How much reinterpretation by language learners the coloring rules caused within the PIE period is unclear. But the loss of laryngeals in most daughters certainly caused the outcomes of these rules to be reinterpreted as underlying, and a wholesale restructuring of the ablaut system necessarily resulted in every daughter language.

Finally, it should be noted that laryngeals not adjacent to syllabics were apparently deleted by three different rules. A laryngeal which was separated from an o-grade vowel by a sonorant, but was in the same syllable as the o-grade vowel, was dropped (cf. Beekes 1969: 74–6, 238–42, 254–5). For instance, whereas the laryngeal of *d^heh_1- 'put' survived in the derived noun *$d^hóh_1mos$ 'thing put' (cf. Gk *θωμός* /$t^hǫ$ːmós/ 'heap' and OE *dōm* 'judgment', both with long vowels that reveal the prior presence of a laryngeal), that of *$terh_1$- 'bore' was dropped in *tórmos 'borehole' (cf. Gk *τόρμος* /tórmos/ 'socket' and OE *þearm* 'intestine'). The most important application of this rule was in the thematic optative, in which the sequence */-o-yh_1-/ was reduced to *-oy- in most forms. Further, laryngeals were dropped between an underlying nonsyllabic and */y/ (in that order) if there was a preceding syllable in the same word (cf. Peters 1980: 81 n. 38 with references); thus, though the present (i.e. imperfective) stem of *$sneh_1$- 'twist, spin' was *$sném_1ye/o$-, with the laryngeal preserved, that of *$werh_1$- 'say' was *$wérye/o$- (cf. Homeric Gk *εἴρει* /éːrei/ '(s)he says'), that of *h_2erh_3- 'plow' was *$h_2érye/o$- (cf. Lith. *ãria* '(s)he plows'), and so on. (A PIE present *$wérh_1yeti$ would have given *ἔρέει* in Homeric Gk, while *$h_2érh_3yeti$ would have given *ária* in Lithuanian.) Finally, it seems clear that a laryngeal was dropped if it was the second of four underlying nonsyllabics and was followed by a syllable boundary (Hackstein 2002 with references); thus, for example, the oblique stem of */$d^hugh_2tér$-/ 'daughter', underlyingly */d^hugh_2tr-′/, surfaced as *$d^hugtr̥$-′ with the laryngeal dropped (at a point in the derivation before the operation of Sievers' Law, on which see the following section).

2.2.4 (ii) *Syllabification of sonorants* Working on the hypothesis that sonorants were underlyingly nonsyllabic, we can state the rule syllabifying them as follows. Vowels were unalterably syllabic and obstruents (including laryngeals) unalterably nonsyllabic. Each sequence of one or more sonorants was syllabified as follows. If the rightmost member of the sequence was adjacent to a syllabic (i.e. a vowel, on the initial application of the rule), it remained nonsyllabic, but if not, it was assigned to a syllable peak. The rule then iterated from right to left, the output of each decision providing input to the next. Forms of *ḱwon- 'dog' neatly illustrate the process. The zero grade was basically *ḱwn- (since full-grade forms show that the high vocalic was an alternating sonorant, not an underlying syllabic high vowel). The genitive singular *ḱwn-és 'dog's, of a dog' was syllabified as follows: the *n was adjacent to a vowel and therefore remained nonsyllabic; consequently the *w was not adjacent to a syllabic, and it therefore surfaced as syllabic *u, giving *ḱunés (cf. Skt *śúnas*, Gk *κυνός* /kunós/). On the other hand, the

locative plural *ḱwn-sú 'among dogs' was syllabified as follows: the *n was not adjacent to a vowel and therefore became syllabic *n̥; consequently the *w was adjacent to a syllabic and therefore remained nonsyllabic, giving *ḱwn̥sú (cf. Skt *śvásu*). It is possible that there were systematic exceptions to this rule. Most strikingly, the zero grade of the present-stem-forming nasal infix *-né- seems to exhibit only nonsyllabic reflexes in the daughter languages when a sonorant precedes; for instance, the zero grade of *linék^{w}- 'be leaving behind' is always a reflex of *link^{w}-, never of the '*l̥yn̥k^{w}-' that the syllabification rule predicts. Note also that the accusative endings are always nonsyllabic sg. *-m, pl. *-ns after a high vocalic. Of course morphological changes in the daughter languages might have obscured the original situation; but the same factor makes the reconstruction of the rule less than fully certain.

The output of the basic syllabification rule was input to a further adjustment rule known as 'Sievers' Law', which operated as follows. If a nonsyllabic sonorant was immediately preceded by two or more nonsyllabics, or by a long vowel and a nonsyllabic, it was replaced by the corresponding syllabic sonorant. For instance, the adjective-forming suffix *-yó- appeared with nonsyllabic *y in *pedyós 'of feet; on foot' (of which the derivational basis was */ped-/ 'foot'; cf. Gk *πεζός* /pesdós/ 'on foot', with *ζ* < *dy), but with syllabic *i in *neptiós 'of grandsons' (basis */nept-/ 'grandson'; cf. Gk *ἀνεψιός* /anepsiós/ 'cousin' (with analogical *ἀ-*), Av. *naptiiō* 'descendant', late Church Slavonic *netĭjĭ* 'nephew'). There seems likewise to have been a syllabic *i in *(h$_2$)ōwióm 'egg', possibly (though not certainly) a derivative of *h$_2$éwis 'bird'. Similarly, the present-stem forming suffix *-yé- ∼ *-yó- appeared with nonsyllabic *y in *wr̥ǵyéti '(s)he's working', but with syllabic *i in *h$_2$ḱh$_2$owsiéti '(s)he is sharp-eared'. The other sonorants seem to have behaved in a similar fashion in PIE, to judge from sychronically isolated forms in the daughter languages (though the distribution of their allophones has been altered in the daughters to a greater extent than those of */y/). For instance, */n/ remained nonsyllabic after a light syllable in *Hyaǵnós 'reverend, worshipful' (cf. Gk *ἁγνός* /hagnós/ 'holy, chaste', Skt *yajñás* 'sacrifice') but became syllabic after a heavy syllable in *pl̥th$_2$n̥ós 'broad' (cf. Proto-Celtic *litanos 'broad' > OIr. *lethan*, Welsh *llydan*; superlative substantivized in Homeric Gk *πλατάνιστος* /platánistos/ 'plane tree', lit. 'the broadest one'). The most thorough discussion of this rule as it applied to vocalic sonorants is Seebold 1972.

Because PIE syllabification rules have often been misrepresented, it has to be emphasized that there was no 'converse of Sievers' Law' replacing syllabic sonorants or high vowels with nonsyllabic sonorants after light syllables in PIE; the evidence against it (such as the reconstructable adjective *néwios 'new', cited above) is much stronger than the evidence against the glottalic

hypothesis, for example (on which see above). The exhaustive discussion of Seebold 1972 effectively settled this dispute.

A phenomenon called 'Lindeman's Law' seems to have been a special case of Sievers' Law affecting word-initial CR-clusters (where C indicates any nonsyllabic and R indicates a sonorant). In the case of monosyllabic forms which began underlyingly with /CR-/, we find cognates with reflexes of nonsyllabic sonorants and those with reflexes of syllabic sonorants in no particular pattern (Lindeman 1965); for instance, the accusative singular of the word meaning 'sky, day' seems to be reconstructable both as *dyḗm (reflected, e.g., in Doric Gk acc. sg. *Ζῆν-α* /sdḛ:na/ 'Zeus') and as *diḗm (reflected, e.g., in Lat. acc. sg. *diem* 'day'). Both syllabifications of the Sanskrit reflex (*dyā́m, diā́m*) are attested in the Rigveda. It appears that this was originally the result of Sievers' Law applying within phrases and thus affecting word-initial CR-clusters, but the apparent restriction of the alternation to monosyllabic forms is odd and difficult to assess. Possibly polysyllabic forms were affected by yet another PIE rule applying only to words and sensitive to word-length; possibly innovative rules in the daughter languages have obscured the picture; possibly the reflexes of the two monosyllabic alternants have simply survived better in the daughters, on the average.

The labial sonorants exhibited a striking type of exceptional behavior: in the word-initial clusters *mr-, *ml-, *wr-, and (therefore probably) *wl-, both sonorants were nonsyllabic; clearly reconstructable examples include *mrégʰus 'short', *mléwHti '(s)he says', and *wreh$_2$d- 'root'. It seems clear that these initial sonorants were underlyingly marked as exceptions to the syllabification rule, because derived *wr-, at least, was subject to the rule: for instance, from the root */war-/ 'to burn' was formed a stative present *ur-ó-r 'it's burning' (⟶ Proto-Anatolian *urórі > Old Hitt. *urāni*; see Oettinger 1979: 515; Yoshida 1990: 203), with an initial sequence that contrasts with that of *wreh$_2$d- 'root'. This strongly suggests that the unalterably nonsyllabic sonorants were obstruents at some pre-PIE period; as Warren Cowgill observed to me more than twenty years ago, the fact that */b/ was so rare in PIE might imply that most pre-PIE *b's had become *w, and the anomaly discussed here is precisely the sort of phenomenon that one would expect to have resulted from such a change.[5]

2.2.4 (iii) *Some rules affecting obstruents* The contrast between velar and labiovelar stops is not reconstructable next to *w, *u, or *ū; evidently it was neutralized in that position (cf. Weiss 1993: 153–65 with references). We

[5] So also Schindler 1972*b*: 3, who however suggests **b > PIE *m.

conventionally write velars (the unmarked member of the opposition). Thus from the 'Caland' root *h$_1$leng^{wh}- 'light [in weight]' were formed the adjectives *h$_1$ln̥g^{wh}rós (with the labiovelar preserved between *n̥ and *r; cf. Gk ἐλαφρός /elap^{h}rós/) and *h$_1$léng^{h}us (with the corresponding velar next to *u; cf. Gk ἐλαχύς /elak^{h}ús/ 'little', Skt *rag^{h}ú*s* 'swift', both reflecting remodeled *h$_1$ln̥g^{h}ús with a zero-grade root).

The sibilant fricative */s/, which was underlyingly voiceless, seems to have been voiced to *[z] before voiced stops (e.g. in *nisdós 'seat, lair, nest'); it probably also had a breathy-voiced allophone before breathy-voiced stops (e.g. in *misd^{h}ó- 'reward').

Underlying */ss/ was simplified to single *s. For instance, the 2sg. pres. indic. of 'be', composed of the stem *h$_1$és- and the personal ending *-si, surfaced as *h$_1$ési 'you are' (cf. Skt *ási,* Gk εἶ /êi/ < *éhi < *ési). The two */s/'s didn't always belong to different morphemes; some become adjacent in zero-grade formations. For instance, *h$_2$éwses- 'ear' appeared with two zero-grade syllables before the nom.-acc. dual ending, and the underlying form */h$_2$uss-íh$_1$/ surfaced as *h$_2$usíh$_1$ 'two ears' (cf. Szemerényi 1967: 67–8).

Geminate coronal stops apparently appeared on the surface only in nursery words (*átta 'dad'); possibly those were the only lexical items in which they were intramorphemic. Where two coronal stops were brought together by morphological processes, an *s was inserted between them. For instance, addition of the verbal adjective suffix *-tó- to the root *yewg- 'join' yielded *yugtós 'joined', but addition of the same suffix to *b^{h}eyd- 'split' yielded *b^{h}idstós 'fissile'. The s-insertion rule still operated in Hittite (cf. e.g. *adwēni* 'we eat' but *aztēni* 'you (pl.) eat', where the ending is *-tēni* and *z* = /ts/); in the non-Anatolian daughters the complex clusters it created were simplified.

The s-insertion rule probably also operated in 'thorn clusters'. Since the 'thorn problem' is a famous conundrum of IE comparative phonology, it seems best to describe it first from the point of view of the actual data, then to work through the probable solution.

In the position after a dorsal stop, Sanskrit sibilants normally correspond to Greek -σ- /-s-/, while Sanskrit coronal stops normally correspond to Greek -τ- /-t-/ and -θ- /-t^h-/; for instance, Skt *dákṣiṇas* ≈ Gk δεξιός /deksiós/ 'right (hand)' (< *deḱsi-), while Skt *aṣṭáu* = Gk ὀκτώ /oktǫ́:/ 'eight' (< *oḱtṓw). But there are also cognate pairs in which Sanskrit sibilants correspond to Greek -τ- or -θ-, e.g. Skt *ŕ́kṣas* = Gk ἄρκτος /árktos/ 'bear', Skt *kṣam-* = Gk χθον- /k^{h}t^{h}on-/ 'earth' (cf. Mayrhofer 1982). A century ago Karl Brugmann reconstructed the final segment of such clusters as '*þ' (so that 'bear', for example, was '*ŕ̥ḱþos'); but since PIE *þ contrasted with both *s and the coronal stops, but occurred nowhere else in the language, Brugmann's

solution never seemed plausible. The discovery of Hittite and Tocharian provided new evidence suggesting that the thorn clusters were actually clusters of coronal plus dorsal, in that order; for instance, whereas 'earth' had been reconstructed as '*ǵ^{h}þem-', the Hittite nominative and accusative singular *tēkan* instead suggested *d^{h}(e)ǵ^{h}em- (cf. Schindler 1967*a*). Further research led the late Jochem Schindler to the suspicion that Tocharian might preserve thorn clusters as *kts;* for instance, Toch. B *taktsāntsa* 'capable' might be cognate with Skt *tákṣā* = Gk *τέκτων* /téktǫ:n/ 'carpenter' (original meaning *'craftsman' or the like; K. T. Schmidt apud Mayrhofer 1990: 614).

These new data eventually led Schindler to the following solution (expounded informally at Oxford in 1991).

1. The surface realization of thorn clusters was actually *KTs (thus *h$_{2}$ŕḱtsos 'bear', *tékḱtsō 'craftsman', locative *ǵ^{h}d^{h}sém 'on the ground').
2. Underlyingly, however, these clusters were */TK/.
3. The rules by which the underlying forms gave rise to the surface forms were:
   a. s-insertion (which must therefore have operated between a coronal stop and *any* following stop);
   b. metathesis, by which the dorsal was shifted from final position in the cluster to cluster-initial position.

As might be expected, these rules gave rise to baroque alternations within paradigms, and the alternations tended to be removed by leveling and other kinds of reanalysis. For instance, the paradigm of 'earth' included nom.-acc. *d^{h}éǵ^{h}ōm, loc. *ǵ^{h}d^{h}sém, and an oblique stem *ǵ^{h}m- (in which the initial coronal was apparently dropped), e.g. in gen. *ǵ^{h}més. In some daughters the stem-shape of the locative, to which Schindler's rules had applied, was generalized (cf. e.g. Gk *χθών* /k^{h}t^{h}ǫ:n/, Skt acc. *kṣā́m*); in others the simple palatal of the oblique stem was apparently generalized (cf. e.g. Lat. *humus*); Anatolian and Tocharian generalized *T(V)K-* (cf. e.g. Hitt. *dagān* 'on the ground', Toch. A *tkaṃ* 'earth').

What happened to the reduplicated present stem *té-teḱ-ti '(s)he produces' (root *teḱ-) is especially instructive. The zero-grade forms were subject to the rules given immediately above; for instance the 3pl., underlyingly */té-tḱ-nti/, surfaced as *tékḱtsn̥ti. Most of the daughters extracted *teḱts- and treated it as the underlying root. Latin simply added the thematic vowel (*téḱts-e-ti > *texit* '(s)he weaves'). Indo-Iranian treated the form as the zero grade of the root and created a new full grade *tēḱts- by adding another *e, which of course contracted with the one already present (see 2.2.4 (i)); hence 3pl.

*téḱtsn̥ti > Skt *tákṣati* but 3sg. *tḗḱts-ti > *tā́ṣṭi* '(s)he fashions'. Only Gk τίκτει /tíktei/ 'she's giving birth' preserves the original reduplicated present, and it has been remodeled in ways typical of Greek: the reduplicating vowel has been replaced by *i, and a thematic stem has been constructed on the old zero grade of the athematic stem (thus *tétek- ~ *téḱts- → *títeḱ- ~ *tíḱts- > *títek- ~ *tíkt- → τικτ-ε- ~ τικτ-ο-).

Clusters of obstruents undergo rules of voicing assimilation in all the daughters, but since most such rules are natural and could have arisen repeatedly, it is unclear whether they should be reconstructed for PIE. The most interesting example is 'Bartholomae's Law', an Indo-Iranian rule by which breathy-voicing spreads rightward through a cluster of obstruents; for instance, in Sanskrit the addition of the past participial suffix /-tá-/ (< PIE verbal adjective *-tó-, see above) to the root /bud^{h}-/ 'awaken' (< PIE *b^{h}ewd^{h}-; Sanskrit roots are traditionally cited in the zero grade) gives *budd^{h}á-* 'awake'. It is possible, but not certain, that the rule was inherited from PIE. Given the uncertainty surrounding the prehistory of these assimilation rules, I write unassimilated forms for PIE (*yugtós, etc.).

Various simplifications of consonant clusters occurred in PIE. It's clear that *KsK clusters were simplified by loss of the first stop; for instance, the present of *preḱ- 'ask' (cf. Lat. *precēs* 'prayer'), underlyingly */pr̥ḱ-sḱé/ó-/, surfaced as *pr̥sḱéti '(s)he keeps asking' (cf. Lat. *poscit* '(s)he asks for', Skt *pr̥cc^{h}áti* '(s)he asks'). Some word-initial clusters of stops were simplified before some sonorants (syllabic or not); an obvious example is *ḱm̥tóm 'hundred', evidently derived from */déḱm̥t/ 'ten' but lacking the initial *d- (as in the oblique stem of 'earth' above). Further details are beyond the scope of this sketch.

2.2.4 (iv) *Auslautgesetze* It is likely that word-final */t/ was voiced when a vowel or sonorant preceded (Hale 1994, Ringe 1997); thus the surface form of 'ten', cited immediately above, was probably *déḱm̥d. This relatively unnatural rule still operated in Hittite and in Proto-Italic, and it is more likely that that reflects a common inheritance than a parallel innovation.

The morphologized effects of some pre-PIE phonological rules affecting word-final sequences had a major impact on PIE nominal inflection. The most important of these rules is 'Szemerényi's Law', by which the word-final sequences **-VRs and **-VRh$_2$ (at least) became *-V:R (where R symbolizes a sonorant, V a vowel, and : vowel length). These rules affected the nom. sg. forms of numerous masculine and feminine nouns, and the nom.-acc. of neuter collectives; for instance, **ph$_2$térs 'father' > *ph$_2$tḗr (the reconstructable form). A word-final *-n that arose by this process was subsequently dropped, at least if the preceding segment was (unaccented) *ō (cf. Jasanoff

2002: 34–5); thus **tétḱons 'craftsman' > **téḱtsōn > *téḱtsō. We know that these rules had already been morphologized in PIE because (a) the resulting long vowel had begun to spread to other nom. sg. forms in which it was not phonologically justified (e.g. *pṓds 'foot'), and (b) word-final sonorants other than *-n were sometimes dropped in nom. sg. forms (only; e.g. *sókʷh$_2$ō 'companion' was actually an i-stem, and its nom. sg. ought to have ended in **-oys, as George Cardona reminds me).

Also fairly important was a complex of rules called 'Stang's Law', by which word-final */-Vmm/, */-Vwm/, and apparently */-Vh$_2$m/ surfaced as *-V:m, and final */-Vyi/ → *-V:y; for instance, the acc. sg. of *dom- 'house' seems to have been *dṓm (not '*dómm̥'; cf. also the acc. sg. of 'earth' cited above), that of *dyew- 'day, sky' was clearly *dyḗm (not '*dyéwm̥'), feminines in *-eh$_2$ had acc. sg. forms in *-ām, and i-stem loc. sg. */-ey-i/ became *-ēy. The same or similar rules appear to have applied before acc. pl. *-ns, ultimately giving forms in *-V:s, but the details are not completely clear.

In utterance-final position laryngeals were lost, at least if a syllabic immediately preceded. Such a sandhi rule is recoverable from various phenomena in the Rigveda; in addition, vocatives were complete utterances, and it is clear that the final laryngeal of stems in *-eh$_2$ was lost in the voc. sg. (cf. Kuiper 1947: 210–12, 1961: 18). This rule was ordered after the laryngeal-coloring rules, so that in the vocatives in question the output was short *[-a]. This is the source of Greek vocatives in -$\tau\alpha$ /-ta/ to masc. ā-stems in -$\tau\eta\varsigma$ /-tę:s/ (< -$\tau\bar{\alpha}\varsigma$ ← *-$\tau\bar{\alpha}$) and of OCS vocatives in -*o* (< *-a) to nouns in -*a* (< *-ā < *-eh$_2$).

2.2.5 *PIE accent*

A PIE word could contain at most one accented syllable. It seems clear that the surface instantiation of accent was high pitch (as attested in Vedic Sanskrit and Ancient Greek, both described by native grammarians), though in all the daughter languages this eventually evolved into prominence ('stress'), and in many the system was eventually lost.

The rules by which accent was assigned in PIE are still incompletely understood, but the following facts are fairly clear. In principle any syllable of a word could be accented. Thematic nominals (i.e. those ending in the thematic vowel; see 2.2.4 (i) above) had the accent on the same syllable throughout the paradigm; thematic verb stems also have fixed accent in the attested languages, and most such stems clearly did in PIE as well (though there is some uncertainty about simple thematic presents; see now Kim 2002, ch. 6). Some athematic verb stems and nominals exhibited fixed accent (mostly on the root), but most exhibited alternating accent; there were several patterns, but in all of them the surface accent was to the left in one group of

forms (the nominative and accusative cases of nominals, the active singular of verbs) and to the right in the rest. It seems clear that stems and endings could be underlyingly accented or not, that the leftmost underlying accent surfaced, and that words with no underlying accent were assigned accent on the leftmost syllable by default; but not all the details have been worked out satisfactorily.

There was a class of small particles, pronouns, and the like, called 'clitics', that never bore an accent. Much more surprisingly, there were rules applying in sentential contexts—therefore on the phrase level, at the end of the phonology—that deaccented major words. Vocatives were normally deaccented; so were finite verb forms in main clauses, though not in subordinate clauses. When such forms occurred sentence-initially, however, they were accented after all. Sentence-initial vocatives clearly received accent on their leftmost syllables by default. Sentence-initial finite verbs in main clauses apparently received whatever accent they would have borne in subordinate clauses—at least to judge from Vedic Sanskrit, the only daughter that preserves the inherited system more or less intact.

This complex and unusual accent system has left extensive traces in Germanic languages, though the system itself had clearly been lost by the Proto-Germanic period.

2.3 PIE inflectional morphology

It is clear that PIE, like all of its daughters that are attested early (and many that are attested only later), possessed a large and complex inflectional system unlike that of any modern west European language. Much of the prehistory and history of English involved the simplification of that system.

2.3.1 *PIE inflectional categories*

The classes of inflected lexemes in PIE included verbs, nouns, adjectives, pronouns, determiners, and most quantifiers. All except verbs were inflected according to a single system and are therefore grouped together as 'nominals'; verb inflection was considerably more complex than nominal inflection.

All nominals were inflected for number and case. Singular, dual, and plural were distinguished, the dual expressing 'two' (or perhaps 'a pair of', i.e. a structured duality). Case was assigned to noun phrases in at least three ways. 'Structural' case assignment depended on the syntactic environment of the noun phrase. Thus subjects of finite verbs were assigned nominative case

(presumably by SPEC-head agreement);[6] objects of verbs were assigned accusative case by government by V in the default instance (see further below); noun phrase complements of noun phrases were assigned genitive case by government by N; and the indirect object of verbs like 'give' was probably assigned dative case structurally (whatever the structure of those verb phrases may have been). It is likely that some verbs assigned case to their objects by lexical rather than structural government; for instance, since verbs meaning 'remember' take genitive objects in many daughter languages, there is a reasonable probability that at least one such verb did so in PIE as well. Adjectives may also have assigned case lexically to the complements of their adjective phrases. Whether PIE possessed prepositions is difficult to say (see 2.5), but if it did, they presumably assigned case to their objects. Finally, it seems clear that in many instances case was assigned semantically (i.e. expressed a particular meaning directly). Number and case clearly 'percolated' from an NP node to all constituents of the noun phrase not dominated by intermediate NP nodes; thus adjectives and determiners in a noun phrase, for example, were marked with the same number and case as the head noun.

PIE marked at least eight cases, and probably nine, as follows.

case	*functions (not lexically governed)*
vocative	direct address
nominative	subject of finite verb; complement of 'be', etc.
accusative	(default) direct object of verb
dative	indirect object
genitive	complement of noun phrase; partitive?
instrumental	instrument
ablative	motion from; separation; standard of comparison
locative	position
allative	motion toward

The allative survives as such only in Old Hittite, but since a few Greek adverbs appear to be fossilized allatives, the case should probably be reconstructed for PIE. (For instance, Homeric Gk *χαμαί* /k^{h}amái/ 'to the ground' evidently reflects the PIE allative *ǵ^{h}méh$_2$ (*ǵ^{h}má?) to which the 'hic-et-nunc' particle *-i has been suffixed; the caseform survives in its original function in Old Hitt. *taknā*, whose stem has been remodeled.) However, in Proto-West IE, at the latest (see 2.1), the allative had undergone syntactic merger with the

[6] Readers unfamiliar with modern syntax should consult one of the standard handbooks, such as Haegeman 1991.

accusative. Therefore in the more familiar IE languages, including Germanic, the accusative has the additional function of expressing motion toward.

Each noun was arbitrarily assigned to a concord class, called a 'gender'; there were three genders, conventionally called masculine, feminine, and neuter. Adjectives, determiners, and most quantifiers modifying a noun exhibited gender concord with the noun. In addition, concord of number, case, and gender obtained under coreference. Thus nominals other than nouns normally had three sets of case-and-number forms, one for each gender. Only in the 1st- and 2nd-person and reflexive pronouns was gender concord not expressed in the inflectional morphology.

There was also concord of person and number (but not gender) between a finite verb and its subject. Since PIE was a pro-drop language, the subject was unexpressed in very many clauses, and the hearer was obliged to recover its person and number from the inflection of the verb.

At least in North IE (the non-Anatolian half of the family), verb inflection was organized around the category of aspect. The basic distinction was between eventive and stative forms; within the eventives, there was a further distinction between perfective and imperfective forms. Each verb stem (see below) was inherently imperfective, perfective, or stative. A basic verb did not necessarily make all three stems; some made only two or one.

The stative stem, traditionally called the perfect (which is very unfortunate—see immediately below), expressed a state (*wóyde '(s)he knows', *dedwóye '(s)he's afraid', *stestóh$_2$e '(s)he's standing upright'). The perfective stem, traditionally called the aorist, denoted an event without reference to its internal structure, if any. The event might in fact have been complex, or repeated, or habitual, or taken a long time to complete; but by using the aorist the speaker indicated no interest in (or perhaps knowledge of) those details (cf. Comrie 1976). Since the present tense by definition includes the time of speaking, which imposes internal structure on the event, the aorist stem could have no present tense (*b^{h}úh$_2$t 'it became', *g^{w}émd '(s)he took a step', *luktó 'it got light', *mr̥tó '(s)he disappeared / died', *wéǵ^{h}st '(s)he transported (it)', *wéwked '(s)he said'). The imperfective stem, traditionally called the present, did focus on the internal structure of an event; the event could extend over time during which something else happened, be repeated, be habitual, be attempted but not completed, be an action performed independently by several subjects or separately upon several objects, and so on (*g^{w}m̥sḱéti '(s)he's walking' [i.e. taking repeated steps—see above], *ǵn̥h$_3$sḱéti '(s)he recognizes' [habitual], *h$_2$éǵeti '(s)he's driving (them)', *b^{h}inédst '(s)he tried to split (it)', *b^{h}oréyeti '(s)he's carrying (it) around', *spéḱyed '(s)he kept looking at (it)'). But a state can also be viewed as an event extending over

time, and in fact quite a few present stems were actually stative in meaning (*$h_1$ésti '(s)he is', *g^wíh$_3$weti '(s)he's alive', *ḱéyor 'it's lying flat', *wéstor '(s)he's wearing'). This kind of inconsistency is not surprising in a natural human language.

Since the system just described is likely to be very unfamiliar to most readers, it may not be out of place to summarize the evidence from which it is reconstructed. Homeric Greek preserves the inherited aspect system almost unchanged, and even in Classical Greek the only major change is the creation of a new class of 'resultative' perfects (much like the modern English perfect in meaning, see Chantraine 1927); Armenian, Albanian, and Old Church Slavonic have lost the perfect (stative) but preserve the present/aorist (imperfective/perfective) opposition; Italic and Indo-Iranian preserve important relics of the aspect system, though in both those subgroups the system was being restructured at the time of our earliest substantial documents. In the other daughter languages, including Germanic, the system has been restructured into a tense-based system—but differently in each major subgroup.

Each aspect stem exhibited different forms for the following 'moods': indicative, subjunctive, optative, and imperative; participles, which were adjectives but could be used to express subordinate clauses as nominalizations, were formally parallel to the moods. The imperative was used for commands, the optative to express the wishes of the speaker (and perhaps in embedded clauses under certain circumstances); the subjunctive was used to make statements that the speaker wished to regard as less than fully realized or certain, including (importantly) future events. The indicative was the default mood, as expected.

Tense was expressed only in the indicative. The present (imperfective) stem made both a present and a past indicative, traditionally called 'present indicative' and 'imperfect indicative' respectively, and distinguished by their endings, called 'primary' and 'secondary' endings respectively. As noted above, the aorist (perfective) stem could make only a past, called the 'aorist indicative' and marked with secondary endings. The perfect (stative) stem could have made both a present and a past, but it apparently did not; there was only a single perfect indicative form, apparently used for both present and past, and most of its endings were unique. (Though various ancient IE languages have pluperfect tenses, the only securely attested formations that appear to correspond—in part—are those of Homeric Greek and Vedic Sanskrit, and they can easily be independent parallel innovations; see e.g. Berg 1977.) The perfect thus looks like some sort of relic of an older system. (On the 'injunctive' see the following section.)

The final morphosyntactic category of the verb was 'voice'. The default voice was the active. The 'mediopassive' voice was used (1) to mark the verb of a passive clause; (2) to mark an 'indirect reflexive', in which the subject was implied to perform the action of the verb for his or her own benefit; and (3) in certain lexically marked verbs, which are called 'deponent verbs'. The perfect had no mediopassive voice, to judge from the following distributional facts. In Tocharian the only direct reflex of the perfect is the preterite participle; it is indifferent to voice, being used both actively and passively. In Latin and Gothic, where the mediopassive has become largely or entirely passive in meaning, the reflexes of the perfect have no passive forms, which are supplied by phrases; Latin does not even have any (non-periphrastic) deponent perfects. Only in Greek and Indo-Iranian are mediopassive perfects clearly attested, and while the formations partly correspond, they can easily be parallel innovations.

2.3.2 *Formal expression of inflectional categories*

The formal expression of the above categories was very far from uniform.

In nominals, number and case were expressed by 'fused' endings in which no separate markers of number on the one hand and case on the other could be distinguished; for instance, gen. sg. *-és ∼ *-os ∼ *-s and gen. pl. *-oHom shared no distinguishable marker of the case 'genitive', and neither exhibited any distinguishable marker of number (cf. e.g. nom. pl. *-es, dat. pl. *-mos, loc. pl. *-su, etc.; it is reasonable to suppose that the singular was unmarked). In those nominals that expressed gender (i.e. all except nouns), feminine gender was normally expressed by a derivational suffix which followed all other derivational suffixes (but preceded the case-and-number endings). Neuter gender was distinguished from masculine (and, in nouns, feminine) only in the nominative, accusative, and vocative cases, in which it exhibited different case-and-number endings; thus in those cases the endings expressed gender as well. This situation was typical of PIE inflection in general: the expression of a majority of inflectional categories was 'packed into' fused endings, which presumably were the reflexes of a much older set of originally analyzable complexes of inflectional markers.

Basic and derived verbs were inflected somewhat differently. The lexical core of an underived verb was its 'root', which was always monosyllabic. The innermost layer of inflectional affixes formed the aspect stem; those affixes included stem-initial reduplication, an infix, various suffixes, and zero-affixation, and all were accompanied by distinctive ablaut patterns. The subjunctive and optative moods were marked by suffixes added to the aspect stem; participial suffixes occupied the same position (and were

followed by nominal endings). All other categories—(indicative) tense, the imperative mood, voice, and the person and number of the subject—were marked by a single set of fused polyfunctional morphemes called simply 'endings' because they were the final element of a (finite) verb form.

In at least some daughters of PIE there was also a prefix *é-, called the 'augment', that marked past tense (in the indicative only, of course). At least in those dialects, there was a three-way opposition in the indicative of the present and aorist stems: (1) forms with primary endings, which marked them for present tense (not in the aorist, of course—see above); (2) forms with secondary endings and the augment, which marked them for past tense; (3) forms with secondary endings but no augment, which were apparently unmarked for tense and were used where tense could be inferred from context (called 'injunctives'). The augment is clearly attested in Greek, Phrygian, Armenian, and Indo-Iranian. It is not clear whether any ancestor of Germanic exhibited the augment, since it could have been a post-PIE innovation of only some daughters (cf. now Delfs, forthcoming).

Derived verbs differed in having only one aspect stem, marked by the derivational suffix, and that stem was always present (imperfective). This is one of several indications that the system of aspect stems had originally been derivational rather than inflectional, like the aspect system of modern Russian (which arose much later). The fact that derived verbs were defective in just this way was to have major consequences for verb inflection in Germanic.

2.3.3 *PIE verb inflection*

This section will describe in detail the verb system that can be reconstructed for Proto-West IE. Since that is essentially the Cowgill–Rix verb, further information can be found in Sihler 1995 and Rix et al. 2001 (though my reconstructions differ from theirs in various details, being in general more conservative than those of Rix et al.).

2.3.3 (i) *Aspect stems* Verb stems expressed aspect. They fell into two purely formal classes, called 'athematic' and 'thematic'. The latter ended in the thematic vowel *-e- ∼ *-o- (see 2.2.4 (i)); the former apparently always ended in a nonsyllabic. Some aspect stems were affixless, while others were marked by one of a wide variety of affixes, as follows.

Present (imperfective) stems exhibited the widest variety of affixes. Basic presents included at least the following types.

Athematic presents:

- root-presents (i.e. affixless athematic presents), e.g. *$h_1$és- ∼ *h_1s- 'be', *$h_1$éd- ∼ *$h_1$éd- 'eat';

- athematic presents reduplicated with *Ce-, e.g. *$d^hé$-d^heh_1- ∼ *$d^hé$-d^hh_1- 'be putting';
- athematic presents reduplicated with *Ci-, e.g. *stí-steh$_2$- ∼ *stí-sth$_2$- 'be getting up (into a standing position)';
- nasal-infixed presents (with the infix *-né- ∼ *-n-), e.g. *li-né-k^w- ∼ *li-n-k^w- 'be leaving behind', *t̥l̥-né-h$_2$- ∼ *t̥l̥-n-h$_2$- 'be lifting';
- presents with suffix *-néw- ∼ *-nw- (∼ *-nu-), e.g. *t̥n̥-néw- ∼ *t̥n̥-nw- 'be stretching'.

Thematic presents:

- simple (i.e. affixless) thematic presents, e.g. *$b^hér$-e/o- 'carry';
- thematic presents reduplicated with *Ci-, e.g. *sí-sd-e/o- 'be sitting down';
- presents in *-sḱé- ∼ *-sḱó-, e.g. *pr̥-sḱé/ó- 'keep asking' (root *preḱ-);
- presents in *-yé- ∼ *-yó-, e.g. *wr̥ǵ-yé/ó- 'be working';
- presents in *-ye- ∼ *-yo- (with accent on the root), e.g. *$g^{wh}éd^h$-ye/o- 'keep asking for';
- presents in *-se- ∼ *-so-, e.g. *h$_2$lék-se/o- 'protect'.

Derived presents included at least the following types.

Athematic derived presents:

- statives in *-éh$_1$-, formed from 'Caland' roots that participated in a wide range of derivational processes, e.g. *h$_1$rud^h-éh$_1$- 'be red' ← *h$_1$rewd^h- 'red'; perhaps also from derived adjectives, e.g. *sil-éh$_1$- 'be silent' ← *si-lo- 'silent';
- factitives in *-h$_2$-, formed from adjectives, e.g. *néwe-h$_2$- 'renew' ← *néwo- 'new'.

Thematic derived presents:

- causatives and iteratives in *-éye- ∼ *-éyo- (with o-grade root), formed from basic verbs, e.g. *sod-éye/o- 'seat (someone)' ← *sed- 'sit down', *b^hor-éye/o- 'be carrying around' ← *b^her- 'carry';
- desideratives in *-(h$_1$)se- ∼ *-(h$_1$)so-, with and without reduplication *Ci-, formed from basic verbs, e.g. *wéyd-se/o- 'want to see' ← *weyd- 'catch sight of', *ḱí-ḱl̥-h$_1$se/o- 'try to conceal' ← *ḱel- 'hide';
- desideratives in *-syé- ∼ *-syó-, formed from basic verbs, e.g. *b^huh$_2$-syé/ó-'want to become';
- denominatives in *-yé- ∼ *-yó-, formed from nominals, e.g. *h$_2$ḱh$_2$ows-ié/ó- 'be sharp-eared' ← *h$_2$eḱ- 'sharp' and *h$_2$éws-es-'ear'; *porh$_2$e-yé/ó- 'bring across, convey' ← *pórh$_2$o- 'passage, crossing' (note the e-grade nominal stem vowel before the present-stem suffix);

- (?) factitives in *-yé- ∼ *-yó-, formed from adjectives, e.g. *pr̥kto-yé/ó- 'frighten' ← *pr̥k-tó- 'afraid' (note the o-grade vowel before the suffix).

There were far fewer types of aorists; the following are reconstructable.

Athematic aorists:

- root-aorists, e.g. *g^{w}ém- ∼ *g^{w}m̥- 'step', *b^{h}uh$_{2}$- 'become';
- s-aorists, e.g. *dḗyḱ-s- ∼ *déyḱ-s- 'point out', *wḗǵ^{h}-s- ∼ *wéǵ^{h}-s- 'transport in a vehicle'.

Thematic aorists:

- simple thematic aorists, e.g. *h$_{1}$lud^{h}-é/ó- 'arrive';
- reduplicated thematic aorists, e.g. *wé-wk-e/o- 'say' (root *wek^{w}-).

It appears that most aorists were root-aorists in PIE. Only a handful of s-aorists are attested in as many as three subfamilies of IE, and it has long been clear that the formation was uncommon in the protolanguage but became very productive in some daughter languages (see e.g. Narten 1964). Similarly, the thematic aorist listed is the only one attested in three subfamilies; moreover, since Cardona 1960 demonstrated that nearly all thematic aorists can be shown to be secondary developments of root-aorists in the individual histories of the daughters, we must reckon with the possibility that this one, too, was actually a root-aorist in PIE (though the fact that it is attested as a thematic aorist in Tocharian argues caution). About reduplicated thematic aorists we are even less certain: the example listed is well attested in Indo-Iranian and Greek, the two non-Anatolian daughters that preserve the greatest number of archaisms in the verb system, but it is the only one not restricted to a single daughter. There were even fewer types of perfect stems, all of which were athematic; the following are reconstructable:

root-perfects, e.g. *wóyd- ∼ *wid- 'know';
reduplicated perfects, e.g. *me-món- ∼ *me-mn- 'remember'.

The root-perfect listed is the only one reconstructable; so far as we can tell, all other perfects were reduplicated.

2.3.3 (ii) *Mood suffixes* In the indicative and imperative moods, the person/number/voice endings were suffixed directly to the stem. The subjunctive and optative moods, however, were characterized by 'secondary' stems constructed by suffixing mood markers to the aspect stems. In the Central dialects of PIE as it diversified (see 2.1), including the dialect ancestral to Germanic, the stems listed above constructed subjunctive and optative stems as follows:

indicative/imperative	*subjunctive*	*optative*
*$h_1$és- ∼ *h_1s-	*$h_1$és-e/o-	*h_1s-iéh$_1$- ∼ *h_1s-ih$_1$-
*$h_1$éd- ∼ *$h_1$éd-	*$h_1$éd-e/o-	*$h_1$éd-ih$_1$-
*d^hé-d^heh$_1$- ∼ *d^hé-d^hh$_1$-	*d^hé-d^heh$_1$-e/o-	*d^hé-d^hh$_1$-ih$_1$-
*stí-steh$_2$- ∼ *stí-sth$_2$-	*stí-steh$_2$-e/o-	*stí-sth$_2$-ih$_1$-
*li-né-k^w- ∼ *li-n-k^w-	*li-né-k^w-e/o-	*li-n-k^w-iéh$_1$- ∼ *li-n-k^w-ih$_1$-
*t̥-né-h$_2$- ∼ *t̥-n-h$_2$-	*t̥-né-h$_2$-e/o-	*t̥-n-h$_2$-iéh$_1$- ∼ *t̥-n-h$_2$-ih$_1$-
*t̥n-néw- ∼ *t̥n-nw-	*t̥n-néw-e/o-	*t̥n-nu-yéh$_1$- ∼ *t̥n-nw-ih$_1$-
*b^hér-e/o-	*b^hér-ē/ō-	*b^hér-o-y(h$_1$)-
*p̥r-sḱé/ó-	*p̥r-sḱḗ/ṓ-	*p̥r-sḱó-y(h$_1$)-

(etc.: all thematic stems formed the subjunctive by lengthening the thematic vowel and the optative with *-y(h$_1$)-, which selected the o-grade of the thematic vowel)

*$h_1$rud^h-éh$_1$-	*$h_1$rud^h-éh$_1$-e/o-	*$h_1$rud^h-éh$_1$-ih$_1$- (?)
*néwe-h$_2$-	*néwe-h$_2$-e/o-	*néwe-h$_2$-ih$_1$- (?)
*g^wém- ∼ *g^wm̥-	*g^wém-e/o-	*g^wm̥-yéh$_1$- ∼ *g^wm-ih$_1$-
*b^huh$_2$-	*b^húh$_2$-e/o-	*b^huh$_2$-yéh$_1$- ∼ *b^huh$_2$-ih$_1$-
*dḗyḱ-s- ∼ *déyḱ-s-	*déyḱ-s-e/o-	*déyḱ-s-ih$_1$- (?)
*wóyd- ∼ *wid-	*wéyd-e/o-	*wid-yéh$_1$- ∼ *wid-ih$_1$-
*me-món- ∼ *me-mn-	*me-mén-e/o-	*me-mn̥-yéh$_1$- ∼ *me-mn-ih$_1$-

(Actual evidence for s-aorist optatives is unimpressive; see e.g. Narten 1964: 43–5, 67–8; Hoffmann 1967; and Kellens 1984: 366–72 with references. The evidence for modal forms made to athematic derived presents is also scanty.) As can be seen, the rules for the construction of these secondary mood stems were straightforward. If the stem was athematic and ablauting, the subjunctive was made by suffixing the thematic vowel to the e-grade of the stem; if it was athematic but non-ablauting (like the derived statives and factitives, and *b^huh$_2$- 'become'), the thematic vowel was suffixed to the invariant stem; if the stem was thematic, the subjunctive vowel contracted with the stem-final thematic vowel, producing a long thematic vowel. Optatives were made by suffixing *-yéh$_1$- ∼ *-ih$_1$- to athematic stems (though if the accent fell consistently to the left only the zero-grade of the optative suffix appeared); when this suffix was added to thematic stems the thematic vowel of the stem appeared in the o-grade and the suffix in the zero grade—with the result that the laryngeal was dropped whenever a nonsyllabic followed immediately (see 2.2.4 (i) ad fin.). In the dialects ancestral to Italic and Celtic the system was the same, except that in place of the analyzable thematic optative complex *-o-y(h$_1$)- there appeared an unanalyzable *-ā- of unknown origin

(Trubetzkoy 1926). The situation in Tocharian is less clear, but it looks as if the thematic vowel of stems may actually have been deleted before the subjunctive and optative suffixes were added. Anatolian exhibits no trace whatever of subjunctive and optative moods; that suggests that they were innovations of the non-Anatolian half of the family, though it is also possible that they were present in the protolanguage and that Anatolian lost them.

2.3.3 (iii) *Endings* The person/number/voice endings, including imperative endings, reconstructable for PIE present and aorist stems are the following. (I accept the reconstructions of Warren Cowgill; see also Sihler 1995: 453–80, 570–2.)

active

	primary	*secondary*	*imperative*	*displaced iptv.*
1sg.	*-m-i / *-h_2	*-m	—	
2sg.	*-s-i	*-s	Ø, *-d^hí	*-tő́d
3sg.	*-t-i	*-t (*[-t ∼ -d])	*-t-u (*-t-ow?)	*-tő́d
1du.	*-wós	*-wé	—	
2du.	*-tés	*-tóm	*-tóm	
3du.	*-tés	*-tā́m	*-tā́m	
1pl.	*-mós	*-mé	—	
2pl.	*-té	*-té	*-té	
3pl.	*-ént-i ∼ *-nt-i	*-ént (*[-énd]) ∼ *-nt (*[-nd])	*-ént-u ∼ *-nt-u	(*-ént-ow ∼ *-nt-ow?)

mediopassive

	primary	*secondary*	*imperative*
1sg.	*-h_2é-r	*-h_2é	—
2sg.	*-th_2é-r	*-th_2é	???
3sg.	*-ó-r / *-t-ó-r	*-ó / *-t-ó	???
1du.	*-wós-d^hh_2	*-wé-d^hh_2	—
2du.	???	???	???
3du.	???	???	???
1pl.	*-mós-d^hh_2	*-mé-d^hh_2	—
2pl.	*-d^hh_2ué	*-d^hh_2ué	*-d^hh_2ué
3pl.	*-ró-r / *-ntó-r	*-ró / *-ntó	???

Some comments are necessary to make the system intelligible.

The primary endings were suffixed to the nonpast of the present (imperfective) stem, traditionally called the 'present indicative', and probably to all subjunctives; the secondary endings were suffixed to the past tenses of the present and aorist (perfective) stem, traditionally called the 'imperfect indicative' and 'aorist indicative' respectively, and to all optatives. The imperative endings were

restricted to that mood. (The perfect (stative) stem exhibited completely different endings in the indicative, on which see further below.)

There are obvious similarities between the primary, secondary, and imperative endings. Since the relations were somewhat different in the active and the mediopassive, I discuss them separately in that order.

Except in the 2du. and 3du., which are puzzling, and excluding the 2sg. imperative (see below), it is clear that the active secondary endings were the 'basic' members of the paradigm. In the sg. and the 3pl., the primary endings were normally derived from the secondary endings by the addition of the 'hic-et-nunc' particle *-i. In the 3sg. and 3pl., the imperative endings were derived from the secondary endings by the addition of a parallel particle *-u (or *-ow; the daughters disagree). In the 2pl. all three were the same, which may be an archaism or may simply reflect impoverishment in a relatively peripheral inflectional category. In the 2du. and 3du. it appears that the secondary ending was likewise used in the imperative. In the 1du. and 1pl. it looks as though a different particle was added to produce the primary endings, though the details are obscure. The 2sg. imperative was apparently endingless, and was probably the unmarked member of the imperative paradigm; *-d^{h}í seems to have been some sort of emphatic particle added to originally endingless forms. The one detail of the system that makes no sense at all is that, whereas athematic presents exhibited the expected primary 1sg. ending *-mi, thematic presents and all subjunctives exhibited *-h_2 instead; that strongly suggests that the latter originally had some sort of relation to the mediopassive and/or perfect, though the details are unclear (and are well beyond the scope of this chapter).

The hic-et-nunc particle of the mediopassive seems to have been *-r rather than *-i; it survives in Anatolian, Tocharian, and Italo-Celtic—all peripheral subgroups of the family—and perhaps in Phrygian, whose position in the IE phylogenetic tree is unclear. In most of the central daughters, however, including Germanic, it was replaced by *-y, evidently reflecting the spread of active *-i to the mediopassive. In the 1du. and 1pl. it looks like the mediopassive endings were derived from the active ones by suffixation of a particle following the (active) hic-et-nunc particle. In the 2pl., as in the active, all three endings appear to have been the same. The unreconstructability of mediopassive dual and imperative endings is an artefact of the defective attestation of their reflexes: in effect, only Greek and Indo-Iranian (and, for the imperative, Hittite) provide any evidence, and they disagree.

Reflexes of the third-person mediopassive endings (primary) sg. *-ó-r, pl. *-ró-r, (secondary) sg. *-ó, pl. *-ró appear only in a restricted set of verbs and forms in Anatolian and Indo-Iranian; it is clear that already in PIE they had largely been replaced by the competing endings with sg. *-t-, pl.

*-nt-, whose distinctive consonants have evidently been imported from the active. To judge from the situation in Sanskrit, 3pl. *-ró survived longest in the optative.

The underlyingly accented endings of the mediopassive and the nonsingular active were accented on the surface if the stem was unaccented; otherwise they, like the endings of the singular active, were unaccented on the surface (i.e. the leftmost underlying accent of a verb form surfaced). The alternative forms of the active 3pl. were distributed thus: if the stem was athematic and unaccented, the accented full-grade form of the ending surfaced; if the stem was accented or thematic or both, the zero-grade form of the ending surfaced.

Perfect (stative) stems exhibited an almost completely different set of endings in the indicative. Exceptionally, primary and secondary (i.e. nonpast and past) were not distinguished, nor were active and mediopassive. The endings can be reconstructed as follows:

	perfect indicative
1sg.	*-h_2e
2sg.	*-th_2e
3sg.	*-e
1du.	*-wé
2du.	???
3du.	???
1pl.	*-mé
2pl.	*-é
3pl.	*-ḗr < **-ér-s (cf. Jasanoff 1988*b*: 71 n. 3)

The similarity between these endings and those of the (secondary) mediopassive is obvious, though specialists are not agreed on what inferences should be drawn from that fact. Once again, the dual endings are not reconstructable because Greek and Indo-Iranian disagree.

2.3.3 (iv) *Nonfinite forms* Present and aorist active participles were made with a hysterokinetic suffix *-ónt- ∼ *-nt- (see 2.3.4 (ii)); present and aorist mediopassive participles ended in a suffix *-mh$_1$nó-. Not surprisingly, the perfect participle exhibited a different suffix *-wos- ∼ *-us-. An infinitive suffix *-d^{h}yōy or *-d^{h}yoey, likewise affixed to aspect-stems, is reconstructable, but not much is known about its distribution, since it survives only in the Indo-Iranian subfamily and in Umbrian (see Rix 1976*b*); possibly it was suffixed only to present stems. Most of the infinitives of the daughter languages were clearly caseforms of derived nouns in PIE, and of course those nouns were formed directly from the verb root rather than from aspect stems.

2.3.3 (v) *The architecture of verb paradigms* The system outlined in this section was codified by the late Warren Cowgill, whose conclusions regarding the West IE verb still seem to me to be largely correct.

Verb roots appear usually to have constructed aspect stems according to the following pattern (at least in West IE). If a basic verb made only one aspect stem, it was unaffixed; thus we find present *$h_1$és-ti 'is', *wés-tor 'is wearing', and *$h_2$ége-ti 'is driving' (none with any aorist or perfect), aorist *b^húh$_2$-t '(s)he became' and *$h_1$lud^{h}é-d '(s)he arrived' (neither with any present or perfect), perfect *wóyd-e 'knows' (with no present or aorist). If a basic verb made two or three stems, either the present or the aorist was unaffixed, and the other of those two stems was affixed, as was the perfect. The following verbs illustrate the system:

present	*aorist*	*perfect*
*d^hé-d^heh$_1$-ti 'is putting'	*d^héh$_1$-t 'put'	—
*stí-steh$_2$-ti 'is getting up'	*stéh$_2$-t 'stood up'	*ste-stóh$_2$-e 'is standing'
*tl̥-né-h$_2$-ti 'is lifting'	*télh$_2$-t 'lifted'	*te-tólh$_2$-e 'is holding up'
*sí-sd-eti 'is getting seated'	*sédst (= */séd+t/) 'sat down'	—
*g^wm̥-sḱé-ti 'is walking'	*g^wém-d 'stepped'	*g^we-g^wóm-e 'has the feet in place'
*ǵn̥h$_1$-yé-tor 'is being born'	*ǵn̥h$_1$-tó 'was born'	*ǵe-ǵónh$_1$-e 'is . . . years old'
*wér-ye-ti 'is saying'	*wérh$_1$-t 'said'	—
*déyḱ-ti 'is pointing out'	*déyḱ-s-t 'pointed out'	—
*wéǵ^{h}e-ti 'is transporting'	*wéǵ^h-s-t 'transported'	—
*wértsti (= */wért+ti/) 'is turning around'	—	*we-wórt-e 'is turned toward'
—	*h$_2$néḱ-t 'reached'	*h$_2$e-h$_2$nóḱ-e 'extends to'

Derived verbs made only present stems, which were always affixed.

Whether this system can be reconstructed for earlier stages of the proto-language (especially PIE proper) is highly doubtful; there are scattered indications that it was originally derivational rather than inflectional. Most strikingly, two presents and two aorists seem to be reconstructable for the root *ǵneh$_3$- 'recognize': present *ǵn̥h$_3$-sḱé/ó- (Lat. *nōscere*, Gk *γι-γνώσκειν* /gignǫ́:skeːn/, Old Persian subjunctive 3sg. *xšnāsātiy*) and nasal-infixed *ǵn̥-né-h$_3$- ∼ *ǵn̥-n-h$_3$- (Skt 3sg. *jānáti*, Toch. A 2sg. *knānat*) and aorist *ǵnéh$_3$- ∼ *ǵn̥h$_3$- (Gk *γνῶναι* /gnǫ́ːnai/, Skt precative 3sg. *jñeyā́s*) and *ǵnéh$_3$-s- ∼ *ǵnéh$_3$-s- (Hitt. pres. *ganeszi*, Toch. A pret. 2sg. *kñasäṣt*). If the system of aspect stems was originally derivational, it is most unlikely to have

exhibited a neat complementary distribution of forms in its earliest stages. But it does appear that by the Proto-West IE stage it had settled out into more or less the shape hypothesized by Cowgill.

Since even the West IE languages do not agree fully on all details of the mood suffixes and the mediopassive endings, it seems advisable to highlight their differences here. Combining the observations that have been made above about the thematic subjunctive and optative and the hic-et-nunc particle of the mediopassive, we can present this comparative table of forms:

	Anatolian	*Tocharian*	*Italo-Celtic*	*Central IE*
thematic subjunctive	(none)	*-e/o- (?)	*-ē/ō-	*-ē/ō-
thematic optative	(none)	*-yéh$_1$- ∼ *-ih$_1$- (?)	*-ā-	*-oy(h$_1$)-
mediopassive primary 3sg.	*-tor	*-tor	*-tor	*-toy

Though it seems clear that *-r was the original mediopassive primary marker (see above), it is much less clear what the thematic subjunctive and optative were originally like (if they existed in the protolanguage at all). In any case, the system of the right-hand column is the one immediately ancestral to Germanic.

The next section will illustrate the verb system more fully with complete paradigms of several reconstructable verbs.

2.3.3 (vi) *Sample PIE verb paradigms* In the finite categories of these paradigms the forms are given in the order 1sg., 2sg., 3sg., 1du., 2du., 3du., 1pl., 2pl., 3pl.; participles are given in the masc. nom. sg. and gen. sg., followed by a semicolon, then the fem. nom. sg. and gen. sg., except for o-stem participles, which are given in the masc. nom. sg. only. Infinitives are omitted, as are displaced imperatives.

A consequence of our uncertainty regarding the reconstruction of the thematic optative (see the preceding section) is that even West IE verb paradigms cannot be given in full. Since Germanic clearly belonged to the central group, I have given the paradigms ancestral to that group, with thematic optatives in *-oy(h$_1$)- and mediopassive primary endings in *-y, the latter replacing PIE *-r (see above).

- h$_1$es- 'be' (root present only, active only)

1ary indic.	*2ary indic.*	*subjunctive*	*optative*	*imperative*
h$_1$ésmi	h$_1$és̥m	h$_1$ésoh$_2$	h$_1$siéh$_1$m	—
h$_1$ési	h$_1$és	h$_1$ésesi	h$_1$siéh$_1$s	h$_1$és, h$_1$sd^{h}í
h$_1$ésti	h$_1$ést	h$_1$éseti	h$_1$siéh$_1$t	h$_1$éstu
h$_1$suós	h$_1$sué	h$_1$ésowos	h$_1$sih$_1$wé	—
h$_1$stés	h$_1$stóm	h$_1$ésetes	h$_1$sih$_1$tóm	h$_1$stóm

$h_1$stés	h_1st̓ám	$h_1$ésetes	$h_1$sih$_1$t̓ám	h_1st̓ám
$h_1$sm̥ós	$h_1$sm̥é	$h_1$ésomos	$h_1$sih$_1$mé	—
$h_1$sté	$h_1$sté	$h_1$ésete	$h_1$sih$_1$té	$h_1$sté
$h_1$sénti	$h_1$sénd	$h_1$ésonti	$h_1$sih$_1$énd	$h_1$séntu

participle $h_1$sónts, $h_1$sn̥tés; $h_1$sóntih$_2$, $h_1$sn̥tyéh$_2$s

- leyk^{w}- 'leave behind' (nasal-infixed present, root-aorist, reduplicated perfect)

present stem, active:

1ary indic.	*2ary indic.*	*subjunctive*	*optative*	*imperative*
linék^{w}mi	linék^{w}m̥	linék^{w}oh$_2$	link^{w}iéh$_1$m	—
linék^{w}si	linék^{w}s	linék^{w}esi	link^{w}iéh$_1$s	linék^{w}, link^{w}d^{h}í
linék^{w}ti	linék^{w}t	linék^{w}eti	link^{w}iéh$_1$t	linék^{w}tu
linkuós	linkué	linék^{w}owos	link^{w}ih$_1$wé	—
link^{w}tés	link^{w}tóm	linék^{w}etes	link^{w}ih$_1$tóm	link^{w}tóm
link^{w}tés	link^{w}t̓ám	linék^{w}etes	link^{w}ih$_1$t̓ám	link^{w}t̓ám
link^{w}m̥ós	link^{w}m̥é	linék^{w}omos	link^{w}ih$_1$mé	—
link^{w}té	link^{w}té	linék^{w}ete	link^{w}ih$_1$té	link^{w}té
link^{w}énti	link^{w}énd	linék^{w}onti	link^{w}ih$_1$énd	link^{w}éntu

participle link^{w}ónts, link^{w}n̥tés; link^{w}óntih$_2$, link^{w}n̥tyéh$_2$s

present stem, mediopassive:

1ary indic.	*2ary indic.*	*subjunctive*	*optative*	*imperative*
link^{w}h$_2$éy	link^{w}h$_2$é	linék^{w}oh$_2$ey	link^{w}ih$_1$h$_2$é	—
link^{w}th$_2$éy	link^{w}th$_2$é	linék^{w}eth$_2$ey	link^{w}ih$_1$th$_2$é	???
link^{w}tóy	link^{w}tó	linék^{w}etoy	link^{w}ih$_1$tó	???
linkuósd^{h}h$_2$	linkué^{h}h$_2$	linék^{w}owosd^{h}h$_2$	link^{w}ih$_1$wéd^{h}h$_2$	—
???	???	???	???	???
???	???	???	???	???
link^{w}m̥ósd^{h}h$_2$	link^{w}m̥éd^{h}h$_2$	linék^{w}omosd^{h}h$_2$	link^{w}ih$_1$méd^{h}h$_2$	—
link^{w}d^{h}h$_2$ué	link^{w}d^{h}h$_2$ué	linék^{w}ed^{h}h$_2$ue	link^{w}ih$_1$d^{h}h$_2$ué	link^{w}d^{h}h$_2$ué
link^{w}n̥tóy	link^{w}n̥tó	linék^{w}ontoy	link^{w}ih$_1$ró	???

participle link^{w}m̥h$_1$nós

aorist stem, active:

2ary indic.	*subjunctive*	*optative*	*imperative*
léyk^{w}m̥	léyk^{w}oh$_2$	lik^{w}yéh$_1$m	—
léyk^{w}s	léyk^{w}esi	lik^{w}yéh$_1$s	léyk^{w}, lik^{w}d^{h}í
léyk^{w}t	léyk^{w}eti	lik^{w}yéh$_1$t	léyk^{w}tu
likwé	léyk^{w}owos	lik^{w}ih$_1$wé	—
lik^{w}tóm	léyk^{w}etes	lik^{w}ih$_1$tóm	lik^{w}tóm

lik^{w}tắm	léyk^{w}etes	lik^{w}ih$_1$tắm	lik^{w}tắm
lik^{w}mé	léyk^{w}omos	lik^{w}ih$_1$mé	—
lik^{w}té	léyk^{w}ete	lik^{w}ih$_1$té	lik^{w}té
lik^{w}énd	léyk^{w}onti	lik^{w}ih$_1$énd	lik^{w}éntu

participle lik^{w}ónts, lik^{w}n̥tés; lik^{w}óntih$_2$, lik^{w}n̥tyéh$_2$s

aorist stem, mediopassive:

2ary indic.	*subjunctive*	*optative*	*imperative*
lik^{w}h$_2$é	léyk^{w}oh$_2$ey	lik^{w}ih$_1$h$_2$é	—
lik^{w}th$_2$é	léyk^{w}eth$_2$ey	lik^{w}ih$_1$th$_2$é	???
lik^{w}tó	léyk^{w}etoy	lik^{w}ih$_1$tó	???
likwéd^{h}h$_2$	léyk^{w}owosd^{h}h$_2$	lik^{w}ih$_1$wéd^{h}h$_2$	—
???	???	???	???
???	???	???	???
lik^{w}méd^{h}h$_2$	léyk^{w}omosd^{h}h$_2$	lik^{w}ih$_1$méd^{h}h$_2$	—
lik^{w}d^{h}h$_2$ué	léyk^{w}ed^{h}h$_2$ue	lik^{w}ih$_1$d^{h}h$_2$ué	lik^{w}d^{h}h$_2$ué
lik^{w}n̥tó	léyk^{w}ontoy	lik^{w}ih$_1$ró	???

participle lik^{w}m̥h$_1$nós

perfect stem (active):

indicative	*subjunctive*	*optative*	*imperative*
lelóyk^{w}h$_2$e	leléyk^{w}oh$_2$	lelik^{w}yéh$_1$m	—
lelóyk^{w}th$_2$e	leléyk^{w}esi	lelik^{w}yéh$_1$s	???, lelik^{w}d^{h}í
lelóyk^{w}e	leléyk^{w}eti	lelik^{w}yéh$_1$t	???
lelikwé	leléyk^{w}owos	lelik^{w}ih$_1$wé	—
???	leléyk^{w}etes	lelik^{w}ih$_1$tóm	???
???	leléyk^{w}etes	lelik^{w}ih$_1$tắm	???
lelik^{w}mé	leléyk^{w}omos	lelik^{w}ih$_1$mé	—
lelik^{w}é	leléyk^{w}ete	lelik^{w}ih$_1$té	???
lelik^{w}ḗr	leléyk^{w}onti	lelik^{w}ih$_1$énd	???

participle lelik^{w}ṓs, lelikusés; lelik^{w}ósih$_2$, lelikusyéh$_2$s

- d^{h}eh$_1$- ‘put’ (reduplicated athematic present, root aorist)

present stem, active:

1ary indic.	*2ary indic.*	*subjunctive*	*optative*	*imperative*
d^{h}éd^{h}eh$_1$mi	d^{h}éd^{h}eh$_1$m	d^{h}éd^{h}eh$_1$oh$_2$	d^{h}éd^{h}h$_1$ih$_1$m̥	—
d^{h}éd^{h}eh$_1$si	d^{h}éd^{h}eh$_1$s	d^{h}éd^{h}eh$_1$esi	d^{h}éd^{h}h$_1$ih$_1$s	d^{h}éd^{h}eh$_1$, d^{h}éd^{h}h$_1$d^{h}i
d^{h}éd^{h}eh$_1$ti	d^{h}éd^{h}eh$_1$t	d^{h}éd^{h}eh$_1$eti	d^{h}éd^{h}h$_1$ih$_1$t	d^{h}éd^{h}eh$_1$tu
d^{h}éd^{h}h$_1$uos	d^{h}éd^{h}h$_1$ue	d^{h}éd^{h}eh$_1$owos	d^{h}éd^{h}h$_1$ih$_1$we	—
d^{h}éd^{h}h$_1$tes	d^{h}éd^{h}h$_1$tom	d^{h}éd^{h}eh$_1$etes	d^{h}éd^{h}h$_1$ih$_1$tom	d^{h}éd^{h}h$_1$tom
d^{h}éd^{h}h$_1$tes	d^{h}éd^{h}h$_1$tām	d^{h}éd^{h}eh$_1$etes	d^{h}éd^{h}h$_1$ih$_1$tām	d^{h}éd^{h}h$_1$tām

$d^{h}éd^{h}h_{1}m̥os$	$d^{h}éd^{h}h_{1}m̥e$	$d^{h}éd^{h}eh_{1}omos$	$d^{h}éd^{h}h_{1}ih_{1}me$	—
$d^{h}éd^{h}h_{1}te$	$d^{h}éd^{h}h_{1}te$	$d^{h}éd^{h}eh_{1}ete$	$d^{h}éd^{h}h_{1}ih_{1}te$	$d^{h}éd^{h}h_{1}te$
$d^{h}éd^{h}h_{1}n̥ti$	$d^{h}éd^{h}h_{1}n̥d$	$d^{h}éd^{h}eh_{1}onti$	$d^{h}éd^{h}h_{1}ih_{1}end$	$d^{h}éd^{h}h_{1}n̥tu$

participle $d^{h}éd^{h}h_{1}n̥ts$, $d^{h}éd^{h}h_{1}n̥tos$; $d^{h}éd^{h}h_{1}n̥tih_{2}$, $d^{h}éd^{h}h_{1}n̥tyeh_{2}s$ (?)

present stem, mediopassive:

1ary indic.	*2ary indic.*	*subjunctive*	*optative*
$d^{h}éd^{h}h_{1}h_{2}ey$	$d^{h}éd^{h}h_{1}h_{2}e$	$d^{h}éd^{h}eh_{1}oh_{2}ey$	$d^{h}éd^{h}h_{1}ih_{1}h_{2}e$
$d^{h}éd^{h}h_{1}th_{2}ey$	$d^{h}éd^{h}h_{1}th_{2}e$	$d^{h}éd^{h}eh_{1}eth_{2}ey$	$d^{h}éd^{h}h_{1}ih_{1}th_{2}e$
$d^{h}éd^{h}h_{1}toy$	$d^{h}éd^{h}h_{1}to$	$d^{h}éd^{h}eh_{1}etoy$	$d^{h}éd^{h}h_{1}ih_{1}to$
$d^{h}éd^{h}h_{1}uosd^{h}h_{2}$	$d^{h}éd^{h}h_{1}ued^{h}h_{2}$	$d^{h}éd^{h}eh_{1}owosd^{h}h_{2}$	$d^{h}éd^{h}h_{1}ih_{1}wed^{h}h_{2}$
???	???	???	???
???	???	???	???
$d^{h}éd^{h}h_{1}m̥osd^{h}h_{2}$	$d^{h}éd^{h}h_{1}m̥ed^{h}h_{2}$	$d^{h}éd^{h}eh_{1}omosd^{h}h_{2}$	$d^{h}éd^{h}h_{1}ih_{1}med^{h}h_{2}$
$d^{h}éd^{h}h_{1}d^{h}h_{2}ue$	$d^{h}éd^{h}h_{1}d^{h}h_{2}ue$	$d^{h}éd^{h}eh_{1}ed^{h}h_{2}ue$	$d^{h}éd^{h}h_{1}ih_{1}d^{h}h_{2}ue$
$d^{h}éd^{h}h_{1}n̥toy$	$d^{h}éd^{h}h_{1}n̥to$	$d^{h}éd^{h}eh_{1}ontoy$	$d^{h}éd^{h}h_{1}ih_{1}ro$

(and the only imperative form reconstructable is the 2pl., identical with the 2ary indicative)

participle $d^{h}éd^{h}h_{1}m̥h_{1}nos$

aorist stem, active:

2ary indic.	*subjunctive*	*optative*	*imperative*
$d^{h}éh_{1}m$	$d^{h}éh_{1}oh_{2}$	$d^{h}h_{1}iéh_{1}m$	—
$d^{h}éh_{1}s$	$d^{h}éh_{1}esi$	$d^{h}h_{1}iéh_{1}s$	$d^{h}éh_{1}$, $d^{h}h_{1}d^{h}í$
$d^{h}éh_{1}t$	$d^{h}éh_{1}eti$	$d^{h}h_{1}iéh_{1}t$	$d^{h}éh_{1}tu$
$d^{h}h_{1}ué$	$d^{h}éh_{1}owos$	$d^{h}h_{1}ih_{1}wé$	—
$d^{h}h_{1}tóm$	$d^{h}éh_{1}etes$	$d^{h}h_{1}ih_{1}tóm$	$d^{h}h_{1}tóm$
$d^{h}h_{1}t̄ám$	$d^{h}éh_{1}etes$	$d^{h}h_{1}ih_{1}t̄ám$	$d^{h}h_{1}t̄ám$
$d^{h}h_{1}m̥mé$	$d^{h}éh_{1}omos$	$d^{h}h_{1}ih_{1}mé$	—
$d^{h}h_{1}té$	$d^{h}éh_{1}ete$	$d^{h}h_{1}ih_{1}té$	$d^{h}h_{1}té$
$d^{h}h_{1}énd$	$d^{h}éh_{1}onti$	$d^{h}h_{1}ih_{1}énd$	$d^{h}h_{1}éntu$

participle $d^{h}h_{1}ónts$, $d^{h}h_{1}n̥tés$; $d^{h}h_{1}óntih_{2}$, $d^{h}h_{1}n̥tyéh_{2}s$

aorist stem, mediopassive:

2ary indic.	*subjunctive*	*optative*	*imperative*
$d^{h}h_{1}h_{2}é$	$d^{h}éh_{1}oh_{2}ey$	$d^{h}h_{1}ih_{1}h_{2}é$	—
$d^{h}h_{1}th_{2}é$	$d^{h}éh_{1}eth_{2}ey$	$d^{h}h_{1}ih_{1}th_{2}é$	???
$d^{h}h_{1}tó$	$d^{h}éh_{1}etoy$	$d^{h}h_{1}ih_{1}tó$	???
$d^{h}h_{1}ued^{h}h_{2}$	$d^{h}éh_{1}owosd^{h}h_{2}$	$d^{h}h_{1}ih_{1}wéd^{h}h_{2}$	—
???	???	???	???

???	???	???	???
$d^hh_1m̥éd^hh_2$	$d^héh_1omosd^hh_2$	$d^hh_1ih_1méd^hh_2$	—
$d^hh_1d^hh_2ué$	$d^héh_1ed^hh_2ue$	$d^hh_1ih_1d^hh_2ué$	$d^hh_1d^hh_2ué$
$d^hh_1n̥tó$	$d^héh_1ontoy$	$d^hh_1ih_1ró$	???

participle $d^hh_1m̥h_1nós$

- b^her- 'carry' (simple thematic present)

present stem, active:

1ary indic.	*2ary indic.*	*subjunctive*	*optative*	*imperative*
$b^héroh_2$	$b^hérom$	$b^hérōh_2$	$b^héroyh_1m̥$	—
$b^héresi$	$b^héres$	$b^hérēsi$	$b^héroys$	$b^hére$
$b^héreti$	$b^héred$	$b^hérēti$	$b^héroyd$	$b^héretu$
$b^hérowos$	$b^hérowe$	$b^hérōwos$	$b^héroywe$	—
$b^héretes$	$b^héretom$	$b^hérētes$	$b^héroytom$	$b^héretom$
$b^héretes$	$b^héretām$	$b^hérētes$	$b^héroytām$	$b^héretām$
$b^héromos$	$b^hérome$	$b^hérōmos$	$b^héroyme$	—
$b^hérete$	$b^hérete$	$b^hérēte$	$b^héroyte$	$b^hérete$
$b^héronti$	$b^hérond$	$b^hérōnti$	$b^héroyh_1end$	$b^hérontu$

participle $b^héronts$, $b^hérontos$; $b^hérontih_2$, $b^hérontieh_2s$

present stem, mediopassive:

1ary indic.	*2ary indic.*	*subjunctive*	*optative*	*imperative*
$b^héroh_2ey$	$b^héroh_2e$	$b^hérōh_2ey$	$b^héroyh_2e$	—
$b^héreth_2ey$	$b^héreth_2e$	$b^hérēth_2ey$	$b^héroyth_2e$	???
$b^héretoy$	$b^héreto$	$b^hérētoy$	$b^héroyto$	???
$b^hérowosd^hh_2$	$b^hérowed^hh_2$	$b^hérōwosd^hh_2$	$b^héroywed^hh_2$	—
???	???	???	???	???
???	???	???	???	???
$b^héromosd^hh_2$	$b^héromed^hh_2$	$b^hérōmosd^hh_2$	$b^héroymed^hh_2$	—
$b^héred^hh_2ue$	$b^héred^hh_2ue$	$b^hérēd^hh_2ue$	$b^héroyd^hh_2ue$	$b^héred^hh_2ue$
$b^hérontoy$	$b^héronto$	$b^hérōntoy$	$b^héroyro$	???

participle $b^héromnos$ (← /-o-mh$_1$no-s/)

- g^wem- 'step' (sḱé-present, root aorist, reduplicated perfect; active only)

present stem:

1ary indic.	*2ary indic.*	*subjunctive*	*optative*	*imperative*
$g^wm̥sḱóh_2$	$g^wm̥sḱóm$	$g^wm̥sḱṓh_2$	$g^wm̥sḱóyh_1m̥$	—
$g^wm̥sḱési$	$g^wm̥sḱés$	$g^wm̥sḱḗsi$	$g^wm̥sḱóys$	$g^wm̥sḱé$
$g^wm̥sḱéti$	$g^wm̥sḱéd$	$g^wm̥sḱḗti$	$g^wm̥sḱóyd$	$g^wm̥sḱétu$
$g^wm̥sḱówos$	$g^wm̥sḱówe$	$g^wm̥sḱṓwos$	$g^wm̥sḱóywe$	—

$g^{w}m̥sḱétes$	$g^{w}m̥sḱétom$	$g^{w}m̥sḱétes$	$g^{w}m̥sḱóytom$	$g^{w}m̥sḱétom$
$g^{w}m̥sḱétes$	$g^{w}m̥sḱétām$	$g^{w}m̥sḱétes$	$g^{w}m̥sḱóytām$	$g^{w}m̥sḱétām$
$g^{w}m̥sḱómos$	$g^{w}m̥sḱóme$	$g^{w}m̥sḱómos$	$g^{w}m̥sḱóyme$	—
$g^{w}m̥sḱéte$	$g^{w}m̥sḱéte$	$g^{w}m̥sḱéte$	$g^{w}m̥sḱóyte$	$g^{w}m̥sḱéte$
$g^{w}m̥sḱónti$	$g^{w}m̥sḱónd$	$g^{w}m̥sḱónti$	$g^{w}m̥sḱóyh_{1}end$	$g^{w}m̥sḱóntu$

participle $g^{w}m̥sḱónts$, $g^{w}m̥sḱóntos$; $g^{w}m̥sḱóntih_{2}$, $g^{w}m̥sḱóntieh_{2}s$

aorist stem:

2ary indic.	*subjunctive*	*optative*	*imperative*
$g^{w}ém$	$g^{w}émoh_{2}$	$g^{w}m̥yéh_{1}m$	—
$g^{w}éms$	$g^{w}émesi$	$g^{w}m̥yéh_{1}s$	$g^{w}ém$, $g^{w}m̥d^{h}í$
$g^{w}émd$	$g^{w}émeti$	$g^{w}m̥yéh_{1}t$	$g^{w}émtu$
$g^{w}m̥wé$	$g^{w}émowos$	$g^{w}mih_{1}wé$	—
$g^{w}m̥tóm$	$g^{w}émetes$	$g^{w}mih_{1}tóm$	$g^{w}m̥tóm$
$g^{w}m̥tā́m$	$g^{w}émetes$	$g^{w}mih_{1}tā́m$	$g^{w}m̥tā́m$
$g^{w}m̥(m)é$	$g^{w}émomos$	$g^{w}mih_{1}mé$	—
$g^{w}m̥té$	$g^{w}émete$	$g^{w}mih_{1}té$	$g^{w}m̥té$
$g^{w}mént$	$g^{w}émonti$	$g^{w}mih_{1}ént$	$g^{w}méntu$

participle $g^{w}mónts$, $g^{w}mn̥tés$; $g^{w}móntih_{2}$, $g^{w}mn̥tyéh_{2}s$

perfect stem:

indicative	*subjunctive*	*optative*	*imperative*
$g^{w}eg^{w}ómh_{2}e$	$g^{w}eg^{w}émoh_{2}$	$g^{w}eg^{w}m̥yéh_{1}m$	—
$g^{w}eg^{w}ómth_{2}e$	$g^{w}eg^{w}émesi$	$g^{w}eg^{w}m̥yéh_{1}s$	???, $g^{w}eg^{w}m̥d^{h}í$
$g^{w}eg^{w}óme$	$g^{w}eg^{w}émeti$	$g^{w}eg^{w}m̥yéh_{1}t$	???
$g^{w}eg^{w}m̥wé$	$g^{w}eg^{w}émowos$	$g^{w}eg^{w}mih_{1}wé$	—
???	$g^{w}eg^{w}émetes$	$g^{w}eg^{w}mih_{1}tóm$	???
???	$g^{w}eg^{w}émetes$	$g^{w}eg^{w}mih_{1}tā́m$	???
$g^{w}eg^{w}m̥(m)é$	$g^{w}eg^{w}émomos$	$g^{w}eg^{w}mih_{1}mé$	—
$g^{w}eg^{w}mé$	$g^{w}eg^{w}émete$	$g^{w}eg^{w}mih_{1}té$	???
$g^{w}eg^{w}mḗr$	$g^{w}eg^{w}émonti$	$g^{w}eg^{w}mih_{1}ént$	???

participle $g^{w}eg^{w}m̥wṓs$, $g^{w}eg^{w}musés$; $g^{w}eg^{w}m̥wósih_{2}$, $g^{w}eg^{w}musyéh_{2}s$

Some generalizations about the above paradigms can be made. Thematic stems, including subjunctives, had fixed accent on the stem. In athematic stems the accent usually alternated, falling on the endings in the mediopassive and the nonsingular active, but on the preceding syllable in the singular active. However, s-aorists seem to have had fixed accent on the root, and it appears that there were a few root-presents that exhibited a similar pattern; and reduplicated presents (but not perfects) seem to have had fixed accent on the reduplicating syllable. No matter what the accentual pattern was, there was

normally a difference in ablaut between the singular active and all other forms of athematic stems; the commoner attested patterns are exemplified in the above paradigms.

Obviously the inflection of thematic stems was simpler and easier to learn. In the development of Germanic nearly all presents would become thematic.

2.3.4 *PIE noun inflection*

2.3.4 (i) *Endings* Like verb stems, nouns fell into two purely formal classes, athematic and thematic, the latter ending in the thematic vowel. However, the inflection of thematic nouns was different enough from that of athematic nouns that it is convenient to list two sets of case-and-number endings, as follows. (I omit the allative, which probably did not survive in the Central daughters except in adverbial relics.)

		athematic	*thematic*
sg.	nom.	*-s ∼ Ø (neut. Ø)	*-o-s (neut. *-o-m)
	voc.	Ø (neut. Ø)	*-e (neut. *-o-m)
	acc.	*-m (neut. Ø)	*-o-m (neut. *-o-m)
	inst.	*-éh$_1$ ∼ *-h$_1$	*-o-h$_1$
	dat.	*-éy	*-o-ey
	abl.	*-és ∼ *-os ∼ *-s	*-e-ad
	gen.	*-és ∼ *-os ∼ *-s	*-o-syo (?)
	loc.	Ø (→ *-i)	(**-e →) *-e-y
du.	nom./acc./voc.	*-h$_1$e (neut. *-ih$_1$)	*-o-h$_1$ (neut. *-o-y(h$_1$))
	inst./dat./abl.	???	???
	gen./loc.	*-ows (?)	???
pl.	nom./voc.	*-es (neut. *-h$_2$ ∼ Ø)	*-o-es (neut. *-e-h$_2$)
	acc.	*-ns (neut. *-h$_2$ ∼ Ø)	*-o-ns (neut. *-e-h$_2$)
	inst.	*-b^{h}í	*-ōys
	dat./abl.	*-mós	*-o-mos (*-o-y-mos?)
	gen.	*-óHom	*-o-oHom
	loc.	*-sú	*-o-y-su

Many details of this system call for comment.

A feature of nominal inflection which was destined to have considerable impact on the subsequent development of the daughters was the widespread incidence of syncretism.[7] The nom. pl. and voc. pl. were always identical, as

[7] Throughout this book I use the term 'syncretism' in a purely descriptive sense: it designates a situation in which forms with different syntactic features exhibit the same inflectional markers. It does not imply that there was ever a time at which different inflectional markers were used. I also distinguish syncretism from the syntactic merger of morphosyntactic categories, in which one category takes over all the functions of another, regardless of inflectional marking. For instance, in

were the dat. pl. and abl. pl.; in athematic stems, the abl. sg. and gen. sg. were also identical (so that the ablative did not have a distinctive ending in either number, though the pattern of syncretisms still distinguished it as a separate case). Though the reconstruction of dual endings is (as usual) difficult, it seems clear that no more than three dual endings can be reconstructed; of course it is not surprising that syncretism was most extensive in the most 'marked' of the numbers. Most strikingly of all, though the neuter exhibited endings in the three direct cases (nom., acc., and voc.) that were largely different from those of the masculine and feminine, there was only one neuter ending for all three cases in each of the numbers. That pattern of syncretism in the neuter persisted in almost all the daughters (including English) for as long as each still distinguished a neuter gender and nominative and accusative cases.

Most of the zero-endings of the non-neuter nom. sg. arose by Szemerényi's Law (see 2.2.4 (iv)) or are obviously analogical on those that did, but most stems in *-h_2, which seem regularly to have been feminine, lacked an overt nom. sg. ending for reasons that are unclear. The zero-endings of the neut. pl. direct cases likewise arose by Szemerényi's Law (which apparently affected all fricatives, thus *-h_2 as well as *-s). On the other hand, the voc. sg. and the neut. sg. direct cases were underlyingly endingless. The loc. sg. was rather different. It seems to have been characterized by an ending which had an underlying accent but no segmental portion to 'carry' it, with the result that the accent had to be linked leftward to the last syllable of the stem. Such a remarkable shape was of course unstable; though endingless locatives are securely attested in Hittite and (especially) in ancient Indo-Iranian languages, in all the daughters the loc. sg. tended to be recharacterized with the hic-et-nunc particle *-i, which eventually was reinterpreted as an accented ending *-í. In thematic stems only the form with the particle is attested; to judge from the Oscan ending **-eí**, it still exhibited the e-grade thematic vowel which was proper to endingless forms (cf. the non-neuter voc. sg.), but even that anomaly was eliminated in most daughters (including Germanic) to give a 'normal' ending *-oy.

It is clear that the endings of the direct cases were underlyingly unaccented, while those of the oblique cases originally were underlyingly accented but lost their accent and their underlying vowel whenever there was an accent to the left in the form (i.e. the leftmost underlying accent surfaced). But even among the athematic stems, which should have preserved the system best, the

Latin the instrumental case has undergone syntactic merger with the ablative, and the dative and ablative cases exhibit syncretism in the plural—as they did already in PIE, the earliest reconstructable ancestor of Latin.

reconstructable situation was no longer so straightforward. Of the singular oblique endings, only the genitive (/ablative) clearly showed extensive ablaut alternations; it looks as though the instrumental appeared in the zero grade only after (surface) vowels (including surface high vowels which were underlyingly sonorants), while for the dative ending only the full-grade form is reconstructable. In the plural the system of ablaut in endings had broken down completely; each ending appeared in only a single form, and there was evidently no longer any relation between ablaut and accent.

Most remarkable of all are the serious discrepancies that existed between the athematic endings and the thematic endings (which presumably should have amounted to the thematic vowel plus the athematic endings, but often did not). The following points regarding thematic endings should especially be noted.

1. Instead of ending in *-e (i.e. thematic vowel plus zero), the neut. sg. direct cases ended in *-o-m, the form proper to the non-neuter acc. sg. Even Hittite exhibits this oddity; for instance, Hitt. *iukan* = Skt *yugám*, Gk *ζυγόν* /sdugón/, Lat. *iugum* < PIE *yugóm 'yoke' (neut.).
2. The abl. sg. had a distinctive ending; but it was obviously just the (original) endingless loc. sg. in *-e plus the adverb (postposition?) *ád (> Lat. *ad* 'to, at', OE *æt* 'at'), which clearly did not mean 'to' in pre-PIE (Kim 2002: 162 n.15). This is one of several indications that the case system of PIE developed partly by the accretion of postpositions or adverbs, much like those of the Finno-Ugric languages.
3. The gen. sg. of thematic nouns is more or less unreconstructable. Hittite apparently has *-o-s, the expected ending (i.e. thematic vowel plus the zero grade of the athematic ending)—but we can't be certain that that isn't really the unaccented athematic ending *-os, because thematic and athematic stems converged phonologically in Hittite to the point where such a transfer of endings was clearly possible. The Tocharian ending is of obscure origin; Italo-Celtic exhibits an ending *-ī, which appears to be an unanalyzable derivational morpheme (cf. Nussbaum 1975), though Old Latin also exhibits *-osyo, and there are other Continental Celtic endings as well; and the Central daughters seem to have generalized *-osyo, which I have therefore entered in the table of endings above. But it is clear that *-osyo was originally the pronominal ending, and it is not clear what ending it replaced in thematic noun paradigms.
4. Before the consonant-initial loc. pl. ending *-su, and perhaps also before dat.-abl. pl. *-mos, thematic stems seem to have exhibited a functionless element *-y-, which was homonymous with the pronominal nom.

pl. ending and was certainly imported from pronominal inflection (see 2.3.6 (ii)).

5. The greatest puzzle is the inst. pl. ending *-ōys, which resembled nothing else in the inflectional system. This too was probably a pronominal ending (see 2.3.6 (ii)).

The mismatches between the athematic and thematic endings naturally tended to be levelled out in each of the daughter languages, but differently in each.

Finally, the table of endings given at the beginning of this section is probably somewhat anachronistic for PIE, for the following reason. It seems clear that neuter nouns originally did not have plurals; instead derived collectives, which were inflected as singulars (much like the 'broken' plurals of Arabic), were formed. The collectives of some athematic neuters survive as the normal singular paradigms in various daughter languages (including Germanic). Eventually, though, the nom.-acc. sg. of neuter collectives was interpreted as a nom.-acc. pl. form and integrated into a plural paradigm whose other members were identical with the corresponding masculine forms. How far that reanalysis had progressed by the end of the PIE period is unclear.

2.3.4 (ii) *Accent and ablaut patterns* Like athematic verb stems, athematic nouns exhibited accent and ablaut alternations within the paradigm; but it is clear that the system of alternations was originally more elaborate in noun inflection. It is necessary to distinguish between monosyllabic athematic nouns, traditionally called 'root nouns' (even when they are not derived from verb roots), and polysyllabic athematic nouns.

Monosyllables exhibited two types of accent and ablaut alternations. The easier type to reconstruct, because it has survived robustly in Indo-Iranian and Greek (and even become productive in the latter language), exhibited alternating accent: on the root in the direct cases, but on the endings in the oblique cases. Typical examples include (non-neuter) *$h_2$ént- ∼ *h_2n̥t-′ 'forehead', (masc.) *$h_2$nér- ∼ *$h_2$nr-′ 'man', (fem.) *wréh$_2$d- ∼ *wr̥h$_2$d-′ 'root', (neut.) *ḱḗr ∼ *ḱr̥d-′ 'heart'.

But there was also a type which had the accent on the root in all forms, but exhibited different ablaut grades in the direct and oblique cases; this 'acrostatic' type was recognized only in the 1960s, because it was already being eliminated by morphological change in PIE and has to be reconstructed from relics in the daughters (cf. Schindler 1967*c*, 1972*a*). Fairly clear examples of acrostatic monosyllables include (fem.) *dóm- ∼ *dém- 'house' (whose archaic gen. sg. is well attested in reflexes of the fossilized phrase *déms pótis

'master of the house'), *nók^{w}t- ∼ *nék^{w}t- 'night', (neut.) *h$_2$ést ∼ *h$_2$ést- 'bone', *mḗms ∼ *méms- 'meat'. Sometimes it is difficult to determine whether a noun was originally acrostatic from the reconstructable pattern of inflection. For instance, from (masc.) nom. sg. *pṓds, acc. sg. *pódm̥, gen. sg. *pedés, etc. 'foot', should we conclude that the original inflection was acrostatic *pód- ∼ *péd- and that the noun has been transferred into the alternating type without adjustment of the root-ablaut, or is it likelier that an inconvenient oblique stem *pd-′ was replaced by *ped-′ (a process for which probable parallels can be cited)?

Polysyllabic nouns seem originally to have exhibited four different accent patterns (cf. Schindler 1975*b*: 262–4). Acrostatic polysyllables survive much better than acrostatic monosyllables, though their ablaut alternations are usually levelled in the daughters; representative examples include (masc.) *mḗh$_1$n̥s- ∼ *méh$_1$n̥s- 'moon', (fem.) *h$_2$ówi- ∼ *h$_2$éwi- 'sheep', (neut.) *h$_1$nḗh$_3$mn̥ ∼ *h$_1$néh$_3$mn- 'name', *Hyḗk^{w}r̥ ∼ *Hyék^{w}n- 'liver', *ósr̥ ∼ *ésn- 'autumn', *wā́stu ∼ *wástu- 'settlement'. Moreover, in late PIE there developed a new class of acrostatic neuter s-stems with clearly secondary ablaut (involving multiple full-grade syllables), and that type seems to have become productive; typical examples are *néb^{h}os ∼ *néb^{h}es- 'cloud', *ḱléwos ∼ *ḱléwes- 'fame', *ǵénh$_1$os ∼ *ǵénh$_1$es- 'lineage', etc.

The other three polysyllabic types exhibited alternating accent: on the leftmost syllable of the stem in the direct cases and on the endings in the oblique cases ('amphikinetic' accent); on the rightmost syllable of the stem in the direct cases and on the endings in the oblique cases ('hysterokinetic' accent); or on the penultimate syllable of the stem in the direct cases and on the rightmost syllable of the stem in the oblique cases ('proterokinetic' accent). Note that in every one of these patterns the accent was to the left in the direct cases and to the right in the oblique cases.

The amphikinetic type appears to be the most archaic; isolated examples survive only in Hittite and the Indo-Iranian languages. Securely reconstructable amphikinetic nouns include, for instance, (masc.) *póntoh$_2$- ∼ *pn̥th$_2$-′ 'path', *léymon- ∼ *limn-′ 'lake', (fem.) *d^{h}ég^{h}ōm ∼ *ǵ^{h}m-′ (loc. *ǵ^{h}d^{h}sém) 'earth', and neuter collectives such as *wédōr ∼ *udn-′ 'waters' (cf. Schindler 1975*a*: 3–4). Interestingly, the inflection of masculine n-stems in Germanic appears to have evolved from an originally amphikinetic pattern (cf. Jasanoff 2002: 32–5), which suggests that this type of inflection had not yet been reduced to relics in late PIE.

Hysterokinetic inflection is most familiar from the r-stem kinship terms, e.g. *ph$_2$tér- ∼ *ph$_2$tr-′ 'father', *d^{h}ugh$_2$tér- ∼ *d^{h}ugtr-′ 'daughter'. But it seems clear that there were also a good many hysterokinetic n-stems, of which

the most important in the development of Germanic was probably *uksén- ~ *uksn-′ 'bull, ox', and various others can be reconstructed, e.g. (fem.) *dn̥ǵʰwéh₂- ~ *dn̥ǵʰuh₂-′ 'tongue' (Peters 1991).

Proterokinetic inflection may have been the most widespread type among polysyllabic athematic nouns in late PIE. Whole classes of nouns followed this accent paradigm, including, for instance, feminine nouns in */-tey-/ (e.g. *dʰéh₁-ti- ~ *dʰh₁-téy- 'act of putting', *gʷém-ti- ~ *gʷm̥-téy- 'step, act of walking', *mén-ti- ~ *mn̥-téy- 'thought'), masculine nouns in */-tew-/ (e.g. *ǵéws-tu- ~ *ǵus-téw- 'taste'), most neuters in */-men-/ (e.g. *séh₁-mn̥ ~ *sh₁-mén- 'seed'), most feminines in *-h₂- that were not derived from o-stems (e.g. *gʷénh₂- ~ *gʷnéh₂- 'woman', *h₁widʰéwh₂- ~ *h₁widʰwéh₂- 'widow'), and a large number of neuter r/n-stems (e.g. *péh₂wr̥ ~ *ph₂uén- 'fire'; cf. Schindler 1975*a*: 9–10). There was a conspicuous group of basic neuter nouns with o-grade direct cases which may originally have been acrostatic (ibid. pp. 4–8) but are reconstructable for late PIE as proterokinetic, e.g. *wódr̥ ~ *udén- 'water', *sóh₂wl̥ ~ *sh₂uén- 'sun', *móri ~ *mréy- 'sea', *ǵónu ~ *ǵnéw- 'knee', *dóru ~ *dréw- 'tree, wood'.

None of this applied to thematic nouns, which had the accent on the same syllable throughout the paradigm, either on the thematic vowel (e.g. in (masc.) *deywós 'god', (fem.) *snusós 'daughter-in-law', (neut.) *yugóm 'yoke') or on the leftmost syllable of the stem (e.g. in (masc.) *éḱwos 'horse', (neut.) *wérǵom 'work'). However, there was a derivational rule by which collectives were formed from o-stem nouns by the addition of the collective suffix *-h₂- and a shift of accent (so that from (masc.) *kʷékʷlo- 'wheel', for example, was formed a collective *kʷekʷlé-h₂- 'set of wheels'); and in the daughter languages these collectives tended to be reinterpreted as neuter plurals and, in some cases, to be integrated into the paradigms of the nouns from which they had originally been formed. The result was a class of thematic nouns with an alternation of accent between singular and plural, and sometimes also a shift of gender in the plural (the 'heteroclitic' nouns of the classical languages). Various daughters levelled the alternations in different ways; for instance, in Greek the accent alternation is normally levelled (cf. Homeric masc. *κύκλος* /kúklos/ 'wheel', pl. neut. *κύκλα* /kúkla/), while in Slavic languages the gender is normally leveled (cf. e.g. Russian neut. *s′eló*, pl. *s′óla* 'village'). There are traces of these phenomena in Germanic.

Finally, feminines (some of which were originally collectives) were also formed from o-stem nouns with the suffix *-h₂-; these, too, had fixed accent on the thematic vowel or on the leftmost syllable of the stem (e.g. *dʰoHnéh₂- 'grain', *h₂wl̥h₁neh₂- 'wool').

2.3.4 (iii) *Sample noun paradigms* These are naturally much smaller than the verb paradigms and require less comment. The oblique cases of the dual, which are difficult to reconstruct, are omitted. Readers should bear in mind that the plural paradigms given for neuter nouns were innovations that at least partly postdated PIE; for several classes of stems in sonorants, at least, the collectives were still derived singulars. Two such cases are noted in the paradigms below.

	night (f.)	foot (m.)	root (f.)	star (m.)	heart (n.)
singular					
nom.	nók^{w}ts	pṓds	wréh$_2$ds	h$_2$stḗr	ḱḗr
voc.	nók^{w}t	pód	wréh$_2$d	h$_2$stér	ḱḗr
acc.	nók^{w}tm̥	pódm̥	wréh$_2$dm̥	h$_2$stérm̥	ḱḗr
inst.	nék^{w}t(e)h$_1$	pedéh$_1$	wr̥h$_2$déh$_1$	h$_2$str̥éh$_1$	ḱr̥déh$_1$
dat.	nék^{w}tey	pedéy	wr̥h$_2$déy	h$_2$str̥éy	ḱr̥déy
abl., gen.	nék^{w}ts	pedés	wr̥h$_2$dés	h$_2$str̥és	ḱr̥dés
loc.	nék^{w}t(i)	péd(i)	wréh$_2$d(i)	h$_2$stér(i)	ḱérd(i)
dual					
n.-v.-acc.	nók^{w}th$_1$e	pódh$_1$e	wréh$_2$dh$_1$e	h$_2$stérh$_1$e	ḱérdih$_1$
…					
plural					
n.-v.	nók^{w}tes	pódes	wréh$_2$des	h$_2$stéres	ḱérd(e)h$_2$
acc.	nók^{w}tn̥s	pódn̥s	wréh$_2$dn̥s	h$_2$stérn̥s	ḱérd(e)h$_2$
inst.	nék^{w}tb^{h}i	pedb^{h}í	wr̥h$_2$db^{h}í	h$_2$str̥b^{h}í	ḱr̥db^{h}í
d.-abl.	nék^{w}tm̥os	pedmós	wr̥h$_2$dm̥ós	h$_2$str̥mós	ḱr̥dmós
gen.	nék^{w}toHom	pedóHom	wr̥h$_2$dóHom	h$_2$str̥óHom	ḱr̥dóHom
loc.	nék^{w}tsu	pedsú	wr̥h$_2$dsú	h$_2$str̥sú	ḱr̥dsú

	sheep (f.)	moon (m.)	name (n.)	(collective:) names (n.)	lake (m.)
singular					
nom.	h$_2$ówis	mḗh$_1$n̥s	h$_1$nḗh$_3$mn̥	h$_1$néh$_3$mō	léymō
voc.	h$_2$ówi	mḗh$_1$n̥s	h$_1$nḗh$_3$mn̥	h$_1$néh$_3$mō	léymon
acc.	h$_2$ówim	mḗh$_1$n̥sm̥	h$_1$nḗh$_3$mn̥	h$_1$néh$_3$mō	léymonm̥
inst.	h$_2$éwih$_1$	méh$_1$n̥s(e)h$_1$	h$_1$néh$_3$mn̥(e)h$_1$	h$_1$n̥h$_3$m̥néh$_1$	limnéh$_1$
dat.	h$_2$éwyey	méh$_1$n̥sey	h$_1$néh$_3$mn̥ey	h$_1$n̥h$_3$m̥néy	limnéy
abl., gen.	h$_2$éwis (→ -yos)	méh$_1$n̥sos	h$_1$néh$_3$mn̥(o)s	h$_1$n̥h$_3$m̥nés	limnés
loc.	???	méh$_1$n̥s(i)	h$_1$néh$_3$mn̥(i)	h$_1$n̥h$_3$mén(i)	limén(i)
dual					
n.-v.-acc.	h$_2$ówih$_1$e	mḗh$_1$n̥sh$_1$e	h$_1$nḗh$_3$mn̥ih$_1$ (?)		léymonh$_1$e
…					

plural			
n.-v.	$h_2$óweyes	mḗh_1n̥ses	léymones
acc.	$h_2$ówins	mḗh_1n̥sn̥s	léymonn̥s
inst.	$h_2$éwib^{h}i	méh_1n̥sb^{h}i	limn̥b^{h}í
d.-abl.	$h_2$éwimos	méh_1n̥smos	limn̥mós
gen.	$h_2$éwyoHom	méh_1n̥soHom	limnóHom
loc.	$h_2$éwisu	méh_1n̥su	limn̥sú

	earth (f.)	thought (f.)	taste (m.)	sea (n.)	tree (n.)
singular					
nom.	d^{h}ég^{h}ōm	méntis	ǵéwstus	móri	dóru
voc.	d^{h}ég^{h}om	ménti	ǵéwstu	móri	dóru
acc.	d^{h}ég^{h}ōm	méntim	ǵéwstum	móri	dóru
inst.	ǵ^{h}méh$_1$	mn̥tíh$_1$	ǵustúh$_1$	mríh$_1$	drúh$_1$
dat.	ǵ^{h}méy	mn̥téyey	ǵustéwey	mréyey	dréwey
abl., gen.	ǵ^{h}més	mn̥téys	ǵustéws	mréys	dréws
loc.	ǵ^{h}d^{h}sém(i)	mn̥téy (-ēy)	ǵustéw(i)	mréy (-ēy)	dréw(i)
dual					
n.-v.-acc.		méntih$_1$	ǵéwstuh$_1$	mórīh$_1$ (?)	dórwih$_1$
…					
plural					
n.-v.		ménteyes	ǵéwstewes	mórih$_2$	dóruh$_2$
acc.		méntins	ǵéwstuns	mórih$_2$	dóruh$_2$
inst.		mn̥tíb^{h}i	ǵustúb^{h}i	mríb^{h}i	drúb^{h}i
d.-abl.		mn̥tímos	ǵustúmos	mrímos	drúmos
gen.		mn̥téyoHom	ǵustéwoHom	mréyoHom	dréwoHom
loc.		mn̥tísu	ǵustúsu	mrísu	drúsu

	seed (n.)	(collective:) seed(s) (n.)	sun (n.)	woman (f.)	widow (f.)
singular					
nom.	séh$_1$mn̥	séh$_1$mō	sóh$_2$wl̥	g^{w}ḗn	h$_1$wid^{h}éwh$_2$
voc.	séh$_1$mn̥	séh$_1$mō	sóh$_2$wl̥	g^{w}én	h$_1$wid^{h}éwh$_2$
acc.	séh$_1$mn̥	séh$_1$mō	sóh$_2$wl̥	g^{w}énh$_2$m̥	h$_1$wid^{h}éwh$_2$m̥
inst.	sh$_1$m̥énh$_1$	sh$_1$m̥néh$_1$	sh$_2$uénh$_1$	g^{w}néh$_2$(e)h$_1$	h$_1$wid^{h}wéh$_2$(e)h$_1$
dat.	sh$_1$m̥éney	sh$_1$m̥ney	sh$_2$uéney	g^{w}néh$_2$ey	h$_1$wid^{h}wéh$_2$ey
abl., gen.	sh$_1$m̥éns	sh$_1$m̥nés	sh$_2$uéns	g^{w}néh$_2$s	h$_1$wid^{h}wéh$_2$s
loc.	sh$_1$m̥én(i)	sh$_1$m̥én(i)	sh$_2$uén(i)	g^{w}néh$_2$(i)	h$_1$wid^{h}wéh$_2$(i)
dual					
n.-v.-acc.	séh$_1$mn̥ih$_1$			g^{w}énh$_2$h$_1$e	h$_1$wid^{h}éwh$_2$h$_1$e
…					

plural					
n.-v.				$g^{w}énh_{2}es$	$h_{1}wid^{h}éwh_{2}es$
acc.				$g^{w}énh_{2}n̥s$	$h_{1}wid^{h}éwh_{2}n̥s$
inst.				$g^{w}néh_{2}b^{h}i$	$h_{1}wid^{h}wéh_{2}b^{h}i$
d.-abl.				$g^{w}néh_{2}mos$	$h_{1}wid^{h}wéh_{2}mos$
gen.				$g^{w}néh_{2}oHom$	$h_{1}wid^{h}wéh_{2}oHom$
loc.				$g^{w}néh_{2}su$	$h_{1}wid^{h}wéh_{2}su$

	father (m.)	bull (m.)	dog (m.)	tooth (m.)	tongue (f.)
singular					
nom.	$ph_{2}t\acute{e}r$	$uks\acute{e}n$	$ḱwṓ$	$h_{1}dónts$	$dn̥ǵ^{h}wéh_{2}s$
voc.	$ph_{2}tér$	úksen	ḱúon (?)	$h_{1}dónt$	$dn̥ǵ^{h}weh_{2}$
acc.	$ph_{2}térm̥$	$uksénm̥$	$ḱwónm̥$	$h_{1}dóntm̥$	$dn̥ǵ^{h}wéh_{2}m$ (-ām)
inst.	$ph_{2}tr̥éh_{1}$	$uksn̥éh_{1}$	$ḱunéh_{1}$	$h_{1}dn̥téh_{1}$	$dn̥ǵ^{h}uh_{2}éh_{1}$
dat.	$ph_{2}tr̥éy$	$uksn̥éy$	ḱunéy	$h_{1}dn̥téy$	$dn̥ǵ^{h}uh_{2}éy$
abl., gen.	$ph_{2}tr̥és$	$uksn̥és$	ḱunés	$h_{1}dn̥tés$	$dn̥ǵ^{h}uh_{2}és$
loc.	$ph_{2}tér(i)$	uksén(i)	ḱwón(i)	$h_{1}dónt(i)$	$dn̥ǵ^{h}wéh_{2}(i)$
dual					
n.-v.-acc.	$ph_{2}térh_{1}e$	$uksénh_{1}e$	$ḱwónh_{1}e$	$h_{1}dónth_{1}e$	$dn̥ǵ^{h}wéh_{2}h_{1}e$
…					
plural					
n.-v.	$ph_{2}téres$	uksénes	ḱwónes	$h_{1}dóntes$	$dn̥ǵ^{h}wéh_{2}es$
acc.	$ph_{2}térn̥s$	$uksénn̥s$	$ḱwónn̥s$	$h_{1}dóntn̥s$	$dn̥ǵ^{h}wéh_{2}ns$ (-ās)
inst.	$ph_{2}tr̥b^{h}í$	$uksn̥b^{h}í$	$ḱwn̥b^{h}í$	$h_{1}dn̥tb^{h}í$	$dn̥ǵ^{h}uh_{2}b^{h}í$
d.-abl.	$ph_{2}tr̥mós$	$uksn̥mós$	$ḱwn̥mós$	$h_{1}dn̥tmós$	$dn̥ǵ^{h}uh_{2}mós$
gen.	$ph_{2}tr̥óHom$	$uksn̥óHom$	ḱunóHom	$h_{1}dn̥tóHom$	$dn̥ǵ^{h}uh_{2}óHom$
loc.	$ph_{2}tr̥sú$	$uksn̥sú$	$ḱwn̥sú$	$h_{1}dn̥tsú$	$dn̥ǵ^{h}uh_{2}sú$

	field (m.)	nest (m.)	work (n.)	yoke (n.)	cloud (n.)
singular					
nom.	$h_{2}égros$	nisdós	wérǵom	yugóm	$néb^{h}os$
voc.	$h_{2}égre$	nisdé	wérǵom	yugóm	$néb^{h}os$
acc.	$h_{2}égrom$	nisdóm	wérǵom	yugóm	$néb^{h}os$
inst.	$h_{2}égroh_{1}$	$nisdóh_{1}$	$wérǵoh_{1}$	$yugóh_{1}$	$néb^{h}es(e)h_{1}$
dat.	$h_{2}égroey$	nisdóey	wérǵoey	yugóey	$néb^{h}esey$
abl.	$h_{2}égread$	nisdéad	wérǵead	yugéad	$néb^{h}esos$
gen.	$h_{2}égrosyo$	nisdósyo	wérǵosyo	yugósyo	$néb^{h}esos$
loc.	$h_{2}égrey$	nisdéy	wérǵey	yugéy	$néb^{h}es(i)$
dual					
n.-v.-acc.	$h_{2}égroh_{1}$	$nisdóh_{1}$	$wérǵoy(h_{1})$	$yugóy(h_{1})$	$néb^{h}esih_{1}$
…					

plural					
n.-v.	$h_2$égroes	nisdóes	wérǵeh$_2$	yugéh$_2$	néb^{h}ōs
acc.	$h_2$égrons	nisdóns	wérǵeh$_2$	yugéh$_2$	néb^{h}ōs
inst.	$h_2$égrōys	nisdṓys	wérǵōys	yugṓys	néb^{h}esb^{h}i
d.-abl.	$h_2$égro(y)mos	nisdó(y)mos	wérǵo(y)mos	yugó(y)mos	néb^{h}esmos
gen.	$h_2$égrooHom	nisdóoHom	wérǵooHom	yugóoHom	néb^{h}esoHom
loc.	$h_2$égroysu	nisdóysu	wérǵoysu	yugóysu	néb^{h}esu

	wool (f.)	grain (f.)		grain (f.)
singular			plural	
nom.	$h_2$wĺ̥h$_1$neh$_2$	d^{h}oHnéh$_2$	n.-v.	d^{h}oHnéh$_2$es
voc.	$h_2$wl̥h$_1$n[a]	d^{h}oHn[á]	acc.	d^{h}oHnéh$_2$ns (-ās)
acc.	$h_2$wl̥h$_1$neh$_2$m (-ām)	d^{h}oHnéh$_2$m (-ā́m)	inst.	d^{h}oHnéh$_2$b^{h}i
inst.	$h_2$wl̥h$_1$neh$_2$(e)h$_1$	d^{h}oHnéh$_2$(e)h$_1$	d.-abl.	d^{h}oHnéh$_2$mos
dat.	$h_2$wl̥h$_1$neh$_2$ey	d^{h}oHnéh$_2$ey	gen.	d^{h}oHnéh$_2$oHom
abl., gen.	$h_2$wl̥h$_1$neh$_2$s	d^{h}oHnéh$_2$s	loc.	d^{h}oHnéh$_2$su
loc.	$h_2$wl̥h$_1$neh$_2$(i)	d^{h}oHnéh$_2$(i)		

2.3.5 *PIE adjective inflection*

In principle adjectives were inflected like nouns, except that there were forms for each of the three genders. The masculine and neuter case-and-number forms were made directly to the adjective stem (and were therefore identical in the oblique cases). The feminine was characterized by a suffix, which was *-h_2- for o-stems and apparently */-yeh$_2$-/ (proterokinetic) for all athematic adjectives. The large and productive classes of adjectives were o-stems, u-stems (proterokinetic), active participles in */-ont-/ (hysterokinetic) made to athematic verb stems and in *-o-nt- (with fixed accent) made to thematic verb stems, and perfect participles in */-wos-/ (probably originally amphikinetic, but perhaps mostly hysterokinetic in late PIE).

The following paradigms were typical.

'thin' (u-stem, proterokinetic)

	masc.	*fem.*	*neut.*
singular			
nom.	ténh$_2$us	tn̥h$_2$éwih$_2$	ténh$_2$u
voc.	ténh$_2$u	tn̥h$_2$éwi	ténh$_2$u
acc.	ténh$_2$um	tn̥h$_2$éwih$_2$m̥	ténh$_2$u
inst.	tn̥h$_2$úh$_1$	tn̥h$_2$uyéh$_2$(e)h$_1$	tn̥h$_2$úh$_1$
dat.	tn̥h$_2$éwey	tn̥h$_2$uyéh$_2$ey	tn̥h$_2$éwey
abl., gen.	tn̥h$_2$éws	tn̥h$_2$uyéh$_2$s	tn̥h$_2$éws

loc.	tn̥h₂éw(i)	tn̥h₂uyéh₂(i)	tn̥h₂éw(i)
dual			
n.-v.-acc.	ténh₂uh₁	???	ténh₂uih₁
…			
plural			
n.-v.	ténh₂ewes	tn̥h₂éwih₂es	ténh₂uh₂
acc.	ténh₂uns	tn̥h₂éwih₂n̥s	ténh₂uh₂
inst.	tn̥h₂úbʰi	tn̥h₂uyéh₂bʰi	tn̥h₂úbʰi
d.-abl.	tn̥h₂úmos	tn̥h₂uyéh₂mos	tn̥h₂úmos
gen.	tn̥h₂éwoHom	tn̥h₂uyéh₂oHom	tn̥h₂éwoHom
loc.	tn̥h₂ú su	tn̥h₂uyéh₂su	tn̥h₂ú su

'being' (active participle, hysterokinetic)

	masc.	*fem.*	*neut.*
singular			
nom.	h₁sónts	h₁sóntih₂	h₁sónd
voc.	h₁sónd	h₁sónti	h₁sónd
acc.	h₁sóntm̥	h₁sóntih₂m̥	h₁sónd
inst.	h₁sn̥téh₁	h₁sn̥tyéh₂(e)h₁	h₁sn̥téh₁
dat.	h₁sn̥téy	h₁sn̥tyéh₂ey	h₁sn̥téy
abl., gen.	h₁sn̥tés	h₁sn̥tyéh₂s	h₁sn̥tés
loc.	h₁sónt(i)	h₁sn̥tyéh₂(i)	h₁sónt(i)
dual			
n.-v.-acc.	h₁sónth₁e	h₁sóntih₂h₁e (?)	h₁sóntih₁
…			
plural			
n.-v.	h₁sóntes	h₁sóntih₂es	h₁sṓnd
acc.	h₁sóntn̥s	h₁sóntih₂n̥s	h₁sṓnd
inst.	h₁sn̥tbʰí	h₁sn̥tyéh₂bʰi	h₁sn̥tbʰí
d.-abl.	h₁sn̥tmós	h₁sn̥tyéh₂mos	h₁sn̥tmós
gen.	h₁sn̥tóHom	h₁sn̥tyéh₂oHom	h₁sn̥tóHom
loc.	h₁sn̥tsú	h₁sn̥tyéh₂su	h₁sn̥tsú

'full' (o-stem)

	masc.	*fem.*	*neut.*
singular			
nom.	pl̥h₁nós	pl̥h₁néh₂	pl̥h₁nóm
voc.	pl̥h₁né	pl̥h₁n[á]	pl̥h₁nóm
acc.	pl̥h₁nóm	pl̥h₁néh₂m (-ām)	pl̥h₁nóm
inst.	pl̥h₁nóh₁	pl̥h₁néh₂(e)h₁	pl̥h₁nóh₁

dat.	pl̥h₁nóey	pl̥h₁néh₂ey	pl̥h₁nóey
abl.	pl̥h₁néad	pl̥h₁néh₂s	pl̥h₁néad
gen.	pl̥h₁nósyo	pl̥h₁néh₂s	pl̥h₁nósyo
loc.	pl̥h₁néy	pl̥h₁néh₂(i)	pl̥h₁néy
dual			
n.-v.-acc.	pl̥h₁nóh₁	???	pl̥h₁nóy(h₁)
...			
plural			
n.-v.	pl̥h₁nóes	pl̥h₁néh₂es	pl̥h₁néh₂
acc.	pl̥h₁nóns	pl̥h₁néh₂ns (-ās)	pl̥h₁néh₂
inst.	pl̥h₁nṓys	pl̥h₁néh₂b^{h}i	pl̥h₁nṓys
d.-abl.	pl̥h₁nó(y)mos	pl̥h₁néh₂mos	pl̥h₁nó(y)mos
gen.	pl̥h₁nóoHom	pl̥h₁néh₂oHom	pl̥h₁nóoHom
loc.	pl̥h₁nóysu	pl̥h₁néh₂su	pl̥h₁nóysu

2.3.6 *The inflection of other PIE nominals*

The remaining classes of nominals that were inflected in PIE included at least personal pronouns, anaphors, determiners, wh-elements (both interrogative and relative), and (most) quantifiers. The membership of that list is given in syntactic terms, but the inflectional system classified these stems differently. At least some quantifiers with relatively general meanings (such as 'all' and 'many') were inflected as ordinary adjectives, but others seem to have exhibited pronominal inflection (see below). Numerals were a more or less distinct inflectional class, many exhibiting formal peculiarities of one sort or another. The first- and second-person pronouns and the reflexive pronoun had a reduced inflectional system very unlike that of other nominals. The remaining items of the above list largely shared inflectional peculiarities; their system of inflection is usually referred to as 'pronominal inflection' by Indo-Europeanists. In this section I will discuss those inflectional classes.

2.3.6 (i) *PIE numerals* It is fairly likely that PIE, like Proto-Algonkian, possessed more than one lexeme translatable by English 'one', though it is not possible to reconstruct the semantics of the words in detail. An obviously archaic m-stem seems likely to have been the basic numeral:

	masc.	*fem.*	*neut.*
nom.	sḗm	sémih₂	sém
voc.	sém	sémi	sém
acc.	sḗm	sémih₂m̥	sém
inst.	sméh₁	sm̥yéh₂(e)h₁	sméh₁

dat.	sméy	sm̥yéh$_2$ey	sméy
abl., gen.	smés	sm̥yéh$_2$s	smés
loc.	sém(i)	sm̥yéh$_2$(i)	sém(i)

This word survives as the ordinary numeral in Tocharian, Greek, Armenian, and perhaps Albanian; it also obviously underlies the Latin adverb *semel* 'once'. Most of the other languages have instead various derivatives of a stem *oy-, which may originally have meant 'single' or the like:

Skt *ékas* < *óykos;
Av. *aēuuō*, Old Persian *aiva* < *óywos (cf. Gk *οἶος* /ôios/ 'alone');
Lat. *ūnus*, OIr. *óen*, Welsh *un*, Goth. *ains* (and so all the Gmc languages), Old Prussian *ains* < *óynos (cf. Gk *οἴνη* /óinę:/ 'one-spot (on dice)').

If the Hittite word was really *ās, as has been suggested (Eichner 1992: 32–4), it presumably reflects *óyos.

It is clear that 'two' was inflected as a dual, and that its direct caseform was masc. *dwóh$_1$, neut. *dwóy(h$_1$); it is not clear whether there was originally a separate feminine stem, though the Central dialects seem to show a fem. direct caseform *dwéh$_2$ih$_1$. The oblique forms are difficult to reconstruct, as is usual for duals. In addition, there was an uninflected form *dwó (Cowgill 1985*b*), which might have arisen by loss of the direct masc. case ending in pausa (see 2.2.4 (iv) ad fin.). It is also clear that there was a parallel stem meaning 'both' (i.e. 'all two'), which either was or ended in *b^{h}ó-. But while Germanic seems to reflect such a monosyllabic stem (cf. Goth. *bai*, etc.), the other languages exhibit compounds of various kinds: the commonest form is compounded with a form of *h$_2$ent- 'forehead' (Jasanoff 1976; cf. Toch. B *antapi*, Toch. A masc. *āmpi*, fem. *āmpuk*, Gk *ἄμφω* /ámphǫ:/, Lat. *ambō*), but we also find *(H)u- (Skt *ub^{h}áu*) and *(H)o- (OCS *oba*). It seems implausible that Germanic—not a notably archaic daughter—preserves the original stem, but that might be the case.

With 'three' we are on firmer ground. This numeral preserved an extraordinarily archaic feminine in */-ser-/, clearly attested in Indo-Iranian and Celtic:

	masc.	*fem.*	*neut.*
n.-v.	tréyes	tisres (accent?)	tríh$_2$
acc.	tríns	tisr̥ns (accent?)	tríh$_2$
inst.	trib^{h}í	tisr̥b^{h}í	trib^{h}í
d.-abl.	trimós	tisr̥mós	trimós
gen.	tr̥yóHom	tisróHom	tr̥yóHom
loc.	trisú	tisr̥sú	trisú

The accent of the fem. direct forms is doubtful. Sanskrit accents the endings, which is hard to believe for the PIE nom. pl. and almost impossible for the acc. pl.; unfortunately neither Iranian nor Celtic preserves any unambiguous reflex of the original accent.

'Four' had a similarly archaic feminine stem:

	masc.	*fem.*	*neut.*
n.-v.	k^{w}etwóres	k^{w}étesres	k^{w}etwṓr
acc.	k^{w}etwórn̥s	k^{w}étesrn̥s	k^{w}etwṓr
inst.	k^{w}etwr̥b^{h}í	k^{w}etesr̥b^{h}í	k^{w}etwr̥b^{h}í
d.-abl.	k^{w}etwr̥mós	k^{w}etesr̥mós	k^{w}etwr̥mós
gen.	k^{w}eturóHom	k^{w}etesróHom	k^{w}eturóHom
loc.	k^{w}etwr̥sú	k^{w}etesr̥sú	k^{w}etwr̥sú

But the subsequent numerals up through at least 'nine' were uninflected: we are able to reconstruct *pénk^{w}e 'five', *swéḱs 'six', *septḿ̥ 'seven', *oḱtṓw 'eight', and (with a bit more uncertainty) *(h$_1$)néwn̥ 'nine'. Whether *déḱm̥d 'ten' was productively inflected is unclear: in the daughters it isn't, but the reconstructable decads are recognizably inflected forms of 'ten'. Thus *wíḱm̥tih$_1$ 'twenty' must be **dwi-dḱm̥t-ih$_1$ 'two tens' (cf. the discussion of Szemerényi 1960: 129–40, and note the neuter dual ending), while the higher decads ended in an archaic neuter collective *dḱṓmd (Schindler 1967*b*: 240). 'Hundred', reconstructable as *ḱm̥tóm, was also some sort of derivative of 'ten' (with **d- lost by the same regular sound change that dropped the initial dental stop in oblique cases of 'earth', see 2.2.4 (iii), 2.3.4 (ii, iii)). Higher numerals cannot be securely reconstructed.

2.3.6 (ii) *PIE 'pronominal' inflection* The inflection of the determiner 'that' was unusual in a number of ways:

	masc.	*fem.*	*neut.*
singular			
nom.	só	séh$_2$	tód
acc.	tóm	téh$_2$m [tā́m]	tód
inst.	tónoh$_1$ (?)	téh$_2$(e)h$_1$	tónoh$_1$ (?)
dat.	tósmey	tósyeh$_2$ey	tósmey
abl.	tósmead (?)	tósyeh$_2$s	tósmead (?)
gen.	tósyo	tósyeh$_2$s	tósyo
loc.	tósmi	tósyeh$_2$(i)	tósmi
dual			
nom.-acc.	tóh$_1$	???	tóy
...			

plural			
nom.	tóy	téh$_2$es	téh$_2$
acc.	tóns	téh$_2$ns [tấs]	téh$_2$
inst.	tṓys	téh$_2$b^{h}i	tṓys
d.-abl.	tóymos	téh$_2$mos	tóymos
gen.	tóysoHom	téh$_2$soHom	tóysoHom
loc.	tóysu	téh$_2$su	tóysu

The suppletion *só- ∼ *tó- was completely unparalleled elsewhere in the inflectional system. Other peculiarities, however, will reappear in various paradigms cited below: the endinglessness of the nom. sg. masc.; the neut. direct case ending *-d; the puzzling infixation of *-sm- in most of the masc. and neut. sg. forms (but gen. sg. *-osyo—why?) and of *-sy- in the fem. sg.; the nom. pl. masc. ending *-y; the reappearance of the same (?) *-y- in the masc. and neut. oblique forms; the infixation of *-s- in all the gen. pl. forms. Those are the signature of PIE 'pronominal' inflection.

While many features of this inflectional system remain puzzling, tentative explanations can be offered for some. It has long been suspected that the *-sm- of the masc. and neut. sg. oblique cases is a reduced form of 'one' (see 2.3.6 (i)). If that is true, it should follow that the *-syeh$_2$- of the fem. sg. forms reflects the corresponding fem. of the numeral; the fact that the root-final *-m- has been dropped rather than syllabified might then reflect an earlier, pre-PIE phonological system (in which case this inflection would be very archaic), or the cluster might simply have been reduced by allegro phonology in relatively long compound forms. In 1993 Eric Hamp suggested to me that the *-y(-) of the masc. and neut. pl. forms could be a pluralizing suffix, the inflection of these nominals thus being in part agglutinative (exceptionally for PIE). Jay Jasanoff suggests that it was actually an archaic suffix that formed collectives, like the more familiar *-h$_2$- (Jasanoff 2003*b*), and that leads him to further interesting observations about pronominal inflection; publication of his results is eagerly awaited.

The relative pronoun *Hyó- was apparently inflected like 'that', except that the nom. sg. masc. was 'normal' *Hyós. It appears that a number of quantifiers and similar lexemes were also inflected in the same way; for instance, a neut. nom.-acc. sg. *ályod 'other' is securely reconstructable from Lat. *aliud* and Gk *ἄλλο* /állo/. The scope of this phenomenon is unclear, though its existence in the protolanguage is not doubtful. Indo-Iranian and Italic preserve relics of the system especially well; though the lexemes which are inflected according to this 'pronominal' pattern are often not cognate, they typically include the basic words for 'other, other (of two), which (of two)?,

every, any, one'—that is, quantifiers which happen to have thematic stems. Various other daughters have eliminated this peculiarity almost completely (including Greek, which makes *ἄλλο* especially probative). The existence of these 'pronominal adjectives' had momentous consequences for adjective inflection in Germanic, which will be discussed in section 3.3.2.

A number of parallel pairs of stems seem to have existed in PIE, such that the o-stem was used in adnominal function while the i/e-stem was used as a full NP (Warren Cowgill, p.c. *c.*1980; cf. Sihler 1995: 395–400). The distribution of Lat. interrogative *quis* and *quī* apparently preserves the PIE situation, though elsewhere leveling has obscured it. The pairs in question are the following:

	adnominal	*full NP*
3rd person pronoun	*o-	*i/e-
determiner 'this'	*ḱo-	*ḱi/e-
interrogative	*k^wo-	*k^wi/e-

The o-stems were inflected like the relative pronoun (i.e. like the determiner 'that' except that the nom. sg. masc. ended in *-os). But the inflection of the i/e-stems exhibited a type of ablaut otherwise unexampled in PIE. I give the paradigm of the 3rd person pronoun:

	masc.	*fem.*	*neut.*
singular			
nom.	éy	$íh_2$	íd
acc.	ím	$íh_2m̥$	íd
inst.	$íh_1$	???	$íh_1$
dat.	ésmey	$ésyeh_2ey$	ésmey
abl.	ésmead (?)	$ésyeh_2s$	ésmead (?)
gen.	ésyo	$ésyeh_2s$	ésyo
loc.	ésmi	$ésyeh_2$(i)	ésmi
dual			
nom.-acc.	???	???	???
...			
plural			
nom.	éyes	$íh_2$es (?)	$íh_2$
acc.	íns	$íh_2n̥s$ (?)	$íh_2$
inst.	$éyb^hi$	$íh_2b^hi$	$éyb^hi$
d.-abl.	éymos	$íh_2$mos	éymos
gen.	éysoHom	$íh_2$soHom	éysoHom
loc.	éysu	$íh_2$su	éysu

This pronoun occurred also as a clitic (i.e. unaccented); the difference seems to have been that the accented form was weakly deictic, while the clitic form referred to an entity already mentioned in the discourse with no trace of deixis. The interrogative, too, occurred as a clitic; its clitic form was indefinite in meaning (*k^{w}id 'something', etc.). Apparently the 'this'-determiner, like 'that', was always accented.

2.3.6 (iii) *PIE personal pronouns* The first- and second-person pronouns and the reflexive pronoun exhibited a unique type of inflection. It seems best first to give the forms, then to comment. For further information the reader is referred especially to Katz 1998 (though cf. also Sihler 1995: 369–82).

	1st person	*2nd person*	*reflexive*
singular			
nom.	égh$_2$	túh$_2$	
acc.	m̥(m)é ∼ me	twé ∼ te	swé ∼ se
gen.	méme ∼ moy	téwe ∼ toy	séwe ∼ soy
dat.	mégʰye ∼ moy	tébʰye ∼ toy	sébʰye ∼ soy
dual			
nom.	wé	yú (?)	
acc.	n̥h$_3$mé ∼ noh$_3$	uh$_3$wé ∼ woh$_3$	
…			
plural			
nom.	wéy	yű (< **yúy ?)	
acc.	n̥smé ∼ nos	uswé ∼ wos	
oblique	??? ∼ nos	??? ∼ wos	

Every detail of these paradigms requires further discussion.

The reflexive lacked a nominative; that is an indication that it was bound by the subject of the clause (as in very many daughters). It was morphologically singular by impoverishment: though it was bound by dual and plural subjects, the marked number features were deleted in the morphological component of the grammar, so that only singular forms surfaced. (See especially Noyer 1997 for a comprehensive discussion of morphosyntactic feature impoverishment.) It was also subject to gender impoverishment. The use of the reflexive in Latin and German appears to have preserved these peculiarities faithfully. Whether it also underwent impoverishment of person features (so that it could refer even to 1st- and 2nd-person subjects, as in Sanskrit) is uncertain. The inflection of the reflexive was clearly parallel to that of the 2nd person singular, the only difference being the initial *s- instead of 2sg. *t-.

The inflection of the 1st- and 2nd-person pronouns seems to have exhibited the following structural features.

1. They were subject to gender impoverishment.
2. Within each number, the nominative was formed from a separate stem. Consequently these were the only PIE nominals in which the acc. du. differed from the nom. du.
3. The singulars were formed from stems completely different from the nonsingulars.
4. There was some sort of relation between the dual and plural stems. It looks as though the nom. du. was endingless, and the nom. pl. was formed with the pronominal (masc.) ending *-y. But the relation of the oblique stems was more complex, the duals ending in *-h_3- while the plurals ended in *-s-.
5. The clitic accusative form of each pronoun seems to have been the endingless oblique stem. The stressed accusative was formed by the addition of a suffix, probably originally *-mé in the 1st person and *-wé in the others, to the zero grade of the stem.
6. At least in the singular there were special genitive and dative forms that showed little resemblance to the caseforms of other nominals.
7. Most strikingly, the case system was greatly impoverished; only four cases can be reconstructed in the singular, and in the nonsingular we cannot even do that.

As Katz observes, this last characteristic is likely to be an extreme archaism, dating to a period when the PIE case system was not so fully developed.

Germanic preserves the overall organization of the PIE pronoun system well; indeed, its general outlines are still visible in most modern Germanic languages.

2.4 PIE derivational morphology

The system of PIE word formation was also very elaborate; Brugmann 1906 spends more than 500 pages listing and exemplifying its formal machinery. The following paragraphs discuss only some of the most important derivational types, together with a few that would later prove important in the development of Germanic.

2.4.1 *Compounding*

In the more archaic IE daughter languages one encounters combinations of verbs and adverbs (or 'preverbs') that exhibit meanings which are not transparently compositional. Evidently PIE possessed such 'compound

verbs', but it is not clear that any of their idiosyncratic meanings in the daughters should be projected back into PIE. For instance, reflexes of *pró b^{h}er- exhibit a wide range of derived meanings, some of which are shared by more than one daughter language: 'offer, present' in Sanskrit and Greek, 'reveal, display' in Greek and Latin, 'carry off' in Greek and Gothic, and so on; but since all can be derived straightforwardly from the etymological meaning *'carry forward', the latter could easily have been the only meaning of the phrase in PIE. In most attested IE languages these compounds have undergone univerbation to single phonological words; but in the three that are well attested earliest, Hittite, Vedic Sanskrit, and Homeric Greek, univerbation is still in progress, and the pattern is rather different in each. It therefore seems likeliest that these were still phrases in PIE.

By contrast, PIE nominal compounds were typically single phonological words. (Apparently that included verbal adjectives and nouns derived from compound verbs, and that could be how univerbation of the latter started.) Adjectives could be preceded by a wide variety of adverbial prefixes, of which the most widely attested are *n̥- 'un-', *h$_{1}$su- 'good', *dus- 'bad', and *sēmi- 'half'. There seem to have been several types of compound nouns; they are usually classified by meaning according to a system worked out by the Sanskrit grammarians more than two millennia ago. Determinative compounds were one of the most important types. In a determinative the final member of the compound is a noun which refers directly to what the compound denotes; the preceding member can be an adjective, as in the modern English example *blackbird* (a kind of bird which is black), or a noun, as in *werewolf* (a wolf who is also a man; cf. OE *wer* 'man'). Exocentric compounds, often referred to as bahuvrīhi compounds (the Sanskrit term), were the other most important type. In a bahuvrīhi the final noun characterizes, but does not refer to, what the compound denotes; a typical English example is *tenderfoot* (literally, a person whose feet are tender (because he isn't used to backpacking)—*not* a tender foot, which would be the case if the compound were a determinative). Few actual PIE examples of these compounds are reconstructable, for the simple reason that nominal compounding remained exuberantly productive in most of the daughters (including Germanic), with new compounds steadily replacing older ones. But we can at least reconstruct the compound adjective *n̥ǵ^{wh}d^{h}sitos 'imperishable' (and even a phrase *n̥ǵ^{wh}d^{h}sitom ḱléwos 'imperishable fame', with reflexes both in the Rigveda and in Homer), and at a conference in 1991 the late Jochem Schindler pointed out that Homeric Gk ἰοχέαιρα /i:ok^{h}éaira/, an epithet of Artemis, is probably the same word as the Vedic Skt bahuvrīhi *íṣuhastas*

'arrowhand', i.e. 'with arrows in his/her hand(s)'; the PIE word must have been something like (masc.) *ísuǵ^{h}es̥r̥.

Also important were agentive nominal compounds in which the final element was a verb root and the prior element the object of the verb; this is the type exemplified by Vedic Skt *vr̥tra-hán-* 'slaying Vr̥tra' and Lat. *au-cep-s* 'bird-catcher'. This formation survived in Germanic, but with remodeling of the final element (see 4.2.1, 4.4).

2.4.2 *PIE derivational suffixes*

The suffixes by which verbs were derived from other verbs and nominals are listed above in 2.3.3 (i), since the result of such derivation was in every case a distinctive type of present (imperfective) aspect stem. Nominal derivation was much more elaborate, as the following sections will show.

2.4.2 (i) *PIE noun-forming suffixes* The proto-vr̥ddhi derivational process is described above in 2.2.4 (i), since it involved a (very unusual) phonological rule. The collective suffix *-h_2- is discussed above at the end of section 2.3.4 (ii), because it was often integrated into noun paradigms as a neuter nom.-acc. pl. ending. In other cases, however, collectives were reinterpreted as feminine singulars; in many of the daughters, including Germanic, a large proportion of feminine *-eh_2-stems belong to derivational classes that probably originated as collectives.

Large and productive classes of thematic nouns with o-grade roots (which I symbolize as R(o)) were formed from verb stems. The type R(ó)-o- (masc.) and its collective R(o)-éh$_2$- (fem.) denoted the action of the verb; the type R(o)-ó- (masc.), which was probably restricted to the final element of compounds, denoted the agent. Typical examples include *ǵónh$_1$-o-s, collective *ǵonh$_1$-éh$_2$ 'begetting, birth, offspring' (Gk *γόνος*, *γονή* /gónos, gonḗ:/ 'offspring'; Skt *jánas* 'creature, person', *janā́* 'birth'), *-ǵonh$_1$-ó-s 'begetter' (Gk compound *τεκνογόνος* /teknogónos/ 'begetting children' with typically shifted accent), all derived from *ǵenh$_1$- 'to beget, to bear (a child)'; *d^{h}rógh^{h}os '(act of) running' (Gk *τρόχος* /trók^{h}os/ 'circular course'), *d^{h}rog^{h}ós 'runner, wheel' (apparently decompound; cf. Gk *τροχός* /trok^{h}ós/, OIr. *droch*, both 'wheel'), from *d^{h}reg^{h}- 'to run'; *sóng^{wh}os 'chant' (PGmc *sang^{w}az 'song'), collective *song^{wh}éh$_2$ (Gk *ὀμφή* /omp^{h}ḗ:/ 'divine voice') from *seng^{wh}- 'to chant'. Similar collectives were also made with zero-grade roots, e.g. *b^{h}ugéh$_2$ 'flight, escape' (Gk *φυγή* /p^{h}ugḗ:/, Lat. *fuga*) from *b^{h}ewg- 'to run away, to flee'. Other types of nouns derived with the thematic vowel also existed, though they may not have been productive; obvious examples are the neuters *yugóm 'yoke' (Hitt. *iukan*, Skt *yugám*, etc.) from *yewg- 'to join' and *wérǵom 'work' (Gk *ἔργον* /érgon/,

PGmc *werką) from *werǵ- 'to work'. As can be seen from the cognates cited, nouns denoting actions tend also to denote the results of those actions; there is no clear dividing line between them.

Acrostatic neuter s-stems with e-grade roots were also action/result nouns. Well-attested examples include *ǵénh$_1$os ∼ *ǵénh$_1$es- 'family, lineage' (Skt *jánas*, Gk *γένος* /génos/, Latin *genus*) from *ǵénh$_1$- 'to beget'; *ḱléwos ∼ *ḱléwes- 'fame' (Skt *śrávas*, Gk *κλέος* /kléos/) from *ḱlew- 'to hear'; *wékʷos ∼ *wékʷes- 'word' (Skt *vácas*, Gk *ἔπος* /épos/) from *wekʷ- 'to say'; etc.

Another class of action/result nouns were proterokinetic neuters in *-men-. Typical examples include *néwmn̥ ∼ *numén- 'nod' (Gk *νεῦμα* /nêuma/, Lat. *nūmen*) from *new- 'to nod' and *séh$_1$mn̥ ∼ *sh$_1$mén- 'seed' (Lat. *sēmen*, OCS *sěmę*) from *seh$_1$- 'to sow'. This class seems to have made amphikinetic collectives; thus the collective of the latter was *séh$_1$mō ∼ *sh$_1$mn-′ (OHG *sāmo*).

Still another group of these nouns were masculine, with the thematic suffix *-mo-. Two ablaut classes, R(ó)-mo- and R(∅)-mó-, were well represented. To the former belonged, e.g., *tórmos 'borehole' (Gk *τόρμος* /tórmos/; PGmc *þarmaz 'intestine') from *terh$_1$- 'to bore'; an example of the latter is *d^{h}uh$_2$-mós 'smoke' (Skt *dʰūmás*, Lat. *fūmus*) from *d^{h}uh$_2$- 'to smoke'.

Two large and productive groups of action nouns, feminines in *-ti- and masculines in *-tu-, had proterokinetic inflection; caseforms of both developed into infinitives in various daughter languages. Typical examples include *gʷém-ti-s ∼ *gʷm̥-téy- 'step' (Skt *gátis*, Gk *βάσις* /básis/; cf. Lat. *con-venti-ō*, Goth. *ga-qumþ-s* 'assembly', lit. 'coming together'); *mér-ti-s ∼ *mr̥-téy- 'death' (Lat. *mors, morti-*, Lith. *mirtìs*); *pér-tu-s ∼ *pr̥-téw- 'crossing' (Av. *peərətuš*; Lat. *portus* 'port', PGmc *ferþuz 'fjord' and *furduz 'ford'). Additional examples have been cited in 2.3.4 (ii).

Neuter nouns denoting instruments were formed with four similar suffixes, *-tro-, *-tlo-, *-d^{h}ro-, and *-d^{h}lo-; the root seems usually to have been accented and e-grade. Typical examples include *h$_2$érh$_3$trom 'plow' (Gk *ἄροτρον* /árotron/, OIr. *arathar*); *péh$_3$tlom 'drinking-cup' (Lat. *pōculum*); *kréyd^{h}rom 'sieve' (Lat. *crībrum*); *syúHd^{h}lom 'awl' (OCS *šilo*; the collective appears in Lat. *sūbula*).

Masculine agent nouns were made with a suffix *-ter-; both amphikinetic and hysterokinetic inflection seem to be reconstructable, though the accent and ablaut relations have become confused in the daughters. An example of the former is *ǵénh$_1$tōr 'parent' (Gk *γενέτωρ* /genétɔ:r/, Lat. *genitor*); the latter underlies such examples as Gk *δοτήρ* /dotḗ:r/ 'giver'.

Abstract nouns were derived from adjectives with a variety of suffixes. There was a large group in *-teh$_2$, e.g. *h$_2$yuHn̥téh$_2$ 'youth' (Lat. *iuventa*,

Goth. *junda*). At least some of these nouns made to o-stem adjectives ended in *-éteh$_2$; cf. e.g. Skt *nagnátā* 'nakedness' (to *nagnás* 'naked') and Goth. *niujiþa* 'newness' (to *niujis* 'new'). That type was to have a long and productive history in Germanic. Also well attested is a suffix *-tāt- (*-teh$_2$t-?), e.g. in *néwotāt-s 'newness' (Lat. *novitās*; Gk *νεότης* /neótę:s/ 'youth'). By contrast, *-tū́t- (*-túHt-?) is restricted to Italic, Celtic, and Germanic; cf. e.g. Lat. *iuventūs* 'youth', OIr. *óentu* 'unity', Goth. *mikildūþs* 'greatness'.

2.4.2 (ii) *PIE adjective-forming suffixes* An extensive derivational system called the Caland system (after the Sanskritist who first noticed some of the connections) can be reconstructed for PIE. At the center of the Caland system were proterokinetic adjectives in *-u-, isofunctional thematic adjectives in *-ró- with zero-grade roots, and adjective stems in *-i- (likewise with zero-grade roots) that appear in compounds. (The system also included, for example, neuter s-stem action nouns (see the preceding section) and derived stative presents (see 2.3.3 (i)).) Occasionally a complete set of such adjectives can be reconstructed for PIE. For instance, *h$_2$r̥ǵ-ró-s 'white' survives in Vedic Skt *ŕjrás* and Homeric Gk *ἀργός* /argós/; the synonymous u-stem *h$_2$érǵ-u- ∼ *h$_2$r̥ǵ-éw- is attested in Toch. B *ārkwi*; and the compounding stem *h$_2$r̥ǵi- appears in Homeric Gk pl. *ἀργίποδες* /argípodes/ 'swift-footed' (lit. *'sparklingfoots') and Skt *ŕjipyás* 'eagle' (lit. *'white-backed'; the second element is the zero grade of *op- 'back', cf. Aischylos, *Agamemnon* 115).[8] (The i-stem may not originally have been confined to compounds, to judge from Hitt. *harkis* 'white'.) For 'deep' we are likewise able to reconstruct both PIE *d^{h}ubrós (cf. Toch. B *tapre* 'high') and *d^{h}éwbus ∼ *d^{h}ubéw- (cf. Lith. *dubùs* 'hollow'; apparently transferred into the thematic class in PGmc *deupaz 'deep'). More often one member of a Caland word-family survives especially well; for instance, there are widespread reflexes of *h$_1$rud^{h}rós 'red' (Gk *ἐρυθρός* /erut^{h}rós/, Lat. *ruber,* late Church Slavonic *rŭdrŭ*, Toch. B *ratre*) and of *g^{w}réh$_2$u-s ∼ *g^{w}r̥h$_2$éw- 'heavy' (Skt *gurús*, Gk *βαρύς* /barús/, Lat. *gravis*, Goth. *kaúrus*).

The Caland system was a system of 'primary' derivation, operating on roots. The most important PIE 'secondary' adjective suffix, forming adjectives from nouns, was thematic *-yó-. The thematic vowel of an underlying noun was zeroed before this suffix. For instance, from *kóros 'cutting, section, division' (Old Persian *kāra* 'people, army'; Lith. *kãras* 'war') was formed *kóryos 'detached', substantivized in the northern languages to mean 'detachment,

[8] That PIE *op- ∼ *ep- might have meant '(animal's) back' was suggested to me by Warren Cowgill *c.*1980.

war party' (Lith. *kãrias*, PGmc *harjaz 'army'; OIr. *cuire* 'company, host'); from *$h_2$égros 'meadow, field' (Skt *ájras*, Gk *ἀγρός* /agrós/, Lat. *ager*, PGmc *akraz) was formed *$h_2$égr̥yos (*$h_2$égrios?) 'characteristic of meadows/fields' (Skt *ajryás*; Gk *ἄγριος* /ágrios/ 'wild'); and so on. Otherwise the suffix was simply added to the noun stem, e.g. *diwyós 'heavenly' (Skt *divyás*, Homeric Gk *δῖος* /dîːos/) from *dyew- 'sky', *ph_2tr̥yós (*ph_2triós?) 'fatherly' (Skt *pítryas*, Gk *πάτριος* /pátrios/, Lat. *patrius*) from *ph_2ter- 'father', etc.

Verbal adjectives with zero-grade roots were derived by means of the thematic suffixes *-tó-, *-nó-, and *-wó-. The last of these seems to have been rare, though an example which survived very widely was *g^wih_3wós 'alive' (Skt *jīvás*, Lat. *vīvos*, PGmc *k^wik^waz, etc.). By contrast, *-tó- became the suffix of perfect participles in Latin, and both *-tó- and *-nó- acquired a similar function in Indo-Iranian and Germanic; for examples see 3.3.1 (iii).

There seems to have been a system of contrastive adjective suffixes in PIE. Adjectives in *-ero- apparently meant 'X (as opposed to its antonym)'; those in *-mo- or *-m̥o- meant 'X (as opposed to everything else)'. Typical examples are *éperos 'behind' (Skt *áparas*; neut. in OIr. prep. *íar* 'after') and *pr̥Hmós 'furthest forward' (Lith. *pìrmas*; remodelled in PGmc *frumō̄ 'first'). There were also forms of these suffixes extended with *-t-, namely *-tero-, e.g. in *énteros 'inside' (Skt *ántaras*; Lat. comparative *interior* 'further in'), and *-tm̥o-, e.g. in *éntm̥os 'inmost' (Skt *ántamas*, Lat. *intimus*).

There was an important class of athematic adjectives in *-went- meaning 'having X' (where X is the noun to which the suffix was added); cf. e.g. Skt *putrá-vant-* 'having sons' (*putrá-s* 'son'), Gk *χαρί-εντ-* /k^harí-ent-/ 'graceful, lovely' (*χάρι-ς* /k^hári-s/ 'grace, loveliness'). This class is well represented in Anatolian, Indo-Iranian, Greek, and Tocharian (a distribution which guarantees its antiquity, even though specific examples are hard to reconstruct).

Finally, it is clear that two formally similar but functionally distinct suffixes have been important in the development of the daughter languages. One, apparently underlyingly */-en-/, was used to 'individualize' adjectives; it appears in Latin cognomina (originally nicknames) such as *Catō* 'the Shrewd' (*catus* 'shrewd') and eventually gave rise to the 'weak' inflection of adjectives in Germanic (see 3.3.2). The other, underlyingly /-Hen-/, had a function similar to *-went- (see the preceding paragraph); it is well represented in Indo-Iranian (Hoffmann 1955*a*) and appears in Latin cognomina such as *Nāsō* 'Bignose' (*'having a nose', cf. *nāsus* 'nose').

2.4.2 (iii) *Derivational suffixes that eventually became inflectional* Several PIE derivational suffixes were integrated into the inflectional system in

numerous daughter languages. By far the most important were the collective suffix *-h_2- (see 2.3.4 (i) ad fin.) and the feminine suffixes *-h_2-, which formed feminines in *-eh_2- from o-stems, and *-ih_2- ∼ *-yéh_2-, which formed feminines from athematic stems and induced proterokinetic inflection. Numerous examples of fem. *-eh_2- can be found among the adjectives of all the more archaic non-Anatolian languages; *-ih_2- ∼ *-yéh_2- survives robustly in Greek, Indo-Iranian, and Germanic, always with some innovations. For examples see 2.3.5.

In West IE, at the latest, there was an elative suffix *-yos- ∼ *-is- deriving adjectives that meant something like 'exceptionally X', where X was the meaning of the basic adjective. This suffix apparently induced amphikinetic inflection; for example, from *$h_1$wér-u-s ∼ *$h_1$ur-éw- 'broad' (Skt *urús*, Gk *εὐρύς* /eurús/, both with zero grade of the root generalized) was constructed *$h_1$wér-yos- ∼ *$h_1$ur-is-′ 'unusually broad' (Skt *várīyas-* 'broader'). Note that the suffix was added directly to the root; evidently it was part of the Caland system. In all the daughters in which this suffix survived it has become a comparative suffix. Superlatives were subsequently formed from it, in *-is-mo- in Italic and Celtic, but in *-is-to- in the other daughters (cf. Skt *váriṣṭʰas* 'broadest').

2.5 PIE syntax

The broad outlines of PIE syntax can be reconstructed mainly because the earliest-attested languages largely agree on the most important features. The underlying word order of the clause was S-O-V-I; COMP elements, however, were to the left rather than to the right. There was clearly a constituent scrambling rule that could give rise to a large number of surface orders, as well as a rule that raised interrogative and relative elements to some position within CP; it would be surprising if there were not also various right-shifting rules, such as extraposition. In general, the basic word order of Latin is probably very much like that of PIE.

On the concord, agreement, and government relations that obtained between the elements of PIE clauses and phrases see 2.3.1. To judge from the situation in the daughters, binding of reflexive pronouns was clause-bound.

A striking feature of PIE syntax was clitic floating, traditionally called 'Wackernagel's Law', by which clitics, including clitic pronouns, moved to a position immediately to the right of the first constituent in the clause. Ancient Greek preserves this rule particularly well.

An unanswered question about PIE syntax is whether the language possessed prepositions. There was clearly an extensive set of adverbs which

were used with the oblique cases (Brugmann 1911: 758–930); what is unclear is whether they were heads of phrases which assigned case to their complements, as opposed to modifiers of NPs which were assigned case directly. The situation in Hittite and Vedic Sanskrit suggests the latter; but in most of the daughters at least some of these adverbs did develop into genuine prepositions and/or postpositions.

Reconstruction of PIE syntax in more detail is difficult both because the protolanguage lies so far in the past and because historical syntax is still in its infancy. There will be much more to say about the syntactic development of English in later volumes dealing with periods for which we have much better evidence.

2.6 The PIE lexicon

In addition to the derivational types discussed in earlier sections of this chapter, a substantial number of underived PIE lexemes can be reconstructed. If it is true that Anatolian is one half of the family, the list of items that can be reconstructed for 'real' PIE is necessarily limited, since in order to be reconstructable for PIE a lexeme must have reflexes in at least one Anatolian and at least one non-Anatolian language; not all the PIE reconstructions cited in this chapter meet that strict criterion. For North IE, however, the number of securely reconstructable lexemes is much greater, and for West IE it at least approaches, and perhaps exceeds, one thousand.

Unfortunately there is no good, up-to-date comparative dictionary of PIE. Pokorny 1959 is badly out of date; moreover, it errs extravagantly on the side of inclusion, listing every word known to the author that might conceivably reflect a PIE lexeme if one's etymological standards are not too strict. Rix et al. 2001 is a great improvement, but it covers only nonderived verbs; moreover, the authors persist in listing items that are attested in only one daughter, so that a nonspecialist must read through the volume to get an accurate idea of what is securely reconstructable for PIE. Under the circumstances, it is still advisable to consult the best etymological dictionaries of the more archaic daughters as well.

Reconstruction of the PIE lexicon can tell us a good deal about the culture of the protolanguage's speakers; Fortson 2004: 16–47 provides a good introduction. The most difficult problem is assessing the gaps that we inevitably find. For instance, it comes as no surprise that there was no PIE word for 'iron', since there are numerous indications that PIE was spoken before the Iron Age. But what about the fact that there is also no reconstructable word for 'finger'? Obviously speakers of the language had

fingers, and they must have had a word for them; the fact that we cannot reconstruct it can only be the result of its loss in all the major subgroups (or all but one). The hard fact is that linguistic evidence relentlessly degrades and self-destructs over time, and that imposes an inexorable limit on what can be reconstructed.

3

The Development of Proto-Germanic

3.1 Introduction

PIE was probably spoken some 6,000 years ago, conceivably even earlier. Even the last common ancestor of Germanic and Italo-Celtic was probably spoken at least 5,000 years ago. Proto-Germanic, by contrast, is unlikely to have been spoken before about 2,500 years ago (*c.*500 BC). Thus a generous half of the reconstructable development of English occurred before the PGmc period.

The consequences of that fact are clear enough on an intuitive level. A student who has studied only Germanic languages typically finds the grammar of PIE very unfamiliar, perhaps even bewildering or intimidating. On the other hand, the grammar of PGmc, while it exhibits plenty of curious archaisms, is recognizably similar in outline even to the grammar of modern German.

As might be expected, the extensive changes that occurred in the development from PIE to PGmc are not evenly distributed throughout the grammar. Hardly any syntactic change can be demonstrated, though that might be partly a result of our relative ignorance. A significant reorganization of nominal inflection took place. Sound changes were much more extensive; some forty regular sound changes can be reconstructed, and their relative chronology is partly recoverable. But the most striking changes affected the system of verb inflection, which was completely reorganized and drastically altered in detail. In consequence, a Germanic language is today immediately recognizable by the inflection of its verbs.

This chapter will discuss in some detail the changes that occurred as PIE developed into PGmc.

3.2 Regular sound changes

I discuss sound change first for a simple reason. Cognate words and affixes can be recognized only by the regular sound correspondences that result from regular sound change; reliance on general phonetic similarity inevitably leads to errors. Therefore, if the reader is to understand the discussion of morphological development in any detail, (s)he must first be given the basic sound change 'tools' with which to recognize the Germanic reflexes of PIE words and inflectional markers. A less-than-perfect result is that we cannot discuss the development in strictly chronological order, even when the relative chronology of a sound change and a morphological change can be recovered.

I will group the characteristic Germanic sound changes in sets, arranged partly thematically and partly chronologically. In each case I will discuss the relative chronology of interacting sound changes to the extent that it can be reconstructed.

Readers who are not primarily interested in sound change and who want a quick overview of the large-scale phonological differences between PIE and PGmc should read at least sections 3.2.1 (ii) and (v), 3.2.2 (i), 3.2.4 (i) and (ii), 3.2.5 (iii) and (iv), and 3.2.7 (i).

3.2.1 *The elimination of laryngeals, and related developments of vowels*

More than any other development, the loss of the 'laryngeal' consonants of PIE altered the phonological typology and the phonotactics of IE languages. But though the laryngeals have been lost in every daughter of the family except (in part) Anatolian, the details are different enough from daughter to daughter to show that that was an independent parallel development. Still, the loss of laryngeals was apparently an early complex of changes in most daughters, and that is certainly the case in Germanic.

3.2.1 (i) *Cowgill's Law* Though the reflexes of laryngeals in Germanic are usually vocalic (when not nil), it is possible that in a few environments at least some laryngeals became PGmc *k. This is sometimes called 'Cowgill's Law', since Warren Cowgill made the best case for such a development (Cowgill 1965: 143 n. 1, 170 n. 58, 178 n. 72, 1985*b*: 27). Cowgill suggested that at least *h_3 became PGmc *k when between a sonorant and *w (in that order); a reasonable case can be made for the suggestion that *h_2 underwent the same development. Here are the examples.

PIE *n̥h$_3$mé 'us two' → *n̥h$_3$wé (Katz 1998: 89–99, 212–17; cf. Skt *āvā́m*, Gk *nōwé > *vṓ* /nɔ́ː/) > *unkwé, to which was formed dat. *unkwís; the two > *unk^{w}é, *unk^{w}ís > PGmc *unk, *unkiz (with regular loss of labialization,

see 3.2.3 (ii); cf. Goth. *ugkis*, ON *okkr*, OE *unc*); this is essentially the scenario of Katz 1998: 224;

PIE *$g^{w}ih_{3}wós$ 'alive' (cf. Skt *jīvás*, Lat. *vīvos*, and with analogical full-grade root Gk *ζωός* /sdǫ:ós/) > *$k^{w}ikwós$ > PGmc *$k^{w}ik^{w}az$ (cf. ON *kvikr*, OE *cwic*).

Less certain is an example with *h_{2}:

PIE *$dayh_{2}w\acute{e}r$ 'brother-in-law' (?; Normier 1977: 182, and similarly Huld 1988; cf. Skt *devā́*, Homeric Gk *dayawér > δᾱήρ /da:ę́r/) > *$taikw\acute{e}r$ >→ PGmc *taikuraz (remodeled on the analogy of *swehuraz 'father-in-law'; cf. OE *tācor*, OHG *zeihhur*).

Surprisingly, there seem to be no clear counterexamples. In the paradigm of such an adjective as *$ténh_{2}u$- 'thin', for instance, a sequence *$nh_{2}w$ or *$n̥h_{2}w$ never occurred: the masc. and neut. stem was *$ténh_{2}u$- ~ *$tn̥h_{2}éw$-, while the fem. stem was *$tn̥h_{2}éwih_{2}$- ~ *$tn̥h_{2}uyéh_{2}$-. But the eventual development of this adjective in PGmc shows that at some point morphological change did give rise to a sequence *$nh_{2}w$ or its reflex (see 3.2.6 (iii)). Cowgill's Law must have occurred before that development in 'thin' and words of similar shape.

Cowgill's proposal has given rise to hot debate, but most of the objections are not cogent. The original proposal, made by William Austin, included a larger number of more questionable examples (Austin 1946), and that has led some critics to damn the idea altogether; but obviously objections to Austin's proposal are not validly applied to Cowgill's greatly constrained revision. Skeptics have observed that Goth. *qius, qiwa-* 'alive' shows loss of the laryngeal (a fairly common development in Germanic and the other western branches of the family), and since the same development is clearly attested in OIr. *béo,* Welsh *byw* < Proto-Celtic *biwos, they have argued that the PGmc development of this word is less than clear. But we cannot exclude the possibility that pre-Gothic *$k^{w}iwaz$ reflects a dissimilatory loss of the second occlusion in PGmc *$k^{w}ik^{w}az$. Finally, it is true that PGmc *taikuraz has been remodeled on the analogy of *swehuraz, but that does not account for its *k; and while it is also true that the ā of the Homeric Greek cognate can be explained as an outcome of *αι before a front vowel (cf. Forssman 1966: 122-3; Peters 1989: 277, 302), a solution that can explain both the Greek vowel (ā < *aya < *ayh_{2}) and the Germanic consonant (*aik < *ayh_{2} before *w) surely ought to be preferred—all the more so since the change of *αι to ā before front vowels is not regular in Homeric Greek (a 'Tendenz', Forssman, ibid.).[1] For the

[1] It must be emphasized that sporadic sound changes are always unlikely and should be accepted only when there is no choice. Of course it is always possible that these Homeric forms are Atticisms in the text, with regular Attic ᾱ for *αι before a front vowel (though no one seems to have suggested that). But although Homeric Gk δαέρων certainly could conceal an earlier *δαιϝρῶν with no reflex of a laryngeal (Chantraine 1973: 216), neither such a form nor the late epigraphical dat. sg. δαιρί (see Liddell, Scott, et al. 1968 s.v. δαήρ) shows that the forms with a full-grade suffix must have contained a

pronoun there is no other plausible solution, as Katz has seen. I therefore tentatively accept Cowgill's Law.

As 'us two' demonstrates, Cowgill's Law occurred before the merger of *Kw with labiovelars and the subsequent delabialization of the same next to *u (see 3.2.3 (ii)). If 'brother-in-law' is a valid example, it must also have occurred before the epenthesis of *ə next to laryngeals between nonsyllabics, which it bleeds. It follows that it occurred before Grimm's Law (see 3.2.4 (i) and 3.2.8); its output must therefore have been *g, which Grimm's Law shifted to *k. That suggests that these laryngeals might have been voiced velar fricatives immediately before Cowgill's Law applied, which is plausible. If 'brother-in-law' is not a valid example, the sound change might have occurred after Grimm's Law; in that case its input must have been a sound which was neither input nor output to Grimm's Law (possibly a glottal stop?).

The conditioning environment for Cowgill's Law seems very strange; but it would be much more natural if the loss of word-initial laryngeals and the contraction of laryngeals with preceding nonhigh vowels had already occurred. In that case the only laryngeals still surviving before *w would be those discussed in this section, and the rule would simply be that laryngeals (or at least the second and third) became stops when *w immediately followed. I tentatively accept that relative chronology.

3.2.1 (ii) *The loss of laryngeals word-initially and next to nonhigh vowels* Word-initial laryngeals immediately followed by consonants were lost in all the daughters of PIE except Anatolian, Greek, Armenian, and Phrygian. Germanic examples are easy to find:

PIE *h_1l̥g^{wh}rós 'light (in weight)' (cf. Gk *ἐλαφρός* /elap^{h}rós/ 'light, nimble') > PGmc *lungraz 'swift' (cf. OS *lungar* 'powerful'; OE adv. *lungre* 'quickly, soon');

PIE *$h_1$dónt- 'tooth' (lit. *'eater' (*'biter'?); cf. Aiolic Gk *ἔδων* /édo:n/, Skt *dánt-*) > PGmc *tanþ- (cf. ON *tǫnn*, OE *tōþ*);

PIE *$h_2$stér- 'star' (cf. Hitt. *hasterz*, Gk *ἀστέρ-* /astér-/) >⟶ PGmc *sternaⁿ- (cf. Goth. *staírno*, OE *steorra*);

PIE *h_2ẃ̥$h_1$neh$_2$ 'wool' (cf. Hitt. *hulana-*, Skt *ū́rṇā*, Lat. *lāna*, Lith. pl. *vìlnos*) > *wulnā > PGmc *wullō (cf. Goth. *wulla*, OE *wull*);

PIE *$h_2$wes- 'to stay the night' (cf. Homeric Gk aor. *awésai > *ἀέσαι* /aésai/; Skt *vásati* 'remains') > PGmc *wesaną 'to stay, to be' (cf. Goth. *wisan*, OE *wesan*);

sequence *-*αιϝ*-; as Olav Hackstein reminds me, the zero-grade stem *dayh$_2$wr- should have lost its laryngeal regularly already in PIE (see 2.2.4 (i)), and it is unclear how we should expect the resulting allomorphy to have been remodeled in Greek.

PIE *$h_3b^hrúHs$ 'eyebrow' (cf. Gk *ὀφρῦς* /op^{h}rúːs/, Skt *$b^hrús$*) > *brūz → PGmc *brūwō (cf. OE *brū*);
PIE *h_3nog^h(w)- 'claw, nail' (cf. Gk *ὄνυχ-* /ónuk^h-/, Lith. *nãgas*) >→ PGmc *naglaz (cf. ON *nagl*, OE *nægl*).

Laryngeals immediately followed by nonhigh vowels, whether word-initial or not, were also lost; but the allophones of PIE */e/ which the laryngeals had induced (*[a] next to *h_2, *[o] next to *h_3) thereby became contrastive. So far as we can tell, they merged with the preexisting PIE */a/ and */o/ respectively. Since the same change occurred in most daughters, it is often difficult to determine whether or not a particular word had a laryngeal in it in PIE (especially in the case of *h_1). The following examples relevant to Germanic, some with laryngeals and some without, seem reasonably certain:

PIE *$h_1$esti '(s)he is' (cf. Gk *ἐστι* /esti/, Lat. *est*; for the laryngeal cf. Skt *ásat-* 'not existing' < * n̥-h_1s-n̥t-) > *esti > PGmc *isti (cf. Goth. *ist*, OE *is*);
PIE *$h_1$ed- 'to eat' (cf. Homeric Gk *ἔδειν* /édeːn/, Lat. *edere*; for the laryngeal cf. 'tooth' above) > PGmc *etanạ (cf. Goth. *itan*, OE *etan*);
PIE *en 'in' (cf. Gk *ἐν* /en/, Old Lat. *en* > Lat. *in*; cf. also Hitt. *andan*, Gk *ἔνδον* /éndon/ 'inside'; no evidence of laryngeal) > PGmc *in (cf. Goth., OE *in*);
PIE *$h_2$énti → *$h_2$entí 'on the surface (lit. 'forehead'), in front of' (Hitt. *hānz* 'in front' and analogically remodeled *hantī* 'apart'; Lat. *ante* 'in front of'; Gk *ἀντί* /antí/ 'instead of') > PGmc *andi 'in addition' → PWGmc 'and' (cf. OE *and*, OHG *enti*);
PIE *h_2éǵeti '(s)he is driving' (cf. Skt *ájati*, Lat. *agit*; for the laryngeal cf. the ablaut of Gk *ὄγμος* /ógmos/ 'furrow') > PGmc *akidi '(s)he goes in a vehicle' (cf. ON inf. *aka*; ?also OE *acan* 'to ache', Seebold 1970: 75);
PIE *$h_2$ówis ~ *$h_2$éwi- 'sheep' (Kimball 1987: 189; cf. Lycian acc. sg. *xawã*, Skt *ávis*, Lat. *ovis*) > PGmc *awiz (cf. Goth. *awistr* 'sheepfold');
PIE *h_2ḱ-$h_2$ows-iéti '(s)he is sharp-eared' (cf. Gk *ἀκούειν* /akóueːn/ 'to hear') > *kowsiéti > PGmc *hauzīþi '(s)he hears' (cf. Goth. *hauseiþ*, OE *hīerþ*);
PIE *átta 'dad' (cf. Gk *ἄττα* /átta/, Lat. *atta*, both used as respectful forms of address for old men; Hitt. *attas* 'father') >→ PGmc *attō̄ (cf. Goth. *atta* 'father');
PIE *ályos 'other' (cf. Lydian *αλα-*, Gk *ἄλλος* /állos/, Lat. *alius*) > PGmc *aljaz (cf. Goth. *alja-*);
PIE *$h_3$érō, *$h_3$éron- ~*h_3r̥n- 'eagle' (cf. Hitt. *hāras, hāran-*; Gk *ὄρνῑς* /órniːs/ 'bird') >→ *orō, *orn- > PGmc *arō̄, *arn- (cf. Goth. *ara*, OE *earn*, OHG *aro, arn*);
PIE *$h_3$ósdos 'branch' (cf. Gk *ὄζος* /ózdos/; Hitt. *hasduēr* 'twigs, brush') > *ósdos > PGmc *astaz (cf. Goth. *asts*, OHG *ast*);

PIE *órsos 'arse' (Hitt. *ārras*, Gk *ὄρρος* /órros/) > PGmc *arsaz (cf. OE *ears*);

PIE *or- 'to rise' (cf. Gk *ὄρνυσθαι* /órnust^{h}ai/, Lat. *orīrī*; Hitt. *āri* 'arrives' (Melchert 1994: 81)) > PGmc *ar- (cf. OE *eart*, Northumbrian *arþ* 'you are', Seebold 1970: 80–1);

PIE *somHós 'same' (cf. Skt *samás*, with the first *a* not lengthened by Brugmann's Law; Gk *ὁμός* /homós/) >⟶ PGmc *sama-n- (usually with weak inflection; cf. Goth. *sama*, OHG *samo*).

Examples of laryngeals between nonhigh vowels will be given and discussed below.

Laryngeals immediately preceded by a nonhigh vowel in the same syllable were likewise lost, and the laryngeal-induced allophones of */e/ likewise became contrastive; but in these cases the vowel was also lengthened. Except in word-final position, these new long vowels appear to have merged with the inherited nonhigh long vowels. These examples, some with laryngeals and some without, are typical:

PIE *séh$_1$mn̥ 'seed' (cf. Lat. *sēmen*, OCS *sěmę*), collective *séh$_1$mō > PGmc *sēmō̃ (cf. OHG *sāmo*);

PIE *d^{h}éh$_1$ti- ~ *d^{h}h$_1$téy- 'act of putting' (cf. Gk *θέσις* /t^{h}ésis/; Av. *zraz-dāti-* 'belief' (lit. 'putting faith'), Skt *vásu-d^{h}iti-* 'bestowal of goods') >⟶ *d^{h}ētís > PGmc *dēdiz 'deed' (cf. OE *dǣd*; Goth. *missadeþs* 'misdeed, sin');

PIE *g^{w}én 'woman (nom. sg.)' (OIr. *bé*; cf. Jasanoff 1989) >⟶ PGmc *k^{w}ēniz 'wife' (cf. Goth. *qens*; OE *cwēn* 'queen');

PIE *sēmi- 'half-' (cf. Gk *ἡμι-* /hę:mi-/, Lat. *sēmi-*) > PGmc *sēmi- (cf. OHG *sāmi-*);

PIE *peh$_2$- 'to protect' (cf. Hitt. iptv. 2sg. *pahsi*) > *pā- > *fō- in PGmc *fōdrą 'sheath' (cf. Goth. *fodr*, OE *fōdor*);

PIE *wréh$_2$d- ~ *wr̥h$_2$d- 'root' (cf. Lat. *rādīx*) > *wrād- ~ *wurd- > PGmc *wrōt- ~ *wurt- (cf. Goth. *waúrts*, ON *rót*; OE *wyrt* 'plant');

PIE *swádus 'pleasant, sweet' (*swéh$_2$dus?; cf. Skt *svādús*, Gk *ἡδύς* /hę:dús/) > PGmc *swōtuz → PNWGmc *swōtiz (cf. ON *sætr*, OE *swēte*);

PIE *b^{h}āǵ^{h}us 'arm' (cf. Skt *bāhús*; Gk *πῆχυς* /pę̂:k^{h}us/ 'forearm') > PGmc *bōguz 'upper arm, shoulder' (cf. ON *bógr*, OE *bōg*);

(post-)PIE *b^{h}leh$_3$- 'bloom, flower' (cf. Lat. *flōs* 'flower') > PGmc *blō- (cf. Goth. *bloma* 'flower', OE *blōstm* 'flower', *blōwan* 'to bloom');

PIE *d^{h}óh$_1$mos 'thing put' (cf. Gk *θωμός* /t^{h}ǫ:mós/ 'heap') > PGmc *dōmaz 'judgment' (cf. Goth. *doms*, OE *dōm*);

PIE *sóh$_2$w̥l 'sun' (cf. Lat. *sōl;* for the laryngeal cf. Gk *ἥλιος* /hé:lios/, Homeric *ἠέλιος* /ę:élios/ < *sāwel- < *seh$_2$wel-) > *sōwul > ?PGmc *sōl (see 3.2.6 (i); cf. ON *sól*);

PIE *pṓds 'foot (nom. sg.)' (cf. Skt *pā́t*, Doric Gk *πώς* /pǫ́ːs/) > PGmc *fōt- (cf. Goth. *fotus*, OE *fōt*);
PIE *k^{w}etwṓr 'four (neut.)' (cf. Skt *catvā́ri*, Lat. *quattuor*) >⟶ PGmc *fedwōr (initial labial probably by lexical analogy with 'five'; cf. Goth. *fidwor*, OE *fēower*).

When a laryngeal was lost between nonhigh vowels, the initial result must have been two vowels in hiatus. As in other IE languages, contraction of the adjacent vowels followed. In Germanic, however, the results of these contractions were not ordinary long vowels, but 'overlong' or 'trimoric' vowels. For the most part these exceptional long vowels eventually merged with the ordinary long vowels, but trimoric *ō̄ in word-final position and before word-final *z can be shown to have remained distinct from ordinary *ō and from nasalized *ǭ (Stiles 1988). The sound correspondences between the principal older Germanic languages show that very clearly:

PGmc	*Gothic*	*Old Norse*	*Old English*	*Old High German*
*-ō	-a	*-u > ∅	-u ∼ ∅	-u ∼ ∅
*-ǭ	-a	-a	-æ > -e	-a
*-ō̄, *-ǭ̄	-o	-a	-a	-o
*-ōz	-os	-ar	-æ > -e	-a
*-ō̄z	-os	-ar	-a	-o

As might be expected, the crucial examples occur exclusively in inflectional syllables. Note the following:

PIE gen. pl. *-oHom (cf. Skt *-ām* (often disyllabic in the Rigveda), Gk *-ῶν* /-ǫ̂ːn/, Lith. *-ų̃*) > PGmc *-ǭ̄ (cf. Goth. (fem.) *-o*, OE *-a*, OHG *-o*);
PIE eh$_2$-stem nom. pl. *-eh$_2$es (cf. Skt *-ās*, Lith. *-õs*) > PGmc *-ō̄z (cf. Goth. *-os*, OE *-a*, OHG (adj.) *-o*).

There is also at least one example of a contraction of adjacent vowels that cannot be shown to have been separated by a laryngeal in PIE:

PIE o-stem nom. pl. masc. *-oes (cf. Skt *-ās*, Oscan **-ús**) > PGmc *-ō̄z (cf. Goth. *-os*, OE *-as*; the voiceless fricative of the northern WGmc ending is puzzling).

Contrast the ordinary ō-vowels in the following endings, which were not originally disyllabic:

PIE thematic pres. indic. 1sg. *-oh$_2$ (cf. Lat. *-ō*, Lith. *-ù*) > PGmc *-ō (cf. Goth. *-a*, ON ∅, OHG, Anglian OE *-u*);
PIE eh$_2$-stem nom. sg. *-eh$_2$ (cf. Skt *-ā*, Lith. *-à*) > PGmc *-ō (cf. Goth. *-a*, ON ∅ with u-umlaut, OE *-u* ∼ ∅);

PIE eh_2-stem acc. sg. *-eh_2m = *[-ām] (see 2.2.4 (iv) on the phonology; cf. Skt *-ām*, Lat. *-am*) > PGmc *-ǭ (cf. Goth. *-a*, OE *-e*, OHG *-a*);
PIE eh_2-stem acc. pl. *-eh_2ns = *[-ās] (see 2.2.4 (iv) on the phonology; cf. Skt *-ās*) > PGmc *-ōz (cf. Goth. *-os*, OE *-e*, OHG *-a*).

From the clear pattern of word-final outcomes we are occasionally able to infer PGmc *ō̄ (and perhaps *ē̄) in word-internal positions when the PIE origin of the vowel is known. For further discussion and examples readers should consult Stiles 1988.

Very surprisingly, PIE *-ō in absolute word-final position yielded not bimoric *-ō but trimoric *-ō̄ in PGmc (Jasanoff 2002: 35–8). The only examples are the nom. sg. of masc. n-stems, which in Germanic survives unaltered only in the West Germanic languages, and the nom.-acc. of neuter n-stem collectives, which became neuter plural in most daughters but singular in Germanic.

PIE *$h_3$érō 'eagle (nom. sg.)' (cf. Hitt. *hāras* with added *-s;* the original ending survives in Lat. n-stem nom. sg. *-ō*, though this word does not) > PGmc *arō̄ (cf. OHG *aro*);
PIE *séh$_1$mō 'seed (collective)' > PGmc *sēmō̄ (cf. OHG *sāmo*);
PIE *h$_1$néh$_3$mō 'nomenclature, names (collective)' (cf. Skt pl. *nā́mā*) > *nṓmō >⟶ PGmc *namō̄ 'name' (with analogical introduction of a root vowel shortened by Osthoff's Law, see the following section; cf. Goth. *namo*, OE *nama*, OHG *namo*).

It follows that the contrast between bimoric and trimoric vowels arose in pre-PGmc either when the first contractions of vowels in hiatus occurred or when word-final *-VH developed into bimoric long vowels, whichever happened first. (Contractions of vowel sequences which arose later gave rise to trimoric vowels only when one of the input vowels was long; otherwise they resulted in bimoric vowels (see 3.2.6 (i)).)

It is difficult to make out what the phonetic difference between PGmc bimoric and trimoric vowels might have been. Nonfinal trimoric vowels might actually have been disyllabic sequences of vowels in hiatus for a long time, though long survival of sequences of identical vowels in hiatus is not particularly plausible. On the other hand, the contrast between word-final *-ō̄ < PIE *-ō and word-final *-ō < PIE *-oH and *-eh_2 suggests a difference in intonation like that of Balto-Slavic, the PGmc bimoric vowels corresponding to Balto-Slavic vowels with acute intonation and the PGmc trimoric vowels corresponding to Balto-Slavic vowels with circumflex intonation. In fact the correspondence is almost exact, since in Balto-Slavic original long vowels

acquired circumflex accent when word-final (Jasanoff 2002: 36–8); it is possible, though not certain, that this is a historically shared innovation which occurred in the last common ancestor of those two daughters. It has been suggested repeatedly that the Balto-Slavic acute intonation was actually glottalization of the syllable nucleus—an especially plausible hypothesis given that some acute syllables are still glottalized in Latvian (cf. e.g. Jasanoff 1996: 1; 2004: 251; Kim 2002: 117)—and we might be tempted to suggest that the same was true of PGmc bimoric vowels; since the PIE laryngeals could have become glottal stops before being lost, that solution appears plausible. It is awkward that PIE nonfinal long vowels which did *not* result from laryngeal contraction also appear in PGmc as bimoric, to judge from the outcomes of long ō-vowels in West Germanic (e.g. in 'four'), since it is difficult to see why they should have been glottalized. Such PIE long vowels do appear with circumflex intonation in Balto-Slavic in nonfinal syllables (cf. e.g. Kim 2002: 115–16). Finally, the eventual outcomes of word-final examples in the attested languages provide a little potential evidence for the phonetics of these vowels in PGmc. The North and West Germanic differences in vowel quality are difficult to interpret, but in Gothic the pattern is clear: word-final short vowels (except *u) were lost, word-final bimoric vowels became short, and word-final trimoric vowels became ordinary long vowels. It appears that, to a first approximation, all word-final vowels were reduced by one mora in Gothic—hence the designation 'trimoric' for the third set of vowels. How to reconcile that result with the other considerations discussed in this paragraph is still a matter of debate among specialists.

As I noted at the end of 3.2.1 (i), the conditioning of Cowgill's Law makes better sense if the losses of laryngeals discussed in this section preceded it.

3.2.1 (iii) *Osthoff's Law* A phonological rule that is most conveniently discussed at this point, even though it does not have to do directly with laryngeals, is Osthoff's Law. Among Indo-Europeanists, Osthoff's Law is a cover term for rules that shortened long vowels when they were followed by a sonorant which was in turn followed by another consonant. (Osthoff's Law usually did not apply before word-final sonorants, which were presumably extrametrical in archaic IE languages.) The details differ from language to language, but it is clear that some version of Osthoff's Law applied in Greek, Latin, and Celtic, but not in Tocharian or Indo-Iranian. Osthoff's Law probably applied in Germanic as well, but cogent examples are surprisingly few. In some ways the best is 'name', in spite of the fact that its inflection has been remodeled by morphological changes. The development of 'name' in Germanic can be outlined briefly as follows.

Most IE languages exhibit o-vowels of some sort between the (first) *n and the *m of 'name', but Tocharian preserves a clear reflex of *ē. Those two facts are most easily reconciled by positing *h_3 immediately before the *m and acrostatic inflection for the word. The Tocharian form should then reflect the direct cases of the singular, in which the *ē of the root would not have been colored by the laryngeal (Ringe 1996: 8 with references):

PIE *$h_1$néh_3m̥ > *nḗm̥ > Proto-Tocharian *ñémə > Toch. A *ñom*, B *ñem*.

The Hittite and Latin forms, on the other hand, must reflect the oblique stem, with a short *e which the laryngeal would have colored:

PIE *$h_1$néh$_3$m̥- > *nṓm̥- > Hitt. *lāman*, Lat. *nōmen*.

Skt *nā́ma* could reflect both ablaut grades (since all nonhigh vowels merged in Indo-Iranian), and its 'columnar' accent on the initial syllable might reflect the PIE acrostatic inflection directly. Various other daughters shifted this word into other ablaut paradigms. In Germanic, however, what seems to have survived is the PIE collective, which was amphikinetic; the expected development would have been:

PIE *$h_1$néh$_3$mō, *h_1n̥h_3m̥-′ > *nṓm̄, *unmun-′.

It seems clear that the *nam- of the actual PGmc form cannot have developed by sound change alone. However, we can account for it if we posit that (1) the initial syllable of the direct form was leveled into the oblique forms—a common and expected development—and (2) the syllabic sonorant in the suffix, or its reflex, was replaced by nonsyllabic *-n-, a development that also occurred in Sanskrit (no doubt independently). The development will then have been:

pre-PGmc *nṓm̄, *nōmn-′ > *nṓm̄, *nomn-′ (by Osthoff's Law) → *nóm̄, *nomn-′ (by leveling) > PGmc *nam̄, *namn- (cf. Goth. *namo*, pl. *namna*, OE *nama*, OHG *namo*; the ON a-stem sg. *nafn* was backformed from the plural).

This appears to be the only way to account for the *a of the PGmc initial syllable. It follows that Osthoff's Law operated after tautosyllabic *VH had become long vowels.

An additional probable example of Osthoff's Law is 'heel':

PIE *pērs-n- 'heel' (cf. Skt *pā́rṣṇis*) > PGmc *fersn- ~ *ferzn- (cf. ō-stem Goth. *faírzna*, OHG *fersana*, i-stem OE *fiersn*).

But the different Verner's Law alternants exhibited by the East and West Germanic forms argue caution, since that pattern suggests that this remained

an ablauting noun in PGmc, and it is possible that short *e was inherited in some forms. 'Meat' is an uncertain example of Osthoff's Law for the same reason; 'shoulder' is uncertain because the daughters in which it could not have undergone Osthoff's Law disagree on the length of the first-syllable vowel. (For further discussion of those two words see 3.2.6 (iii).) 'Wind' is equally uncertain, but for a much more complex reason. The PIE word was the participle of an archaic acrostatic root-present meaning 'blow'; it survives as such in Hittite:

PIE *$h_2$wéh$_1$n̥ts 'wind' > Hitt. *hūwanz* (Melchert 1994: 54 with references).

In other daughters it was remodeled as an o-stem. Indo-Iranian preserves it without further change:

PIE *$h_2$wéh$_1$n̥ts → *$h_2$wéh$_1$n̥tos > Proto-Indo-Iranian *váatas > Skt *vā́tas* (still scanned as three syllables in some passages of the Rigveda).

At least in Tocharian the o-stem was remodeled further as *wēntos, no doubt because it was still clearly related to *$h_2$wéh$_1$- 'blow', which had become *wē- before consonant-initial endings. We are certain of that because only an intermediate *ē can account for the further developments of the first-syllable vowel:

post-PIE *wēntos > Proto-Tocharian *w^{y}entë > Toch. A *want*, B *yente*.

The same post-PIE preform can of course account for Lat. *ventus*, Welsh *gwynt*,[2] and PGmc *windaz (with regular raising of *e before a tautosyllabic nasal, see 3.2.7 (ii); cf. Goth. *winds*, ON *vindr*, OE *wind*, OHG *wint*); if that is correct, the word is another example of Osthoff's Law in Germanic, and we can also say that it was oxytone (because Verner's Law has applied, see 3.2.4 (ii)). But we cannot completely exclude the possibility that loss of the medial laryngeal in such a form as *$h_2$weh$_1$n̥tós resulted in a sequence *en directly, with no lengthening of the vowel. The same objection can be raised in the case of 'young', which will be discussed in detail in section 3.2.2 (i).

[2] There are two different lines of development that could have led to Welsh *gwynt*, as Michael Weiss reminds me. Possibly post-PIE *wēntos > Proto-Celtic *wīntos > Welsh *gwynt;* but if the Proto-Celtic form had instead been *wentos (see the text immediately below), it too should have yielded Welsh *gwynt* (cf. Schrijver 1995: 27–30). But we can be certain that Osthoff's Law applied in Celtic after the change of (post-)PIE *ē to *ī because of OIr. pret. 3sg. *as·rubart* '(s)he has said'. As Warren Cowgill observed to me *c.*1980, the raising of the perfective prefix *ro-* to *ru-* shows that the following syllable originally contained a high vowel; it can only have been Proto-Celtic *bīrt < *bīrst < post-PIE s-aorist *b^{h}ér-s-t (cf. Watkins 1962: 162–74). The stressed vowel of *as·bert* '(s)he said' etc. can of course have been introduced analogically from the present and subjunctive.

Finally, there is the extraordinary case of 'stand'. Though its past tense exhibits a stem-final *-d- in the West Germanic languages (cf. e.g. OE 3sg. *stōd*, pl. *stōdon*), *-þ- has been generalized in Gothic (cf. e.g. 3pl. *stoþun* 'they were standing', *atstoþun* 'they confronted', 2pl. *gastoþuþ* 'you have stood firm', 1pl. *afstoþum* 'we have renounced', opt. 3sg. *afstoþi* '(that) it might depart'), which makes it very unlikely that the voiceless fricative of Goth. 3sg. *stoþ* '(s)he stood' arose within the separate history of Gothic by word-final devoicing. Evidently we must reconstruct a PGmc past 3sg., 1sg. *stōþ, default stem *stōd- with the Verner's Law alternation (see 3.2.4 (ii)), reflecting pre-PGmc *stắt- ∼ *stāt-′. The PGmc present *standaną was apparently backformed to the past with the nasal infix (Seebold 1970: 461) and suffixal accent (whence its stem-final *-d-). Its vowel might have been shortened by Osthoff's Law, but we cannot exclude the possibility that the stem was based on a zero-grade root (see 4.3.3 (i.f)).

3.2.1 (iv) *Other developments of laryngeals* The development of tautosyllabic laryngeals immediately following nonvocalic syllabic sonorants is best discussed in connection with the development of those sonorants; I therefore postpone it to section 3.2.2 (i). Here I will outline the development of laryngeals in other positions not adjacent to nonhigh vowels.

To some extent laryngeals in contact with high vowels developed just as they did when in contact with nonhigh vowels. When the vowel followed, the laryngeal was lost:

PIE *$h_2$wap- 'evil' (cf. Hitt. *huwappas*, Melchert 1994: 147) suffixed in *$h_2$upélos > PGmc *ubilaz 'evil, bad' (Watkins 1969: 30; cf. Goth. *ubils*, OE *yfel*);

PIE *pélh$_1$u 'much (neut.)' (cf. OIr. *il*; Skt *purú* with remodeled ablaut) > PGmc *felu (cf. Goth., OHG *filu*, ON *fjǫl-*);

PIE *g$^{\text{w}}$réh$_2$u- ∼ *g$^{\text{w}}$r̥h$_2$éw- 'heavy' (cf. Lat. *gravis*) → *g$^{\text{w}}$r̥h$_2$ús (cf. Skt *gurús*, Gk *βαρύς* /barús/) > PGmc *kuruz (cf. Goth. *kaúrus*).

There seem to be no certain examples before *i. When the vowel preceded, the development was less uniform: aside from the Cowgill's Law examples (on which see 3.2.1 (i)), there seem to be two different developments. Usually the laryngeal was lost with compensatory lengthening of the preceding vowel:

PIE *wélih$_1$s optative 2sg. 'you would want' (cf. Lat. *velīs*) > PGmc *wilīz 'you want' (cf. Goth. *wileis*);

PIE yeh$_2$-stem nom. sg. *-ih$_2$ (cf. Skt *-ī*, Gk *-ια* /-ia/) > PGmc *-ī, e.g. in *bandī 'fetter' (cf. Goth. *bandi*, OE *bend*);

PIE *k$^{\text{w}}$yeh$_1$- 'rest', derived noun *k$^{\text{w}}$yéh$_1$tis (cf. Lat. *quiēs*; Old Persian *šiyātiš* 'peace'), zero grade *k$^{\text{w}}$ih$_1$- in PGmc *h$^{\text{w}}$īlō 'time' (cf. Goth. *hveila*, OE *hwīl*);

PIE *b^{h}uh$_{2}$- 'become' (cf. aorist 3sg. Skt *áb^{h}ūt*, Gk *ἔφυ* /épʰuː/), innovative pres. *b^{h}uh$_{2}$-ye/o- (cf. Gk *φύ̄ϵσθαι* /pʰúːestʰai/, Lat. *fierī*; Þórhallsdóttir 1993: 152–6) > PGmc *būanạ 'dwell' (cf. ON *búa*, OE *būan*);

PIE *h$_{3}$b^{h}rúHs 'eyebrow' (cf. Gk *ὀφρύ̄ς* /opʰrúːs/, Skt *b^{h}rús*) > *brūz → PGmc *brūwō (cf. OE *brū*).

Occasionally, however, the laryngeal is simply lost without lengthening of the vowel:

PIE *wih$_{1}$rós 'young' (cf. Toch. A *wir*) → 'warrior' (cf. Skt *vīrás*) >⟶ PGmc *wiraz 'man' (cf. Goth. *waír*; note further that OE *wer* exhibits an unexpected lowering of PGmc *i to *e*);

PIE *suHnús 'offspring' (cf. Skt *sū́te* 'she's giving birth') → 'son' (cf. Skt *sūnús*) >⟶ PGmc *sunuz (cf. Goth. *sunus*, OE *sunu*).

The first of these words exhibits the same peculiarity in Italic and Celtic; the short vowel of 'son' reappears in other derivatives of the same root in various languages (e.g. Skt *sutás* 'son' and the OIr. u-stem *suth* 'fetus'). Probably these short vowels are in most cases the results of morphological resegmentations or reanalyses which yielded roots without a final laryngeal (or its reflex), though for 'man', which is derivationally isolated in most IE languages, some other explanation may be needed. There was certainly no regular sound change that could have shortened the vowels.

As might be expected, word-initial laryngeals before other syllabic sonorants were apparently dropped:

PIE *h$_{2}$n̥tb^{h}í 'on both sides of' ?> *h$_{2}$m̥b^{h}í (cf. Gk *ἀμφί* /ampʰí/, Lat. *ambi-*)> PGmc *umbi 'around' (cf. OE *ymbe*).

An epenthetic *ə seems to have been inserted next to noninitial laryngeals that were not adjacent to any syllabic; subsequently the laryngeals were lost, leaving the *ə as their effective reflex. When the *ə was in a word-initial syllable, it eventually merged with *a:

PIE *ph$_{2}$tḗr 'father' (cf. Skt *pitā́*, Lat. *pater*) > *pətḗr > PGmc *fadēr (cf. ON *faðir*, OE *fæder*);

PIE *kh$_{2}$piéti '(s)he is grasping' (cf. Gk *κάπτϵιν* /kápteːn/ 'to gulp down', Lat. *capere, capi-* 'take'; zero-grade root, cf. Gk *κώπη* /kɔ́ːpeː/ 'handle' < *koh$_{2}$p-, and see Rix et al. 2001 s.v. **keh$_{2}$p-*) > PGmc *habiþi, *habja- 'lift' (cf. ON *hefja*, OE *hebban*; Goth. *hafjan* with analogical voiceless Verner's Law alternant);

PIE *stéh$_{2}$ti- ~ *sth$_{2}$téy- 'act of standing, place to stand' → *sth$_{2}$tís (cf. Skt *st^{h}itís*) > PGmc *stadiz 'place' (cf. Goth. *staþs*, OE *stede*);

post-PIE *deh$_1$g- ∼ *dh$_1$g- 'touch' (cf. Toch. B *tek-*; Ringe 1991: 105–15) > PGmc *tēk- ∼ *tak- (cf. Goth. *tekan* 'to touch' but ON *taka* 'to take').

In most noninitial syllables the *ə was eventually lost; see 3.2.6 (ii) for further discussion of that development. In one word a laryngeal seems to be reflected by PGmc *u:

PIE *h$_2$énh$_2$t- 'duck' (cf. Lat. *anat-*, Lith. *ántis*) > PGmc *anud- (cf. OHG *anut*, OE i-stem *ened*).

It is at least conceivable that laryngeals between consonants are regularly reflected by *u in word-final syllables (Bennett 1978: 14–15), though one can hardly draw such a conclusion from one example; a second potential example, PGmc *meluk- 'milk', is not probative because there is no clear evidence for a laryngeal in the PIE root which it reflects (see Rix et al. 2001 s.v. *h_2*melĝ-*).

The example 'lift' shows that the epenthesis of *ə, which created a light initial syllable in that stem, must have preceded the reanalysis of Sievers' Law (see 3.2.5 (ii)). Further chronological observations will be made in section 3.2.6 (ii).

In PIE laryngeals had already been lost between a nonsyllabic and *y if at least one syllable preceded in the word (see 2.2.4 (i)). However, it appears that in one class of PGmc present stems *ə was introduced analogically into that position; see 3.2.6 (ii) for further discussion of that phenomenon and subsequent developments.

3.2.1 (v) *The effect of laryngeal developments on ablaut* The developments described here, especially those in section 3.2.1 (ii), had a profound effect on the system of ablaut. That can be seen by comparing the PIE root-internal alternations on the left with the corresponding PGmc alternations on the right, after all laryngeals had been lost. (I omit the lengthened grades, which were rare in roots.)

PIE root-ablaut alternations		*pre-PGmc root-ablaut alternations*
a ∼ ∅	>	a ∼ ∅
e ∼ ∅ ∼ o	>	e ∼ ∅ ∼ o
h$_1$e ∼ h$_1$ ∼ h$_1$o	>	e ∼ ∅ ∼ o
h$_2$e ∼ h$_2$ ∼ h$_2$o	>	a ∼ ∅ ∼ o
h$_3$e ∼ h$_3$ ∼ h$_3$o	>	o ∼ ∅ ∼ o
eh$_1$ ∼ h$_1$ ∼ oh$_1$	>	ē ∼ a ∼ ō
eh$_2$ ∼ h$_2$ ∼ oh$_2$	>	ā ∼ a ∼ ō
eh$_3$ ∼ h$_3$ ∼ oh$_3$	>	ō ∼ a ∼ ō

Except for the first line, the alternations on the left are identical; most of those on the right are at least partly different (even in the simplified form presented here, which takes no account of developments in less common situations, such as zero grades of laryngeal-final roots before vowel-initial suffixes). In the new system there were six underlying vowels, three short and three long; all were subject to the o-grade rule, and the zero grade of all the long vowels was at first *ə. The change of *ə to *a in initial syllables—which were overwhelmingly the same as root syllables—made *a the usual zero-grade vowel for the underlying long vowels, so that the system for the vast majority of roots was now the following:

short series	*long series*
e ∼ Ø ∼ o	ē ∼ a ∼ ō
a ∼ Ø ∼ o	ā ∼ a ∼ ō
o ∼ Ø ∼ o	ō ∼ a ∼ ō

The set e ∼ Ø ∼ o was still by far the commonest lexically.

This system was further altered by the development of syllabic sonorants (on which see 3.2.2 (i)) and by the merger of the a- and o-vowels (3.2.7 (i)).

3.2.2 *Changes affecting sonorants*

3.2.2 (i) *Syllabic sonorants* The nonvocalic syllabic sonorants of PIE developed into sequences of *u plus the corresponding nonsyllabic sonorant; that is, *m̥ > *um, *n̥ > *un, *l̥ > *ul, and *r̥ > *ur. This change cannot be shown to have followed any other regular sound change. Isolated examples illustrating this sound change include the following:

PIE *sm̥H- 'summer' (cf. OIr. *sam*, Av. *ham*-) ⟶ PGmc *sumaraz (cf. OE *sumor*);

PIE *dék̑m̥d 'ten' (cf. Skt *dáśa*, Lat. *decem*, Lith. *dẽšimt*) > PGmc *tehun (cf. Goth. *taíhun*);

PIE *ḱm̥tóm 'hundred' (cf. Skt *śatám*, Lat. *centum*, Lith. *šimtas*) > PGmc *hundą (cf. Goth. pl. *hunda*, OE *hundred*);

PIE *h_2n̥tb^{h}í 'on both sides of' ?> *h_2m̥b^{h}í (cf. Gk *ἀμφί* /amp^{h}í/, Lat. *ambi*-) > PGmc *umbi 'around' (cf. OE *ymbe*);

PIE *n̥- 'un-' (cf. Skt *a*-, Gk *ἀ*- /a- /, Lat. *in*-) > PGmc *un- (cf. Goth., OE *un*-);

PIE *n̥tér 'inside' (cf. Lat. *inter* 'between') and *n̥d^{h}ér 'under' (cf. Lat. *īnfrā*, Skt *ad^{h}ár*) > PGmc *under 'under; among' (cf. OE *under*);

PIE *dn̥ǵ^{h}wéh$_2$- 'tongue' (cf. Old Lat. *dingua*) ⟶ PGmc *tungōn- (cf. Goth. *tuggo*, OE *tunge*; the Gmc. form has been remodeled as an n-stem);

PIE *wl̥kʷos 'wolf' (cf. Skt *vṛ́kas*, Lith. *vil̃kas*) >⟶ PGmc *wulfaz (cf. Goth. *wulfs*, OE *wulf*; the labial after the *l is irregular);
PIE *spr̥dʰ- 'contest' (cf. Skt *spr̥dʰ-*) > PGmc *spurd- 'racecourse' (cf. Goth. *spaúrds*);
PIE *wr̥ǵyéti 'is working' (cf. Av. *vərəziieiti*) >⟶ PGmc *wurkīþi 'works, makes' (the suffix has been adjusted by the reanalysis of Sievers' Law, see 3.2.5 (ii); cf. Goth. *waúrkeiþ*);
(post-)PIE *ḱr̥n- 'horn' (cf. Skt *śr̥ńgam*, Lat. *cornū*; see Nussbaum 1986: 11–14) >⟶ PGmc *hurną (cf. Goth. *haúrn*, OE *horn*);
(post-)PIE *wr̥mis 'worm' (cf. Lat. *vermis*; most IE languages reflect *kʷr̥mis, cf. e.g. OIr. *cruim*, Skt *kr̥mis*, Lith. *kirmėlẽ*) > PGmc *wurmiz 'worm, serpent' (cf. Goth. *waúrms*, OE *wyrm*);
(post-)PIE *bʰr̥ǵʰ- 'hill' (cf. OIr. *brí*, *brig-*; the root is PIE 'high') > PGmc *burg- 'hill-fort' (cf. Goth. *baúrgs*, OE *burg*, both 'town').

Tautosyllabic laryngeals immediately following these sounds have been lost without a trace in PGmc:

PIE *ǵn̥h₁tós 'born' (cf. Skt *jātás*, Lat. *nātus*, Homeric Gk *κασίγνητος* /kasígnɛːtos/ 'brother', lit. 'co-gnātus') > PGmc *kundaz (cf. Goth. *aírþakunds* 'of earthly origin', OE *godcund* 'divine');
PIE *pl̥h₁nós 'full' (cf. Skt *pūrṇás*, Lith. *pìlnas*) > *pulnos > PGmc *fullaz (cf. Goth. *fulls*, OE *full*);
PIE *h₂wl̥h₁neh₂ 'wool' (cf. Hitt. *hulana-*, Skt *úrṇā*, Lat. *lāna*, Lith. pl. *vìlnos*) > *wulnā > PGmc *wullō (cf. Goth. *wulla*, OE *wull*);
PIE *dl̥h₁gʰós 'long' (cf. Skt *dīrgʰás*, OCS *dlŭgŭ*) > PGmc *tulgaz 'firm' (cf. Goth. *tulgus* 'firm, steadfast' (*'long-lasting'), transferred into the u-stems; OE adv. *tulge* 'firmly');
PIE *wr̥h₁tóm 'said' (neut.; for the verb cf. Palaic *wērti* 'calls', for the laryngeal cf. Gk *wrē- in e.g. *ῥῆμα* /hrɛ̂ːma/ 'word') > PGmc *wurdą 'word' (cf. Goth. *waúrd*, OE *word*);
PIE *ǵr̥h₂nóm 'crushed, ground' (neut.; cf. Skt *jīrṇám* 'worn out', Lat. *grānum* 'grain') > PGmc *kurną 'grain' (cf. Goth. *kaúrn*, OE *corn*);
PIE *pr̥Hmós 'first' (cf. Lith. *pìrmas*; parallel *pr̥Hwós in e.g. Skt *pū́rvas*, Toch. B *pärweṣṣe*) > *purmós >⟶ PGmc *fruma-n- (cf. Goth. *fruma*, OE *forma*).

This is mildly surprising, since in most well-attested daughters of PIE these sequences exhibit outcomes clearly different from those of other syllabic sonorants.

The loss of these laryngeals might be easier to explain if syllabic sonorants became *uR before any of the changes affecting laryngeals. The laryngeals

would then have been between nonsyllabics; they would have acquired an epenthetic *ə and subsequently have been lost, leaving the *ə as their effective reflex (see 3.2.1 (ii)); and finally the *ə itself would have been lost, since it could never have been in a word-initial syllable (see 3.2.6 (ii)). Two other pieces of evidence might seem to support this line of reasoning. First, the fact that syllabic sonorants never became nonsyllabic even after the loss of an immediately following laryngeal brought them into contact with a vowel (as in 'summer', the first example adduced above) might suggest that they had become *uR before the loss of the laryngeals. Secondly, the development of 'young' might be easier to account for if the sound changes occurred in the order suggested here, as follows:

PIE *$h_2$yuH$_{\text{o}}^{\text{n}}$ḱós 'young' (cf. Skt *yuvaśás*; Lat. *iuvencus* 'steer', i.e. 'young bull') > *yuunkós > *yūnkós (with loss of the laryngeal and vowel contraction) > *yunkós (by Osthoff's Law, see 3.2.1 (iii)) > PGmc *jungaz (cf. Goth. *juggs*, OE *iung*, *ġeong*).

Unfortunately none of these arguments is watertight. Though it does appear that Osthoff's Law operated in Germanic (see 3.2.1 (iii)), we cannot exclude the possibility that the medial laryngeal in 'young' was lost first and that the resulting sequence *u$_{\text{o}}^{\text{n}}$ was automatically resyllabified to *un. Nor would it follow that such a sequence as *$_{\text{o}}^{\text{n}}$a, likewise generated by the loss of a laryngeal, would necessary be resyllabified to *na; it might remain disyllabic (like similar sequences generated by Sievers' Law; see 2.2.4 (ii)) and become *una later by the sound change under discussion. Finally, the scenario for the loss of laryngeals with which I began this paragraph is not the only one possible. The development of syllabic sonorants in Balto-Slavic was apparently similar to that in Germanic, except that the intonation of the resulting syllable was different depending on whether or not a tautosyllabic laryngeal followed; for instance, PIE *w$_{\text{o}}^{\text{l}}$k$^{\text{w}}$os 'wolf' > Lith. *vil̃kas*, but PIE *h_2w$_{\text{o}}^{\text{l}}$$h_1neh_2$ 'wool' > Lith. (pl.) *vìlnos*. The same development could conceivably have occurred in Germanic, the intonation contrasts being lost subsequently; in fact, the PGmc contrast between bimoric and trimoric long vowels actually suggests as much (see 3.2.1 (ii)). In short, we cannot securely date the change of syllabic sonorants to *uR relative to the changes that affected laryngeals.

It is clear that this change fed the reanalysis of Sievers' Law (cf. the example 'work' in the list above), but since the latter might have operated as a surface filter, chronological inferences from that fact are not completely secure. The resolution of syllabic sonorants probably did precede the change of *ln to *ll (cf. 'full' and 'wool'); it necessarily preceded the delabialization of labiovelars

next to *u (cf. 'tongue', and see 3.2.3 (ii)) and the loss of word-final *-n with nasalization of the preceding vowel (see the following section).

Though the development of syllabic sonorants is best illustrated by the isolated examples cited above (since they are unlikely to have been altered by morphological change or lexical analogy), it is much more important for its impact on the system of ablaut. Consider the following developments:

PIE ablaut alternations		*pre-PGmc ablaut alternations*
e ∼ Ø ∼ o	>	e ∼ Ø ∼ o
ey ∼ i ∼ oy	>	ey ∼ i ∼ oy
ew ∼ u ∼ ow	>	ew ∼ u ∼ ow
er ∼ r̥ ∼ or	>	er ∼ ur ∼ or
el ∼ l̥ ∼ ol	>	el ∼ ul ∼ ol
en ∼ n̥ ∼ on	>	en ∼ un ∼ on
em ∼ m̥ ∼ om	>	em ∼ um ∼ om

Once again, the left column simply gives seven examples of the same alternations. But the change of nonvocalic syllabic sonorants to *uR disrupted the parallelism of the surface outputs, making the nonvocalic examples vulnerable to reanalysis by language learners, since in them the zero-grade vowel appeared to be *u rather than zero. As we will see, this had important consequences for verb inflection.

A less important, but still interesting, consequence for PGmc ablaut was the following. A set of alternations like

re ∼ r̥ ∼ ro,

with a nonvocalic sonorant preceding the underlying vowel, became

re ∼ ur ∼ ro

as a result of this sound change. Pressure to reanalyze such an outcome must have been considerable, and in some cases we can show that reanalysis did occur. The most obvious example is the Germanic verb 'break'. Though it has no exact cognates in other branches of the family, it looks as though it ought to reflect *b^hreg-, perhaps a lexical conflation of *b^heg- (well attested in Indo-Iranian and Armenian) and *b^hrag- (well attested in Latin and Old Irish). By regular sound change

*b^hreg- ∼ *b^hr̥g- ∼ *b^hrog- > *brek- ∼ *burk- ∼ *brak-;

but adjustment of the zero grade gave

*brek- ∼ *bruk- ∼ *brak-,

e.g. in *brekaną ‘to break’, *brak ‘(s)he broke’, *brukanaz ‘broken’ (cf. Goth. *brikan*, *brak*, *brukans*, OE *brecan*, *bræc*, *brocen*). Reanalysis of *u as the zero-grade vowel has led naturally to its transposition with the *r, so that it occupies the underlying vowel-slot of the lexeme.

It is also striking that the third class of PGmc strong verbs includes not only those whose roots end in (pre-)PGmc *eRC, but also those ending in *eCC where neither consonant is a sonorant; that is unexpected, since in this class the default past stem and past participle exhibit a *u which arose from syllabic sonorants by the sound change discussed in this section. However, inspection of the verbs in question reveals a surprising fact: nearly all have roots of the shape *CReCC- (see 4.3.3 (i.c)). It seems clear that the zero-grade stems of these verbs too underwent a sequence of changes

*CR̥CC- > *CuRCC- → *CRuCC-.

3.2.2 (ii) *Auslautgesetze affecting nasals* PIE word-final *-m became *-n in PGmc. Since most examples were subsequently lost with nasalization of the preceding vowel (see below), the evidence for this change is largely inferential; nevertheless it is certain, for the following reasons. In the first place, it is likely that PIE acc. sg. masc. *tóm ‘that’ in its temporal meaning ‘at that (time)’ (cf. Lat. *tum*) actually survives in Goth. *þan* ‘then’; if that is true, the loss of word-final *-n must have affected only polysyllables. Secondly, a number of pronominal forms were suffixed with a particle of obscure origin (> PGmc *-ǭ) after the change of *-m to *-n (but before its loss if it was lost in monosyllables). Note the following examples, all of which are acc. sg. masc.:

PIE *tóm ‘that’ > *tón >⟶ PGmc *þanǭ (cf. Goth. *þana*, OE *þone*);
PIE *k^{w}óm ‘which?’ > *k^{w}ón ‘whom?’ >⟶ PGmc *h^{w}anǭ (cf. Goth. *hvana*, OE *hwone*);
PIE *ḱím ‘this’ > *kín >⟶ PGmc *hinǭ (cf. OE *hine* ‘him’, Goth. *und hina dag* ‘until this day’);
PIE *ím ‘him’ > *ín >⟶ PGmc *inǭ (cf. Goth. *ina*).

Since PIE word-final *-m̥ apparently became *-un (and then PGmc *-u̯, see below), we might suggest that this change followed the change of syllabic sonorants to *uR; but it also seems possible that a change of *-m to *-n would entail a change of *-m̥ to *-n̥ if syllabic sonorants still existed. Thus this change, too, cannot be shown to have occurred after any other.

After the resolution of syllabic sonorants into *uR and the change of word-final *-m to *-n, word-final *-n was lost with nasalization of the preceding vowel, at least in polysyllables. For forms ending in PGmc *-ǭ this can be proved, since that word-final nasalized vowel has distinctive

reflexes in West Germanic (OHG *-a*, OE *-e*, etc.); for the other vowels it must be inferred. Inflectional paradigms provide a variety of examples:

PIE *yugóm 'yoke' (cf. Skt *yugám*, Lat. *iugum*) > *yugón > PGmc *juką (cf. Goth. *juk*, OE *ġeoc*; the vowel has been lost in all the literary languages, but is still written in the oldest Runic Norse, e.g. *horna* 'horn' on the horn of Gallehus);

PIE *wĺ̥kʷom 'wolf (acc. sg.)' (cf. Skt *vṛ́kam*, Lat. *lupum*) >⟶ *wúlpon > PGmc *wulfą (cf. Goth., OE *wulf*; vowel still written in Runic *-wulafa*);

PIE *h₂wĺ̥h₁neh₂m = *[h₂wĺ̥h₁nām] 'wool (acc. sg.)' (see 2.2.4 (iv) on the phonology; cf. Skt *úrṇām*, Lat. *lānam*) > *wúlnān > PGmc *wullǭ (cf. Goth. *wulla*, OE *wulle*);

PIE *stéh₂tim 'act of standing, place to stand (acc. sg.)', remodeled as *sth₂tím (cf. Skt *stʰitím*) > PGmc *stadį 'place' (cf. Goth. *staþ*, OE *stede*);

(post-)PIE *suHnúm 'offspring (acc. sg.)' (cf. Skt *sūnúm* 'son') >⟶ PGmc *sunų 'son' (with short root-vowel for unclear reasons; cf. Goth. *sunu*, OE *sunu*);

PIE *dʰédʰeh₁m = *[dʰédʰēm] 'I was putting' (see 2.2.4 (iv) on the phonology; cf. Skt *ádadʰām*, Gk *ἐτίθην* /etítʰɛ̣ːn/, both with the 'augment' prefix) > *dedē̯ > PGmc (*dedą̄ >) *dedǭ 'I did' (cf. OS *deda*, and see 3.2.7 (i)).

It seems almost certain that *-n̥ and *-m̥ became *-un and then PGmc *-ų from two pieces of evidence, both provided by the handful of monosyllabic consonant-stem nouns that Germanic languages preserve. Most such nouns are feminine; the usual exceptions are *mann- 'human being', *fōt- 'foot', and *tanþ- ∼ *tund- 'tooth', which are masculine. In Gothic the latter two stems have become u-stems, and it is difficult to see how that could have happened if they had not shared salient case endings with the u-stems. They certainly shared the acc. pl. ending (because PIE *-n̥s > PGmc *-unz) and perhaps also the dat. pl. and inst. pl. (in which *-m- after a heavy syllable should have undergone Sievers' Law to become *-m̥- > *-um-); but their transfer to the u-stems is easier to explain if they also had an acc. sg. in *-ų < *-un < PIE *-m̥. The second piece of evidence is provided by Old Norse and involves feminine nouns of this class. Most are inflected in the singular like ō-stems, with u-umlaut in all forms except the gen. sg. (Noreen 1923: 283–5). While the simple fact that they are feminines is obviously responsible in part for this development, it is easier to understand if their acc. sg. originally ended in *-ų (so Gordon 1962: 273). The same circumstance would also make it easier to account for the vowel of ON *nótt* 'night', which exhibits a degree of rounding and raising caused by u-umlaut and nasalization jointly (Noreen 1923: 105–6).

It should follow that 'seven' and 'nine' ended in *-u̯ in PGmc, but they did not; they clearly ended in *-un. This is the result of lexical analogy among numerals adjacent (or nearly so) in the sequence of counting, a very common type of change. In 'ten' a PGmc outcome *-un is expected (cf. Szemerényi 1960: 42):

PIE *dék̑m̥d 'ten' (cf. Skt *dáśa*, Lat. *decem*, Lith. *dẽšimt*) > *dékund > *téhunt (by Grimm's Law, see 3.2.4 (i)) > PGmc *tehun (cf. Goth. *taíhun*; see 3.2.6 (iv)).

It would not be surprising if the ending of 'ten' had spread to 'nine', giving a development such as the following (cf. Szemerényi 1960: 127 n. 53):

PIE *(h$_1$)néwn̥ 'nine' (cf. Skt *náva*, Gk *ἐννέα* /ennéa/; Lat. *novem*, but cf. *-n-* in *nōnus* 'ninth') > *néwun → *néwunt > PGmc *ne(w)un (cf. Goth. *niun*, ON *níu*, OHG *niun*, all with *i* regularly from PGmc *e; OE *nigon* reflects a northern WGmc *nigun whose origin is unclear).

The same thing must have happened in 'seven', and in that case it led to a much more drastic change, namely the dissimilatory loss of the inherited medial *-t- (cf. Szemerényi 1960: 35 with references, and especially Stiles 1985–6, part 3, pp. 6–7):

PIE *septḿ 'seven' (cf. Skt *saptá*, Lat. *septem*) > *septún > *seftún (by Grimm's Law) → *seftúnt > *sefúnt > PGmc *sebun (by Verner's Law, see 3.2.4 (ii); cf. Goth. *sibun*, OE *seofon*).

That effectively eliminated the best evidence for the outcome of word-final syllabic nasals, forcing us to reconstruct their development inferentially.

As these examples show, the loss of word-final *-n with nasalization of the preceding vowel must have preceded the loss of *-t (see 3.2.6 (iv)), which gave rise to new word-final *-n which were not lost in PGmc.

3.2.3 *Changes affecting obstruents*

3.2.3 (i) *Coronal clusters* The PIE surface cluster *tst, reflecting underlying */T+t/ (see 2.2.4 (iii)), appears in PGmc as *ss. Examples are comparatively few, and many appear to be lexical relics; note the following:

PIE *widstós 'known' (cf. Skt *vittás*; *wóyde '(s)he knows', cf. Skt *véda*, Gk *οἶδε* /ôide/, PGmc *wait) > PGmc *(ga)wissaz 'certain' (cf. OE *ġewiss*; Goth. *unwiss* 'uncertain');

PIE *sedstós 'seated' (*sed- 'to sit down', cf. Lat. *sedēre*, PGmc *sitjaną) > PGmc *sessaz 'seat' (cf. ON, OE *sess*);

PIE *wéd^{h}stis 'act of joining' (*wed^{h}- 'to join', cf. PGmc *(ga)wedaną; Skt *vád^{h}ram* 'leather strap', Welsh *gwedd* 'yoke') > PGmc *(ga)wissiz 'joint' (cf. Goth. *gawiss*);
pre-PGmc *g^{w}étstis 'act of speaking' (PGmc *k^{w}eþaną 'to say') > PGmc *k^{w}issiz (cf. Goth. *samaqiss* 'agreement', OE *andcwiss* 'answer');
pre-PGmc *k^{w}h$_{1}$dstós 'sharpened' (PGmc *h^{w}ētaną 'to strike', *h^{w}atjaną 'to sharpen') > PGmc *h^{w}assaz 'sharp' (cf. ON *hvass*, OE *hwæss*),

The outcome of this sound change was simplified to *s when a long vowel, a diphthong, or a consonant immediately preceded (either by a further sound change or by a preexisting phonotactic constraint operating as a surface filter):

pre-Gmc. *káydstis 'act of calling' (PGmc *haitaną 'to call, to command') > PGmc *haisiz 'command' (cf. OE *hǣs*);
pre-PGmc *pn̥tstós (meaning difficult to determine, but apparently related to PGmc *finþaną 'to find') > PGmc *funsaz 'ready to go, hastening' (cf. ON *fúss*, OE *fūs*, OHG *funs*);
pre-Gmc. *weydstos 'knowledgeable' (also a derivative of 'know' (see above), but the ablaut grade and meaning are unexpected) > PGmc *wīsaz (cf. Goth. *unweis* 'ignorant', OE *wīs* 'wise');
pre-PGmc *(h$_{1}$)ēdstos 'eaten' (cf. Lat. *ēsus*?; but the long vowel is as likely to be a Germanic innovation, see below) > PGmc *ēsaz 'food; carrion' (cf. OE *ǣs*).

There are a handful of further examples, some of them uncertain.

The actual changes that gave these outcomes were probably *Tst > *tst > *ts > *ss (> *s). They are difficult to date and could have occurred indefinitely early in the independent history of Germanic. Italic and Celtic show the same outcomes of these PIE clusters, but it seems clear that the changes were parallel developments rather than historically shared changes, if only because an intermediate stage is clearly attested in Gaulish (at a time when Latin had long completed the process). At least the last two examples cited exhibit ablaut patterns unexpected in PIE, and the long vowel of the last item may actually reflect a fairly late stage in the reorganization of PGmc verb inflection (see 3.4.3 (ii)); but it does not follow that the sequence of changes began so late, because the pattern of derivation might have remained productive, as it did in Latin (in which case some of the preforms given above may be anachronistic).

3.2.3 (ii) *The reorganization of dorsal stops* The PIE 'palatal' and 'velar' stops (see 2.2.1) merged as velars; examples are naturally numerous. The origin of a

particular example of PGmc *k, *g, or *h can be determined only by finding a good cognate in one of the daughters of PIE that preserves the contrast between palatals and velars (Indo-Iranian, Balto-Slavic, Armenian, Albanian, or the Luvian subgroup of Anatolian). Note the identical PGmc outcomes in the following sets of words.

- PIE *ḱ and *k:

PIE *ḱonk- 'to hang' (cf. Hitt. pres. 3sg. *gānki*; Skt *śáṅkate* 'is indecisive, worries') > PGmc *hanhaną (cf. OE *hōn*, OHG *hāhan*; Goth. *hāhan* 'to suspend (judgment)');

PIE *ḱérd- ~ *ḱr̥d- 'heart' (cf. Lat. *cord-*, Lith. *širdìs*) >⟶ PGmc *hertan- (cf. Goth. *haírto*, OE *heorte*);

PIE *ḱm̥tóm 'hundred' (cf. Lat. *centum*, Skt *śatám*) > PGmc *hundą (cf. Goth. pl. *hunda*, OE *hundred*);

PIE *kátus 'fight' (cf. OIr. *cath* 'battle'; Luvian *kattawatnallis* 'plaintiff') > PGmc *haþuz 'battle' (cf. OE *heaþu-*, OHG *hadu-*; ON *Hǫðr*, name of the god of battle);

PIE *ḱlew- 'to hear' with derivs. *ḱléwmn̥ 'hearing', *ḱléwtrom 'means of hearing' (cf. Skt *śrav-, śrótram* 'ear', Av. *srauu-, sraoma, sraoθrəm* 'singing') > PGmc *hleuman- 'hearing', *hleuþrą 'noise' (cf. Goth. *hliuma*, OE *hlēoþor*, OHG *hliodar*);

PIE *klep- 'to steal' (cf. Gk *κλέπτειν* /klépteːn/; Old Prussian *auklipts* 'hidden', OCS *poklopŭ* 'cover') > PGmc *hlefaną (cf. Goth. *hlifan*);

PIE *pórḱos 'pig' (cf. Lat. *porcus*; Lith. *paršas* 'barrow') > PGmc *farhaz 'piglet' (cf. OE *fearh*, OHG *farah*);

PIE *lówkos 'clearing' (cf. Lith. *laũkas* 'field', Lat. *lūcus* 'grove') > PGmc *lauhaz (cf. OE *lēah* 'meadow', OHG *lōh* 'copse, grove');

PIE *deḱs- 'right(-hand)' (cf. Gk *δεξιός* /deksiós/, Av. *dašinō*) > PGmc *tehswaz (cf. Goth. *taíhswa*, OHG *zeso, zesawēr*);

PIE *uksḗn 'bull, ox' (cf. Av. *uxša*) >⟶ PGmc *uhsō̄ (ending remodeled; cf. OE *oxa*, Goth. gen. pl. *aúhsne*).

- PIE *ǵ and *g:

PIE *ǵómbʰos 'row of teeth' (cf. Skt pl. *jámbʰāsas*; Gk *γόμφος* /gómpʰos/ 'peg') > PGmc *kambaz 'comb' (cf. ON *kambr*, OE *camb*);

PIE *gol- 'cold' (o-grade; cf. Lat. *gelū*, Lith. *gelumà* 'frost') in PGmc *kalaną 'to be cold, to freeze' (cf. ON *kala,* OE *calan*) and *kaldaz 'cold' (cf. Goth. *kalds*, ON *kaldr*, OE *ċeald*);

PIE *ǵónu ~ *ǵnéw- 'knee' (cf. Skt *jā́nu*, Gk *γόνυ* /gónu/) >⟶ PGmc *knewą (cf. Goth. *kniu*, OE *cnēo*);

(post-)PIE *gnét- ∼ *gn̥t-′ ‘to press, to squeeze’ (cf. OCS *gnetetŭ* ‘(s)he oppresses’) > *kneþ- ∼ *kund- → PGmc *knudaną ‘to knead’ (cf. Old Swedish *knodha*; ablaut regularized in OE *cnedan*, OHG *knetan*);

PIE *wérǵom ‘work’ (cf. Gk *ἔργον* /érgon/; for the palatal cf. the related verb in Av. *vərəziieiti*) > PGmc *werką (cf. ON *verk*, OE *weorc*);

PIE *yugóm ‘yoke’ (cf. Skt *yugám*, Lat. *iugum*) > PGmc *juką (cf. OE *ġeoc*; Goth. *juk* ‘yoke (of oxen), pair’).

- PIE *ǵ^{h} and *g^{h}:

PIE *ǵ^{h}áns ‘goose’ (cf. Gk *χήν* /k^{h}ɛ́:n/, Lith. *žąsis*) > PGmc *gans (cf. OE *gōs*, OHG *gans*);

PIE *g^{h}óstis ‘stranger’ (cf. Lat. *hostis* ‘enemy’, OCS *gostĭ* ‘guest’) > PGmc *gastiz ‘guest’ (cf. Goth. *gasts*, OE *ġiest*);

PIE *wéǵ^{h}eti ‘(s)he’s transporting (it)’ (cf. Skt *váhati* (aor. *ávāṭ* with reflex of palatal cluster), Lat. *vehit*) > PGmc *wigidi ‘(s)he moves’ (cf. OE *wiġþ*, OHG *wigit*);

PIE *lég^{h}yeti ‘(s)he’s lying down (eventive)’ (cf. OCS *ležetŭ* [stative], Homeric Gk aor. *λέκτο* /lékto/ ‘(s)he lay down’) >⟶ PGmc *ligiþi (stative; cf. OE *liġþ*, OHG *ligit*, and see 3.4.3 (i) ad fin. on the ending);

PIE *h$_{3}$méyǵ^{h}eti ‘(s)he’s urinating’ (cf. Skt *méhati* (past ptc. *mīḍhás* with reflex of palatal cluster), Gk *ὀμείχει* /oméik^{h}ei/) > PGmc *mīgidi (cf. OE *mīġþ*);

PIE *stéyg^{h}eti ‘(s)he’s walking’ (cf. Gk *στείχει* /stéik^{h}ei/; Skt *stig^{h}*-, pres. 3sg. *stig^{h}nóti*) > PGmc *stīgidi ‘(s)he climbs’ (cf. Goth. *steigiþ*, OE *stīġþ*).

This is a natural change which occurred independently in at least four other daughters: Hittite (but not the Luvian subgroup of Anatolian), Tocharian, Italo-Celtic, and Greek. It could have occurred indefinitely early in pre-Gmc; it preceded the change discussed in the next paragraph.

Labiovelars and sequences of velar plus *w merged. Since *Kw-sequences were quite rare in PIE, all the certain Germanic examples developed from sequences of palatal plus *w (see the preceding paragraph) or by Cowgill’s Law (see 3.2.1 (i)). Note the following:

PIE *éḱwos ‘horse’ (cf. Skt *áśvas*, Lat. *equos*) > *ékwos > PGmc *eh^{w}az (cf. OE *eoh*; Goth. *aíhvatundi* ‘thornbush’, lit. *‘horse-tooth’);

PIE aor. subj. *léyk^{w}eti ‘(s)he will leave (it)’ (Gk pres. indic. *λείπει* /léipei/ ‘(s)he is leaving (it)’; but the original pres. was nasal-infixed, cf. Skt *riṇákti*, Lat. *linquit*) > PGmc *līh^{w}idi ‘(s)he lends’ (cf. Goth. *leihviþ*, OE *līehþ*);

PIE *dn̥ǵ^{h}wéh$_{2}$- ‘tongue’ (cf. Old Lat. *dingua*; for the palatal cf. OCS *języ̨kŭ* ⟵< *dn̥ǵ^{h}uh$_{2}$-kó- with irregular loss of the initial consonant) >

*dung^{h}wā- (see 3.2.1 (ii), 3.2.2 (i), and the preceding paragraph) > *dung^{wh}ā- > *dung^{h}ā- (see the following paragraph) >→ PGmc *tungōn- (remodeled as n-stem; cf. Goth. *tuggo*, OE *tunge*);

PIE *h$_1$lr̥ng^{wh}rós 'light (in weight)' (cf. Gk *ἐλαφρός* /elap^{h}rós/ 'light, nimble'; for the nasal cf. full-grade superlative *h$_1$léng^{wh}istos > Av. *rəⁿjĭštō* 'swiftest') > *lung^{wh}rós > PGmc *lungraz 'swift' (cf. OS *lungar* 'powerful'; OE adv. *lungre* 'quickly, soon').

For the Cowgill's Law examples it is more difficult to find close parallels with labiovelars, since the PIE labiovelar with which their sequences eventually merged was the relatively rare *g^{w}. However, note the following:

PIE *g^{w}ih$_3$wós 'alive' (cf. Skt *jīvás*, Lat. *vīvos*, and with analogical full-grade root Gk *ζωός* /sdo̯ós/) > PGmc *k^{w}ik^{w}az (cf. ON *kvikr*, OE *cwic*);

PIE *h$_1$rég^{w}os ~ *h$_1$rég^{w}es- 'darkness' (cf. Skt *rájas* 'empty space', Gk *ἔρεβος* /érebos/ 'hell'; for the meaning cf. the related formation *h$_1$r̥g^{w}ónt- in Toch. B *erkeṃt* 'black (obl. sg. masc.)') > PGmc *rek^{w}az ~ *rik^{w}iz- (cf. Goth. *riqis*).

There are also at least two examples involving the feminines of u-stems:

PIE *h$_2$éng^{h}us, fem. *h$_2$n̥g^{h}éwih$_2$ 'constricted' (cf. Skt *aṃhús*; OIr. compound *cumung* 'narrow') >→ pre-PGmc *ang^{h}us, *ang^{h}wī > PGmc *anguz, *ang^{w}ī 'narrow' (cf. Goth. *aggwus* with levelling of the labiovelar into the masc.; *aggwiþa* 'tribulation', etc.);

post-PIE *mag^{h}us 'boy' (cf. Goth. *magus*; OE *magu* 'son', Ogham Irish *magu-*, OIr. *mug* 'slave'), deriv. *mag^{h}wī 'girl' > *mag^{wh}ī > PGmc *mawī (cf. Goth. *mawi*).

Three considerations suggest that the outcomes of this merger were labiovelars rather than *Kw-sequences: (1) the change discussed in the following paragraph would have been much more natural if it applied to labiovelars, and it did apply to the outcomes of this merger; (2) the fact that the reflexes of labiovelars could occur word-finally in PGmc would have been much more natural if they were still labiovelars at that stage; and (3) in Gothic, the only fairly well-attested Germanic language written in an alphabet devised for it by a native speaker, the reflexes of PGmc *h^{w} and *k^{w} are written with single symbols, usually transcribed *ƕ* and *q* respectively. (PGmc *g^{w} survived only after a homorganic nasal and was rare; thus the fact that it is not written with a single symbol in Gothic need not be significant. The fact that there are no Runic symbols for labiovelars also need not be significant; the arrangement of the runes in three sets of eight shows clearly enough that considerations other than the accurate representation of PGmc phonemes were important in the invention of that alphabet.)

Labiovelars were delabialized next to *u. This probably reflects the persistence of the PIE rule, operating as a surface filter. All the certain new examples involve *u that developed from syllabic sonorants (see 3.2.2 (i)), and some also involve labiovelars that arose by the merger discussed in the preceding paragraph. Interestingly, labiovelars were delabialized when preceded by the sequence *un (so already Normier 1977: 182 with n. 28); that demonstrates that *n had a rounded velar allophone before labiovelars (as might be expected), and that the entire consonant cluster underwent the change (as the Obligatory Contour Principle predicts). Note the following examples (cf. also the discussion of Seebold 1967*b*):

PIE *g^{w}réh$_2$u- ~ *g^{w}r̥h$_2$éw- 'heavy' (cf. Lat. *gravis*) → *g^{w}r̥h$_2$ús (cf. Skt *gurús*, Gk *βαρύς* /barús/) > *g^{w}urús > PGmc *kuruz (cf. Goth. *kaúrus*);

PIE *g^{wh}énti- ~ *g^{wh}n̥tí- '(act of) killing, (a) blow' (cf. Skt *hatís*; for the labiovelar cf. Hitt. *kuēnzi* 'kills') → *g^{wh}n̥tis > *g^{wh}úntis > PGmc *gunþiz 'battle' (cf. ON *gunnr*, *guðr*; OE *gūþ* has been remodeled as an ō-stem);

PIE *dn̥ǵ^{h}wéh$_2$- 'tongue' (cf. Old Lat. *dingua*) > *dung^{h}wā- > *dung^{wh}ā- > *dung^{h}ā- >→ PGmc *tungōn- (remodeled as an n-stem; cf. Goth. *tuggo*, OE *tunge*);

PIE *n̥h$_3$mé 'us two' → *n̥h$_3$wé (Katz 1998: 89–99, 212–7; cf. Skt *āvā́m*, Gk *nōwé > *νώ* /nǫ́:/) > *ungwé (see 3.2.1 (i)), to which was formed dat. *ungwís; the two > *unk^{w}é, *unk^{w}ís (by the sound change discussed above and Grimm's Law) > PGmc *unk, *unkiz (cf. Goth. *ugkis*, ON *okkr*, OE *unc*; 'you two (obl.)' was remodeled on the basis of this pronoun as *ink^{w}, *ink^{w}iz before the loss of labialization, cf. Goth. *igqis*, ON *ykkr*, OE *inc*);

PIE *h$_1$ln̥g^{wh}rós 'light (in weight)' (cf. Gk *ἐλαφρός* /elap^{h}rós/ 'light, nimble') > *lung^{wh}rós > PGmc *lungraz 'swift' (cf. OS *lungar* 'powerful'; OE adv. *lungre* 'quickly, soon'); but since the labialization would subsequently have been lost in OE, OS, and OHG anyway, this example is not probative.

The example 'battle' shows that this change bled, and thus preceded, the change of PIE word-initial *g^{wh} to PGmc *b (see 3.2.4 (i)).

There is also a probable example in which the labiovelar was brought into contact with a u-vowel by loss of a laryngeal with compensatory lengthening:

(post-)PIE *b^{h}ruHg^{w}- 'use, enjoy' (cf. Lat. *fruī* < *frūvī, ptc. *frūctus*) > *b^{h}rūg^{w}- > PGmc *brūkaną (cf. OE *brūcan*, OHG *brūhhan*; Goth. *brūkjan* has been remodeled on the basis of the verb's weak past).

Of course if the apparent labiovelar of the Latin verb is original, the velar of the Latin noun *frūgēs* (mostly pl.) 'produce', (dat. sg.) *frūgī* 'moderate' (a fossilized idiom), and their derivatives must be explained as secondary

developments. (Other forms of this word-family in Italic are etymologically ambiguous.) But a nom. sg. (*)frūx, potentially < *$b^hrūg^ws$, must once have been commonplace and can have been reanalyzed to yield a velar-final root-noun, whereas all forms of the present stem of the verb had a vowel immediately following the root.

Not surprisingly, labiovelars are sometimes restored in derivationally transparent environments in the attested languages, especially in Gothic; thus we find e.g. Goth. *ussuggwuþ* 'you have read' (← PGmc *sung- < PIE *$sn̥g^{wh}$-, zero grade of *$seng^{wh}$- 'chant' > PGmc *$sing^waną$ 'to sing' > Goth. *siggwan*), *gaqumþs* 'assembly, conventiō' (← PGmc *kum-þi-z < PIE *$g^wm̥$-, zero grade of *g^wem- 'step' > PGmc *$k^wemaną$ 'to come' > Goth. *qiman*), and so on; note also *aggwus* 'narrow' (see above), in which the labiovelar arose from *$ǵ^hw$ in the feminine.

Finally, it seems clear that labiovelars were delabialized before *t. One clear example was inherited from PIE:

PIE *$nók^wt$- ~ *$nék^wt$- 'night' (cf. Gk *νύξ* /núks/, *νυκτ-* /nukt-/ with raising of *o next to a labiovelar; Hitt. *nekuz mēhur* 'evening time') > *nókt- > PGmc *naht- (cf. Goth. *nahts*, OHG *naht*).

It is unclear what happened to labiovelars before *s, since there seem to be no examples that could not have been altered by morphological change.

Unfortunately none of the changes discussed in this section interacted crucially with Grimm's Law, the shift in the manner of articulation of stops which is the most salient feature of the Germanic subgroup (see 3.2.4 (i)), so that the relative chronology of these changes and Grimm's Law is unrecoverable.

3.2.4 *Grimm's Law and Verner's Law*

These two sound changes deserve to be treated separately from the foregoing, not only because they are the most obvious (and best-known) sound changes that occurred in the development of PGmc from PIE, but also because they completely transformed the Germanic system of obstruents. Grimm's Law must have followed the changes which eliminated *h_2, since that consonant was clearly an obstruent in PIE but did not prevent an immediately following voiceless stop from becoming a fricative (see below). Verner's Law must have followed Grimm's Law, since it operated on the outputs of Grimm's Law.

3.2.4 (i) *Grimm's Law* It remains unclear whether Grimm's Law was in any sense a unitary natural sound change or a series of changes that need not have occurred together. It is true that no sound change can be shown to have occurred between any of the components of Grimm's Law; but since Grimm's

Law was among the earliest Germanic sound changes, and since the other early changes that involved single non-laryngeal obstruents affected only the place of articulation and rounding of dorsals (see 3.2.3 (ii)), that could be an accident. In any case, Grimm's Law is most naturally presented as a sequence of changes that counterfed each other.

PIE voiceless stops became PGmc fricatives, provided that they were not immediately preceded by another obstruent (usually *s, but sometimes another stop). It seems overwhelmingly likely that the fricatives originally exhibited the same place of articulation as the stops from which they developed; in other words, there is no reason to believe that this sound change was automatically accompanied by any change in place of articulation. Thus the original changes will have been *[p] > *[ɸ], (*/t/ =) *[t̪] > *[θ], and so on; if it is true that PIE 'palatals' were really velars, while PIE 'velars' were really postvelars (see 2.2.1), it is even possible that this part of Grimm's Law preceded the merger of those PIE sounds, so that (*/ḱ/ =) *[k] > *[x], (*/k/ =) *[q] > *[χ], (*/kʷ/ =) *[qʷ] > *[χʷ]. In all the attested Germanic languages, however, further phonetic changes have occurred. The dorsal fricatives have everywhere become *[h] and *[hʷ] in word-initial position, and that change can have occurred already in PGmc. Eventually they gave the same outcomes whenever they were not immediately followed by an obstruent or a word boundary; but that must be a post-PGmc development, because intervocalic examples that became word-final in PWGmc were still pronounced as velars in OE. The labial fricative tended to become labiodental, but that too must be a post-PGmc development, at least in part: it is fairly likely that Gothic *f* was still bilabial (to judge from the fact that word-final devoicing of bilabial fricative *b* yielded *f*), and in ON this fricative remained bilabial when immediately followed by *t* (and is therefore written < p > in that position in our standardized orthography). The traditional spellings for the PGmc outcomes of this part of Grimm's Law are *f, *þ, *h, *hʷ, and I will continue to use them throughout this book; but the reader should remember that they are not intended to be representations of the actual phonetics of the PGmc phonemes.

Examples of this change are very numerous. I begin with the PIE voiceless stops; the following word-initial examples are typical:

PIE *pṓds 'foot (nom. sg.)' (cf. Skt *pā́t*, Doric Gk *πώς* /pṓːs/) > PGmc *fōt- (cf. Goth. *fotus*, OE *fōt*);

PIE *pélh₁u 'much (neut.)' (cf. OIr. *il*; Skt *purú* with remodeled ablaut) > PGmc *felu (cf. Goth., OHG *filu*, ON *fjǫl-*);

PIE *pl̥h₁nós 'full' (cf. Skt *pūrṇás*, Lith. *pìlnas*) > PGmc *fullaz (cf. Goth. *fulls*, OE *full*);

PIE *pr̥Hmós 'first' (cf. Lith. *pìrmas*; parallel *pr̥Hwós in e.g. Skt *pū́rvas*, Toch. B *pärweṣṣe*) >⟶ PGmc *fruma-n- (cf. Goth. *fruma*, OE *forma*);

PIE *pórḱos 'pig' (cf. Lat. *porcus*; Lith. *paršas* 'barrow') > PGmc *farhaz 'piglet' (cf. OE *fearh*, OHG *farah*);

PIE *pénkʷe 'five' (cf. Skt *páñca*, Gk *πέντε* /pénte/) > PGmc *fimf (cf. Goth. *fimf*, OE *fīf;* the word-final labial is puzzling);

PIE *pró 'in front, forward' (cf. Skt *prá*, Gk *πρό* /pró/) > PGmc *fra- (cf. Goth. *fra-*, OE *for-*);

PIE *tóm 'that' (acc. sg. masc.) >⟶ PGmc *þanǭ (cf. Goth. *þana*, OE *þone*);

PIE *tórmos 'borehole' (cf. Greek *τόρμος* /tórmos/ 'socket') > PGmc *þarmaz 'intestine' (cf. ON *þarmr*, OE *þearm*);

PIE *tríns 'three (acc. masc.)' (cf. Skt *tŕ̥n*, Lat. *trīs*) > PGmc *þrinz (cf. Goth. *þrins*);

PIE *teg- 'to cover' (cf. Lat. *tegere*) in (post-)PIE *togom 'roof' > PGmc *þaką (cf. ON *þak*, OE *þæc*; similar semantic development in Lat. *tēctum*, OIr. *tugae*);

PIE *ḱím 'this' (acc. sg. masc.; cf. Lith. *šį̃*) >⟶ PGmc *hinǭ (cf. OE *hine* 'him', Goth. *und hina dag* 'until this day');

PIE *ḱérd- ~ *ḱr̥d- 'heart' (cf. Lat. *cord-*, Lith. *širdìs*) >⟶ PGmc *hertan- (cf. Goth. *haírto*, OE *heorte*);

PIE *ḱey- 'to be lying down' (cf. pres. 3sg. Skt *śéte*, Gk *κεῖται* /kêitai/) in *ḱóymos 'resting place' > PGmc *haimaz 'settlement' (cf. ON *heimr* 'world', OE *hām* 'home'; Goth. *haims* 'village' has been remodeled as an i-stem, but note a-stem pl. *haimos* 'countryside');

(post-)PIE *ḱr̥n- 'horn' (cf. Skt *śŕ̥ṅgam,* Lat. *cornū*; see Nussbaum 1986: 11–14) >⟶ PGmc *hurną (cf. Goth. *haúrn*, OE *horn*);

PIE *kátus 'fight' (cf. OIr. *cath* 'battle'; Luvian *kattawatnallis* 'plaintiff') > PGmc *haþuz 'battle' (cf. OE *heaþu-*, OHG *hadu-*; ON *Hǫðr*, name of the god of battle);

PIE *kusdʰo- 'treasure' (cf. Lat. *custōs* 'guardian', Gk *κύσθος* /kústʰos/ 'vulva') > PGmc *huzdą (cf. Goth. *huzd*, OE *hord*);

PIE *kóryos 'detachment' (OIr. *cuire* 'company'; Lith. *kārias* 'army') > PGmc *harjaz 'army' (cf. Goth. *harjis*, OE *here*);

(post-)PIE *kólso- 'neck' (cf. Lat. *collum*) > PGmc *halsaz (cf. Goth. *hals,* OE *heals*);

PIE *kʷóm 'which? (acc. sg. masc.; cf. Skt *kám* 'which?, whom?')' > *kʷón 'whom?' >⟶ PGmc *hʷanǭ (cf. Goth. *ƕana*, OE *hwone*);

PIE *kʷóteros 'which (of two)?' (cf. Gk *πότερος* /póteros/; Skt *katarás*) > PGmc *hʷaþeraz (cf. Goth. *ƕaþar*, OE *hwæþer*);

PIE *k^{w}yeh$_1$- 'to rest', derived noun *k^{w}yéh$_1$tis (cf. Lat. *quiēs*; Old Persian *šiyātiš* 'peace'), zero grade *k^{w}ih$_1$- in PGmc *h^{w}īlō 'time' (cf. Goth. *ƕeila*, OE *hwīl*).

Word-medial examples not adjacent to another obstruent are also easy to find. In addition to *kátus, *k^{w}óteros, and *pórḱos, cited above, note the following:

PIE *swépnos 'sleep' (cf. Skt *svápnas*) > PGmc *swefnaz 'sleep, dream' (cf. ON *svefn*, OE *swefn*);
PIE *népōts 'grandson' (cf. Lat. *nepōs*, Skt *nápāt*) >⟶ PGmc *nefō 'grandson, nephew' (remodeled as an n-stem; cf. OE *nefa*, OHG *nefo*);
PIE *b^{h}réh$_2$tēr 'brother' (cf. Skt *b^{h}rā́tā*, Lat. *frāter*) > PGmc *brōþēr (cf. ON *bróðir*, OE *brōþor*);
PIE *nítyos '(one's) own' (cf. Skt *nítyas*) > PGmc *niþjaz 'relative, kinsman' (cf. Goth. *niþjis*, ON *niðr*);
PIE *ánteros 'other (of two)' (apparently a derivative of *ályos 'other' with an archaic *l ~ *n alternation) > PGmc *anþeraz (cf. Goth. *anþar*, OE *ōþer*);
PIE *péḱu 'cattle, property' (cf. Skt *páśu*, Lat. *pecū*) > PGmc *fehu (cf. Goth. *faíhu*, OE *feoh*);
PIE *déḱm̥d 'ten' (cf. Skt *dáśa*, Lat. *decem*, Lith. *dẽšimt*) > PGmc *tehun (cf. Goth. *taíhun*);
PIE *swéḱuros 'father-in-law' (cf. Skt *śváśuras*, Lat. *socer*) > PGmc *swehuraz (cf. OE *swēor*, OHG *swehur*);
PIE *éḱwos 'horse' (cf. Skt *áśvas*, Lat. *equos*) > *ékwos > PGmc *eh^{w}az (cf. OE *eoh*; Goth. *aíƕatundi* 'thornbush', lit. *'horse-tooth');
PIE *lówkos 'clearing' (cf. Lith. *laũkas* 'field', Lat. *lūcus* 'grove') > PGmc *lauhaz (cf. OE *lēah* 'meadow', OHG *lōh* 'copse, grove');
post-PIE *márkos 'horse' (cf. Welsh *march*) > PGmc *marhaz (cf. OE *mearh*, OHG *marah*);
post-PIE *ák^{w}eh$_2$ 'running water' (cf. Lat. *aqua* 'water') > PGmc *ah^{w}ō 'river' (cf. Goth. *ahƕa*, OE *ēa*, OHG *aha*).

There are also a number of examples of labials and dorsals immediately preceding obstruents:

PIE *kh$_2$ptós 'grabbed' (cf. Lat. *captus* 'taken, caught') > PGmc *haftaz 'captive' (cf. OE *hæft*, OHG *haft*);
PIE *oḱtṓw 'eight' (cf. Skt *aṣṭáu*, Lat. *octō*) > PGmc *ahtōu (cf. Goth. *ahtau*, OE *eahta*);
PIE *swéḱs 'six' (cf. Av. *xšuuaš*, Gk *ἕξ* /héks/, Boiotian *Ϝέξ* /(h)wéks/) → *séḱs (by lexical analogy with 'seven'; cf. Skt *ṣáṭ*, Lat. *sex*) > PGmc *sehs (cf. Goth. *saíhs*, OE *siex*);

PIE *deḱs- 'right(-hand)' (cf. Gk δεξιός /deksiós/, Av. *dašinō*) > PGmc *tehswaz (cf. Goth. *taíhswa*, OHG *zeso, zesawēr*);
PIE *uksḗn 'bull, ox' (cf. Av. *uxša*) >⟶ PGmc *uhsō̄ (ending remodeled; cf. OE *oxa*, Goth. gen. pl. *aúhsne*).

Note also, with delabialization (see 3.2.3 (ii)):

PIE *nók^{w}t- ~ *nék^{w}t- 'night' (cf. Gk νύξ /núks/, νυκτ- /nukt-/; Hitt. *nekuz mēhur* 'evening time') > *nókt- > PGmc *naht- (cf. Goth. *nahts*, OHG *naht*).

If PIE *tst and/or *ts survived when Grimm's Law occurred, their initial *t's would presumably have been shifted to *þ; since the eventual outcome would almost certainly have been PGmc *ss in any case, we cannot date, relative to Grimm's Law, any of the changes that affected those clusters.

However, a PIE voiceless stop immediately following another obstruent was not affected by Grimm's Law. Most of the examples involve clusters of PIE *s and a stop; note the following:

PIE *spr̥d^{h}- 'contest' (cf. Skt *spr̥d^{h}-*) > PGmc *spurd- 'racecourse' (cf. Goth. *spaúrds*);
PIE *spr̥-n-h$_1$- 'to kick' (cf. Lat. *spernere* 'to despise, to reject', pf. *sprēvisse*) > PGmc *spurnaną 'to kick, to trample' (cf. OE *spurnan*);
PIE *h$_2$stér- 'star' (cf. Hitt. *hasterz*, Gk ἀστέρ- /astér-/) >⟶ PGmc *sternan- (cf. Goth. *staírno*, OE *steorra*);
PIE *stéh$_2$ti- ~ *sth$_2$téy- 'act of standing, place to stand', → *sth$_2$tís (cf. Skt *st^{h}itís*) > PGmc *stadiz 'place' (cf. Goth. *staþs*, OE *stede*);
PIE *stéyg^{h}eti '(s)he's walking' (cf. Gk στείχει /stéik^{h}ei/; Skt *stig^{h}-*, pres. 3sg. *stig^{h}nóti*) > PGmc *stīgidi '(s)he climbs' (cf. Goth. *steigiþ*, OE *stīġþ*);
PIE *h$_1$esti '(s)he is' (cf. Gk ἐστι /esti/, Lat. *est*) > PGmc *isti (cf. Goth., OHG *ist*);
PIE *g^{h}óstis 'stranger' (cf. Lat. *hostis* 'enemy', OCS *gostĭ* 'guest') > PGmc *gastiz 'guest' (cf. Goth. *gasts*, OE *ġiest*);
PIE *sḱéydeti '(s)he will cut (it) off' (cf. Rigvedic Skt aor. injunctive *mā́ c^{h}edma* 'may we not break') > PGmc *skītidi '(s)he defecates' (cf. ModHG *scheißt*; ON *skítr* with ending replaced; seldom attested in the older Gmc. documents);
PIE *skab^{h}eti '(s)he's scratching' (cf. Lat. *scabit*) > PGmc *skabidi '(s)he shaves' (cf. Goth. *skabiþ*, OE *scæfþ*);
(post-)PIE *pisk- 'fish' (cf. Lat. *piscis*) > PGmc *fiskaz (cf. Goth. *fisks*, OE *fisc*).

There are also some examples of PIE *t preceded by a labial or dorsal stop; cf. especially *kh$_2$ptós, *okt́ōw, and *nók^{w}t-, cited above (and 3.2.4 (iv) below).

The examples 'brother' and 'taken/caught' show that *h_2 was no longer an obstruent in contact with following *t when Grimm's Law affected the latter. PGmc *attō̄ 'dad' (see 3.2.3 (i)) presumably escaped Grimm's Law because of the Obligatory Contour Principle (since the second *t could not undergo the change).

PIE voiced stops became PGmc voiceless stops by Grimm's Law. Since this change and the one just described are in counterfeeding order, they must have occurred either simultaneously or in the chronological order implied by the order of presentation here. Since there seem to have been no restrictions on this stage of Grimm's Law, I give examples in various phonotactic positions together (though see also 3.2.4 (iv)). Examples involving PIE *b are rare both because it was the rarest PIE consonant and because two basic examples, *$h_2$ébō 'river' and *píbeti '(s)he's drinking', happen not to survive in Germanic. In addition to *déḱm̥d, *deḱs-, *pṓds, *ḱérd-, and *teg-, cited above, note:

PIE *d^héwbu- ∼ *d^hubéw- 'deep' (cf. Lith. *dubùs* 'hollow'; *d^hubrós in Toch. B *tapre* 'high') >⟶ PGmc *deupaz (cf. Goth. *diups*, OE *dēop*);

PIE *leb- 'lip' (cf. Lat. *labrum*; Hitt. *lilipai* '(s)he licks') > PGmc *lep- ∼ *lip- (cf. OE *lippa*);

PIE *treb- ∼ *tr̥b- 'building' (cf. OIr. *atreba* '(s)he dwells'; secondary zero grade in Lat. *trabs* 'beam') in PGmc *þurpą 'farmstead, village' (cf. ON *þorp*; Goth. *þaúrp* 'field');

(post-)PIE *g^hreyb- 'to grab, to grasp' (cf. Lith. *griẽbti* 'to grasp at, make a grab for') > PGmc *grīpaną (cf. Goth. *greipan*, OE *grīpan*);

PIE *dn̥ǵ^{h}wéh$_2$- 'tongue' (cf. Old Lat. *dingua*) >⟶ PGmc *tungōn- (cf. Goth. *tuggo*, OE *tunge*; the Gmc. form has been remodeled as an n-stem);

PIE *$h_1$dónt- ∼ *$h_1$dn̥t- 'tooth' (cf. Skt *dánt-* ∼ *dat-*) > PGmc *tanþ- ∼ *tund- (cf. ON *tǫnn*, OE *tōþ*; Goth. *tunþus* 'tooth', *aíhvatundi* 'thornbush', lit. *'horse-tooth');

PIE *dóru ∼ *dréw- 'tree, wood' (cf. Skt *dā́ru*, gen. sg. *drós*) >⟶ PGmc *trewą (cf. OE *trēo*; Goth. dat. pl. *triwam* 'with clubs');

PIE *dwóh$_1$ 'two' (masc. nom.-acc.; cf. Skt *dvā́*, Homeric Gk δύω /dúǫ:/) > ?PGmc *twō, possibly in OE *twæġen* > *twēġen* (*twō inō??; cf. van Helten 1906: 91–3, Ross and Berns 1992: 568–9, but see also 3.4.5 (ii)); or >⟶ ?PGmc *twai (with plural inflection, cf. Goth *twai*);

PIE *ád 'at' (cf. Lat. *ad*) > PGmc *at (cf. Goth. *at*, OE *æt*);

PIE *k^{w}ód 'which? (neut.)' (cf. Lat. *quod*; Vedic Skt *kád* 'what?') > PGmc *h^{w}at 'what?' (cf. ON *hvat*, OE *hwæt*);

PIE *$h_1$ed- 'to eat' (cf. Homeric Gk ἔδειν /é:dɛ:n/, Lat. *edere*) > PGmc *etanā (cf. Goth. *itan*, OE *etan*);

PIE *wréh$_2$d- ~ *wr̥h$_2$d- 'root' (cf. Lat. *rādīx*) > *wrād- ~ *wurd- > PGmc *wrōt- ~ *wurt- (cf. Goth. *waúrts*, ON *rót*; OE *wyrt* 'plant');

PIE *swā́dus 'pleasant, sweet' (*swéh$_2$dus?; cf. Skt *svādús*, Gk *ἡδύς* /hę:dús/) > PGmc *swōtuz → PNWGmc *swōtiz (cf. ON *sætr*, OE *swēte*);

PIE *wóyde '(s)he knows' (cf. Skt *véda*, Gk *οἶδε* /ôide/) > PGmc *wait (cf. Goth. *wait*, OE *wāt*);

PIE *ǵn̥h$_1$tós 'born' (cf. Skt *jātás*, Lat. *nātus*, Homeric Gk *κασίγνητος* /kasígnę:tos/ 'brother', lit. 'co-gnātus') > PGmc *kundaz (cf. Goth. *aírþakunds* 'of earthly origin', OE *godcund* 'divine');

PIE *ǵr̥h$_2$nóm 'crushed, ground' (neut.; cf. Skt *jīrṇám* 'worn out', Lat. *grānum* 'grain') > PGmc *kurną 'grain' (cf. Goth. *kaúrn*, OE *corn*);

PIE *ǵómb^{h}os 'row of teeth' (cf. Skt pl. *jámb^{h}āsas*; Gk *γόμφος* /gómp^{h}os/ 'peg') > PGmc *kambaz 'comb' (cf. ON *kambr*, OE *camb*);

PIE *ǵónu ~ *ǵnéw- 'knee' (cf. Skt *jā́nu*, Gk *γόνυ* /gónu/) >→ PGmc *knewą (cf. Goth. *kniu*, OE *cnēo*);

PIE *h$_2$éǵeti '(s)he is driving' (cf. Skt *ájati*, Lat. *agit*) > PGmc *akidi '(s)he goes in a vehicle' (cf. ON inf. *aka*; ?also OE *acan* 'to ache', Seebold 1970: 75);

PIE *h$_2$éǵros 'pasture' → 'field' (cf. Skt *ájras*, Lat. *ager*) > PGmc *akraz (cf. Goth. *akrs*, OE *æcer*);

PIE *wérǵom 'work' (cf. Gk *ἔργον* /érgon/; for the palatal cf. the related verb in Av. *vərəziieiti*) > PGmc *werką (cf. ON *verk*, OE *weorc*);

PIE *égh$_2$ 'I' (cf. Skt *ahám*, Lat. *ego*, both with innovative second syllables) > PGmc *ek, unstressed *ik (cf. ON *ek*, OE *iċ*);

PIE *gol- 'cold' (o-grade; cf. Lat. *gelū*, Lith. *gelumà* 'frost') in PGmc *kalaną 'to be cold, to freeze' (cf. ON *kala*, OE *calan*) and *kaldaz 'cold' (cf. Goth. *kalds*, ON *kaldr*, OE *ċeald*);

PIE *glewb^h- 'to split' (cf. Lat. *glūbere* 'to peel') > PGmc *kleubaną (cf. ON *kljúfa*, OE *clēofan*, OHG *klioban*);

PIE *yugóm 'yoke' (cf. Skt *yugám*, Lat. *iugum*) > PGmc *juką (cf. OE *ġeoc*; Goth. *juk* 'yoke (of oxen), pair');

(post-)PIE *tong- 'to percieve, to think' (cf. dialectal Lat. *tongitiō* 'nōtiō, idea', OIr. *tongid* '(s)he swears') > PGmc *þank- in *þankijaną 'to think' (cf. Goth. *þagkjan*, OE *þenċan*), *þankō 'thanks' (cf. ON *þǫkk*, OE *þanc*);

PIE subjunctive *g^{w}émeti '(s)he will step' (cf. Skt *gámat*, Hoffmann 1955*b*) > PGmc *k^{w}imidi '(s)he comes' (cf. Goth. *qimiþ*, OHG *quimit*; on the shift in function see 3.3.1 (ii));

PIE *g^{w}én 'woman (nom. sg.)' (OIr. *bé*; cf. Jasanoff 1989) >→ PGmc *k^{w}ēniz 'wife' (cf. Goth. *qens*; OE *cwēn* 'queen');

PIE *g^{w}ih$_3$wós 'alive' (cf. Skt *jīvás*, Lat. *vīvos*, and with analogical full-grade root Gk *ζωός* /sdǫ:ós/) > *k^{w}ikwós > PGmc *k^{w}ik^{w}az (cf. ON *kvikr*, OE *cwic*);

PIE *g^{w}réh$_2$u- ~ *g^{w}r̥h$_2$éw- 'heavy' (cf. Lat. *gravis*) → *g^{w}r̥h$_2$ús (cf. Skt *gurús*, Gk *βαρύς* /barús/) > PGmc *kuruz (cf. Goth. *kaúrus*);

PIE *h$_1$rég^{w}os ~ *h$_1$rég^{w}es- 'darkness' (cf. Skt *rájas* 'empty space', Gk *ἔρεβος* /érebos/ 'hell'; for the meaning cf. the related formation *h$_1$r̥g^{w}ónt- in Toch. B *erkeṃt* 'black (obl. sg. masc.)') > PGmc *rek^{w}az ~ *rik^{w}iz- (cf. Goth. *riqis*);

PIE *h$_3$éng^{w}n̥ 'ointment' (cf. Lat. *unguen*), collective *h$_3$éng^{w}ō > PGmc *ank^{w}ō̄ (Jasanoff 2002: 35; cf. OHG *ancho* 'butter').

It seems clear that an *s immediately preceding any of these stops adjusted in voicing as this change occurred, to judge from two clear examples of PIE *sd:

PIE *h$_3$ósdos 'branch' (cf. Gk *ὄζος* /ósdos/; Hitt. *hasduēr* 'twigs, brush') > *ósdos > PGmc *astaz (cf. Goth. *asts*, OHG *ast*);

PIE *nisdós 'seat' (*ni-sd- 'down-sit-', cf. Arm. *nist*, Skt *nīḍás*), 'nest' (cf. Lat. *nīdus*, OIr. *net*, Welsh *nyth*) > PGmc *nistaz 'nest' (*nestaz??; that is the form reconstructable from OE, OS, OHG *nest*—the word does not occur in North or East Germanic—but the lowering of the vowel in OE is puzzling).

Finally, the breathy-voiced stops of PIE became PGmc voiced obstruents, conventionally written *b, *d, *g, *g^{w}, which were stops in some environments and fricatives in others. The pattern of allophony is not clear in every detail, because it was noncontrastive and has to be deduced from the corresponding patterns in the attested daughters. (The comparative method gives mathematically certain results only for contrasts.) So far as we can tell, the PGmc allophony was the following. All these phonemes were stops immediately after homorganic nasal consonants; *b and *d, but not *g, were also stops word-initially (see below on *g^{w}); *d was also a stop immediately after *l and *z. The allophony of *d after *r is unclear; in Gothic it behaves like a stop (e.g. not devoicing word-finally, so that the nom.-acc. sg. of 'word' is *waúrd*, not '*waúrþ*'), but in Old Norse it is a fricative (so that 'word', for example, is *orð*). (WGmc is no help on this point, since PGmc *d became a stop in all positions in that subgroup.) Since the outcomes of Verner's Law, which should have been fricatives (see 3.2.4 (ii)), merged with these preexisting obstruents, it was long believed that Grimm's Law must have changed PIE *b^{h}, etc., into fricatives in every position, and that these phonemes acquired stop allophones only after Verner's Law had occurred. But it seems clear from more modern work in phonology that the rules governing these allophones could have operated as surface filters, and thus could have preexisted Verner's Law. In what follows I shall use the traditional spellings; once again, the reader must remember that they do not reflect the phonetics of the sounds precisely.

I here give examples only for the PIE labial, coronal, palatal, and velar stops; discussion of the labiovelar is postponed till section 3.2.4 (iii), since in most positions it underwent further changes before the PGmc period. In addition to *b^{h}réh$_{2}$tēr, *skab^{h}eti, *glewb^{h}-, *ǵómb^{h}os, *d^{h}éwbu-, *spr̥d^{h}-, *g^{h}óstis, and *stéyg^{h}eti, cited above, note:

PIE *b^{h}éreti '(s)he's carrying' (cf. Skt *b^{h}árati*, Lat. *fert*) > PGmc *biridi (cf. Goth. *baíriþ*, OE *birþ*);

PIE subjunctive *b^{h}éydeti '(s)he will split' (cf. Skt *b^{h}édati*) > PGmc *bītidi '(s)he bites' (cf. Goth. *beitiþ*, OE *bītt*);

PIE *b^{h}uh$_{2}$- 'to become' (cf. aorist 3sg. Skt *áb^{h}ūt*, Gk *ἔφῡ* /ép^{h}uː/) → pres. *b^{h}uh$_{2}$-ye/o- (cf. Þórhallsdóttir 1993: 152–63 with references) > PGmc *būanaⱬ 'to dwell' (cf. ON *búa*, OE *būan*);

PIE *h$_{3}$b^{h}rúHs 'eyebrow' (cf. Gk *ὀφρῦς* /op^{h}rúːs/, Skt *b^{h}rús*) > *brūz → PGmc *brūwō (cf. OE *brū*);

(post-)PIE *b^{h}r̥ǵ^{h}- 'hill' (cf. OIr. *brí, brig-*; the root is PIE 'high') > PGmc *burg- 'hill- fort' (cf. Goth. *baúrgs*, OE *burg*, both 'town');

PIE *web^{h}(H)- 'to weave' (cf. Skt *vab^{h}(i)-*, Toch. B /wəpa-/) > PGmc *webanaⱬ (cf. OE *wefan*, OHG *weban*);

PIE *d^{h}éh$_{1}$ti- ~ *d^{h}h$_{1}$téy- 'act of putting' (cf. Gk *θέσις* /t^{h}ésis/; Av. *zraz-dāti-* 'belief' (lit. 'putting faith'), Skt *vásu-d^{h}iti-* 'bestowal of goods') >→ *d^{h}ētís > PGmc *dēdiz 'deed' (cf. OE *dǣd;* Goth. *missadeþs* 'misdeed, sin');

PIE *d^{h}óh$_{1}$mos 'thing put' (cf. Greek *θωμός* /t^{h}ǫːmós/ 'heap') > PGmc *dōmaz 'judgment' (cf. Goth. *doms*, OE *dōm*);

PIE *d^{h}ugh$_{2}$tḗr 'daughter' (cf. Skt *duhitā́*, Gk *θυγάτηρ* /t^{h}ugáteːr/) > PGmc *duhtēr (cf. ON *dóttir*, OE *dohtor*);

PIE *d^{h}wór- ~ *d^{h}ur- 'door' (cf. Gk *θύρᾱ* /t^{h}úraː/, Lat. pl. *forēs*) > PGmc *dur- (cf. OE *duru*; Goth. *daúr*, OE *dor* 'gate');

PIE *h$_{1}$wid^{h}éwh$_{2}$ ~ *h$_{1}$wid^{h}wéh$_{2}$- 'widow' (cf. Skt *vid^{h}ávā*, Lat. *vidua*) >→ PGmc *widuwōn- (cf. Goth. *widuwo*, OE *widuwe*);

PIE *méd^{h}yos 'middle' (cf. Skt *mád^{h}yas*, Lat. *medius*) > PGmc *midjaz (cf. Goth. *midjis*, OE *midd*);

PIE *sámh$_{2}$d^{h}os 'sand' (cf. Gk *ἄμαθος* /ámat^{h}os/) > *sáməd^{h}os > *sámd^{h}os > PGmc *samdaz (sic; cf. MHG *sam(b)t* beside ON *sandr*, OE *sand*, OHG *sant*, and see 3.2.6 (ii));

PIE *misd^{h}ó- 'reward' (cf. Gk *μισθός* /mist^{h}ós/; Skt *mīd̥^{h}ám* 'prize') > PGmc *mizdō (cf. OE *mēd*, *meord*; Goth. *mizdo* has been remodeled as an n-stem);

PIE *ǵ^{h}áns 'goose' (cf. Gk *χήν* /k^{h}ɛ́ːn/, Lith. *žąsìs*) > PGmc *gans (cf. OE *gōs*, OHG *gans*);

PIE *ǵ^{h}elHwos 'yellow' (cf. Lat. *helvos* 'bay (horse)'; for the palatal cf. OCS *zelenŭ* 'green') > PGmc *gelwaz (cf. OE *ġeolu*, OHG *gelo*);

PIE *wéǵ^{h}eti '(s)he's transporting (it)' (cf. Skt *váhati* (aor. *ávāṭ* with reflex of palatal cluster), Lat. *vehit*) > PGmc *wigidi '(s)he moves' (cf. OE *wiġþ*, OHG *wigit*);

PIE *h$_3$méyǵ^{h}eti '(s)he's urinating' (cf. Skt *méhati* (past ptc. *mīḍhás* with reflex of palatal cluster), Gk *ὀμείχει* /oméik^{h}ei/) > PGmc *mīgidi (cf. OE *mīġþ*);

(post-)PIE *g^{h}ayd- 'goat' (cf. Lat. *haedus* 'kid') > PGmc *gait- (cf. Goth. *gaits*, OE *gāt*);

PIE *dl̥h$_1$g^{h}ós 'long' (cf. Skt *dīrg^{h}ás*, OCS *dlŭgŭ*) > PGmc *tulgaz 'firm' (cf. Goth. *tulgus* 'firm, steadfast' (*'long-lasting'), transferred into the u-stems; OE adv. *tulge* 'firmly');

PIE *lég^{h}yeti '(s)he's lying down [eventive]' (cf. OCS *ležetŭ* [stative], Homeric Gk aor. *λέκτο* /lékto/ '(s)he lay down') >⟶ PGmc *ligiþi (stative; cf. OE *liġþ*, OHG *ligit*);

PIE *h$_3$nog^{h}(w)- 'claw, nail' (cf. Gk *ὀνυχ-* /ónuk^{h}-/, Lith. *nāgas*) >⟶ PGmc *naglaz (cf. ON *nagl*, OE *næġl*).

3.2.4 (ii) *Verner's Law and the elimination of contrastive accent* After the PIE voiceless stops had become voiceless fricatives by Grimm's Law, they became voiced by Verner's Law if they were not word-initial *and* not adjacent to a voiceless sound *and* the last preceding syllable nucleus was unaccented; *s was also affected, and became voiced *z under the same conditions (cf. Schaffner 2001: 57–60). I postpone discussion of the labiovelar to section 3.2.4 (iii). Note especially these synchronically underived examples:

PIE *upér(i) 'over, above' (cf. Skt *upári*, Gk *ὑπέρ* /hupér/) > *ufér, *uféri > PGmc *uber, *ubiri (cf. OHG *obar*, *ubiri*; OE *ofer* but ON *yfir*);

PIE *h$_2$wap- 'evil' (cf. Hitt. *huwappas*, Melchert 1994: 147) suffixed in *h$_2$upélos > *ufélos > PGmc *ubilaz 'evil, bad' (Watkins 1969: 30; cf. Goth. *ubils*, OE *yfel*);

PIE *selp- 'to anoint', attested mostly in derived nouns (cf. Skt *sarpís* 'ghee', Toch. B *ṣalype* 'oil, fat'); *sólpos 'ointment', collective *solpéh$_2$ > *solfā́ > PGmc *salbō (cf. OE *sealf*, OHG *salba*), derived verb *salbōną 'to anoint' (cf. Goth. *salbon*);

PIE *septḿ̥ 'seven' (cf. Skt *saptá*, Lat. *septem*) > *seftún → *seftúnt > *sefúnt > PGmc *sebun (see Stiles 1985–6, part 3, pp. 6–7; cf. Goth. *sibun*, OE *seofon*);

PIE *ph$_2$tḗr 'father' (cf. Skt *pitā́*, Lat. *pater*) > *faþḗr > PGmc *fadēr (cf. ON *faðir*, OE *fæder*);

PIE *meh$_2$tḗr 'mother' (cf. Skt *mātā́*, Lat. *māter*) > *māþḗr > PGmc *mōdēr (cf. ON *móðir*, OE *mōdor*);

PIE *k^{w}etwór 'four (neut.)' (cf. Skt *catvā́ri*, Lat. *quattuor*) >⟶ *feþwór (initial labial probably by lexical analogy with 'five') > PGmc *fedwōr (cf. Goth. *fidwor*, OE *fēower*);

PIE *ḱm̥tóm 'hundred' (cf. Skt *śatám*, Lat. *centum*, Lith. *šimtas*) > *hunþón > PGmc *hundą (cf. Goth. pl. *hunda*, OE *hundred*);

PIE *h$_2$énh$_2$t- 'duck' (cf. Lat. *anat-*, Lith. *ántis*) > *ánuþ- > PGmc *anud- (cf. OHG *anut*, OE i-stem *ened*);

PIE *wr̥h$_1$tóm 'said' (neut.; see 3.2.2 (i)) > *wurþón > PGmc *wurdą 'word' (cf. Goth. *waúrd*, OE *word*);

PIE *tewtéh$_2$ 'tribe, people' (cf. Oscan *touto*, OIr. *túath*, Lith. *tautà*) > *þeuþā́ > PGmc *þeudō (cf. Goth. *þiuda*, OE *þēod*);

PIE *swekrúh$_2$ 'mother-in-law' (cf. Skt *śvaśrū́s*) > *swehrū́ >⟶ PGmc *swegrū? or >⟶ *swegrō?; in either case, > PWGmc *swegru (cf. OE *swe*ġ*er*, OHG *swigar*);

PIE *h$_2$yuHn̥ḱós 'young' (cf. Skt *yuvaśás*; Lat. *iuvencus* 'steer', i.e. 'young bull') > *yunhós > PGmc *jungaz (cf. Goth. *juggs*, OE *iung, ġeong*);

post-PIE pres. *wiké/ó- 'to fight' (cf. OIr. 3sg. *fichid*) > *wihé/ó- > PGmc *wiganą 'to fight' (cf. Goth. *du wigana* 'to battle'; ON *vega*, influenced by lexical analogy with *vega* 'to move');

PIE *snusós 'daughter-in-law' (cf. Gk *νυός* /nuós/) → *snuséh$_2$ (cf. Skt *snuṣā́*) > PGmc *snuzō (cf. OE *snoru*, OHG *snura*);

PIE *h$_2$ḱ-h$_2$ows-iéti '(s)he is sharp-eared' (cf. Gk *ἀκούειν* /akóueːn/ 'to hear') > PGmc *hauzīþi '(s)he hears' (cf. OE *hīerþ*, OHG *hōrit*);

PIE *mḗms ~ *méms- (cf. Skt *mā́s*, Toch. B pl. *misa*) → *mēmsóm (cf. Skt *māṃsám*) or *memsóm (see 3.2.1 (iii)) > PGmc *mimzą (cf. Goth. *mimz*);

PIE *h$_1$rég^{w}os ~ *h$_1$rég^{w}es- 'darkness' (cf. Skt *rájas* 'empty space', Gk *ἔρεβος* /érebos/ 'hell'; for the meaning cf. the related formation *h$_1$r̥g^{w}ónt- in Toch. B *erkeṃt* 'black (obl. sg. masc.)') > PGmc *rek^{w}az ~ *rik^{w}iz- (cf. Goth. *riqis*, gen. *riqizis*, ON *røkkr*);

PIE *dus- 'bad' (cf. Skt *duṣ-*, Gk *δυσ-* /dus-/) > PGmc *tuz- (cf. Goth. *tuzwerjan* 'to doubt', OE *torbeġīete* 'hard to get').

Since Grimm's Law followed the loss of laryngeals, so did Verner's Law; cf. also 'father', 'mother', and 'duck' in the above list. Determining whether Verner's Law followed the contraction of vowels in hiatus depends on finding a clear example of the purely phonological development of a PIE sequence *V′(H)VC, where *C is a consonant that could have undergone Verner's Law. The examples adduced in Schaffner 2001: 59–60 do not seem to me compelling enough to decide the question beyond a reasonable doubt, and I can adduce no others. (The example PIE *-oes, including *-óes, > PGmc

*-ō̄z, adduced in section 3.2.1 (ii), is not probative either, since *-z was generalized at the expense of *-s in the endings of polysyllabic nominals in PGmc. The unexpected appearance of *-s* in northern WGmc in this ending will be discussed in vol. ii.)

There is surprising evidence that Verner's Law followed the apocope of word-final nonhigh vowels (see 3.2.5 (i)); the only example is the pronoun 'us', but it appears to be clinching. The development of personal pronouns will be discussed in detail in 3.4.5 (iv); here it is sufficient to note that in pre-PGmc the PIE stressed oblique 1pl. *n̥smé was replaced by *n̥swé (on the model of 2pl. *uswé), which then developed as follows:

post-PIE *n̥swé 'us' > *unswé > *úns (with retraction of the accent upon apocope, bleeding Verner's Law) > PGmc *uns (cf. Goth., OHG *uns*).

The only way to account for the voiceless *s of all the attested forms is to posit a shift of the accent to the preceding vowel before Verner's Law occurred; and the only plausible motivation for such a shift is the loss of the word-final vowel, which had originally borne the accent.

There are two potential counterexamples to this hypothesis, both of which are prepositions / preverbs:

?PIE *apó 'away' (cf. Gk *ἀπό* /apó/, *ἄπο* /ápo/[3] 'from', Skt *ápa* 'away') > *afó > ?*abó > PGmc *ab (cf. Goth. *af, ab-u,* OE *of,* OHG *ab*);

?PIE *supó 'under, near' (cf. Toch. B *spe* 'near', Gk *ὑπό* /hupó/, *ὕπο* /húpo/ 'under') → *upó (under the influence of *upér(i) 'over'; cf. Skt *úpa*) > *ufó > ?*ubó > PGmc *ub 'under' (cf. Goth. *uf, ub-uh*).

But neither of these counterexamples is probative. It is clear from a third example that words of this class were destressed, or could be destressed, at some point before Verner's Law occurred:

PIE *éti 'in addition' (cf. Gk *ἔτι* /éti/) > *eþi(-) > *edi(-) > PGmc *idi(-) 'but, and' (cf. Lat. *et* 'and'), 'counter-, re-' (cf. Goth. *id-*, OHG *iti-*; OE *ed-* exhibits an unexpected vowel, while the fricative of Goth. *iþ* can have undergone word-final devoicing).

[3] Whether the accent of *ἀπό* and *ὑπό* is linguistically real is not clear. These words usually appear as proclitics before the case-marked nominals which they govern, and in that environment their acute accents are replaced by grave—i.e. their surface phonological forms are accentless. Before enclitics (such as *τε* 'and') they do exhibit acute accents on their final syllables, but those accents can be attributed to the enclitic. When they follow the nominal which they govern, we find instead barytone *ἄπο* and *ὕπο*—which might be the underlying forms, and which agree in accent with the Skt cognates. Consequently it is not at all clear that PIE forms in accented *-ó should be reconstructed; I have done so here only for the sake of making an argument a fortiori.

Obviously the same destressing could have affected the ancestors of PGmc *ab and *ub.

Relatively isolated examples of the sort adduced above are important for establishing the fact that a regular sound change occurred, but the major impact of Verner's Law on PGmc grammar was that it introduced a widespread alternation between voiceless and voiced fricatives. That alternation will concern us repeatedly in the sections on inflectional morphology.

Though the phonetic mechanism of Verner's Law is not fully understood, it seems clear that the contrastive accent which pre-PGmc had inherited from PIE must have become a (predominantly) stress accent in order to trigger such a voicing. However, after Verner's Law had run its course contrastive accent was lost; stress then fell by default on the initial syllable of the phonological word. Since that destroyed the original phonological conditioning factor for Verner's Law, the alternations just referred to became morphologically conditioned. Not surprisingly, their subsequent history has been a story of gradual loss; in modern English, for instance, only a few fossilized relics of the Verner's Law alternations remain.

There seems to be a widespread belief among theoretical phonologists that Verner's Law applied to a somewhat different set of forms in Gothic because in the Gmc dialect ancestral to that language unique accentual developments had occurred before Verner's Law applied. Bernhardsson 2001 has conclusively refuted that view.

Verner's Law must have occurred before most of the sound changes which removed *g^w from the language, since *g^w which arose by Verner's Law were treated in the same way as those that reflected PIE *g^{wh}. I now turn to that complex of changes.

3.2.4 (iii) *The elimination of* *g^w PIE *g^{wh} became pre-PGmc *g^w by Grimm's Law, at least in most environments (see below), and the voicing of pre-PGmc *h^w by Verner's Law also yielded *g^w in the first instance. However, by the PGmc period most examples of this consonant had been eliminated by further sound changes. The most important work on this problem is Seebold 1967*b*, on which this section is largely based, though I have not invariably adopted his solutions. Note that many of the etymologies that have been adduced for one phonological outcome or another are doubtful; like Seebold, I have tried to use only relatively certain examples as evidence.

In word-initial position PIE *g^{wh} became PGmc *b, except when it had already been delabialized by a following *u (see 3.2.3 (ii)). Examples are few, since this PIE stop was relatively rare:

PIE *g^{wh}éd^{h}yeti '(s)he is asking for' (cf. Av. *ǰaδiieiti*, OIr. *guidid*; intensive in Gk *ποθεῖ* /pot^{h}êi/ '(s)he longs for') >⟶ PGmc *bidiþi, inf. *bidjaną (cf. Goth. *bidjiþ*, *bidjan*, OE *bitt, biddan*, and see 3.4.3 (i) ad fin.);

PIE *g^{wh}en- 'strike, kill' (cf. Skt *hánti*, Hitt. *kuēnzi*), o-grade *g^{wh}on- (cf. Gk *φόνος* /p^{h}ónos/ 'murder') in PGmc derived nouns *banō̄ 'murderer' (cf. ON *bani,* OE *bana*), *banjō 'wound' (cf. Goth. *banja*, OE *benn*);

PIE *g^{wh}reh$_1$- 'smell' (cf. Skt *g^{h}rā-*) > PGmc *brē- in OE *brǣþ* 'smell, vapor'.

There is also a possible example of PIE *ǵ^{h}w, which would have merged with *g^{wh} (see 3.2.3 (ii)):

PIE *ǵ^{h}wḗr- ∼ *ǵ^{h}wér- 'wild animal' (cf. Gk *θήρ* /t^{h}ḗːr/, Lith. *žvėrìs;* Lat. *ferus* 'wild') > PGmc *berō̄ 'bear' (cf. OE *bera*, OHG *bero*).

This Germanic word is usually said to reflect a root *b^{h}er- 'brown'; but while that is plausible semantically (in light of later, historical developments in various languages), an actual PIE word of that shape and meaning is not recoverable, whereas 'wild animal' is securely reconstructable. The etymology given above should therefore perhaps be preferred (pace Seebold 1967*b*: 115).

It is difficult to specify precisely the intermediate stages that led to this result. Since there seems to be a 'phonological conspiracy' to eliminate *g^{w} from the consonant inventory of PGmc, it would be reasonable to suggest that the shift to labial articulation followed Grimm's Law, the development being *g^{wh} > *g^{w} > *b. However, we cannot completely exclude the possibility that this rare consonant was eliminated in word-initial position before the relevant part of Grimm's Law occurred, so that the development was *g^{wh} > *b^{h} > *b instead. All we can say for certain is that the shift followed the delabialization of labiovelars next to *u, which bled it (see 3.2.3 (ii)).

In word-internal position it seems clear that Grimm's Law applied before anything else happened, so that *g^{wh} > *g^{w}; in addition, Verner's Law clearly voiced pre-PGmc *h^{w} to *g^{w}. It is the subsequent development of that outcome that concerns us here.

Immediately following a (homorganic) nasal, *g^{w} survived in PGmc. There is really only one example that has not been delabialized next to *u, but it is virtually certain:

PIE *seng^{wh}- 'to chant', derived noun *sóng^{wh}os (collective *song^{wh}éh$_2$ > *honk^{wh}ā́ > Gk *ὀμφή* /omp^{h}ḗː/ 'divine voice') > PGmc *sing^{w}aną 'to sing', *sang^{w}az 'song' (cf. Goth. *siggwan*, ON *syngva*, OF *siunga;* labialization lost regularly in OE, OS, OHG *singan*; Goth. *saggws*, ON

sǫngr, OF *song*, OE *song* ∼ *sang*, OS, OHG *sang*, with regular loss of labialization in all the WGmc languages and some shifts of stem class (i-stem in Gothic, neut. in OHG)).

Elsewhere either the labialization or the occlusion was lost, apparently already in PGmc; in most environments the latter change occurred, resulting in *w. It seems clear that that was the regular development intervocalically, to judge from the one certain Grimm's Law example:

PIE *sneyg^{wh}- 'to snow' (cf. Gk *νείφειν* /néip^{h}e:n/, Old Lat. pres. 3sg. *nīvit* (*nĭvit?*)), derived noun *snóyg^{wh}os (cf. Lith *sniẽgas*, OCS *sněgŭ*) > PGmc *snīwidi 'it's snowing', *snaiwaz 'snow' (cf. ON *snýr*, OHG *snīwit*; Goth. *snaiws*, ON *snjór*, OE *snāw*, OHG *snēo*).

There are also three good examples of the outcome of Verner's Law:

PIE aor. subj. *léyk^{w}eti '(s)he will leave (it)' (Gk pres. indic. *λείπει* /léipei/ '(s)he is leaving (it)'; see 3.2.3 (ii)) > PGmc *līh^{w}idi '(s)he lends' (cf. Goth. *leihviþ*): PIE verbal adj. *lik^{w}nós remodeled in pre-PGmc ptc. *lih^{w}onós > *lig^{w}onós > PGmc *liwanaz 'lent' (cf. OHG *giliwan*);

PIE aor. subj. *séyk^{w}eti '(s)he will filter' (cf. late Rigvedic Skt pres. indic. *sécate* '(s)he moistens', beside frequent *siñcáti* and aor. 3pl. *asican*) > PGmc *sīh^{w}idi '(s)he filters' (cf. OHG *sīhit*): PIE verbal adj. *sik^{w}nós remodeled in pre-PGmc ptc. *sih^{w}onós > *sig^{w}onós > PGmc *siwanaz 'filtered' (cf. OE *siwen*; OHG *bisiwan* 'parched');

PIE *sek^{w}- 'to see' (cf. Alb. *sheh* '(s)he sees'; Hitt. *sākuwa* 'eyes') > PGmc *seh^{w}aną (cf. Goth. *saihvan*): (post-)PIE verbal adj. *sek^{w}nós remodeled in pre-PGmc ptc. *seh^{w}onós > *seg^{w}onós > PGmc *sewanaz 'seen' (cf. OE *sewen*, OHG *gisewan*).

On the other hand, there seems to be a clear counterexample in which all the NWGmc languages exhibit *-g-:*

post-PIE *kneyg^{wh}- 'to bend, to droop' (cf. Lat. *cōnīvēre* 'to close the eyes') > PGmc 'to bow': *hnīwaną (cf. Goth. *hneiwan*)? or *hnīganą (cf. ON *hníga*, OF *hnīga*, OE, OS *hnīgan*, OHG *nīgan*)?

Since this is a verb (like all the other clear examples), it is reasonable to suppose that analogical leveling has occurred in different directions in the different daughters; Seebold 1967*b*: 122 therefore suggests that the NWGmc languages have leveled the *-g- that ought to have occurred before *-u- in the indicative dual and plural of the past tense, while Gothic has leveled the *-w-

that ought to have occurred everywhere else. That solution has the great merit of refusing to accept a sporadic sound change (a very rare type of phenomenon), but it would be more plausible if *-g- had occurred in a greater variety of environments. In fact *-h- should have occurred before past indic. 2sg. *-t (cf. 3.2.3 (ii) ad fin., 3.2.4 (iv)), and in that position it could have been interpreted as underlying */-g-/ by native learners. But it is also worth asking whether *-g was not also the regular outcome in the endingless past indic. 1sg. and 3sg.—thus in the entire past indicative—which would have made its propagation through the rest of the paradigm by reanalysis much more likely. This seems possible, since some other instances of the delabialization of *g^w to *g followed Verner's Law, which followed the loss of word-final nonhigh vowels (see below, and cf. 3.2.8).

Immediately before sonorants the PGmc outcome was likewise *w, forming u-diphthongs with the preceding vowel. There are at least three solid examples:

PIE *neg^{wh}ró- 'kidney' (cf. pl. Gk *νεφροί* /nep^hrói/, dialectal Lat. *nefrōnēs*) >⟶ PGmc *neurō̄ (n-stem, like the Latin word; cf. ON *nýra*, OHG *nioro*);

post-PIE *sek^{w}nís 'sight' (derived from 'see', cf. immediately above) > *seh^{w}nís > *seg^{w}nís > PGmc *siuniz (cf. Goth. *siuns* 'face', OE *sīen* 'appearance');

PIE *k^{w}ék^{w}los 'wheel' (cf. Gk *κύκλος* /kúklos/; Toch. B *kokale* 'chariot') > PGmc *h^{w}eh^{w}laz (cf. ON *hvél*, OE *hwēol*); but PIE collective *k^{w}ek^{w}léh$_2$ (cf. Homeric Gk pl. *κύκλα* /kúkla/, Skt neut. sg. *cakrám*) > PGmc *h^{w}eula- (cf. ON *hjól*).

In this case too there is a counterexample: whereas one might expect the Verner's Law variant also to have resulted in OE *hwēol*, we find in addition not only *hweowul* (in which the vocalic segment before the *l* has been reanalyzed as consonantal), but also *hweogol* (with an apparent alternative outcome of pre-PGmc *g^w). However, in this case it is possible to argue that the OE *g* is the result of a late reanalysis. It can only have been the perception that the word exhibited a Verner's Law alternation which caused learners of some pre-OE generation to reinterpret the *u as a *w in *hweowul* (which in time led also to the insertion of an epenthetic vowel). But word-medial *h^w merged with *h in West Germanic (see vol. ii), and the Verner's Law alternation *h ∼ *w was gradually replaced lexically by the more common *h ∼ *g; for instance, while *w survives in the participles 'seen' and 'filtered' cited above, the participle 'lent', which ought to have been OE *liwen, actually appears as *(for)liġen*. I can see no reason why the *g* of *hweogol* might not have arisen in the same way within the separate history of OE.

Before *j the situation is more complex. There is a clear example of (*w >) *u:

post-PIE *ák^{w}eh$_2$ 'running water' (cf. Lat. *aqua* 'water') > PGmc *ah^{w}ō 'river' (cf. Goth. *ahva*, OE *ēa*, OHG *aha*): pre-PGmc derived noun *ah^{w}já 'island' > *ag^{w}já > PGmc *aujō (cf. ON *ey*, OE *īeġ*).

But there are also two good examples of *g before *j:

PGmc *sagjaz 'retainer, warrior' (cf. ON *seggr*, OE *seċġ*), which appears to be cognate with Lat. *socius* 'ally' and must be a derivative of PIE *sek^{w}- 'accompany, follow' (cf. pres. 3sg. Skt *sácate*, Lat. *sequitur*) to which Grimm's Law and Verner's Law have applied;

PGmc *sagjaną 'to say' (cf. ON *seg(g)ja*, OE *seċġan*), which is clearly a derivative of PIE *sek^{w}- 'to say' (cf. Homeric Gk iptv. 2sg. *ἔννεπε* /énnepe/ 'tell!' < *en-hek^{w}-, Lat. *inquit* '(s)he said' < *en-sk^{w}-) to which Grimm's Law and Verner's Law have applied.

Closer inspection of these latter two examples reveals an interesting fact: in both there is reason to believe that the reflex of a laryngeal might have intervened between the *g and the *j in pre-PGmc.[4] We must therefore ask whether that fact can account for their divergent reflex of *g^{w}.

As I will argue in section 3.2.6 (i), a reflex of the first laryngeal, which at the time was probably a vowel *ə, was introduced analogically into the suffix of class III weak presents at some point within the prehistory of Germanic, and it must have separated the *g^{w} of 'say' from the following *j. But we have seen that intervocalic *g^{w} became *w; why did that change not affect 'say'? A plausible phonetic rationale for its development to *g instead can be suggested: possibly underlying */g^{w}ə/ was realized phonetically as *[ɣŭ], with a hypershort u-vowel that, in effect, delabialized the labiovelar (see 3.2.3 (ii) ad fin.). Thus 'say' is not obviously inconsistent with 'island' (see above).

But the case of 'retainer' gives rise to further doubts. If Lat. *socius* were the only plausible cognate, we might reconstruct a PIE *sok^{w}yós and conclude that we had a straightforward example of PGmc *g < *g^{w} before *j. But the

[4] It needs to be emphasized that the ungeminated *g* of the usual ON form *segja* does not justify any inference that there was a vowel between the *g* and the *j* in the immediate prehistory of Norse. Gemination of velars between a short vowel and *j* led to alternations between single and geminate consonants in most paradigms, which were levelled in one direction or the other; in fact *seggja* does occur, though it is early and rare (Noreen 1923: 203–4). The case of *vekja* 'wake (someone) up' (rarely *vekkja*) is precisely similar, and it certainly reflects PGmc *wakjaną with *k and *j in contact.

Indo-Iranian cognates reveal a much more complex prehistory for this word. Skt *sák^{h}ā* 'companion' is an athematic noun which preserves part of the inherited amphikinetic ablaut pattern:

nom. sg. *sák^{h}ā* < PIE *sók^{w}h$_{2}$ō
acc. sg. *sák^{h}āyam* ← *sákh$_{2}$āy-a < PIE *sók^{w}h$_{2}$oy-m̥
dat. sg. *sák^{h}ye* < *sákh$_{2}$y-ay ←< PIE *sk^{w}h$_{2}$i-éy

The corresponding Avestan forms likewise reflect Proto-Indo-Iranian *k^{h} < PIE *k^{w}h$_{2}$. Clearly the suffix with which this noun was derived was */-h$_{2}$ey-/, and the laryngeal should not have been dropped in any form of the noun because whenever it was immediately followed by the */y/ there was no preceding syllable in the word (see 2.2.4 (i) ad fin.). It seems possible that this noun could have been shifted into the thematic class in the ancestor of PGmc late enough to escape the loss of laryngeals before *y, so that the immediate preform was *sok^{w}əyós, and the sequence *-k^{w}ə- can have developed according to the scenario suggested for 'say' above. But there is good reason to doubt that. Though it is not clear whether Lat. *socius,* which appears to be perfectly cognate with the PGmc word, could reflect a form with a laryngeal before its *y, a Homeric Greek denominative verb derived from an identical thematized noun shows clearly that the laryngeal has been dropped, since in Greek *h$_{2}$ would have survived as *α*:

Homeric Gk *ἀοσσείν* /aossêːn/ 'to help' < *ha-hokye-ye- 'be a companion of' < *sm̥-sok^{w}ye-yé- ← *sm̥- 'same', *sok^{w}yó- 'companion' (see 2.3.3 (i) on the derivational pattern).

Of course the creation of a thematized noun *sok^{w}yó- cannot literally be a shared innovation of Greek and Germanic, because they share no common ancestor that Indo-Iranian does not also share. But the fact that Greek apparently thematized this noun at a date when laryngeals were still regularly dropped between a consonant and *y if a syllable preceded makes it more likely that Germanic did the same. In that case this word is probably a good example of the delabialization of *g^{w} before *j after all, and its development should have been as follows:

PIE *sók^{w}h$_{2}$oy- ∼ *sk^{w}h$_{2}$i-′ (cf. Skt *sák^{h}ā*) → *sok^{w}yós (cf. Lat. *socius*) > *sog^{w}jós > PGmc *sagjaz (cf. ON *seggr*, OE *secġ*).

And since even the analogically introduced *ə in the present stem of 'say' had been lost by the PGmc stage (see 3.2.6 (ii)), and the delabialization of *g^{w} could have occurred after its loss, it is simplest to regard 'say' as a parallel example.

It follows that we must reevaluate 'island'. Since the word from which it was derived survived in PGmc as *ah^{w}ō 'river', its *-w- can be explained as the result of morphological reanalysis—especially since an alternation between *-h^{w}- and *-w- survived elsewhere in PGmc (e.g. in the paradigm of 'see'). The hypothesis that best accounts for all the facts is that *g^{w} was delabialized to *g before *j, and that in 'island' *g was replaced by PGmc *w because of the word's continued derivational link to 'river'.

Finally, there is the case of ON *ylgr* 'she-wolf', the only Germanic word of that meaning that has not been reshaped by lexical analogy with PGmc *wulfaz 'wolf'. To judge from its Skt cognate *vr̥kī́s*, the word originally exhibited a feminine suffix containing underlying */i/ which did not ablaut, but it is clear that in the prehistory of Germanic that suffix was replaced with the more familiar ablauting *-yéh$_2$- ∼ *-ih$_2$-. The development of the word must have been approximately the following:

PIE *wl̥k^{w}íh$_2$- (cf. Skt *vr̥kī́s*) → *wl̥k^{w}íh$_2$ ∼ *wl̥k^{w}yéh$_2$- >⟶ *wulg^{w}ī́ ∼ *wulg^{w}iá- > PGmc *wulg(^{w})ī ∼ *wulg(^{w})ijō- > *ulg(^{w})i ∼ *ulg(^{w})jō- >⟶ ON *ylgr* (with analogical nom. sg. *-r*), gen. *ylgjar*, etc.

The question is when and why the delabialization of the labiovelar occurred. Schaffner 2001: 62 suggests that this, too, is an example of regular delabialization before *j in the oblique cases (with leveling into the nom. sg.), but there is a chronological problem. By the PGmc period Sievers' Law had reapplied to former sequences of syllabic sonorant plus *Cy, since resolution of the sonorants into *uR-sequences had made their syllables heavy (see 3.2.5 (ii)); thus by that point the labiovelar was no longer followed by *j, but by *ij. By far the most likely explanation for this development is that Sievers' Law was operating as a surface filter, so that the adjustment occurred automatically when syllabic sonorants were resolved. But in that case the delabialization of *g^{w}, and therefore also Grimm's Law and Verner's Law, must have occurred before the resolution of the sonorants. That seems unlikely, but not impossible, since nothing in the reconstructable relative chronology of sound changes clearly contradicts it (see 3.2.8). But this is the only relevant example, and unfortunately there is an alternative explanation: a surviving labiovelar would have been delabialized in any case within the separate history of Norse when it ceased to be followed by syllabic vowels and came into contact with following *-r* and *-j-*. We must therefore consider the possibility that *g^{w} survived in PGmc not only after a nasal but also after *l. That is mildly surprising, since (unlike the nasal) the lateral should not have been homorganic, but it is possible; it does suggest, however, that *g^{w} should have survived after any nonvocalic sonorant. Other good examples after *l do not

seem to exist (cf. Schaffner 2001: 214–17). Of potential examples after *r, the best is 'arrow' (ibid. 387–9). Its only good extra-Germanic cognates are Lat. *arcus* 'bow' and its derivatives, whose antecedents are frankly uncertain, but at least the Germanic facts are clear:

PGmc *arh^{w}ō 'arrow' is reflected in OE *earh,* with deriv. in Goth. *arhvaznos* 'arrows'; the voiced Verner's Law alternant *arwō- is reflected in ON *ǫr,* pl. *ǫrvar,* and Northumbrian OE *arwe* (with analogical shifts of stem class in both the OE forms, see Schaffner ibid.).

Possible corroboration of this outcome after *r is given by ON *fjǫrvi* 'life (dat. sg.)' (ibid. 190–1); forms of the same word-family with PGmc *g (ibid. 191–2) can reflect delabialization before *u.

How are we to judge this pattern of facts? There are at least three reasonable alternative explanations, none of which can be excluded. Either

1. the chronology implied by Schaffner's explanation of the *g* of ON *ylgr* is correct, or
2. post-Verner's Law *g^{w} regularly became PGmc *w after *r but remained unchanged after both *n and *l; or, most interestingly,
3. post-Verner's Law *g^{w} regularly remained in PGmc after all nonvocalic sonorants, but in the two examples after *r—both of which participated in Verner's Law alternations—the unusual alternation *h^{w} ∼ *g^{w} was replaced by the productive *h^{w} ∼ *w (cf. *w in 'island', cited above).

It appears that this point of PGmc historical phonology must remain uncertain.

3.2.4 (iv) *Related changes of obstruents* I here discuss a number of sound changes which affected (or may have affected) stops and which bear some relation to Grimm's Law and Verner's Law.

No matter what their manner of articulation was in PIE, labial and dorsal stops appear in PGmc as *f and *h respectively when followed immediately by *s or *t. There are a few fully fossilized examples of voiced and breathy-voiced stops:

PIE *h$_2$eǵ-s- 'axle' (cf. Skt *ákṣas*, Lat. *axis*, Lith. *ašìs*; deriv. of *h$_2$éǵ- 'to drive', see 3.2.4 (i)) > PGmc *ahsō (cf. OE *eax*, OHG *ahsa*);

post-PIE *h$_3$reǵtós 'straightened' (cf. Lat. *rēctus* 'straight', ptc. of *regere* 'to guide'; Gk *ὀρέγειν* /orégeːn/ 'to reach', Lith. *rę́žti* 'to reach') > PGmc *rehtaz 'straight, right' (cf. Goth. *raíhts*, OHG *reht*);

PIE *h$_2$wégseti '(s)he increases (it)' (cf. Homeric Gk *ἀέξει* /aéksei/; root *h$_2$weg-, cf. zero grade *h$_2$ug- in Skt *ugrás* 'strong', from which a new full

grade *$h_2$ewg- was created analogically, cf. Lat. *augēre* 'to increase', PGmc *aukaną 'to increase' > Goth. *aukan*, ON *auka*): at some point the present was resegmented to give a new root *$h_2$wegs-, o-grade *$h_2$wogs-, whence PGmc *wahsijaną (cf. Goth. *wahsjan*) or, less likely, *wahsaną (cf. ON *vaxa*, OE *weaxan*) 'grow';

PIE *wob^{h}seh$_2$ 'wasp' (cf. Old Prussian *wobse*, Balochi *gvabz*; ?Av. *vaβžakō*, name of a daēvic animal; apparently derived from *web^h- 'weave', see 3.2.4 (i)) > PGmc *wafsō (cf. OHG *wafsa*; OE *wæfs* has been transferred into the masc. a-stems);

PIE *$h_1$leng^{wh}- 'light' (e.g. in *$h_1$ln̥g^{wh}rós, see 3.2.1 (ii); cf. also Av. *rənjištō* 'swiftest' < *$h_1$léng^{wh}istos) suffixed with *-to- (formation unclear) in PGmc *linhtaz 'light(weight)' (cf. Goth. *leihts*, OE *līoht*).

More numerous are nominals derived from verbs, especially verbal nouns in *-ti-. Many are derived from verbs that have no good extra-Germanic cognates, and a large number are sparsely attested in documents of the 'Old' stage. The better-attested examples include:

PIE *web^h(H)- 'to weave' (cf. Skt *vab^h(i)-*, Toch. B /wəpa-/) > PGmc *webaną (cf. ON *vefa*, OE *wefan*, OHG *weban*): ?PIE *wéb^{h}tis > PGmc *wiftiz 'act of weaving' (cf. OE *wift* 'weft', OHG *gewift* 'fabric');

PIE *glewb^h- 'to split' (cf. Lat. *glūbere* 'to peel') > PGmc *kleubaną (cf. ON *kljúfa*, OE *clēofan*, OHG *klioban*): PGmc *kluftiz 'act of splitting' (cf. OE *ġeclyft* 'cleft', OHG pl. *clufti* 'shears');

PIE *mog^h- 'to be able' (cf. OCS *mogǫ* 'I can', OIr. *mochtae* 'powerful', Skt *mag^{h}ám* 'possessions') > PGmc *mag '(s)he can' (cf. Goth., OHG *mag*, ON *má*, OE *mæġ*): PGmc *mahtiz 'power' (cf. Goth. *mahts*, OE *miht*, OHG *maht*);

post-PIE *d^{h}rewg^h- (cf. *d^{h}rowg^{h}os in Lith. *draũgas*, OCS *drugŭ* 'friend') > PGmc *dreuganą 'serve, be a retainer' (cf. Goth. *driugan* 'to campaign', OE *drēogan* 'to act, to accomplish'): PGmc *druhtiz 'band of retainers' (cf. ON *drótt*, OE *dryht*, OHG *truht*; Goth. *gadraúhts* 'soldier'), *druhtinaz 'lord' (ON *dróttinn*, OE *dryhten*, OHG *truhtin*);

PGmc *drībaną 'to drive' (cf. Goth. *dreiban*, ON *drífa*, OE *drīfan*, OHG *trīban*): PGmc *driftiz 'act of driving' (cf. ON *dript* 'snowdrift', OHG *trift* 'influence');

PGmc *ganganą 'to go' (cf. Goth. *gaggan*, ON *ganga*, OE, OHG *gangan*): PGmc *ganhtiz 'act of going' (cf. Goth. *innatgāhts*, ON *gátt* 'entrance'; OHG *bettegāht* 'going to bed');

PGmc *gebaną 'to give' (cf. Goth. *giban*, ON *gefa*, OE *ġiefan*, OHG *geban*): PGmc *giftiz 'gift' (cf. OHG *gift*; Goth. *fragifts* 'grant', ON *gipt* 'luck'; with shift of stem class, OE pl. *ġifta* 'wedding');

PGmc *seukaną ‘to be sick’ (cf. Goth. *siukan*), *seukaz ‘sick’ (cf. Goth. *siuks*, ON *sjúkr*, OE *sēoc*, OHG *sioh*): PGmc *suhtiz ‘sickness’ (cf. Goth. pl. *saúhteis*, ON *sótt*, OHG *suht*);

PGmc *skapjaną ‘to create, to make’ (cf. Goth. *gaskapjan*, ON *skepja*, OE *scieppan*, OHG *skephen*): PGmc *gaskaftiz ‘creation’ (cf. Goth. *gaskafts*, OE *ġesceaft*, OHG *giscaft*).

This pattern of attestation strongly suggests that the formation, and thus the phonological rule, was productive, and that is confirmed by a well-attested example formed from a borrowed verb:

Lat. *scrībere* ‘to write’ → PWGmc *skrīban (cf. OHG, OS *scrīban*, OF *skrīva*; OE *scrīfan* ‘to prescribe’): PWGmc *skrifti ‘writing’ (cf. OHG *scrift* ‘writing, scripture’, OF *scrift* ‘writing, manuscript’, OE *scrift* ‘confession’; ON *skript* ‘embroidered picture’ looks suspiciously like a loanword from WGmc).

Note also the following well-attested formations:

(post-)PIE *weg- ‘to wake’ (?; cf. Lat. *vigil* ‘awake’), o-grade *wog- in PGmc *waknō- ∼ *wakna- ‘to wake up (intr.)’ (cf. OE *wæcnan*, ON *vakna*), *wakjaną ‘to wake up (tr.)’ (cf. Goth. *uswakjan*, ON *vekja*, OE *weċċan*, OHG *wecken*): PGmc *wahtwō ‘night watch’ (Goth. dat. pl. *wahtwom*, OHG *wahta*);

PGmc *slīkaną ‘to slide, to slip’ (cf. OHG *slīhhan* ‘to creep’; related nominals include OE *slīc* ‘slick’, ON *slíkisteinn* ‘whetstone’): *slihtaz ‘smooth’ (cf. Goth. *slaíhts*, ON *sléttr*, OHG *sleht*; OE adv. *eorðslihtes* ‘thick on the ground’);

PIE *$h_3$méyǵ^{h}eti ‘(s)he’s urinating’ (cf. Skt *méhati*, Gk *ὀμείχει* /oméik^{h}ei/) > PGmc *mīgidi (cf. ON *mígr*, OE *mīġþ*): PGmc *mihs- ‘urine’ (variously extended in attested words for ‘dung’: Goth. *maíhstus*, OE *meox*, *mixen*, OS *mehs*, OHG *mixin*, *mist*).

Finally, there are a few past participles that show the effects of the same phonological rule:

PIE *wr̥ǵyéti ‘(s)he is working’ (cf. Av. *vərəziieiti*) >⟶ PGmc *wurkīþi ‘(s)he works, makes’ (cf. Goth. *waúrkeiþ*, OE *wyrcþ*, OHG *wurchit*): verbal adj. *wr̥ǵtós ‘worked, fashioned’ > PGmc *wurhtaz ‘made’ (cf. Goth. *waúrhts*, OE *worht*, OHG *giworaht*);

PIE *seh$_2$gieti ‘(s)he gives a sign’ (cf. Hitt. *sākizzi*; Lat. *sāgīre* ‘to be keen-nosed’; slightly different formations in OIr. *saigid* ‘(s)he goes after’, Gk *ἡγεῖται* /hę:gê:tai/ ‘(s)he is leading’) > PGmc *sōkīþi ‘(s)he seeks’ (cf.

Goth. *sokeiþ*, OE *sēcþ*, OHG *suohhit*; ON *sækir* '(s)he meets'): PGmc *sōhtaz 'sought' (cf. OE *sōht*, OHG *gisuoht*; ON *sóttr* 'met');

(post-)PIE *tong- 'to perceive, to think' (cf. Lat. dial. *tongitiō* 'nōtiō, idea', OIr. *tongid* '(s)he swears' > PGmc *þank- in *þankijaną 'to think' (cf. Goth. *þagkjan*, OE *þenċan*, OHG *denchen;* ON *þekkja* 'to perceive'): PGmc *þanhtaz 'thought' (cf. OE *þōht*, OHG *gidāht*; ON *þáttr* 'perceived');

PGmc *þunkijaną 'to seem' (intrans. to the preceding, with zero-grade root; cf. Goth. *þugkjan*, ON *þykkja*, OE *þynċan*, OHG *dunchen*): PGmc *þunhtaz 'seemed' (cf. ON *þóttr*, OE *þūht*, OHG *gidūht*);

PGmc *bugjaną 'to buy' (cf. Goth. *bugjan*, OE *byċġan*): PGmc *buhtaz 'bought' (cf. Goth. *baúhts*, OE *boht*);

PGmc *bringaną 'to bring' (cf. Goth. *briggan*, OE, OHG *bringan*): PGmc *branhtaz 'brought' (cf. OE *brōht*, OHG *brāht*).

It is difficult to reconstruct the sequence of sound changes by which this robust phonological rule came into existence. Voiced stops could have been devoiced before *t and *s already in PIE, so far as the comparative evidence can tell us; but breathy-voiced stops could not have been, since in Indo-Iranian they survive in that position (and their breathy voice spreads rightward through the cluster by a sound change called 'Bartholomae's Law'). The simplest scenario is that all stops were devoiced before voiceless obstruents in pre-Germanic (as in most other IE languages) before Grimm's Law occurred and thus underwent Grimm's Law, but various other sequences of changes can be posited that will yield the same outcome.

It remains to mention two proposed pre-PGmc sound changes which I regard as doubtful at best. Well over a century ago Friedrich Kluge suggested that numerous PGmc forms with unexpected root-final *pp, *tt, *kk had arisen from forms with pre-PGmc *ƀn, *ð̄n, *ɜ̄n (i.e. with the fricative outcomes of Verner's Law and the first and third parts of Grimm's Law, before voiced stop allophones arose—see 3.2.4 (i) ad fin.) if a stressed syllabic did not immediately precede; he was even able to suggest a relative chronology of the parts of Grimm's Law and Verner's Law that would render such an outcome natural. (See Lühr 1980 with references for fuller discussion.) The problem with Kluge's suggestion is simply that the etymologies are unconvincing in detail: the best examples are assembled at Brugmann 1897: 383–4, and not one *must* reflect a form with *-n-. On the other hand, perusal of the numerous examples scattered throughout Seebold 1970 strongly suggests that they have been generated by some sort of sound symbolism ('Intensiv-Gemination'), and that is still perhaps the most widely accepted explanation.

It has also been suggested that PGmc *wulfaz 'wolf' < PIE *wl̥̍k^{w}os (see 3.2.2 (i)) and/or its fem. nom. sg. *wulbī < *wl̥̍k^{w}íh$_2$ (if the *g* of ON *ylgr* is really the result of leveling, see 3.2.4 (iii)) and PGmc *twalib- 'twelve' (cf. Goth. *twalif*, *twalib-*) < *-lik^{w}- (cf. Lith. *dvýlika*) are evidence for a regular change of labiovelars to labials when *w preceded (cf. Seebold 1970: 531; Schaffner 2001: 62); such a sound change would also allow us to regard PGmc *werpaną 'to throw' (cf. Goth. *wairpan*, OE *weorpan*, etc.) as the regular reflex of the post-PIE *werg^{w}- which appears in OCS *vrĭgǫ* 'I throw', inf. *vrěšti* (Seebold 1970: 559). But there are too few examples to create any confidence that the sound change was regular, and too many counterexamples: ON *ylgr* is a counterexample unless one particular relative chronology is right (see 3.2.4 (iii)), and there are a handful of WGmc verb forms that appear ultimately to be derived from PIE *wok^{w}- 'voice' but exhibit root-final *-h-* and *-g-* rather than a labial (ibid. 531). I think it prudent to suspend judgment.

3.2.5 *Sievers' Law and non-initial syllables*

In this section I discuss a number of sound changes that affected non-initial syllables, as well as specifically Germanic developments of Sievers' Law, which interacted with those changes in a number of ways.

3.2.5 (i) *The apocope of nonhigh short vowels* Except in monosyllabic words, PIE word-final nonhigh short vowels were lost. Not surprisingly, most of the examples involve inflectional endings:

- PIE *pénk^{w}e 'five' (cf. Skt *páñca*, Gk *πέντε* /pénte/) >⟶ *femf > PGmc *fimf (cf. Goth. *fimf*, OE *fīf*); the replacement of the labiovelar by a labial is irregular and poorly understood;
- PIE o-stem voc. sg. *-e, e.g. in *wl̥̍k^{w}e 'wolf!' (cf. Skt *vṛ́ka*, Gk *λύκε* /lúke/), > PGmc -∅, e.g. in *wulf (cf. endingless Goth. voc. *þiudan* 'king!');
- PIE act. 2pl. *-te, e.g. in *b^{h}érete 'you (pl.) are carrying' (cf. Gk *φέρετε* /p^{h}érete/), > PGmc *-d, e.g. in *birid (cf. Goth. *bairiþ*);
- PIE pf. 1pl. *-mé ~ *-ḿ̥, e.g. in *widmé 'we know' (cf. Skt *vidmá*), ?> PGmc *-um (apparently with generalization of the heavy Sievers' Law alternant under the influence of the 3pl., see 3.2.5 (ii)), e.g. in *witum 'we know' (cf. Goth. *witum*);
- PIE pf. 3sg. *-e, e.g. in *wóyde '(s)he knows' (cf. Skt *véda*, Gk *οἶδε* /ôide/), > PGmc -∅, e.g. in *wait (cf. Goth. *wait*, OE *wāt*);
- PIE pf. 1sg. *-h$_2$e, e.g. in *wóydh$_2$e 'I know' (cf. Skt *véda*, Gk *οἶδα* /ôida/; for the laryngeal cf. Luvian past 1sg. *-hha*), > *-a > PGmc -∅, e.g. in *wait (cf. Goth. *wait*, OE *wāt*);
- PIE *apo 'away' (cf. Skt *ápa*; Gk *ἀπό* /apó/ 'from') > PGmc *ab (see 3.2.4 (ii) on the application of Verner's Law; cf. Goth. *af*, *ab-u*, OE *of*, OHG *ab*);

PIE *supo 'under, near' (cf. Lat. *sub*; Toch. B *spe* 'near') → *upo (under the influence of *upér(i) 'over'; cf. Skt *úpa*) > PGmc *ub 'under' (see 3.2.4 (ii) on the application of Verner's Law; cf. Goth. *uf*, *ub-uh*).

A nonsyllabic vocalic sonorant immediately preceding the final vowel was also lost if a consonant immediately preceded (Cowgill, p.c. *c.*1980):

PIE *tósyo 'of that (masc./neut)' (cf. Skt *tásya*, Homeric Gk τοῖο /tôio/) > PGmc *þas (cf. OE *þæs*);
PIE *k^{w}ésyo 'whose?' (cf. Homeric Gk τεῖο /têio/) > PGmc *h^{w}es (cf. Goth. *hvis*, OHG *wes*);
PIE *n̥smé 'us' (see 3.4.5 (iv)) → *n̥swé > *unswé > *úns (see 3.2.4 (ii)) > PGmc *uns (cf. Goth., OHG *uns*);
PIE *wé 'we two' → *wé-dwo (Cowgill 1985*b*: 15–16 with references; cf. Lith. *mù-du* 'we two') > PGmc *wet, unstressed *wit (see 3.2.5 (iii); cf. Goth., OE *wit*).

This part of the sound change should have caused the loss of postconsonantal *y in o-stem voc. sg. and pres. iptv. 2sg. forms in *-ye; but, not surprisingly, an apparent reflex of *y was reintroduced in those categories by paradigmatic leveling. Also not surprisingly, the loss of vowels did not affect monosyllables:

PIE *né 'not' (cf. Skt *ná*) > PGmc *ne, unstressed *ni (see 3.2.5 (iii); cf. Goth. *ni*, OE *ne*);
PIE *só 'that (nom. sg. masc.)' (cf. Skt *sá*, Gk ὁ /ho/) > PGmc *sa (cf. Goth. *sa*).

However, enclitics, which were not phonological words, were affected:

PIE *k^{w}e 'and' (postposed clitic; cf. Skt *ca*, Gk τε /te/, Lat *-que*) > PGmc *-h^{w} (cf. Goth. postvocalic *-h* ~ postconsonantal *-uh*).

Determining the relative chronology of this change is difficult. Probably it followed the loss of prevocalic laryngeals; but strictly speaking that cannot be proved, since any postconsonantal laryngeal 'stranded' in word-final position by this change would have been lost in any case (see 3.2.1 (iv)), and there seem to be no Germanic reflexes of PIE word-final *-VHV that cannot have been altered by reanalysis. The relative chronology of apocope and the loss of word-final coronal stops is a complex problem that will be taken up in 3.2.6 (iv).

Two chronological inferences seem certain, however. The *s of 'us' can be explained only by positing that apocope of the final sequence *-wé was accompanied by an automatic shift of stress to the preceding syllable before Verner's Law occurred (see 3.2.4 (ii)). Further, it is clear that PIE *-i was not apocopated; a certain example is the preposition/adverb:

PIE *upéri 'over, above' (cf. Skt *upári*) > PGmc *ubiri (cf. OHG *ubiri*, ON *yfir*), in which only a surviving *-i can have caused umlaut of the preceding *e in PGmc (see 3.2.5 (iii–iv)); contrast

PIE *upér 'over, above' (cf. Gk ὑπέρ /hupér/) > PGmc *uber (cf. OHG *obar*, OE *ofer*),

the alternative form to which the 'hic-et-nunc' particle *-i had not been added. It follows that the apocope of PIE *-e must have preceded the raising of unstressed *e, including the *e of final syllables, to *i (see 3.2.5 (iii)).

It has been claimed that apocope occurred only in the post-PGmc period, on the evidence of a supposed form *wraita* 'I wrote' in a Runic Norse inscription (Antonsen 1975: 52–3). That is impossible. Note that on the same stone the same author reads nom. sg. *unnamz*. Since that cannot be an o-grade deverbal root-noun (a formation unknown in Germanic), it must be an a-stem nom. sg., which could only mean that the *a of PGmc *-az had been lost; and it should follow that post-PIE *-a had also been lost. Whether the readings are correct, and whether '*unnamz*' could possibly mean 'untakeable', are of course separate questions; see Krause 1971: 159 for a more generally accepted reading and interpretation of this inscription.

In fact the subsequent development of strong past 1sg. and 3sg. forms in ON demonstrates that word-final short nonhigh vowels were lost earlier than other final syllable rhymes. Stops which became word-final by the sound change discussed in this section were devoiced; thus we find, for example:

post-PIE *b^{h}eb^{h}ónd^{h}e '(s)he has tied' (cf. Skt *babánd^{h}a*) >⟶ PGmc *band '(s)he tied' (cf. Goth., OE *band*) > *bant > ON *batt*.

Stops which became word-final by subsequent losses of syllable rhymes were not devoiced in ON; cf. the following:

post-PIE *land^{h}om 'open area' (cf. OIr. *land*, which must reflect a collective in *-eh$_2$ because it is a fem. ā-stem) > PGmc *landą 'land' (cf. Goth., OE *land*) > ON *land*.

Of course the *-nd* of the latter can be explained as the result of analogical leveling from other forms of the paradigm; but leveling should also have been possible in verb paradigms, and it is not plausible that all the nominal examples, but none of the verbal examples, should have been leveled.

3.2.5 (ii) *Developments of Sievers' Law* The outputs of Sievers' Law were of course inherited from PIE. Clear Sievers' Law examples of most sonorants are difficult to find, but those involving *y are numerous; the following examples with light roots are typical. (Note that in various of these examples Gothic has

restored or introduced a sequence *ji* by various reanalyses; see further 3.2.6 (i). On the voiceless fricatives of the verb endings see 3.4.3 (i) ad fin.)

PIE *g^{wh}éd^{h}yeti '(s)he is asking for', *g^{wh}éd^{h}yonti 'they are asking for' (see 3.2.4 (iii)) >⟶ PGmc *bidiþi, *bidjanþi (cf. Goth. *bidjiþ*, *bidjand*, OE *bitt*, *biddaþ*);

PIE *lég^{h}yeti '(s)he's lying down', *lég^{h}yonti 'they're lying down' (eventive; see 3.2.4 (i) ad fin.) >⟶ PGmc *ligiþi, *ligjanþi (cf. OE *liġþ, liċġaþ*);

PIE *h$_2$éryeti 'he's plowing', *h$_2$éryonti 'they're plowing' (cf. Lith. *ãria*, OCS *orjetŭ*, *orjǫtŭ*) >⟶ PGmc *ariþi, *arjanþi (cf. OE *ereþ*, *eriaþ*; Goth. ptc. *arjands*);

PIE *méd^{h}yos 'middle' (cf. Skt *mád^{h}yas*, Lat. *medius*) > PGmc *midjaz (cf. Goth. *midjis*, OE *midd*);

PIE *ályos 'other' (cf. Lydian *αλα-*, Gk *ἄλλος* /állos/, Lat. *alius*) > PGmc *aljaz (cf. Goth. *alja-*);

PIE *nítyos '(one's) own' (cf. Skt *nítyas*) > PGmc *niþjaz 'relative, kinsman' (cf. Goth. *niþjis*; OE pl. *niþþas* 'people');

PIE *kóryos 'detachment' (OIr. *cuire* 'company'; Lith. *kārias* 'army') > PGmc *harjaz 'army' (cf. Goth. *harjis*, OE *here*).

Oxytone examples with solid PIE pedigrees happen to be hard to find, but an example clearly analyzable in pre-PGmc terms is:

post-PIE *ḱl̥yéti '(s)he hides', *ḱl̥yónti 'they hide' (cf. unsuffixed *ḱéleti in OIr. *celid*, OE *hilþ*) > PGmc *huliþi '(s)he covers', *huljanþi 'they cover' (cf. Goth. *huljiþ*, *huljand*).

A similar example with no clear extra-Germanic cognates but archaic inflection in PGmc is:

pre-PGmc *b^{h}ug^{h}yéti, *b^{h}ug^{h}yónti > PGmc *bugiþi '(s)he buys', *bugjanþi 'they buy' (cf. Goth. *bugjiþ*, *bugjand*, OE *byġeþ*, *byċġaþ*).

These examples with heavy roots are typical:

PIE *seh$_2$gieti '(s)he gives a sign', *seh$_2$gionti 'they give a sign' (cf. Hitt. *sākizzi*, *sākianzi*; Lat. *sāgīre* 'to be keen-nosed'; see 3.2.4 (iv)) > PGmc *sōkīþi '(s)he seeks', *sōkijanþi 'they seek' (cf. Goth. *sokeiþ*, *sokjand*, OE *sēcþ*, *sēċaþ*);

PIE *h$_2$ḱh$_2$owsiéti '(s)he is sharp-eared', *h$_2$ḱh$_2$owsiónti 'they are sharp-eared' (cf. Gk *ἀκούειν* /akóuɛːn/ 'to hear') > PGmc *hauzīþi '(s)he hears', *hauzijanþi 'they hear' (cf. Goth. *hauseiþ*, *hausjand*, OE *hīerþ*, *hīeraþ*);

post-PIE *h$_2$entíos 'in front' (derived from loc. sg. *h$_2$entí, like Gk *ἐναντίος* /enantios/ 'opposite', Hoenigswald 1985: 168; Skt *ántyas* 'last' can be derived

from *$h_2$énti, with more archaic accent) > PGmc *andijaz 'end' (cf. Goth. *andeis*, OE *ende*);

post-PIE *orb^{h}iom 'inheritance' (cf. OIr. *orbe*; apparently a derivative of *orb^{h}os 'bereft, orphan', cf. Armenian *orb*, Lat. *orbus*, Gk *ὀρφανός* /orp^{h}anós/) > PGmc *arbiją (cf. Goth. *arbi*, OE *ierfe*).

At some point in the development of PGmc before the sound changes affecting *j, the automatic offglide between *i and a following vowel was reanalyzed as a separate segment; thus the reflexes of PIE prevocalic *y ~ *i are PGmc *j ~ *ij. (The spelling *j rather than *y is simply a matter of traditional orthography; there was no change in the sound, so far as we can tell.)

But there is also good evidence that Sievers' Law continued to be a productive rule in the prehistory of Germanic. The resolution of nonvocalic syllabic sonorants into *uR-sequences created new heavy syllables, and Sievers' Law reapplied at least to *y immediately following those syllables. There is at least one example inherited from PIE:

PIE *wr̥ǵyéti '(s)he is working', *wr̥ǵyónti 'they are working' (cf. Av. *vərəziieiti*, *vərəzinti*) > *wurgiéti, *wurgiónti > PGmc *wurkīþi '(s)he works/makes', *wurkijanþi 'they work/make' (cf. Goth. *waúrkeiþ*, *waúrkjand*, OE *wyrcþ*, *wyrċaþ*).

A further example that could predate PGmc considerably is:

pre-PGmc *tn̥gyéti 'it is perceived', *tn̥gyónti 'they are perceived' (root *tong- 'to perceive', see 3.2.4 (iv)) > *tungiéti, *tungiónti > PGmc *þunkīþi 'it seems', *þunkijanþi 'they seem' (cf. Goth. *þugkeiþ*, *þugkjand*, OE *þyncþ*, *þynċaþ*).

Though the pre-Germanic stem formation of this latter example cannot be known for certain, it seems most likely that it was a derived intransitive in *-yé/ó-, historically connected with the derived passive presents in *-yá-* of Sanskrit; if that is true, then Sievers' Law has reapplied to it too.

The reapplication of Sievers' Law is hard to understand if it was an ordered rule, fossilized within the phonology of the language but no longer operative on the postlexical phonetic level; but it makes sense if Sievers' Law was operating as a surface filter, applying to any derived input that met its structural description in much the same way as modern German obstruent devoicing. If that is so, then Sievers' Law probably reapplied to forms of the relevant shape as soon as syllabic sonorants had become *uR-sequences.

How long Sievers' Law remained productively applicable to other sonorants is unclear. It seems reasonably likely that PGmc past 1pl. *-um reflects the

heavy Sievers' Law alternant of PIE pf. 1pl. *-mé (see the preceding section), but the PGmc 3pl. ending *-un is also an obvious source for generalization of a stem vowel *-u- in the past, and the 1pl. ending might have acquired a *-u- from that source even without a heavy Sievers' Law alternant. Other heavy Sievers' Law alternants are surprisingly hard to find. The shapes of such PGmc words as *hunhruz 'hunger' and *unhtwōn- 'dawn' strongly suggest that Sievers' Law ceased to apply to sonorants other than *j rather early. So far as our evidence goes, it appears that Sievers' Law became a rule applicable only to *j (= PIE *y) at some point in the prehistory of Germanic.

It is clear that there was no converse of Sievers' Law, changing *i to *y after a light syllable, in PIE; but in pre-PGmc such a rule did begin to apply before the sound changes affecting *j occurred. There is at least one clear example with a good PIE pedigree:

PIE *néwios 'new' (cf. Welsh *newydd*, Skt *návias*, spelled *návyas* but often scanned as three syllables in the Rigveda; derivative of *néwos, cf. Hitt. *nēwas*, Lat. *novos*) > PGmc *niwjaz (cf. Goth. *niujis*, OHG *niuwi* with geminate *ww reflecting PGmc *wj).

If, as seems likely, Sievers' Law also gave syllabic *i after word-initial *CHC- sequences in PIE, then the Germanic present of 'lift' is also an inherited example:

PIE *kh_2piéti '(s)he is grasping', *kh_2piónti 'they are grasping' (see 3.2.1 (iv)) > *kapyéti, *kapyónti (as also in Lat. *capit* '(s)he takes', *capiunt* 'they take') > PGmc *habiþi '(s)he lifts', *habjanþi 'they lift' (cf. Goth. *hafjiþ*, *hafjand*, OE *hefeþ*, *hebbaþ*).

This apparently reflects a reanalysis of Sievers' Law so that it applied in both directions, so to speak; it is unlikely ever to have been a separate rule. If that is true, then this process too ought to have operated as a surface filter, which makes it hard to date. (For instance, we cannot be confident that it began to apply only after the laryngeal in the latter example had developed into a vowel, since if it was a preexisting surface filter it would have applied anyway as soon as the *a, or rather *ə, arose—see 3.2.1 (iv).) It continued to apply for a considerable period of time; we will have occasion to return to it in discussing inflectional morphology.

The 'Lindeman's Law' alternation between initial *CR- and *C$\underset{\circ}{\text{R}}$- in monosyllabic words (see 2.2.4 (ii)) seems to have been resolved in favor of nonsyllabic *CR-. However, since this appears to have been a special case of Sievers' Law, since the only clear example involved the sequence *dw- ~ *du-, and since it appears that *w ceased to be affected by Sievers' Law anyway

(see immediately above), exactly what happened is far from clear. The example is 'two':

PIE *dwóh$_1$ 'two' (masc. nom.-acc.; cf. Skt *dvá*, Homeric Gk δύω /dúǫ:/) > ?PGmc *twō, possibly in OE *twǣġen* > *twēġen* (*twō inō??; cf. van Helten 1906: 91–3, Ross and Berns 1992: 568–9, but see also 3.4.5 (ii)); or >⟶ ?PGmc *twai (with plural inflection, cf. Goth *twai*).

But that is not the whole story. It is clear that the PIE word for 'pig' was *suH- or *sū- (cf. Gk ὗς /hû:s/, Lat. *sūs*) with a derived adjective *suHīno- or *suīno- 'of pigs' (cf. Lat. *suīnus*). In Germanic the neuter of the adjective became the word for 'pig', and its phonological shape is somewhat unexpected:

PIE neut. *su(H)īnom 'of pigs' > *suwīnom > PGmc *swīną 'pig' (cf. Goth. *swein*, OE *swīn*).

To judge from the development of this word, word-initial *Cuw- became PGmc *Cw-. That in turn might help to account for the shape of 'fire' in Germanic. It seems clear that the PGmc word reflects the PIE amphikinetic collective (Schindler 1975*a*: 10), which apparently developed as follows (cf. 4.3.4 (i)):

PIE *péh$_2$wōr ~ *ph$_2$un-′ → *ph$_2$uór ~ *ph$_2$un-′ (cf. Toch. B *puwar, pwār-*; see Ringe 1996: 17–18) > *puwōr ~ *pun- > *pwōr ~ *pun- > PGmc *fōr ~ *fun- (see 3.2.6 (i); cf. Goth. *fon* ~ *funin-*, with suffixal *n* generalized and the obl. stem recharacterized with *-in-*, cf. *watin-* 'water').

On the other hand, this makes it somewhat harder to account for OHG disyllabic *fuïr* (see 4.3.4 (i) and vol. ii).

3.2.5 (iii) *The raising of unstressed *e; unstressed *ew* After stress had been shifted to the initial syllables of polysyllabic words (see 3.2.4 (ii)), unstressed *e was raised to *i, merging with inherited *i, unless *r followed immediately. (See the end of this section on the problem of unstressed *ewC.)

Before illustrating this change with examples I think it necessary to discuss the evidence for it, which is not completely straightforward. Most unfortunately, PGmc *e and *i later merged 'across the board' in Gothic, yielding [ɛ] (spelled '*aí*') before *r*, *h*, and *hv*, but [i] in all other positions. (The tiny handful of exceptions can be explained by other sound changes and changes of other kinds; see e.g. Braune and Ebbinghaus 1973: 23–4 with references.) It is clear that the ancestor of Gothic first underwent the more limited merger of unstressed *e and *i discussed here, both because Gothic exhibits a divergent outcome of unstressed *e before *r* (see below) and because this merger was

followed by other sound changes that are clearly reflected in Gothic, notably the loss of intervocalic *j and the subsequent contraction of unstressed vowels in hiatus (see 3.2.6 (i)); thus there is no doubt that the merger of unstressed *e and *i was a pre-PGmc sound change. But because of the later, more sweeping merger in Gothic, forms from that language cannot be adduced as direct evidence for this change. In North and West Germanic, on the other hand, numerous unstressed vowels have been lost, including many that might provide evidence for this change. Fortunately all those languages underwent sound changes collectively called 'i-umlaut', by which vowels were fronted and/or raised when a high front vocalic occurred in the following syllable. In fact i-umlaut of *e occurred in pre-PGmc (see 3.2.5 (iv)); in Norse and northern WGmc, i-umlaut of other vowels occurred before the loss of most unstressed *i. Much of our evidence, then, will consist of ON and OE forms which have endings that contained *e in PIE but which also exhibit i-umlaut, thus demonstrating that those *e had been raised to *i in PGmc.

However, that is still not the whole story. In each language the effects of i-umlaut were undone by paradigmatic leveling in some morphological categories, thus eliminating potential evidence. Moreover, the reflexes of PIE high front vocalics also triggered i-umlaut, so that a form containing both an unstressed *e and an *i in successive syllables, or a sequence *ye or *ey, cannot be a probative example of the raising of *e if the basis of the evidence is i-umlaut. Taken together, these considerations eliminate a startlingly large proportion of the potential evidence for the raising of unstressed *e in PGmc. For instance, the PIE present tense endings 2sg. *-esi, 3sg. *-eti unarguably developed into PGmc *-izi and *-idi respectively, and both trigger i-umlaut in North and West Germanic; but was their *e raised by the change under discussion here or umlauted by the following *i? PIE present 2pl. *-ete, which lost its final vowel early (see 3.2.5 (i)), is not so ambiguous, and I expect it to have yielded PGmc *-id by the sound changes I accept and so to have triggered i-umlaut of the vowels of preceding verb roots. But in ON and OHG i-umlaut has been eliminated from the plural forms of the present by paradigmatic leveling; and in northern WGmc the plural forms of all verb categories underwent syncretism, so that only the 3pl. endings survive.

In spite of these difficulties there are enough unarguable examples to demonstrate that unstressed *e was raised to *i in pre-PGmc, as the following list (and the discussion in 3.2.6 (i)) will show. But it will be necessary at least to ask whether the change might not have been as exceptionless as I here suggest. I will address that question at the end of this section.

Most of the examples are in noninitial syllables of polysyllabic words:

PIE consonant-stem gen. sg. *-és and nom. pl. *-es > *-ez > PGmc *-iz, e.g.: PIE *mū́s 'mouse', gen. sg. *mūsés, nom. pl. *mū́ses (cf. Skt *mū́s*, *mūṣás*, *mū́ṣas*, Gk μῦς /mû:s/, nom. pl. μῦες /mû:es/, Lat. *mūs*, gen. sg. *mūris*) > PGmc *mūs, gen. sg. *mūsiz (with Verner's Law alternants leveled), nom. pl. *mūsiz (cf. OE *mūs*, *mȳs*, *mȳs*);

PIE neut. s-stem suffix *-os ~ *-es- > PGmc *-az ~ *-iz-, e.g.: PIE *$h_2ég^hos$ ~ *$h_2ég^hes$- 'emotional distress' (cf. Homeric Gk ἄχος /ák^{h}os/, gen. sg. ἄχεος /ák^{h}eos/) > PGmc *agaz ~ *agiz- 'fear' (cf. Goth. *agis* (remodeled as a neut. a-stem), OE *ege* (remodeled as a masc. i-stem));

late PIE *-éteh$_2$, suffix forming abstract nouns from adjs. (cf. Skt *nagn-átā* 'nakedness'; for the medial vowel cf. also Gk ἀρετή /aretɛ́:/ 'virtue', etc.), > *-eþā > PGmc *-iþō, e.g. in *strangiþō 'strength' (cf. OE *strengþ*);

PIE *uksḗn ~ *uksén- ~ *uksn̥-′ 'bull' (cf. Skt *ukṣā́*, acc. sg. *ukṣáṇam*, gen. sg. *ukṣṇás*) >⟶ PGmc *uhsō̄ (nom. sg. remodeled; cf. OE *oxa*, OHG *ohso*) ~ *uhsin- (cf. ON *yxn*-) ~ *uhsn- (cf. Goth. gen. pl. *aúhsne*);

late PIE diminutive suffix *-el- (cf. Lat. *-ol-* ~ *-ul-*, e.g. in *fīliolus* 'little son', *rotula* 'little wheel') > PGmc *-il- (cf. e.g. OE *cyrnel* 'kernel', derived from *corn* 'grain');

post-PIE nom. pl. *suHnéwes 'offspring, sons' (cf. Skt *sūnávas* 'sons'; for the vowels cf. Gk masc. nom. pl. βαρέες /barées/ 'heavy') >⟶ PGmc *suniwiz (cf. Goth. *sunjus*, ON *synir*).

Other, less certain examples can be cited, but the above seem solid (pace Lloyd 1961). There are also some examples in unstressed alternants of personal pronouns:

PIE *$ég^h_2$ 'I' (cf. Skt *ahám*, Lat. *ego*, both with innovative second syllables) > PGmc *ek, unstressed *ik (cf. ON *ek* but OE *iċ*, OHG *ih*);

PIE *m̥(m)é ge 'me!' (with enclitic emphasizing particle, cf. Gk ἐμέγε /emége/) >⟶ PGmc acc. *mek, unstressed *mik 'me' (cf. Anglian OE *mec* but ON *mik*, OHG *mih*).

If these examples are taken into account, it appears that the raising of unstressed *e occurred in more or less the full range of consonantal environments, except before *r.

Since it can be shown that this change preceded the i-umlaut of *e (see the following section), the raising of unstressed *e before PIE *y (= PGmc *j) is best regarded as part of this change, even though it would also have been effected by i-umlaut. The clearest examples are derived causative verbs, such as:

PIE *wortéyeti '(s)he turns it', *wortéyonti 'they turn it' (cf. Skt *vartáyati*, *vartáyanti*) >⟶*wordijiþi, *wordijonþi > PGmc *(fra-)wardīþi, *(fra-)wardijanþi '(s)he, they ruin it' (*'turn it wrong'; cf. Goth. *frawardeiþ*, *frawardjand*, OE *(for)wiert*, *(for)wierdaþ*, OHG *arwertit*, *arwertent*).

These forms were affected by the converse of Sievers' Law (see 3.2.5 (ii)); this example is typical:

PIE *woséyeti '(s)he clothes', *woséyonti 'they clothe' (cf. Hitt. *wassezzi*, *wassanzi*, Skt *vāsáyati*, *vāsáyanti*) >⟶ *wozijiþi, *wozijonþi > *wozjiþi, *wozjonþi > PGmc *waziþi, *wazjanþi (cf. Goth. *wasjiþ*, *wasjand*, OE *wereþ*, *weriaþ*, OHG *werit*, *werient*).

In these cases the evidence of Gothic (and ON, though it is more complex) is important, since in West Germanic the difference between the resulting two types of verbs was partly obscured (see the discussion in vol. ii).

Though it is clear that this raising did not occur before *r, it is less clear what the PGmc outcome of unstressed *e before *r was. Consider this example, which is typical:

PIE *ánteros 'other (of two)' (apparently a derivative of *ályos 'other' with an archaic *l ~ *n alternation) > PGmc *anþeraz (?, see below; cf. Goth. *anþar*, ON *annarr*, OE *ōþer*, OF *ōther*, OS *ōðar*, OHG *andar*).

The regular Gothic and ON reflex is *a*. The OS and OHG spellings are variable, but *a* is a frequent variant. Only in northern WGmc ('Anglo-Frisian') do we typically find *e*—and that is precisely the area in which PGmc *a was fronted (except before nasals) and typically appears as *e* when unstressed (see vol. ii). It is not unreasonable to infer from this pattern of evidence that unstressed *e was lowered to *a before *r already in PGmc. Unfortunately such an inference is not secure, because the lowering (a natural phonetic change) can also have occurred independently in the individual histories of the languages. That could account for the inconsistent spellings of OHG. Note also that two Latin loanwords in Gothic, *lukarn* 'lamp' ← *lucerna* and *karkara* 'prison' ← *carcer*, appear to exhibit the effects of the lowering; should we conclude that it followed the borrowing of those words, or is this a case of 'sound substitution' prompted by the lack of unstressed *e in Gothic at the time the borrowings occurred? A definitive answer to any of these questions seems unattainable. In any case, *e clearly remained before *r until after the i-umlaut of *e had occurred (see the following section).

Another gap in the pattern should probably be accounted for differently. Examples of unstressed *iw from *ew are regularly encountered in caseforms

of u-stem nominals; in addition to nom. pl. *-iwiz noted above, cf. Goth. gen. pl. *suniwe* and ON dat. sg. *-i* < *-ī < Runic *-iu* < *-iwi (cf. Noreen 1923: 121, 272–4; Krause 1971: 118). But none of the examples are tautosyllabic; before consonants and word-finally we find only *au, e.g. in gen. sg. *sunauz 'son's' (cf. Goth. *sunaus*, ON *sonar*, OE *suna*) and voc. sg. *-au (cf. Goth. *sunau*). It is customary to posit PIE o-grade *ow as the ancestor of this diphthong. But a modern understanding of PIE ablaut leads us to expect *e, not *o, in these forms. Moreover, the other daughter languages in which we find reflexes of *ow—namely Italic, Celtic, and Balto-Slavic—are those in which *ew is known to have become *ow by regular sound change. I therefore suggest that the best way to account for the Gmc facts is to posit a regular change of unstressed tautosyllabic *ew to *ow. Since that change bled the raising of unstressed *e, it ought to have preceded it; it would also be most natural if it preceded the merger of *o with *a. Like the raising of unstressed *e, it must have followed the fixation of stress on initial syllables.

It has been suggested that the raising of unstressed *e to *i was even more limited than the above discussion suggests (see Lloyd 1961). That seems much less likely, for several reasons. Most significantly, no clear phonological constraints on the raising can be stated (cf. the wide range of environments exhibited by the certain cases above); the suggestion of Lloyd (ibid. 850–1) that the raising was blocked by a following syllable containing a nonhigh vowel seems to me to be contradicted by some of the examples cited above, and even if it were not, the amount of analogical levelling required to eliminate the alternant *-ez- from the neuter s-stem suffix, for example, would be very great. But the only alternative is to posit an irregular sound change—always an unlikely option. Moreover, the apparent counterexamples to the raising (Lloyd, ibid.) are almost entirely confined to OHG, which raises the suspicion that they are later developments specific to OHG. In fact, it is not difficult to propose an OHG sound change that will account for them: after the effects of i-umlaut were leveled out in the morphosyntactic categories in question, *i can have been lowered to *e* after syllables containing a low or lower mid vowel—a suggestion that is especially plausible because it is known (from the subsequent history of High German vowels) that PGmc *e, which on this hypothesis was introduced into the root syllables of these forms by leveling, was actually lower than the *e* that developed by i-umlaut of *a.

3.2.5 (iv) *i-umlaut of *e* After the preceding change had occurred, *e was raised to *i if a high front vocalic followed in the same or an immediately succeeding syllable. The relative chronology of those two changes is

guaranteed by the development of s-stem neuter nouns with post-PIE *e in the root syllable:

PIE *ség^{h}os ~ *ségʰes- 'control, power' (cf. Skt *sáhas*, Av. *hazō*; the verb survives in Gk ἔ̆χειν /ék^{h}eːn/ 'to have') > *segaz ~ *segiz- > PGmc *segaz ~ *sigiz- 'victory' (cf. Goth. *sigis*, reanalyzed as a neut. a-stem; ON *sigr*, OE *siġe*, OHG *sigi-*, reanalyzed as a masc. i-stem).

There are numerous other examples, many triggered by PIE *i or *y; note the following:

PIE *b^{h}éresi 'you are carrying', *b^{h}éreti '(s)he is carrying' (cf. Skt *b^{h}árasi*, *b^{h}árati*, OCS *bereši*, *beretŭ*) > *berizi, *beridi > PGmc *birizi, *biridi (cf. OE *birst*, *birþ*, OHG *biris*, *birit*);

PIE *g^{wh}éd^{h}yeti '(s)he is asking for', *g^{wh}éd^{h}yonti 'they are asking for' (cf. Av. *ǰaδiieiti*, *ǰaδiieinti*) > *bedjidi, *bedjondi ⟶ PGmc *bidiþi, *bidjanþi (cf. OE *bitt*, *biddaþ*, OHG *bitit*, *bittent*);

PIE *mélid, *mélit- 'honey' (cf. Hitt. *milit*, Luvian *mallit*, Gk μέλι /méli/, μέλιτ- /mélit-/) > *melit, *melid- > PGmc *mili, *milid- (cf. Goth. *miliþ*; OE *mildēaw* 'honeydew', OHG *militou* 'mildew');

PIE *néwios 'new' (cf. Welsh *newydd*, Skt *návias;* derivative of *néwos, cf. Hitt. *nēwas*, Lat. *novos*) > PGmc *niwjaz (cf. Goth. *niujis*, OE *nīewe*, OHG *niuwi*);

PIE *méd^{h}yos 'middle' (cf. Skt *mád^{h}yas*, Lat. *medius*) > PGmc *midjaz (cf. Goth. *midjis*, ON *miðr*, OE *midd*, OHG *mitti*).

Assuming that this was a phonetically natural change, it should also have affected tautosyllabic *ey, giving *ī. That is the case, and examples are likewise numerous; cf. the following:

PIE *deywós 'god' (cf. Skt *devás*, Lat. *deus*, *dīv-*) > PGmc *Tīwaz, name of the war god (cf. OE *Tīw* in *Tīwes-dæġ* 'Tuesday');

PIE *h$_{3}$méyǵ^{h}onti 'they're urinating' (cf. Skt *méhanti*, Gk ὀμείχουσι /oméik^{h}oːsi/) > PGmc *mīgandi (cf. OE *mīgaþ*);

PIE *b^{h}éyd^{h}onti 'they trust' (vel sim.; cf. Lat. *fīdunt* 'they trust', Gk (mid.) πείθονται /péit^{h}ontai/ 'they believe') > PGmc *bīdandi 'they wait (for)' (cf. Goth. *beidand*, ON *bíða*, OE *bīdaþ*, OHG *bītant*).

As the last example (indeed the whole first class of strong verbs) shows, this part of the change is clearly reflected in Gothic ('*ei*' being merely an orthographic device to represent /ī/, as loanwords demonstrate).

The i-umlaut of *e is crucially ordered only before the loss of intervocalic *j and the changes that subsequently affected vowels in hiatus. The complex

conditions on the loss of *j presuppose that immediately preceding *e had already become *i (see 3.2.6 (i)), but most examples of *e are in noninitial syllables and thus should already have become *i because they were unstressed (see 3.2.5 (iii)). However, there is one example in an initial syllable, namely 'three':

PIE *tréyes 'three' (nom. masc.; cf. Skt *tráyas*, Gk τρεῖς /trêːs/) > *þréjes > *þrejiz > *þrijiz > PGmc *þrīz (cf. ON *þrír*; OE *þrīe* has added the strong adj. nom. pl. ending).

Since the loss of *j occurred in Gothic as well as in the other Germanic languages, we must reconstruct this sound change for PGmc (in spite of the fact that its effects were later eliminated by the merger of *i and *e in Gothic). The proposal that Germanic '*$\bar{e}_2$' reflects inherited *ey is without merit; see Ringe 1984*a* for fuller discussion.

3.2.6 *Loss of *j, *w, and *ə; miscellaneous consonant changes*

The sound changes discussed in the first two subsections of this section are among the most complex and obscure in the prehistory of Germanic, and there is no consensus regarding them. I here present the scenario that I accept; it is based heavily on Cowgill 1959; Bennett 1962; Hock 1973; Dishington 1978; and þórhallsdóttir 1993. The sound changes discussed in the third subsection are 'minor' sound changes, affecting few forms. The fourth subsection discusses an Auslautgesetz whose exact formulation and chronology have been uncertain; I believe that I adduce hitherto overlooked evidence that helps to settle the question.

3.2.6 (i) *The loss of *j and *w* PIE *y survives word-initially in PGmc, traditionally spelled *j; examples are fairly few but certain. Note especially:

PIE *yes- 'boil' (cf. Skt *yásyati* 'it foams', Gk ζεῖν /sdêːn/ 'to boil' < *d^{z}eh-e-) > PGmc *jesaną 'to ferment' (cf. OHG *jesan*);
PIE *yugóm 'yoke' (cf. Skt *yugám*, Lat. *iugum*) > PGmc *juką (cf. OE *ġeoc;* Goth. *juk* 'yoke (of oxen), pair');
PIE *yū́ 'you (pl.)' (cf. Skt *yūyám*) → *yū́s (recharacterized, cf. Lith. *jūs*, Av. *yūžəm*) > PGmc *jūz (cf. Goth. *jūs*; OE *ġē*, etc. have been remodeled on 'we');
PIE *h$_2$yuHn̥ḱós 'young' (cf. Skt *yuvaśás*; Lat. *iuvencus* 'steer', i.e. 'young bull') > PGmc *jungaz (cf. Goth. *juggs*, OE *iung*, *ġeong*);
PIE relative pronoun *Hyó- (cf. Skt *yás*, Gk ὅς /hós/) + *k^{w}e 'and' (see 3.2.5 (i); for the formation cf. Lat. *quo-que* 'also') > PGmc *jah^{w} 'and' (cf. Goth. *jah*; OE *ġe . . . ġe* 'both . . . and').

In noninitial position, however, *y / *j was lost in a complex pattern:

word-internally *j was lost,
except when immediately preceded by a consonant, *i, or *ə,
unless *i immediately followed (in which case it was lost after all).

The outcomes can be listed schematically as follows:

*Cji > *Ci;	other *CjV > *CjV;
*iji > *ii (> *ī);	other *ijV > *ijV;
*əji > *əi;	other *əjV > *jV;
all other *VjV > *VV.	

Even a cursory glance at this table suggests that the pattern of outcomes was not the result of a single natural phonetic change (cf. Þórhallsdóttir 1993: 22 n. 32), and in fact that can be demonstrated. The crucial point is the behavior of *ə. It seems clear enough that a preceding *i 'protected' *j from loss if any other vowel followed, because it was the syllabic that shared all the features of *j; but why should *ə, which was not particularly like *j, have protected it as well? The outcome *jV < *əjV would make much more sense if *ə between nonsyllabics had already been lost by the time *j was dropped between vowels other than *i. But *ə does survive in the sequence *əji, in which *j was lost instead. The simplest chronology of changes that will give those outcomes is the following:

1. *j was lost before *i;
2. *ə was lost between nonsyllabics;
3. *j was lost between vowels unless the preceding vowel was *i.

That is the chronology that I adopt.

I will give examples of these changes together with examples of related forms in which *j was preserved (to the extent that such forms exist), since that will show most clearly the consequences of the loss of *j for PGmc inflectional morphology.

The loss of *j between a consonant and *i occurred in the forms of j-presents of light roots in which the thematic vowel was in the e-grade (see 3.4.3 (i) ad fin. on the endings):

PIE *g^{wh}éd^{h}yeti '(s)he is asking for', *g^{wh}éd^{h}yonti 'they are asking for' (see 3.2.4 (iii)) > *bidjidi, *bidjondi >⟶ PGmc *bidiþi, *bidjanþi (cf. Goth. *bidjiþ*, *bidjand*, ON *biðr*, *biðja*, OE *bitt*, *biddaþ*, OHG *bitit*, *bittent*);

PIE *lég^{h}yeti '(s)he's lying down', *lég^{h}yonti 'they're lying down' (eventive; see 3.2.4 (i) ad fin.) > *ligjidi, *ligjondi >⟶ PGmc *ligiþi, *ligjanþi (cf. OE *liġþ*, *liċġaþ*, OHG *ligit*, *liggent*; ON inf. *liggja*);

PIE *$h_2$éryeti 'he's plowing', *$h_2$éryonti 'they're plowing' (see 3.2.5 (ii)) > *arjidi, *arjondi >⟶ PGmc *ariþi, *arjanþi (cf. OE *ereþ*, *eriaþ*, OHG *erit*, *erient*; Goth. ptc. *arjands*);

PIE *kh_2piéti '(s)he is grasping', *kh_2piónti 'they are grasping' (see 3.2.1 (iv)) > *kapyéti, *kapyónti (as also in Lat. *capit* '(s)he takes', *capiunt* 'they take') > *habjiþi, *habjonþi > PGmc *habiþi '(s)he lifts', *habjanþi 'they lift' (cf. Goth. *hafjiþ*, *hafjand*, ON *hefr*, *hefja*, OE *hefeþ*, *hebbaþ*, OHG *hefit*, *heffent*);

PIE *woséyeti '(s)he clothes', *woséyonti 'they clothe' (cf. Hitt. *wassezzi*, *wassanzi*, Skt *vāsáyati*, *vāsáyanti*) > *wozijidi, *wozijondi > *wozjidi, *wozjondi >⟶ PGmc *waziþi, *wazjanþi (cf. Goth. *wasjiþ*, *wasjand*, OE *wereþ*, *weriaþ*, OHG *werit*, *werient*).

That *j was lost before *i is indicated by the following. In WGmc *j caused the gemination of any preceding consonant except *r (including *r < *z, see vol. ii); in ON a similar gemination of the velars *k and *g (only) occurred. In verbs of the classes just listed we do find gemination when the stem vowel was *a, but not when it was *i. Gothic does show *-ji-* ∼ *-ja-* in these verbs, but *-j-* can easily have been reintroduced before *-i-* by levelling. Of course it is conceivable that this particular loss of *j occurred only in NWGmc; but since *j was lost before *i in all other environments, and since the loss is reflected in several Gothic forms and classes of forms (see below), it is much more likely to have occurred in pre-PGmc.

Preservation of *j between consonants and vowels other than *i is also demonstrated, of course, by numerous nominals:

PIE *méd^{h}yos 'middle' (cf. Skt *mád^{h}yas*, Lat. *medius*) > PGmc *midjaz (cf. Goth. *midjis*, OE *midd*);

PIE *ályos 'other' (cf. Lydian *αλα-*, Gk *ἄλλος* /állos/, Lat. *alius*) > PGmc *aljaz (cf. Goth. *alja-*);

PIE *nítyos '(one's) own' (cf. Skt *nítyas*) > PGmc *niþjaz 'relative, kinsman' (cf. Goth. *niþjis*; OE pl. *niþþas* 'people');

PIE *kóryos 'detachment' (OIr. *cuire* 'company'; Lith. *kãrias* 'army') > PGmc *harjaz 'army' (cf. Goth. *harjis*, OE *here*, pl. *herġas*);

PIE *néwios 'new' (cf. Welsh *newydd*, Skt *návias*, see 3.2.5 (i)) > PGmc *niwjaz (cf. Goth. *niujis*, OHG *niuwi* with geminate *ww reflecting PGmc *wj).

Note again the West Germanic gemination of consonants (other than *r*) triggered by *j. The *-ji-* of these Gothic examples is also the result of leveling: just as PGmc *-az > Goth. *-s*, so PGmc *-jaz > Goth. *-is* (the *j becoming a syllable nucleus), and *-j-* was then reintroduced from the oblique forms.

The loss of *j between two *i's occurred in the forms of j-presents of heavy roots in which the thematic vowel was in the e-grade. The two *i's then contracted to PGmc *ī:

PIE *seh$_2$gieti '(s)he gives a sign', *seh$_2$gionti 'they give a sign' (cf. Hitt. *sākizzi*, *sākianzi*; Lat. *sāgīre* 'to be keen-nosed'; see 3.2.4 (iv)) > *sākijiþi, *sākijonþi > PGmc *sōkīþi '(s)he seeks', *sōkijanþi 'they seek' (cf. Goth. *sokeiþ*, *sokjand*, OE *sēcþ*, *sēċaþ*)

PIE *h$_2$ḱh$_2$owsiéti '(s)he is sharp-eared', *h$_2$ḱh$_2$owsiónti 'they are sharp-eared' (cf. Gk *ἀκούειν* /akóueːn/ 'to hear') > *hauzijiþi, *hauzijonþi > PGmc *hauzīþi '(s)he hears', *hauzijanþi 'they hear' (cf. Goth. *hauseiþ*, *hausjand*, OE *hīerþ*, *hīeraþ*);

PIE *wr̥ǵyéti '(s)he is working', *wr̥ǵyónti 'they are working' (cf. Av. *vərəziieiti*, *vərəzinti*) > *wurgiéti, *wurgiónti > *wurkijiþi, *wurkijonþi > PGmc *wurkīþi '(s)he works/makes', *wurkijanþi 'they work/make' (cf. Goth. *waúrkeiþ*, *waúrkjand*, OE *wyrcþ*, *wyrċaþ*);

PIE *wortéyeti '(s)he turns it', *wortéyonti 'they turn it' (cf. Skt *vartáyati*, *vartáyanti*) > *wordijidi, *wordijondi ⟶ PGmc *(fra-)wardīþi, *(fra-)wardijanþi '(s)he, they ruin it' (*'turn it wrong'; cf. Goth. *frawardeiþ*, *frawardjand*, OE *(for)wiert*, *(for)wierdaþ*, OHG *arwertit*, *arwertent*).

The same change affected *iji-sequences in nominal forms:

PIE masc. nom. pl. *tréyes 'three' (cf. Skt *tráyas*, Lat. *trēs*) > *þrijiz > PGmc *þrīz (cf. ON *þrír*; OE *þrīe*, OHG *drīe* with analogically added ending);

PIE nom. pl. *g^{h}ósteyes 'strangers' (cf. Lat. *hostēs* 'enemies', with the same contraction as in *trēs*) > *gostijiz > PGmc *gastīz 'guests' (cf. Goth. *gasteis*, ON *gestir*, OHG *gesti*).

Note that Gothic exhibits both the loss of *j and the contraction. The Gothic evidence is important, since suffixal vowels were reduced in various ways in North and West Germanic.

Preservation of *j between *i and vowels other than *i is again demonstrated by nominals, of which the following are typical:

PIE *priHós 'beloved, happy' (cf. Skt *priyás* 'beloved', verb *prīṇā́ti* '(s)he gladdens') → 'free' (cf. Welsh *rhydd*) > PGmc *frijaz (cf. Goth. *freis*, OHG *frī*);

post-PIE *h$_2$entíos 'in front' (see 3.2.5 (ii)) > PGmc *andijaz 'end' (cf. Goth. *andeis*, ON *endir*, OE *ende*, OHG *enti*);

post-PIE *orb^{h}iom 'inheritance' (see 3.2.5 (ii)) > PGmc *arbiją (cf. Goth. *arbi*, OE *ierfe*, OHG *erbi*).

Note that though all the literary languages exhibit reflexes of *-ī(z) < *-ij(z) < *-ijaz, *-iją in these words, nom. sg. *-ijaz* is well attested in Runic Norse (Krause 1971: 117). Cf. also the class II weak verb derived from the first example in the above list:

(post?-)PIE *priHeh$_2$yé/ó- (cf. Skt *priyāyáte* '(s)he reconciles') > PGmc *frijǭną 'to love' (see below on the shape of the suffix; cf. Goth. *frijon*).

A few other similar verbs can be cited (Þórhallsdóttir 1993: 23–6).

While the statements in the preceding paragraphs reflect a consensus, there is no unanimity regarding the fate of *j after *ə, because virtually all examples occur in the present stems of class III weak verbs, whose PGmc shape and ultimate origin are still a matter of dispute. I here present the conclusions that I accept; see also 3.4.3 (i).

It seems clear that the PIE stative present-stem suffix *-éh$_1$- always occurred accented in the e-grade; that is why we find invariant -*ē*- in Latin second-conjugation stative presents, e.g.:

PIE *h$_1$rud^{h}éh$_1$- 'to be red, to blush' (cf. OIr. 3sg. *ruidid* < *rudī- < *rud^{h}ē-) > Lat. *rubēre*;
(post?-)PIE *takéh$_1$- or *tHkéh$_1$- 'to be silent' (see below) > Lat. *tacēre*.

But it seems clear that in Germanic this non-ablauting athematic suffix was replaced by the thematic suffix complex *-ə-yé- ∼ *-ə-yó- (Bennett 1962: 135–8). Though the *ə of this complex is evidently the reflex of a laryngeal, the development must have been post-PIE, since laryngeals had been lost between a nonsyllabic and *y in the protolanguage when a syllable preceded (see 2.2.4 (iii)). The most plausible scenario for this development is the following: when verbal adjectives in *-tó- became passive participles, they began to be formed to derived present stems, which had formerly made no non-finite forms; at the time when that occurred, the participial suffix still productively induced zero grade of immediately preceding morphemes, so that the result was a suffix complex *-h$_1$-tó-; the latter developed to *-ə-tó- by regular sound change (see 3.2.1 (iv)); finally, present stems in *-ə-yé- ∼ *-ə-yó- were back-formed to the participles, ousting the original athematic presents (see Ringe 1991: 83–91, 1996: 56–8). It is the subsequent development of those new thematic presents that we must now consider.

There is a fairly wide consensus that after the sequence *-əyé- had become *-əji- the *j was lost, yielding a diphthong *əi that then merged with *ai:

pre-PGmc *takəyé- 'be silent' (see above) > *þagəji- > *þagəi- > PGmc *þagai- (cf. OHG *dagēt* '(s)he is silent'; Goth. *þahaiþ* has unexpectedly

introduced the voiceless Verner's Law alternant, apparently from a related word that is not attested (pace Bernhardsson 2001: 45, 252, 281–2)).

This explains why (as Bennett 1962: 138–9 notes) *-ai-* appears in all and only those forms of the Gothic present paradigm in which an e-grade thematic vowel is expected (though it has also been leveled into the finite past and past participle in Gothic, and throughout the paradigm of the verb in OHG). What happened to the alternant *-əyó- is much less clear. It must have become pre-PGmc *-əja-, but whether that sequence survived in PGmc, or became *-ja-, or became *-əa- which then developed into *-a-, is disputed because the evidence of the daughter languages is conflicting. We find that:

Goth. has *-a-* in the o-grade forms of all class III weak presents;
ON has *-a- in most, but *-ja- in *segja* (*seggja*) 'say' and *þegja* 'be silent';
OE has *-ja- in all, but the class has been reduced to a handful of relics; so also in OF and OS;
OHG has generalized e-grade *-ē-* < *-ai-, but with relics suggesting a prehistory like that of northern WGmc (Braune and Eggers 1975: 297–9).

Bennett (1962: 138–9) suggests that the Gothic and majority ON development was phonologically regular, reflecting the last alternative sound change scenario sketched immediately above. But relic formations are more likely to preserve regular sound-change outcomes, and both the ON minority paradigm and the few surviving class III weak presents in OE and the other northern WGmc languages clearly qualify as relics (so Hock 1973: 332–3; Dishington 1978). I therefore accept the view that the sequence *əja yielded *ja by regular sound change; the development of the o-grade stem alternant of 'be silent' will then have been approximately:

pre-PGmc *takəyó- 'be silent' (see above) > *þagəja- > PGmc *þagja- (cf. ON 3pl. *þegja* 'they are silent'),

and the development of the present of 'say' will have been:

pre-PGmc *sok^{w}əyé- ~ *sok^{w}əyó- 'say' > *sag^{w}əi- ~ *sag^{w}əja- (see 3.2.4 (iii)) > *sag^{w}ai- ~ *sagja- → PGmc *sagai- (cf. OHG *sagēt* '(s)he says') ~ *sagja- (cf. ON *seg(g)ja*, OE *seċġaþ* 'they say').

Note that the unrounding of *g^{w} before *j must have followed the loss of *ə, and that the resulting *g must have been leveled into the remaining forms of the paradigm. The j-less forms of Gothic and ON class III weak presents will be discussed in 3.4.3 (i).

It seems clear from the evidence presented in Þórhallsdóttir 1993 that *j was lost between all other pairs of vowels. Note especially these examples (all cited by Þórhallsdóttir):

PIE thematic optative 1sg. *-oyh$_1$-m̥ (cf. Arkadian Gk *-οια* /-oia/ and, with analogically added *-m*, Skt *-eyam*) > *-oyun > PGmc *-aų (Bammesberger 1981: 80–1; cf. Goth. *-au*, e.g. in *baírau* 'I may carry');

(post-)PIE thematic optative 3pl. *-oyh$_1$-end (cf. Gk *-οιεν* /-oien/) > *-oyin > PGmc *-ain (Bammesberger 1981: 82; cf. OHG *-ēn*, OE *-en*, e.g. respectively in *berēn*, *beren*; extended with a particle in Goth. *-aina*, e.g. in *baíraina*);

PIE *áyeri 'in the morning' (cf. Av. *aiiarə* 'day', Gk *ἄ̆ριστον* /á:riston/ 'breakfast' < *ayeri-h$_1$d-s-to- 'eaten in the morning') > *ajiri > PGmc *airi 'early' (cf. Goth. *air*, ON *ár*, OE *ǣr*, OHG *ēr*);

PIE *áyos ~ *áyes- 'copper' (cf. Skt *áyas* 'metal, iron', Lat. *aes* 'bronze'; I suggest the meaning of the protoform on the grounds that PIE was clearly spoken in the Neolithic period) > *ajaz ~ *ajiz- >⟶ PGmc *aiz 'bronze' (cf. Goth. *aiz*, ON *eir*, OE *ār*, OHG *ēr*);

PIE *steh$_2$- 'to stand' (cf. aor. 3sg. Skt *ást^{h}āt*, Gk *ἔστη* /éstę:/ '(s)he stood up'), innovative pres. *sth$_2$-yé/ó- or stative *sth$_2$-h$_1$yé/ó- (cf. OCS 3sg. *stojitŭ;* Þórhallsdóttir 1993: 35–6, citing Cowgill 1973: 296) > *staja- ~ *staji- > PGmc *stā- ~ *stai- (cf. OF, OS, OHG *stān* beside OHG *stēn*);

PIE *b^{h}uh$_2$- 'to become' (cf. aorist 3sg. Skt *áb^{h}ūt*, Gk *ἔφῡ* /ép^{h}u:/), innovative pres. *b^{h}uh$_2$-ye/o- (cf. Gk *φῡ́ϵσθαι* /p^{h}ú:est^{h}ai, Lat. *fierī*; Þórhallsdóttir 1993: 152–6) > *būji- ~ *būja- 'be' > PGmc *būi- ~ *būa- 'dwell' (cf. ON *búa*, 3sg. *býr*, OE *būan*, 3sg. *bȳþ*);

PIE pres. *snéh$_1$ye/o- 'to spin' (cf. Gk *νῆν* /nę̂:n/, Lat. *nēre*; Skt *snā́yati* '(s)he wraps', OIr. *sníid* '(s)he twists') >⟶ PGmc *nēï- ~ *nēa- 'sew' (cf. OHG *nāen*, *nāwen*);

PIE pres. *h$_2$wéh$_1$- ~ *h$_2$wéh$_1$- 'to blow' (cf. 3sg. Skt *vā́ti*, Homeric Gk *ἄ̆ησι* /áę:si/) >⟶ *wéh$_1$ye/o- (cf. OCS 3sg. *vějetŭ*) > *wēji- ~ *wēja- > PGmc *wēï- ~ *wēa- (cf. Goth. *waian*, OE 3sg. *wǣweþ*);

PIE *seh$_1$- 'to sow' (cf. Lat. perf. *sēvit* '(s)he sowed'), innovative pres. *séh$_1$ye/o- (cf. 3sg. Lith. *sėja*, OCS *sějetŭ*) > *sēji- ~ *sēja- > PGmc *sēï- ~ *sēa- (cf. Goth. *saian*, ON *sá*, 3sg. *sær*, OE *sāwan*, 3sg. *sǣwþ*, OHG *sā(j)en*, *sāwen*).

Þórhallsdóttir 1993 argues convincingly that the various semivowels found before the thematic vowel in West Germanic languages are secondary developments, none directly reflecting PGmc *j. There are many other potential examples among vowel-final strong verbs, but the above are especially useful

because a present in *-ye/o- was either inherited from PIE or can be paralleled in other daughter languages.

The example 'stand' is especially interesting because it reveals two things about the relative chronology of the sound changes. First, *ə in initial syllables must have become *a before the loss of intervocalic *j; the most plausible point for such a development is after the accent became fixed on the first syllables of phonological words (see 3.2.4 (ii)). Secondly, it is striking that the contraction product of *aa in this stem is not *ō; it follows that the contraction must have occurred after the shift of inherited *ā to *ō, which can be shown to have been a very late sound change (see 2.7 below). I will argue in 3.4.3 (i) that factitive presents of the 3rd weak class exhibit the same outcome.

Finally, the inflection of class II weak presents provides an example of the loss of *j between various pairs of unstressed vowels, as Cowgill 1959 demonstrated. Forms of the PGmc present *salbō̄ną 'anoint' illustrate the outcomes:

PIE *sólpos 'ointment', collective *solpéh$_2$ (see 3.2.4 (ii)), (post-PIE?) denominative *solpeh$_2$yé/ó- 'anoint': indic. 3sg. *solpeh$_2$yéti > *salbājiþi > PGmc *salbō̄þi (cf. Goth. *salboþ*, OE *sealfaþ*, OHG *salbōt*);
indic. 3pl. *solpeh$_2$yónti > *salbājanþi > PGmc *salbō̄nþi (cf. Goth. *salbond*, OHG *salbōnt*);
opt. 3sg. *solpeh$_2$yóyd > *salbājait > PGmc *salbō̄ (cf. Goth., OHG *salbo*);
opt. 3pl. *solpeh$_2$yóyh$_1$end > *salbājajint > PGmc *salbō̄n (cf. Goth. *salbona*, OHG *salbōn*);
opt. 1sg. *solpeh$_2$yóyh$_1$m̥ > *salbājajun > PGmc *salbō̄ (cf. Goth., OHG *salbo*).

Note that the pre-PGmc sequences *āji, *āja, *ājai, *ājaji, *ājaju all eventuated in PGmc trimoric *ō̄, which was also the outcome of much older contractions (see 3.2.1 (ii)). For the opt. 1sg. and 3sg. that is demonstrated by the fact that the resulting word-final vowel is not shortened in Gothic and appears in OHG as (short) *-o* rather than *-a*, and for the indic. 3sg. it is demonstrated by the quality of the surviving internal vowel (not fronted in OE, not unrounded in OHG); other forms could be analogical, but there is no reason to suppose that they are (except for the imperative 2sg., whose PIE *-e should have been lost by sound change long before any contraction could occur). On the other hand, there is no evidence that trimoric vowels resulted from this late contraction when the input was two *short* vowels; in that respect it differs from the early contraction discussed in 3.2.1 (ii).

Since paradigmatic leveling was continuously possible, none of these forms can provide any direct evidence about the relative chronology of Osthoff's Law (see 3.2.1 (iii)).

It is worth remarking that *j was not lost after *w; that is, at the time when the loss of intervocalic *j occurred, the second segment of the diphthongs *au and *iu was structurally a semivowel *w rather than a vowel *u. Thus there was no loss of *j in *niwjaz 'new' (cited above), nor in *hawją 'grass, hay' (cf. Goth. *hawi*, OE *hīeġ*, etc.), nor in *tawjaną 'to fit together' (cf. Goth. *taujan* 'to make') nor *siwjaną 'to sew' (cf. Goth. *siujan*). Whether we should expect *j to have been lost after *j is not clear, given that it was largely preserved after *i (see above); in any case, there was no degemination in such forms as *wajjuz 'wall' (cf. Goth. *-waddjus*, ON *veggr*, etc.) and *twajjǭ 'of two' (cf. Goth. *twaddje*, ON *tveggja*, etc.).

There is some evidence that *w was lost between round vowels, but there are far fewer examples, and it does not appear that the loss of *w and of *j were related. The most striking piece of evidence is Goth. 1du. *-os*, which should be a reflex of PIE thematic *-o-wos; the most straightforward way to account for this ending is to posit that the *w was lost and the adjacent o-vowels subsequently contracted:

PIE them. 1du. *-o-wos, e.g. in *b^{h}érowos 'the two of us are carrying' (cf. Skt *b^{h}árāvas*), > *-oos > *-ōs > PGmc *-ōz, e.g. in *berōz (cf. Goth. *baíros*).

If this was a natural sound change, it must have occurred before the unrounding of *o to *a in pre-PGmc (see 3.2.7 (i)). But it cannot be the case that *w was lost between all pairs of o-vowels; note the counterexample:

PGmc *hrawaz 'raw' (cf. ON *hrár*, OE *hrēaw*, OHG *rō*) < (post-)PIE *krowh$_2$os, derivative of *kréwh$_2$s 'raw meat' (cf. Skt *kravís*; Gk κρέας /kréas/ 'meat').

However, this and the (few) other counterexamples all have one thing in common: one o-vowel or the other was in a root-syllable, which was stressed by rule after the PIE contrastive accent was lost. (That also applies to the preform of PGmc *frawardijaną 'to ruin' if that compound had been formed early enough to be a potential input to the sound change under discussion; see above for citation of the comparative evidence, which is somewhat equivocal.) It appears that *w was lost between short *o's only when both were unaccented.

The same restriction may not have affected cases involving other round vowels. There is one plausible example of loss of *w between a stressed *ō and a following *u:

PIE *sóh$_2$wl̥ 'sun' (cf. Lat. *sōl*; for the laryngeal cf. Gk ἥλιος /hḗːlios/, Homeric ἠέλιος /ɛːélios/ < *sāwel- < *seh$_2$wel-) > *sōwul > ?PGmc *sōl (cf. ON *sól*).

But this example is not completely certain, since if the *w survived in PGmc it would have been lost in the separate development of ON in any case. There is a similar uncertainty about PGmc 'nine', in which *w may have been lost in the sequence *ewu:

PIE *(h$_1$)néwn̥ 'nine' (cf. Skt *náva*, Gk *ἐννέα* /ennéa/; Lat. *novem*, but cf. *-n-* in *nōnus* 'ninth') > *néwun → *néwunt >→ PGmc *ne(w)un (cf. Goth. *niun*, ON *níu*, OHG *niun*).

Finally, there is one example of the loss of *w between a labial and a round vowel (cf. 4.3.4 (i)):

PIE *péh$_2$wōr ~ *ph$_2$un-′ → *ph$_2$uór ~ *ph$_2$un-′ (cf. Toch. B *puwar*, *pwār-*; see Ringe 1996: 17–18) > *puwōr ~ *pun- > *pwōr ~ *pun- > PGmc *fōr ~ *fun- (see 3.2.5 (ii); cf. Goth. *fon* ~ *funin-*, with suffixal *n* generalized and the obl. stem recharacterized with *-in-*, cf. *watin-* 'water').

It is unclear whether the loss of *w was a single sound change, since the environments in which it was lost were rather different from one another. However, nothing in the reconstructable relative chronology excludes that possibility (see 3.2.8).

3.2.6 (ii) *Loss of surviving *ə* I argued above that noninitial laryngeals not adjacent to any syllabic became *ə, which became *a in initial syllables but disappeared in most other positions (see 3.2.1 (iv)). We must now discuss how and when those *ə's were lost.

Clear examples inherited from PIE are rare, but the following can be cited:

PIE *sámh$_2$d^{h}os 'sand' (cf. Gk *ἄμαθος* /ámat^{h}os/) > *sáməd^{h}os > *sámd^{h}os > PGmc *samdaz (sic; cf. ON *sandr*, OE *sand*, OHG *sant*, but also MHG *sam(b)t*);

PIE *égh$_2$ 'I' (cf. Skt *ahám*, Lat. *ego*, both with innovative second syllables) > PGmc *ek, unstressed *ik (cf. Goth. *ik*, ON *ek*, OE *ic*, OHG *ih*), but cf. also Runic Norse *-ika*, *-eka*, OHG *ihha*, Plattdeutsch /ikə/.

Because the final vowel in the disyllabic forms of 'I' survives in High and Low German, it must have been a PGmc long vowel (cf. Feist 1939 s.v. *ik*), not a short vowel reflecting a laryngeal; perhaps the likeliest explanation is that it reflects a particle optionally cliticized to the pronoun. The rare MHG variant *sam(b)t* is more surprising, since it shows that the PGmc form of 'sand' was actually *samdaz and that the assimilation of the nasal to the following stop occurred independently in the development of the daughter languages.

A word which probably does not reflect the loss of *ə by regular sound change within the separate history of Germanic is the following:

PIE *$d^hugh_2tér$ 'daughter' (cf. Skt *duhitá*, Gk *θυγάτηρ* /$t^hugátę:r$/, Toch. B *tkācer*, Lycian acc. *kbatrã*), oblique stem *$d^hugtr̥$-′ (with regular loss of the laryngeal, Hackstein 2002: 5; cf. Gaulish *duxtir*, Oscan **futír**, Armenian *dowstr*, Lith. *duktẽ*, all with loss of the laryngeal leveled throughout the paradigm) > *$d^hugətér$ ∼ *d^huktr-′ >→ PGmc *duhtēr ∼ *duhtr- (cf. Goth. *daúhtar*, ON *dóttir*, OE *dohtor*, OHG *tohter*).

For discussion and further examples of the PIE rule that eliminated the laryngeal in the oblique stem see 2.2.4 (i) and Hackstein 2002 with references; widespread loss of the laryngeal in this word was noted already by G. Schmidt 1973.

The most important examples of the loss of *ə occur in the paradigms of class III weak verbs, in which the *ə was a post-PIE innovation (see the preceding section). The past participles are relatively straightforward:

pre-PGmc *$sok^wətós$ 'said' > *sagədaz > PGmc *sagdaz (cf. ON *sagðr*, OE *sæġd*, OS *sagd*);
pre-PGmc *kapətós 'held' > *habədaz > PGmc *habdaz 'had' (cf. ON *hafðr*, OE *hæfd*, OS *habd*).

(Pre-PGmc *takətós 'silent' must therefore have become PGmc *þagdaz; but within the area that preserves participles of this shape unaltered, the verb survives only in ON, where its participle—occurring only in the neuter, since the verb is intransitive—has been remodeled as *þagat,* with a default suffix.) The fact that Verner's Law has applied to all the internal stops of these forms shows that *ə survived beyond the time when Verner's Law occurred, since otherwise the outcomes would have been *ht, *ft. On the other hand, no attested language preserves any trace of the *ə, and it should not have undergone the regular syncope of internal short vowels in OE in the most basic forms of the paradigm (the nom. and acc. sg. masc. and neut.), whose final syllables had already been lost in PWGmc. It therefore appears that these *ə's had been lost already in the PGmc period.

The case of the corresponding infinitives (and other forms of the present with an o-grade thematic vowel) is similar. Since 'have' has undergone complex analogical changes, our best witness for the sound-change outcome is 'say' (and, in ON, its rhyming opposite 'be silent'). Note the pattern of outcomes:

pre-PGmc *$sok^wəyó$- 'say', *takəyó- 'be silent' > PGmc (inf.) *sagjaną, *þagjaną > ON *seg(g)ja*, *þegja*, OE *seċġan.*

Compare the inherited simple *-ye/o-present:

PIE *lég^{h}yo- 'lie down' (see 3.2.4 (i) ad fin.) > PGmc (inf.) *ligjaną > ON *liggja*, OE *liċġan.*

Though ON has leveled single *-g-* into the o-grade forms of 'say' from pres. indic. 3sg. *segir*, etc., and geminate *-gg-* into the e-grade forms of 'lie' (e.g. 3sg. *liggr*), there are enough relics (such as early Old Icelandic *seggja* and Old Norwegian *ligr*) to show that the same sound changes affected both verbs. There is thus no evidence that these *ə too were not lost already in the PGmc period.

3.2.6 (iii) *Assimilation in consonant clusters* A number of 'minor' sound changes in the prehistory of Germanic involved the assimilation of consonants in contact. At least two, the change of *nw to *nn and that of *ln to *ll, can be shown to have followed the resolution of syllabic sonorants (see 3.2.2 (i)).

There are several clear examples of PGmc *nn from earlier *nw, most involving paradigmatic leveling:

PIE *ténh$_2$u-s ~ *tn̥h$_2$éw- 'thin' (cf. Lat. *tenuis*; Gk *ταναός* /tanaós/ 'stretched, long'), fem. *tn̥h$_2$éw-ih$_2$ ~ *tn̥h$_2$u-yéh$_2$- → masc. *tn̥h$_2$ú-s ~ *tn̥h$_2$éw-, fem. *tn̥h$_2$w-íh$_2$ ~ *tn̥h$_2$w-iéh$_2$- (cf. Skt *tanús*, fem. *tanvī́*, *tanviā́*-) > masc. *þunuz, fem. *þunwī ~ *þunwijā- >⟶ PGmc masc. *þunnuz, fem. *þunnī ~ *þunnijō- (?, cf. ON *þunnr*); in PWGmc a masc. *þunnija- was backformed to the fem. (cf. OE *þynne*, OHG *dunni*);

PIE *ǵénu-s ~ *ǵénw- 'jaw' (cf. Toch. A dual *śanweṃ*, Gk *γένυς* /génus/) >⟶ PGmc *kinnuz 'cheek' (cf. Goth. *kinnus*, ON *kinn*; OE *ċinn* 'chin');

PIE *mánu-s ~ *mánw- 'person' (cf. Skt *mánus*) >⟶ PGmc *mann- (cf. Goth. *manna*, OE *mann*);

PIE pres. *mi-néw- ~ *mi-nw-′ 'to lessen' (cf. Skt 3sg. *minóti*, Lat. *minuere*), apparently also the basis for some nominal formations (cf. Lat. adv. *minus* 'less') > PGmc *minn- in *minnizō̄ 'less', *minnistaz 'least' (cf. Goth. *minniza*, *minnists*, OHG *minniro*, *minnisto*).

There are also three secure examples of *ll from earlier *ln, and two others that are probable:

PIE *pl̥h$_1$nós 'full' (cf. Skt *pūrṇás*, Lith. *pìlnas*) > *pulnos > PGmc *fullaz (cf. Goth. *fulls*, OE *full*);

PIE *h$_2$wĺ̥h$_1$neh$_2$ 'wool' (cf. Hitt. *hulana-*, Skt *ū́rṇā*, Lat. *lāna*, Lith. pl. *vìlnos*) > *wulnā > PGmc *wullō (cf. Goth. *wulla*, OE *wull*);

PIE *kl̥Hnís 'hill' (cf. Lat. *collis*) > *kulnis > PGmc *hulliz (cf. OE *hyll*); a different ablaut grade of the same root (and a slightly different suffix) appears in Lith. *kálnas* 'mountain' < *kólHnos;

post-PIE *pel-n- 'skin' (cf. Lat. *pellis* < *pelnis) > PGmc *fellą (cf. OE *fell* 'animal skin, hide', Goth. *þrūtsfill* 'leprosy');
post-PIE *ol- 'all' (cf. OIr. *uile* < Prehistoric Irish *olias < *olyos) in pre-PGmc *olnos (?) > PGmc *allaz (cf. Goth. *alls*, OE *eall*).

At least some Germanic strong verbs with roots in *-nn-* and *-ll-* probably reflect stems that have undergone these sound changes, though the details of individual cases are largely obscure.

These changes must be ordered after the resolution of syllabic sonorants to *uR-sequences because in 'thin', 'full', 'wool', and 'hill' the first of the two sonorants in the assimilating clusters resulted from that resolution. In all four of these examples there was also a laryngeal immediately following the syllabic sonorant in PIE. If it could be established that the chronology of changes was (1) resolution of syllabic sonorants, (2) epenthesis of *ə next to laryngeals, with subsequent loss of the laryngeals, and (3) loss of *ə in noninitial syllables (see the preceding section), these assimilations would also be ordered after the last of those changes. However, it cannot be excluded that laryngeals after syllabic sonorants were lost in some other way, possibly related to the resolution of the sonorants (see 3.2.2 (i)).

A number of forms exhibit assimilation of a nasal to an immediately following stop:

PIE *dék̑m̥d 'ten' (cf. Skt *dáśa*, Lat. *decem*, Lith. *dẽšimt*) > *tehunt > PGmc *tehun (cf. Goth. *taíhun*);
PIE *ḱm̥tóm 'hundred' (cf. Skt *śatám*, Lat. *centum*, Lith. *šimtas*) > PGmc *hundą (cf. Goth. pl. *hunda*, OE *hundred*);
PIE *h_2n̥tb^{h}í 'on both sides of' ?> *h_2m̥b^{h}í (cf. Gk *ἀμφί* /amp^{h}í/, Lat. *ambi-*) > PGmc *umbi 'around' (cf. OE *ymbe*).

Once again all the examples involve syllabic sonorants; but in this instance we cannot argue that the assimilation must have followed their resolution, because it does not depend on syllable structure and could easily have affected syllabic sonorants if such sounds still existed in the language. (The Latin and Greek cognates suggest that the loss of *t and assimilation of the nasal in 'around' could have occurred well before the independent development of Germanic began.) On the other hand, PGmc *samdaz 'sand' (discussed in the preceding section) shows that assimilation in 'ten' and 'hundred' had occurred before the loss of *ə, since the *md of 'sand' survived beyond the end of the PGmc period.

Interestingly, *m was not assimilated to a following *s, as these forms demonstrate:

PIE *mḗms- ∼ *méms- 'meat' (cf. the Skt derivative *māṃsám* for the consonants; the short vowel appears also in Toch. B (pl.) *misa*, cf. *mit* 'honey' < *méd^{h}u) >⟶ *mēmsóm or *memsóm (see 3.2.1 (iii)) > PGmc *mimzą (cf. Goth. *mimz*);

PIE *ómsos 'shoulder' (cf. Skt *áṃsas*) > PGmc *amsaz (cf. Goth. acc. pl. *amsans*).

PGmc exhibits a geminate *mm in a number of forms in which PIE clearly had *sm. A direct change *sm > *mm is unlikely, to judge from a small but widespread group of Gmc nouns like OHG *rosmo* 'rust' (post-PIE *h$_1$rud^{h}-smen-, cf. Meid 1967: 129). Moreover, the pres. indic. of 'be' provides positive evidence that the immediate ancestor of PGmc *mm was the voiced Verner's Law alternant *zm. That the PGmc forms developed from PIE unaccented main-clause alternants (see 2.2.5) is demonstrated by the operation of Verner's Law in the 3pl. (PIE *h$_1$senti > *senþi > *sendi > PGmc *sindi, cf. Goth. *sind*, OE *sindon*). The development of the 1sg. should therefore have been:

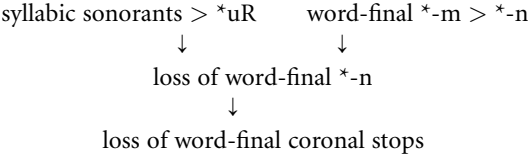
PIE *h$_1$esmi 'I am' (cf. Skt *asmi*, Gk ϵἰμι /e:mi/) > *esmi > *ezmi > PGmc *immi (cf. Goth. *im,* ON *em*; OHG *bim* has analogical *b*- from the perfective present).

The same development should have occurred in the enclitic loc. sg. form of the 3sg. masc. and neut. pronoun:

PIE *esmi 'on him/it' (cf. Skt *asmin*) → *esmoy (with o-stem *-oy, see 2.3.4 (i)) > *ezmai > PGmc dat. sg. *immai (cf. Goth. *imma*; OHG *imu* has substituted the instrumental ending).

From there *mm must have spread to (originally stressed) dat. sg. *þammai 'to that (one)', *himmai 'to this (one)', etc.

3.2.6 (iv) *The loss of word-final *t* It is clear that PGmc *tehun 'ten' has lost the final *-d of PIE *dék̑m̥d (see the preceding section). The loss of the stop must have occurred after, or at the earliest at the same time as, word-final *-n was lost (with nasalization of the preceding vowel, see 3.2.2 (ii)), since the final *-n of 'ten' has not been lost. Since the loss of *-n followed the resolution of syllabic sonorants and the change of word-final *-m to *-n, the loss of the stop must also have followed those changes, according to the chronology:



Either word-final *-m must then have become *-n a second time, or else the assimilation of the nasal to the stop occurred before the stop was lost; the latter is the more economical hypothesis, since we know that such an assimilation occurred in any case (see 'hundred' in the preceding section), and is therefore somewhat more likely.

A few other clear examples of the loss of word-final coronal stops can be cited, mostly from third-person verb endings:

- PIE thematic opt. 3sg. *-oyd, e.g. in *b^{h}éroyd '(s)he would carry' (cf. Skt *b^{h}áret*) > PGmc *-ai, e.g. in *berai (cf. Goth. *baírai*, OE *bere*);
- PIE thematic opt. 3pl. *-oyh$_1$end, e.g. in *b^{h}éroyh$_1$end 'they would carry' (no daughter language preserves the final stop, which is reconstructed from the internal pattern of PIE endings, but for the rest of the form cf. Gk *φέροιεν* /p^{h}éroien/) > *-ajin > PGmc *-ain (see 3.2.6 (i)), e.g. in *berain (cf. Goth. *baíraina*, OE *beren*, OHG *berēn*);
- PIE impf. 3sg. *d^{h}éd^{h}eh$_1$t '(s)he was putting' (or *-d after *h$_1$?; in either case, cf. Skt *ádad^{h}āt* with augment *é-) > *d^{h}éd^{h}ēd > PGmc *dedē '(s)he did' (cf. OHG *teta*; also weak past 3sg. Goth. *-da,* Runic Norse *-de,* ON *-ði,* OE *-de,* OHG *-ta,* see 3.3.1 (iv));
- PIE impf. 3pl. *d^{h}éd^{h}h$_1$n̥d 'they were putting' (cf. Skt *ádad^{h}ur*, with the usual replacement of the zero-grade ending; for the final stop cf. Faliscan *f[if]iqod* 'they made', i.e. [-o^{n}d]) > *dedun → PGmc *dēdun 'they did' (cf. OHG *tātun;* also weak past 3pl. Goth. *-dedun,* see 3.3.1 (iv)); this must also be the analogical source of 3pl. *-un in the strong past;
- PIE thematic abl. sg. *-e-ad (cf. Proto-East Baltic thematic gen. sg. *-ā > Lith. *-o*, Latvian *-a*; replaced analogically by *-ōd in most daughters, cf. Oscan **-úd,** Old Lat. *-ōd*) > PGmc adverb ending *-ō̄, e.g. in *þaþrō̄ 'from there, from then on' (cf. Goth. *þaþro*);
- PIE *mélid, *mélit- 'honey' (cf. Hitt. *milit*, Luvian *mallit*, Gk *μέλι* /méli/, *μέλιτ-* /mélit-/) > PGmc *mili, *milid- (cf. OE *mil-dēaw* 'honeydew', OHG *mili-tou* 'mildew'; in Goth. *miliþ* the final cons. of the oblique stem has been leveled into the nom.-acc. sg.).

The loss does not appear to have affected monosyllables; cf. especially:

- PIE *ád 'at' (cf. Lat. *ad*) > PGmc *at (cf. Goth., ON *at*, OE *æt*, OHG *aʒ*);
- PIE *tód 'that' (nom.-acc. sg. neut., cf. Skt *tát*) > PGmc *þat (cf. ON *þat*, OE *þæt*, OHG *daʒ*).

Neuter pronouns like the last item cited will be discussed in greater detail below.

The line of reasoning outlined at the beginning of this section tells us only that the loss of these stops occurred after the sound changes affecting word-final nasals, all of which could have occurred early in the prehistory of Germanic. It makes sense to ask whether the loss can be ordered relative to other Auslautgesetze. A promising candidate is the apocope of nonhigh short vowels (see 3.2.5 (i)). Though PGmc *wet 'we two' < *wédwo is not probative because it is a monosyllable, and PGmc *wait '(s)he knows' < *wóyde, etc., are not probative both for that reason and because their final consonants could have been restored by leveling, 2pl. verb forms appear to offer a diagnostic beyond the reach of analogical disturbance:

> PIE act. 2pl. *-te, e.g. in *b^{h}érete 'you (pl.) are carrying' (cf. Gk φέρετε /p^{h}érete/), > *-þ > PGmc *-d, e.g. in *birid (cf. Goth. *baíriþ*).

Since all active 2pl. verb forms ended in *-te, their consonant could not have been restored by leveling; they appear to show that the loss of word-final coronal stops preceded, or at least did not follow, the apocope of nonhigh short vowels (Hollifield 1980: 32–3).

But that argument is not clinching, for the following reason. It seems clear that underlying */t/ was realized as *-d word-finally in PIE, at least if no obstruent preceded (see 2.2.4 (iv)), and when laryngeals were lost with compensatory lengthening the voicing rule was almost certainly applied to */-t/ after the new long vowels (as in the impf. 3sg. cited above). Thus all the word-final stops lost in Germanic should have been reflexes of PIE *-d. When the final vowel of 2pl. *-te was lost, its stop clearly did not undergo the voicing rule, since it became *þ by Grimm's Law (and then *d by Verner's Law). If word-final loss affected only (reflexes of) PIE *d, the fact that the PIE *t of the 2pl. ending survives in PGmc tells us nothing about the relative chronology of sound changes. It might seem implausible that word-final stop deletion should target only voiced stops; but the evidence we have seen so far does not tell us whether the loss occurred before or after Grimm's Law had begun to operate. If it occurred after the earliest stage of Grimm's Law (see 3.2.4 (i)), the consonant of the 2pl. ending might have survived because it was no longer a stop but a fricative.

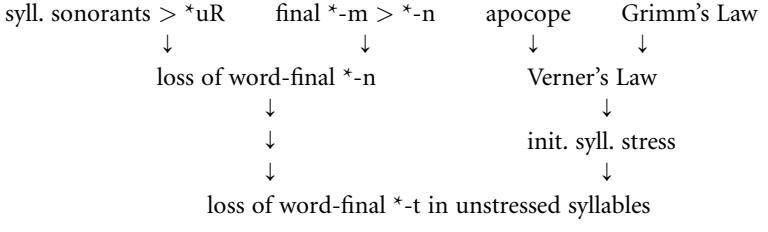
However, there is some indirect evidence that we have not yet considered. The Gothic shapes of the nom.-acc. sg. neut. pronouns and determiners fail to match those of the other Germanic languages:

> PIE *k^{w}ód 'which?' (cf. Lat. *quod*) > PGmc *h^{w}at 'what?' > ON *hvat*, OE *hwæt*, OHG *waz*; but Gothic has *hva*;

PIE *tód 'that' (cf. Skt *tát*) > PGmc *þat > ON *þat*, OE *þæt*, OHG *daz*; but Gothic has *þata*;
PIE *ḱíd 'this' > PGmc *hit > OE *hit* 'it'; but Gothic has *und hita* 'until now';
PIE *íd 'it' (cf. Lat. *id*) > PGmc *it > OHG *iz;* but Gothic has *ita.*

In the latter three examples Gothic has evidently appended to the inherited form a particle similar to the one that appears more widely in the acc. sg. masc. (cf. PGmc *þanō̯ 'that' > Goth. *þana,* OE *þone*), but the endinglessness of Goth. 'what' is unique and surprising. It must be analogical. The only possible model is the neut. nom.-acc. sg. ending of the strong adjective, and such an analogical change is inherently likely because an approximately reverse change—spread of the ending of 'that' to neut. nom.-acc. sg. strong adjectives—occurred in ON, and optionally in Gothic and OHG (though not in OE). The inherited neut. nom.-acc. sg. ending of strong adjectives is generally supposed to have been PGmc *-ą < PIE *-om, but that is not what we should expect. The endings of the PGmc strong adjective are in every other case those of the PIE 'pronominal' adjectives (McFadden 2004); thus we should expect this ending to be a reflex of PIE *-od (as in Gk *ἄλλο* /állo/, Lat. *aliud* < PIE *ályod). If *-d was lost first, and word-final nonhigh vowels were subsequently dropped, this form would have been endingless (like the voc. sg. of masc. o-stems); but if those two changes occurred in the other order, it should have been PGmc *-a. Goth. *hva* is thus indirect evidence for ordering apocope before the loss of *-d. It then follows that the last consonant of *b^{h}érete was not lost when it became word-final because it was not *d; and, as suggested above, that is most plausible if the loss occurred after Grimm's Law, when PIE *t had become the fricative *þ but PIE *d had had remained a stop, now *t. Since the loss occurred only in polysyllables, it makes sense to order it also after the fixation of stress on the initial syllable.

I therefore posit loss of word-final *-t after Grimm's Law had occurred and propose this relative chronology:



3.2.7 *Other changes of vowels*

A considerable number of sound changes that affected PGmc vowels can be shown to have occurred late in the prehistory of the subgroup; some might even have occurred after the unity of PGmc had begun to disintegrate. Most of the sound changes discussed in this section fall into that category (see the chart in 3.2.8).

3.2.7 (i) *Mergers of nonhigh back vowels* An obvious characteristic of Germanic as a whole is that the inherited contrast between a- and o-vowels has been lost. The short nonhigh nonfront vowels (including those colored by the second and third laryngeals in PIE) appear straightforwardly as PGmc *a. Examples can be multiplied almost ad libitum; these are representative:

PIE *átta 'dad' (cf. Gk ἄττα /átta/, Lat. *atta*, both used as respectful forms of address for old men; Hitt. *attas* 'father') >⟶ PGmc *attō̄ (cf. Goth. *atta* 'father');

PIE *$h_2$égros 'pasture' → 'field' (cf. Skt *ájras*, Lat. *ager*) > PGmc *akraz (cf. Goth. *akrs*, OE *æcer*);

PIE *$h_2$ówis ~ *$h_2$éwi- 'sheep' (Kimball 1987: 189; cf. Lycian acc. sg. *xawã*, Skt *ávis*, Lat. *ovis*) > PGmc *awiz (cf. Goth. *awistr* 'sheepfold');

PIE *$h_3$érō, *$h_3$éron- ~*h_3r̥n- 'eagle' (cf. Hitt. *hāras*, *hāran-*; Gk ὄρνῑς /órniːs/ 'bird') >⟶ *orō̄, *orn- > PGmc *arō̄, *arn- (cf. Goth. *ara*, OE *earn*, OHG *aro*, *arn*);

PIE *$h_3$ósdos 'branch' (cf. Gk ὄζος /ósdos/; Hitt. *hasduēr* 'twigs, brush') > *ósdos > PGmc *astaz (cf. Goth. *asts*, OHG *ast*);

PIE *órsos 'arse' (Hitt. *ārras*, Gk ὄρρος /órros/) > PGmc *arsaz (cf. OE *ears*);

PIE *kátus 'fight' (cf. OIr. *cath* 'battle'; Luvian *kattawatnallis* 'plaintiff') > PGmc *haþuz 'battle' (cf. OE *heaþu-*, OHG *hadu-*; ON *Hǫðr*, name of the god of battle);

PIE *sámh$_2$d^{h}os 'sand' (cf. Gk ἄμαθος /ámat^{h}os/) > *sáməd^{h}os > PGmc *samdaz (cf. ON *sandr*, OE *sand*);

PIE *ǵ^{h}áns 'goose' (cf. Gk χήν /k^{h}ɛ́ːn/, Lith. *žąsìs*) > PGmc *gans (cf. OE *gōs*, OHG *gans*);

PIE *kápros 'male (animal)' (cf. Gk κάπρος /kápros/ 'boar', Lat. *caper* 'he-goat') > PGmc *hafraz 'he-goat' (cf. ON *hafr*, OE *hæfer*);

PIE *dayh$_2$wḗr 'brother-in-law' (Normier 1977: 182, Huld 1988; cf. Skt *devá́*, Homeric Gk *dayawḗr > δᾱήρ /daːɛ́ːr/) > *taikwḗr >⟶ PGmc *taikuraz (remodeled on the analogy of *swehuraz 'father-in-law'; cf. OE *tācor*, OHG *zeihhur*);

post-PIE *káykos 'one-eyed' (cf. OIr. *cáech*; Lat. *caecus* 'blind') > PGmc *haihaz (cf. Goth. *haihs*);
PIE *kaw(H)- 'to strike' (cf. Lith. *káuti* 'to beat', Toch. B *kautsi* 'to kill') > PGmc *hawwaną 'to chop' (cf. ON *hǫggva*, OE *hēawan*);
PIE *g^{h}óstis 'stranger' (cf. Lat. *hostis* 'enemy', OCS *gostĭ* 'guest') > PGmc *gastiz 'guest' (cf. Goth. *gasts*, OE *ġiest*);
PIE *ḱonk- 'to hang' (cf. 3sg. Hitt. *gānki*; Skt *śáṅkate* 'is indecisive, worries') > PGmc *hanhaną (cf. OE *hōn*, OHG *hāhan*; Goth. *hāhan* 'to suspend (judgment)');
PIE *ǵómb^{h}os 'row of teeth' (cf. Skt pl. *jámb^{h}āsas*; Gk *γόμφος* /gómp^{h}os/ 'peg') > PGmc *kambaz 'comb' (cf. ON *kambr*, OE *camb*);
PIE *wóyde '(s)he knows' (cf. Skt *véda*, Gk *οἶδε* /ôide/) > PGmc *wait (cf. Goth. *wait*, OE *wāt*);
PIE *lówkos 'clearing' (cf. Lith. *laũkas* 'field', Lat. *lūcus* 'grove') > PGmc *lauhaz (cf. OE *lēah* 'meadow', OHG *lōh* 'copse, grove').

I have argued that this merger must have followed a change of unstressed tautosyllabic *ew to *ow, which in turn must have followed the shift of stress to initial syllables (see 3.2.5 (iii) ad fin.).

The long a- and o-vowels appear as PGmc (bimoric) *ō and (trimoric) *ō̄, the latter reflecting original disyllabic sequences and PIE word-final *-ō (see 3.2.1 (ii)). However, in this case there is some evidence that the merger at first yielded *ā (and therefore presumably also *ā̄), with rounding occurring only later. The most convincing piece of evidence is Gothic *Rūmoneis* 'Romans', reflecting earlier *Rūmōnīz. The latter was obviously borrowed from Lat. *Rōmānī*; but if the language had a vowel *ō when the borrowing took place, why was it not used to render Latin *ō*? The shape of the loanword makes sense, however, if at the time of the borrowing the language had an *ā but no *ō; in that case *ū should have been the best choice to represent Latin *ō,* the word must have been borrowed as *Rūmānīz, and the subsequent shift of *ā to *ō is responsible for the shape of the reconstructable form (cf. already Streitberg 1896: 48–9). We might then try to estimate the date of the latter sound change from the probable date of the borrowing. The latest possible date for direct contact between Romans and Germans is 113 BC, when the Cimbri and Teutones, in the course of an extensive raid into southern Europe, defeated a Roman army at the battle of Noreia (in southern Austria). Unfortunately we do not know what sort of trade contacts, mediated or unmediated, existed before that time. The most we can say is that the third and second centuries BC are probably the period in which the borrowing occurred.

Whether there was still a single PGmc language (in any sense) at that time is far from clear, but since the expansion of the Germanic tribes throughout central Europe was already underway, it is reasonable to suppose that at least noticeable dialect divergence was already occurring. It thus appears that the rounding of *ā to *ō (and of *ā̄ to *ō̄) was among the latest reconstructable PGmc sound changes, possibly spreading through an already diversified dialect continuum (though we know of no relic areas that it failed to reach). On the other hand, the merger of inherited *ā and *ō (as *ā) probably was part of the same change as the merger of the corresponding short vowels. The whole course of development can be illustrated by these typical examples:

PIE *swā́dus 'pleasant, sweet' (*swéh$_2$dus?; cf. Skt *svādús*, Gk *ἡδύς* /hę̄dús/) > *swātuz > PGmc *swōtuz → PNWGmc *swōtiz (cf. ON *sætr*, OE *swēte*);

PIE *wréh$_2$d- ~ *wr̥h$_2$d- 'root' (cf. Lat. *rādīx*) > *wrāt- ~ *wurt- > PGmc *wrōt- ~ *wurt- (cf. Goth. *waúrts*, ON *rót*; OE *wyrt* 'plant');

PIE *h$_2$wĺ̥h$_1$neh$_2$ 'wool' (cf. Hitt. *hulana-*, Skt *úrṇā*, Lat. *lāna*, Lith. pl. *vìlnos*) > *wulnā > PGmc *wullō (cf. Goth. *wulla*, OE *wull*);

PIE *h$_2$wĺ̥h$_1$neh$_2$m 'wool (acc.)' > *wulnām > *wullą̄ > PGmc *wullǭ (cf. Goth. *wulla*, OE *wulle*);

PIE *pṓds 'foot (nom. sg.)' (cf. Skt *pā́t*, Doric Gk *πώς* /pǫ́ːs/) > *fāt- > PGmc *fōt- (cf. Goth. *fotus*, OE *fōt*);

PIE *k$^{\text{w}}$etwṓr 'four (neut.)' (cf. Skt *catvári*, Lat. *quattuor*) >⟶ *fedwār > PGmc *fedwōr (cf. Goth. *fidwor*, OE *fēower*);

(post-)PIE *b$^{\text{h}}$leh$_3$- 'bloom, flower' (cf. Lat. *flōs* 'flower') > *b$^{\text{h}}$lō- > *blā- > PGmc *blō- (cf. Goth. *bloma* 'flower', OE *blōstm* 'flower', *blōwan* 'to bloom');

PIE *d$^{\text{h}}$óh$_1$mos 'thing put' (cf. Gk *θωμός* /t$^{\text{h}}$ǫ́ːmós/ 'heap') > *d$^{\text{h}}$ómos > *dāmaz > PGmc *dōmaz 'judgment' (cf. Goth. *doms*, OE *dōm*);

PIE *sóh$_2$wl̥ 'sun' (cf. Lat. *sōl;* for the laryngeal cf. Gk *ἥλιος* /hę́ːlios/, Homeric *ἠέλιος* /ę́ːélios/ < *sāwel- < *seh$_2$wel-) > *sṓwl̥ > *sāwul > *sōwul > ?PGmc *sōl (cf. ON *sól*);

PIE thematic pres. indic. 1sg. *-oh$_2$ (cf. Lat. *-ō*, Lith. *-ù*) > *-ō > *-ā > PGmc *-ō (cf. Goth. *-a*, ON Ø, OHG, Anglian OE *-u*);

PIE h$_1$néh$_3$mō 'nomenclature, names (collective)' (cf. Skt pl. *nā́mā*) > *nṓmō >⟶ *namā̄ (see 3.2.1 (iii)) > PGmc *namō̄ (cf. Goth. *namo*, OE *nama*, OHG *namo*);

PIE o-stem nom. pl. masc. *-oes (cf. Skt *-ās*, Oscan **-ús**) > *-ā̄z > PGmc *-ō̄z (cf. Goth. *-os*, OE *-as*);

PIE gen. pl. *-oHom (cf. Skt *-ām* (often disyllabic in the Rigveda), Gk *-ων* /-ǭːn/) > *-ą̄ > PGmc *-ǭ (cf. Goth. (fem.) *-o*, OE *-a*, OHG *-o*);

PIE eh_2-stem nom. pl. *-eh_2es (cf. Skt *-ās,* Lith. *-õs*) > *-ā̃z > PGmc *-ōz (cf. Goth. *-os*, OE *-a*, OHG (adj.) *-o*).

As a result of these mergers, (pre-)PGmc had a 'square' vowel system in which the qualitative differences between the vowels can be minimally described by the oppositions high : nonhigh and front : nonfront. Moreover, the qualitative ablaut system of PIE became a system in which, for the most part, the nonhigh vowels *e and *a alternated with each other and with zero.

Finally, a regular sound change which has not been generally recognized (though cf. Bazell 1937: 5) can account for the anomalous stem vowel in the 1sg. of the past 'did', which is also the source of the weak past suffix (see 3.3.1 (iv)). It is clear enough that the stem reflects the PIE imperfect of 'put'; note the third-person forms:

PIE impf. 3sg. *$d^hédeh_1t$ (or *-d) '(s)he was putting' (see 3.2.6 (iv)) > *$d^hédēd$ > PGmc *dedē '(s)he did' (cf. OHG *teta* and weak past 3sg. Goth. *-da*, Runic Norse *-de*, ON *-ði*, OE *-de*, OHG *-ta*);

PIE impf. 3pl. *$d^hédh_1n̥d$ 'they were putting' (see 3.2.6 (iv)) > *dedun → PGmc *dēdun 'they did' (cf. OHG *tātun* and weak past 3pl. Goth. *-dedun*).

However, the 1sg. unexpectedly ends in PGmc *-ǭ. Since the expected ending *-ę̄ would be the only clear PGmc example of a word-final long nasalized e-vowel, positing a sound change by which it became *-ǭ is unarguably consistent with the observed regularity of sound change; but the phonetics of the change appear improbable. They are considerably better if *-ę̄ actually became *-ą̄ in the first instance. If that change occurred early enough, the resulting *-ą̄ can have been shifted to *-ǭ by the late sound change discussed in the preceding paragraphs; that is the chronology illustrated in the chart in 3.2.8. However, Patrick Stiles (p.c.) has observed that there is another alternative: even if long ā-vowels had already been rounded, it is possible that *[-ą̄] would have been reinterpreted as */-ǭ/ in unstressed final syllables by language learners. In that case the change under discussion must have followed the fixation of stress on initial syllables, but need not have preceded any other pre-PGmc sound change. In either case the development of this form must have been:

PIE *$d^hédeh_1m$ 'I was putting' (see 3.2.2 (ii)) = *[$d^hédēm$] > *dedę̄ > *dedą̄ > PGmc *dedǭ 'I did' (cf. OS *deda* and weak past 1sg. Goth. *-da,* Runic Norse *-do,* ON *-ða*).

A further possible example is the 1sg. present optative of 'be':

PIE *h$_1$siéh$_1$m 'I would be' (cf. Skt *syā́m*, Gk *εἴην* /eíę:n/) > *sijḗ > *sijā́ > PGmc *sijǭ (?cf. early ON *sjá*, OE *sīe;* but the former might have been remodeled on the thematic pres. opt. 1sg., like Goth. *sijau,* while the latter might have been remodeled on the 3sg., like OHG *sī* and later ON *sé*).

In any case this sound change must have taken place after the loss of word-final *-n with nasalization of preceding vowels. For further discussion see Ringe, forthcoming.

3.2.7 (ii) *Late developments of *VNC-sequences* Late in the development of PGmc inherited *e was raised to *i when followed by a nasal in the syllable coda (though not before a nasal which was in turn followed by a vowel). Examples are fairly easy to find:

PIE *en 'in' (cf. Gk *ἐν* /en/, Old Lat. *en* > Lat. *in*; cf. also Hitt. *andan*, Gk *ἔνδον* /éndon/ 'inside') > PGmc *in (cf. Goth., OE *in*);
PIE *pénk^{w}e 'five' (cf. Skt *páñca*, Gk *πέντε* /pénte/) > PGmc *fimf (cf. Goth. *fimf*, OE *fīf*);
PIE *ǵénu-s ~ *ǵénw- 'jaw' (cf. Toch. A dual *śanweṃ*, Gk *γένυς* /génus/) >⟶ *genwu- > PGmc *kinnuz 'cheek' (cf. Goth. *kinnus*, ON *kinn*; OE *ċinn* 'chin');
PIE *méms- 'meat' (see 3.2.6 (iii)) >⟶ *memsóm > PGmc *mimzą (cf. Goth. *mimz*);
PIE *seng^{wh}- 'chant' (see 3.2.4 (iii)) > PGmc *sing^{w}aną 'sing' (cf. Goth. *siggwan*, OE, OHG *singan*);
PIE *b^{h}end^{h}- 'tie' (cf. Skt *band^{h}*-) > PGmc *bindaną (cf. Goth., OE *bindan*);
post-PIE *h$_2$weh$_1$n̥tós or *wēntós 'wind' (see 3.2.1 (iii)) > *wentós > PGmc *windaz (cf. Goth. *winds*, OE *wind*).

In this case too we know that the change was fairly late because of a loanword: Finnish *rengas* 'ring' was clearly borrowed from a preform of PGmc *hringaz (with the normal sound-substitutions, cf. Finn. *kuningas* 'king' ← PGmc *kuningaz) at a date prior to the raising of *e before tautosyllabic nasals, and since most Germanic loanwords in Finnish reflect a state of the language not noticeably more archaic than reconstructable PGmc, it is reasonable to infer that the raising was a late change. It preceded only the change discussed in the following paragraph.

Finally, it is likely that PGmc *VN-sequences were realized phonetically as long nasalized vowels immediately before *h, since (1) the outcome is a long vowel in all the daughter languages and (2) the low vowel was rounded, like other nasalized low vowels, in the northernmost dialects of WGmc ('Anglo-Frisian'; see the discussion in vol. ii). Again examples are easy to find, though few have solid PIE pedigrees:

PIE *ḱonk- 'to hang' (cf. 3sg. Hitt. *gānki*; Skt *śáṅkate* 'is indecisive, worries') > PGmc *hanhanąˀ = *[hą̄hanąˀ] (cf. OE *hōn*, OHG *hāhan*; Goth. *hāhan* 'to suspend (judgment)');

PIE *$h_1$leng^{wh}- 'light' (e.g. in *h_1lṇg^{wh}rós, see 3.2.1 (ii); cf. also Av. *rənǰišatō* 'swiftest' < *$h_1$léng^{wh}istos) suffixed with *-to- (formation unclear) in PGmc *linhtaz 'light(weight)' = *[līhtaz] (cf. Goth. *leihts*, OE *līoht*);

post-PIE *tenk- 'to fit, to adapt' (?; cf. Lith. *teñka* 'belongs') > PGmc *þinhanąˀ 'to thrive' = *[þīhanąˀ] (cf. Goth. *þeihan*, OHG *dīhan*);

PGmc *þanhtaz 'thought' (see 3.2.4 (iv)) = *[þą̄htaz] (cf. OE *þōht*, OHG *gidāht*; ON *þáttr* 'perceived');

PGmc *þunhtaz 'seemed' (see 3.2.4 (iv)) = *[þū̆htaz] (cf. ON *þóttr*, OE *þūht*, OHG *gidūht*);

PGmc *branhtaz 'brought' = *[brą̄htaz] (cf. OE *brōht*, OHG *brāht*; pres. *bringanąˀ, cf. Goth. *briggan*, OE, OHG *bringan*);

PGmc *hunhruz (= *[hū̆hruz]) ~ *hungru- 'hunger' (cf. Goth. *hūhrus* but OE *hungor*);

PGmc *junhizō 'younger' = *[jū̆hizō] (cf. Goth. *jūhiza;* base adj. *jungaz, cf. Goth. *juggs*, OE *iung*, *ġeong*).

Note that this change must have followed both the raising of *e before tautosyllabic nasals (which fed it) and the rounding of inherited *ā (which it counterfed). It was probably the latest phonological innovation shared by all the attested Germanic languages, and as such it could have spread through an already well-differentiated dialect continuum.

3.2.8 *Chronological overview*

It is most convenient to express the recoverable chronological relations of the sound changes in a chart (Fig. 3.1). However, such a chart is inevitably oversimplified, since it cannot express differing degrees of likelihood or take account of plausible alternatives (to note only the two most obvious shortcomings). Therefore this chart is best used in conjunction with the text above, not as a substitute for it.

In Fig. 3.1 I express sound changes in the usual generative notation, in which / introduces the environment in which the change occurs and __ marks the position of the input in the environment; if there is no __, the change occurred when the input was adjacent to the environment. I use the following abbreviations:

C	nonsyllabic	#	word boundary
H	laryngeal	$	syllable

K	velar	:	length
K′	palatal	ˊ	stressed
K^w	labiovelar	ˋ	unstressed
R	sonorant	˛	nasalized
T	coronal stop		
V	syllabic		

3.3 Restructurings of the inflectional morphology

Some of the changes in inflectional morphology that characterize the development of PGmc appear to have been straightforward (at least in retrospect), such as the loss of most dual forms, the syncretism of genders in the oblique plural of some nominals, and the leveling of ablaut in nominal inflection. By contrast, the complete restructuring of the verb system clearly involved a complex series of changes that took place over many generations; the acquisition of a set of two parallel paradigms for most adjectives was also a development that cannot be explained as garden-variety simplification. Both developments are uniquely characteristic of Germanic. The results of the restructuring of verb inflection are immediately obvious in all attested Germanic languages (including Modern English), rendering them instantly recognizable as Germanic; the parallel paradigms of adjectives persist in the more conservative modern languages and are robustly attested in the 'Old' stages of every Germanic language.

This section will deal with those two large-scale developments; the following section will treat the development of inflection in more detail, taking these restructurings for granted.

3.3.1 *The restructuring of the verb system*

In the evolution of PGmc from PIE, by far the most important development was an extensive restructuring of the verb system. The magnitude of the change can be conveyed in a few sentences. In PIE, verb stems indicated aspect, and a verb could have from one to three stems (not counting derived presents); in PGmc, verb stems indicated tense, and almost all verbs had exactly two finite stems, a present and a past. In PIE there were a large number of ways of forming present (i.e. imperfective) stems, as well as at least a few ways of forming aorist (i.e. perfective) stems, and it appears that the choice of stem formations was lexically idiosyncratic (as in Sanskrit and Greek); in PGmc there were only three past-tense markers and not more than six ways of forming a present (a handful of irregular verbs excepted), and present and past stem formations were correlated in such a way that the vast majority of

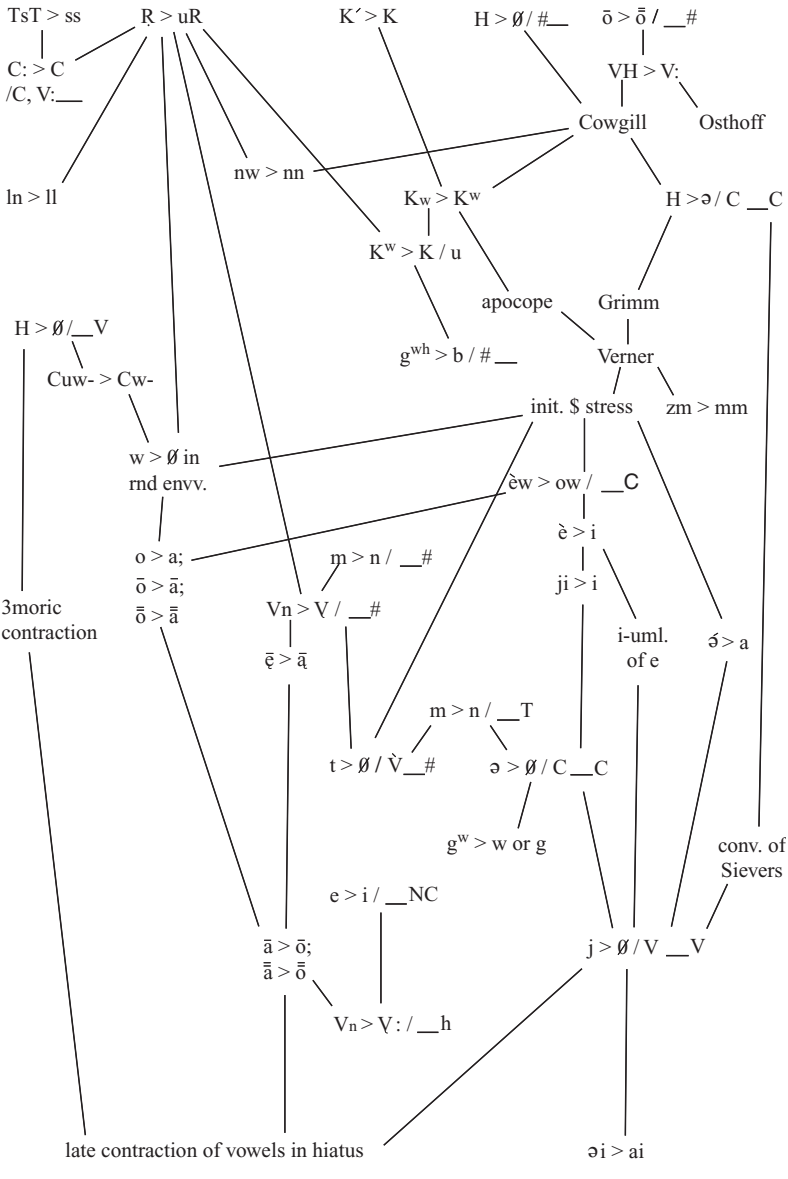

TsT > ss
R̥ > uR
K´ > K
H > ø / #__
ō > ō̄ / __#
C: > C
/C, V:__
VH > V:
Cowgill
Osthoff
nw > nn
ln > ll
Kw > Kw
H > ə / C __C
Kw > K / u
apocope
Grimm
H > ø /__V
gwh > b / #__
Verner
Cuw- > Cw-
init. $ stress
zm > mm
w > ø in
rnd envv.
èw > ow / __C
è > i
o > a;
m̥ > n / __#
ō > ā;
ji > i
3moric
contraction
ō̄ > ā̄
Vn > V̨ / __#
i-uml.
of e
ɔ́ > a
ę̄ > ą̄
m > n / __T
t > ø / V̀__#
ə > ø / C__C
gw > w or g
conv. of
Sievers
e > i / __NC
ā > ō;
ā̄ > ō̄
j > ø / V __V
Vn > V̨: / __h
late contraction of vowels in hiatus
əi > ai

Fig. 3.1

verbs fell into regular 'conjugations', as in Latin. In PIE, the non-active voice was polyfunctional—hence its traditional name mediopassive—and there were verbs that were lexically mediopassive ('deponent' verbs); in PGmc, the non-active voice was restricted to passive function.

This section will describe the most important changes that cumulatively accomplished the restructuring just described, insofar as they can be reconstructed.

3.3.1 (i) *The semantic development of the PIE perfect (stative) and the loss of the aorist indicative* One of the most striking peculiarities of the PGmc verb system is that two very different classes of stems are descended from the PIE perfect (i.e. stative). On the one hand, the past stems of all Germanic 'strong' verbs are etymologically PIE or post-PIE perfects; on the other hand, the present stems of fifteen verbs, traditionally called 'preterite-present verbs', also reflect (post-)PIE perfects. The developments that must have given rise to such a situation are reconstructable because similar developments are attested in the documented histories of other IE languages. We can say with some confidence that what happened was the following.

Since the PIE perfect is reconstructable as a stative, on the basis of the Homeric Greek situation and relics in Latin and Indo-Iranian, it is clear that the preterite-presents preserve the original function of this stem-type (more or less). In fact nine of them (60%) are clearly or arguably descended from PIE perfects, and all are stative in meaning (cf. Benveniste 1949: 19–22):

- PIE *wóyde '(s)he knows' (cf. Skt *véda*, Gk *οἶδε* /ôide/) > PGmc *wait (cf. Goth. *wait*, ON *veit*, OE *wāt*, OHG *weiȝ*);
- PIE *d^hed^hórse '(s)he dares' (cf. Skt *$dad^hárṣa$*) ⟶ PGmc *(ga)dars (cf. Goth. *gadars;* OE *dearr,* OHG *gitar* have generalized *-rz- from the plural);
- PIE *memóne '(s)he remembers' (cf. Gk *μέμονε* /mémone/ '(s)he is eager', Lat. *meminit* '(s)he remembers') ⟶ PGmc *(ga)man '(s)he remembers' (cf. Goth. *(ga)man*, ON *man*, OE *(ġe)man*);
- PIE *$h_2eh_2$nó(n)ḱe '(s)he is at / has reached' (Skt *ānáśa* ~ *ānáṃśa*; OIr. *tánaic* '(s)he arrived, (s)he came' with prefix *to-) ⟶ PGmc *ganah 'it is enough' (cf. Goth. *ganah*, OE *ġeneah*, OHG *ginah*);
- PIE *$h_2eh_2$óyḱe '(s)he possesses' (zero grade *h_2eh_2iḱ- ⟶ *HiHiḱ- in Skt mid. *íśe,* reanalyzed as a present, Rix et al. 2001 s.v. **Heiḱ-*) ⟶ PGmc *aih (cf. Goth. *aih*, ON *á*, OE *āh*, OHG 3pl. *eigun*);
- PIE *$h_2eh_2$óg^{h}e '(s)he is upset' (cf. OIr. *ad·ágathar* '(s)he is afraid', remodeled as a present; for the meaning and the laryngeal cf. Gk pres. *ἄχνυται* /ák^{h}nutai/ '(s)he is upset') > PGmc *ōg '(s)he is afraid' (cf. Goth. *og*);

PIE *tetórpe '(s)he enjoys' (?; cf. Skt 3pl. *tāt̥r̥púr* 'they are satisfied'; for the root cf. Gk pres. *τέρπεσθαι* /térpest^{h}ai/ 'to enjoy oneself') >⟶ PGmc *þarf '(s)he needs' (cf. Goth., ON *þarf*, OE *þearf*, OHG *darf*);

PIE *d^{h}ed^{h}ówg^{h}e 'it is productive' (not preserved outside of Gmc, but the semantics are exactly as expected; cf. pres. *d^{h}éwg^{h}ti 'produces', reflected in Skt *dógd^{h}i* '(s)he milks' and (thematized) Homeric Gk *τεύχει* /téuk^{h}ei/ '(s)he fashions') >⟶ PGmc *daug 'it is useful' (cf. Goth. *daug*, OE *dēag*, OHG *toug*);

PIE *h$_1$eh$_1$óre '(s)he is there, (s)he has arrived' (cf. Skt *ā́ra* '(s)he has come')—or *h$_1$óre? (cf. Hitt. *āri* '(s)he arrives')— >⟶ PGmc *ar '(s)he is' (?; cf. OE 2sg. *eart*, Mercian *earþ*, 3pl. Northumbrian *arun*; Old Swedish 3pl. *aru*).

Interestingly, a tenth example, also stative in meaning, was clearly formed to a present with a nasal infix within the separate prehistory of Germanic:

PIE *ǵneh$_3$- 'to recognize' (cf. Gk aor. *ἔγνω* /égnǫ:/ '(s)he recognized'): pres. *ǵn̥néh$_3$ti '(s)he recognizes' (cf. Skt *jānā́ti*, OIr. *ad·gnin*, Toch. A 2sg. *knānat*, all with various remodelings) > pre-PGmc *gunnā́ti; whence new pf. *gegónne (pace Harðarson 1993: 80–1) >⟶ PGmc *kann '(s)he recognizes, (s)he knows how' (cf. Goth., ON *kann*, OE *cann*, OHG *kan*).

This shows clearly that the perfect in its inherited stative meaning remained productive for some time in the development of Germanic.

(It is less clear what to make of the remaining five preterite-present verbs reconstructable for PGmc. Three of them have reasonably clear root-etymologies, but the prehistory of the stem is not reconstructable because there is too little evidence from other branches of IE:

PIE root *h$_3$neh$_2$- 'to benefit' vel sim. (cf. Gk pres. *ὀνίνησι* /oníne:si/ 'it benefits' (trans.)): a perfect similar in shape to that of 'recognize' was eventually formed and developed into PGmc *ann '(s)he grants' (cf. ON, OE *ann*, OHG *an*);

PIE root *mog^{h}- 'to be able' (cf. OCS pres. *možetŭ* '(s)he can', OIr. *do·formaig* 'it adds, it increases', *mochtae* 'mighty'): ?pf. *memóg^{h}e (identical in meaning with the present? or is this the original inflection?) >⟶ PGmc *mag '(s)he can' (cf. Goth., OHG *mag*, ON *má*, OE *mæġ*);

(post-)PIE root *skel- 'to owe' (cf. Old Lith. pres. 1sg. *skelù*): ?pf. >⟶ PGmc *skal '(s)he owes' (cf. Goth., ON *skal*, OE *sceal*, OHG *scal*).

The etymologies of the remaining two are obscure in every way:

PGmc *mōt '(s)he is allowed to' (cf. OE *mōt*, OHG *muoʒ*; Goth. *gamot* '(s)he finds room');

PGmc *lais '(s)he knows' (cf. Goth. 1sg. *lais*); securely reconstructable because the derived causative *laizīþi '(s)he teaches' is widely attested (cf. Goth. *laiseiþ*, OE *lǣrþ*, OHG *lērit*).

It is reasonable to conclude, with caution, that at least some of these must also be innovations; that amounts to supporting evidence for the continued productivity of the inherited type of perfect.)

For the most part, however, the PIE perfect underwent an extensive semantic shift of a type that seems to be characteristic of IE languages. The initial stage is well attested in the history of Greek. In the Homeric poems (8th c. BC) nearly all perfects are still obviously stative (cf. e.g. Wackernagel 1904; Chantraine 1927), and in Classical Attic (5th–4th cc. BC) there are still about forty stative perfects in use; we find not only such demonstrably inherited examples as *εἰδέναι* /eidénai/ 'to know', *δεδιέναι* /dediénai/ 'to be afraid of', *γεγονέναι* /gegonénai/ 'to be . . . years old', *ἀπολωλέναι* /apolǫ:lénai/ 'to be doomed', etc., but also some that are not attested earlier but could be old, such as *ἐρρωγέναι* /errǫ:génai/ 'to be broken' and *ἐρρῶσθαι* /errǫ̂:sthai/ 'to be strong' (with imperative *ἔρρωσο* /érrǫ:so/ 'farewell'). But a large majority of the perfects in Classical Attic are obvious innovations and have meanings like that of a Modern English perfect; that is, they denote a past action and its present result. We find *ἀπεκτονέναι* /apektonénai/ 'to have killed', *πεπομφέναι* /pepomp^{h}énai/ 'to have sent', *κεκλοφέναι* /keklop^{h}énai/ 'to have stolen', *ἐνηνοχέναι* /enę:nok^{h}énai/ 'to have brought', *δεδωκέναι* /dedǫ:kénai/ 'to have given', *γεγραφέναι* /gegrap^{h}énai/ 'to have written', *ἠχέναι* /ę:k^{h}énai/ 'to have led', and many dozens more. Most are clearly new creations, but a few appear to be inherited stems that have acquired the new 'resultative' meaning, such as *λελοιπέναι* /leloipénai/ 'to have left behind' and 'to be missing' (the old stative meaning). A very similar development must have occurred fairly early in the separate prehistory of Germanic.

It appears that the meaning of the Greek perfect developed no further before the Byzantine period (see e.g. McKay 1965, 1980; Ringe 1984*b*: 533–4). The Latin perfect, on the other hand, has already developed further by the time that we have enough material to make any determination about its meaning. Though a tiny handful of Latin perfects are still stative (*meminisse* 'to remember', *ōdisse* 'to hate', *nōvisse* 'to recognize, to know (someone)'), most are used both as English-type perfects and as simple past tenses (*cecidit* '(s)he has fallen' and '(s)he fell', etc.).[5] While that is partly a consequence of the fact that the inherited perfect and aorist have merged morphologically in

[5] That the Latin perfect triggers both primary and secondary sequence of tenses shows that this is not simply an artefact of translation.

Latin, it is natural in any case for an English-type perfect to develop into a simple past. That is the stage that has been reached in Old Irish, in which some active preterites are etymologically perfects and others are aorists: whereas Lat. *cecinit* means both '(s)he sang' and '(s)he has sung', OIr. *cechain* means only '(s)he sang' (unless one prefixes a perfectivizing particle: *ro·cechain* '(s)he has sung'). The same is true of Latin's descendants, the Romance languages, as can be seen from the perfect of the alternative verb 'to sing': Lat. *cantāvit,* '(s)he sang' and '(s)he has sung' > French *chanta* '((s)he) sang', Spanish *cantó* '(s)he sang', etc. In French the same development has occurred one more time: the new periphrastic perfect *il/elle a chanté* has in its turn developed into a simple past and is now the stylistically neutral way of saying '(s)he sang'.

A similar change occurred in pre-PGmc as well: most PIE and post-PIE perfects have undergone the complete semantic development from stative through 'resultative' perfect (indicating a past action and its present result) to simple past. Probable examples of inherited stative perfects that have been reinterpreted as resultative perfects are few; four plausible examples are the following (given in the context of the whole verb paradigm):

PIE pres. *b^{h}éyd^{h}-e/o- 'to trust, to believe (someone)' (cf. Lat. *fīdere*; Gk *πείθεσθαι* /péit^{h}est^{h}ai/ 'to believe, to obey'), pf. *b^{h}eb^{h}óyd^{h}e '(s)he is trusting/confident' (cf. Gk *πέποιθε* /pépoit^{h}e/) ⟶ pre-PGmc pres. *b^{h}éyd^{h}-e/o- 'to wait for', pf. *b^{h}eb^{h}óyd^{h}e '(s)he has waited for' ⟶ PGmc pres. *bīdaną 'to wait (for)', past *baid '(s)he waited (for)' (cf. Goth. *beidan*, ON *bíða*, *beið*, OE *bīdan*, *bād*, OHG *bītan*, *beit*);

PIE pres. *linék^{w}- ~ *link^{w}- 'to leave behind (severally or repeatedly), to be leaving behind' (cf. Skt 3sg. *riṇákti*, 3pl. *riñcánti*, Lat. *linquit*, *linquont*), aor. *léyk^{w}- ~ *lik^{w}- 'to leave behind' (cf. Lat. pf. *līquisse*, Gk aor. *λιπεῖν* /lipêːn/), pf. *lelóyk^{w}e '(s)he is missing' (cf. Gk *λέλοιπε* /léloipe/) ⟶ pre-PGmc pres. *léyk^{w}-e/o- 'to leave' (see 3.3.1 (ii)), pf. *lelóyk^{w}e '(s)he has left' ⟶ PGmc *līh^{w}aną 'to lend', *laih^{w} '(s)he lent' (cf. Goth. *leihvan*, OE *līon*, *lāh*, OHG *līhan*, *lēh*);

PIE pres. *g^{w}m̥sḱé/ó- 'to walk' (cf. Gk *βάσκειν* /báskeːn/, Skt 3sg. *gácc^{h}ati*), aor. *g^{w}ém- ~ *g^{w}m̥- 'to step' (cf. Skt 3sg. *ágan* '(s)he has gone'), pf. *g^{w}eg^{w}óme '(s)he has the feet planted' (Skt *jagā́ma* '(s)he went'; for the meaning cf. Homeric Gk *ἀμφιβέβηκας* /amp^{h}ibébęːkas/ 'you stand astride', made to the synonymous root *g^{w}eh$_2$-) ⟶ pre-PGmc pres. *g^{w}ém-e/o- 'to come' (see 3.3.1 (ii)), pf. *g^{w}eg^{w} óme '(s)he has come' ⟶ PGmc *k^{w}emaną 'to come', *k^{w}am '(s)he came' (cf. Goth. *qiman, qam,* OHG *queman, quam*);

PIE pres. *wert-, mostly thematized *wért-e/o- 'to be turning' (cf. Lat. *vertere*, Skt 3sg. *vártate*), pf. *wewórte 'is turned toward' (cf. Skt *ánu vavarta* 'he rolled after') >⟶ pre-PGmc *wért-e/o- 'to turn into', pf. *wewórte 'it has turned into' >⟶ PGmc *werþaną 'to become', *warþ 'it became' (cf. Goth. *waírþan, warþ*, ON *verða, varð*, OE *weorþan, wearþ*, OHG *werdan, ward*).

More often it appears that a PGmc strong past is descended from an innovative post-PIE or pre-PGmc perfect that probably had resultative force when it was first formed; the following examples are typical:

post-PIE *b^{h}eb^{h}óyde '(s)he has split' (cf. Skt *bib^{h}éda* '(s)he split') >⟶ PGmc *bait '(s)he bit' (cf. Goth. *bait*, ON *beit*, OE *bāt*, OHG *beiȝ*);

post-PIE *ǵeǵówse '(s)he has tasted' (cf. Skt *jujóṣa* '(s)he enjoyed') >⟶ PGmc *kaus '(s)he tested', PNWGmc '(s)he chose' (cf. ON *kaus*, OE *ċēas*, OHG *kōs*);

post-PIE *b^{h}eb^{h}ónd^{h}e '(s)he has tied' (cf. Skt *babánd^{h}a* '(s)he tied') >⟶ PGmc *band '(s)he tied' (cf. Goth., OE *band*, ON *batt*, OHG *bant*);

post-PIE *sesóde '(s)he has sat down' (cf. Skt *sasā́da* '(s)he sat down') >⟶ PGmc *sat '(s)he sat' (cf. Goth., ON *sat*, OE *sæt*, OHG *saȝ*);

post-PIE *h$_{1}$eh$_{1}$óde '(s)he has eaten', *h$_{1}$eh$_{1}$dḗr 'they have eaten' (cf. Lat. *ēdēre* 'they have eaten', Benveniste 1949: 16–17) >⟶ PGmc *ēt '(s)he ate', *ētun 'they ate' (cf. Goth. *et, etun*, ON *át, átu*, OE *æt, æton*, OHG *āȝ, āȝun*).

Of course many PGmc strong pasts do not exhibit such parallels in any other IE language, though every detail of their formation shows clearly that as a class they reflect pre-PGmc perfect stems.

An important consequence of this semantic development was that the perfect indicative and aorist indicative became isofunctional in pre-PGmc, and were therefore in competition. So far as can now be determined, the perfect 'won out' completely; there are *no* plausible reflexes of the aorist indicative *at all* in any Germanic language. (On the Northwest Germanic class VII strong pasts, the West Germanic 2sg. strong past forms, OE *cuman* 'come' and the like see the discussion in vol. ii, where it will be argued that all are post-PGmc innovations.)

3.3.1 (ii) *The loss of the perfective : imperfective and indicative : subjunctive oppositions* During the development of PGmc from PIE the contrast between imperfective and perfective aspect was lost; in other words, the functional opposition between present and aorist stems broke down. In the indicative, that brought the imperfect (i.e. the past tense of the imperfective (present) stem) and the aorist (i.e. the past tense of the perfective (aorist) stem) into direct competition—if this development occurred when the aorist

indicative was still in use. If the aorist indicative had already been driven out of use by the perfect indicative (see above), then it brought the imperfect and perfect indicatives into direct competition. Either way, the result was that almost all PIE imperfects were lost. Only one, the imperfect of PIE 'put', survived in Germanic, where the meaning of the verb had been shifted to 'make' and then to 'do' (cf. the Latin root-cognate *facere*); it is attested as the past of an independent verb 'do' in the West Germanic languages and as the suffix forming the past tense of weak verbs throughout the family (see especially 3.3.1 (iv)).[6] The development of the singular indicative forms was relatively straightforward:

PIE *d^héd^{h}eh_1m = *[d^héd^{h}ēm] (by Stang's Law, see 2.2.4 (iv)) 'I was putting' (cf. Skt *ádad^{h}ām*, Gk *ἐτίθην* /etít^{h}ę:n/, both with the 'augment' prefix) > *dedę̄ > *dedą̄ (see 3.2.7 (i)) > PGmc *dedǭ 'I did' (cf. OS *deda*, OHG *teta*) and weak past 1sg. *-dǭ (cf. Goth. *-da*, Runic Norse *-do*, ON *-ða*, OE *-de*, OS *-da*, OHG *-ta*);

PIE *d^héd^{h}eh_1s 'you were putting' (cf. Skt *ádad^{h}ās*, Gk *ἐτίθης* /etít^{h}ę:s/) > PGmc *dedēz 'you did' (the ending of OS *dedōs* has been remodeled) and weak past 2sg. *-dēz (cf. Goth. *-des*, ON *-ðir*; OE *-des(t)*, etc. exhibit remodeling);

PIE *d^héd^{h}eh_1d '(s)he was putting' (cf. Skt *ádad^{h}āt*, Gk *ἐτίθη* /etít^{h}ę:/) > PGmc *dedē '(s)he did' (cf. OS *deda*, OHG *teta*, probably with remodeling) and weak past 3sg. *-dē (cf. Goth. *-da*, ON *-ði*, OE *-de*, OS *-da*, OHG *-ta*).

The remaining forms of the paradigm, however, replaced the inherited reduplicating vowel *e (syncopated in the suffix) with long *ē. The only plausible source for this *ē is the corresponding forms of class V strong pasts.[7] Exact proportional analogy cannot have been involved, since the vowels of the indicative singular forms did not match; instead this change must reflect the extension of a morphological rule to the past stem 'did'. The process must have proceeded roughly as follows.

[6] The hypothesis that a post-PIE perfect underlies this PGmc past (Hill 2004: 261–6) cannot easily account for the weak past endings Goth. 2sg. *-des*, ON 2sg. *-ðir*, 3sg. *-ði*; attempting to derive the weak past suffix from some other stem of this verb (Hill 2004: 288–9) necessitates the further proposal that the Gothic suffix *-ded-* owes its long vowel to analogy with a freestanding form, which is very implausible. On Runic Norse *talgidai* see now Hill 2004: 287 n. 84 with references, and Ringe, forthcoming.

[7] Strong pasts of class IV are less relevant here, since they too must have been remodeled on those of class V, and (as Patrick Stiles reminds me) the chronological ordering of the two remodelings is not recoverable.

1. In class V strong pasts the root-vowel *a of the singular indicative was reanalyzed as basic to the paradigm. That is interesting, since the sg. indic. stem was not the default finite past stem but was the stem of the 3sg. indic., the 'psychologically basic' form of the paradigm.
2. The *ē of the remaining finite past forms was consequently derived by a rule 'replace basic /a/ with /ē/ in the nonsingular and subjunctive of the past', at first applicable only to this fairly small class of verbs.
3. Sg. indic. *dedē-N, *dedē-z, *dedē-∅ were resegmented as *ded-ę̄, *ded-ēz, *ded-ē (on the basis of pl. *ded-um, *ded-ud, *ded-un, the corresponding dual forms, and subjunctive *ded-ī-), yielding a uniform past stem *ded- which was unique in exhibiting a root-vowel *e. (*de- was no longer felt to be a reduplicating syllable, evidently because the inherited root had been reduced to *-d- in so many forms.)
4. The rule replacing a short vowel with /ē/ was extended to the past 'made/did', which was *the only other past in the language* with a singular indicative stem of the shape *CVT-, where *V is a short vowel and *T an obstruent.

The 3pl. indicative illustrates these developments:

PIE 3pl. *d^{h}éd^{h}h_1n̥d 'they were putting' (cf. Av. *dadaṯ*; Skt *ádad^{h}ur* has replaced the ending) > *dedun → PGmc *dēdun 'they did' (cf. OS *dādun*, OHG *tātun*) and weak past 3pl. *-dēdun (cf. Goth. *-dedun*).

The development of *ē in class V strong pasts (see 3.4.3 (ii)) is therefore a terminus post quem for this change. On the other hand, the univerbation that gave rise to the weak past (see 3.3.1 (iv)) is a terminus ante quem, since it is very unlikely that *ē would have been introduced into a suffix by analogy with a class of freestanding past stems.

Why this lone imperfect survived is difficult to determine. If the perfect had already driven the aorist indicative out of use, it is not clear why 'put (/make/ do)' did not simply form an innovative perfect (or strong past); that is what happened in other IE languages, even at a much earlier stage of development (cf. 3sg. Skt *dad^{h}áu,* Gk *τέθηκε* /tét^{h}ę:ke/, Oscan fut. pf. *fefacust*). If the contrast between the present and aorist stems collapsed first, it is reasonable to ask why more imperfects did not 'win out'. At least we can suggest that two unusual characteristics of this stem have had something to do with its survival. One is its maximally general meaning in Germanic: if the semantic development of 'put' to 'make' occurred earlier than the relevant formal changes, the very basic status of the verb and (presumably) its great frequency of use can have led to the atypical survival of this stem (though the details are

not reconstructable). The other relevant peculiarity is that while the past tense of the PIE present stem *$d^héd^heh_1$- ~ *$d^héd^hh_1$- (i.e. the imperfect) survived as 'did' in PGmc, the rest of that present stem (i.e. the present indicative and the modal forms) apparently did not. It's hard to be sure, because the verb is attested as an independent lexeme only in West Germanic (having been replaced by *taujan* < *tawjaną 'to fit together' in Gothic and *gøra* < *garwijaną 'to prepare' in ON), but it looks as though the PGmc present stem of 'do' was athematic *dō- (cf. OE, OS *dōn,* OHG *tuon*). Unfortunately that stem has no known PIE source; none of the suggested origins strikes me as at all plausible (though see Lühr 1984 for comprehensive discussion). In particular, note that the full-grade stem of the Hittite hi-conjugation present *dāi* '(s)he puts' reflects not *d^hoh_1- but suffixed *d^hoh_1-i- (Jasanoff 1979: 88–9; hence 1sg. *tēhhi,* with *ē* < *oi before *h,* and 3pl. *tiyanzi,* with zero-grade *d^hh_1-i-.) Until that puzzle is solved, the survival of a PIE imperfect as PGmc 'did' will also remain at least somewhat puzzling.[8]

The PIE subjunctive mood (which survives in its modal functions in Greek, in its temporal function as the Latin future tense, and in all functions in Vedic Sanskrit) has also been lost in Germanic. It is clear that it was lost by functional merger with the indicative, because a number of aorist subjunctive stems survived as present indicatives in PGmc (Hoffmann 1955*b*). That is, while the functional merger of present subjunctive and present indicative simply led to the loss of the former, the additional collapse of the aspectual opposition imperfective (present) : perfective (aorist) brought the aorist SUBJUNCTIVE into competition with the old present INDICATIVE, and in some instances the aorist subjunctive 'won out', becoming the PGmc present indicative. The clear cases are those in which the PIE present was formed with the suffix *-sḱé/ó- or was characterized by a nasal infix that could not be reinterpreted as a suffix (see 3.4.3 (i)); so far as can be determined, those presents were regularly replaced by the aorist subjunctive in PGmc. These are the clearest examples:

PIE *$g^wm̥sḱéti$ '(s)he's walking' (cf. Skt *gácchati,* Gk *βάσκει* /báskei/, both '(s)he goes'), aor. subj. *$g^wém$-e/o- (cf. Skt 3sg. *gámat*) > PGmc *$k^wemaną$ 'to come' (cf. Goth. *qiman*, OHG *queman*; Hoffmann 1955*b*: 91);

PIE *$b^hinédsti$ '(s)he's splitting (it)', 3pl. *$b^hindénti$ (cf. Skt *$b^hinátti$*, *$b^hindánti$*; thematized in Lat. *findit, findunt*), aor. sub. *$b^héyd$-e/o- (cf. Skt 3sg. *$b^hédati$*) > PGmc *bītaną 'to bite' (cf. Goth. *beitan*, ON *bíta*, OE *bītan*, OHG *bīzan*);

[8] The hypothesis of Hill 2004: 282–6 suffers from the same weaknesses as its predecessors, including the awkward fact that the West Germanic present is athematic (Jay Jasanoff, p.c.) and the improbability of extending *ō throughout the paradigm by analogy.

PIE *sḱinédsti '(s)he's cutting (it) off', 3pl. *sḱindénti (cf. Skt *c^{h}inátti, c^{h}indánti*; thematized in Lat. *scindit, scindunt* '(s)he splits, they split'), aor. sub. *sḱéyd-e/o- > PGmc *skītaną 'to defecate' (cf. ON *skíta*, ME *shiten*, MHG *schizen*);

PIE *linék^{w}ti '(s)he's leaving (it)', 3pl. *link^{w}énti (cf. Skt *riṇákti, riñcánti*; thematized in Lat. *linquit, linquont*), aor. subj. *léyk^{w}-e/o- (cf. Gk pres. *λείπειν* /léipeːn/) > PGmc *līh^{w}aną 'to lend' (cf. Goth. *leihvan*, OE *līon*, OHG *līhan*);

PIE *Hrunépti '(s)he's breaking (it)' (thematized in Skt *lumpáti*, Lat. *rumpit*), aor. subj. *Hréwp-e/o- > PGmc *reufaną 'to tear' (cf. ON *rjúfa*).

The final elimination of the sk-presents, at least, cannot have been a very early change, because two of them have left indirect reflexes in West Germanic languages. It is clear enough that OE *āscian*, OS *ēskōn*, OHG *eiscōn* 'to ask' (< PWGmc *aiskōn) have something to do with the PIE present *Hisḱé/ó- 'to look for, to seek' (cf. Skt 3sg. *icc^{h}áti*; root *Heys-, cf. Skt inf. *éṣṭum*), and likewise that OHG *forscōn* 'to investigate' has something to do with the PIE present *pr̥sḱé/ó- 'to ask' (cf. Skt 3sg. *pr̥cc^{h}áti*, Lat. *poscere*; root *preḱ-, cf. Lat. *precēs* 'prayer(s)'); but in both cases the verb is a class II weak verb, certainly denominative, which must have been formed from a noun that was in turn formed from the sk-present—necessarily in the post-PIE period, since nominals were not normally formed from aspect stems in PIE. Unfortunately it is difficult to draw more precise inferences about the date of the sk-presents' demise.

3.3.1 (iii) *The past passive participle* PIE verb inflection included active and mediopassive participles formed to aspect stems (see 2.3.3 (i)); the inherited system is best preserved in Greek and Indo-Iranian. In various daughter languages PIE verbal adjectives, a derivational category formed directly to the verb root, were also eventually integrated into the verb paradigm as passive or intransitive participles. The original situation is well preserved in Greek, whereas in Latin and in Sanskrit the transition from adjective to participle has already occurred. For instance, Greek *ἰτός* /itós/ (< *h$_{1}$itós, root *h$_{1}$ey- 'go') and *βατός* /batós/ (< *g^{w}m̥tós, root *g^{w}em- 'step') are still adjectives meaning 'passable', but in Sanskrit their cognates have become participles, active in meaning because the verbs are intransitive (*sū́rya úd-ite* 'the sun having risen'; *gatás* 'having gone'), and likewise in Latin, where they are used in periphrasis with 'be' to make an impersonal passive perfect (*itum est* 'someone went'; *quoniam ad hunc locum perventum est* 'since we've reached this point'). Similarly, Greek *στατός* /statós/ (< *sth$_{2}$tós, root *steh$_{2}$- 'stand') means 'stationary', but its Sanskrit and Latin cognates are participles (*api-st^{h}itás* 'having approached'; *status* 'having been

placed'); Greek πιστός /pistós/ (< *b^{h}id^{h}stós, root *b^{h}eyd^{h}- 'trust') means 'trustworthy', but its Latin cognate *fīsus* is a participle 'having trusted' (active in meaning because the verb is deponent in the perfect); and so on. The Greek adjectives can sometimes have similar meanings, especially in compounds; for instance, the second element of θεόδοτος /t^{h}eódotos/ 'god-given' is not only cognate with Latin *datus* but translates it. It is also possible to find examples that demonstrate how the meanings can shade into one another; for instance, though we are accustomed to translate Greek γνωτός /gnǫ:tós/ as 'known', like the Latin participle *nōtus,* 'recognizable' would do just as well. But the point is that in PIE, as in Greek, this was a category of derived adjectives, not part of the verb paradigm, whereas in many other daughters the formation has been integrated into the paradigm of the verb—that is, the adjectives have become participles.

Since verbal adjectives were formed to the verb root, there were originally none corresponding to derived presents. In those languages in which they became participles it was felt necessary to form them to derived presents (since a paradigm lacking one or more members is defective), and in each language a range of strategies was employed to do that. For instance, Sanskrit causatives in *-áya-* (< PIE *-éye/o-) make past passive participles in *-i-tá-*, apparently adding the participial suffix to the zero grade of the present stem-forming suffix; thus to *veśáyati* '(s)he makes enter' (causative of *viśáti* '(s)he enters') the past participle is *veśitás*, to *sādáyati* '(s)he seats' (causative of *sī́dati* '(s)he sits') the past participle is *sāditás*, and so on. Denominatives in *-a-yá-* and (at least in Vedic) *-ā-yá-* do the same; thus we find *kat^{h}itás* 'narrated' (*kat^{h}ayáti* '(s)he narrates'), *meg^{h}itás* 'clouded over' (*meg^{h}āyáti* 'it is cloudy'), etc. But other denominatives add the suffix complex *-itá-* to the whole present stem (minus its thematic vowel); thus *kaṇḍūyáti* '(s)he scratches', for instance, has a past participle *kaṇḍūyitás*. The Latin system is roughly the same. Most verbs of the first and fourth conjugations, which contain a large proportion of (originally) derived verbs, simply add the participial suffix to the present stem-forming suffix (*numerus* 'number' → *numerāre* 'to count': *numerātus; moenia* 'walls' → *mūnīre* 'to fortify': *mūnītus*, and so on); third-conjugation denominatives in *-uere* have participles in *-ūtus* (e.g. *acus* 'needle' → *acuere* 'to sharpen': *acūtus*; the reason for the lengthening of the stem-vowel is unclear). But in the second conjugation, which also contains many originally derived verbs, we find a pattern reminiscent of the Sanskrit causatives; for instance, to the present *monēre* 'to warn' (< PIE causative *mon-éye/o- 'cause to think') the perfect participle is *monitus,* with a short vowel. The original identity of that vowel cannot be recovered with certainty, since any short vowel in an internal open syllable before *t* would have become *i* by regular 'vowel weakening' in Latin, but

comparison with a handful of similar verbs in the first conjugation suggests that it was *-e-. That is, we probably have

pres. stem *monē-* < *mon-e-ye-,
pf. stem *monu-* < *mon-e-w-,
participle *monitus* < *mon-e-to-s

parallel to the corresponding forms of *sonāre* 'to (re)sound', namely

pres. stem *sonā-* < *swena-ye-,
pf. stem *sonu-* < *swena-w-,
participle *sonitus* < *swena-to-s

(with pre-Lat. *swena- < PIE *swenH-, cf. Skt ipf. 3sg. *asvanīt* 'it sounded'). These facts will be relevant when we consider the development of participles in Germanic.

PGmc was one of the daughters of PIE in which verbal adjectives became past passive participles; but the outcome is different in detail from that of any other daughter, which shows that the process was historically independent. Like Sanskrit and Slavic (and unlike Latin), PGmc integrated both verbal adjectives in *-tó- and those in *-nó- into the verb paradigm as participles, but in a distribution unique to Germanic. Nearly all basic verbs acquired a past participle in *-nó- (later remodeled to *-onó-, see 3.4.3 (ii)), whereas in Sanskrit that suffix was restricted to a small minority of basic verbs whose roots ended in vowels or voiced nonlabial stops. All PGmc derived verbs, and a few basic verbs (mostly with presents in *-ye/o-), acquired past participles in *-tó- instead. These examples of past participles formed to basic verbs are typical:

PIE *b^{h}idnós 'fissile' (cf. Skt *b^{h}innás* 'split') → *b^{h}idonós > PGmc *bitanaz 'bitten' (cf. Goth. *bitans*, ON *bitinn*, OE *biten*, OHG *gibiȝȝan*);
PIE *lugnós 'fragile' (cf. Skt *rugnás* 'broken') → *lugonós > PGmc *lukanaz 'torn out' (cf. OHG *arlohhan*; OE *locen* 'weeded');
PIE *b^{h}ud^{h}nós 'perceptible' (vel sim.; contrast *b^{h}ud^{h}stós in Skt *budd^{h}ás* 'awake, aware', Gk *ἄπυστος* /ápustos/ 'unheard-of') → *b^{h}ud^{h}onós > PGmc *budanaz 'offered' (cf. ON *boðinn,* OE *boden,* OHG *gibotan;* Goth. *anabudans* 'commanded');
PIE *b^{h}r̥nós 'portable' (contrast Skt *b^{h}r̥tás* 'carried') >⟶ PGmc *buranaz 'carried, born(e)' (cf. Goth. *baúrans,* ON *borinn,* OE *boren,* OHG *giboran*).

Basic verbs with solid PIE pedigrees and participles in *-tó- include at least:

PIE *wr̥ǵyéti '(s)he is working / making', *wr̥ǵtós 'workable' (cf. Av. *vərəziieiti*, ptc. *vərəštō*) >→ PGmc *wurkīþi '(s)he makes', *wurhtaz 'made' (cf. Goth. *waúrkeiþ, waúrhts*, ON *yrkir, ortr*, OE *wyrcþ, worht*, OHG *wurchit, giworaht*);

PIE *seh$_2$gieti '(s)he's giving a sign' (cf. Hitt. *sākizzi*; Lat. *sāgīre* 'to be keen-nosed') > PGmc *sōkīþi '(s)he seeks' with innovative ptc. *sōhtaz 'sought' (cf. ON *sækir, sóttr*, OE *sēcþ, sōht*, OHG *suohhit, gisuoht*).

(The other PGmc verbs that inflect according to the same pattern, with a present stem in *-ye/o- and a participle in *-tó- suffixed directly to the root, might or might not be underived.)

PGmc derived verbs usually exhibited a vowel or a vowel-final suffix before the participial suffix *-tó-. The situation seems clearest in the case of class II weak verbs. Verbs of that class must at first have been derived only from nouns in *-ā- (< PIE *-eh$_2$-); their present stems end in trimoric *-ō̄- < *-āyé/ó- (and optative *-āyóy-; Cowgill 1959, and see 3.2.6 (i)), but their participles seem to reflect *-ā-tó-, having been formed by subtracting the denominative suffix *-yé/ó- and adding the participial suffix at a date before the loss of intervocalic *j. Their development can be exemplified thus:

post-PIE *solpā́ 'ointment' (see 3.2.4 (ii)) → pres. *solpā-yé/ó- 'anoint' (see 3.2.6 (i)) → ptc. *solpā-tó-s > PGmc *salbō, *salbō̄-, *salbōdaz (cf. Goth. *salbo-, salboþs* (noun not attested), OE *sealf, sealfa-, sealfod*, OHG *salba, salbō-, gisalbōt*).

I have argued above (3.2.6 (i–ii)) that the statives of weak class III exhibit a similar pattern, in this case because the present has been backformed to an older participle:

post-PIE pres. *kh$_2$péh$_1$- 'be holding' (with the suffix of Lat. *habēre* but the root of *capere*) → ptc. *kapətós 'held' → pre-PGmc pres. *kapəyé- ~ *kapəyó- 'hold' (see 3.2.6 (i)) > PGmc *habai- ~ *habja- 'have, hold', ptc. *habdaz 'had, held' (cf. Goth. *habai-*, OHG *habē-* for the e-grade of the pres. stem, OE *hæbb-* (with analogical elimination of i-umlaut) for the o-grade, OE *hæfd* for the ptc.).

The situation is much less clear for the factitives of class III, which are poorly attested, and for the fientives of class IV; see 3.4.3 (i) for discussion of those classes. There is also some uncertainty about class I weak verbs, but only concerning the etymological origin of the vowel preceding the participial suffix. The problem can best be appreciated by examining a number of examples of different derivational types.

For denominatives formed to consonant-stem nouns with the suffix *-yé/ó- (∼ *-ié/ó- by Sievers' Law, see 2.2.4 (ii)) the vowel before the participial suffix can hardly have been anything other than *-i-, evidently the nonvocalic part of the present-stem forming suffix. There are at least three good examples:

PIE *h_2eḱ- 'sharp', *$h_2$éwsos 'ear' → *h_2ḱ-$h_2$ows-iéti '(s)he is sharp-eared' (cf. Gk *ἀκούειν* /akóueːn/ 'to hear') → pre-PGmc *h_2ḱ$h_2$ows-i-tós 'heard'; > PGmc *hauzīþi, *hauzidaz (cf. ON *heyrir, heyrðr*, OE *hīerþ, hīered*, OHG *hōrit, gihōrit*; Goth. *hauseiþ, hausiþs* with analogical voiceless Verner's Law alternant);

PIE *h_1ḗh_3m̥ ∼ *$h_1$néh$_3$m̥- 'name', collective *$h_1$néh$_3$mō ∼ *h_1n̥h$_3$m̥-′ (cf. Toch. B *ñem*, Lat. *nōmen*, etc.; see 3.2.1 (iii)) → *h_1n̥h$_3$m̥-yéti '(s)he names' (cf. Gk *ὀνομαίνει* /onomáinei/) >⟶ pre-PGmc *nṓmō̄ ∼ *nomn-′, *nomn-iéti; → *nomn-i-tós 'named'; >⟶ PGmc *namō̄, *namnīþi, *namnidaz (cf. Goth. *namo, namneiþ, namniþs*, OE *nama, nemneþ ∼ nemþ, nemned*, OHG *namo, nemnit, ginemnit*);

post-PIE *b^hr̥g^h- 'hill, mound' (cf. OIr. *brí-, brig-* 'hill') → *b^hr̥g^h-yéti '(s)he raises a mound over' >⟶ PGmc *burg- 'fortress, walled city' (cf. Goth. *baúrgs*, ON *borg*, OE, OHG *burg*) but *burgīþi '(s)he buries', *burgidaz (cf. OE *byrġ(e)þ, byrġed*).

(A fourth such present survives in Germanic:

PIE *$h_1$rég^{w}os ∼ *$h_1$rég^{w}es- 'darkness' (cf. Skt *rájas* 'empty space', Gk *ἔρεβος* /érebos/ 'hell') → *$h_1$reg^{w}es-yéti 'it's getting dark' (cf. Skt *rajasyáti*, and note that this derivative preserves the original meaning) > PGmc *rek^{w}az ∼ *rik^{w}iz-, *rik^{w}iziþi (cf. Goth. *riqis, riqizeiþ*).

However, it cannot be shown to have had a PGmc past participle—not surprisingly, since it is both intransitive and impersonal.) Presumably denominatives formed from i-stems also originally had *-i- before the participial suffix; there are at least two examples formed to nominals that have reasonably good cognates outside Germanic:

PIE *séh$_2$ti-s 'satiety' (cf. Lith. *sótis*, OIr. *sáith*) → *seh$_2$ti-(y)éti 'it satisfies' → *seh$_2$ti-tós > PGmc *sōþiz, *sōdīþi, *sōdidaz (cf. Goth. *soþ* (dat. sg.; stem class unclear), *ga-soþeiþ, ga-soþiþs*, the latter two with analogical voiceless Verner's Law alternant);

post-PIE *ko(m)moini-s 'common' (?; cf. Lat. *commūnis*) → *ko(m)moini-(y)ónti 'they hold in common' → *ko(m)moini-tós 'held in common' > PGmc *gamainiz, *gamainijanþi, *gamainidaz (why *g-?; but cf. Goth. *gamains, gamainjand, gamainiþs*, OHG *gimeini, gimeinent, gimeinit*).

But when we consider denominatives formed to o-stems it becomes impossible to determine whether the vowel before the participial suffix was *-i- (as in Sanskrit) or *-e- (as probably in Latin). I cite the example with the best extra-Germanic cognate:

PIE *somHós 'same' (cf. Skt *samás*, Gk *ὁμός* /homós/) → *somHe-yéti '(s)he makes them the same' (cf. Skt *samayáti*) → ptc. *somHe-tós? or *somH-i-tós?; in either case, >⟶ PGmc *sama-n- (weak inflection only), *samiþi (with the converse of Sievers' Law, see 3.2.5 (ii)), *samidaz (cf. Goth. *sama, samjiþ* 'conforms', *samiþs*, ON *sami, semr* 'puts in order', *samðr*).

The same indeterminacy obtains for the participles of causatives in PIE *-éye/o-; note the following examples:

PIE *(pró) wortéyeti '(s)he turns it (forward)' (cf. Skt *vartáyati* '(s)he rolls it') → ptc. *(pro)worti-tós (like Skt *vartitás*)? or *(pro)worte-tós (like Lat. *monitus*, see above)?; in either case, >⟶ PGmc *(fra)wardīþi '(s)he destroys', ptc. *(fra)wardidaz (cf. Goth. *frawardeiþ, frawardiþs*, OE *(for)wiert, (for)wierded*);

PIE *tonéyeti '(s)he extends (it)' (cf. Skt *tānáyati*) → ptc. *tonitós or *tonetós?; in either case, >⟶ PGmc *þaniþi '(s)he stretches / extends' (with the converse of Sievers' Law), ptc. *þanidaz (cf. ON *þenr, þanðr*, OHG *denit, gidenit*; Goth. compound *ufþanjiþ* '(s)he strives', *ufþaniþs*).

It can be seen that, even if the formation of past participles to class I weak verbs was not originally uniform, it became so by the merger of unstressed *e and *i (see 3.2.5 (iii)).

3.3.1 (iv) *Derived verbs and the weak past* PIE derived presents were not associated with any aorist or perfect formations (cf. 2.3.3 (i) ad fin.). In some of the daughter languages they eventually acquired aorists and/or perfects of inherited types (more or less); for instance, the Classical Attic Greek present *φυλάττειν* /p^{h}ulátte:n/ 'to guard' (← noun *φύλαξ* /p^{h}úlaks/ 'guard') has acquired an s-aorist *φυλάξαι* /p^{h}uláksai/ and a reduplicated perfect *πεφυλαχέναι* /pep^{h}ulak^{h}énai/, the present *φιλεῖν* /p^{h}ilêːn/ 'to love' (← adjective *φίλος* /p^{h}ílos/ 'dear') has likewise acquired an aorist *φιλῆσαι* /p^{h}ilɛ̂ːsai/ and a perfect *πεφιληκέναι* /pep^{h}ilɛːkénai/, and so on. The alternative to such a development was the use of periphrastic formations; for instance, though Sanskrit has a causative formation not only for the present, where it is inherited (e.g. *kārayati* '(s)he causes to do'), but also for the aorist (*ácīkarat* '(s)he caused to do'), the causative perfect is periphrastic (*kārayām āsa* '(s)he caused to do'). Some of the periphrases eventually underwent

univerbation to single forms; for instance, it now seems certain that the Latin perfects in *-v-* and *-u-*, which are characteristic of (originally) derived verbs of the first, second, and fourth conjugations, reflect older phrases composed of the inherited perfect active participle and the verb 'be' (Rix 1992).

It seems clear that the PGmc 'weak' past developed by the univerbation of such a periphrasis, which was employed in the first place because derived presents (i.e. the presents of nearly all weak verbs) did not form perfects in PIE or pre-PGmc.[9] That the lone surviving imperfect 'did' (see 3.3.1 (ii)) somehow became part of the weak past has been clear for more than a century (cf. already Loewe 1894: 371–6), simply because the anomalous alternation of the weak past suffix in Gothic (indic. sg. *-d-* but otherwise *-dēd-*) so closely matches the anomalous alternation of the stem of 'did' in Old High German (indic. sg. *tet-* < *ded-, otherwise *tāt-* < *dēd-). But it is also clear that some other form must be involved as well, since in the small class of irregular class I weak pasts exemplified by *wurhtē '(s)he made', *wurhtēdun 'they made', the suffixal *-t- can hardly reflect the initial *d- of 'did' (cf. Tops 1974: 44–86 with references). Wolfgang Meid has suggested that it is the consonant of the past participial suffix, and that the weak past reflects univerbation of the participle with a following auxiliary verb (Meid 1971: 107–11); that is highly plausible, since the participle is a past-tense form and an auxiliary would provide a finite verb. Meid's specific hypothesis has met with little acceptance, because he proposed that the auxiliary in question was 'be'; that forced him to posit very complex phonological and morphological changes, and there is no good explanation for the fact that the resulting forms are not passive (as one would expect from the univerbation of 'be' with a passive participle).

But it is easy to construct a plausible derivation of the weak past using Meid's suggestion and the older observation that 'did' must be involved; moreover, if we hypothesize that the univerbation occurred at a particular point in the phonological development of PGmc, it can have been a simple matter of haplology. Here is what I think must have happened. The original meaning of the periphrasis must have been 'made . . . Xed', for each verb X; in consequence the participle should originally have been inflected, agreeing with the direct object. But since the meaning of the auxiliary became attenuated to the point that it was merely a vehicle for marking past tense, it would not be surprising if agreement marking on the participle had been lost; one would then expect to find default agreement, which in Germanic appears to be the accusative singular neuter. I hypothesize that univerbation

[9] For discussion of alternative theories, all of which fail to account adequately for one or more crucial facts, see Tops 1974, 1978, Hill 2004.

occurred after all those developments, and also after the remodeling of adjective inflection (see 3.3.2). The 3sg. and 3pl. of typical periphrastic pasts would then have been the following just before univerbation occurred:

*wurhta dedē '(s)he made'
*wurhta dēdun 'they made'
*frawardida dedē '(s)he destroyed'
*frawardida dēdun 'they destroyed'
*salbōda dedē '(s)he anointed'
*salbōda dēdun 'they anointed'

(See 3.2.6 (iv) on the ending of the participles.) These phrases were affected by a simple rule of haplology which can be stated as follows:

> Beginning immediately to the right of the participial suffixal consonant, delete all successive sequences of the shape *VT, where *V is a short vowel and *T is a coronal obstruent.

This is not a classical 'regular sound change', in the sense it that affected all such sequences in the language, but it can have been regular in a different sense: probably it was conditioned by the rate of speech, like most haplologies, and the surviving PGmc weak past forms were probably originally allegro forms. The phrases listed above thus developed as follows (the sequences targeted for haplology are parenthesized at the earlier stage):

*wurht(a d)(ed)ē '(s)he made' > *wurhtē (cf. Goth. *waúrhta*)
*wurht(a d)ēdun 'they made' > *wurhtēdun (cf. Goth. *waúrhtedun*)
*frawardid(a d)(ed)ē '(s)he destroyed' > *frawardidē (cf. Goth. *frawardida*)
*frawardid(a d)ēdun 'they destroyed' > *frawardidēdun (cf. Goth. *frawardidedun*)
*salbōd(a d)(ed)ē '(s)he anointed' > *salbōdē (cf. Goth. *salboda*)
*salbōd(a d)ēdun 'they anointed' > *salbōdēdun (cf. Goth. *salbodedun*)

It can be seen that the distinctive weak past of PGmc, which has no exact counterpart in any other IE subgroup, was the result of these changes. Some analogical extension must also be posited; for instance, fientive verbs, which probably had no past participles, must have formed their finite past tenses on the model of other derived verbs, and such past tense forms as *wissēdun 'they knew' (to the preterite-present *witaną 'to know') are almost certainly the products of analogy rather than of haplology affecting the sequence *-ssa d-.

3.3.1 (v) *The passive* In PIE the non-active voice was used not only in passive clauses but also in indirect reflexives (the 'middle' voice, see 2.3.1 ad

fin.), and is therefore called 'mediopassive'; moreover, some verbs were lexically mediopassive, or 'deponent'. Hittite and the Tocharian languages preserve those details of the verb system unchanged; so do Greek and the ancient Indo-Iranian languages, except that they have begun to differentiate the passive from the middle. In the other daughters, however, the system has been simplified to one degree or another; for instance, if a Latin verb makes forms of both voices, the nonactive voice is strictly passive in function (though there are still deponent verbs, which are typically described as 'passive in form but active in meaning').

In PGmc the non-active voice had become strictly passive, and deponent verbs no longer existed. Moreover, since the PIE perfect was undifferentiated for voice, it is not surprising to find that there was no morphological past passive in PGmc; all past passive forms were periphrastic, constructed with the past participle and auxiliary verbs (presumably 'be', as in Latin, but apparently also 'become'). Thus the passive forms of a PGmc verb consisted of (*a*) the passive forms of the present and (*b*) the past participle. In the daughters of PGmc the present passive was steadily eroded, until in most the past participle was the only passive form remaining.

3.3.2 *The double paradigm of adjectives*

PGmc adjectives, like those in other western IE languages, were lexically vowel stems for the most part; consonant-stem adjectives had largely been eliminated (the most important class of 'holdouts' being the present participles in *-nd-). But nearly all PGmc adjectives had also acquired a second, parallel inflectional paradigm, and these new paradigms were n-stems. Moreover, even the older vowel-stem paradigms had undergone a major innovation: their original endings, which had been those of nouns, were replaced by those of the 'pronominal adjectives,' i.e. of quantifiers that were inflected like the relative pronoun and largely like the determiner 'that' (McFadden 2004; see 2.3.6 (ii)). The vowel-stem paradigms with pronominal endings are conventionally called 'strong', the n-stem paradigms 'weak'. These examples are typical:

	strong	weak
'alive'	*k^wik^wa-, fem. *$k^wik^wō$-	*k^wik^wan-, fem. *$k^wik^wōn$-
'common'	*gamaini-, fem. *gamainijō-	*gamainijan-, fem. *gamainijōn-
'heavy'	*kuru-, fem. *kurjō-	*kurjan- (?), fem. *kurjōn-
'carrying'	*berand-, fem. *berandijō-	*berandan-, fem. *berandīn-

Such a double inflection of adjectives is unique to Germanic.

The most general rule governing the use of the strong and weak paradigms in attested Germanic languages is that weak forms are used when the adjective is governed by a determiner or quantifier, while strong forms are used in most other syntactic environments. Such a distribution—an automatic consequence of the syntax—reveals little about the original functional distinction between the two paradigms. Fortunately there are a number of exceptions which reveal more about the original system. Adjectives modifying nouns in direct address are usually weak (though cf. the discussion of Stiles 1984: 23–6); so are comparatives; so is the adjective 'same' (*saman-, see 3.3.1 (iii)). All these instances have one thing in common: they modify definite NPs.

It is therefore reasonable to hypothesize that the n-stem suffix of the weak adjective paradigm was originally a definite article—the first of several that arose within the development of Germanic—and that its use with determiners was originally pleonastic, much like Classical Attic Greek οὗτος ὁ ἀνήρ /hôutos ho anɛ́:r/ 'this man', literally 'this the man' (so e.g. Krause 1968: 173). That would also explain why in a few archaic documents, most notably in *Beowulf*, we find weak adjectives used without determiners of any kind (though more research is needed to determine whether the weak suffix is still functioning as a definite article in those instances or whether the examples are simply formulaic expressions of the oral poetic tradition in which the original function of the n-stem suffix has been forgotten).

It has been clear for more than a century that PGmc weak adjective inflection developed from the PIE n-stem 'individualizing' suffix that also appears in Greek and Latin names (originally nicknames) like Gk *Ἀγάθων* /agátʰɔ:n/ 'the Good' (*ἀγαθός* /agatʰós/ 'good') and Lat. *Catō* 'the Shrewd' (*catus* 'shrewd'); see e.g. Krause 1968: 175, Jasanoff 2002: 40 with references. (Kim 2005 provides a good overview of this phenomenon with further references.) The syntactic developments involved are not entirely clear, because it is not clear (for example) whether lexemes marked with the suffix had always been adjectives which could appear attributively within the NP or were originally nouns in apposition (therefore separate NPs) which were reanalyzed as attributive adjectives. It is also unclear whether this phenomenon has anything to do with the spread of 'pronominal' inflection to all strong adjectives in PGmc.

3.4 The development of inflectional morphology in detail

The following sections will discuss the development of each PIE inflectional class in PGmc, in the same order as they are treated in section 2.3. The large-scale restructurings already discussed in section 3.3 will largely be assumed in what follows.

Since it is scarcely possible to describe the development of a system without reference to the states at the beginning and end of the development, readers may find it helpful to consult the corresponding sections of Chapters 2 and 4 while reading this chapter.

3.4.1 *Changes in inflectional categories*

The inherited classes of inflected lexemes remained the same, as did their inflectional classification into nominals and verbs.

Two notable simplifications in the set of nominal categories occurred. The dual was largely lost, surviving only in the first- and second-person pronouns and perhaps in the quantifiers 'two' and 'both'. However, there was a further indirect relic of the dual. When the genders of conjoined NPs differed, an adjective modifying both was neuter plural. That peculiar rule of concord probably arose by native learner reinterpretation of dual forms as follows. The PIE nom.-acc. dual masculine of o-stems (probably the default stem-class of nouns) ended in *-oh$_1$; the nom.-acc. plural neuter of o-stems ended in *-eh$_2$. The regular phonological development of those two endings was as follows:

*-oh$_1$ > *-ō (see 3.2.1 (ii)) > *-ā > *-ō (see 3.2.7 (i));
*-eh$_2$ > *-ā (see 3.2.1 (ii)) > *-ā > *-ō (see 3.2.7 (i)).

It can be seen that the two endings merged in *-ā during the development of PGmc. Apparently that led some language learners to reinterpret masculine dual predicates, agreeing with conjoined subjects of different genders, as neuter plural predicates, and generalization of that reanalysis led to the PGmc concord rule. We can infer that the merger of the endings must have preceded the loss of the dual in most third-person contexts; thus the latter change cannot have occurred very early in the development of PGmc (see 3.2.8). The other simplification occurred in the case system: the dative, ablative, and locative cases underwent syntactic merger, yielding a 'dative' case with the functions of all three. PGmc case assignment was similar to that of PIE, except that PGmc almost certainly had prepositions, which assigned case to their objects.

Because of the restructuring discussed in 3.3.1, PGmc verb inflection was organized around the category tense, with a simple opposition between present and past. Since the dual survived in nominals only in the first- and second-person pronouns, it is not surprising that 3du. endings were lost (their function being taken over by the 3pl.). Since only one non-indicative, non-imperative mood survived, it is usually called the subjunctive, though it was actually a (completely straightforward) reflex of the PIE optative.

Not surprisingly, the imperative mood was restricted to the present tense. Voice had been simplified to a simple opposition between active and passive (see 3.3.1 (v)). PGmc acquired a present (active) infinitive, but otherwise it simplified the system of nonfinite forms to a present active and a past passive participle.

3.4.2 *Changes in the formal expression of inflectional categories*

Possibly the most pervasive change in the expression of inflectional categories was one that is usually taken for granted: many morpheme boundaries that must have been more or less obvious in PIE shifted or were obscured in the development to PGmc. This happened somewhat differently, and for somewhat different reasons, in nominals and in verbs.

Ablaut in the root-syllables of nominals was almost completely leveled, being thereby restricted to suffixal syllables and endings; within the latter, some ablaut grades were generalized at the expense of others. In addition, various sound changes affecting unaccented (i.e., non-initial) syllables tended both to obscure morpheme boundaries in those syllables and to disrupt the parallelism between inflectional classes ('declensions'). Finally, the paradigms of different stem classes influenced one another in some details. The cumulative effect of these changes can be seen by comparing some case-and-number forms of three PIE proterokinetic nominals: an i-stem noun, a u-stem noun, and a feminine adjective in *-yeh$_2$-. In PIE the paradigms of all three were obviously parallel:

	'putting'	'tasting'	'heavy' (fem.)
nom. sg.	*d^{h}éh$_1$-ti-s	*ǵéws-tu-s	*g^{w}r̥h$_2$-éw-ih$_2$
acc. sg.	*d^{h}éh$_1$-ti-m	*ǵéws-tu-m	*g^{w}r̥h$_2$-éw-ih$_2$-m̥
gen. sg.	*d^{h}h$_1$-téy-s	*ǵus-téw-s	*g^{w}r̥h$_2$-u-yéh$_2$-s
...			
nom. pl.	*d^{h}éh$_1$-tey-es	*ǵéws-tew-es	*g^{w}r̥h$_2$-éw-ih$_2$-es
acc. pl.	*d^{h}éh$_1$-ti-ns	*ǵéws-tu-ns	*g^{w}r̥h$_2$-éw-ih$_2$-n̥s
gen. pl.	*d^{h}h$_1$-téy-oHom	*ǵus-téw-oHom	*g^{w}r̥h$_2$-u-yéh$_2$-oHom
...			

In PGmc that was no longer obvious:

	'deed'	'test'	'heavy' (fem.)
nom. sg.	*dēd-iz	*kust-uz	*kur-ī (?)
acc. sg.	*dēd-į	*kust-ų	*kur-jǭ
gen. sg.	*dēd-īz	*kust-auz	*kur-jōz
...			

nom. pl.	*dēd-īz	*kust-iwiz	*kur-jō̄z
acc. pl.	*dēd-inz	*kust-unz	*kur-jōz
gen. pl.	*dēd-ijǭ	*kust-iwǭ	*kur-jǭ

...

One result of these changes is suggested by the hyphens in the second table: the final segment(s) of the stems had probably been reanalyzed as part of the case-and-number endings, so that instead of a small number of inflectional classes mostly characterized by ablaut-and-accent paradigms there were now a somewhat larger number of classes characterized by different sets of endings containing different vowels (the 'a-stems', 'ō-stems, 'i-stems', and so on of the traditional grammars).[10] Thus the situation resembled that of Latin, with a number of more or less arbitrary declensions. In those nominals that expressed gender, feminine gender was still expressed by a suffix, but that was now fused with the case-and-number endings; thus to a considerable extent feminine nominals simply had 'different endings' from those of the other genders.

In verbs the details of the process were somewhat different. Athematic present stems were almost completely eliminated; that automatically eliminated ablaut in root syllables within the present paradigm, since the only ablaut within the paradigms of thematic stems was ablaut of the thematic vowel. In addition, the thematic vowel contracted with a following optative suffix, and in derived presents in *-yé- ∼ *-yó- also with vowels preceding the *-y- (which was lost, for the most part; see 3.2.6 (i)). The result was a set of 'conjugations' which differed mainly in the vowels or sequences of vocalics which immediately preceded the person-and-number endings. However, most of those endings remained clearly segmentable, since they began with consonants. Once again the situation was reminiscent of that in Latin (except that the subjunctive endings, which reflected the secondary endings of the PIE optative, remained largely distinct from those of the indicative, which reflected the PIE primary endings).

The past tense was a very different story. In derived verbs the finite past was marked by an obviously segmentable suffix, but in basic verbs the past stem was distinguished from that of the present by ablaut (or, less often,

[10] A similar reanalysis almost certainly occurred in Latin, as suggested by Carstairs 1987 passim; Carstairs-McCarthy 1991: 231–7; Aronoff 1994: 79–85, and many others; the alternative analysis of these systems, according to which the original stem-final vowels remained part of the stem (e.g. Hall 1946; Householder 1947 for Latin), is probably too abstract to reflect accurately what native learners must have learned. Note that the reanalysis suggested here accounts easily for the transfer of lexical items between classes (e.g. the Latin 2nd and 4th declensions, or the Gothic a- and i-stems), while the alternative analysis does not.

reduplication), and in most there was also ablaut within the finite past stem. These markers are formal relics of the PIE perfect. It thus seems clear that the development of the perfect into the past tense of PGmc basic verbs was largely responsible for the elaborate system of ablaut classes that are a prominent feature of Germanic 'strong' verb inflection. The past participle likewise betrays its origin by a formal anomaly: while it was marked by mere suffixation in derived verbs, in basic verbs it also sometimes exhibited a distinctive ablaut grade of the root, because it was originally a derived adjective formed directly from the verb root. Neither the PIE perfect nor the imperfect which eventually became the weak past suffix had any stem vowel, and their endings were originally quite different. But in PGmc the endings of strong and weak past stems had become largely identical, and a new stem vowel *-u- spread through the nonsingular of the indicative (starting from the 3pl. and perhaps the 1pl. and 1du.); those are unsurprising regularizations of the system.

There were a few small classes of underived verbs whose inflectional paradigms varied from the system just described. The most important were the 'preterite-presents', whose present stems were inflected like the finite past stems of basic verbs and whose past stems (including the past participle) were inflected like the past stems of derived verbs. 'Go', 'be', 'do', and 'want to' were anomalous in very various ways (see 3.4.3 (iii)).

3.4.3 *Changes in verb inflection*

In addition to the sweeping reorganization that has been described in 3.3.1, numerous more restricted changes took place in the development of the PGmc verb system. This section will examine them in some detail. Readers might be well advised to look ahead to section 4.3.3, in which the PGmc verb system is described at length, in order to make the discussion more immediately intelligible.

3.4.3 (i) *The present system* Section 3.3.1 (ii) has described how some classes of PIE affixed presents of basic verbs were eliminated through competition with their aorist subjunctives, which were constructed exactly like simple thematic presents. That is only part of the picture. Almost all basic verbs have been provided with simple thematic presents in PGmc by one means or another. Athematic root presents were thematized directly, and it was usually the full grade of the root that was generalized; for instance, *HréwdH- ~ *HrudH- 'to weep' (cf. Skt 3sg. *róditi*, 3pl. *rudánti*) was thematized as *rewd-e/o- > PGmc *riut-i- ~ *reut-a- (cf. OE *rēotan*, OHG *rioȝan*), and *$h_1$éd- ~ *$h_1$éd- 'to be eating' (cf. Lat. 3sg. *ēst*, 3pl. *edunt*) was thematized as *ed-e/o- > PGmc *iti- ~ *eta- (cf. Goth. *itan*, OE *etan*, etc.).

Very occasionally the zero grade was chosen; a clear example is *d^héyǵ^h- ∼ *d^hiǵ^h- 'to be making (out of clay)', which was thematized as *d^hig^h-e/o- > PGmc *dig-i/a- (cf. Goth. ptc. dat. sg. *þamma digandin* 'to him who made it [the pot]'). Some of the PGmc strong presents with roots in *-nn- might reflect reanalysis of PIE presents in *-néw- ∼ *-nw- with the zero grade of the suffix, but convincing examples are elusive. Reduplicated presents were all replaced in one way or another, except for the imperfect that underlies the past tense 'did'.

Two types of PIE affixed presents did survive in substantial numbers, namely nasal-infixed presents whose infix could be reanalyzed as a suffix and presents in *-ye/o-. The largest class of the former are the PGmc fientive presents of the fourth weak class, which will be discussed below, but a number also survive among strong verbs. Many are found in the first strong class (e.g. *gīn-i/a- 'to yawn, to gape'). An innovative example is *frig-ni- ∼ *freg-na- 'to ask for'; *stand-i/a- 'to stand' is a unique nasal-infixed monster, apparently built to its own innovative past stem (see 3.2.1 (iii)). Basic presents in *-ye/o- seem usually to have become parts of strong verb paradigms if their root vowel was *e, or if it was (PGmc) *a followed by a single consonant or by two obstruents; other basic verbs with the same present suffix typically acquired weak past tenses (see 4.3.3).

The inflection of the classes of presents that developed from PIE affixed presents differed from the inflection of simple thematic presents most obviously in their stem vowels. The alternants of the thematic vowel and the optative suffix, given in the first line of the following table, were reflected as indicated below in the other classes:

	e-grade	*o-grade*	*1sg.&1du.*	*subjunctive*
simple thematic	-i-	-a-	-ō-	-ai-
j-presents	-i- / -ī-	-ja- / -ija-	-jō- / -ijō-	-jai- / -ijai-
weak class II	-ǭ-	-ǭ-	-ǭ-	-ǭ-
weak cl. III statives	-ai-	-ja-	-jō-	-jai-
weak cl. III factitives	-ai-	-ā-	???	???
weak. cl. IV fientives	-nō-	-na-	???	-nai-?

The uniform stem vowel of class II weak verbs is accounted for exceptionlessly by the sound changes discussed in 3.2.6 (i). Probably its only etymological source was the PIE nominal suffix *-eh$_2$- plus the denominative present suffix *-yé/ó-, though at some point it was reanalyzed as a denominative suffix in its own right (and eventually even acquired deverbative functions, cf. Meid 1967: 240–3).

The developments of the other stem vowels call for varying amounts of comment; I begin with the least controversial.

The 'j-present' suffix, which was characteristic of class I weak verbs and strong j-presents, had several etymological sources which were not all phonologically identical, but its development is well understood. In underived verbs it reflects PIE *-ye/o- and *-yé/ó-, subject to Sievers' Law, which was readjusted to accommodate sound changes that altered the weight of the root (see 3.2.5 (ii)). In some derived verbs the suffix likewise represents *-yé/ó- ∼ *-ié/ó- with the Sievers' Law outcomes readjusted (see 3.3.1 (iii) ad fin.); all those verbs became regular class I weak verbs. In verbs derived from o-stem nominals the suffix probably reflects *-e-yé/ó-, and in causatives derived from verbs it definitely reflects *-éye/o- (see 3.3.1 (iii)). Both those suffix complexes should have given *-ī- ∼ *-ija- by sound change. However, in those cases too the converse of Sievers' Law was applied after light syllables. The result was a completely uniform class of j-present stems in which the suffix was always *-i- ∼ *-ja- after light roots and always *-ī- ∼ *-ija- after heavy roots.

The development of derived fientive presents—class IV weak verbs in the traditional classification—was more complex but is still fairly well understood. The comparative Germanic facts can be summarized as follows. In Gothic the present is inflected like a strong present, with a suffix *-ni-* ∼ *-na-*, but the past suffix is preceded by *-no-*, reflecting *-nō- (or, in principle, *-nō̄-, though that would be contrary to the usual pattern of weak past tense formation). That last detail is significant, because fientives, being intransitive, had no past participles in Gothic and perhaps not in PGmc; it is therefore likely that they formed their weak past stems not by univerbation with a participle, but by analogy to those of the other classes, necessarily using morphological material from the inherited present stem. It it reasonable to infer that there was once a suffix alternant *-nō- in the present stem (or, conceivably, *-nō̄-, since that would be reflected by *-nō- before the past suffix, as in class II weak verbs). That is indirectly confirmed by Old Norse, the other language in which this class of verbs remained common and productive. In ON these verbs are inflected entirely like class II weak verbs, and that development is easiest to understand if the present stem inherited a suffix alternant containing a long o-vowel. (PGmc *ō and *ō̄ merged in ON except word-finally.) In West Germanic these verbs survive only as lexical relics, and OHG offers no help in reconstructing their phonology, since in that language they typically appear as class III weak verbs, for reasons that are completely unclear. But the two most obvious northern WGmc relics (on whose etymologies see further below) exhibit a striking divergence of development. 'Learn' is a class II weak verb (OE *liornian*, OF *lernia*; cf. also OS *lernunga* 'instruction', with the deverbal suffix proper to that class of presents, and note

that PGmc *ō and *ǭ merged in West Germanic except in final syllables), but 'wake up' is inflected like a strong present (OE *wæcnan*). (The OE past is strong too, but that can easily be an innovation.) It seems clear that we ought to reconstruct for PGmc a present stem in which a suffix *-nō- alternated with *-nV-, where '*V' is some short vowel, and that the long-vowel alternant was made the basis of the finite past stem. We need to find a plausible etymological source for such a present paradigm.

Only one plausible source exists, and it requires some explanation. PIE possessed a class of athematic presents with a nasal infix; the infix appeared immediately before the final consonant of the zero-grade root as *-né- in those forms in which a full-grade stem would be expected and as *-n- in those forms in which a zero-grade stem would be expected. The present paradigm of *leyk^{w}- 'leave behind' in 2.3.3 (ii) is typical; note that the infix has been added to the zero grade *lik^{w}-, giving a present stem *li-né-k^{w}- ∼ *li-n-k^{w}-′. Since 'laryngeals' were ordinary consonants in PIE, nasal-infixed presents were made to laryngeal-final roots in the same way; an example is *tl̥-né-h$_2$- ∼ *tl̥-n-h$_2$-′, the present of *telh$_2$- 'lift' (cited in 2.3.3 (i)). But in most daughter languages the contraction of laryngeals with preceding tautosyllabic vowels (see 3.2.1 (ii)), and the loss of laryngeals in most other environments, greatly obscured the underlying structure of nasal-infixed presents to laryngeal-final roots, rendering it difficult for learners to recover; the usual result was reanalysis of the infix and the following laryngeal as a suffix (Skt *-nā́-* ∼ *-n(ī)-*, OIr. *-na-*, etc.). Moreover, because the second laryngeal was by far the commonest of the three, the shape of the suffix yielded by roots with a final *h$_2$ was generalized, at least in most daughters. Here is how such a development should have played out in Germanic, according to the known regular sound changes. I begin with the inherited present active paradigm of 'lift', omitting the dual forms; I first put them through the regular developments of laryngeals and of syllabic sonorants (see 3.2.2 (i)), which were clearly early sound changes:

*tl̥-né-h$_2$-mi	>	*tulnámi
*tl̥-né-h$_2$-si	>	*tulnási
*tl̥-né-h$_2$-ti	>	*tulnáti
*tl̥-n-h$_2$-mós	>	*tulnəmós
*tl̥-n-h$_2$-té	>	*tulnəté
*tl̥-n-h$_2$-énti	>	*tulnánti

Note that already at this stage the nasal and the vowel that followed it could have been reanalyzed as a suffix in this and all presents formed to roots of the shape *CeRH-, because laryngeals were lost without a trace after syllabic

sonorants (see 3.2.2 (i)). That is, because PIE *telh$_2$- ∼ *tl̥h$_2$- > *telə- ∼ *tul-, it was now possible for learners to reanalyze the *tul- of this paradigm as the whole root, in which case *-nā́- ∼ *-nə- ∼ *-ná- could only be a suffix. The new suffix could then spread in two ways: nasal-infixed presents made to roots ending in *-CH- (where *C was not a sonorant) could be reanalyzed as suffixed presents (with appropriate readjustments of their shape), and the suffix could be used to form new presents to roots of all shapes. It is therefore the subsequent development of the shape of the suffix that is now of interest.

The (active) singular alternant *-nā́- would eventually have become PGmc *-nō- (see 3.2.7 (i)); the 2sg. and 3sg. must have been *-nōsi and *-nōþi in PGmc (see below on the voiceless fricatives of their endings). The vowel of the 3pl. suffix-and-ending complex *-nánti would have fallen together with that of the thematic 3pl. ending *-onti when short *a and *o merged (ibid.). However, it is also possible that the same result was effected much earlier by morphological change, namely the replacement of athematic 3pl. *-énti by thematic *-ónti (a change attested in Latin). Either way, PGmc should have inherited an alternating suffix *-nō- ∼ *-na-. It is highly likely that the suffix alternant *-na- would have spread to the 1pl., giving PGmc *-na-maz, since 3pl. and 1pl. normally shared a stem vowel in PGmc verb paradigms. What happened in the 1sg. is less clear; there is no reason that an athematic *-nō-mi could not have survived in PGmc, though such a suffix-and-ending complex is nowhere attested. What happened in the 2pl. is unrecoverable; one can imagine that *-na- was simply leveled through the plural, or that *-nō- was reinterpreted as an e-grade alternant and thus spread to the 2pl. (as the table at the beginning of this section suggests, without much conviction), or even that the plural became 'thematic', so that the PGmc 2pl. was *-ni-þ. In any case, it is clear that the attested pattern of facts can be explained by the scenario sketched here, which in its broad outlines is the standard explanation.

Verbs of this class that are solidly reconstructable for PGmc are listed in 4.3.3 (ii.e). As can be seen, most are deverbative, though there is one denominative as well. The example *liznō- ∼ *lizna- 'learn', lexically fossilized in West Germanic, is important because it demonstrates that verb roots, in addition to being in the zero grade, exhibited root-final voiced fricatives in this class of verbs, showing clearly that the pre-PGmc accent fell on the suffix. All reconstructable examples are fientive—and that is the greatest puzzle of this class of derived verbs, since the attested examples give no hint of how the formation might have acquired such a meaning. It has been suggested that they are actually derived from the verbal adjective in

*-nó-, the ultimate source of the strong past participle (Feist 1939: 4 with references); but while that might account for their meaning, it cannot account for the alternating suffix which must be reconstructed for PGmc.

The development of stative verbs of the 3rd weak class is much more controversial; for the most part I accept the hypotheses of Bennett 1962 and Hock 1973, which have been discussed in part in earlier sections (see 3.2.6 (i–ii) and 3.3.1 (iii)). Briefly, the development of the stative present suffix must have been the following. PIE derived stative presents were athematic, with an invariant suffix *-éh$_1$-. At an early point in the separate development of Germanic, past participles in *-h$_1$-tó- were formed to those presents, and that suffix complex developed regularly into *-ə-tó-. Presents in *-ə-yé- ∼ *-ə-yó- were subsequently backformed to the participles, and their suffix developed by regular sound change into *-ai- ∼ *-ja-. That paradigm survives intact in the ON relic verbs *segja* 'say' and *þegja* 'be silent' and is presupposed by the northern WGmc relics of weak class III (to be discussed in vol. ii). In OHG the e-grade alternant *-ai- was generalized. In Gothic, and in the majority ON type, the o-grade of the suffix was ousted by the corresponding alternant of the factitive suffix, to which we now turn.

Dishington 1976 first established that the 3rd weak class of verbs includes a handful of denominative factitives, meaning 'make X' where X is the adjective from which the verb is derived. There are half a dozen clear Gothic examples, two of which have OHG cognates, as well as one remarkable ON fossil:

Goth. *ana-, ga-þiwan* 'to enslave' = OHG *dewēn* 'to humiliate' < PGmc *þewai-, derived from *þewa- 'slave';
Goth. *arman* 'to pity' = OHG *ir-b-armēn* < PGmc *armai-, derived from *arma- 'poor' (orig. *'to consider poor' or *'to treat as poor');
Goth. *ga-ainan* 'to separate', derived from *ain-* 'one';
Goth. *fastan* 'to hold fast, to maintain', derived from PGmc *fasta- 'fixed' (not attested in Gothic);
Goth. *sweran* 'to honor', derived from *swer-* 'honored' (< PGmc *swēra- 'heavy');
Goth. *weihan* 'to sanctify', derived from *weih-* 'holy';
ON *vara* 'to lead one to expect' (used impersonally, e.g. *varir mik* 'I expect'), derived from *varr* 'aware' (thus originally *'to make one aware of').

The OHG cognates, the ON example, and possibly Goth. *fastan* (whose derivational basis may have been lost in Gothic) show that the formation is inherited; on the other hand, Goth. *sweran* shows that it continued to be at least marginally productive well down into the independent history of Gothic,

since the base adjective means 'honored' only in that language. In the other Germanic languages this formation died out. The problem is to find an etymology for the suffix—which can hardly have been identical with the stative suffix to begin with, given the gross difference in meaning between them—and (simultaneously) a reason why it should have become similar enough to the stative suffix for the two classes to merge into one. James Dishington has suggested a connection with the Greek o-contract presents, which (if they are inherited) must reflect a suffix *-o-yé- ∼ *-o-yó- and are factitive in meaning (cf. especially 1976: 859 with references); recently Craig Melchert has identified a class of Anatolian denominatives that appear to reflect a similar suffix (Melchert 1997: 136–7), which suggests that the type could be inherited from PIE.[11] So far as I can see, that will account for the PGmc factitives very well indeed. A suffix *-o-yé- would certainly give PGmc *-ai- by regular sound change (see 3.2.6 (i)), which provides a 'pivot' for the merger of the factitive and stative classes. The o-grade alternant *-o-yó- should have become *-aja-, and the *j would then have dropped, just as it did in the PGmc present stem *stai- ∼ *stā- < *staji- ∼ *staja- (Þórhallsdóttir 1993: 35–6, citing Cowgill 1973: 296; see 3.2.6 (i) ad fin.). The resulting suffix *-ai- ∼ *-ā- is apparently *exactly* what we find in Gothic, though of course the alphabet provides no way of marking the length of the o-grade vowel. What the optative suffix, or the vowel of the 1sg. and 1du., should have been is very unclear.

If the above is correct, we need to motivate the merger of the stative and factitive classes in the attested daughters in some detail. That it occurred at all is not surprising, since the suffixes of the two classes shared an e-grade alternant and since both classes seem to have become comparatively small (especially the factitives, which were in competition with deadjectival presents of the first weak class). What is surprising is that both in Gothic and in ON the classes merged under the form of the factitives, even though statives are

[11] However, the prehistory of this class is not likely to have been as simple as this brief discussion might imply. The attested Anatolian forms reflect analogical retraction of the accent (cf. Melchert 1997: 135). Elizabeth Tucker has explored the Greek formation in detail, pointing out that it actually reflects two separate formations, an 'instrumental' class formed from nouns that exhibits perfect passive forms in Homer and in Mycenaean and a purely factitive class formed from adjectives that exhibits no early perfect forms (Tucker 1981: 16–19). The former appears to be connected to a widespread class of pseudo-verbal adjectives in *-tó-, while the latter does not. As can be seen from the list above, the Germanic examples are all strictly factitive, and most are formed from adjectives. Thus the connection between these presents and derived nominals in *-ōtó- suggested in Dishington 1976: 859–62 may be an illusion. In any case it seems increasingly unlikely that the Greek present stem is a purely Greek innovation (pace Tucker 1981: 15 with references p. 30 n. 4). The paucity of Homeric examples can perhaps be explained in discourse terms; if the number is small enough, the idiosyncrasies noted ibid. 32 n. 28 with references might even be statistical accidents. Much more work on this problem is needed.

about five times as common in Gothic and are overwhelmingly more common in ON. Of course it is possible that the relative rarity of the factitives in both languages is a straightforward result of the fact that the formation had ceased to be productive; if it was still productive in PGmc, factitives of this class can have been much more common early in the separate development of Gothic and ON. But another factor may also have operated in this case. The stative paradigm shared its o-grade alternant *-ja- with the very large first weak class, but the factitive paradigm's o-grade alternant *-ā- was unique; once the two paradigms had begun to merge, language learners may have preferred the factitive alternant simply because it was unambiguous. Of course that obviously did not happen in West Germanic; but such structurally 'directed' learner choices are merely possible, not necessary.

I turn now to the endings. The indicative passive endings clearly reflect the innovative 'central' dialect endings with final *-y rather than *-r (as already discussed in 2.3.3 (iii) and exemplified in 2.3.3 (vi)). The 2sg. ending reflects *-soy, remodeled on 3sg. *-toy, as in Indo-Iranian and Greek (modulo details).

The third-person imperative endings seem to have a final segment reflecting *-ow, like the corresponding Old Irish forms but unlike the corresponding Indo-Iranian forms, which have *-u; Hittite *-u* could reflect either. In other words:

OIr. *berat* 'let them carry' < Proto-Insular Celtic *berontō < *b^hérontow;
Goth. *baírandau* 'let them carry' likewise < *b^hérontow;
Skt *b^hárantu* 'let them carry' < *b^hérontu; so also *sántu* 'let them be' < *$h_1$séntu;
Hitt. *asandu* 'let them be' < *$h_1$séntu or *$h_1$séntow.

Obviously we cannot be certain what the PIE situation was. It would be natural to assume that Sanskrit and Avestan preserve the original situation, because (1) they are attested so much earlier than Gothic and Old Irish that the latter two languages are more likely to have innovated (having had much more time to do so), and (2) some Indo-Europeanists suspect that Germanic and Celtic might for a time have been in close enough contact to share morphological innovations. But those are not overwhelming arguments.

The appearance of a similar final segment in the passive subjunctive endings is puzzling; one would have expected secondary mediopassive endings in *-o, which would have been lost by regular sound change. The source of this *-ow is completely obscure. (Or should we suppose that the PGmc sequence *-au actually reflects *-o-Hu or the like?)

A number of syncretisms and levelings have occurred, but for the most part they 'make sense' in terms of the system. The primary 2du. ending has

obviously been generalized to the subjunctive and imperative (and, as we will see, to the past); since the 2du. is the most marginal person-and-number category in the system, leveling of some sort is not surprising. The generalization of o-grade *-a- as the default thematic vowel in the 2du., the 3rd-person imperatives, and the passive, if it had occurred already by the PGmc period, can also be attributed to the relatively marginal status of those categories (Cowgill 1985*a*); all three survive only in Gothic (with one fossilized exception), and Cowgill's discussion makes it clear that they were moribund in that language. Again, some leveling might have been expected, and leveling of either grade of the vowel should be unsurprising.

More striking is the syncretism of persons in the passive: so far as the evidence of the daughters can tell us, there was only a single form for all nonsingular person-and-number categories, reflecting the inherited form of the 3pl. But that appears to be a natural type of development in a Germanic verb system; we will meet it again in northern WGmc, where it occurred much later in the active (see vol. ii).

An obscure but important detail concerns the shape of some of the personal endings. In the table of strong verb endings at the beginning of 4.3.3 (i) are listed a considerable number of endings with the voiced fricatives *-z- and *-d-, or the cluster *-nd-, immediately after the thematic vowel. All those voiced obstruents developed from PIE *-s- and *-t- by Verner's Law. But in many classes of derived verbs (and a handful of basic verbs) the PIE accent fell on the thematic vowel, so that a voiceless fricative is expected instead. It is clear that both Verner's Law alternants occurred in PGmc, since the voiceless fricatives have been generalized in OE (for the most part), but the voiced fricatives in Gothic. (The much later word-final devoicing of fricatives in Gothic has obscured that development; but when enclitic particles are attached to a verb form, the underlying voiced fricative appears on the surface. ON has probably also generalized the voiced alternants, though in the case of *d we can't tell because of further sound changes. The other languages exhibit a more mixed pattern.) Thus we must also reconstruct a set of PGmc endings pres. indic. 2sg. *-si, 3sg. *-þi, 3pl. *-nþi, opt. 2sg. *-s, and so on. The expected distribution of the two sets of endings across the present stem classes, according to where the accent fell in PIE (or pre-PGmc), is the following. Large classes that should have exhibited endings of the type in question are marked with an asterisk.

1. Endings with voiced Verner's Law alternants.
   *unaffixed strong presents: the vast majority;

strong j-presents: at least *bidjaną ‘to ask (for)’, *ligjaną ‘to lie’, *sitjaną ‘to sit’, *arjaną ‘to plow’, *hlahjaną ‘to laugh’, and *skaþjaną ‘to harm’, either because the PIE or pre-PGmc etymon was root-accented or because a root-final voiceless fricative is reconstructable for PGmc;
strong nasal-affixed presents: none? (though cf. Seebold 1970: 394–5, 502, 531);
unaffixed weak presents: completely unclear;
class I weak presents with anomalous past tenses: possibly *þankijaną ‘to perceive’ and *sōkijaną ‘to look for’;
*regular class I weak presents: causatives (a large and productive class);
class II weak presents: probably none;
class III and IV weak presents: none.

2. Endings with voiceless Verner’s Law alternants.
unaffixed strong presents: *diganą ‘to knead’, *wiganą ‘to fight’, *stikaną ‘to stab’, *wulaną ‘to boil’, *knudaną ‘to knead’, *trudaną ‘to tread’; whether the strong class II presents with *ū in the root belong here is unclear;
strong j-presents: at least *habjaną ‘to lift’ and *sabjaną ‘to notice’;
strong nasal-affixed presents: at least *fregnaną ‘to ask’ and *standaną ‘to stand’;
unaffixed weak presents: completely unclear;
class I weak presents with anomalous past tenses: at least *wurkijaną ‘to work’, *þunkijaną ‘to seem’, *bugjaną ‘to buy’;
*regular class I weak presents: denominatives (a large and productive class);
*class II weak presents: probably all;
*class III and IV weak presents: all.

Such a complex distribution is most unlikely to have survived the loss of contrastive accent; there must have been substantial leveling. The weak classes II, III, and IV, which included only derived verbs, should have exhibited the voiceless alternants without exception, and there is no reason to suppose that they did not keep them. An overwhelming proportion of affixless strong verbs should have exhibited the voiced endings, and it is reasonable to suppose that they were generalized to the few that were exceptions. The regular class I weak presents were much more evenly balanced, with a large and productive class of causatives that ought to have exhibited the voiced alternants and an even larger and more productive class of denominatives that ought to have exhibited the voiceless alternants. What happened in that class is necessarily somewhat unclear. I hypothesize that the voiceless alternants were generalized because (1) they were eventually generalized to all verbs in the northern WGmc languages, which presupposes a solid ‘base’ of inherited verbs from which to generalize them, but (2) the derived presents of weak classes III and

IV were largely lost in those same languages, and it seems unlikely that weak class II alone would be a sufficient base from which voiceless alternants could spread; also, (3) most class I weak presents were obviously derived presents, and the other classes of derived presents exhibited the voiceless alternants. But it should be remembered that none of these arguments is clinching; in particular, voiceless alternants could in principle have been generalized from a small group of very common anomalous verbs with monosyllabic stems (especially 'do'). What happened in the small classes of presents is even less clear.

Since I need to cite verb forms throughout this book, it is necessary to make some simplifying assumptions about the generalization of the voiced and voiceless endings in PGmc. The obvious alternatives are (1) to assume that voiced endings were generalized in strong verbs and voiceless endings in weak verbs, and (2) to assume that voiced endings were generalized in presents whose stem vowel was the simple thematic vowel *-i- ∼ *-a-, nearly all of which were strong, and voiceless endings in all others, most of which were weak. I have preferred the second alternative for two reasons. In the first place, the 'strong vs. weak' classification is based on the formation of the past, not the present; but it is the present endings that are in question. Secondly, it seems clear that a hard-and-fast division of verbs into strong and weak 'conjugations' became increasingly dominant over time; it is reasonable to suppose that the cross-classification of present and past types was much more obvious in PGmc than it would later be, so that one would expect the types of presents to exhibit more autonomy at that early period. Readers should remember not to take my decision too seriously.

Finally, a word should be said about nonfinite forms. The present participle was formed with a suffix *-a-nd- that directly reflects PIE (active) *-o-nt-. (One would also expect a voiceless alternant *-a-nþ-, but *-nþ- seems to be attested only in fossilized nominals.) The present infinitive, like those of nearly all other IE languages, clearly reflects a PIE derived verbal noun. But whereas neuter verbal nouns in *-no-m are reasonably well attested (cf. Brugmann 1906: 260–4, 266–9), they were formed directly to the root in PIE, not to aspect stems. In PGmc the formation has apparently been adjusted so as to include the thematic present stem vowel; thus we have pre-PGmc *-o-no-m > PGmc *-aną.

3.4.3 (ii) *The past system* Though it is true that the PGmc strong past is in all essentials a descendant of the PIE perfect, that simple statement glosses over drastic changes in the inflectional morphology of the paradigm. The most important development can be summarized in a few words. Virtually all

PIE perfects were reduplicated, but in six of the seven classes of PGmc strong verbs the past is not reduplicated. A discussion of the changes in stem formation that occurred in the prehistory of Germanic is best structured around that observation.

PIE roots of the shape *C(C)eRC- (where *R is any sonorant) underlie the first three classes of PGmc strong verbs. Their finite pasts developed in a more or less uniform fashion, as this pair of tables shows:

Post-PIE perfects:

indic. sg. stem		default stem	
*b^{h}e-b^{h}óyd-	∼	*b^{h}e-b^{h}id-′	'have split'
*ǵe-ǵóws-	∼	*ǵe-ǵus-′	'have tasted'
*b^{h}e-b^{h}ónd^{h}-	∼	*b^{h}e-b^{h}n̥d^{h}-′	'have tied'
*we-wórt-	∼	*we-wr̥t-′	'have turned'

PGmc pasts descended from the above:

indic. sg. stem		default stem	
*bait-	∼	*bit-	'bit'
*kaus-	∼	*kuz-	'chose'
*band-	∼	*bund-	'tied'
*warþ-	∼	*wurd-	'became'

As can be seen, the reduplicating syllable has simply been dropped. That appears to be the normal development for the pasts of roots with an internal underlying *e, provided that the stem (minus reduplication) eventuated in a PGmc form that constituted a syllable. As a result the default past stem of these verbs has become identical with the zero-grade root that appears in the past participle (originally a derived adjective, not part of the perfect system; see 3.3.1 (iii)).

The pasts of roots with underlying *e that ended in a single consonant developed more complexly. It is simplest to begin with the only PGmc strong verb with root-initial *e-, namely 'eat':

	indic. sg. stem		*default stem*
Post-PIE perfect	*h$_1$e-h$_1$ód-	∼	*h$_1$e-h$_1$d-′
PGmc past	*ēt-	∼	*ēt-

It is clear that the default past stem has developed by regular sound change. But it also appears that the indicative singular stem developed by sound change, namely by contraction of the reduplicating vowel with that of the root—which would make it an exception to the generalization noted above. The most likely explanation for such a development is that the contraction occurred before the period during which reduplicating syllables were dropped. Since contraction of

vowels after the loss of laryngeals demonstrably gave 'trimoric' vowels in final syllables (see 3.2.1 (ii)), it is reasonable to suppose that the result was a trimoric vowel in this case as well. Whether the distinction between bimoric and trimoric long vowels in nonfinal syllables persisted until the end of the PGmc period is unclear; it does not persist in any attested daughter.

The pasts of other roots of the shape *C(C)eC- (where root-final *C is not a sonorant) developed differently; the following are typical.

Post-PIE perfects:

indic. sg. stem		*default stem*	
*$g^he\text{-}g^hób^h\text{-}$	∼	*$g^he\text{-}g^hb^h\text{-}'$	'have given'
*$g^{wh}e\text{-}g^{wh}ód^h\text{-}$	∼	*$g^{wh}e\text{-}g^{wh}d^h\text{-}'$	'have asked for'

PGmc pasts:

indic. sg. stem		*default stem*	
*gab-	∼	*gēb-	'gave'
*bad-	∼	*bēd-	'asked for'

In the indicative singular stem the reduplication has been lost, as expected. But loss of the reduplication in the default stem would have yielded a nonsyllabic stem, and it appears that instead the entire form, including the reduplication, has been remodeled (Cowgill, p.c. *c.*1979). The process by which that occurred is unclear. In examples like the above, exhibiting unusual consonant clusters, sound change might have played some role, but the obvious source for the PGmc *ē of these stems is the corresponding stem of 'eat'. It is true that a single verb, however common, is a very small basis on which to remodel a whole class (unless the verb has a very general meaning, like 'be' or 'do'); but we do not know that 'eat' was the only strong verb with initial *e- that ever existed—we only know that it is the only one that survived to be attested in the daughter languages. In any case, at least some analogical remodeling must be posited, because a good many of these verbs had consonant clusters that should have caused no problems in their default stems; these examples are typical:

Post-PIE perfects:

indic. sg. stem		*default stem*	
*se-sód-	∼	*se-sd-′	'have sat down'
*le-lóg^h-	∼	*le-lg^h-′	'have lain down'
*we-wóǵ^h-	∼	*we-wǵ^h-′	'have transported'

PGmc pasts:

indic. sg. stem		*default stem*	
*sat-	∼	(*sest- →) *sēt-	'sat'

*lag-	∼	(*lelg- →) *lēg-	'lay'
*wag-	∼	(*weug- →) *wēg-	'moved'

In consequence of these developments the default stem did not share an ablaut grade with the past participle. The verbal adjectives of *CeC-roots (where neither *C was a sonorant) almost certainly exhibited the e-grade of the root already in (late) PIE, so that their development into PGmc participles was straightforward:

PIE *$g^{wh}ed^{h}$-nó-s 'that can be asked for' >⟶ PGmc *bedanaz 'asked for'.

At some point the corresponding formations from roots containing sonorants, which did have zero-grade roots, were adjusted to fit that paradigm; for instance, either PIE *$uǵ^{h}nós$ 'transportable' was replaced by *$weǵ^{h}nós$, or its pre-PGmc descendant *uganaz was replaced by PGmc *weganaz. At least one root of the shape *CReC- resisted that development: PGmc 'broken' was *brukanaz ← *burkanaz ←< post-PIE *$b^{h}r̥gnós$. On the other hand, the participle of *wrekaną 'drive (out)' was *wrekanaz, to judge from the agreement of Gothic, ON, and OE. For the participle of *drepaną 'hit' the evidence is conflicting; for other relevant participles it is insufficient.

The pasts of roots of the shape *C(C)eR- ultimately developed in much the same way. The past participles descended from their verbal adjectives did retain zero grade of the root; thus, for example, PIE *$b^{h}r̥$-nó-s 'portable' >⟶ PGmc *buranaz 'carried, born(e)'. Since at least one alternant of the default stem yielded a syllabic stem even when the reduplicating syllable was subtracted, one might have expected a development like:

	indic. sg. stem		*default stem*	
Post-PIE perfect	*$b^{h}e$-b^{h}ór-	∼	*$b^{h}e$-$b^{h}r$-′ ∼ *$b^{h}e$-$b^{h}r̥$-′	'have carried'
PGmc past	*bar-	∼	*bur-	'carried'

Such a default stem is actually attested only in the presents of preterite-present verbs (*mun- 'remember', *skul- 'owe'); the corresponding default strong pasts have all been replaced by the type *bēr-. Evidently these default stems were remodeled on those of the similar class with roots that ended in obstruents (see above).

The pasts of verbs whose roots did not contain underlying *e in (pre-) PGmc developed very differently. The most puzzling class are those that contained underlying *a followed by a single consonant or by a cluster of obstruents. Enough of the present stems have good stem-cognates outside Germanic to show that their *a reflects all phonologically possible sources, thus:

1. PIE *h_2e:
   *aki/a- 'drive (a vehicle)' < PIE *$h_2$égʷe/o- 'drive (animals), lead' (Lat. *agere*, Gk *ἄγειν* /á*g*eːn/, etc.);
   *ali/a- 'raise (a child)' < PIE *$h_2$éle/o- (Lat. *alere*, OIr. 3sg. *ailid*);
   *ani/a- 'breathe' (inferred from Goth. past *uz-on* 'he expired') ⟵< PIE *$h_2$énh$_1$- (Skt 3sg. *ániti*; for the identity of the laryngeals cf. Gk *ἄνεμος* /ánemos/ 'wind');
   *ari- ~ *arja- 'plow' < PIE *$h_2$érye/o-, root *$h_2$erh$_3$- (3sg. MIr. *airid*, Lith. *ãria*, OCS *orjetŭ*; with restored laryneal Gk *ἀροῦν* /arôːn/, Lat. *arāre*).
2. (post-)PIE *a:
   *skabi/a- 'shave' < PIE *skab^{h}e/o- 'scratch' (Lat. *scabere*);
   *dragi/a- 'pull, drag' < (post-)PIE *d^{h}rag^{h}e/o- (probably, cf. Lat. *trahere*).
3. PIE laryngeals:
   *habi- ~ *habja- 'lift' < PIE *kh$_2$pié/ó- 'seize' (Lat. *capere, capi-* 'to take', Gk *κάπτειν* /kápteːn/ 'to gulp down');
   *taki/a- 'touch' (in ON *taka* 'to take', *taka á* 'to touch') < post-PIE *dh$_1$g-, cf. *deh$_1$g- > *tēki/a- (in Goth. *tekan* 'to touch'); or was the ON present backformed to a dereduplicated past *tók* (see below)?
4. PIE *o:
   *mali/a- 'grind' < post-PIE *mólh$_2$e/o- (Lat. *molere*, Lith. 3sg. *māla*) ← PIE *mólh$_2$- ~ *mélh$_2$- (Hitt. 3sg. *mallai*; cf. also OIr. 3sg. *melid*, etc.; Jasanoff 1979: 83–4);
   *swari- ~ *swarja- 'swear' < PIE intensive (?) *sworéye/o- 'speak emphatically' (only possible reconstruction, see below; *swer- clearly in Oscan dat. sg. **sverruneí** (title of an official), Toch. B *ṣarm*, A *ṣurm* 'cause', Lat. *sermō* 'speech' (*w lost by lexical analogy); cf. also the zero-grade past participle OE *sworen*, OS *sworan*, OHG *gisworan*, very unusual for a verb of this class).
5. Secondary zero grade:
   *flahi/a- 'skin', with secondary zero grade to *flēh- < post-PIE *pleh$_1$ḱ- (Lith. *plėšti* 'to tear, pluck, peel').

Less clear examples of every type except the first can also be adduced. For instance, it is clear that *kali/a- 'freeze' must reflect PIE *gol-, given Lat. *gelū* and Lith. *gelumà* 'frost', though the formation of the stem is unrecoverable; if *baki/a- 'bake' is related to Gk *φώγειν* /p^{h}ǫ́ːgeːn/ 'to roast' it must reflect *b^{h}h$_3$g-; *wadi/a- 'wade' can only reflect either *wad^h- or a secondary zero grade, given the long vowel in Lat. *vādere* 'to go', and so on.

It is surprising that the strong verb 'swear' reflects a derived present, yet there seems to be no way to escape that conclusion. It was clearly a j-present in PGmc; only Gothic exhibits a simple thematic present, which is an obvious

innovation (as also in 'sit' and 'lie'). It clearly had an o-grade root, to judge not only from cognates elsewhere but also from the West Germanic zero-grade past participles; the latter might not directly reflect a PGmc form (which might have been *suranaz), but they are common enough to suggest that the PGmc verb did have a zero-grade participle, and the OE derived noun *manswora* 'perjurer' points in the same direction (cf. Seebold 1970: 480–2). Possibly the verb became strong because it was neither a causative nor a denominative. A second possible example of the same phenomenon is the strong verb 'grow', if its present should be reconstructed as PGmc *wahsijaną (cf. Goth. *wahsjan* and the rare weak verbs Old Swedish *væxa*, Norwegian *vexa*, Seebold 1970: 532) instead of *wahsaną (cf. ON *vaxa*, OE *weaxan*, OF *waxa*, OS, OHG *wahsan*). In the former case the etymon would be a post-PIE intensive (?) stem *$h_2$wogséye/o- made to a root abstracted from the present *$h_2$wég-se/o- 'to increase' (cf. Homeric Gk *ἀέξειν* /aéksɛːn/), parallel to but historically unconnected with the Sanskrit causative *vakṣáyati* '(s)he makes (it) grow'.

Obviously roots of such diverse phonological antecedents cannot originally have exhibited the same pattern of ablaut, but a unitary strong paradigm had been created for them by the PGmc period (with the exception of 'plow', on which see further below). I exemplify the paradigm with two very common verbs whose origins are problematic in various ways:

pres. inf.	*past 3sg.*	*past 3pl.*	*past ptc.*	
*faraną	*fōr (*fō̄r?)	*fōrun	*faranaz	'go, travel'
*slahaną	*slōh (*slō̄h?)	*slōgun	*slaganaz	'hit, kill'

This ablaut pattern is very different from most of those we have already seen, but it does closely resemble that of 'eat', which suggests that vowel-initial verbs which had been laryngeal-initial in PIE might have played a role in establishing it. As it happens, three such verbs of this class are known to have been inherited. Their post-PIE perfects and the pasts descended from them can be reconstructed thus:

Post-PIE perfects:

indic. sg. stem		*default stem*	
*h_2e-h_2óǵ-	∼	*h_2e-h_2ǵ-′	'have driven'
*h_2e-$h_2$ól-	∼	*h_2e-h_2l-′	'have raised (a child)'
*h_2e-$h_2$ónh$_1$-	∼	*h_2e-h_2n̥h$_1$-′	'have breathed'

PGmc pasts:

indic. sg. stem		*default stem*	
*ō̄k-	∼	*ōk-	'drove'

*ō̄l-	∼	*ōl-	'raised (a child)'
*ō̄n-	∼	*ōn-	'breathed'

The development of the indicative singular stems was evidently the same as in the case of 'eat' (see above). It is possible that this ablaut system simply spread to consonant-initial pasts, giving paradigms like *fō̄r- ∼ *fōr and *slō̄h- ∼ *slōg- (see above), but that is not the only alternative. Consider the expected shape of the past stems of verbs whose underlying *a reflects a PIE laryngeal:

	indic. sg. stem		*default stem*	
Post-PIE perfect	*ke-kóh$_2$p-	∼	*ke-kh$_2$p-′	'have seized'
PGmc past	*hōf-	∼	(*hab- →) *hōb-	'lifted'

One would expect the reduplication to have been lost in the usual way (see the beginning of this section); the result should have been an alternation *ō ∼ *a within the past paradigm, and that could easily have been adjusted to non-alternating *ō in at least two ways: either by leveling within the paradigm, or by extending the ablaut rule that yielded *ō in the default past stems of vowel-initial verbs. In short, we do not know exactly how the unitary *ō of these pasts in the attested languages arose, but there is no lack of plausible sources for it, and its spread to verbs in which it did not originally occur is not very surprising. The *a in the root-syllables of the past participles must have arisen in roots of the shape *CaC- (whose zero grade would have been nonsyllabic) and *CeHC- (in which zero-grade *CHC- > *CaC-) and have spread from those verbs to the others in much the same way.

The remaining PGmc strong verbs are those with root-internal *ē, *ō, *ai, and *au, and those whose roots contain *aR followed by a consonant. The pasts of those that were consonant-initial (the vast majority) retained the inherited reduplicating syllable *Ce-; the rule of reduplication was extended to vowel-initial verbs as well, giving a reduplicating syllable *e- which arose too late to contract with the following vowel in PGmc (Attested are Goth. *af-aíaik* '(s)he disavowed' < PGmc *eaik; Goth. *aíauk*, ON *jók* '(s)he increased' < PGmc *eauk; ON *jós* '(s)he drew (water)' < PGmc *eaus.) Very surprisingly, *arjaną 'plow' seems to have belonged to this class in spite of the shape of its root. The present is attested in almost all the older languages (Goth. *arjan*, ON *erja*, OE *erian*, OF *era*, OHG *erien*), but in most of the languages its past is weak (the default for j-presents, therefore not necessarily old), while no Gothic past is attested. Only in OHG is a strong past attested, and it is (3pl.) *iarun* < (?)*earun. Without further information it is difficult to know what to make of that.

Since most of the roots described in the last paragraph did not ablaut at all in PGmc, their retention of reduplication is not surprising, as it was the only

clear marker of the past. However, a subset of the roots with internal *ē did have o-grade forms with *ō; they leveled the o-grade from the indicative singular stem into the entire past and are the only PGmc verbs to retain both (overt) reduplication and ablaut in the past. Six can be reconstructed for PGmc; I here give the present infinitive and the past 3sg.:

*wēaną, *wewō 'blow [of the wind]' < PIE *$h_2$weh$_1$-, pres. 3sg. *$h_2$wéh$_1$ti (Skt *vā́ti*, Homeric Gk *ἄησι* /áę:si/);
*sēaną, *sezō (see below) 'sow' < PIE *seh$_1$- (cf. Lat. pf. 3sg. *sēvit*);
*lētaną, *lelōt 'let, allow' < PIE *leh$_1$d- 'release' (?; Albanian 3sg. *lodh* 'it tires (him) out');
*rēdaną, *rerōd 'advise, plan' < PIE *Hreh$_1$d- (cf. o-grade derived pres. in OCS *raditi* 'to worry about', OIr. 3sg. *ráidid* 'speaks');
*tēkaną, *tetōk 'touch' < post-PIE *deh$_1$g- (see above and cf. 3.2.1 (iv));
*grētaną, *gegrōt 'weep' (no convincing etymology).

All six continue to exhibit this ablaut in Gothic; it is also possible that the Old Swedish past 3sg. *lót* (to pres. *láta*) preserves the inherited ablaut, and that ON *tók* 'took' is actually an exact cognate of Goth. *taítok* 'touched' with the reduplicating syllable dropped, in which case its present was backformed to it.

Two final details of strong past stem formation involve Verner's Law. First, since the PIE accent fell on the root in the indicative singular but on some subsequent syllable in every other form (including the verbal adjectives in *-nó- that underlie the PGmc participles), we should expect to find the Verner's Law alternation in verbs with underlying root-final voiceless fricatives. It is clear that the alternation was still fully regular in PGmc: the past singular indicative (and, usually, the whole present stem) retained the underlying root-final voiceless fricative on the surface, but in all the rest of the past paradigm it was replaced by the corresponding voiced obstruent. The Verner's Law alternation is preserved fairly well in the older WGmc languages and to a limited extent in ON, but not in Gothic, which has almost completely leveled it in favor of the underlying voiceless fricative in strong verb paradigms. Secondly, since the reduplicating syllable was not accented in PIE, one might expect an underlying root-*initial* voiceless fricative to have been voiced as well after a reduplicating syllable (at least in those forms in which the reduplication survives). At least two such stems are attested, Goth. *gasaízlep* 'has fallen asleep' (beside *saíslep* 'he was asleep' and *anasaíslepun* '(who) have fallen asleep' with leveling) and ON 1sg. *sera* 'I sowed' (the past of *sá* 'sow', with analogical weak 2, 3sg.; contrast Goth. *saíso*). The strong past infixes *-*Vr*- of ON and OHG must have begun their precarious careers with the reanalysis of such forms (cf. e.g. ON *gnera* 'rubbed' to pres. *gnúa,* OHG

anasterōʒ 'knocked against' to pres. *stōʒan;* see Noreen 1923: 340, Braune and Eggers 1975: 288 with references). It is striking that all these relics and the innovations based on them involve the voicing of *s to *z; it would be reasonable to infer that the Verner's Law alternation of other root-initial fricatives had already been leveled in PGmc.

The origin of the weak past has been described in 3.3.1 (iv). Synchronically its suffix in PGmc exhibited the same pattern of allomorphy as the strong past: there was a default stem in *-Tēd-, where '*-T-' is whatever coronal obstruent appeared in the past participle (usually *-d-, but *-t- in the few weak verbs in which it immediately followed a root-final consonant, and variously *-d-, *-t-, *-þ-, or *-s(s)- in preterite-present verbs), and a shorter indicative singular stem in *-T-. On the long vowel of the default past stem see 3.3.1 (ii).

The endings of the PGmc past are mostly of transparent origin. There was no imperative or passive. The subjunctive endings were the same as those of the present, but the mood suffix preceding them was *-ī-, reflecting the zero-grade alternant *-ih_1- of the PIE athematic optative suffix *-$yéh_1$- ∼ *-ih_1-. Given that the PGmc subjunctive reflects the PIE optative and that the past reflects the (athematic) PIE perfect and an athematic imperfect, that is exactly what we expect to find. Though the full-grade alternant originally occurred in the singular, leveling in favor of zero-grade *-ī- is not surprising; exactly the same thing happened in Latin.

The indicative endings had become the same for the strong and weak pasts except in the singular. Most of the singular endings developed entirely by regular sound change, but the development of the strong 2sg. ending was not so simple. The PIE ending *-th_2e became *-ta and then lost its vowel by apocope (see 3.2.5 (i)). But it should also have undergone Grimm's Law (see 3.2.4 (i)) and the sound changes that affected clusters of coronal obstruents (see 2.3.3 (i)). The result should have been *-s(s) when the root ended in a coronal stop, *-t after noncoronal stops and *-s-, and *-þ in virtually all other cases. It is not surprising that *-t was restored analogically in the first class of cases (e.g. in *bais-t 'you bit', underlyingly */bait + t/), since otherwise the forms would have been opaque. But *-t has also spread to almost all other strong verbs and preterite-presents, nearly ousting *-þ; this can only be a consequence of the fact that a large majority of strong verb roots ended in obstruents (cf. Seebold 1970: 42–65). The ending *-þ is attested only in a completely isolated and fossilized form in the Anglian dialects of OE, namely Mercian *earþ,* Northumbrian *arþ* 'you are'. (In West Saxon *-t* has spread even to that form, giving *eart.*) The fact that *-t has become so nearly universal in the attested languages strongly suggests that it had already become the default ending, at least, in PGmc.

Of the nonsingular endings, 3pl. *-un is the ending of *dēdun 'they did' and unambiguously reflects the ending of PIE impf. *$d^héd^hh_1\underset{\circ}{n}d$ 'they were putting'; it is the one feature of weak past inflection which has clearly spread to the strong past, ousting the 3pl. ending of the PIE perfect (which contained an *r: cf. Lat. *-ēre* < *-ēr-i ← *-ēr, Hitt. past 3pl. *-ēr,* both reflecting PIE *-ér < pre-PIE **-érs, Jasanoff 1988*b*: 71 n. 3; Skt *-úr,* Av. *-ərəš* < PIE zero-grade *-$\underset{\circ}{r}$s). It has been resegmented as *-u-n, apparently on the basis of subjunctive 3pl. *-n, and the resulting theme vowel *-u- has spread to all the other forms of the nonsingular. (It is possible that 1pl. *-um partly reflects the heavy Sievers' Law alternant *-$\underset{\circ}{m}$é of the PIE ending *-mé and thus contributed to the development of that theme vowel; the corresponding 1du. alternant *-ué might conceivably have played a role as well.) The 2pl. ending reflects the PIE ending characteristic of all active categories except the pf. indic., so that its appearance here too is not surprising (and is paralleled in most other IE languages in which the perfect survives). The 2du. ending has spread from the present, perhaps via the subjunctive. The 1du. ending was clearly inherited, but its phonological development is not entirely clear because we do not know whether Goth. 1du. *-u*—the only attested reflex—was a short vowel (presumably < PGmc *-u < PIE *-ué) or a long vowel (< PGmc *-ū = */-u-w/).

The development of the past participle from PIE verbal adjectives has been described in 3.3.1 (iii). The one puzzling question, left unanswered in that section, is how the verbal adjective suffix *-nó- was remodeled to *-onó-, the immediate source of the PGmc strong past participle suffix *-ana-. It used to be thought that the Skt athematic mediopassive participle suffix *-āná-*, which of course appears in the mediopassive perfect paradigm of that language, was an exact cognate, but a better understanding of PIE participle suffixes has made that seem very unlikely. Here are the relevant facts in brief. It is now clear that the PIE mediopassive participle suffix was *-mh_1nó-, since that is the only shape that can account both for Gk *-μενο-* (/-meno-/) and Tocharian B *-mane*, A *-māṃ* (Klingenschmitt 1975: 161–3). But when immediately preceded by a consonant (as would always be the case in athematic paradigms) the initial sonorant of this suffix must have been syllabic; and *-$\underset{\circ}{m}h_1$nó- > Proto-Indo-Iranian *-āná- > Skt *-āná-* by regular sound change. Moreover, though thematic *-o-mh_1no- (with analogically restored laryngeal) > Gk *-ομενο-* (/-omeno-/), Toch. B *-emane*, Av. *-aməna-*, Middle Indic *-amīna-* by regular sound change, Skt *-amāna-* reflects the influence of the athematic alternant. (On the Middle Indic form see Mayrhofer 1981: 434–5; I am grateful to Elizabeth Tucker for the reference.) Everything fits, including the fact that these are all participles formed from aspect stems, and there is no room for a suffix *-onó-.

The simplest and most direct explanation for the first vowel of pre-PGmc *-onó- is that it was introduced from the pre-PGmc infinitive suffix *-onom, in which it was simply the thematic present stem vowel (see 3.4.3 (i) ad fin.). However, the motivation for such a development remains obscure, since the two formations were not similar in structure or in meaning. This remains a minor unsolved problem.

3.4.3 (iii) *Small classes of verbs* The most substantial small class of verbs in PGmc were the preterite-presents, whose origin has been described in 3.3.1 (i). Because they reflect PIE perfects that have retained their stative meaning, their presents are inflected like strong pasts. Not surprisingly, they have been provided with weak past systems. Since many were (or became) very common verbs, their unusual inflection had a major impact on developments in some daughter languages, including English.

Two present stems meaning 'stand' are reconstructable for PGmc; *standi/a- was clearly strong, while *stai- ∼ *stā- was an anomalous j-present (*sta-ji- ∼ *sta-ja- before the loss of intervocalic *j). Only one past, strong *stōþ- ∼ *stōd-, seems to be reconstructable. It looks as though the strong present had been formed from the past with a nasal infix, which is very unusual; even more surprising is the fact that the past looks as though it were somehow internally reduplicated (pre-PGmc *stā-t- to root *stā-??). The alternative present actually makes sense as a j-present made to the zero-grade root (or a stative?; see Rix et al. 2001 s.v. *$steh_2$-) and might be inherited.

The present of 'go' presents a similar puzzle, with strong *gangi/a- and weak *gai- ∼ *gā- apparently in competition; but in this case the root etymologies of the verbs are not very impressive (cf. Seebold 1970: 213–17), so that we are less well able to suggest what might have happened to give such a result. Most remarkably, the past of 'go' was a suppletive form, beginning with *ijj-, that must somehow reflect the usual PIE root *h_1ey- 'go' (which in PIE formed only an athematic root-present). Its inflection cannot be reconstructed, because Gothic and Old English, the only languages that preserve the stem, disagree: Gothic has a weak past *iddj-* ∼ *iddjed-*, evidently analogical since it does not exhibit the first of the expected coronal obstruents (*ddj* being simply the Gothic reflex of *jj); OE weak *ēode* has somehow added the normal weak past suffix to the inherited form. The details of the etymology of *ijj- are also unclear; for inconclusive discussion see e.g. Seebold 1970: 174–6 (and note that, while the solution of Cowgill 1960 is not fully plausible, the premises underlying Seebold's objections to it are themselves questionable).

There remain only three verbs that retained their PIE athematic present inflection in PGmc. The easiest to describe is 'want'. Unlike every other

present in the language, it has undergone syncretism of the indicative and subjunctive, under the form of the subjunctive; to put it differently, one invariably said 'I would like' rather than (the inherited indicative) 'I want'. That development must have begun as a form of politeness which became so habitual that it lost its original force. Because it was athematic its (subjunctive) stem vowel was *-ī-; in fact, the present stem *wil-ī- is perfectly cognate with the Latin present subjunctive stem *vel-ī-* (since the Latin subjunctive also reflects the PIE optative). Not surprisingly, the verb had been provided with a weak past.

'Do' is remarkably difficult to reconstruct for PGmc, because only the West Germanic languages have preserved the verb, and their present paradigm is clearly something etymologically different from its expected PIE antecedent. The Germanic verb was clearly a lexical descendant of PIE 'put', but whereas the PIE present was reduplicated *$d^hé$-d^heh_1- ∼ *$d^hé$-d^hh_1-, the PWGmc present stem was a uniform *dō-. It is at least clear that its weak past *ded- ∼ *dēd- reflects the PIE imperfect, with a long vowel in the default stem introduced from the strong past (see 3.3.1 (ii)); it is the source of all the other weak pasts, as described in 3.3.1 (iv).

As usual in IE languages, 'be' was the most irregular verb. Its past was suppletive, being simply the strong past of *wesaną 'to remain' (< PIE *$h_2$wes- 'stay overnight, camp'), and it appears that the present imperative, infinitive, and participle of that verb were also used for 'be' in PGmc. The present indicative and subjunctive, however, reflected the inherited PIE verb. The subjunctive stem, (sg.) *sijē- ∼ (nonsg.) *sī-, was a direct reflex of PIE opt. *h_1s-iéh_1- ∼ *h_1s-ih_1-′. Not all the indicative forms can be reconstructed securely, but those that can be indicate that the PIE clitic (accentless) forms survived in PGmc. Note especially:

	PIE		*PGmc*
1sg.	*$h_1$es-mi	> *ezmi > *izmi >	*immi
2sg.	*$h_1$esi	> *ezi >	*izi
3sg.	*$h_1$es-ti	>	*isti
3pl.	*h_1s-enti	> *senþi > *sendi >	*sindi

For the remaining nonsingular forms Gothic has a stem *siju-* with what look like past endings; this appears to be a backformation from the subjunctive influenced by preterite-presents, though the details are not completely clear. In northern WGmc these forms have been lost by syntactic merger with the 3pl. It is possible that OHG and ON preserve the original PGmc forms, more or less:

1pl. ON *erum*, OHG *birum* ⟵< PGmc *izum?
2pl. ON *eruð*, OHG *birut* ⟵< PGmc *izud?

(OHG *b-* has spread from the perfective present, on which see below.) If that is true, it appears that an underlying stem */iz-/ had been abstracted from the singular forms and provided with typical preterite-present endings. However, it is also possible that the ON and OHG forms arose within the independent histories of those languages; thus we cannot reconstruct the PGmc non-singular non-third-person forms of 'be' with any confidence.

In addition to the usual present of 'be', the WGmc languages have a perfective present formed to a stem *bi-. This is generally believed to represent some stem made to PIE *b^huh_2- 'become', but the stem vowel—an unambiguously short *i—has defied all attempts at explanation. For further discussion see vol. ii.

3.4.4 *Changes in noun inflection*

So far as we can tell, the complex ablaut system of PIE athematic nouns had largely been lost in PGmc. That is not very surprising, since the PIE system was closely linked to accent alternations and the only trace of the latter surviving in PGmc was the Verner's Law alternation of fricatives. Moreover, the PIE case-and-number endings had become fused with stem vowels to a considerable extent in PGmc because of sound changes (see 3.4.2). For those reasons it makes sense to classify Germanic nouns according to the final segments of their stems.

3.4.4 (i) *The development of noun stem classes* The a-stems, reflecting PIE thematic nouns (o-stems), are the largest class in attested Germanic languages and probably were already so in PGmc. Feminines did not survive. The corresponding class of feminine nouns in PGmc was the ō-stems, reflecting PIE stems in *-eh_2-. (Thus it is not surprising that PIE *snusós 'daughter-in-law' was remodeled as an ō-stem in PGmc *snuzō.) Though virtually all nouns in *-eh_2- had been derived in PIE, typically by suffixing feminine or collective *-h_2- to thematic stems in *-e-, many PGmc ō-stems were synchronically basic lexemes, and the class seems to have been fairly large. There was also a smaller class of feminines in *-ī ∼ -jō-, reflecting PIE derived feminines in *-ih_2- ∼ *-$yéh_2$-; the suffix alternant *-ī had become restricted to the nominative and vocative singular in PGmc. PIE i-stems and u-stems survived as substantial lexical classes in PGmc, though feminine u-stems and neuters of both classes seem to have been few.

One of the most striking innovations in Germanic noun inflection is the large increase in the number of n-stems. Most masculines and a few inherited neuters seem to reflect a PIE amphikinetic type (Jasanoff 1980: 376; 2002: 32–4), with nom. sg. (and neuter acc. sg.) in *-ǭ < PIE *-ō, a suffix alternant

*-in- in the gen. and dat. sg. that can only reflect PIE loc. sg. *-én, and suffix alternants *-n- and *-an- (reflecting PIE *-on-) generalized in most other forms. By contrast, all the feminines seem to have been made by adding *-n- to stems that already ended in *-ō- or *-ī-, and some neuters were also n-stem extensions of originally unsuffixed nouns. The reasons for the latter developments remain obscure.

Most other classes of consonant-stem nouns in PGmc were clearly small. The r-stems had apparently been reduced to the five nuclear kinship terms that still survive in Modern English. Of the neuter r/n-stems, which were a large class in PIE, only 'water' and 'fire' survived in PGmc; like the inherited neuter n-stems, they seem to reflect amphikinetic collectives. The archaic l/n-stem 'sun' may have survived as such in PGmc, though its inflection is difficult to reconstruct. Perhaps as many as a dozen neuter stems in *-az ∼ *-iz- can be reconstructed for PGmc; they reflect PIE acrostatic neuters in *-os ∼ *-es-.

The largest PGmc class of consonant stems aside from the n-stems was clearly the class of nouns with no synchronically identifiable suffixal syllable or segment (sometimes loosely referred to as 'root nouns', though not all of them are derived from verb roots); more than two dozen can be reconstructed for PGmc, and the class might have been larger than that. (The indeterminacy is due partly to the fact that some original members have been shifted into other classes in all the attested languages, including even Gothic, while in ON numerous nouns of other classes have adopted the consonant-stem pattern of inflection. The most up-to-date treatment of this class is Griepentrog 1995.) A large majority of these nouns seem to have been inherited. Most have generalized a single ablaut grade; we find basic full-grade stems (*gans- 'goose' < *ǵʰáns-, *meluk- 'milk' ⟵< *h₂mélǵ-, *nas- 'nose' < *nás-), at least one o-grade stem (*naht- 'night' < *nókʷt-), zero-grade stems (*burg- 'fort' < *bʰr̥ǵʰ- 'hill', *dur- 'door' < *dʰur-, *furh- 'furrow' < *pr̥k-, *spurd- 'racecourse' < *spr̥dʰ-), and at least one stem that has generalized the lengthened grade of the nom. sg. (*fōt- 'foot' ⟵< *pód- ∼ *ped-, nom. sg. *pṓd-s). As expected, there are a few that cannot be shown to have ablauted even in PIE (e.g. *mūs- 'mouse' < *mūs- and *gait- 'goat' < *gʰayd-, cf. Lat. *haedus* 'kid'). However, at least two of these nouns apparently preserved their PIE ablaut alternations in PGmc:

PIE *h₁dónt- ∼ *h₁dn̥t- 'tooth' (cf. Skt *dánt-* ∼ *dat-*, Gk *ὀδόντ-* /odónt-/, Lat. *dent-*) > PGmc *tanþ- (cf. ON *tann-*, OE *tōþ*) ∼ *tund- (surviving unaltered only in Goth. *aíhvatundi* 'thornbush', lit. *'horse-tooth', but cf. also Goth. *tunþus* 'tooth');

PIE *wréh$_2$d- ~ *wr̥h$_2$d- 'root' (cf. Lat. *rādīx*) > PGmc *wrōt- (cf. ON *rót*) ~ *wurt- (cf. Goth. *waúrts*, ON *urt*, OE *wyrt*, OHG *wurz*, all remodeled as i-stems and the latter three with meaning shifting or shifted to 'herb, plant').

(Of course 'tooth' was originally a participle—see 3.2.1 (ii) ad init.—but by the PGmc period it must have been an unanalyzable fossil.) The pattern of attestation suggests that 'root' might have lost its ablaut within the PGmc period, but later parallel development in the daughters cannot be excluded (pace Griepentrog 1995: 458–61). There is also an example that might reflect either inflectional or derivational ablaut (see Feist 1939 s.v. *brusts* with references, Griepentrog 1995: 463–71):

(post-)PIE *b^{h}réws- ~ *b^{h}rus- 'belly' (cf. Russian *brjúxo* < *b^{h}réws-o- but OIr. *brú*, gen. sg. *bronn* < *b^{h}rus-ō, *b^{h}rus-n-os) >⟶ PGmc *breus-t- (cf. ON *brjóst*, OE *brēost*) ~ *brus-t- (cf. Goth. *brusts*, OHG *brust*) 'breast'?—but note that the full-grade nouns are neuter while the zero-grade nouns are feminine, suggesting a derivational relationship (basic fem.) *b^{h}rus-t-′ → (neut. collective) *b^{h}réws-t-eh$_2$ (cf. Griepentrog 1995: 469–70).

Finally, there is one major puzzle. It is clear that the basic PIE word for 'bovine' was an acrostatic noun (cf. Szemerényi 1956: 199–201) with nom. sg. *g^{w}ṓw-s, acc. sg. *g^{w}ṓm (< pre-PIE **g^{w}ówm̥ by Stang's Law), oblique *g^{w}éw- (replaced in all the daughters by *g^{w}ow-), nom. pl. *g^{w}ów-es, acc. pl. *g^{w}ṓs (also by Stang's Law). What we find in Germanic is a stem *kū- in the more northerly languages (OF *kū*, OE *cū*, ON *kýr* < *kū-z) but *k^{w}ō- in the south (OHG *kuo*). The latter can have been generalized from the accusative forms (ibid. 243 with references), but the source of the former remains unclear (cf. the inconclusive discussion of ibid. 242–50); of the expected default stem '*k^{w}au-' there is no trace. Of course *kū- might reflect a pre-PGmc sequence of regular sound changes (roughly *g^{w}ow- > *g^{w}uw- > *gū- > *kū-), with a raising of *o to *u between a labiovelar and *w (in that order) at a time before *o merged with *a; but this is the only example.

About half a dozen disyllabic consonant stems ending in *þ or *d are reconstructable for PGmc A few are inherited, but—somewhat surprisingly—they do not always reflect PIE stems ending in *t, as one would have expected. The following table gives a fair idea of the developments involved:

	PIE		*PGmc*
'honey'	*mélit-	>	*milid-
'duck'	*h$_2$énh$_2$t-	>	*anud-
'grandson, nephew'	*népot-	>⟶	*nefan-

'moon, month'	*méh$_1$n̥s- → *méh$_1$nos-	>⟶	*mēnan- 'moon'
'moon, month'	*méh$_1$n̥s- → *méh$_1$nos-	>⟶	*mēnōþ- 'month'
'knowing'	*wéydwos-	>⟶	*wītwōd- 'witness'

It seems clear that there has been substantial interchange between stem types when the vowel immediately preceding the stem-final consonant was *o in the strong stem-alternant and the gender of the noun was masculine: s-stems were eliminated in favor of other types, and there was also some tendency for stems in coronal stops to become n-stems. One probable reason for these developments is that the nom. sg. forms of the interchanging types were similar. It is reasonable to suppose that PIE nom. sg. *népōt-s, for instance, became *népōs (as it also did in Latin), and that would make the remodeling of *mḗnōs and *wéydwōs as t-stems easier. But to explain why 'nephew' and 'moon' have become n-stems we must apparently posit a further change, namely the spread of PIE n-stem nom. sg. *-ō to other nouns with a similar ablaut pattern; such a change is plausible, since it is actually attested in Lithuanian (cf. e.g. *mẽnuo* ∼ *mẽnes-* 'month'). Further details seem to be unrecoverable.

Finally, we must at least ask whether there was a class of PGmc consonant-stems in *-nd- ultimately reflecting PIE present (active) participles. In every 'Old' Germanic language the productive formation of participles has been remodeled, leaving a relic class of nouns in *-nd-. However, note that the daughter languages have not undergone the same remodeling of participles. In Gothic, for instance, the masculines and neuters have (largely) become n-stems, and the feminines have adopted a corresponding inflection in *-īn-; in West Germanic, on the other hand, masculine and neuter forms in *-ija- have apparently been backformed to the inherited feminines in *-ī ∼ *-ijō-. It therefore seems likeliest that PGmc present participles were still consonant-stem adjectives ending in *-nd-, with derived feminines in in *-nd-ī ∼ *-nd-ijō-. It then becomes a matter of speculation whether such a PGmc participle as *frijō̄nd- 'loving' was already being used also in its attested derived function as a noun 'friend', and it seems more than a little rash to project back into PGmc the later class of fossilized agent-nouns in *-nd-*.

3.4.4 (ii) *Changes in inflectional endings* To a considerable extent the reconstructable inflectional endings of PGmc nouns are sound-change reflexes of the corresponding PIE endings. However, some changes have come about by (1) the functional merger of the ablative and locative cases with the dative, (2) the 'analogical' influence of various endings on each other, (3) the phonological fusion of stem-vowels and endings, and (4) the influence of the 'pronominal' endings on those of the adjectives and ultimately of the nouns.

Since the only distinctive ablative ending in PIE was thematic *-e-ad (see 2.3.4 (i)), it is not very surprising that it did not survive in its original function in PGmc (though it probably underlies the final vowel of the PGmc adverb suffix *-þrō̄ preserved in Goth. *þaþro* 'from there', etc.; see Braune and Ebbinghaus 1973: 123–4). Conversely, the syncretism of dat. pl. and abl. pl. in PIE might have contributed to the functional merger of dative and ablative in PGmc. The pattern of survival of dative and locative endings is more interesting. In the plural the old dative(-ablative) ending *-mos (on which see Beekes 1985: 143–4; 1995: 115–18; Hajnal 1995: 327–37; Katz 1998: 248–51) ousted the locative ending *-su, so that all PGmc dat. pl. forms except the 1st- and 2nd-person pronouns ended in *-maz. In the singular a PGmc ō-stem ending *-ō̄i < dat. sg. *-eh$_2$-ey is probably guaranteed by Goth. *-ai*, which cannot reflect the short PGmc loc. sg. *-ai that would probably have developed from PIE *-eh$_2$-i. On the other hand, the corresponding a-stem ending has to be reconstructed as PGmc *-ai, which clearly reflects a post-PIE loc. sg. *-oy ← PIE *-e-y (whereas the PIE dat. sg. *-o-ey would have given PGmc '*-ō̄i').[12] The development of the consonant-stem dat. sg. in Gothic also shows that its PGmc ending was short *-i < (late or post-)PIE loc. sg. *-i rather than long *-ī < PIE dat. sg. *-ey. Thus there are enough unambiguous cases to show that both dative and locative endings survived in the singular in dative function, even though some PGmc endings may not be etymologically unequivocal.

An important analogical development in the PGmc case system was the replacement of the (late or post-)PIE inst. pl. ending *-b^{h}is (or its reflex *-biz) by *-mis (or its reflex *-miz), evidently under the influence of dat. pl. *-mos (or its reflex *-maz). As a result the two 'oblique' plural endings were distinguished only by the vowels of their final syllables; the eventual loss of those vowels in all the daughter languages led to their homonymy (except insofar as i-umlaut had occurred, see vol. ii), and that may have contributed to the functional merger of the dative and instrumental cases. That is true even of the a-stems, since the anomalous PIE inst. pl. *-ōys (which would probably have given PGmc '*-aiz') was regularized to *-a-miz, so far as we can tell by reconstruction from the daughter languages. Most other analogical

[12] The suggestion of Walde 1900: 6–8 that various Germanic a-stem dat. sg. endings reflect a PGmc ending *-ē, which in turn reflects a (post-laryngeal) PIE o-stem loc. sg. ending of the same shape, is without merit. Walde was unaware that the Lithuanian loc. sg. in *-è*, which he cites as cognate, is a late innovation (the inherited o-stem ending *-ey or *-oy surviving in the adverb *namiẽ* 'at home'; see Stang 1966: 182–3). Nor is an inst. sg. ending *-ē any better, since it is clear from Norse and West Germanic evidence that the PGmc o-stem inst. sg. ending was *-ō. On the other hand, all the endings in question can easily reflect PGmc *-ai (cf. also pres. passive 3sg. Goth. *-da* < PGmc *-dai < post-PIE *-toy). Of course the other, related problems discussed in Walde 1900 and Hollifield 1980 require alternative solutions.

changes seem to have been modest in scope. For instance, the ablaut of the consonant-stem gen. sg. ending was eliminated in favor of an invariant PGmc ending *-iz (⟵< PIE *-és); the thematic neuter nom.-acc. pl. *-ō (< PIE *-eh$_2$) seems to have spread to neuter nouns of other stem-classes, and it is possible that there was some spread of other a-stem endings as well already in PGmc.

One simple leveling, however, was the most far-reaching of all. Just as Verner's Law gave rise to two parallel sets of verb endings containing coronal fricatives (see 3.4.3 (i) ad fin.), it must have given rise to alternative noun endings ending in *-s and *-z, and there must have been a large number of such pairs, since noun endings terminating in sibilants were very common in PGmc. But in reconstructable PGmc we normally find the alternants in *-z, which had apparently been generalized throughout the system.

There is only one exception to that generalization: the PGmc a-stem gen. sg. ending was *-as. By far the easiest explanation for this anomaly is that *-as is *not* the sound-change reflex of PIE *-osyo in noun paradigms, but a (re)importation of the ending of the determiner *þas < PIE *tósyo, in which the Verner's Law voicing would not be expected to have occurred. Presumably the pronominal ending spread first to the inflection of strong adjectives (see 3.3.2) and from there to a-stem nouns. This simple explanation is all the more compelling because a similar analogical change can be demonstrated to have occurred again in the individual histories of Gothic and OHG. In those languages the a-stem gen. sg. ending is not a reflex of the *-as which we find preserved in Runic Norse and early OE; instead we find reflexes of *-es, which cannot be original on two quite different grounds. First, if the ending were inherited it would have to reflect an o-stem gen. sg. '*-esyo', and no such ending is attested in any other IE language, as Warren Cowgill pointed out to me more than twenty years ago. (OCS *česo,* of course, reflects the gen. sg. *k^{w}ésyo of PIE *k^{w}i- ∼ *k^{w}e-, not the corresponding form of *k^{w}o-; see 2.3.6 (ii)). Secondly, in OHG the vowel of the ending *-es* has clearly not been raised to *i* even though it must have been unstressed (see 3.2.5 (iii)); it follows that the ending must have been introduced into noun paradigms after the PGmc raising of unstressed *e. (In Gothic the wholesale merger of *i and *e renders that argument moot.) In short, an a-stem gen. sg. ending *-es *must be* analogical, and it is not hard to see how it was introduced into noun paradigms. In both Gothic and OHG the strong adjective gen. sg. ending also reflects *-es; thus the noun ending can have spread from the adjective paradigm. Further, in both languages the gen. sg. of the default demonstrative reflects *þes (Goth. *þis,* OHG *des*); thus the adjective ending can have spread from the demonstrative. But the latter cannot be original either, because no

PIE '*tésyo' is reconstructable; instead the ending of *þes 'of that' must have been introduced from PGmc *es 'of him, of it' (Goth. *is,* OHG neut. *es*) and *h^{w}es 'of whom?' (Goth. *hvis,* OHG *wes*). The last-mentioned change, which was the first in the historical sequence, also occurred in ON (where we find *þess* formed on the model of *hvess*), though there seems to be no evidence that it went any further than that. I wish to emphasize that, if one's reconstruction of PIE is coherent, the explanation just outlined is obvious; that it has not become standard in our handbooks can be attributed partly to too little knowledge of PIE at large on the part of too many Germanic specialists, partly to a tendency to project alternative reconstructions back into the protolanguage (as if it were not a normal human language with a coherent grammar), and partly to an outmoded Neogrammarian reluctance to accept analogical changes (as though they were somehow not as good as regular sound changes). But if we must explain all those examples of *-es by the process just outlined, there is no reason not to explain the puzzling PGmc gen. sg. ending *-as by an earlier occurrence of the same process. It is of course interesting that precisely that analogical pressure should have begun to operate already in PGmc.

The general restructuring discussed in 3.4.2 made possible a range of analogical changes that would previously have been improbable, if not impossible. In particular, because Germanic nouns were distributed among increasingly arbitrary inflectional classes with increasingly opaque endings, the transfer of individual nouns from one stem-class to another became a major trend in all the attested languages, including even Gothic.

3.4.5 *Changes in the inflection of other nominals*

Though I have grouped these together for convenience, the changes that each class underwent were very different, as the following paragraphs will show.

3.4.5 (i) *Changes in adjective inflection* The most important innovation in adjective inflection—the double-paradigm system, one paradigm exhibiting pronominal endings while the other was n-stem—has already been described in 3.3.2. However, many details of that innovation remain somewhat problematic, for the following reason.

The PIE pronominal adjectives whose endings spread to all (strong) adjectives in PGmc were all thematic, so far as our evidence can tell us. Transfer of their endings to thematic adjectives therefore involved no difficulties; and it seems that a large majority of PGmc adjectives were in fact thematic.

However, PGmc also inherited i-stem and u-stem adjectives, as well as active present participles in *-nd- (< PIE *-nt-); at least twenty i-stems and a

dozen u-stems are reconstructable, and the participles were of course completely productive. How or even whether the thematic pronominal endings were attached to these stems remains unclear, because the evidence of the attested daughters is slender and difficult to evaluate.

A description of the evidence for the participles will show what we are up against. In PIE these were consonant-stems in *-nt- with feminines in *-ih$_2$- ~ *-yeh$_2$-; participles made to thematic stems ended in *-o-nt- with feminines in *-o-nt-ih$_2$- ~ *-o-nt-ieh$_2$- (with proterokinetic ablaut of the fem. suffix, but accent fixed on the verb stem). One would expect to find PGmc participles in *-and- with feminines in *-andī ~ *-andijō-. The fossilized masculine participles that have become nouns in the daughter languages (such as *frijn̄d- 'friend') are indeed consonant stems, and that strongly suggests that the PGmc participles exhibited the inflection just described. But every daughter has innovated. In Gothic and ON present participles are always inflected weak (except that there is an alternative Goth. nom. sg. masc. in *-and-s*), and the fem. stem is (weak) *-and-īn-, no doubt reflecting the inherited nom. sg. fem. in *-ī. In WGmc there is no such restriction, but the stems end in *-and-ija-, fem. *-and-ijō-; evidently the masc. and neut. paradigms were backformed to the inherited feminine. Thus we have reasonable evidence that present participles could be inflected strong in PGmc, but hardly any evidence for what the strong masc. and neut. endings were.

Evidence for the i- and u-stems is almost as poor. Only Gothic recognizably preserves those inflectional classes. The Gothic pattern of inflection is easy enough to describe: the nom. sg., and the acc. sg. neut., preserve non-pronominal endings; all the other forms (insofar as they are attested) are made to alternative stems in *-ja-*. We could project that pattern back into PGmc, but two details argue caution. One is that even the fem. nom. sg. forms end in (i-stem) *-s* and (u-stem) *-us*, though the inherited ending must have been *-ī < PIE *-ih$_2$. The other is that the default masc. and neut. stem in *-ja-* was almost certainly backformed to fem. *-jō-* < PIE *-yeh$_2$-. Those innovations might or might not have occurred already by the PGmc period. Perhaps the fairest assessment is that, though we know what these paradigms looked like in PIE and how they have developed in the attested Germanic languages, we do not have enough evidence to reconstruct exactly what stage of development had been reached by the PGmc period.

At least one detail regarding the formation of feminines from u-stem adjectives can probably be recovered. The *-nn- of PGmc *þunnuz 'thin' probably reflects *-nw-, and the most likely source for such a cluster is a

feminine in *-w-ī. That is what we might expect on etymological grounds (cf. e.g. Skt *svādvī́*); yet there is no trace of any *-w- in the feminines of Germanic u-stem adjectives. We can probably infer that the feminine stem was leveled into the masculine when the relationship between the two was opaque (as it must have been in the case of *þunnī), and that the resulting pattern, with the feminine marked only by the suffix *-ī ∼ *-ijō-, was generalized.

Finally, PGmc adjectives had certainly acquired a comparative and superlative; in fact that development might have occurred long before the PGmc period, since all the more closely related subgroups of IE exhibit a similar system. The superlative in PGmc *-ista- < PIE *-is-to- is completely straightforward. In the comparative the zero-grade suffix *-is- has been generalized, and only the weak inflection is found (no doubt because of its originally definite function); since the pre-Verner's Law accent apparently fell on the root syllable (as in Vedic Sanskrit), the comparative suffix was effectively *-iz-an-, with a fem. in *-iz-īn- indirectly reflecting the inherited fem. nom. sg. in *-ih$_2$.

3.4.5 (ii) *Changes in the system of numerals* The reconstruction of PGmc numeral inflection poses a number of serious problems, but many details are clear. *sem- 'one' does not survive; PGmc *ainaz 'one' reflects PIE *óynos 'single (?)', which is also the usual word for 'one' in Italic, Celtic, and probably Balto-Slavic (to judge from Old Prussian *ains;* the other languages have remodeled the word). 'Two' is inflected as a plural in the attested languages, but it is at least possible that traces of its original dual inflection are detectable (cf. Ross and Berns 1992: 562–9 with references, but also Cowgill 1985*b*: 14–15; see 4.3.6 (i) for further discussion). The feminine stem of 'three' has been replaced by the default stem *tri- > *þri-. 'Four' underwent gender syncretism: only the neut. forms survived, and they were used for all three genders (see Stiles 1985–6). The initial consonant of 'four' has clearly been replaced by that of 'five'; similar lexical analogies have affected several other PGmc numerals:

PIE *swéḱs 'six' (cf. Av. *xšuuaš,* Boiotian Gk *Ϝέξ* /(h)wéks/, Welsh *chwech*) → *séḱs (cf. Lat. *sex*) under the influence of 'seven'; > PGmc *sehs (cf. Goth. *saíhs,* OHG *sehs*);

PIE *septḿ̥ 'seven' (cf. Skt *saptá,* Lat. *septem*) > *seftún → *seftúnt under the influence of 'ten' and 'nine' (see below); > *sefúnt > PGmc *sebun (cf. Goth. *sibun,* OE *seofon;* see 3.2.2 (ii) and Stiles 1985–6, part 3, pp. 6–7);

PIE *(h$_1$)néwn̥ 'nine' (cf. Skt *náva,* Gk *ἐννέα* /ennéa/, Lat. *novem*—but cf. *-n-* in *nōnus* 'ninth') > *néwun → *néwunt under the influence of 'ten';

> PGmc *ne(w)un (cf. Goth., OHG *niun*; if the *-t had not been added the *-n would have been lost, cf. 3.2.2 (ii)).

Very surprisingly, 'eleven' and 'twelve' were compounds *aina-lif- (cf. OHG *einlif*; or *-b-?, cf. Goth. dat. pl. *ainlibim*) and *twa-lif- (cf. OHG *zwelif;* or *-b-?, cf. Goth. *twalib-wintrus* 'twelve years old'); neither the last consonant nor the vowel that must have followed it is securely reconstructable. There is general agreement that the literal meanings must originally have been *'one left over', *'two left over', but even the etymology of the second part is unclear. The only parallels within IE, Lith. *vienúolika* 'eleven' and *dvýlika* 'twelve', suggest *-lik^{w}-, the zero grade of PIE *leyk^{w}- 'leave behind'. A better phonological match would be *-lip-, the zero grade of PIE *leyp- 'be left over' (cf. Toch. B *lipetär* 'is left over', OCS *prilĭpěti* 'to adhere to'), which also survived in PGmc in the verbs *bilībaną 'remain' (cf. OHG *bilīban*) and *libnōną 'be left over' (cf. ON *lifna;* Goth. *aflifnan* shows an analogical voiceless Verner's Law alternant). Unfortunately it is clear that root-final labiovelars do occasionally appear as labials in PGmc (cf. 3.2.4 (iv) ad fin.), and that renders the etymology of the second element of these compounds indeterminate.

So far as the attested languages can tell us, the numerals 13 through 19 were expressed by collocations or compounds of the units and 'ten', apparently without any word for 'and' (cf. the Latin situation).

The history of the decads in Germanic was complex; the best discussion available is still Szemerényi 1960: 27–44. The following account is based on Szemerényi's, though I have updated it.

Most of the terms for decads were eventually replaced by PGmc phrases (see below), but before that happened the inherited forms underwent extensive analogical remodeling, as follows. The PIE decads from 'thirty' through 'ninety' were compounds reflecting pre-PIE phrases of units and *dḱ́md, the archaic plural of *déḱm̥d 'ten'. That form survives as such only in Toch. B *-ka*, A *-k* (Schindler 1967*b*: 240; Ringe 1996: 74), but a remodeled neut. pl. *dḱomteh$_2$ clearly survives in Gk *-κοντα* /-konta/ and Lat. *-gintā* (the latter further remodeled on the basis of *vīgintī* 'twenty'). Whatever changes might have affected this fossilized morpheme in Germanic, one would expect it to have resulted in PGmc *-ganþ- or (more likely) *-hand-. Instead we find *-hund-. That is not likely to be the word for 'hundred', but it could easily have spread from 'twenty' (as in Latin, see above), since PIE *wíḱm̥tih$_1$ 'twenty' must have become *wīhundī by the regular Germanic sound changes. Exactly what happened to 'thirty' and 'forty' before they were replaced by PGmc phrases is no longer recoverable, but the prehistory of 'fifty' can be reconstructed in some detail:

pre-PIE *pénk^{w}e dḱ́md 'five tens' > PIE *penk^{w}ēḱōmd 'fifty' (Szemerényi 1960: 15, 24; cf. Toch. B *piśāka*, Ringe 1996: 162–3) → *penk^{w}ēḱomteh$_2$ (cf. Gk πεντήκοντα /pentɛ́ːkonta/) ⟶ pre-PGmc *fimfēhund-.

Since 'five' had become endingless *fimf by the loss of word-final nonhigh short vowels (see 3.2.5 (i)), the *-ē- that had arisen by compensatory lengthening many centuries before was resegmented as a linking vowel. It spread to 'sixty', giving *sehsēhund-, then to 'seventy' at a time when 'seven' still ended in *-t (see above). But when 'seven' lost its final stop a reanalysis became possible:

pre-PGmc *sebunt-ēhund- 'seventy' → PGmc *sebun-tēhund-, cf. PGmc *sebun 'seven'.

The new element *-tēhund- then spread to 'eighty' and 'ninety'. Gothic preserves that stage of development, exhibiting *sibuntehund* 'seventy', *ahtautehund* 'eighty', *niuntehund* 'ninety'. (In fact Gothic has extended the pattern further, so that we also find *taíhuntehund* 'one hundred', the plural noun *hunda* 'hundreds' being reserved for higher multiples. However, the fact that *hund* still means 'one hundred' in Old Saxon suggests that that last development had not yet occurred in PGmc.) Subsequently the decads 'twenty' through 'sixty' were replaced by phrases of units and a plural noun *tigiwiz 'decads' (acc. *tegunz, etc.) whose stem *tegu- was evidently a derivative of *tehun 'ten'. Eventually this periphrastic formation was extended to all the decads throughout Germanic, but in Gothic and the oldest stages of West Germanic that has not yet happened, which shows that it had not happened in PGmc. (It has happened in Old Norse, but Norse is adequately attested only much later than the other languages.) Why such a transparent innovation should have stopped at 'sixty' for many centuries is not understood.

Not surprisingly, multiples of 100 seem to have been expressed by phrases composed of units and the plural of *hundą 'hundred' in PGmc. Whether PIE or any of its immediate daughters had a word for 'thousand' is unclear; Skt *sahásram*, Av. *hazaŋrəm*, and Ionic Gk χέϵλιοι /k^{h}éːlioi/ all reflect compounds or derivatives of a stem *ǵ^{h}éslo- which must have existed in the last common parent of Greek and Indo-Iranian, but so long as the subgrouping of the central daughters of IE remains uncertain, we cannot be sure that Germanic or any other branch of the family also inherited such a form. In any case, the PGmc word was clearly *þūsundī, which might be a compound of *hundą (or are the variants ON *þúshund,* Salian Frankish *thūschunde* the results of folk etymology?). Its only (approximate) cognates are found in Balto-Slavic (cf. OCS *tysęšta*, Lith. *tū́kstantis*).

Most Germanic ordinals are formed with a suffix reconstructable as (post-)PIE *-tó-, though *þridja-n- 'third' exhibits *-tió-, roughly as in Skt *tr̥tī́yas* and Lat. *tertius*. On the pre-Germanic history of these forms see Szemerényi 1960: 67–94. As in many IE languages, 'first' and 'second' were etymologically unrelated to their cardinals. 'Second' was expressed by *anþeraz 'other (of two)'. 'First' belongs to a widespread family of IE forms that clearly have something to do with adverbs meaning 'in front':

PGmc *fruman- 'first' (cf. Goth. *fruma*, OE *forma*) ⟵< *furma- < (post-) PIE *pr̥Hmó- (cf. Lith. *pìrmas*), parallel to *pr̥Hwó- (cf. Skt *pū́rvas*, Toch. B *pärweṣṣe*); more distantly related to Lat. *prīmus*, Paelignian *prismu* (fem.) < *prīsmo-, etc.

3.4.5 (iii) *Changes in the pronominal endings* While the preservation of 'pronominal' inflection is certainly an archaism in Germanic, the actual shapes of the endings have undergone a series of innovations which can be summarized as follows.

Most striking is the outcome of PIE *-s- in these endings. In the masculine and neuter gen. sg. forms *þas 'of that', *h^{w}as ∼ *h^{w}es 'whose?', *es 'his, its', *hes 'of this' the voiceless Verner's Law alternant survives, but in all other forms the voiced alternant *-z- appears. The latter is expected in the enclitic forms of the 3rd-person pronoun (and of the interrogative, which had indefinite meaning); it must first have been generalized in the 3rd-person pronoun and then have spread to the other lexical items that exhibit this type of inflection. In the same way (*-zm- >) *-mm- ousted *-sm- throughout the system.

Almost equally striking is the complete elimination of direct reflexes of *-sy- in these endings. A 'confrontation' of two reconstructable PIE and PGmc forms will show what has happened:

	PIE	*PGmc*
'of that (fem.)'	*tósyeh$_2$s	*þaizōz
'her(s)'	*esyeh$_2$s (encl.)	*ezōz

In the former there appears to have been a metathesis of the sibilant and the semivowel; in the latter the semivowel is simply gone. At least in the former case we can suggest that the influence of a related form is responsible for the change. The masc./neut. gen. pl. form developed as follows:

PIE *tóysoHom 'of them' > *þaisō̯ → *þaizō̯.

Since this form was also generalized to the feminine (see below), it is reasonable to suggest that its sequence *-aiz- has replaced the expected *-azj- of the

fem. oblique singular forms through some sort of learner error. The generalization of *(-)ez- in the i/e-stem pronouns (including PGmc gen. pl. *ezǭ 'their(s)', whose initial vowel does not reflect the diphthong of PIE *eysoHom) must have required more than one paradigmatic leveling; the details do not seem to be recoverable.

One of the biggest surprises of PGmc pronominal inflection is the fact that gender syncretism apparently had already occurred in the oblique cases of the plural; at least, it has occurred in all the daughter languages, and in exactly the same way, so that the most economical hypothesis is to suppose that it had already occurred in PGmc. The specific changes were simple enough—the masculine and neuter forms were generalized to the feminine too—but the development seems significant because it was the first in a series of changes, probably occurring many generations apart, that eventually eroded gender marking of plurals in the daughter languages.

Most of the remaining changes in pronominal inflection seem fairly straightforward; for instance, some of the feminine and neuter forms of *i/e-stem pronouns seem to have been built to an innovative stem in *-ija-, apparently with the stem vowel of 'that', and the masc./neut. dat. sg. forms ended in *-mm-ai, with the loc. sg. ending of a-stem nouns replacing inherited *-i. Two changes seem a bit more surprising. For reasons that are not at all clear the masc. acc. sg. forms have been extended with a particle *-ǭ of unclear origin. Most remarkably of all, the fem. nom. sg. of the 3rd-person pronoun was not *ī, as might have been expected, but *sī. Presumably the initial *s- of 'that' had spread to this form, though it is not clear why that should have happened. Alternatively, it is possible that the form has some etymological connection with the Vedic acc. sg. *sīm* (which is used for all genders) and/or Old Irish *sí* (though the Irish feminine pronoun originally had an *s- in all its forms, to judge from the infixed and suffixed forms). These remain unsolved problems.

3.4.5 (iv) *Changes in personal pronouns* The most recent treatment of the complex development of these forms, and by far the best, is Katz 1998, on which the following discussion is heavily based (though I have sometimes preferred slightly different alternatives to those suggested by Katz).

It is most convenient to begin with the plural and dual forms. Recall that the reconstructable PIE paradigms are:

		1st person	*2nd person*
plural	nom.	wéy	yú
	obl.	n̥smé ∼ nos	uswé ∼ wos
dual	nom.	wé	yú
	obl.	n̥h$_3$mé ∼ noh$_3$	uh$_3$wé ∼ woh$_3$

The enclitic forms have left no trace in Germanic. The stressed forms developed as follows.

The development of the nominatives was comparatively straightforward. The 1pl. has undergone the least analogical alteration:

PIE *wéy 'we' (cf. Skt *vay-ám*) → *wéy-es (with the default nom. pl. ending, cf. Hitt. *wēs*) > PGmc *wīz (cf. Goth. *weis*) ∼ *wiz (with reduction of the vowel when unstressed, cf. ON *vér*, OE *wē*).

At some point the new ending of the 1pl. spread to the 2pl. as well; the PGmc outcome was apparently *jūz (cf. Goth. *jūs*). The simple parallelism of the PGmc forms is consistent with an analogical change very late in the prehistory of the language, but it is also possible that the ending was extended to the 2pl. at a much earlier date and in a rather different shape (e.g. *yúw-es > *juwiz??), and that the shape of the 2pl. was subsequently altered at least once under the continued influence of the 1pl. The duals were extended by the addition of uninflected *dwo 'two' (Cowgill 1985*b*: 15–16; cf. the parallel development of Lith. *mù-du*, *jù-du*) and then developed by regular sound change:

PIE *wé 'we two', *yú 'you two' (cf. Skt *vā́m* < *va-ám (1× in the Rigveda), *yuv-ám*) → *wé-dwo, *yú-dwo > PGmc *wét ∼ *wit (by apocope, see 3.2.5 (i); cf. Goth., OE *wit*), *jut (not actually attested in any daughter, though the Gothic form was almost certainly *jut, cf. Braune and Ebbinghaus 1973: 91).

The development of the oblique forms was much more complex. In some ways the most important innovation was the replacement of *-mé in the first-person forms by the *-wé that was originally characteristic of the second-person forms (cf. Katz 1998: 125–6, 210–17, 224). Once that had occurred, the 1du. accusative developed by regular sound change:

PIE *n̥h$_3$mé → *n̥h$_3$wé (cf. Skt *āvā́m* < *āva-ám, Gk *νώ* /nǫ́ː/ < *nōwé) > *unkwé (by Cowgill's Law, see 3.2.1 (i)) > *unk^{w}é (see 3.2.3 (ii)) > *unk (by unrounding and apocope, see 3.2.3 (ii) and 3.2.5 (i); cf. OE *unc*).

It is also likely that the 1pl. accusative developed by regular sound change:

PIE *n̥smé (cf. Aiolic Gk *ἄμμε* /ámme/; Skt *asmā́n* has added a default acc. pl. ending) → *n̥swé > *unswé > *úns (with retraction of the accent upon apocope, bleeding Verner's Law; see 3.2.4 (ii)) > PGmc *uns (cf. Goth., OHG *uns*).

However—and very importantly for the development of Germanic pronouns—even before the replacement of *-mé by *-wé an innovative

instrumental plural *n̥s-mís was created (Katz 1998: 118–21). That is not likely to have been a simple process. In particular, a dative plural *n̥s-mós was probably the initial innovation, given the salience of datives among the personal pronouns, and the instrumental *n̥s-mís was subsequently formed to that model. But it is the inst. pl. that survives, in dative function, in the attested languages, and its *-iz spread to the dat. sg. already in PGmc (suggesting that the syncretism of those two cases had already begun—perhaps only in personal pronouns, which inherited a reduced case system). In any case, once the (dat. and) inst. pl. was in place the first-person plural and dual forms developed in tandem, as follows: (1) the ending *-mís was extended to the dual as well; (2) the replacement of *-mé by *-wé triggered a parallel change of *-mís to *-wís (yielding a unique (dat.-)inst. pl. ending); (3) the reduction and loss of *-w- in the 1du. gave rise to an ending *-is, or (after leveling of the Verner's Law alternants in nominals) *-iz; (4) finally, the 1pl. was adjusted on the model of the 1du., so that in both the pattern was that the dative was formed by adding *-iz to the accusative. The entire process can be summarized as follows:

PIE *n̥smé; *n̥h$_3$mé → *n̥smé, *n̥smís; *n̥h$_3$mé → *n̥smé, *n̥smís; *n̥h$_3$mé, *n̥h$_3$mís
→ *n̥swé, *n̥smís; *n̥h$_3$wé, *n̥h$_3$mís
→ *n̥swé, *n̥swís; *n̥h$_3$wé, *n̥h$_3$wís
> *unswé, *unswís; *unkwé, *unkwís (see 3.2.1 (i), 3.2.2 (i))
> *unswé, *unswís; *unk^{w}é, *unk^{w}ís (see 3.2.3 (ii))
> *úns, *unswís; *únk^{w}, *unk^{w}ís (see 3.2.5 (i))
> *uns, *unzwis; *unk, *unkis (delabialization and Verner's Law, see 3.2.3 (ii) and 3.2.4 (ii))
→ PGmc *uns, *unsiz; *unk, *unkiz (adjustment of the dat. pl. form and generalization of *-z in nominals).

Though this is a strikingly long series of changes, each was simple and natural; moreover, it can be seen that a large central part of the sequence were regular sound changes.

The 2pl. pronoun was strongly influenced by the 1pl., but Katz has shown that the initial stage of its development, too, was an idiosyncratic change: PIE *uswé underwent aphaeresis of its initial vowel (presumably first in certain sandhi environments), yielding *swé (Katz 1998: 102–5, 110–12). That would be hard to believe, were it not for the fact that there is an impeccable parallel elsewhere in the IE family. In Greek and Indo-Iranian, at least, PIE *uswé was replaced by *usmé (cf. Aiolic Gk *ὔμμε* /úmme/); that is, the first-person element *-mé replaced *-wé (the reverse of what happened in pre-Germanic). In Indic the *y- of the nominative spread to the oblique as well, so that we

find, for example, Skt acc. pl. *yuṣmā́n* in place of expected *uṣmā́n. Avestan exhibits a corresponding stem *yušma-*, but there is also a competing stem *xšma-* in which the initial vowel has been lost. (The source of the initial *x-* remains unclear, but cf. Av. *xšuuaš* 'six' < PIE *swéḱs.) Katz has argued persuasively that a similar loss of word-initial vowels in this and other pronouns occurred in various other branches of the family, and pre-Germanic *swé is a typical example. Apparently *swé eventually acquired an initial prothetic *i-; at least, that seems the best available explanation for its appearance in the PGmc forms. An inst. pl. in *-ís was also formed on the model of the 1pl. The development of the oblique 2pl. can be summarized thus:

PIE *uswé > *swé > *iswé → *iswé, *iswís (cf. the 1pl.)
> *ís (?), *iswís (see 3.2.5 (i))
> *is (?), *izwis (Verner's Law, see 3.2.4 (ii))
→ *is (?), *izwiz (generalization of *-z)
→ *izwiz (or *iz??), *izwiz (cf. Goth. acc. and dat. *izwis*).

The inherited accusative should have become *is, like 1pl. *uns, but no such form can be reconstructed for PGmc. Apparently it did not survive because it was too dissimilar from the rest of the paradigm; probably it was replaced by the (dat.-)inst. pl. *izwiz, though an analogical *iz or the like is perhaps not completely out of the question.

The PGmc oblique 2du. pronoun acc. *ink^{w}, (dat.-)inst. *ink^{w}iz need have nothing directly to do with PIE *uh$_3$wé; it can have been formed to the model of 1du. *unk^{w}, *unk^{w}iz using the initial *i- of the 2pl. at some point before the labiovelar of the 1du. was unrounded.

The development of the singular pronouns was much more straightforward. PGmc nom. 1sg. *ék (unstressed *ik) and 2sg. *þū are the sound-change reflexes of the PIE forms. The accusatives 1sg. *mék, 2sg. *þék, reflexive *sék (unstressed *mik, *þik, *sik) reflect the PIE clitic forms plus the PIE particle *-ge, which was also used to emphasize (some) personal pronouns in Ancient Greek. The datives 1sg. *miz, 2sg. *þiz, reflexive *siz are by far the most surprising; they must have acquired their odd ending from the (dat.-)inst. pl. forms.

Finally, all the PGmc genitive forms of the personal pronouns are actually forms of possessive adjectives, as (independently) in Latin.

3.5 Changes in other components of the grammar

It seems clear that no major syntactic changes occurred in the development of PGmc. For minor changes that affected word-classes and inflectional categories see 3.4.1 and 3.4.2; other minor changes (if any occurred) cannot

be recovered, since the syntax of neither protolanguage has been reconstructed in detail.

Changes in derivational morphology and in the lexicon were substantial, but all were of universal types that can be summarized in a few words: old derivational formations became fossilized and were replaced by new ones; new words replaced old words; shifts in the meanings of numerous words occurred. All these changes are best appreciated by a direct comparison of the PGmc situation with its PIE antecedent; they will therefore be addressed at the end of Chapter 4.

4

Proto-Germanic

4.1 Introduction

Though some details remain obscure, on the whole it is easier to reconstruct PGmc than PIE, simply because the daughters of PGmc had been diverging for much less long before being recorded. We can also say with reasonable confidence that PGmc was spoken in and around Denmark a few centuries earlier than the Zeitwende, but probably not earlier than about 500 BC (cf. de Vries 1960: 45–9; Mallory 1989: 84–7).

The subgrouping of Germanic is relatively uncontroversial. A rigorous cladistic analysis gives the evolutionary tree at Fig. 4.1.

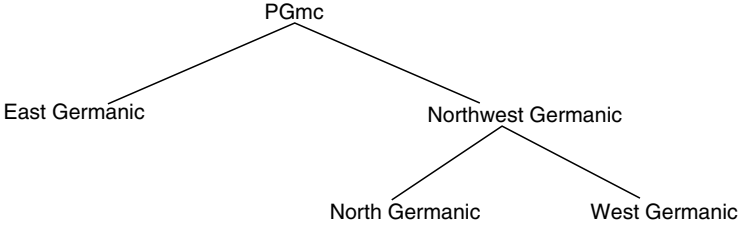


FIG. 4.1

As the only well-attested East Germanic language is Gothic, little can be said about the internal subgrouping of that branch of the family. Whether there was ever a more or less unitary Northwest Germanic language has been a matter of dispute. In my opinion the number of significant innovations which North and West Germanic unarguably share, though admittedly small, is large enough to justify positing such a unity. By contrast, the innovations shared by East and North Germanic are extremely few and can have resulted from parallel development, while those supposedly shared by East Germanic and the more southerly dialects of West Germanic are actually shared retentions which prove nothing (cf. e.g. Krause 1968: 48–52). That North Germanic is itself a unitary subgroup is completely obvious, as all its dialects shared a long

series of innovations, some of them very striking (see Noreen 1923 passim). That the same is true of West Germanic has been denied, but I will argue in vol. ii that all the West Germanic languages share several highly unusual innovations which virtually force us to posit a West Germanic clade. On the other hand, the internal subgrouping of both North Germanic and West Germanic is very messy, and it seems clear that each of those subfamilies diversified into a network of dialects which remained in contact for a considerable period of time (in some cases right up to the present).

4.2 PGmc phonology

Unlike the phonology of PIE, that of PGmc resembles those of modern western European languages in a general way. The system of surface-contrastive sounds was:

Consonants:

bilabial	dental	alveolar	velar	labiovelar
p	t		k	k^w
b	d	z	g	g^w
f	þ	s	h	h^w
m	n			
	l	r		

Vocalics:

nonsyllabic	short	long	trimoric
j	i e	ī ē	ē̄
	a	ā	
w	u	ū ō	ō̄
diphthongs:	eu (∼ iu), ai, au		

*ā occurred only in the present-stem suffix *-ai- ∼ *-ā- (see 4.3.3 (ii.f)). It seems clear that the diphthongs *ōu and *ō̄i, at least, also occurred word-finally. In addition, nasalization of vowels was surface-contrastive (see below), but stress was not: the initial syllable of a phonological word was always stressed (perhaps with systematic exceptions, if compound verbs were already undergoing univerbation; see 4.4.1).

Though this is a relatively familiar-looking phonemic inventory, it exhibits some interesting idiosyncrasies, as the following sections will make clear.

4.2.1 *PGmc consonants*

The obstruents in the first row of the above table were voiceless stops. It is possible that the dental stop had become alveolar and that all were aspirated

when initial in the onset of stressed syllables (since those changes have occurred in all the modern daughters). But as those particular phonetic changes are exceptionally natural and repeatable, we cannot suggest with any confidence that either had already occurred by the PGmc stage.

The obstruents in the third row were voiceless fricatives in every position. It is very likely that those labeled 'velar' and 'labiovelar' had been debuccalized to [h] and [h^{w}] respectively word-initially, as in all the well-attested daughters (probably including Gothic). It is likely that */f/ was still bilabial, though it eventually became labiodental in all the daughters (except, probably, Gothic).

The obstruents of the second row were voiced in every position. */z/ was a sibilant fricative in all positions, and */g^{w}/ apparently occurred only after a homorganic nasal (see below), in which position it was a stop, but the others probably exhibited a well-defined allomorphy as follows. After homorganic nasals all were stops; */d/ was also a stop after */l/ and */z/. (If its stop allophone had become alveolar, then it may also have been a stop after */r/, but that is very uncertain. Gothic exhibits that allomorphy, but the reflex of */d/ after */r/ is a fricative in ON. For the WGmc situation see vol. ii.) */b/ and */d/ were also stops word-initially. In all other positions these consonants were fricatives; apparently */g/ was a fricative even word-initially, to judge from its outcomes in OE, OF, and modern Netherlandic. Thus this allomorphy was like that of modern Spanish in general, though not in every detail.

The allomorphy of */n/ was complex. Immediately preceding velar and labiovelar stops it was a velar nasal *[ŋ]; it is likely that it was also rounded before the labiovelars. Immediately preceding the fricatives */h/ and */h^{w}/, however, */n/ was realized as nasalization and lengthening of the preceding vowel (see 3.2.7 (ii)). Perhaps because these fricatives alternated with other dorsals (see below) before which */n/ was fully consonantal, the nasal apparently remained easy for language learners to 'recover'; these examples are typical:

*hunhruz ∼ *hungru- 'hunger' (cf. Goth. *hūhrus* but ON *hungr*, OE *hungor*, OHG *hungar*);

*fanhaną; 'to seize', past ptc. *fanganaz (cf. ON *fá, fenginn*, OE *fōn, fangen*, OHG *fāhan, gifangan;* Goth. has leveled the alternation in *fāhan, fāhans*);

*þinhaną; 'to thrive', past ptc. *þunganaz (cf. OE *þīon, þungen*; the other languages have remodeled the inflection as a result of sound changes);

*bringaną; 'to bring', *branhtē '(s)he brought' (cf. Goth. *briggan, brāhta*, OE *bringan, brōhte*, OHG *bringan, brāhta*);

*þunkijaną; 'to seem', *þunhtē 'it seemed' (cf. Goth. *þugkjan, þūhta*, ON *þykkja, þótti*, OE *þynċan, þūhte*, OHG *dunken, dūhta*).

In any case the situation must have been stable, as the nasalization persisted down into the separate history of the Anglo-Frisian dialect group (see vol. ii).

That was not the only environment in which nasalized vowels appeared on the surface in PGmc. In word-final position there was also a contrast between nasalized and non-nasal vowels—reconstructable from the different development of *-ō and *-ǭ in NWGmc—and it would seem most natural to analyze the latter as underlying sequences of vowel plus */n/ (all the more so as that was their etymological source, see 3.2.2 (ii)). Unfortunately there were also examples of surface word-final consonantal *[n], reflecting pre-PGmc *-nt (see 3.2.6 (iv)). Note the contrasts:

nom. sg. PGmc *wullō 'wool' (> PNWGmc *wullu, cf. ON *ull*, OE *wull*) < PIE *$h_2w\acute{l}̥h_1neh_2$ (cf. Lat. *lāna*, Skt *ū́rṇā*),
PGmc *ahslō 'shoulder' (> PNWGmc *ahslu, cf. ON *ǫxl*, OE *eaxl*) < post-PIE *aǵslā (cf. Lat. *āla* 'wing'),
PGmc *snuzō 'daughter-in-law' (> PNWGmc *snuzu, cf. ON *snor*, OE *snoru*) < post-PIE *snusā́ (cf. Skt *snuṣā́*) ← PIE *snusós (cf. Gk *νυός* /nuós/)
vs. acc. sg. PGmc *wullǭ (cf. OE *wulle*) < PIE *$h_2w\acute{l}̥h_1neh_2m$ (cf. Lat. *lānam*, Skt *ū́rṇām*),
PGmc *ahslǭ (cf. OE *eaxle*) < post-PIE *aǵslām (cf. Lat. *ālam* 'wing'),
PGmc *snuzǭ (cf. OE *snore*) < post-PIE *snusā́m (cf. Skt *snuṣā́m*) ← PIE *snusóm (cf. Gk *νυόν* /nuón/);
PGmc *fehu 'livestock' (cf. OHG *fihu*; Goth. *faíhu* 'property') < PIE *péḱu, PGmc *felu 'much (neut.)' (cf. Goth., OHG *filu*) < PIE *pélh$_1$u
vs. PGmc *sunu̯ acc. sg. 'son' (cf. Goth., OE *sunu*) < PIE *suHnúm 'offspring', PGmc *nahtu̯ acc. sg. 'night' (cf. ON *nótt* with nasal-labial umlaut) < PIE *nók^{w}t̥m
vs. PGmc *tehun 'ten' (cf. Goth. *taíhun*) < PIE *déḱm̥d,
PGmc *dēdun 'they did' (cf. OHG *tātun*, Goth. weak past 3pl. *-dedun*) ←< PIE *d^{h}éd^{h}h$_1$n̥d 'they were putting'.

How language learners analyzed this situation necessarily remains uncertain, and for that reason we are unable to posit underlying forms for the word-final nasals with any confidence. This is a good example of how the poverty of the information retrievable for protolanguages gives rise to systematic gaps in our analyses of them.

Alternations between surface-contrastive consonants were limited in PGmc, but the alternation between voiceless fricatives and voiced obstruents

(and between *h^{w} and *w) resulting from Verner's Law was pervasive and important. It seems clear that the voiceless fricatives were underlying and were voiced by a rule with multiple morphological triggers. Numerous examples in the conjugation of strong verbs will appear in 4.3.3 (i). Derivational examples were probably just as common; the following word-classes may serve as examples.

The root-final fricatives of derived causative verbs were voiced by Verner's Law; note these examples:

PGmc *swabjaną 'to put to sleep' (cf. ON *svefja* 'to smooth', OE *swebban* 'to kill', OHG *inswebben* 'to fall asleep') ← *swefaną 'to fall asleep; to sleep' (cf. ON *sofa*, OE *swefan*; PIE *swep- 'fall asleep');

PGmc *frawardijaną 'to destroy' (cf. Goth. *frawardjan*, OE *(for)wierdan*) ← *frawerþaną 'to perish' (cf. Goth. *frawaírþan*, OE *forweorþan*; PIE *wert- 'turn', *pró 'forward');

PGmc *nazjaną 'to save' (cf. OE *nerian*; OHG *nerien* 'to support'; Goth. *nasjan* 'to save' has been remodeled on the basic verb) ← *nesaną 'to survive' (cf. Goth. *ganisan*, OE *nesan*, OHG *ginesan*; PIE *nes- 'return home');

PGmc *laizijaną 'to teach' (cf. OE *lǣran*, OHG *lēren*; Goth. *laisjan* has been remodeled on the basic verb) ← *lais 'I know' (cf. Goth. *lais*);

PGmc *hlōgijaną 'to cause to laugh' (cf. ON *hlœgja*; Goth. *ufhlohjan* has been remodeled on the basic verb) ← *hlahjaną 'to laugh' (cf. Goth. *hlahjan*, ON *hlæja*, OE *hliehhan*).

A fossilized causative also exhibited the effects of Verner's Law:

PGmc *sandijaną 'to send' (cf. Goth. *sandjan*, ON *senda*, OE *sendan*, OHG *senten*) ← *sinþ- 'go', which does not survive as a verb but occurs in the derived noun *sinþaz 'way, journey' (cf. OE *sīþ;* Goth. *ainamma sinþa* 'one time, once', etc.).

This is not surprising, considering that the PIE causative suffix was *-éye/o-, with the accent following the root.

Derived fientives likewise showed the effects of Verner's Law, to judge from a few examples that have escaped remodeling:

PGmc *liznō- ~ *lizna- 'to learn' (cf. OE *liornian*, OHG *lirnēn, lernēn*) ← *lais 'I know' (cf. Goth. *lais*);

PGmc *þurznō- ~ *þurzna- 'to dry out (intr.), to wither' (cf. ON *þorna*; Goth. *gaþaúrsnan* has been remodeled on the basic verb) ← *þersaną 'to dry out' (attested only in Goth. past ptc. *gaþaúrsans* 'withered', but cf. Homeric Gk middle τέρσεσθαι /térsest^{h}ai/ 'to dry out'; PIE *ters- 'dry');

(post-)PGmc *flagnō- ~ *flagna- 'to be skinned' (cf. ON *flagna* 'to be peeled') ← *flahaną 'to skin' (cf. ON *flá*, OE *flēan*);
(post-)PGmc *tugnō- ~ *tugna- 'to be led / pulled' (cf. ON *togna* 'to get longer') ← *teuhaną 'to lead, to pull' (cf. Goth. *tiuhan*, OE *tēon*, OHG *ziohan;* post-PIE *dewk- 'lead').

Again, this is not surprising, since the post-PIE suffix *-néh$_2$- ~ *-nh$_2$-′ always had the accent following the root.

Among the nominal formations, masculine n-stem agent nouns with zero-grade roots conspicuously exhibit the effects of Verner's Law:

PGmc *-kuzō 'tester, chooser' (cf. OE *wiþercora* 'rebel') ← *keusaną 'to test, to choose' (cf. Goth. *kiusan*, ON *kjósa*, OE *ċēosan*, OHG *kiosan*);
PGmc *-luzō 'loser' (cf. OE *hlēowlora* 'without protection') ← *(fra)leusaną 'to lose' (cf. Goth. *fraliusan*, OE *forlēosan*, OHG *farliosan*);
PGmc *-slagō 'killer' in WGmc *mann-slagō 'murderer' (cf. OE *manslaga*, OHG *manslago*) ← *slahaną 'to kill';
PGmc *-tugō 'leader' in WGmc *hari-togō 'commander of a (late Roman) mobile field force, dux' (cf. OE *heretoga*, OHG *herizogo*; ON *hertogi* 'duke' is almost certainly a loanword; *hari < PGmc *harjaz 'army') ← *teuhaną 'to lead' (see above).

So do many neuter a-stem action and result nouns:

PGmc *fangą 'grasp, (act of) taking' (cf. ON *fang*; OE *fang* 'booty') ← *fanhaną 'to take' (cf. Goth., OHG *fāhan*, ON *fá*, OE *fōn*);
PGmc *fruzą 'frost' (cf. OHG *fror*) ← *freusaną 'to freeze' (cf. ON *frjósa*, OE *frēosan*, OHG *friosan*; PIE *prews-);
PGmc *hruzą '(a) fall' (cf. ON *hrør* 'corpse', OE *ġehror* 'death') ← *hreusaną 'to fall' (cf. OE *hrēosan*);
PGmc *lidą 'expedition' (cf. ON *lið* 'retainers; vessel', OE *lid* 'ship') ← *līþaną 'to go' (cf. Goth. *galeiþan*, ON *líða*, OE *līþan*).

The same is true of feminine ō-stem nouns with similar meanings:

PGmc *falgō 'entry' (cf. OHG *falga* 'occasion, opportunity') ← *felhaną 'to enter' (or 'to put in'?: cf. Goth. *filhan*, ON *fela* 'to hide'; OE *fēolan* 'to penetrate'; OHG *felahan* 'to store up');
PGmc *laidō 'way' (cf. ON *leið*, OE *lād*, OHG *leita*) ← *līþaną 'to go' (see above);
PGmc *nazō 'survival, rescue' (cf. OHG *nara* 'redemption') ← *nesaną 'to survive' (see above);
PGmc *taugō 'pulling' (cf. ON *taug*, OE *tēag* 'rope') ← *teuhaną 'to pull' (see above).

The last class are clearly descended from PIE collectives in *-éh$_2$ with o-grade roots (preserved most obviously in the Greek type τομή /tomɛ́ː/ 'cutting, cut end' ← τέμνειν /témneːn/ 'to cut'). The PIE antecedents of the other two classes are less clear, but the preponderance of zero-grade roots among them makes it unsurprising that their pre-PGmc ancestors apparently exhibited accent on the suffix.

A considerable number of other derivational classes and isolated words also show the effects of Verner's Law; but the examples adduced above are sufficient to demonstrate that the Verner's Law alternation was a productive phonological rule with morphological triggers in Proto-Germanic, and that it was the morphologized descendent of the Verner's Law sound change. Derivational examples involving *h^{w} are naturally rare; the best-attested is

PGmc *siuniz (cf. Goth. *siuns* 'face', OE *sīen* 'appearance') ← *seh^{w}aną 'to see' (cf. Goth. *saihvan*),

with surface *[iu] ← *eu (see below) = preconsonantal *ew ← */eh^{w}/ (by Verner's Law).

Immediately before *t all labials were replaced by *f and all dorsals by *h; a range of derivational examples is adduced in 3.2.4 (iv), to which can be added such inflectional forms as past 2sg. *gaft 'you gave' (cf. Goth., ON *gaft*; *gebaną 'to give') and pres. 2sg. *maht 'you can' (cf. OE *meaht*, OHG *maht*; *maganą 'to be able'). The treatment of dentals before *t was more complex. Before 2sg. *-t they were replaced by *s, e.g. in *waist 'you know' (cf. Goth. *waist*, OE *wāst*; *witaną 'to know'), *baust 'you offered' (cf. Goth. *anabaust* 'you commanded'; *beudaną 'to offer'), *k^{w}ast 'you said' (cf. Goth. *qast*; *k^{w}eþaną 'to say'; see further 4.3.3). In derivation the reflex of the entire cluster is often *ss, simplified to *s except after a short vowel (see 3.2.3 (i)). But there are also some examples of *st; among the better attested are the following:

- *blōstrą 'sacrifice' (cf. OHG *bluostar*; Goth. *gudblostreis* 'worshipper of God') ← *blōtaną 'to sacrifice' (cf. Goth. *blotan*, OE *blōtan*);
- *gelstrą 'tax' (cf. Goth. *gilstr*, OHG *gelstar*) ← *geldaną 'to pay' (cf. Goth. *fragildan*, OE *ġieldan*);
- *hlastiz 'load' (cf. OE *hlæst*, OF *hlest*, OHG *last*) ← *hlaþaną 'to load' (cf. ON *hlaða*, OHG *ladan*);
- *hrustiz 'cover' (cf. OE *hyrst* 'adornment', OHG *hrust* 'armor') ← *hreudaną 'to cover' (attested only in OE past *hrēad*, ptc. *hroden* and ON *hroðinn* 'plated');
- *rustaz 'rust' (cf. OE *rust*, OHG *rost*) ← *reudaną 'to redden' (cf. ON *rjóða*; OE *rēodan* 'to slay').

It is usually suggested that the suffixes of these formations began with *-st- (so Seebold 1970 passim); but it is also possible that they reflect a new phonological rule */T + t/ → *st that had begun to compete with the inherited rule */T + t/ → *ss (pace Meid 1967: 166).

4.2.2 *PGmc vocalics*

Alternations between vocalics were both more numerous and more varied than those between consonants. Several, collectively referred to as ablaut, were inherited from PIE, in which they were already conditioned by morphology to a large extent; not surprisingly, their conditioning in PGmc was entirely morphological. But there were also a few pervasive alternations between surface-constrastive vocalics that were entirely phonological, and it is to those that I turn first.

4.2.2 (i) *Automatic alternations between vocalics* In unstressed syllables PGmc underlying */e/ was raised to *i unless *r followed immediately. This rule could operate only on those elements that could occur both stressed and unstressed in the sentence (since otherwise its output *i must have been reinterpreted as underlying by native-language learners). The obvious examples are a few pronoun forms:

PGmc *ék ~ *ik 'I' (cf. ON *ek* but OE *iċ*, OHG *ih*);
PGmc *mék ~ *mik 'me (acc.)' (cf. Anglian OE *mec* but ON *mik*, OHG *mih*);
PGmc *þék ~ *þik 'you (sg. acc.)' (cf. Anglian OE *þec* but ON *þik*, OHG *dih*).

The striking fact that ON and OE have generalized stressed and unstressed forms in a cross-classifying pattern is perhaps the best evidence for suggesting that such a rule still existed in PGmc. On the PIE antecedents of these forms see 3.4.5 (iii).

PGmc underlying */e/ was also raised to *i if a high front vocalic occurred in the following syllable. This rule created a pervasive alternation between surface *e and *i in stressed syllables in paradigms in which the following syllable sometimes contained *i and sometimes some other vowel—above all, in the present indicative and imperative of simple thematic verbs (for the most part, strong verbs). The singular and plural present indicative active forms of 'carry' are a textbook example:

1sg.	*berō	(cf. Anglian OE *beoru*)
2sg.	*birizi	(cf. OE *birst*)
3sg.	*biridi	(cf. OE *birþ*)
1pl.	*beramaz	

2pl. *birid
3pl. *berandi (cf. OE *beraþ*)

This rule also affected the diphthong */eu/ (on which see further below), which therefore had an allophone *[iu] occurring always and only before syllables containing a high front vocalic.

Somewhat surprisingly, OE preserves this alternation in verbs best of all the daughters of PGmc. In Gothic *e and *i have merged by unconditioned sound change; in ON the alternation has been leveled completely in favor of *e. In OHG the raising of word-final *ō to *u (on which see vol. ii) caused a further raising of *e to *i* in the preceding syllable, so that the OHG 1sg. form is *biru* and the entire singular exhibits *i* in the root; perhaps as a consequence of that development, *e* was leveled throughout the plural (so that the 2pl. is *beret*). However, there is unambiguous evidence for the sound change underlying this rule (see 3.2.5 (iv)), and since the deviations in the daughter languages' reflexes can be explained unproblematically, it is clear that the rule operated in PGmc.

The nonsyllabic high front vocalic *j also triggered this raising, with the result that j-presents of strong class V exhibited surface *i in the root throughout their present stems. These examples are especially clear:

PGmc *sitjaną 'to sit' (cf. ON *sitja*, OE *sittan*, OHG *sizzen*),
but PGmc *etaną 'to eat' (cf. ON *eta*, OE *etan*, OHG *ezzan*);
PGmc *ligjaną 'to lie' (cf. ON *liggja*, OE *liċġan*, OHG *liggen*),
but PGmc *weganą 'to move' (cf. ON *vega*, OE, OHG *wegan*).

Other examples are more isolated morphologically.

Probably the same sound change was responsible for the change of pre-PGmc *ey to *ī (see 3.2.5 (iv)). Whether that remained part of the synchronic PGmc rule of e-raising is unclear; see 4.2.2 (ii) for further discussion.

In word-medial position between a consonant and a vowel there was an exceptionless alternation of high front vocalics, such that *j occurred after sequences of a short vowel plus a single nonsyllabic ('light syllables'), whereas *ij occurred after consonant clusters and sequences of a long vowel or diphthong plus a single nonsyllabic ('heavy syllables'). This rule is the Germanic reflex of Sievers' Law (see 2.2.4 (ii), 3.2.5 (ii)). Examples are very numerous; these are typical.

Nominals with *j after light syllables:
PGmc *harjaz 'army' (cf. Goth. *harjis*, ON *herr*, OE *here*, OHG *heri*);
PGmc *midjaz 'middle' (cf. Goth. *midjis*, ON *miðr*, OE *midd*, OHG *mitti*);

PGmc *niwjaz (*niujaz) 'new' (cf. Goth. *niujis*, ON *nýr*, OE *nīewe*, OHG *niuwi*);
PGmc *badją 'bed' (cf. Goth. *badi*, OE *bedd*, OHG *betti*);
PGmc *hawją (*haują) 'grass, hay' (cf. Goth. *hawi*, ON *hey*, OE *hīeġ*, OHG *hewi, houwi*);
PGmc *fergunją 'mountain' (cf. Goth. *faírguni*; OE *firġen-* in compounds);
PGmc *haljō 'hell' (cf. Goth. *halja*, ON *hel*, OE *hell*, OHG *hella*);
PGmc *sibjō 'relationship' (cf. Goth. *sibja*, OE *sibb*, OHG *sippea*).

Nominals with *ij after heavy syllables:
PGmc *hirdijaz 'herdsman' (cf. Goth. *haírdeis*, ON *hirðir*, OE *hierde*, OHG *hirti*);
PGmc *lēkijaz 'physician' (cf. Goth. *lekeis*, OE *lǣċe*, OHG *lāhhi*);
PGmc *rīkiją 'kingdom, power' (cf. Goth. *reiki*, ON *ríki*, OE *rīċe*, OHG *rīhhi*).

Present stems with *j after light syllables:
PGmc *warjaną 'to protect' (cf. Goth. *warjan*, ON *verja*, OE *werian*, OHG *werien*);
PGmc *hazjaną 'to praise' (cf. Goth. *hazjan*, OE *herian*);
PGmc *bidjaną 'to ask for' (cf. Goth. *bidjan*, ON *biðja*, OE *biddan*, OHG *bitten*);
PGmc *siwjaną (*siujaną) 'to sew' (cf. Goth. *siujan*, ON *sýja*, OE *sīewan*, OHG *siuwen*);
PGmc *saljaną 'to hand over' (cf. ON *selja*, OE *sellan*, OHG *sellen*; Goth. *saljan* 'to sacrifice');
PGmc *skapjaną 'to make' (cf. Goth. *gaskapjan*, ON *skepja*, OE *scieppan*, OHG *skephen*);
PGmc *framjaną 'to further' (cf. ON *fremja*; OE *fremman* 'to make'; OHG *fremmen* 'to accomplish').

Present stems with *ij after heavy syllables:
PGmc *timrijaną 'to build' (cf. Goth. *timrjan*, ON *timbra*, OE *timbran*, OHG *zimberen*);
PGmc *laizijaną 'to teach' (cf. Goth. *laisjan*, OE *lǣran*, OHG *lēren*);
PGmc *laidijaną 'to lead' (cf. OE *lǣdan*, OHG *leiten*; ON *leiða* 'to accompany');
PGmc *garwijaną 'to prepare' (cf. OE *ġierwan*, OHG *garwen*; ON *gøra* 'to make, to do');
PGmc *dailijaną 'to divide' (cf. Goth. *dailjan*, ON *deila*, OE *dǣlan*, OHG *teilen*);
PGmc *wōpijaną 'to cry out' (cf. Goth. *wopjan*, ON *œpa*; OE *wēpan*, OHG *wuofen* 'to weep');

PGmc *dōmijaną 'to judge' (cf. Goth. *domjan*, ON *dœma*, OE *dēman*, OHG *tuomen*).

(See further below on forms in which *i followed.)

The evidence for this alternation has been partly obscured by further changes in the daughter languages as follows. In Gothic the contrast survives when the following vowel was lost before a word-final consonant; otherwise the shortening of word-final *ī and the syncope of *i before *jV have led to a merger of the two types. In other words,

*-Cjaz > *-Ciz > *-Cis (→ *-Cjis,* see below), whereas *-Cijaz > *-Cīz > *-Ceis;* but
*-Cją > *-Ci,* and apparently *-Ciją > *-Cī > *-Ci;* further,
surviving *-CijV- > *-CjV-* = *-CjV-* < *-CjV.

In ON the contrast between the two types largely survives: when the following vowel was lost, postconsonantal *j > ∅ whereas *ij > *i;* when the following vowel survives, postconsonantal *j likewise survives, but *ij does not (except after velars, where it appears as *j*). In the WGmc languages the outcomes before a surviving vowel are roughly like those of ON, the most important difference being that *Cj > *CC* when *C* ≠ *r;* when the following vowel was lost, the situation has been complicated by further changes (to be discussed in vol. ii).

Because the alternation of *j and *ij was exceptionless (in both directions, so to speak), it is not clear which alternant was underlying; possibly different native language learners abduced different grammars on this point. But in any case the output of the rule was input to a further rule by which *j was dropped before *i; resulting sequences *ii were contracted to *ī by still another rule. The result was that *jV (where *V ≠ *i) alternated not with '*ji' but simply with *i, while *ijV alternated not with '*iji' but with *ī. The indicative 3sg. and 3pl. forms of some j-presents will illustrate.

Verbs with light root-syllables:
PGmc *wariþi 'protects', 3pl. *warjanþi (cf. OE *wereþ, weriaþ*, OHG *werit, werient*);
PGmc *haziþi 'praises', 3pl. *hazjanþi (cf. OE *hereþ, heriaþ*);
PGmc *bidiþi 'asks for', 3pl. *bidjanþi (cf. OE *bitt, biddaþ*, OHG *bitit, bittent*);
PGmc *saliþi 'hands over', 3pl. *saljanþi (cf. OE *selþ, sellaþ*, OHG *selit, sellent*);
PGmc *framiþi 'furthers', 3pl. *framjanþi (cf. OE *fremeþ, fremmaþ*, OHG *fremit, fremment*).

Verbs with heavy root-syllables:
PGmc *laizīþi 'teaches', 3pl. *laizijanþi (cf. Goth. *laiseiþ, laisjand*);

PGmc *garwīþi 'prepares', 3pl. *garwijanþi (cf. ON *gørir, gøra*, OE *ġiereþ, ġierwaþ*);
PGmc *hauzīþi 'hears', 3pl. *hauzijanþi (cf. Goth. *hauseiþ, hausjand*, ON *heyrir, heyra*);
PGmc *þunkīþi 'seems', 3pl. *þunkijanþi (cf. Goth. *þugkeiþ, þugkjand*, ON *þykkir, þykkja*);
PGmc *rignīþi 'it's raining' (cf. Goth. *rigneiþ*, ON *rignir*).

The evidence for this pattern in the daughter languages has been fragmented by subsequent changes. Gothic and ON exhibit clear reflexes of *ī for expected '*iji' after heavy syllables; in WGmc, however, the alternation between *ī (after heavy syllables) and *i (after light syllables) was leveled in favor of *i (Cowgill 1959: 8). After light syllables Gothic actually has *ji* (*bidjiþ*, etc.), and it is sometimes supposed that PGmc exhibited similar forms. However, on this point the testimony of Gothic cannot be trusted, because Gothic has introduced *j* analogically even before *i* which is itself a reflex of PGmc *j. For instance, the development of the nom. sg. masc. of the adjective 'middle' in Gothic was:

PIE *méd^{h}yos 'middle', stem *méd^{h}yo- > PGmc *midjaz, *midja- > pre-Goth. *midiz, *midja- → *midjiz, *midja- > Goth. *midjis, midja-*.

And since the sequence *ji* in these nominal forms *must* be the result of analogical change, the sequence *ji* in verb forms obviously *can* be. ON is unhelpful in these cases, as the entire vocalic sequence is syncopated. In WGmc, however, it is clear that the relevant forms exhibited *i, not *ji, because a preceding consonant is not geminated. (See vol. ii on WGmc gemination.) Of course it is possible that postconsonantal *j was lost before *i very early in the separate history of WGmc, before gemination occurred; but the fact that *j was lost in so many other environments already in PGmc suggests that this loss, too, occurred in the protolanguage (cf. Þórhallsdóttir 1993: 4–10 with references).

PGmc */e/ was raised to *i before a nasal in the coda of the same syllable. It is very likely that this remained a rule recoverable by native-language learners, since it was the only development that split the otherwise unitary third class of strong verbs; thus a learner would have found

PGmc *bindaną 'to tie', pres. 3sg. *bindidi, past 3sg. *band, 3pl. *bundun beside
PGmc *helpaną 'to help', pres. 3sg. *hilpidi, past 3sg. *halp, 3pl. *hulpun,
PGmc *werpaną 'to throw', pres. 3sg. *wirpidi, past 3sg. *warp, 3pl. *wurpun,

leading easily to the recovery of underlying */bend-/ 'tie' (cf. Seebold 1970 passim).

Finally, a word should be said about the traditional notation of the diphthongs *ai, *au, *eu (∼ *[iu]). Obviously the second element was nonsyllabic, and it would be at least as reasonable to write these sequences *aj, *aw, *ew (∼ *[iw]), parallel to my convention for PIE. The traditional spellings are convenient largely because PGmc diphthongs developed as unitary syllable nuclei in the daughter languages in most instances. Occasionally, however, subsequent developments demonstrate that the second element actually did function as a consonant. That is especially true of the developments of *jj, *ww in East and North Germanic, and of *wj in WGmc I have therefore written those sequences as sequences of semivowels in this book. I do not mean to imply that *ai, etc. should be analyzed differently when a semivowel did *not* follow.

4.2.2 (ii) *Ablaut* The ablaut system inherited from PIE remained a system of living rules (with various modifications) in the inflection of PGmc strong verbs. Ablaut in verb inflection will be discussed in greater detail in 4.3.3 (i). However, the system also remained pervasive in derivational morphology. Derivational ablaut and its relation to the ablaut system of strong verb inflection will be discussed in this section.

From a historical viewpoint, derivational ablaut relationships are interesting particularly in two types of cases. On the one hand are those which cannot be explained as regular sound-change developments of PIE patterns, and which therefore reveal something about the restructuring of morphological rules in (pre-)PGmc. On the other hand are those which differ from the patterns usual in strong verb inflection. The latter are the cases listed in Seebold 1970 as 'außerhalb der Ablautreihe'. Some seem to be archaisms, better explained in PIE than in PGmc terms; others seem to be innovations (as are also some of the regular inflectional patterns). The following discussion will pay particular attention to the types of cases just enumerated.

The vast majority of strong verbs inflecting according to the first three traditional classes reflect the basic PIE pattern *e ∼ *o ∼ ∅ followed by a tautosyllabic sonorant. The PGmc outcomes were:

īC ∼ aiC ∼ iC	(class I)
euC (/iuC) ∼ auC ∼ uC	(class II)
eww (/iww) ∼ aww ∼ uw	(class II)
iNC ∼ aNC ∼ uNC	(class III)
erC (/irC) ∼ arC ∼ urC	(class III)
elC (/ilC) ∼ alC ∼ ulC	(class III)

The sound-change source of PGmc *ww in the third type is not clear, but in any case the ablaut pattern 'makes sense' in PGmc terms.

In addition, a small number of roots ending in two consonants neither of which was a sonorant exhibited a pattern exactly like that of the last two lines above, i.e.

eCC (/iCC) ∼ aCC ∼ uCC (class III)

In this last type the third grade (i.e., the functional zero grade, found in the default past stem and the past participle) must reflect at least modest remodeling, since the first of the root-final consonants was not a sonorant which would have become syllabic in the zero grade and so would have given rise to PGmc *u (see 3.2.2 (i)). Fewer than a dozen such verbs are attested in the 'Old' Germanic languages, as follows (cf. Seebold 1970 passim).

Attested (or clear derivatives attested) in Gothic and at least one other language:

*flehtaną 'to plait', *þreskaną 'to thresh', *wresk^{w}aną 'to grow, to bear fruit'; possibly *hnesk^{w}aną 'to soften, to wear away'.

Attested in ON and WGmc:

*bregdaną 'to brandish', *brestaną 'to burst'.

Attested in ON only:

gnesta 'to make a sudden loud sound'.

Attested widely in WGmc:

PWGmc *fehtan 'to fight', *hrespan 'to tear', *leskan 'to be extinguished'.

Attested only in OE:

streġdan 'to strew'.

It is very striking that all these verb roots but one exhibit a sequence *Re (where *R is any coronal sonorant), of which the zero grade should be *uR by sound change; the attested zero grade of those roots can have arisen by a metathesis which brought the anomalous order of sonorant and vowel into line with the order in the other ablaut grades (see 3.2.2 (i) ad fin.). The extension of the resulting pattern to 'fight' would then have been an almost trivial lexical analogy.

An odd variant of class II ablaut should also be mentioned here. Strong verbs with *ū in place of expected *eu in the present—thus exhibiting a pattern

ūC ∼ auC ∼ uC (class II)—

are fairly common in older Germanic languages (see Seebold 1970: 48). However, surprisingly few are reconstructable for PGmc. An unarguable example is *lūkaną 'to close', attested with *ū* in Gothic, ON, OE, OF, OS, and OHG; one might also make a case for *sūganą 'to suck', which is at least approximately cognate with Lat. *sūgere*,[1] and perhaps also *sūpaną 'to drink', the failure of both to appear in our Gothic corpus being plausibly attributable to accident. But most examples are clearly confined to ON and/or the northern WGmc languages, often beside forms with *eu in Gothic and/or OHG. (Two appear to be innovations common to the WGmc languages; *brūkaną 'to need, to enjoy' does not appear to have been a strong verb in PGmc, see 3.4.3 (i) and 4.3.3 (ii.a).) It seems reasonable to suggest that the post-PGmc examples reflect an incipient reanalysis of the ablaut system, a new *ū having been created as an obvious parallel to class I *ī (because the latter was no longer analyzable as underlying */ei/?). Whether that process had already begun in PGmc is unclear. Neither *lūkaną nor *sūpaną has any plausible extra-Germanic cognates, while those of *sūganą are formally problematic (see n. 1, and cf. Seebold 1970: 398) and in part ambiguous (for instance, note that the *ū* of Lat. *sūgere* could conceivably reflect *ew). Under the circumstances the most we can say is that either a reanalysis of the system had already begun or a handful of verb roots with inherited *ū had been attracted into the system; and if the latter is what happened, then of course that could have helped provoke a (later) reanalysis.

The most striking general fact about the ablaut patterns discussed above is a negative one. Though Seebold 1970 lists some 300 strong verbs belonging to the first three classes, most with at least a few derivatives and some with very many, *not one* derivative exhibits an ablaut grade not mentioned above.[2] The greatest irregularity is the vacillation between *eu and *ū, and it is no more salient in derivation than in inflection. It seems fair to say that these particular ablaut rules remained very stable throughout the Germanic family for more than a millennium after PGmc began to diversify.

Most strong verbs of the fourth class exhibit roots ending in sonorants. They originally exhibited the same ablaut as the third class, with the syllabic form of the zero grade generalized (so as to yield a syllabic root-form in every case); thus the outcome should have been

eR (/iR) ∼ aR ∼ uR (class IV).

[1] It is not clear whether the final consonant of the Latin root can reflect *$\acute{g}^{h}$ or *g^{h}, as the PGmc final consonant must. The OE byform *sūcan* looks like a better fit, but since it is confined to that language it is almost certainly a post-PGmc innovation.

[2] There is some interchange between the classes because of disruptive sound changes, e.g. among OE contract verbs.

That is exactly what we find in the case of the preterite-presents *man '(s)he remembers', *skal '(s)he owes', and their derivatives. However, normal strong verbs have acquired an additional ablaut grade *ēR, which appears in the default past stem, by the processes described in 3.4.3 (ii); as a result, their ablaut system is

eR (/iR) ∼ aR ∼ ēR ∼ uR (class IV),

and there are consequently two competing 'functional zero grades' which can appear in lexemes derived from these verb roots. Examination of all the derivatives listed in Seebold 1970[3] reveals an interesting pattern of facts. In the older Germanic languages altogether derivatives with the old zero grade in *uR still outnumber those with innovative *ēR by a ratio of five to two (51 examples vs. 20). However, examples with *ēR do appear in all the languages, and their numbers appear to reflect the size of a language's attested corpus, roughly speaking (so that there are between nine and twelve each from ON, OE, and OHG, but only three or four each from the much smaller corpora of Gothic, OF, and OS). This suggests that derivatives in *ēR were already a regular feature of PGmc. Because of the striking regularity of the Germanic ablaut system, there are many ways in which *ēR could have spread from inflection to derivation. Some of these examples might actually reflect (post-)PIE vr̥ddhi formations with inherited *ē (as argued by Darms 1978: 93–102), but that will account for only a fraction of the examples listed in Seebold 1970, most of which were clearly Germanic innovations.[4]

Roots ending in *eC (where *C was an obstruent) fall into several potentially different ablaut classes which I will discuss separately: those with no initial consonant or with an initial obstruent (only), those with an initial sonorant, and those with an initial CR-cluster.

Roots of the shape *(C)eC- (where *C ≠ *R) have no inherited zero grade in PGmc, the full grade with *e functioning as zero grade in the past participle while the new functional zero grade *ē occurs in the default past stem; thus their ablaut schema is

eC (/iC) ∼ aC ∼ ēC (class V).

Fewer than a dozen such roots are reconstructable, and only *et- 'eat' and *set- 'sit' make more than a few derivatives; nevertheless all three ablaut

[3] I do not take into account the derivatives of the anomalous zero-grade present *wulanǫ 'to boil', all of which likewise reflect a root-form *wul- (see Seebold 1970: 552).

[4] The only anomaly that is not covered by the discussion of this paragraph is the odd family *snew- ∼ * sneww- ∼ *snū- ∼ *snō(w)- 'hurry' (Seebold 1970: 446–7). It is not clear to me whether all these root-shapes should be projected back into PGmc; if they should, it is not clear whether they were still synchronically related, nor how.

grades are well represented. Note that *at-, which did not survive in the paradigm of 'eat' because it contracted with the reduplicating syllable (see 3.4.3 (ii)), is well attested in that verb's derivatives. The *ō of OE *sōt* (nt.) 'soot' is startling. The word is almost certainly derived from *set- 'sit', like a number of other northern European words for the same substance (cf. Holthausen 1963: 307), though none of the latter is an exact cognate. Inherited ō-grades in root-syllables are rare, but if this is a Germanic innovation, it is not obvious what the model for it could have been; the formation remains puzzling (cf. Darms 1978: 296–8).

Roots of the shape *ReC- might be expected to exhibit an inherited syllabic zero grade, since they contain sonorants which could be syllabic in PIE. All the normal strong verbs of this shape, however, belong to class V, and their derivatives exhibit exactly the same ablaut grades as those of the group just discussed. (There is even a puzzling ō-grade derivative—ON *æsa* 'to agitate' ←< *jōzijaną, derived from *jesaną 'to boil'—which Darms 1978 does not discuss, no doubt because it could be purely deverbal.) However, the lone preterite-present with a root of this shape exhibits a quite different ablaut pattern. The inflectional ablaut is *ganah ∼ *ganug-, past *ganuh-t- 'be sufficient'. In *-nug- we have the expected inherited zero grade (*-nug- < *-nuh-′ (by Verner's Law) ← *-unh- (by morphological remodeling on the full grade) < *-unk- < PIE *h_2n̥ḱ-, zero grade of *$h_2$neḱ- 'reach'). It is not surprising that the few transparent derivatives of this root show that zero grade (Seebold 1970: 355). But the most widespread and important derivative is the adj. *ganōgaz 'enough', well attested throughout the family; and once again it exhibits a long ō-grade which is difficult to explain. What is most striking in this case is that there is neither evidence for any kind of long ē-grade (whether inherited or innovative) nor any likelihood that such a thing ever existed (recall that preterite-presents to *CeR-roots also fail to exhibit any such ablaut grade). We are more or less forced to conclude that this is an inherited lengthened grade—at least pre-Germanic, though of course not necessarily PIE. (The explanation of Darms 1978: 267, according to which the adjective was backformed to a causative *ganōgijaną of the type discussed below, strikes me as implausible; *ganōgijaną seems much likelier to be a denominative formed from the adjective.)

The final group of verb roots in *eC is those of the shape *CReC. They are heterogeneous in terms of inflectional ablaut class: *brekaną 'break' clearly belonged to class IV (past ptc. *brukanaz), but the rest either clearly belonged to class V (with *e in the past ptc.) or else the daughter languages do not agree on which class they belong to. However, a few of the latter do have derivatives with zero-grade *u in the root (e.g. OE *drype* 'stroke, blow', ON *troð*

'tread' = OE *trod* 'track', OE *trodu* 'step' = OHG *trota* 'winepress'), and it seems clear that these are archaisms. There is also a verb root of this group with unusual inflection and ablaut, namely

'ask' freg/h- ∼ frag- ∼ frēg- (∼ fursk-),

reflecting PIE *preḱ-. The ancient zero grade given in parentheses has been completely lexicalized; it appears only in OHG *forskōn* 'to investigate', which is obviously denominative. The (lost) noun from which it was formed must in turn have been made to the PIE present stem *pr̥sḱé/ó- (see 2.3.3 (i)). (On the other hand, there is also an OS and OHG *fergōn* 'to beseech, to plead for' the shape of whose root is difficult to explain.) Finally, the long *ō of ON *sœfa* 'to kill, to sacrifice', derived from *swef- 'sleep' (see above), perhaps reflects an inherited PIE ablaut grade (cf. Lat. *sōpīre* 'put to sleep', which appears to be a perfect cognate).

Roots ending in *-aC- (where *C includes sonorants) have a simpler system of inflectional ablaut, the only derived grade exhibiting *ō (and/or *ō̄—the two cannot be distinguished in root syllables); thus the system is

aC ∼ ōC (ō̄C) (class VI).

(Here also belongs the lone root in *-a-, namely *sta- 'stand' (Seebold 1970: 464–5).) Deviations from the expected ablaut pattern are of two kinds: not only do we occasionally find other ablaut grades, we also find *a in some forms in which *ō might be expected. I turn to the latter phenomenon first.

Because derived causative presents exhibited o-grade roots in PIE, and because the indicative sg. of the Germanic past reflects the o-grade indicative sg. of the PIE perfect in the first five ablaut classes, it appears as though PGmc causatives are formed from the indic. sg. past stem in a large majority of cases. It is therefore no surprise to find causatives to verbs of this class that exhibit *-ōC- in the root; at least the following can be cited:

- *fōrijaną 'to lead, to bring' (cf. ON *fœra*, OF *fēra*, OS *fōrian*, OHG *fuoren*; OE *fēran* has become intransitive) ← *faraną 'to travel, to go';
- *gōlijaną 'to cause to sing' (?; cf. Goth. *goljan* 'to greet', ON *gœla* 'to make laugh') ← *galaną 'to sing';
- *hlōgijaną 'to make laugh' (cf. Goth. *ufhlohjan*, ON *hlœgja*) ← *hlahjaną 'to laugh';
- *kōlijaną 'to cool' (cf. ON *kœla*, OE *cēlan*, OF *kēla*, OHG *kuolen*) ← *kalaną 'to freeze';
- *stōdijaną 'to stand (something) up' (cf. Goth. *anastodjan* 'to begin', ON *stœða* 'to establish') ← *standaną 'to stand' (with nasal infix); in this example (though not in the others) *ō can reflect post-PIE *-oh$_2$-.

But there are also at least two causatives that retain *a in the root:

*farjaną 'to make go, to carry across' (cf. ON *ferja*, OE *ferian*; Goth. *farjan*, OS *ferian*, OHG *ferien* 'sail') ← *faraną 'to travel, to go';
*wakjaną 'to wake (someone) up' (cf. Goth. *uswakjan*, ON *vekja*, OE *weċċan*, OS *wekkian*, OHG *wecken*) ← *wak- (in *wakai- ~ *wakja- 'to be awake', *waknō- ~ *wakna- 'to wake up').

(There are quite a few such verbs that do not appear to be causative in meaning; whether they were originally causatives is usually unclear.) This *a is of course the inherited o-grade vowel: this is an archaic type. It is very striking that *far- makes causatives of both types, and interesting that only the older one is attested in Gothic, the most divergent daughter; unfortunately that could easily be an accident. Whether any nominals exhibit *a in place of expected *ō is unclear.

Derivational ablaut grades that do not appear in the inflectional system are found especially among roots ending in sonorants. Most exhibit zero-grade *u (e.g. OE *ȳst* 'storm' < *unstiz (*an- 'breathe'), *manswora* 'perjurer', ON *kylr* 'cold(ness)', *mylja* 'to pulverize'), though note also *melwą 'meal' (ON *mjǫl*, OE *melu*, etc.) and other e-grade derivatives of *malaną 'to grind'. This is not surprising, since the roots in question are reflexes of PIE roots with underlying *e (preceded by *h_2 in the roots which became vowel-initial in PGmc). This is another set of archaisms.

Cases of *u in derivatives of roots beginning with *R or *CR are much rarer. To *slah- 'hit, kill' we find only Goth. *slaúhts* 'slaughter'; though the root has no convincing etymology (so that we cannot say for certain whether such an ablaut grade should be expected), the early attestation and isolation of the form suggest that it is an archaism, reflecting PGmc *sluhtiz ← *sulh-ti- (with metathesis of *u and the sonorant on the basis of the full grade, as usual). To *grab- 'dig' we find only OHG *gruft* 'den' and perhaps *grubilōn* 'to brood, to ponder'; this distribution does not particularly suggest an archaism, but the root did have an underlying */e/ in (post-)PIE (cf. OCS *grebetŭ* '(s)he rows'), so an inherited zero grade is not out of the question. On the other hand, the ON weak verb *muga* 'to be able', derived from the preterite-present *mag '(s)he can', is certainly an innovation; *u tends to spread in the inflection of preterite-presents over time, and such a development is attested for ON (cf. Noreen 1923: 352).

Finally, there are a couple of NWGmc examples of *ā (< PGmc *ē?) in roots of this shape (see Seebold 1970: 441, 461); presumably they are innovations, though the details are unclear.

Among the reduplicating strong verbs of class VII the most interesting group are those with internal *ē. Of the seven verbs whose pasts are attested in Gothic, six replace that vowel with *ō in the past;[5] their ablaut pattern is thus

ē ∼ ō (class VII).

The remaining verb, *slepan* 'to sleep', does not ablaut. Preterites to the remaining roots of this class are not attested in Gothic, and whether they exhibited ablaut cannot be determined from the remodeled NWGmc past stems which are attested. Somewhat surprisingly, the ablaut of derivatives does not correlate well with that of the inflectional paradigms. About half of these verbs either make no derivatives or make only derivatives with *ē. The rest (of all inflectional types) make derivatives with *a in the root at least as often as with root-internal *ō. Though the origin of particular examples is not always clear, it appears that this pattern, as a whole, reflects the usual PIE ablaut grades followed by the first laryngeal, with PGmc *a reflecting PIE *h_1 between nonsyllabics. Here too belongs the odd verb *dō- 'make, do', past *ded- ∼ *dēd-, whose only derivatives are *dēdiz 'deed' and *dōmaz 'judgment' (both well attested in every Germanic language; see Seebold 1970: 157–8).

Other class VII strong verbs did not exhibit inflectional ablaut in PGmc. Those with *ō in the root also fail to exhibit any derivational ablaut. (Apparent counterexamples, which are very few, are amenable to alternative explanations.) For the most part those with *ai, *au, *al, or *an in the root also exhibit no derivational ablaut. However, there are some plausible zero-grade derivatives (see Seebold 1970 passim):

OHG *skidōn* 'separate' ← *skeidan* < *skaiþaną 'separate';
OE *spittan* 'spit' ← *spātan* < *spaitaną 'spit';
ON *svipr* 'assault'; ON *svipa*, OE *swipe* 'whip'; ON *svipa* 'spin around'; ON *svipall* 'changeable'; OE *swipor* 'easy, clever' and OHG *swepfarlīhho* 'nimbly, craftily'; OE *swift* 'swift', all ← *swaipaną 'swing, wave';
OE *butorflēoge* 'butterfly' ← *bēatan* < *bautaną 'beat' (?; cf. ibid. 91);
OHG *loffōn* 'overflow' ← *loufan* < *hlaupaną 'run';
OHG *erstuzzen* 'shy away' ← *stōʒan* < *stautaną 'knock';
OHG *sulza* 'brine' ← *salzan* < *saltaną 'salt'.

There are even a few e-grade forms (ibid.):

[5] There is also an uncertain example *laíloun* 'they insulted', whose present is not attested; see Seebold 1970: 324 for potential cognates.

*skīdą 'billet, shingle' (cf. ON *skíð*, OE *scīd*, OF *skīd*, OHG *scīt*) ← *skaiþaną;
Goth. *midjasweipains* 'deluge' ← *swaipaną;
Goth. *spilda*, ON *flagspilda*, *spjald* 'board', OE *speld* 'wood-chip', cf. OHG *spaltan* 'split' noun *spalt* (not attested elsewhere).

These do not all seem to represent the same phenomenon. The large number of examples reflecting *swīp- ∼ *swip- must be connected with the odd fact that the corresponding verb has a past of class I in ON even though its present belongs to class VII; a reasonable guess would be that there were originally two strong verbs belonging to this etymological family (though why that should be so is not clear). The last word-family listed above shows an unusual geographical split, with *a in OHG but *e ∼ *i elsewhere. The other examples are less easy to judge. Zero-grade forms are numerous enough to raise a suspicion that at least some of these verbs might once have had default past stems with zero-grade rather than 'a-grade' roots.

Finally, it seems clear that the inherited pattern of derivation with lengthened-grade roots ('vr̥ddhi') was no longer productive in PGmc; Darms 1978 has assembled all the more plausible examples (with much other relevant material), and they appear to be fossils.

4.3 PGmc inflectional morphology

4.3.1 *Inflectional categories of PGmc*

The classes of inflected lexemes in PGmc included verbs, nouns, adjectives, pronouns, determiners, and most quantifiers. All except verbs were inflected according to a single system and are therefore grouped together as 'nominals'; verb inflection was modestly more complex than nominal inflection.

As in PIE, all nominals were inflected for number and case. Singular and plural were distinguished for all nominals; the dual survived only in the first- and second-person pronouns and perhaps in the quantifiers 'two' and 'both'.

Case was assigned to noun phrases in PGmc in the same ways as in PIE, and number and case 'percolated' in the same way. PGmc prepositions assigned case to their objects. There were six nominal cases with the following functions:

case	*functions*
vocative	direct address
nominative	subject of finite verb; complement of 'be', etc.
accusative	(default) direct object of verb; motion toward; object of prepositions
dative	indirect object; position; standard of comparison; object of prepositions

genitive	complement of noun phrase; object of prepositions
instrumental	instrument; object of prepositions

The PIE system of noun class concord (gender) remained unchanged in PGmc. Concord of person and number (but not gender) obtained between a finite verb and its subject. PGmc probably continued to be a pro-drop language.

PGmc verb inflection was organized around the category tense. Every verb had a nonpast stem, traditionally called 'present', and a finite past stem, as well as a past participle. Each of the finite tense stems exhibited forms for the indicative mood and a mood usually called 'subjunctive', though it was descended from the PIE optative; the present stem also had an imperative mood. In addition, there was a (present) infinitive and a present participle. There were different active and passive forms only in the present indicative and subjunctive; the present imperative, infinitive, and participle, as well as the entire finite past system, was active only, while the past participle was passive. Other passive categories must have been expressed periphrastically, as in the attested daughter languages.

4.3.2 *The formal expression of PGmc inflectional categories*

In nominals, number and case were expressed by 'fused' endings. The system resembled that of Latin, with a number of more or less arbitrary declensions.

In those nominals that expressed gender, the feminine suffix had fused with the case-and-number endings and might no longer have been segmentable. Neuter gender continued to be distinguished from masculine only in the nominative, accusative, and vocative cases, in which it exhibited different case-and-number endings.

The present stem of an underived verb usually exhibited the underlying form of the lexical root (unaffected by ablaut, the Verner's Law alternation, etc.), followed by a stem vowel reflecting the PIE thematic vowel, which in turn was followed by endings expressing the person and number of the subject (or the infinitive, or the participial suffix), with special endings for passives and for the imperative mood. The subjunctive mood was marked partly by replacing the stem vowel with *-ai-, but the endings were also mostly different from those of the indicative. The finite past stems of most underived verbs exhibited initial reduplication or (more often) an ablaut grade of the root different from that of the present; in a large majority of the latter cases, the singular indicative also exhibited an ablaut grade different from that of the rest of the past paradigm. Indicative endings—largely different from those of the present—were added directly to the stem in the singular; otherwise the stem vowel was *-u-. The subjunctive suffix was *-ī-, which was followed

by the same endings as in the present subjunctive. The past participles of underived verbs exhibited a distinctive suffix, with an ablaut grade of the root usually (though not always) identical either with that of the default past tense stem or with that of the present stem.

The present stems of derived verbs exhibited a variety of suffixes, all consisting of or ending in vowels and nearly all distinct from the simple thematic stem vowel typical of underived verbs. The subjunctive suffix and all the endings were more or less the same as for basic verbs (modulo fusion with the stem vowel and the Verner's Law alternants of endings). The finite past stem was constructed by adding the past-tense suffix *-T- ∼ *-Tēd- (usually *-d- ∼ *-dēd-) to a base that was usually slightly different from the present stem; the subjunctive suffix and the endings were mostly the same as for basic verbs, though the singular endings of the indicative were different. The past participle was similarly constructed, except that the suffix was *-Ta- (usually *-da-).

There were a few small classes of underived verbs whose inflectional paradigms varied from the system just described. The most important were the 'preterite-presents', whose present stems were inflected like the finite past stems of most basic verbs and whose past stems (including the past participle) were inflected like the past stems of derived verbs. At least 'be', 'go', 'want to', and 'do' were anomalous; the first two were suppletive.

4.3.3 *PGmc verb inflection*

In PGmc, as in Latin (but not Greek or Sanskrit), most verbs belonged to one of several large inflectional classes. Verbs can be classified as follows on the basis of stem formation.

I. Strong verbs (including most underived verbs)
   - A. Unaffixed thematic presents, stem vowel *-i- ∼ *-a- < PIE *-e- ∼ *-o-. (This subclass included the vast majority of strong verbs.)
   - B. Presents in *-i- ∼ *-ja- < PIE *-ye- ∼ *-yo- (after a light syllable) or *-ī- ∼ *-ija- < PIE *-ie- ∼ *-io- (after a heavy syllable, by Sievers' Law; about ten verbs of this subclass are reconstructable for PGmc).
   - C. Thematic presents with a nasal affix (a few relics).

II. Weak verbs
   - A. Unsuffixed thematic present, past with no vowel before the suffix (at most three verbs reconstructable: *bringaną, past *branhtē 'bring'; *brūkaną, past *brūhtē 'use'; possibly *būaną, past *būdē 'dwell').
   - B. Presents in *-i- ∼ *-ja- or *-ī- ∼ *-ija-, past with no vowel before the suffix (five verbs reconstructable, e.g. *wurkijaną 'make', past *wurhtē).

C. Presents in *-i- ∼ *-ja- or *-ī- ∼ *-ija-, past with *-i- before the suffix (the normal 'first weak' class, large and productive).
D. Presents in *-ō̄- < *-āye- ∼ *āyo-, past with *-ō- before the suffix (the 'second weak' class, probably large and certainly productive).
E. Presents in *-ai- ∼ *-ja- < *-əye- ∼ *-əyo-, past with no vowel before the suffix (statives, part of the 'third weak' class).
F. Presents in *-ai- ∼ *-ā- < *-oye- ∼ *-oyo-, past possibly with *-a- before the suffix (factitives, part of the 'third weak' class).
G. Presents in *-nō- ∼ *-na-, ultimately < PIE *-ne-h_2- ∼ *-n̥-h_2-, past apparently with *-nō- before the suffix (fientives, the 'fourth weak' class).

III. Preterite-present verbs (fifteen reconstructable).

IV. Anomalous verbs. These included at least the suppletive 'be' (with a unique athematic present) and 'go' (with a strong present but a suppletive past), as well as 'want (to)' (of which the pres. indic. was an old optative; the past was weak) and 'do' (of which the past was the old imperfect; the pres. survives only in West Germanic and may have been remodeled extensively). Alternative presents of 'stand' and 'go' perhaps belonged here as well.

The large classes were IA (which was only marginally productive but contained a large majority of underived verbs) and IIC through IIG (all of which were productive), but—as is usual in IE languages—many very common verbs belonged to the small classes.

4.3.3 (i) *Strong verbs* The classification given above is based on stem-forming affixes. A more detailed picture of the system is obtained if one first separates the strong verbs into lexical classes on the basis of the ablaut patterns of their root syllables. That is the system used in traditional grammars, and I will also use it here. This initial section will describe aspects of the system that are common to all strong verbs; the idiosyncrasies of each class of verbs will then be described in separate sections.

Every strong verb had four stems (not necessarily all different from one another): a present stem, from which all forms of the present tense were made; a past indicative singular stem; a default past stem, from which the remaining finite past forms were made; and a past participle. Each stem was distinguished by an ablaut grade of the root and/or initial reduplication, determined by the lexical class of the verb and the identity of the stem; the past participle was also marked by a suffix *-an-a-. If the root ended underlyingly in a voiceless fricative, that fricative was replaced by the corresponding voiced obstruent in the default past stem and the past participle; that alternation,

sometimes called 'grammatical change', was the synchronic residue of Verner's Law in strong verb inflection. It is customary to exemplify the stems by listing the 'principal parts' of a strong verb, namely the present infinitive, the past indicative 3sg., the past indicative 3pl., and the past participle.

The vast majority of strong verbs exhibited the following combinations of stem-vowel and endings in the present:

		indicative	*subjunctive*	*imperative*	
active					infinitive -a-nạ
sg.	1	-ō	-a-ụ	—	participle -a-nd-
	2	-i-zi	-ai-z	Ø	
	3	-i-di	-ai-Ø	-a-dau	
du.	1	-ōz (?)	-ai-w	—	
	2	-a-diz (?)	-ai-diz (?)	-a-diz (?)	
pl.	1	-a-maz	-ai-m	—	
	2	-i-d	-ai-d	-i-d	
	3	-a-ndi	-ai-n	-a-ndau	
passive					
sg.	1	-ōi? -ai?	???	—	
	2	-a-zai	-ai-zau?	—	
	3	-a-dai	-ai-dau?	—	
du. & pl.		-a-ndai	-ai-ndau?	—	

The reconstruction of the dual, passive, and 3rd-person imperative endings is not fully secure, because (with the exception of the fossilized passive 'be called') they are attested only in Gothic, and we cannot be sure that every innovation appearing in Gothic was already present in PGmc. The 2du. ending is especially unclear because it is possible that its shape in Gothic resulted from a Gothic sound change whose effects were eliminated by morphological change in other, less isolated morphemes. I here assume that Goth. 2du. *-ts* reflects *-þs < *-diz, with a shift of *þ to a stop before word-final *-s* that was eliminated by paradigmatic leveling elsewhere (pace Krause 1968: 261). It is also possible that the generalization of the o-grade thematic vowel *-a-* in passives, duals, and 3rd-person imperatives had not yet occurred in PGmc, and that the syncretism of persons in the non-singular passive was likewise a post-PGmc development. On the other hand, it seems clear that Goth. pres. indic. 1pl. *-m* must reflect *-mz < *-maz, with loss of word-final *-z after *-m-*, both because the same change is reflected in the dative plural and because early Runic inscriptions prove that the latter category did end in *-mVz. It is also very likely that the Gothic subjunctive endings 1du. *-aiwa,*

1pl. *-aima,* 3pl. *-aina,* in which *-a* must reflect an earlier long vowel, are innovations, since the 1pl. and 3pl. subjunctive endings in the other Germanic languages show no trace of a final long vowel.

The endings of j-presents were the following (if one accepts the conjecture about the distribution of Verner's Law alternants advanced at the end of 3.4.3 (i)). Verbs with light roots:

		indicative	*subjunctive*	*imperative*	
active					infinitive -ja-ną
sg.	1	-j-ō	-ja-ų	—	participle -ja-nd-
	2	-i-si	-jai-s	-i (?)	(-ja-nþ- ??)
	3	-i-þi	-jai-Ø	-ja-þau	
du.	1	-j-ōs (?)	-jai-w	—	
	2	-ja-þiz (?)	-jai-þiz (?)	-ja-þiz (?)	
pl.	1	-ja-maz	-jai-m	—	
	2	-i-þ	-jai-þ	-i-þ	
	3	-ja-nþi	-jai-n	-ja-nþau	
passive					
sg.	1	-jōi? -jai?	???	—	
	2	-ja-sai	-jai-sau?	—	
	3	-ja-þai	-jai-þau?	—	
du. & pl.		-ja-nþai	-jai-nþau?	—	

Verbs with heavy roots:

		indicative	*subjunctive*	*imperative*	
active					infinitive -ija-ną
sg.	1	-ij-ō	-ija-ų	—	participle -ija-nd-
	2	-ī-si	-ijai-s	-ī	(-ija-nþ-?)
	3	-ī-þi	-ijai-Ø	-ija-þau	
du.	1	-ij-ōs (?)	-ijai-w	—	
	2	-ija-þiz (?)	-ijai-þiz (?)	-ija-þiz (?)	
pl.	1	-ija-maz	-ijai-m	—	
	2	-ī-þ	-ijai-þ	-ī-þ	
	3	-ija-nþi	-ijai-n	-ija-nþau	
passive					
sg.	1	-ijōi? -ijai?	???	—	
	2	-ija-sai	-ijai-sau?	—	
	3	-ija-þai	-ijai-þau?	—	
du. & pl.		-ija-nþai	-ijai-nþau?	—	

All strong verbs exhibited the following combinations of stem-vowel and endings in the finite past (which exhibited only active forms):

		indicative	*subjunctive*
sg.	1	Ø	-ij-ų (?; or -ī??)
	2	-t	-ī-z
	3	Ø	-ī-Ø
du.	1	-ū (?)	-ī-w
	2	-u-diz (?)	-ī-diz (?)
pl.	1	-u-m	-ī-m
	2	-u-d	-ī-d
	3	-u-n	-ī-n

4.3.3 (i.a) *The first strong class*

The majority ablaut pattern of this class was pres. *ī, past indic. sg. *ai, default past *i, past ptc. *i; the root normally ended in a consonant (but see further below). About thirty verbs of this majority type are securely reconstructable for PGmc.[6] Typical examples include:

*bītaną, *bait, *bitun, *bitanaz 'bite';
*bīdaną, *baid, *bidun, *bidanaz 'wait (for)';
*snīþaną, *snaiþ, *snidun, *snidanaz 'cut'.

About an equal number of well-attested examples are restricted to various subgroups of the family.

It appears that there were no verbs of this class with roots ending in the geminate sonorant characteristic of the class (i.e., in *-ijj-), in contrast to the second and third classes (see the following two sections).

Three verbs of this class seem to have had zero-grade presents with *i rather than *ī in the root. The reconstruction of these verbs is more than usually inferential, but their principal parts in PGmc must have been:

*diganą, *daig, *digun, *diganaz 'knead, make out of clay';
*stikaną, *staik, *stikun, *stikanaz 'stab, stick';
*wiganą, *waih, *wigun, *wiganaz 'fight'.

The first of these verbs is attested only in Gothic, and its only attested present form is the pres. ptc. dat. sg. (weak) *digandin* (translating Gk *πλάσαντι*); but the form is unambiguous, and the verb was clearly inherited from PIE (cf. Seebold 1970: 151–2). Since the Skt root-present almost certainly reflects the PIE inflection, we must suppose that in this case (exceptionally) the verb was thematized

[6] The numbers given in this and subsequent sections are necessarily approximations. A lexeme that is 'securely reconstructable' for PGmc is by definition one which (a) is attested in Gothic (the most divergent daughter) and at least one other language, and/or (b) has good cognates outside the Gmc subgroup. Accidents of attestation inevitably give rise to uncertainty in numerous cases.

in Gmc on the basis of zero-grade rather than full-grade forms. 'Fight' is attested in every 'Old' Gmc language; its inflection has generally been regularized, but differently in each daughter, so that the original inflection is easy to recover (cf. Seebold 1970: 544–5). Two details of its form are noteworthy: the root clearly exhibited final */h/ underlyingly, which underwent the Verner's Law voicing in the present stem because the following thematic vowel had originally been accented (as in Skt presents of the type *tudáti*); and the present stem is a perfect etymological match for OIr. *fichid*—a very rare example of a *tudáti*-type present appearing in more than one branch of the IE family. The example 'stick' survives as a verb only in WGmc, where the short vowel of its present stem has been lowered to *e* and the verb has been shifted into the fifth or even the fourth ablaut class (Seebold 1970: 467). But the vast majority of the verb's putative derivatives are clearly derived from a verb of class I (ibid. 467–8), and Gk στίζειν /stízdeːn/ 'to tattoo' is the most convincing external cognate (ibid. 471).

No PGmc class I j-presents are reconstructable. However, at least three PGmc verbs—*kīnaną 'sprout', *gīnaną 'yawn, gape', and *skīnaną 'shine'—must originally have had present stems formed with a nasal suffix, apparently thematic *-ni- ∼ *na-. To be sure, only one attested inflectional form of any of these verbs lacks the nasal, namely Goth. past ptc. (nt. nom.-acc. sg.) *uskijanata* 'having sprouted'; otherwise *-n- has been reanalyzed as the root-final consonant. However, each of these verbs has a substantial number of derivatives that lack the *-n- (cf. ibid. 220, 291, 410), showing that it was an inflectional morpheme for much of the independent prehistory of PGmc.[7] Since the spread of *-n- through the paradigm was probably a repeatable innovation, the situation in PGmc is not recoverable with certainty. The original formation of these presents is also somewhat unclear. From a PIE standpoint one would expect to find zero-grade roots before the nasal suffix, and for some of these verbs one might also expect that suffix to have been fientive *-nō- ∼ *-na- (see 3.4.3 (i)). A few isolated facts suggest as much: Goth. past 3sg. *uskeinoda* 'it sprouted' (the only attested past form of that particular verb); class II weak OE *ġinian*, OS *ginōn* 'to yawn'; and a few nominal derivatives with *-in- made from each of the verbs. But at least one fully 'regular' paradigm of this subclass is reconstructable for PGmc, namely

*skīnaną, *skain, *skinun, *skinanaz 'shine, appear'.

The evidence does not seem to support more definite conclusions.

4.3.3 (i.b) *The second strong class*

[7] A few verbs of this shape that are not attested in Gothic and do not have secure external cognates also exhibit a possible derivative or two each without *-n-, which at least suggests that they might already have been part of the PGmc lexicon; see Seebold 1970: 171, 280, 484.

The majority ablaut pattern of this class was pres. *eu (∼ *[iu]), past indic. sg. *au, default past *u, past ptc. *u; the root always ended in a consonant. About thirty verbs of this type, too, are securely reconstructable for PGmc. Typical examples include:

*geutaną, *gaut, *gutun, *gutanaz 'pour';
*kleubaną, *klaub, *klubun, *klubanaz 'split';
*teuhaną, *tauh, *tugun, *tuganaz 'lead, pull'.

About twenty other well-attested examples are restricted to various subgroups of the family.

In at least three securely reconstructable examples—*blewwaną 'beat', *brewwaną 'brew', and *kewwaną 'chew'—the consonant closing the root is identical with the preceding sonorant. The inflection of this subtype seems to have been regular, e.g.

*kewwaną, *kaww, *ku(w)un, *kuwanaz 'chew'.

(Two further examples, *hnewwaną 'knock' and *hrewwaną 'cause regret', are restricted to NWGmc; both are very well attested.) The etymological source of these *ww remains unclear; it has often been suggested that they reflect *wH (cf. e.g. Lehmann 1965: 213–15), but of the putative PIE etyma only *gewH- 'chew' can actually be shown to have ended in a laryngeal. (Almost all the other supposed Germanic reflexes of laryngeals listed in Lehmann 1965 are likewise questionable or indefensible.)

No 'normal' zero-grade presents of class II appear anywhere in Germanic. However, presents with *ū in place of the usual *eu are surprisingly common, especially in the northern dialects of WGmc. But only one is securely reconstructable for PGmc:

*lūkaną, *lauk, *lukun, *lukanaz 'close'.

Since this verb has no secure cognates outside of Gmc, the source of its *ū is unknown. See vol. ii for discussion of the further development of this subclass.

Neither j-presents nor nasal presents appear in class II.

4.3.3 (i.c) *The third strong class*

This class had already been split in PGmc by the superficial rule raising *e to *i before tautosyllabic nasals. I deal first with the subclass of roots in *iNC, then with those in *elC and *erC; roots ending in two obstruents will be discussed at the end of the section.

The ablaut pattern of the nasal subclass was pres. *iN, past indic. sg. *aN, default past *uN, past ptc. *uN; the root always ended in a consonant. About

twenty verbs of this type are securely reconstructable for PGmc (including those ending in geminate nasals; see below). Typical examples include:

*finþaną, *fanþ, *fundun, *fundanaz 'find';
*drinkaną, *drank, *drunkun, *drunkanaz 'drink';
*brinnaną, *brann, *brunnun, *brunnanaz 'burn (intr.)'.

Some thirty further well-attested examples are restricted to various subgroups of the family.

In this subclass roots ending in geminates are common; they include about a third of the securely reconstructable examples (including the only one ending in a labial, *swimmaną 'swim'). Since most of the roots in question have no clear outside cognates, the etymological source of these geminates is difficult to determine. In one case, however, it seems fairly likely that PGmc *nn reflects earlier *nw (cf. Seebold 1970: 376–7): *rinnaną 'run; flow' is likely to be cognate either with Skt *ṛṇóti* 'goes, arises' (in which case *(H)ṛ-nw- > *urnw- → *runw- → *renw- > *rinn-), or else (approximately) with Skt *riṇáti* 'flows' (with a different nasal suffix; in which case *ri-nw- > *rinn-, and the latter was reinterpreted as underlying */renn-/).[8]

There were no minority present formations in this subclass.

The ablaut pattern of the nonnasal subclass was pres. *eR (∼ *[iR]), past indic. sg. *aR, default past *uR, past ptc. *uR; the root normally ended in a consonant (though see further below). About fifteen verbs of this type are securely reconstructable for PGmc. Typical examples include:

*werþaną, *warþ, *wurdun, *wurdanaz 'become';
*þersaną, *þars, *þurzun, *þurzanaz 'dry out';
*felhaną, *falh, *fulgun, *fulganaz 'enter';
*helpaną, *halp, *hulpun, *hulpanaz 'help'.

Another two dozen well-attested examples are confined to various subgroups of the family.

Verbs with roots in *ll are fairly well attested in the daughter languages, but the only one securely reconstructable for PGmc seems to be *swellaną 'swell'; as it has no clear outside cognates, the source of its *ll is obscure.

Though there are no simple thematic presents with zero-grade roots nor j-presents in this subclass, two nasal-suffixed presents are probably reconstructable for PGmc or its immediate ancestor, namely *spurnaną 'kick, stomp on' and *murnaną 'lament, mourn'. The first of these verbs is attested

[8] The fact that most zero-grade derivatives of this stem exhibit a single *-n- (Seebold 1970: 376) might be taken as an indication that the suffix was originally *-nH-, not *-nw-; in that case the second Skt. verb cited could be the more plausible cognate.

only in NWGmc, and in every language the original present suffix *-n- has spread to the other stems of the verb (to the extent that they occur, ibid. 453); but all the derivatives lack the *-n- (ibid. 454), the zero-grade root is exactly what would be expected in a nasal-infixed present, and the Gmc present is an unproblematic reflex of PIE *spr̥-né-h_1- ∼ *spr̥-n-h_1-. Whether the present suffix had already been leveled into the rest of the paradigm in PGmc cannot be determined. The second example is more problematic. Only OE *murnan* is actually inflected as a strong verb; Goth. *maúrnan* and OHG *mornēn* belong to the third weak class, and OE, OS weak class II *mornian* (OS also *mornōn*) can reflect an earlier verb of that class. Yet the verb unquestionably exhibited a present-stem forming suffix (since PIE roots could not end in two sonorants), and development of such a present into a class III weak verb in PGmc would be unparalleled. That is perhaps as much as can usefully be said.

It is striking that roots ending in *eCC, where both consonants are obstruents, also belong to this ablaut class. Probably only four such verbs are reconstructable for PGmc:

*flehtaną, *flaht, *fluhtun, *fluhtanaz 'plait';
*þreskaną, *þrask, *þruskun, *þruskanaz 'thresh';
*wresk^{w}aną, *wrask^{w}, *wruskun, *wrusk^{w}anaz 'grow';
*fehtaną, *faht, *fuhtun, *fuhtanaz 'fight'.

The fourth example is somewhat problematic: though it is attested only in WGmc, it appears to be an exact cognate of Lat. *pectere* 'to comb', which can also mean 'to thrash (someone)'; how to assess the relationships is necessarily a matter of judgment. The other three examples—including the only one with indisputable outside cognates, *flehtaną (< PIE *plek-t-)—all began with CR-clusters; it seems clear that the *u of the zero-grade forms originally arose from a syllabic sonorant, and that the sequence *uR was adjusted on the model of the full-grade forms (e.g. *pl̥kt- > *fulht- → *fluht-; see 3.2.2 (i), 4.2.2 (ii)). Seven more examples of roots of this type are well attested in various subgroups of the family; very strikingly, all but one begin with CR-clusters, and the remaining example, PWGmc *leskan 'be extinguished', begins with a sonorant. Under the circumstances it is not very surprising that zero-grade *u has been extended to 'fight'.

4.3.3 (i.d) *The fourth strong class*

Most of the verbs of this class exhibited roots ending in sonorants. So few are securely reconstructable for PGmc that it seems reasonable to give a complete list:

*beraną, *bar, *bērun, *buranaz 'carry, bear';

*skeraną, *skar, *skērun, *skuranaz 'shear';
*teraną, *tar, *tērun, *turanaz 'tear';
*dwelaną, *dwal, *dwēlun, *d(w)ulanaz 'go astray';
*helaną, *hal, *hēlun, *hulanaz 'hide';
*stelaną, *stal, *stēlun, *stulanaz 'steal';
*k^{w}emaną, *k^{w}am, *k^{w}ēmun, *kumanaz 'come';
*nemaną, *nam, *nēmun, *numanaz 'take';
*temaną, *tam, *tēmun, *tumanaz 'fit';
*stenaną, *stan, *stēnun, *stunanaz 'sigh, groan'.

A zero-grade present of this class was probably *wulaną 'boil' (vel sim.), which survives only in Gothic and is there attested only in the present. With the exception of *dwelaną, *stelaną, and *wulaną, all these verbs have good PIE etymologies. It is possible that a verb *bremaną 'roar' should also be reconstructed for PGmc; the reconstruction rests on a single OHG form, a derived class I weak verb, and some names of insects, but Lat. *fremere* appears to be a perfect cognate (cf. Seebold 1970: 135). Other possible examples are still less certain. PNWGmc *k^{w}elaną 'suffer' may or may not have outside cognates (ibid. 313–14); the same can be said of PWGmc *þweran 'stir up' (ibid. 528) and OHG *sweran* 'be painful, smart' (ibid. 494). A couple of examples are completely confined to the 'continental' WGmc languages and so are of no relevance here. It seems clear that this is largely a class of inherited verbs that has undergone very little expansion in several millennia of development.

The only other verb that clearly belonged to this ablaut class in PGmc exhibits a root of the shape *CReC-:

*brekaną, *brak, *brēkun, *brukanaz 'break'.

All the 'Old' Gmc. languages except ON (which has lost the verb) and OF exhibit reflexes of *u in the past ptc.; it seems clear that the *u arose from the syllabic sonorant that one would expect in zero-grade forms (see the preceding section with references). However, this was not the only PGmc root of such a shape. The ablaut class membership of the others is a complex problem that will be discussed at the end of the following section.

4.3.3 (i.e) *The fifth strong class*

Here belong most roots ending in *-eC-, where *C is an obstruent. They fall naturally into several subclasses, which will be discussed in turn.

The only vowel-initial example—in fact, the only strong verb beginning with *e- —was the inherited basic verb meaning 'eat':

*etaną, *ē̄t, *ētun, *etanaz.

It appears that the reduplicating syllable had contracted with the root in the past indic. sg. (see 3.4.3 (ii)).

Otherwise the default ablaut pattern for this class was pres. *e (~ *[i]), past indic. sg. *a, default past *ē, past ptc. *e—identical with that of the fourth class, except that the past ptc. exhibits an e-grade root.

The largest class of these verbs exhibited roots of the shape *CeC-. Some seventeen simple thematic presents with default ablaut can be reconstructed for PGmc, and fourteen of them have clear PIE etymologies. The following are typical:

*gebaną, *gab, *gēbun, *gebanaz 'give';
*k^{w}eþaną, *k^{w}aþ, *k^{w}ēdun, *k^{w}edanaz 'say';
*seh^{w}aną, *sah^{w}, *sēgun (subj. *sēwī-), *sewanaz 'see';
*weganą, *wag, *wēgun, *weganaz 'move';
*wesaną, *was, *wēzun, *wezanaz 'stay, be'.

Three further examples are confined to WGmc. Once again we are in the presence of an old class that has undergone very little expansion.

Three verbs of this class reconstructable for PGmc exhibited j-presents, and all three have good PIE etymologies:

*bidjaną, *bad, *bēdun, *bedanaz 'ask for';
*ligjaną, *lag, *lēgun, *leganaz 'lie';
*sitjaną, *sat, *sētun, *setanaz 'sit'.

The last two have been remodeled as simple thematic presents in Gothic. A fourth example, *þigjaną 'receive', appears to have been a NWGmc innovation. Note that the presence of the *j has raised the root vowel to *i throughout the present stem of these verbs.

There were no other minority present types among roots of this shape.

Roots of the shape *CReC- pose some complex problems. I noted above that 'break' clearly belonged to class IV in PGmc. At least one such verb clearly belonged to class V:

*wrekaną, *wrak, *wrēkun, *wrekanaz 'drive (out), pursue'.

The past ptc. with internal *e is securely reconstructable on the basis of Goth. *wrikans,* ON *rekinn,* and OE *wrecen* (ibid. 568–9); OHG disagrees with *girohhan,* but it is clear that verbs of this type have largely been shifted into class IV in OHG. For other PGmc verbs of this type the evidence is insufficient to permit the reconstruction of the past participle. PGmc *swefaną 'sleep' survives only in ON and OE (though it has an absolutely solid PIE etymology); ON *sofinn* could reflect either *sweb- or *sub-, and

the OE past ptc. is not attested (Seebold 1970: 482). For *hlefaną 'steal' (the inherited PIE word) we have only Goth. pres. *hlifan* and past subj. 3sg. *hlefi* (ibid. 261). PGmc *hreþaną 'sift', though it has good Celtic and Baltic cognates, survives only in OHG *redan,* of which the past ptc. is not attested (ibid. 274). Other examples are restricted to various subgroups of the family. In OHG they usually (though not invariably) belong to class IV; in ON and OE they usually belong to class V. The most evenly balanced example is PNWGmc *drepaną 'hit, kill', which belongs to class IV in OHG (past. ptc. *gitroffan*), class V in ON (past ptc. *drepinn*), and vacillates in OE (past ptc. *drepen* and *dropen*); the OS past ptc. is not attested, and OF lacks the verb (ibid. 166).

Two roots of this shape seem to have exhibited zero-grade presents in PGmc, namely *trudaną 'step on, tread' and *knudaną 'knead'. The former is solidly attested in the non-WGmc languages:

Goth. *trudan,* —, —, *trudans;*
ON *troða, trað, tráðu, troðinn*

(ibid. 505); in those languages it was clearly a class IV verb. In WGmc, however, we find a class V verb:

OE *tredan, træd, trǣdon, treden;*
OF *treda,* —, —, *treden*;
OHG *tretan, trat, trātun, gitretan.*

Even the OHG verb[9] belongs unambiguously to the fifth class. Since the anomalous zero-grade present must be original, the WGmc e-grade present can only be an innovation, but its source is unclear. We might consider positing a PGmc paradigm

*trudaną, *trad, *trēdun, *tredanaz (?) 'step on'

with an e-grade past participle, which could easily have been leveled in both directions; but it is difficult to see why the participle should not have exhibited a zero-grade root when even the present stem did so. The alternative is to suggest that this verb was shifted into the fifth class in WGmc by sheer 'pattern pressure', based on the shape of its root. The case of 'knead' is similar, but the data are sketchier:

Old Swedish *knodha,* —, —, —;
OE *cnedan,* —, *cnǣdon, cneden;*

[9] Apparently omitted from Seebold 1970: 505 by mistake, since he lists it in his summary table and lists OHG compounds of it (ibid.).

OS —, —, —, *giknedan;*
OHG *knetan, knat,* —, *giknetan*

(cf. ibid. 303–4).

Finally, this group included one verb with a nasal suffix that is securely reconstructable for PGmc:

*fregnaną, *frah, *frēgun, *freganaz 'ask'.

The reflexes of this verb have undergone extensive analogical remodeling, especially in WGmc (ibid. 208–9), but the shape of the PGmc paradigm is not doubtful. It is striking that an e-grade root occurred not only in the past ptc. but also in the present, even though the Verner's Law voicing of the root-final consonant shows that the suffix must originally have been accented (which might lead us to expect a zero-grade root).

4.3.3 (i.f) *The sixth strong class*

It seems likely that in the vowel-initial verbs of this class—namely *akaną 'drive', *alaną 'nourish, rear (a child)', and *ananą 'breathe'—the reduplicating syllable and root syllable contracted to a trimoric vowel in the past indic. sg. stem; a typical PGmc paradigm would then have been

*akaną, *ōk, *ōkun, *akanaz 'drive'.

Though the first of these verbs is attested only in ON (and OE?; see Seebold 1970: 75) and the third must be inferred from the single Gothic form *uzon* 'he expired', all three have solid PIE etymologies.

So far as can be determined, the ablaut pattern of the remaining verbs of this class in PGmc was pres. *a, past *ō, past ptc. *a. About fourteen verbs with simple thematic presents to roots of the shape *C(C)aC- are reconstructable for PGmc; these are typical:

*faraną, *fōr, *fōrun, *faranaz 'travel, go';
*malaną, *mōl, *mōlun, *malanaz 'grind';
*wadaną, *wōd, *wōdun, *wadanaz 'wade, walk';
*skabaną, *skōb, *skōbun, *skabanaz 'shave';
*hlaþaną, *hlōþ, *hlōdun, *hladanaz 'load';
*slahaną, *slōh, *slōgun, *slaganaz 'hit, kill'.

As can be seen, the exact shape of the root does not affect the ablaut. About half as many well-attested examples are confined to particular subgroups of the family.

j-presents are common in this ablaut class; the following are securely reconstructable for PGmc:

*swarjaną, *swōr, *swōrun, *s(w)uranaz (*swaranaz?) 'swear';
*habjaną, *hōf, *hōbun, *habanaz 'lift';
*sabjaną, *sōf, *sōbun, *sabanaz 'notice';
*skaþjaną, *skōþ, *skōdun, *skadanaz 'hurt, harm';
*skapjaną, *skōp, *skōpun, *skapanaz 'make, fashion';
*fraþjaną, *frōþ, *frōdun, *fradanaz 'understand';
*hlahjaną, *hlōh, *hlōgun, *hlaganaz 'laugh';
*wahsijaną, *wōhs, *wōhsun, *wahsanaz 'grow'.

The first example has been remodeled as a simple thematic present in Gothic. The last example appears as a simple thematic verb in WGmc and partly in ON, but not in Gothic (ibid. 532); both the pattern of attestation and the fact that the j-present can be explained as a PIE derived present (with an o-grade root) suggest that the j-present is old. The only clearly innovative j-present in this class of strong verbs is PWGmc *stapjan 'step'; whether ON *kefja* 'press down' is cognate with Gk *βάπτειν* /bápteːn/ 'to dip' (ibid. 311–12) is very unclear.

The only unarguable nasal-infixed present of PGmc also belonged to this ablaut class:

*standaną, *stōþ, *stōdun, *stadanaz 'stand'.

While this verb obviously reflects PIE *steh$_2$- 'stand', its formation is more than a little unclear. The past stem appears to reflect pre-PGmc *stāt- (< *steh$_2$-t- ??); the past ptc. (preserved in ON *staðinn*) appears to reflect the corresponding form with a short vowel, *stat- (< *sth$_2$-t- ??). The nasal appears to have been infixed to form the present stem. No close parallels from other subgroups of IE can be cited.

Other nasal-affixed presents of this class are much more uncertain. OE *wæcnan* 'wake up' is a strong verb, but both its fientive meaning and ON weak class II *vakna* suggest that we ought to reconstruct a PGmc class IV weak verb *wak-nō- ∼ *wak-na-. (Goth. pres. ptc. *gawaknands* '(upon) awakening' is morphologically ambiguous.) For an even less certain example see Seebold 1970: 531.

4.3.3 (i.g) *The seventh strong class*

This is a residual category, unified by a single morphological feature: finite pasts of this class were still reduplicated in Gothic and must have been so in PGmc as well. I will first deal with the reduplicating syllable and then treat subclasses of verbs, defined by the shape of their root-syllables, in turn.

The basic shape of the reduplicating syllable was the initial consonant of the root followed by the vowel *e. Clusters of *s followed by a stop

were reduplicated in their entirety; otherwise only the initial consonant was reduplicated, even if another consonant (in practice always a sonorant) followed. If there was no initial consonant, the reduplicating syllable was simply *e-. Except for the last detail, the reduplicating rule was inherited from PIE without change.

Since the accent originally fell on the root, not the reduplicating syllable, Verner's Law ought to have applied to root-initial voiceless fricatives. In the case of *s we can show that it did: in Gothic we find *gasaízlep* 'he fell asleep' beside *saíslep* 'he slept'; ON *sera* 'I sowed' can only reflect PGmc *sezō; and the curious OHG infix *-er-* occasionally found in the pasts of a number of these verbs probably reflects sequences *-e-r- and *-e-z- (which would have merged by regular sound change) reinterpreted and generalized (Noreen 1923: 340; Braune and Eggers 1975: 288 with references). In the case of the other fricatives, however, there is no trace of the Verner's Law alternation, so that we must reconstruct restored root-initial voiceless fricatives for PGmc. That is probably realistic: since *z was the only voiced obstruent that arose *only* by Verner's Law, the *s ∼ *z alternation should have been more transparent than the other outputs of the rule, and it is reasonable to suppose that the (morphologized) Verner's Law rule might have been more resistant to loss in the case of the sibilants for that reason. In what follows I will assume such a scenario for PGmc.

Of the nine strong verbs with root-internal *ē reconstructable for PGmc, six can be shown to have replaced that vowel with *ō in the past stems, because such pasts are actually attested in Gothic (the only daughter that regularly preserves reduplication); an occasional Old Swedish past *lót* '(s)he allowed' probably confirms that. The verbs in question are reconstructable as:

*grētaną, *gegrōt, *gegrōtun, *grētanaz 'weep';
*lētaną, *lelōt, *lelōtun, *lētanaz 'let';
*rēdaną, *rerōd, *rerōdun, *rēdanaz 'advise';
*sēaną, *sezō, *sezōun, *sēanaz 'sow';
*tēkaną, *tetōk, *tetōkun, *tēkanaz 'touch';
*wēaną, *wewō, *wewōun, *wēanaz 'blow' [of wind].

In addition, *h^{w}ētaną 'push (continuously), drive out', though it does not survive in Gothic, probably belonged to this group, since a derived verb with root-internal *ō is attested (Goth. *hwotjan,* ON *hæta* 'threaten', formally parallel to ON *græta* 'cause to weep'). On the other hand, at least one verb of this shape did not ablaut, to judge from its Gothic paradigm:

*slēpaną, *sezlēp, *sezlēpun, *slēpanaz 'sleep'.

The past of the remaining reconstructable verb, *blēsaną 'blow [with the breath]', is not reconstructable with certainty, because it is not attested in Gothic and (like all reduplicating pasts) has been drastically remodeled in NWGmc (see vol. ii). It is true that there are no derivatives of this verb with internal *ō; but that is likewise true not only of *slēpaną, which does not ablaut, but also of *lētaną, *rēdaną, and *sēaną, which do. (*tēkaną and *wēaną have no reconstructable PGmc derivatives; though *windaz 'wind' is of course etymologically related to the latter, it must already have been a fossilized noun by the PGmc period.) About eight more strong verbs with root-internal *ē are well attested in various subgroups of the family.

All the remaining strong verbs of class VII exhibit no ablaut. About thirty are reconstructable for PGmc The following are typical:

*h^{w}ōsaną, *h^{w}eh^{w}ōs, *h^{w}eh^{w}ōzun, *h^{w}ōzanaz 'cough';
*rōaną, *rerō, *rerōun, *rōanaz 'row';
*haitaną, *hehait, *hehaitun, *haitanaz 'call';
*skaiþaną, *skeskaiþ, *skeskaidun, *skaidanaz 'separate';
*aukaną, *eauk, *eaukun, *aukanaz 'increase';
*hawwaną, *hehaww, *hehawwun, *hawwanaz 'chop';
*falþaną, *fefalþ, *fefaldun, *faldanaz 'fold';
*staldaną, *stestald, *stestaldun, *staldanaz 'possess';
*fanhaną, *fefanh, *fefangun, *fanganaz 'take, seize'.

Half as many again are well attested in various subgroups of the family.

A single j-present of class VII is reconstructable for PGmc with reasonable certainty:

*wōpijaną, *wewōp, *wewōpun, *wōpanaz 'cry out, lament'.

It is true that this verb is strong only in WGmc (where it often means 'weep'); both Goth. *wopjan* 'call' and ON *æpa* 'cry out' are class I weak verbs. However, since transfer of a j-present into the first weak class is surely an easily repeatable change, it seems reasonable to reconstruct this as a strong verb for PGmc.

Finally, a word must be said about PGmc *arjaną 'plow'. In ON, OE, and OF its reflexes are regular class I weak verbs, which can of course reflect (at least partly independent) innovations. In Gothic we have only the present. In OHG, however, we find an indic. 3pl. *iarun,* which is unambiguously a class VII strong past. (There are also some forms that are difficult to interpret; see Seebold 1970: 82.) One would have expected to find a class VI preterite instead, given the shape of the root. What the PGmc situation was can only be guessed at.

4.3.3 (ii) *Weak verbs* The present stems of the various classes of weak verbs differ too much to be treated together conveniently. However, all weak verbs share the formation of the finite past and past participle and distinctive past indicative singular endings.

The weak past ptc. was always an a/ō-stem adjective, and the suffix was usually *-da- (see below for exceptions). The same dental obstruent was the first segment of the finite past suffix. The (default) suffix and the endings of the finite past were:

		indicative	*subjunctive*
sg.	1	-d-ǭ	-dēd-ij-ų (?; or -dēd-į ??)
	2	-d-ēz	-dēd-ī-z
	3	-d-ē	-dēd-ī-∅
du.	1	-dēd-ū (?)	-dēd-ī-w
	2	-dēd-u-diz (?)	-dēd-ī-diz (?)
pl.	1	-dēd-u-m	-dēd-ī-m
	2	-dēd-u-d	-dēd-ī-d
	3	-dēd-u-n	-dēd-ī-n

It can be seen that the endings differed from those of the strong past only in the indicative singular. Since the inflection of the entire finite past can be predicted from a single form, it is not necessary to list more than one form as a 'principal part' of a weak verb; I use the indicative 3sg.

The following sections will treat the various classes of PGmc weak verbs in turn.

4.3.3 (ii.a) *Weak verbs with simple thematic presents*
For the endings of the present see 4.3.3 (i). This was already a rare relic type in PGmc; at most three examples are reconstructable:

*bringaną, *branhtē, *branhtaz 'bring';
*brūkaną, *brūhtē, *brūhtaz 'need';
*būaną, *būdē 'dwell'.

The comparative evidence for this type is far from uniform. 'Bring' exhibits this anomalous paradigm in all the daughters (except ON, which lost the verb), though there are various byforms which are obviously analogical innovations (strong pasts and past participles and j-presents; see Seebold 1970: 136–7). 'Need' has acquired a j-present in Gothic; in WGmc it is mostly a strong verb, though a weak past *brūchte* also appears, rather late, in OHG (in which the strong past is also very sparsely attested; see ibid. 140–1). 'Dwell' is a much less certain case. The OE and OHG past stems support the

reconstruction given above, though there are also isolated OHG forms with an infix *-ir-* that can only reflect a class VII strong past. In ON the past is strong; in Gothic we find a class III weak past *bauaida*. No past forms are attested in OS, and the verb fails to appear in OF. Thus the reconstruction given above is not certain, though it seems to me to be the most plausible alternative.

Note that the past stems of all these verbs were formed with no vowel between the root and the suffix. That is also true of the next group to be discussed.

4.3.3 (ii.b) *Class I weak verbs with no linking vowel in the past*

All class I weak verbs have j-presents; see 4.3.3 (i) for the endings. Exactly five with no linking vowel before the past suffix are reconstructable for PGmc; all are well attested in the oldest daughters (though 'look for' has been regularized in Gothic and 'buy' lost in ON). They were very similar formally:

*bugjaną, *buhtē, *buhtaz 'buy';
*sōkijaną, *sōhtē, *sōhtaz 'look for, seek';
*wurkijaną, *wurhtē, *wurhtaz 'work, make';
*þankijaną, *þanhtē, *þanhtaz 'perceive, think';
*þunkijaną, *þunhtē, *þunhtaz 'seem'.

The last two were obviously related derivationally, though the relationship was unique.

In the NWGmc languages this class of verbs underwent a surprising expansion; the details differ from language to language. For further discussion see vol. ii.

4.3.3 (ii.c) *Regular class I weak verbs*

These had present stems exactly like those of the preceding class, but past stems in *-id- and past participles in *-ida-. This was a very large and productive class of verbs in PGmc. There were several derivational types.

More than two dozen causatives of this class derived from strong verbs are securely reconstructable for PGmc; since many more examples are confined to various subgroups of the family, it is clear that this was a productive type. Those made from roots with internal *e or *ē exhibit *a or *ō (< PIE *o or *ō / *oH) in the root; root-final voiceless fricatives are voiced by the Verner's Law rule. These examples are typical:

*atjaną, *atidē, *atidaz 'cause to eat' ← *etaną 'eat';
*brannijaną, *brannidē, *brannidaz 'burn' (trans.) ← *brinnaną 'burn' (intr.);

*drankijaną 'cause to drink' ← *drinkaną 'drink';
*lagjaną 'lay' ← *ligjaną 'lie';
*laizijaną 'teach' ← pret.-pres. *lais '(s)he knows';
*bilaibijaną 'leave' ← *bilībaną 'be left over';
*nazjaną 'save' ← *nesaną 'survive';
*raizijaną 'raise' ← *rīsaną 'rise';
*satjaną 'seat, set' ← *sitjaną 'sit';
*frawardijaną 'destroy' ← *frawerþaną 'perish';
*grōtijaną 'cause to weep' ← *grētaną 'weep';
*wakjaną 'awaken' (tr.) ← *wak-, cf. *wakai- ∼ *wakja- 'be awake';
*farjaną 'carry across' ← *faraną 'travel, go';
*fōrijaną 'lead, bring' ← *faraną;
*hlōgijaną 'cause to laugh' ← *hlahjaną 'laugh'.

(On the ablaut of the last few examples see 4.2.2 (ii).) Already in PGmc there seem to have been some fossilized causatives derived from basic verbs no longer in use; fairly clear examples include:

*sandijaną 'send' ← *sinþ-, cf. *sinþaz 'journey' (cf. Seebold 1970: 394–5);
*tandijaną 'kindle' ← *tinþ-, cf. ON *tinna* 'flint' (cf. ibid. 502);
*tawjaną 'make' ← *'fit' (trans.), root PIE *dewh$_2$- 'fit' (intrans.) (cf. Toch. B *tswetär* 'it fits', Gk δύνασθαι /dúnast^{h}ai/ 'be able', Ringe 1996: 31 with references);
*wazjaną 'clothe, dress' < PIE *woséye/o-, caus. of *wéstor '(s)he's wearing'.

There are also some derived verbs of this shape that seem to differ little in meaning from the basic verbs from which they are derived; presumably they reflect (as a class) the PIE intensives and iteratives which were identical in form with causatives. The following seem reasonably clear (cf. Meid 1967: 247):

*draibijaną 'drive' ← *drībaną;
*wagjaną 'move' ← *weganą;
*waljaną 'choose' ← *wiljaną 'want';
*wrakjaną 'drive (out)' ← *wrekaną.

However, some caution is necessary in judging examples of this type. In Gothic, at least, the difference between a basic strong verb and a derived class I verb can be a simple matter of transitivity, e.g. *gastigqan* 'knock' vs. *gastagqjan* 'knock on' (Feist 1939 s.vv. *gastagqjan, stigqan*). Other cases are less clear; for instance, the semantic relationship between *windaną 'wind, wrap' and *wandijaną 'turn' (trans.) had obviously undergone some sort of idiosyncratic development, but the extra-Gmc cognates are not clear

enough to allow us to reconstruct it with certainty (see Seebold 1970: 554–6).

Denominatives of this class were also common and productive. Those derived from adjectives were usually factitive, e.g.:

*daudijaną 'kill' ← *daudaz 'dead';
*fullijaną 'fill' ← *fullaz 'full';
*furhtijaną 'frighten' ← *furhtaz 'afraid';
*garwijaną 'prepare' ← *garwaz 'ready';
*hailijaną 'heal' ← *hailaz 'whole, healthy';
*lausijaną 'release' ← *lausaz 'empty, loose, free';
*warmijaną 'heat, warm' ← *warmaz 'warm'.

The semantics of those derived from nouns seem to have been governed by the semantics of the noun, e.g.:

*dailijaną 'divide' ← *dailiz 'part';
*dōmijaną 'judge' ← *dōmaz 'judgment';
*laistijaną 'follow' ← *laistaz 'track';
*namnijaną 'name' ← *namō̄ (*namin-, *namn-) 'name';
*rik^{w}izjaną 'get dark' ← *rek^{w}az (*rik^{w}iz-) 'darkness'.

At least one denominative was already fully fossilized in PGmc:

*hauzijaną 'hear' < PIE *h_2ḱ-$h_2$ows-ié/ó- 'be sharp-eared'.

In some cases it is difficult to determine whether a class I weak verb was derived from any of its associated nouns or whether they were all derived from the verb; typical examples are *gaumijaną 'notice, pay attention to' and *wrōgijaną 'accuse' (see Feist 1939 s.vv. *gaumjan, wrohjan*).

Finally, a considerable number of these verbs are not well enough understood etymologically to allow confident statements about their derivational status; solidly reconstructable examples include *hazjaną 'praise', *huljaną 'cover', *saljaną 'offer, give', and *warjaną 'ward off, defend'. At least one, *siwjaną 'sew', is the reflex of a PIE present in *-ye/o- whose reconstruction poses complex problems (cf. e.g. Feist 1939 s.v. *siujan*).

4.3.3 (ii.d) *Class II weak verbs*

Because of the pre-PGmc loss of intervocalic *j and the subsequent contraction of the vowels thus brought into hiatus, the stem vowel of presents of this class was trimoric *ō̄ (see Cowgill 1959); the past suffix complex was *-ō-d- ∼ *-ō-dēd-, while the past ptc. ended in *-ō-da-. The endings of the present were the following:

		indicative	*subjunctive*	*imperative*	
active					infinitive -ō̄-ną
sg.	1	-ō̄	-ǭ	—	participle -ō̄-nd- (-ō̄-nþ- ?)
	2	-ō̄-si	-ō̄-s	-ō̄	
	3	-ō̄-þi	-ō̄	-ō̄-þau	
du.	1	-ō̄s (?)	-ō̄-w	—	
	2	-ō̄-þiz (?)	-ō̄-þiz (?)	-ō̄-þiz (?)	
pl.	1	-ō̄-maz	-ō̄-m	—	
	2	-ō̄-þ	-ō̄-þ	-ō̄-þ	
	3	-ō̄-nþi	-ō̄-n	-ō̄-nþau	
passive					
sg.	1	-ō̄i	???	—	
	2	-ō̄-sai	-ō̄-sau?	—	
	3	-ō̄-þai	-ō̄-þau?	—	
du. &pl.		-ō̄-nþai	-ō̄-nþau?	—	

(The original final vowel of the imperative 2sg. should have been lost before the loss of *j and contraction, but it seems clear that the contraction product *ō̄ had been leveled into that form already in PGmc.)

The oldest members of this class must have been denominatives formed from ō-stem nouns; reconstructable examples include:

*karō̄ną 'worry about' ← *karō 'worry';
*laþō̄ną 'invite' ← *laþō 'invitation';
*salbō̄ną 'anoint' ← *salbō 'ointment, salve';
*sibjō̄ną 'reconcile' ← *sibjō 'relationship, friendship';
*sweglō̄ną 'play the flute' ← *sweglō 'flute'.

But already in the PGmc period verbs of this class were being formed from nouns of other stem classes, and especially from adjectives, e.g.:

*aljanō̄ną 'be zealous' ← *aljaną 'zeal';
*fiskō̄ną 'fish, catch fish' ← *fiskaz 'fish';
*friþō̄ną 'make peace' ← *friþuz 'peace';
*hulō̄ną 'hollow out' ← *hulaz 'hollow';
*galīkō̄ną 'compare' ← *galīkaz 'similar';
*werþō̄ną 'value' ← *werþaz 'worth' (adj.);
*aiginō̄ną 'appropriate, possess' ← *aiganaz 'possessed, (one's) own';
*faginō̄ną 'be glad' ← *faganaz 'glad'.

There are a few ambiguous examples, for instance:

*wundōną 'wound' ← *wundō '(a) wound'? or *wundaz 'wounded'?

Also in the PGmc period at least two deverbal patterns had developed, one with *a in the root and the other with *e, though reconstructable examples are few:

*h^{w}arbōną 'go here and there, wander' (cf. Goth. *ƕarbon,* ON *hvarfa,* OE *hwearfian,* OS *hwarbōn*) ← *h^{w}erbaną 'turn';
*wlaitōną 'look around' (cf. Goth. *wlaiton,* ON *leita;* OE *wlātian* 'stare at') ← *wlītaną 'look';
*metōną 'think over' (cf. Goth. *miton,* OE *ġeðancmetian;* OHG *widarmeʒʒōn* 'compare') ← *metaną 'measure'.

There were a few fossilized verbs, no longer analyzable in PGmc, e.g.:

*frijōną 'love' < (post?-)PIE *priHeh$_2$yé/ó- (cf. Skt *priyāyáte* '(s)he reconciles');
*wratōną 'travel' (cf. Goth. *wraton;* ON *rata* 'wander around'; etymology?).

But the most important characteristic of this class was that new denominatives belonging to it could be formed freely.

4.3.3 (ii.e) *Stative verbs of weak class III*

Unlike the classes discussed above, this class of verbs and the ones discussed below were well defined semantically as well as formally. If the arguments presented in section 3.4.3 (i) are correct, the present stem vowel of this class was *-ai- ∼ *-ja-, and both past *-d- ∼ *-dēd- and past ptc. *-da- were added to the root syllable with no linking vowel. The endings of the present were:

		indicative	*subjunctive*	*imperative*	
active					infinitive-ja-ną
sg.	1	-j-ō	-ja-ų	—	participle -ja-nd-
	2	-ai-si	-jai-s	-ai	(-ja-nþ- ?)
	3	-ai-þi	-jai-Ø	-ja-þau	
du.	1	-j-ōs (?)	-jai-w	—	
	2	-ja-þiz (?)	-jai-þiz (?)	-ja-þiz (?)	
pl.	1	-ja-maz	-jai-m	—	
	2	-ai-þ	-jai-þ	-ai-þ	
	3	-ja-nþi	-jai-n	-ja-nþau	

(In this class too the imperative 2sg. is likely to reflect analogical leveling, though the details are unclear.)

It is unclear whether Sievers' Law was extended to apply to the *-j- of this suffix; as it happens, reconstructable class III weak verbs in which it could have applied are few. In what follows I have assumed that it did, since it was otherwise exceptionless in PGmc; if that is correct, then every *-j- in the above table should actually be *-(i)j-.

A fairly large proportion of the verbs of this class seem to have been unanalyzable fossils, and it is those that typically survive in northern WGmc:

*sagjaną, *sagdē, *sagdaz 'say' (cf. Lith. *sakýti*);
*þagjaną 'be silent' (cf. Lat. *tacēre*);
*siljaną 'be silent' (cf. Lat. *silēre*);
*libjaną 'live' (cf. OCS *prilĭpěti* 'adhere'?);
*habjaną 'hold, have' (with the root of *habjaną 'lift' = Lat. *capere* 'take');
*þuljaną 'endure' (derivative of PIE *telh$_2$- 'lift');
*fijaną 'hate' (cf. Skt *pī́yate* '(s)he insults');
*hatjaną 'hate' (with derived noun *hataz ~ *hatiz-; cf. Oscan gen. sg. *cadeis* 'enmity');
*hugjaną 'think' (etymology?).

Others, however, were transparently derived statives; those tend to survive in Gothic and OHG. Some of the reconstructable examples were deverbal:

*hangijaną 'hang' (intr.) ← *hanhaną 'hang' (trans.);
*wakjaną 'be awake' ← *wak- (cf. class I *wakjaną 'awaken' (trans.), class IV *wak-nō- ~ *wak-na- 'wake up' (intr.));
*witjaną 'observe, pay attention to', possibly ← *wītaną 'look after; reproach' (or is this a fossilized cognate of Lat. *vidēre* 'see'?).

Others were denominative:

fastijaną 'fast' ('resist the temptation to eat', cf. Dishington 1976: 857) ← *fastaz 'fixed, firm';
*galīkijaną 'be pleasing' ← *galīkaz 'similar';
rūnijaną 'conspire, plot' ('be secret') ← *rūnō 'secret';
*surgijaną 'be sad' ← *surgō 'worry, sorrow'.

One appears to have been an inherited stative formed to a Caland root, undoubtedly still interpretable as derived in PGmc, but not necessarily with a clear derivational basis:

*rudjaną 'be red' ←< PIE *h$_1$rudh-éh$_1$- (cf. PGmc *reudaną 'redden', *raudaz 'red').

4.3.3 (ii.f) *Factitive verbs of weak class III*

This class of verbs survives as a recognizable (sub)class only in Gothic, and even in that language its inflection and that of the preceding class have been homogenized. If the arguments presented in section 3.4.3 (i) are correct, the past ended in *-ad- ∼ *-adēd- and the past ptc. in *-ada-; the inflection of the present, to the extent that it can be reconstructed at all, was the following:

		indicative	*subjunctive*	*imperative*	
active					infinitive -ā-nạ
sg.	1	-ō̄	-???	—	participle -ā-nd-
	2	-ai-si	-???-s	-ai	(-ā-nþ- ?)
	3	-ai-þi	-???-∅	-ā-þau	
du.	1	-ōs (?)	-???-w	—	
	2	-ā-þiz (?)	-???-þiz (?)	-ā-þiz (?)	
pl.	1	-ā-maz	-???-m	—	
	2	-ai-þ	-???-þ	-ai-þ	
	3	-ā-nþi	-???-n	-ā-nþau	
passive					
sg.	1	???	???	—	
	2	-ā-sai	-???-sau	—	
	3	-ā-þai	-???-þau	—	
du. & pl.		-ā-nþai	-???-nþau	—	

The suffix of the subjunctive is difficult to reconstruct; it should be the sound-change outcome of pre-PGmc *-a-jai-, which should in the first instance have contracted to *-āi-; but (1) the further development of that diphthong is unknown, and (2) in any case it could have been replaced analogically (as the imperative 2sg. ending almost certainly was).

Only two of the Gothic examples have clear cognates in another daughter (namely OHG), so strictly speaking they are the only examples reconstructable for PGmc:

armāną 'pity' ('consider poor'; Goth. *arman,* OHG *ir-b-armēn*) ← *armaz 'poor';

*þewāną 'enslave, subject' (Goth. *gaþiwan,* OE *þeowian* (shifted into class II); OHG *dewēn* 'humiliate') ← *þewaz 'slave'.

However, the fact that this type obviously became unproductive very early in the separate history of NWGmc might reasonably lead us to project the single ON example back into PGmc, with due caution:

?*warāną 'make aware' (ON *mik varir* 'I expect') ← *waraz 'aware'.

For the history of WGmc this class is unimportant, though its inflection seems to have spread to the statives in Gothic and (for the most part) ON.

4.3.3 (ii.g) *Class IV weak verbs*

This remained a separate class of verbs only in Gothic; in ON (and WGmc, to the extent that they survived at all) their inflection became exactly like that of weak class II or (in OHG) weak class III. It is clear that the past suffix was *-nōd- ~ *-nōdēd-; it seems unlikely that these fientive verbs already had past participles in PGmc. In Gothic the present stem suffix is *-n- followed by the thematic vowel, but the development of the class in NWGmc suggests that that was not the case in PGmc. Since the PIE suffix complex that gave rise to the PGmc present stem suffix should have given PGmc *-nō- ~ *-na-, it is reasonable to suppose that that was the shape of the morpheme in PGmc (see section 3.4.3 (i)). Unfortunately the distribution of suffix alternants is difficult to recover, and it does not seem helpful to give even a tentative table of endings here.

Verbs of this class were fientive in meaning. At least six deverbative examples are securely reconstructable for PGmc:

PGmc *libnō- ~ *libna- 'be left over' (ON *lifna* 'to survive'; Goth. *aflifnan* 'to be left over' has introduced a voiceless fricative by reanalysis), made to the root of *bi-lībaną 'to stay' and stative *libjaną 'to live';

PGmc *fra-luznō- ~ *fra-luzna- 'become lost' (Goth. *fralusnan* 'to become lost', ON *losna* 'to dissolve', both with voiceless fricatives by reanalysis), to *fra-leusaną 'to lose';

PGmc *þurznō- ~ *þurzna- 'dry out (intr.), wither' (cf. ON *þorna;* Goth. *gaþaúrsnan* has been remodeled on the basic verb), to *þersaną 'to dry out' (attested only in Goth. past ptc. *gaþaúrsans* 'withered', but cf. Homeric Gk middle *τέρσεσθαι* /térsest^{h}ai/ 'to dry out'; PIE *ters- 'dry');

PGmc *ga-sturknō- ~ *ga-sturkna- 'dry up (intr.), thicken' (Goth. *gastaúrknan*; ON *storkna* 'to become thick, coagulate', OHG ptc. *gistorchanēt* 'congealed'), to *ga-sterkaną 'to cause to harden', of which only the ptc. is actually attested in the daughters;

PGmc *waknō- ~ *wakna- 'wake up (intr.)' (Goth. *gawaknan*, ON *vakna*, OE *wæcnan*), to the root of causative *wakjaną 'to wake (someone) up' and stative *wakjaną 'to be awake';

PGmc *liznō- ~ *lizna- 'learn' (OE *liornian*, OHG *lirnēn, lernēn*), to the root of *lais 'I know' and causative *laizijaną 'to teach'.

So is at least one denominative example:

PGmc *k^{w}ik^{w}nō-~ *k^{w}ik^{w}na- 'come to life' (ON *kvikna*; Goth. *ga-qiunan* 'to revive' shows dissimilation of the stops), to adj. *k^{w}ik^{w}az 'alive'.

There is also a reconstructable example derived from an old Caland root:

PGmc *(ga-)batnō- ∼ *(ga-)batna- 'get better' (Goth. *gabatnan*, ON *batna*), to the root of *batizō 'better' (Goth. *batiza*, ON *betri*, etc.).

This class, too, is of little importance for the history of WGmc.

4.3.3 (iii) *Preterite-present verbs* This archaic class, though it always remained small, has been hugely important in the morphosyntactic development of those Germanic languages that still survive. Fifteen of these verbs are reconstructable for PGmc (a couple of them just barely). Their presents were conjugated like strong pasts, not because they had developed from strong pasts but because both those categories had developed from the PIE perfect (see section 3.3.1 (i)). Their finite pasts and past participles were weak, but there were various anomalies in the shape of the suffix.

Though most of these verbs can be assigned to one or another of the strong ablaut classes, there are so few of them, and they exhibit so many anomalies, that it makes more sense to treat them entirely in their own terms. In this section I will list the reconstructable verbs with their principal parts—infinitive, pres. 3sg., past 3sg., and past ptc. (if any)—and give fairly full present paradigms for those that are well attested and not defective. Formally similar verbs will be grouped together in an ad hoc fashion.

Preterite-presents with roots of the shape *(C)eRC- exhibited considerable uniformity of inflection, except for the formation of the past and past ptc.:

*witaną, *wait, *wissē, *wissaz 'know';
*duganą, *daug, *duhtē 'be useful';
*þurbaną, *þarf, *þurftē, *þurftaz 'need';
*durzaną, *dars, *durstē 'dare';
*kunnaną, *kann, *kunþē, *kunþaz 'recognize, know how';
*unnaną, *ann, *unþē, *unþaz 'grant'.

A synopsis of the inflection of their present stems can be given as follows: indic.

1/3sg.	*wait	*daug	*þarf	*dars	*kann
2sg.	*waist	*dauht	*þarft	*darst	*kan(n)t
3pl.	*witun	*dugun	*þurbun	*durzun	*kunnun
subj.	*witī-	*dugī-	*þurbī-	*durzī-	*kunnī-
ptc.	*witand-	*dugand-	*þurband-	*durzand-	*kunnand-

So far as can be determined, *unnaną rhymed with *kunnaną in all forms; the *-þ- of the past and past ptc., which presupposes a pre-Verner's Law accent on

the root syllable, is unexplained. A further example parallel to *wait was *lais 'I know', attested only in Gothic, only in that form, and only once.

Preterite-presents made to light roots with (original) internal *e were even more uniform in inflection:

*munanạ, *man, *mundē, *mundaz 'remember';
*skulanạ, *skal, *skuldē, *skuldaz 'owe';
*ganuganạ, *ganah, *ganuhtē 'be sufficient'.

The last of these might have had only 3rd-person forms. The paradigms can be constructed from the principal parts without difficulty. An isolated relic of another verb of this type is Mercian OE *earð*, Northumbrian *arð* 'you are' < PGmc *arþ, with a strikingly archaic 2sg. ending (vs. *mant 'you remember', *skalt 'you owe, you are obliged'); related forms (for which see Seebold 1970: 80–1) reflect innovations of various kinds.

There were a few preterite-presents that did not ablaut in PGmc:

*maganạ, *mag, *mahtē 'be able';
*mōtanạ, *mōt, *mōsē 'be allowed';
*aiganạ, *aih, *aihtē, *aihtaz 'possess'.

Very striking is the past of 'be allowed', in which a double dental has developed into *ss (as in 'know', see above) and has then been simplified to *s after a long vowel; the form is preserved only in OHG *muosa*. The only other forms that seem noteworthy are pres. 2sg. *maht, *mōst, *aiht.

Finally, there was a preterite-present meaning 'fear' that is preserved only in Gothic. Though it exhibits a uniform long *o* in the root in Gothic, it is vowel-initial and therefore may have had a trimoric contracted vowel in the pres. indic. sg. in PGmc (like vowel-initial strong class VI pasts; see sections 3.4.3 (ii), 4.3.3 (i.f)). The principal parts would then have been

*ōganạ, *ōg, *ōhtē 'be afraid'.

The pres. indic. 2sg., which happens not to be attested in Gothic, must have been *ōht.

But there is also an unusual 2sg. form which appears in the Gothic prohibition *ni ogs þus* 'do not be afraid'. Since the ending is nonsyllabic in Gothic, it must reflect either PGmc *-s or PGmc *-iz < *-es;[10] it looks like a

[10] Jasanoff 2004: 35 argues that the ending was PGmc *-s, and further that the form is evidence for a PIE category 'pluperfect', and not (for example) an old subjunctive. That is conceivable, but hardly compelling. Note that (1) the contention that a direct replacement of the injunctive by the optative should be preferred to the more complex scenario 'injunctive → subjunctive → optative' is far from clinching, especially considering that this development had at least a millennium and a half in which to

morphological cognate of a Vedic injunctive (i.e. a form with secondary endings but no augment to mark the past), which is similarly used with the prohibitive negative *mā́* < PIE *mḗ. Since this is the only such form attested in any Germanic language, no PGmc category can really be reconstructed; we have no idea whether this was already completely fossilized in PGmc or was still part of a larger paradigm of forms. This is a reminder of how much PGmc lexicon and grammar might have been so thoroughly lost as to be unreconstructable.

A great deal of information about the subsequent development of this class of verbs in Germanic can be found in Birkmann 1987.

4.3.3 (iv) *Anomalous verbs* Not surprisingly, the basic verbs 'be', 'want', and 'do', as well as an alternative present meaning 'stand' and a present and a past meaning 'go', did not fit into any of the above categories. They will here be described in turn, insofar as they are reconstructable.

The finite forms of the usual present stem of 'be' were inherited from PIE; the indicative forms, at least, reflected PIE clitic (i.e. unaccented) forms. The paradigm can be reconstructed in part thus:

	indicative	*subjunctive*
1sg.	*immi	*sijǭ (?)
2sg.	*izi	*sijēs
3sg.	*isti	*sijē
1du.	*izū?	*sīw
2du.	*izudiz?	*sīþiz (?)
1pl.	*izum?	*sīm
2pl.	*izud?	*sīþ
3pl.	*sindi	*sīn

The subjunctive forms given here are the ones that should have developed from the PIE forms by sound change. In OHG the plural forms survive more or less intact, and their stem *sī-* has been leveled into the singular. In Gothic the singular stem *sijē- has been remodeled as *sijai-* (cf. thematic pres. subj. *-ai-*) and has then been leveled into the nonsingular. The 1sg. form given here might survive in older ON *sjá* and OE *sīe*. The non-3rd person nonsingular forms of the indicative are difficult to reconstruct (see the discussion in 3.4.3 (iii)); note that the stem *izu- could be a NWGmc innovation.

occur; (2) in Ancient Greek the construction *mḗ + injunctive has actually been replaced by *μή* + aorist subjunctive; and (3) some PIE subjunctives do survive in PGmc (see 3.3.1 (ii)). A better argument against the suggestion that Goth *ogs* is an old subjunctive might be the fact that its ending cannot reflect *-esi (though the fact that subjunctives with secondary endings do occur in Vedic Sanskrit robs that argument, too, of its probativeness). The precise etymology of Goth *ogs* remains an open question.

It appears that there was also an alternative present of 'be' formed to the stem *bi- (apparently with a short vowel). Most unfortunately, this stem survives only in WGmc, and remains functionally distinct only in OE; in the other WGmc languages its paradigm has been conflated with the one described above. But it is hard to shake the suspicion that it ultimately reflects some form of PIE *b^huh_2- 'become', which supplies forms of 'be' in Italic, Insular Celtic, Balto-Slavic, and Sanskrit (at least). It is usually said that in OE this stem is used to express future states or states that are always true (Campbell 1962: 350), and those do not appear to constitute a natural class. But both are in fact typical uses of *perfective* presents, since actions or states with no internal structure are in practice incompatible with those going on at the moment of speaking; thus in Russian perfective presents normally express future tense, while in English non-progressive presents of non-stative verbs are typically used to express actions always or habitually performed or not performed (*I don't smoke* vs. *I'm not smoking (now)*). It would not be unreasonable, then, to suggest that if this stem was already part of PGmc grammar (as seems likely) it was a perfective present. But to reconstruct its PGmc forms on the basis of OE alone—that is, in the absence of comparative evidence—is beyond the capability of scientific linguistics.

Both these verb roots were defective in PGmc: for the usual present only finite forms can be reconstructed, while for *bi- it is at least clear that no non-present forms are anywhere attested. In all the daughters the remaining forms of the verb were supplied by the strong verb *wesaną 'remain, stay', and that is the situation we must reconstruct for PGmc.

The present of the verb 'want' was unique in that its indicative and subjunctive had undergone syncretism under the form of the subjunctive; in other words, PGmc 'I want', etc. were etymologically 'I would like', etc.—evidently a fossilized form of politeness. The pres. subj. suffix was athematic *-ī-, as in the past subj.; thus the stem *wilī- was a perfect cognate of Lat. pres. subj. *velī-*. The paradigm is easy to reconstruct:

	sg.	*du.*	*pl.*
1	wiljų (-į?)	wilīw	wilīm
2	wilīz	wilīdiz (?)	wilīd
3	wilī	—	wilīn

A thematic pres. inf. *wiljaną and ptc. *wiljand- were constructed to this paradigm; the past was weak *wel-d- ∼ *wel-dēd-.

The most basic verb meaning 'make, do', by contrast, is very difficult to reconstruct. The finite past was clearly *ded- ∼ *dēd-, and was the etymological source of the weak past suffix (see section 3.3.1 (iv)).

Unfortunately the present survives only in WGmc; there its stem is *dō-. Since the OHG and Anglian OE forms are clearly athematic, that is probably the inflection that we must reconstruct for PGmc; the indicative must have been:

	sg.	*du.*	*pl.*
1	dōmi	(dōwaz??)	dōmaz
2	dōsi	dōþiz (?)	dōþ
3	dōþi	—	dōnþi

The subjunctive paradigm has been recharacterized with thematic endings in the more northerly languages, but not in the oldest OHG documents, which exhibit contracted forms; the original inflection seems likely to have been:

	sg.	*du.*	*pl.*
1	dǭ	dōw (?)	dōm
2	dōz	dōdiz (?)	dōd
3	dō	—	dōn

The other pres. forms seem to have been imperative 2sg. *dō, 2pl. *dōþ, inf. *dōną (*dǭną?), ptc. *dōnd- (*dōnþ-??; *-ǭ-?), more or less as one would expect. Surprisingly, all the languages agree in exhibiting a strong past ptc., which can be reconstructed as *dōnaz or *dǭnaz.

Alternative presents meaning 'stand' and 'go' are reasonably well attested in WGmc (the latter also in Old Swedish and perhaps in Crimean Gothic; see Seebold 1970: 464–5, 216–17). Guðrún Þórhallsdóttir (1993: 35–7 with references) has demonstrated that these are contracted presents in *-ji- ∼ *-ja-, the *j having been lost intervocalically; the outcomes were clearly PGmc *stai- ∼ *stā- and *gai- ∼ *gā-. PGmc probably preserved the original distribution of stem-alternants, though most daughters do not. In the OHG dialects the vocalic alternation has been leveled and the verbs are inflected athematically, no doubt under the influence of 'do' (Braune and Eggers 1975: 306–7); in OE, where only 'go' survives, the alternant *gai- has been generalized, and the verb is inflected as though further thematic endings had contracted with that stem (again like 'do'). Old Saxon might preserve the old alternation best—if we can trust the distribution of a very small number of examples. We find the following (normalizing the spelling of consonantal endings; cf. Gallée 1891: 113):

inf.	stān	gān
ptc.	—	gānde (1 ×)
indic.		
2sg.	stēs (2×)	—

3sg.	stēð ∼ stād	begēd (1×)
pl.	stād	—

It is striking that the 2sg. and 3sg., which ought to reflect *staisi, *staiþi, and *gaiþi, usually appear with *ē* < *ai, while in all the other forms we find *stā-* and *gā-* as expected.

Finally, there was a defective finite past meaning 'went'. In Gothic it appears as indic. 1sg., 3sg. *iddja* with a default stem *iddjed-*, thus partially assimilated to the weak past paradigm; in OE it has been provided with a weak suffix and appears as *ēode*. In both languages it functions as a suppletive past; in Gothic the other forms are supplied by *gaggan,* in OE usually by *gān* (but also occasionally by *gangan*). The precise etymology and development of this stem remain obscure; see e.g. Brunner 1965: 360; Seebold 1970: 174–6; Braune and Ebbinghaus 1973: 121–2; all with references.

4.3.3 (v) *Sample verb paradigms* The PGmc verb system was so much more regular and uniform than that of PIE that it does not seem strictly necessary to give verb paradigms in addition to the above discussion. I give some here both in the hope that they might be convenient and in order to facilitate comparison with those given in section 2.3.3 (vi).

Representative strong verbs are *līh^{w}aną 'lend' (< PIE 'leave'), *werþaną 'become' (< PIE 'turn'), *k^{w}emaną 'come' (< PIE 'step'), *bidjaną 'ask for', and *lētaną 'let'. I give their paradigms in parallel:

pres. inf.		līh^{w}aną	werþaną	k^{w}emaną	bidjaną	lētaną
pres. ptc.		līh^{w}and-	werþand-	k^{w}emand-	bidjand-	lētand-
pres. indic. act.						
sg.	1	līh^{w}ō	werþō	k^{w}emō	bidjō	lētō
	2	līh^{w}izi	wirþizi	k^{w}imizi	bidisi	lētizi
	3	līh^{w}idi	wirþidi	k^{w}imidi	bidiþi	lētidi
du.	1	līh^{w}ōz (?)	werþōz (?)	k^{w}emōz (?)	bidjōz (?)	lētōz (?)
	2	līh^{w}adiz (?)	werþadiz (?)	k^{w}emadiz (?)	bidjaþiz (?)	lētadiz (?)
pl.	1	līh^{w}amaz	werþamaz	k^{w}emamaz	bidjamaz	lētamaz
	2	līh^{w}id	wirþid	k^{w}imid	bidiþ	lētid
	3	līh^{w}andi	werþandi	k^{w}emandi	bidjanþi	lētandi
pres. subj. act.						
sg.	1	līh^{w}aų	werþaų	k^{w}emaų	bidjaų	lētaų
	2	līh^{w}aiz	werþaiz	k^{w}emaiz	bidjais	lētaiz
	3	līh^{w}ai	werþai	k^{w}emai	bidjai	lētai
du.	1	līh^{w}aiw	werþaiw	k^{w}emaiw	bidjaiw	lētaiw
	2	līh^{w}aidiz (?)	werþaidiz (?)	k^{w}emaidiz (?)	bidjaiþiz (?)	lētaidiz (?)

pl.	1	līh^{w}aim	werþaim	k^{w}emaim	bidjaim	lētaim
	2	līh^{w}aid	werþaid	k^{w}emaid	bidjaiþ	lētaid
	3	līh^{w}ain	werþain	k^{w}emain	bidjain	lētain
pres. imptv.						
sg.	2	līh^{w}	werþ	k^{w}em	bidi (?)	lēt
	3	līh^{w}adau	werþadau	k^{w}emadau	bidjaþau	lētadau
du.	2	līh^{w}adiz (?)	werþadiz (?)	k^{w}emadiz (?)	bidjaþiz (?)	lētadiz (?)
pl.	2	līh^{w}id	wirþid	k^{w}imid	bidiþ	lētid
	3	līh^{w}andau	werþandau	k^{w}emandau	bidjanþau	lētandau
pres. indic. pass.						
sg.	1	līh^{w}ōi? (-ai?)			bidjōi? (-ai?)	lētōi? (-ai?)
	2	līh^{w}azai			bidjasai	lētazai
	3	līh^{w}adai			bidjaþai	lētadai
du. & pl.		līh^{w}andai			bidjanþai	lētandai
pres. subj. pass.						
sg.	1	???			???	???
	2	līh^{w}aizau?			bidjaisau?	lētaizau?
	3	līh^{w}aidau?			bidjaiþau?	lētaidau?
du. &pl.		līh^{w}aindau?			bidjainþau?	lētaindau?
past indic.						
sg.	1	laih^{w}	warþ	k^{w}am	bad	lelōt
	2	laih^{w}t	warst	k^{w}amt	bast	lelōst
	3	laih^{w}	warþ	k^{w}am	bad	lelōt
du.	1	ligū (?)	wurdū (?)	k^{w}ēmū (?)	bēdū (?)	lelōtū (?)
	2	ligudiz (?)	wurdudiz (?)	k^{w}ēmudiz (?)	bēdudiz (?)	lelōtudiz (?)
pl.	1	ligum	wurdum	k^{w}ēmum	bēdum	lelōtum
	2	ligud	wurdud	k^{w}ēmud	bēdud	lelōtud
	3	ligun	wurdun	k^{w}ēmun	bēdun	lelōtun
past subj.						
sg.	1	liwjų (?)	wurdijų (?)	k^{w}ēmijų (?)	bēdijų (?)	lelōtijų (?)
	2	liwīz	wurdīz	k^{w}ēmīz	bēdīz	lelōtīz
	3	liwī	wurdī	k^{w}ēmī	bēdī	lelōtī
du.	1	liwīw	wurdīw	k^{w}ēmīw	bēdīw	lelōtīw
	2	liwīdiz (?)	wurdīdiz (?)	k^{w}ēmīdiz (?)	bēdīdiz (?)	lelōtīdiz (?)
pl.	1	liwīm	wurdīm	k^{w}ēmīm	bēdīm	lelōtīm
	2	liwīd	wurdīd	k^{w}ēmīd	bēdīd	lelōtīd
	3	liwīn	wurdīn	k^{w}ēmīn	bēdīn	lelōtīn
past ptc.		liwanaz	wurdanaz	kumanaz	bedanaz	lētanaz

Representative weak verbs (of the larger and more securely reconstructable classes) are *sōkijaną 'look for', *lagjaną 'lay', *dōmijaną 'judge', *salbōną 'anoint', and *sagjaną 'say'; their paradigms, too, are given in parallel:

pres. inf.		sōkijaną	lagjaną	dōmijaną	salbōną	sagjaną
pres. ptc.		sōkijand-	lagjand-	dōmijand-	salbōnd-	sagjand-
pres. indic. act.						
sg.	1	sōkijō	lagjō	dōmijō	salbō	sagjō
	2	sōkīsi	lagisi	dōmīsi	salbōsi	sagaisi
	3	sōkīþi	lagiþi	dōmīþi	salbōþi	sagaiþi
du.	1	sōkijōs (?)	lagjōs (?)	dōmijōs (?)	salbōs (?)	sagjōs (?)
	2	sōkijaþiz (?)	lagjaþiz (?)	dōmijaþiz (?)	salbōþiz (?)	sagjaþiz (?)
pl.	1	sōkijamaz	lagjamaz	dōmijamaz	salbōmaz	sagjamaz
	2	sōkīþ	lagiþ	dōmīþ	salbōþ	sagaiþ
	3	sōkijanþi	lagjanþi	dōmijanþi	salbōnþi	sagjanþi
pres. subj. act.						
sg.	1	sōkijaų	lagjaų	dōmijaų	salbǭ	sagjaų
	2	sōkijais	lagjais	dōmijais	salbōs	sagjais
	3	sōkijai	lagjai	dōmijai	salbō	sagjai
du.	1	sōkijaiw	lagjaiw	dōmijaiw	salbōw	sagjaiw
	2	sōkijaiþiz (?)	lagjaiþiz (?)	dōmijaiþiz (?)	salbōþiz (?)	sagjaiþiz (?)
pl.	1	sōkijaim	lagjaim	dōmijaim	salbōm	sagjaim
	2	sōkijaiþ	lagjaiþ	dōmijaiþ	salbōþ	sagjaiþ
	3	sōkijain	lagjain	dōmijain	salbōn	sagjain
pres. imptv.						
sg.	2	sōkī	lagi (?)	dōmī	salbō	sagai
	3	sōkijaþau	lagjaþau	dōmijaþau	salbōþau	sagjaþau
du.	2	sōkijaþiz (?)	lagjaþiz (?)	dōmijaþiz (?)	salbōþiz (?)	sagjaþiz (?)
pl.	2	sōkīþ	lagiþ	dōmīþ	salbōþ	sagaiþ
	3	sōkijanþau	lagjanþau	dōmijanþau	salbōnþau	sagjanþau
pres. indic. pass.						
sg.	1	sōkijǭ̄i? (-ai?)	lagjǭ̄i? (-ai?)	dōmijǭ̄i? (-ai?)	salbōi	sagjǭ̄i? (-ai?)
	2	sōkijasai	lagjasai	dōmijasai	salbōsai	sagjasai
	3	sōkijaþai	lagjaþai	dōmijaþai	salbōþai	sagjaþai
du. &pl.		sōkijanþai	lagjanþai	dōmijanþai	salbōnþai	sagjanþai
pres. subj. pass.						
sg.	1	???	???	???	???	???
	2	sōkijaisau?	lagjaisau?	dōmijaisau?	salbōsau?	sagjaisau?
	3	sōkijaiþau?	lagjaiþau?	dōmijaiþau?	salbōþau?	sagjaiþau?

du. &pl.		sōkijainþau?	lagjainþau?	dōmijainþau?	salbōnþau?	sagjainþau?
		past indic.				
sg.	1	sōhtǭ	lagidǭ	dōmidǭ	salbōdǭ	sagdǭ
	2	sōhtēz	lagidēz	dōmidēz	salbōdēz	sagdēz
	3	sōhtē	lagidē	dōmidē	salbōdē	sagdē
du.	1	sōhtēdū (?)	lagidēdū (?)	dōmidēdū (?)	salbōdēdū (?)	sagdēdū (?)
	2	sōhtēdudiz (all (?))	lagidēdudiz	dōmidēdudiz	salbōdēdudiz	sagdēdudiz
pl.	1	sōhtēdum	lagidēdum	dōmidēdum	salbōdēdum	sagdēdum
	2	sōhtēdud	lagidēdud	dōmidēdud	salbōdēdud	sagdēdud
	3	sōhtēdun	lagidēdun	dōmidēdun	salbōdēdun	sagdēdun
past subj.						
sg.	1	sōhtēdijų (?)	lagidēdijų (?)	dōmidēdijų (?)	salbōdēdijų (?)	sagdēdijų (?)
	2	sōhtēdīz	lagidēdīz	dōmidēdīz	salbōdēdīz	sagdēdīz
	3	sōhtēdī	lagidēdī	dōmidēdī	salbōdēdī	sagdēdī
du.	1	sōhtēdīw	lagidēdīw	dōmidēdīw	salbōdēdīw	sagdēdīw
	2	sōhtēdīdiz (all (?))	lagidēdīdiz	dōmidēdīdiz	salbōdēdīdiz	sagdēdīdiz
pl.	1	sōhtēdīm	lagidēdīm	dōmidēdīm	salbōdēdīm	sagdēdīm
	2	sōhtēdīd	lagidēdīd	dōmidēdīd	salbōdēdīd	sagdēdīd
	3	sōhtēdīn	lagidēdīn	dōmidēdīn	salbōdēdīn	sagdēdīn
past ptc.		sōhtaz	lagidaz	dōmidaz	salbōdaz	sagdaz

4.3.4 *PGmc noun inflection*

Noun inflection was both simpler and more opaque in PGmc than in PIE. Most ablaut alternations had been eliminated (though the Verner's Law alternation seems to have persisted in the inflection of some nouns—see further below). Thematic nouns had become much more common; in addition, stems ending in semivowels and laryngeals had given rise to further classes of stems ending in vowels. Stem-final vowels and endings had become fused to a considerable extent. Among the consonant stems, stems in *-n- had been reduced to a few types but had become (or remained) common; other types of consonant stems had become relatively rare.

Nouns inflected for two numbers, singular and plural, in PGmc, and there were six cases: vocative, nominative, accusative, genitive, dative, and instrumental. The old syncretisms of PIE persisted: the nom. pl. and voc. pl. were always identical, and the nom., acc., and voc. of each number were identical for neuter nouns. As in PIE, each noun was assigned to one of three concord classes ('genders').

4.3.4 (i) *Stem classes and endings* The distribution of PGmc stem classes and concord classes is reminiscent of the situation in Latin:

a-stems (< PIE o-stems): masculine, neuter;
ō-stems (< PIE eh_2-stems): feminine;
ī/jō-stems (< PIE ih_2/yeh_2-stems): feminine;
i-stems: all three genders (few neuters);
u-stems: all three genders (few neuters, fairly few feminines);
n-stems: all three genders (few neuters);
r/n-stems: neuter (two);
r-stems: masculine, feminine (five);
z-stems: neuter;
other consonant stems: all three genders (few neuters).

The a-stems were by far the largest class, masculines apparently being more numerous than neuters. The inflection of stem classes will be discussed in turn, similar classes being treated together.

The a-stems and ō-stems functioned more or less as a single class, the latter supplying the missing feminine gender of the former; in addition, most ī-stem endings were like those of the ō-stems, so that it is reasonable to treat those classes together. The reconstructable endings are:

		masc. -a-	*neut. -a-*	*fem. -ō-*	*fem. -ī/jō-*
sg.	nom.	-az	-ą	-ō	-ī
	voc.	∅	-ą	-ō	-ī
	acc.	-ą	-ą	-ǭ	-(i)jǭ
	gen.	-as		-ōz	-(i)jōz
	dat.	-ai		-ōi (?)	-(i)jōi (?)
	inst.	-ō		-ō	-(i)jō
pl.	n.-v.	-ōz	-ō	-ōz	-(i)jōz
	acc.	-anz	-ō	-ōz	-(i)jōz
	gen.	-ǭ		-ǭ	-(i)jǭ
	dat.	-amaz		-ōmaz	-(i)jōmaz
	inst.	-amiz		-ōmiz	-(i)jōmiz

There are some obvious regularities in these paradigms, but on the whole the endings are idiosyncratic fused morphemes.

A striking fact about these stem classes is that in each there were at least a few nouns exhibiting the Verner's Law alternation. In the ī/jō-stems this is expected, since they exhibited the proterokinetic accent alternation in PIE (see 2.3.4 (ii)). Perhaps the best reconstructable example for PGmc is 'ax'. The data of the attested languages, with their proximate preforms, are:

Goth. *aqizi* (1×, nom. sg.) < *ak^{w}izī;

ON *øx* < *ak^{w}isi(z) or *akusi(z), and *ǫx* < *akus (early loss of *-i?), all ←< *ak^{w}isī / *akusī;
Mercian OE *æces* < *æcysi < *akusi < *akusī;[11]
OS *acus,* OHG *achus* < *akusi < *akusī.

It seems clear that Gothic and NWGmc have leveled the Verner's Law alternation in different directions; the distribution of *k^{w}i and *ku is considerably less clear. But since the word ought originally to have exhibited proterokinetic inflection (if it is old enough), a reasonable conjecture is that its PGmc inflection and etymology were:

PGmc *ak^{w}isī ~ *akuzjō- < *agwésī ~ *agusjā́- < post-PIE *agwés-ih$_2$ ~ *agus-yéh$_2$- (?).[12]

A similar PGmc paradigm must be the source of Goth. dat. sg. *ubizwai* 'hall' (1×), ON *ups* 'vestibule', OE *yfes* 'eaves', OHG *obisa, obasa* 'entrance hall', but the details are much harder to recover. For the most part, alternations of this type had already been leveled by the PGmc period; for instance, PIE *h$_1$wid^{h}éw-h$_2$ ~ *h$_1$wid^{h}w-éh$_2$- 'widow' (cf. OIr. *fedb* vs. OCS *vĭdova;* Lionel Joseph, p.c. *c.* 1980) appears in PGmc in the 'compromise form' *widuwō-n-, with a full-grade stem vowel (extended by *-n-) and a medial syllable that seems to owe its syllabicity to one PIE alternant and the identity of its vowel to the other.

It is also not very surprising that a large proportion of these alternating nouns are neuter a-stems, e.g.:

*blōþa- ~ *blōda- 'blood' (cf. Goth. *bloþ-* (prevocalic) vs. OE *blōd*, OHG *bluot*);[13]
*gulþa- ~ *gulda- 'gold' (cf. Goth. *gulþ-*, ON *gull*, OHG *gold* vs. OE *gold*);
*tahra- ~ *tagra- 'tear' (cf. ON *tár*, OE *tēar*, OHG *zahar* vs. Goth. *tagr*; the WGmc words have been transferred into the masc. concord class);
*glasa- ~ *glaza- 'glass' (cf. OE *glæs*, OHG *glas* vs. ON *gler*).

As I noted in 2.3.4 (ii), the neuter nom.-acc. plurals of the daughters of PIE were originally derived collectives, and the derivational rule involved a shift of accent; thus the reflex of alternating accent in these paradigms is no surprise.

Masculine examples are typically less certain, but at least two of the best probably reflect a prehistory similar to that of the neuters:

*h^{w}eh^{w}la- ~ *h^{w}eula- 'wheel' (cf. OE *hwēol*, ON *hvél* vs. OE *hweowol*, ON *hjól*; both ON forms are neuter) < PIE *k^{w}ék^{w}los, collective *k^{w}ek^{w}léh$_2$;

[11] West Saxon *æcs* exhibits an unexplained syncope after a light syllable.

[12] It is customary to compare Gk. *ἀξίνη* /aksí:nę:/ and Lat. *ascia,* but there are phonological problems with both equations; see Feist 1939: 54.

[13] In evaluating these examples it is important to remember that PGmc *d became OHG *t,* while PGmc *þ became OHG *d.*

*ansa- ∼ *anza- 'beam' (cf. ON *áss* vs. Goth. dat. sg. *anza*): etymology obscure, but a collective of 'beam' is expected.

These are comparable to the 'heteroclitic' nouns of Latin and Ancient Greek.

The rare examples to be found among feminine ō-stems are generally harder to assess; two examples with comparatively good etymologies will illustrate the problems. Two different explanations are possible in the case of

*nēþlō- ∼ *nēdlō- 'needle' (cf. Goth. *neþla*, ON *nál*, OHG *nādala* vs. OE *nǣdl*).

It seems clear that this name of a tool has been formed from a verb root with one of the PIE suffixes normally used to form instrument nouns (though the source of PGmc *nē- 'sew' is slightly uncertain: if it reflects PIE *sneh$_1$- 'spin', why has the *s- been lost?). But PIE possessed two such suffixes containing an *l, namely *-tlo- and *-d^{h}lo-; it is at least possible that the forms with PGmc *þ reflect the former and those with *d the latter. Moreover, instrument nouns were normally thematic neuters, but this PGmc noun is a feminine ō-stem, reflecting a (post-)PIE stem in *-eh$_2$-; the likeliest explanation is that the PGmc noun actually reflects an older collective, and it is possible that one alternant reflects the accent of the collective and the other the accent of the derivational base noun. This example is easy to explain, then, but we cannot be certain which explanation is correct. The other example is simply puzzling:

*fersnō- ∼ *ferznō- 'heel' (?; cf. OS *fersna*, OHG *fersana* vs. Goth. *faírzna*—but also OE i-stem *fiersn*, see further below).

In terms of stem class the external cognates fall into two groups: Homeric Gk *πτέρνη* /ptérnɛ̄:/ 'heel' and Lat. *perna* 'ham' agree with Gothic and the continental WGmc languages, while Skt has an i-stem *pā́rṣṇis* 'heel', agreeing with OE. There is no obvious reason for the difference—in particular, the *eh$_2$-stem does not look like a collective formed from an i-stem—and we must probably conclude that the word has changed its stem class in at least two languages by lexical analogy. The most economical hypothesis is that it was originally an *eh$_2$-stem; does it therefore exhibit alternating accent because it was originally a derived collective? If it had originally been an i-stem, an accent alternation is expected—except that the long vowel in the root of the Skt form suggests an acrostatic accent paradigm, the one athematic type in which the accent does not alternate. In fact, the consensus of Sanskrit, Greek, and WGmc is that the word had fixed accent on the root, and only Gothic contradicts that. This suggests that a purely Gothic explanation for the difference should be sought, but it is not clear what that would be.

The i-stem and u-stem paradigms were still similar enough to be treated together conveniently:

		m./f. -i-	*neut. -i-*	*m./f. -u-*	*neut. -u-*
sg.	nom.	-iz	-i	-uz	-u
	voc.	-i?	-i	-u? -au?	-u
	acc.	-į	-i	-ų	-u
	gen.	-īz (-aiz?)		-auz	
	dat.	-ī? (-ai??)		-iwi	
	inst.	-ī		-ū	
pl.	n.-v.	-īz	???	-iwiz	???
	acc.	-inz	???	-unz	???
	gen.	-ijǭ		-iwǭ	
	dat.	-imaz		-umaz	
	inst.	-imiz		-umiz	

Securely reconstructable neuters of these stem classes include *mari 'sea' (which does not survive as a neut. i-stem in any daughter) and *fehu 'cattle, property'; other probable examples are *medu 'mead' (which is masc. in NWGmc but has neuter external cognates—the word is not attested in Gothic) and *līþu, the name of some sort of alcoholic drink (neuter in most daughters; u-stem, but not clearly neuter, in Gothic). No distinctive neut. pl. forms are attested in any daughter.

The greatest puzzle in the inflection of these stem classes is the ablaut grade of the stem vowel in the gen. sg. and dat. sg. The evidence of the daughters is conflicting:

- i-stem gen. sg.: OHG (fem.) *-i*,[14] early OE *-i* (1×, Brunner 1965: 218) < PGmc *-īz, but Goth. (fem.) *-ais*, ON *-ar* < PGmc *-aiz;
- i-stem dat. sg.: ON ∅ < PGmc *-ī (or is this an old instrumental?—see below), but otherwise no evidence: Goth. (fem.) *-ai* must reflect something longer than PGmc *-ai, which should have become Goth. '*-a*' (cf. the passive endings); OHG (fem.) *-i* must likewise reflect something longer than PGmc *-ī; all other endings are clearly analogical on other paradigms;
- u-stem gen. sg.: Goth. *-aus*, ON *-ar*, OE *-a* < PGmc *-auz;
- u-stem dat. sg.: ON *-i* (Early Runic *-iu*), early OHG *-iu* < PGmc *-iwi, but Goth. *-au*, ?OE *-a* < PGmc *-awi.

In addition, ON has a u-stem dat. sg. with no ending and u-umlaut of the root syllable, which can only reflect a PGmc inst. sg. in *-ū; but that suggests

[14] The fact that this *-i* is consistently short does not tell against this etymology, given that nom. pl. *-i*, which can only reflect *-īz, is also consistently short (Braune and Eggers 1975: 199).

that the corresponding ON i-stem ending might also be an old instrumental (see above). The most economical reconstruction is that only the u-stem gen. sg. *-auz exhibited *a in PGmc, and that that ablaut grade spread partly to the corresponding i-stem ending and partly to the u-stem dat. sg. in the daughters; that is the scenario that I tentatively accept.

The reconstruction of the voc. sg. is also uncertain. Aside from a doubtful Runic Norse example (Krause 1971: 118, 163), all the evidence is from Gothic. For the u-stems both *-u* and *-au* are well attested (Braune and Ebbinghaus 1973: 71); for the i-stems we have only endingless masculine forms, which might reflect PGmc *-i but can equally well have been remodeled on the a-stems.

Finally, fairly few distinctive gen. pl. forms are attested. The rare OE i-stem ending *-iġ(e)a* matches OHG *-io* and the ON subtype *bekkja* (see Noreen 1923: 266, 268–9); Gothic has remodeled the ending. Conversely, Goth. u-stem gen. pl. *-iwe* is virtually our only evidence for the stem-vowel ablaut of that ending.

Since many of these nouns exhibited alternating accent in PIE, we expect to find at least some Verner's Law alternations in PGmc, and we do. For instance, most reflexes of PIE verbal abstracts in *-ti-, which exhibited proterokinetic ablaut, show either *-þ- or *-d- in all the Gmc. languages, but a few show both:

*arþi- ∼ *ardi- 'plowing' (cf. OE *ierþ* vs. OHG *art*; OF *raeferd* 'predatory plowing');
*gaburþi- ∼ *gaburdi- 'birth' (cf. Goth. *gabaúrþ-i-* vs. OHG *giburt*; OE *ġebyrd* 'birth; destiny');[15]
*kumþi- ∼ *kumdi- 'coming' (cf. Goth. *gaqumþ-i-* 'assembly' vs. ON *samkund* 'feast');
*mēþi- ∼ *mēdi- 'mowing' (cf. OE *māþ* vs. OHG *amāt* 'second mowing');
*nauþi- ∼ *naudi- 'compulsion, distress' (cf. Goth. *nauþ-i-* vs. OE *nīed*, OHG *nōt*, and Goth. compounds in *naudi-*);
*skulþi- ∼ *skuldi- 'debt' (cf. OHG *sculd* vs. OE *scyld*; ON *skyld* 'tax').

In these cases Gothic generalizes the voiceless alternant (though in many others, e.g. *missaded-i-* 'misdeed', *mannased-i-* 'humankind', it does not), and it would be tempting to suggest that the result of word-final devoicing in the nom. sg. and acc. sg. has been leveled through the Gothic paradigms; but the occasional appearance of *þ in WGmc forms shows that at least some of these *þ are of PGmc date.

Other examples are more isolated. One especially involves a word with a complex suffix:

[15] In ON both consonants became *ð* in most noninitial environments. Both the shape and the restricted meaning of ModE *birth* suggest that it is a Scandinavian loan, though it is possible that the OE word exerted some influence; see Björkman 1900: 162.

*hunhru- ∼ *hungru- 'hunger' (cf. Goth. *hūhrus* vs. ON *hungr*, OE *hungor*, OHG *hungar*) with derived verb *hungrijaną (cf. Goth. *huggrjan*, OE *hyngran*, etc.).

—unless the NWGmc nouns were backformed to the verb. At least one example had probably undergone lexical split already by the PGmc period:

PIE *pértu- ∼ *pr̥téw- 'crossing' (cf. Av. *pərətuš*, Welsh *rhyd* 'ford'; Lat. *portus* 'port') ⟩⟶ PGmc *ferþuz 'inlet' (cf. ON *fjǫrðr*) and *furduz 'ford' (cf. OE *ford*, OHG *furt*).

(It seems less likely that the split occurred as late as the diversification of NWGmc, though that cannot be ruled out completely.)

Consonant-stem nouns seem to have exhibited the following endings, at least for the most part:

	sg.	*pl.*
nom.	Ø ∼ -z (∼ -s?)	-iz
voc.	???	-iz
acc.	-u̯	-unz
gen.	-iz	-ǭ
dat.	-i	-maz
inst.	(-ē?)	-miz

(The inst. sg. ending given is the one that is etymologically expected, but it is not certainly attested in any Germanic language. Whether there was a nom. sg. alternant *-s depends on whether the leveling of Verner's Law alternants in favor of *-z in nominal endings affected all monosyllabic nouns, a detail which is unrecoverable.)

The only large class of PGmc consonant-stem nouns was the n-stems. All the feminines were innovative formations, but at least some of the masculines and neuters were inherited. Vocatives do not seem to be reconstructable. It is clear that the nom. sg. of masculines and inherited neuters (and, therefore, also the acc. sg. of the latter) ended in *-ō̄ < PIE *-ō (Jasanoff 2002: 33–8). Gothic preserves that ending in neuters, WGmc in masculines (and has therefore transferred the few inherited neuters into the masc. concord class). But the PGmc nom. sg. of feminines and of innovative neuters cannot be reconstructed, because all the attested endings can be the result of analogical leveling in the daughters, as can the masc. nom. sg. forms of Gothic and ON (see Stiles 1984: 16–18 with references, Jasanoff 2000: 38–43). Specifically:

- in Gothic, masc. *-a* can have been remodeled on acc. sg. *-an,* nom.-acc. pl. *-ans,* fem. *-o* can have been remodeled on acc. sg. *-on,* nom.-acc. pl. *-ons,* and neut. nom.-acc. sg. *-o* can have been remodeled on nom.-acc. pl. *-ona;*

- in Runic Norse, masc. *-a* (*-ą* ?) was the result of the same remodeling as in Gothic, but that vowel was subsequently lost by regular sound change, and a new *-i* was added on the model of the ijan-stems (see Stiles, ibid.; the number of the latter was substantial, cf. Noreen 1923: 277–8, and for comparative data Braune and Ebbinghaus 1973: 72; Meid 1967: 96–8);
- throughout NWGmc the fem. and neut. nom. sg. are reconstructable as *-ō̄, but since the entire fem. oblique and the nom.-acc. pl. neut. exhibited stems in *-ōn-, that can easily be the result of NWGmc paradigmatic leveling.

This is a good example of how morphological remodeling can make reconstruction impossible.

For the most part, the masc. and neut. n-stem suffix was *-in- in the oblique cases of the sg., but *-an- in other forms; it seems clear that in the neut. nom.-acc. pl. it was *-ōn-. However, the inherited neuters—a very small class, including only *namō̄ 'name', *sēmō̄ 'seed', and *ank^{w}ō̄ 'butter' (Jasanoff 2002: 35)—seem to have exhibited zero-grade *-n- in at least some cases of the plural. Both the fact that ON *nafn* has been remodeled as an a-stem and the Goth. dat. pl. *namnam* suggest that a-stem endings had spread to those plurals already in PGmc. Finally, it is clear that at least some masculines also exhibited zero-grade *-n- in at least some plural forms. Surviving Gothic examples of gen. pls. are *aúhsne* 'of oxen' and *abne* 'of husbands'. It is not surprising that there is also a dat. pl. *abnam;* but acc. pl. *aúhsnuns* is a striking archaism, showing not only a zero-grade suffix but also the expected consonant-stem ending, which has otherwise been eliminated from the n-stems in Gothic (Braune and Ebbinghaus 1973: 72). On the other hand, the ON plural stem *yxn-* 'oxen' (Noreen 1923: 277) must reflect *uhsin- because of the i-umlaut of its root. These considerations strongly suggest that the inherited n-stem paradigm still exhibited substantial suffixal ablaut, in part lexically determined, though not all the details are reconstructable.

Since the inherited n-stems were polysyllabic consonant-stem nouns in PIE, we expect to find Verner's Law relics of original accent alternations especially among the masculines. We find a few in each gender class, e.g.:

*hasan- ~ *hazan- 'hare, rabbit' (masc., cf. OHG *haso* vs. OE *hara*, ON *heri*);
*ausan- ~ *auzan- 'ear' (neut., cf. Goth. *auso* vs. ON *eyra*, OE *ēare*, OHG *ōra*).

By far the most bizarre example is a feminine noun in which the Verner's Law rule has apparently been extended to an obstruent cluster:

*askōn- ~ *azgōn- 'ashes' (fem., cf. ON, OHG *aska*, OE *asce* vs. Goth. *azgo*).

Since all feminine n-stems that have plausible etymologies appear to have been formed simply by suffixing *-n- to older stems in *-ā- or *-ī- (cf. PGmc *tungōn- = Lat. *lingua* 'tongue', etc.), this is doubly unexpected. We seem forced to the conclusion that alternating accent was actually productive in pre-PGmc n-stems, though there is not enough surviving material to reconstruct exactly what happened.

The class of r-stems had apparently been reduced to five nuclear kinship terms, inflected identically, in PGmc: the masculines *fadēr 'father', *brōþēr 'brother', and the feminines *mōdēr 'mother', *swestēr 'sister', *duhtēr 'daughter'. The direct cases of the singular seem to have exhibited the shapes expected of hysterokinetic stems (nom. sg. *-ēr, acc. sg. *-erų, voc. sg. *-er, cf. Stiles 1984, 1988); otherwise the zero grade of the suffix seems to have been generalized. The gen. sg. ended in *-urz, to judge from Anglian OE *fadur* and ON *fǫður*, reflecting PIE acrostatic *-r̥s and cognate with Skt *-ur* (e.g. in *bʰrā́tur* 'brother's'). Goth. dat. pl. *-rum* suggests that the *-u- of acc. pl. *-r-unz (< PIE *-r-n̥s) had begun to be generalized in the plural. The daughters disagree on the nom. pl. forms; ON *feðr, mœðr, brœðr, dœtr* clearly presuppose *-r-iz, and that is probably the ending that was remodeled to *-r-jus* in Gothic.

Two of the distinctive neuter r/n-stems of PIE, 'water' and 'fire', survived in Germanic. The inherited stem-final alternation between consonants had not yet been leveled in PGmc, but the situation is not fully reconstructable from the Germanic evidence; it is necessary to begin from the reconstructable PIE paradigms. It seems clear that PIE 'water' had a nom.-acc. sg. *wódr̥ and an oblique stem *udén- (the proterokinetic accent paradigm); the collective was nom.-acc. *wédōr (later *udṓr?), probably with an oblique stem *udn-′ (the amphikinetic accent paradigm; see Schindler 1975*a*). As in the case of n-stem neuters, it is the collective that survives in PGmc as the nom.-acc. sg., but the o-grade root *wat- < *wod- has been generalized. The result was apparently PGmc nom.-acc. sg. *watōr, gen. sg. *watiniz (*watinz??), dat. sg. *watini. A plural (which evidently functioned as a collective) was apparently made to a stem *wat-n-, parallel to the plural of 'name' (see above). Gothic nearly preserves this paradigm, the only innovation being the remodeling of the nom.-acc. sg. as an n-stem: nom. sg. *wato*, gen. *watins*, dat. *watin*, dat. pl. *watnam* (the only plural form attested). In ON the word was remodeled as a neuter a-stem *vatn*, starting from the plural (precisely as in the case of 'name'), though there is also a rare early form *vatr* (Noreen 1923: 254); whether Old Swedish *vætur* might actually preserve the PGmc nom.-acc. sg. form is not clear to me. PWGmc *watar (*-ār? *-er?; cf. OE *wæter*, OHG *waʒʒar*, etc.) might reflect the inherited nom.-acc. *watōr. The development of 'fire' was more complex and less easy to reconstruct. The PIE word was

*péh$_2$wr̥, obl. *ph$_2$uén-, with a collective *péh$_2$wōr, obl. *ph$_2$un-′ (Schindler 1975*a*). The attested Germanic forms are Gothic *fon,* gen. *funins,* dat. *funin;* ON *fúrr* ∼ *fýrr* (inflected as a masc. i-stem); and WGmc *fuïr (inflected as a neut. a-stem), which is the source of OE *fȳr,* OHG *fuïr* (> *fiur,* i.e. /fūr/), etc. Gothic *fon* must reflect an immediate preform *fōr (< PIE *péh$_2$wr̥ or *péh$_2$wōr) or *fōr (reflecting post-PIE *ph$_2$uór, see 3.2.6 (i)). Since PGmc inherited neuters normally reflect PIE collectives, and since neuters of this type do not usually preserve their full-grade initial syllables outside of Anatolian, the most likely scenario is:

PIE coll. *péh$_2$wōr → *ph$_2$uór (cf. Toch. B *puwar,* Ringe 1996: 17–18) > *puór > PGmc *fuwōr > *fwōr (see 3.2.5 (ii)) > PGmc *fōr (see 3.2.6 (i).

Goth. oblique *funin-* apparently reflects PIE collective obl. *ph$_2$un-′, the sound-change outcome *fun- having been recharacterized with an n-stem suffix; it probably cannot be the reflex of PIE *ph$_2$uén-, unless the sound-change outcome *fuwin- or *fuïn- was remodeled to *funin- before word-initial *Cuw- became *Cw- (see 3.2.5 (ii)). The last-mentioned sound change makes PWGmc *fuïr- difficult to account for: why is it not *fwir-? A possible solution is that *funin- already existed in PGmc, that its first *n was lost by dissimilation, and that the resulting post-PGmc *fuïn- was then remodeled to *fuïr- (cf. 'water' above).

'Sun' is the only reconstructable PIE neuter l/n-stem. The nom.-acc. sg. seems to have been *sóh$_2$wl̥ (cf. Lat. *sōl*); the oblique stem seems to have been *sh$_2$uén- (e.g. in gen. sg. *sh$_2$uén-s, cf. Gatha-Avestan *x$^{\text{v}}$ə́ng*). The former can easily be the source of the ON noun:

PIE *sóh$_2$wl̥ > *sōwul > PGmc *sōl (?; see 3.2.6 (i)) >⟶ *sōlō (fem., see below) > ON *sól.*

The Gothic neuter noun *sauil,* attested twice, seems to show leveling of the oblique suffix ablaut *-e- into the direct form in *-l, though the details are hard to recover. But all the Gmc languages also attest an n-stem noun *sunnōn- (Goth. *sunno*, ON, OHG *sunna*, OE *sunne*); it is normally feminine, evidently because 'moon' is masculine (cf. the converse in Latin), though a neuter dat. sg. *sunnin* attested twice in Gothic suggests that this word too was originally neuter (cf. Braune and Ebbinghaus 1973: 73 with references). It must somehow be a reflex of PIE *sh$_2$uén-, which in the first instance should have become *suwen- > *swen- (see 3.2.6 (i)). Apparently it was remodeled to *sunwen-; but how to account for that is basically a test of one's ingenuity.

Though the inflection of the neuter z-stems survives scarcely anywhere in the attested daughter languages, it can be reconstructed for PGmc partly from

the disagreements between the daughters and partly by reference to reconstructable PIE. At least the following seem to be reconstructable (cf. Meid 1967: 131–3; the a-stems cited are neuter unless noted otherwise, and the *-r* of the ON examples is part of the stem):

- *agaz ~ *agiz- 'fear' (Goth. a-stem *agis*, OE i-stem *ege*; OHG *egislīh* 'horrible'; cf. Homeric Gk ἄχος /ák^{h}os/ '(emotional) pain');
- *ahaz ~ *ahiz- 'ear (of grain)' (a-stem OE *ēar*, OHG *ehir*; cf. Lat. *acus* 'chaff'; a-stem Goth. *ahs*, ON *ax* seem to reflect a different preform);
- *aiz 'bronze' (a-stem Goth. *aiz*, ON *eir*, OE *ār*, OHG *ēr*; cf. Lat. *aes*; Skt *áyas* 'metal, iron');
- *baraz ~ *bariz- 'barley' (ON a-stem *barr*, OE i-stem *bere*; Goth. *barizeins* 'made of barley'; cf. Lat. *far, farr-* 'spelt');
- *hataz ~ *hatiz- 'hatred' (a-stem Goth. *hatis*, ON *hatr*; OE i-stem *hete*, OHG masc. a-stem *haȝ*);
- *hlaiwaz ~ *hlaiwiz- 'grave' (a-stem even in Runic Norse, but note OHG pl. *lēwir* and Goth. derivative (pl.) *hlaiwasnos* 'tombs');
- *jeukaz ~ *jiukiz- 'acre' (MHG *jiuch*; cf. Lat. pl. *iūgera*; Gk ζεῦγος /sdêugos/ 'yoke (of oxen)', the measure being originally as much as could be plowed with a pair of oxen in a specified time);
- *lambaz ~ *lambiz- 'lamb' (OE *lamb*, pl. *lambru*, OHG *lamb*, pl. *lembir*, but also the Finnish loan *lammas* ~ *lampah-*; Goth., ON *lamb* is a normal a-stem);
- *rek^{w}az ~ *rik^{w}iz- 'darkness' (a-stem Goth. *riqis*, ON *røkkr*; cf. Skt *rájas* 'empty space', Gk ἔρεβος /érebos/ 'hell');
- *remaz ~ *rimiz- 'rest' (Goth. a-stem *rimis*; probably < PIE *h$_1$rémos, cf. Skt *rámate* '(s)he rests', Gk ἠρεμέστερος /ęremésteros/ 'quieter');
- *segaz ~ *sigiz- 'victory' (a-stem Goth. *sigis*, masc. OE *sigor*, ON *sigr* (gen. sg. *sigrs* and *sigrar-*, Noreen 1923: 250), i-stem OE *siġe*, OHG *sigi-*, u-stem OHG *sigu*; cf. Skt *sáhas*);
- *setaz ~ *sitiz- 'seat' (ON a-stem *setr*; cf. Homeric Gk ἕδος /hédos/).

The only reconstructable example that seems to have eliminated the ablaut of its suffix already in PGmc is *aiz; that is not surprising, since the sound-change outcomes of PIE *áyos ~ *áyes- would have been *āz ~ *aiz-, with an unusual vowel alternation. These nouns must have had the endings characteristic of consonant-stems in PGmc: thus, for example, sg. nom.-acc. *segaz, gen. *sigiziz, dat. *sigizi; pl. nom.-acc. *sigizō (probably), gen. *sigizǭ, etc., though no daughter preserves such a paradigm.

Monosyllabic consonant stems survive far better in the daughter languages, particularly in Gothic, OE, and ON (in the last of which they have

undergone dramatic expansion as a class). Scarcely any neuters are reconstructable. Among the hardest forms to reconstruct is the nom. sg.: the ending should have been *-z (or *-s, since *-z might not have been generalized to all monosyllables), but the forms have been remodeled in all the daughters. The inst. sg. is also unrecoverable. Otherwise the reconstruction of these paradigms poses few problems. The endings are generally those expected by regular sound change; gen. sg. *-iz apparently reflects PIE *-és with the usual leveling of the Verner's Law alternation in favor of the voiced alternant. At least one monosyllabic noun, 'tooth', still exhibited paradigmatic ablaut in PGmc: all the NWGmc forms presuppose *tanþ-, while Gothic exhibits a u-stem *tunþus* and a derived noun *aíhvatundi* 'thornbush' (lit. *'horse-tooth'). Most monosyllabic nouns clearly did not ablaut, however.

Finally, there were at least a few polysyllabic consonant stems in addition to the classes discussed above. Reconstructable examples include the masculines *mēnōþ- 'month' and *wītwōd- 'witness' and the feminine *magaþ- 'girl'. It appears that the PIE neuter *mélid ∼ *mélit- 'honey' survived in PGmc as *mili ∼ *milid-; its reflexes in the daughters are Goth. *miliþ* (1×, acc. sg.; stem class?) and the first element of OE *mildēaw* 'honeydew', OHG *militou* 'mildew', which appears to be the old nom.-acc. sg.

4.3.4 (ii) *Sample noun paradigms*

	day (m.)	army (m.)	herdsman (m.)	yoke (n.)	gift (f.)
singular					
nom.	dagaz	harjaz	hirdijaz	juką	gebō
voc.	dag	hari (?)	hirdī (?)	juką	gebō
acc.	dagą	harją	hirdiją	juką	gebǭ
gen.	dagas	harjas	hirdijas	jukas	gebōz
dat.	dagai	harjai	hirdijai	jukai	gebōi (?)
inst.	dagō	harjō	hirdijō	jukō	gebō
plural					
n.-v.	dagōz	harjōz	hirdijōz	jukō	gebōz
acc.	daganz	harjanz	hirdijanz	jukō	gebōz
gen.	dagǭ	harjǭ	hirdijǭ	jukǭ	gebǭ
dat.	dagamaz	harjamaz	hirdijamaz	jukamaz	gebōmaz
inst.	dagamiz	harjamiz	hirdijamiz	jukamiz	gebōmiz

	fetter (f.)	guest (m.)	deed (f.)	son (m.)	livestock (n.)
singular					
nom.	bandī	gastiz	dēdiz	sunuz	fehu
voc.	bandī	gasti (?)	dēdi (?)	sunu? -au?	fehu

acc.	bandijǭ	gastį	dēdį	sunų	fehu
gen.	bandijōz	gastīz	dēdīz	sunauz	fehauz
dat.	bandijōi (?)	gastī	dēdī	suniwi	fehiwi
inst.	bandijō	gastī	dēdī	sunū	fehū
plural					
n.-v.	bandijōz	gastīz	dēdīz	suniwiz	
acc.	bandijōz	gastinz	dēdinz	sununz	
gen.	bandijǭ	gastijǭ	dēdijǭ	suniwǭ	
dat.	bandijōmaz	gastimaz	dēdimaz	sunumaz	
inst.	bandijōmiz	gastimiz	dēdimiz	sunumiz	
	human (m.)	name (n.)	eye (n.)	tongue (f.)	height (f.)
singular					
nom.	gumō	namō	???	???	???
acc.	gumanų	namō	???	tungōnų	hauhīnų
gen.	guminiz	naminiz	auginiz	tungōniz	hauhīniz
dat.	gumini	namini	augini	tungōni	haunīni
inst.	???	???	???	???	???
plural					
nom.	gumaniz	namnō	augōnō	tungōniz	hauhīniz
acc.	gumanunz	namnō	augōnō	tungōnunz	hauhīnunz
gen.	gumanǭ	namnǭ	auganǭ	tungōnǭ	hauhīnǭ
dat.	gumammaz	namnamaz?	augammaz	tungōmaz	hauhīmaz
inst.	gumammiz	namnamiz?	augammiz	tungōmiz	hauhīmiz
	‘brother’ (m.)	‘foot’ (m.)	‘tooth’ (m.)	‘night’ (f.)	‘mouse’ (f.)
singular					
nom.	brōþēr	fōts? (fōs?)	tanþs? (tans?)	nahts? (nahs?)	mūs
voc.	brōþer	???	???	???	???
acc.	brōþerų	fōtų	tanþų	nahtų	mūsų
gen.	brōþurz	fōtiz	tundiz	nahtiz	mūsiz
dat.	brōþri	fōti	tundi	nahti	mūsi
inst.	???	???	???	???	???
plural					
n.-v.	brōþriz?	fōtiz	tanþiz	nahtiz	mūsiz
acc.	brōþrunz	fōtunz	tanþunz	nahtunz	mūsunz
gen.	brōþrǭ	fōtǭ	tundǭ	nahtǭ	mūsǭ
dat.	brōþrumaz	fōtumaz?	tundumaz?	nahtumaz?	mūsumaz?
inst.	brōþrumiz	fōtumiz?	tundumiz?	nahtumiz?	mūsumiz?

4.3.5 *PGmc adjective inflection*

A unique characteristic of Germanic is the inflection of most adjectives in two parallel paradigms, conventionally called 'strong' and 'weak'. The origins of this system were explored in 3.3.2; in this section I will present the PGmc system insofar as it is reconstructable. PGmc had also developed a system of comparison for adjectives, which will likewise be described here.

In every Germanic language there are some adjectives that are always inflected according to the strong paradigm; they typically include possessive adjectives, quantifiers, *anþeraz 'other, second', and a few other adjectives of similar meaning (such as *fullaz 'full', *midjaz 'middle', *ganōgaz 'enough'; cf. Braune and Ebbinghaus 1973: 79; Brunner 1965: 236). Conversely, only weak inflection is found for *samō 'same', ordinals from 'third' up, comparatives, and the fossilized formations in *-mō (cf. Braune and Ebbinghaus 1973: 85, Brunner 1965: 236). The situation in PGmc must have been much the same.

4.3.5 (i) *Strong adjective inflection* Except for present participles in *-nd- (and possibly the fossilized participle 'true', on which see the end of this section), all PGmc strong adjectives seem to have been vowel stems. A large majority exhibited masculine and neuter paradigms in *-a- and feminines in *-ō-, those two inflectional classes functioning as a single class for adjectives. Thus the situation roughly resembled that encountered in Latin.

The inflection of the a/ō-stems can be reconstructed with certainty, with the exception of one or two details. The lexeme 'good' can serve as an example:

		masc.	*neut.*	*fem.*
sg.	nom.	gōdaz	gōda	gōdō
	acc.	gōdanǭ	gōda	gōdǭ
	gen.	gōdas		gōdaizōz
	dat.	gōdammai		gōdaizōi (?)
	inst.	gōdana (?)		gōdaizō
pl.	nom.	gōdai	gōdō	gōdōz
	acc.	gōdanz	gōdō	gōdōz
	gen.		gōdaizǭ	
	dat.		gōdaimaz	
	inst.		gōdaimiz	

The endings are those of PIE 'pronominal' adjectives (McFadden 2004; see 4.3.6 (ii)). The masc.-neut. inst. sg. is difficult to reconstruct; probably the best evidence is the first element of the Gothic compound adverb *þanamais*

'further, thereafter' (= OE *þon mā* 'more than that'). No vocatives are reconstructable: in Gothic the few examples are identical with the nom. even in the masc. sg.; adjectives which are complements of noun phrases used in direct address are often inflected according to the weak paradigm (Braune and Ebbinghaus 1973: 80), though not invariably (cf. Stiles 1984: 24–6).

It is remarkable that all the attested daughters exhibit syncretism of all three genders in the oblique cases of the plural (except that Gothic has recharacterized the gen. pl. with the innovative opposition fem. *-o* : nonfem. *-e*, and in the *Skeireins*—only—the fem. dat. pl. ends in *-om*, Braune and Ebbinghaus 1973: 80[16]). Presumably that syncretism had already occurred in PGmc.

Except for the northern dialects of WGmc, all the daughters exhibit longer alternative forms of the neut. nom.-acc. sg. In Gothic we find both *goþ* and *godata*, in OHG both *guot* and *guotaȝ*; in ON there is only the longer form, in this case *gott* (masc. *góðr*). In OHG there seems to be no functional difference between the two (Braune and Eggers 1975: 216); in Gothic the longer form is usual within an NP, but also occurs predicatively, where the short form is usual (Krause 1968: 178). The preform of the longer ending is also difficult to reconstruct: *-atō would give both the Gothic and the OHG forms (because the final *-ō would have become *-u in NWGmc and would eventually have been lost); but such a preform should trigger u-umlaut in ON, and we never find that development in these forms. On the other hand, *-at would account for the ON and OHG forms, but not for the additional vowel of the Gothic ending. This strongly suggests that the longer ending is a parallel innovation, Gothic exhibiting *-ata* because in that language the neut. nom.-acc. sg. determiner is *þata*, while the other languages exhibit *-at because they preserved inherited *þat unextended. In that case northern WGmc is most conservative in this particular point.

i-stem and u-stem adjectives are also attested in Gothic and must have existed in PGmc. It seems clear that they formed feminines in *-ī ∼ *-(i)jō-, with the strong fem. endings given above (except for the nom. sg.); but otherwise their inflection is difficult to reconstruct (see 3.4.5 (i)). There were several derivational types of i-stems: some were formed directly to verb roots, not all of which survive in Gmc as such (e.g. *brūkiz 'useful', *brukiz 'brittle', *sēliz 'good-natured'); others exhibit a suffix *-ni- or *-ri- (e.g. *hrainiz 'clean', *grōniz 'green', *skauniz 'beautiful'; *witriz 'wise', *diuriz 'dear'); a considerable number were compounds, and it is possible that that

[16] Unless the three examples in *-om* are actually weak adjectives; see Bennett 1960: 34.

type was productive (cf. Lat. *arma* 'weapons' : *inermis* 'unarmed'; e.g. *gamainiz 'common', *gatēmiz 'fitting', *andanēmiz 'pleasant', *aljakuniz 'alien'). By contrast, u-stem adjectives were almost all inherited basic words, originally belonging to the PIE 'Caland system' of derivation; reconstructable are e.g. *þursuz ∼ *þurzu- 'dry, withered', *kuruz 'heavy', *harduz 'hard', *anguz 'narrow' (*/-g^{w}-/), *feluz 'much, many', *þunnuz 'thin', *swōtuz 'sweet', *k^{w}erruz 'friendly', *sīþuz 'late', *hnaskuz 'soft' (*/-k^{w}-/). (See Meid 1967 passim on all these formations.)

Present participles in *-nd- also formed their feminines with *-ī ∼ *-ijō-. Their paradigm is likewise difficult to reconstruct because it was remodeled in every daughter language (see 3.4.5 (i)). In all the daughters at least a few masc. participles have been substantivized (typically including *frijōnd- 'friend' and *fijand- 'enemy'), and in that function they exhibit the endings of consonant-stem nouns; it seems possible that they exhibited such endings in strong adjective function in PGmc.

Finally, it is possible that the fossilized participle of 'be', which had come to mean 'true' in PGmc, still exhibited traces of its old ablaut and accent alternations; if so, its stem will have been *sanþ- ∼ *sund-, with a fem. *sundī ∼ *sundijō- (cf. 'tooth' in 4.3.4 (i)). The uncertainties regarding the strong inflection of participles naturally apply to this word as well.

4.3.5 (ii) *Weak adjective inflection* In all the daughter languages, and so presumably in PGmc, the weak adjective paradigm is identical with that of derived n-stem nouns. Thus *gōdaz, for example, had a weak masc. *gōdō̜ with oblique stem *gōdan- ∼ *gōdin-; a weak neut. with the same oblique stem, a nom.-acc. pl. *gōdōnō, and a nom.-acc. sg. that is difficult to reconstruct (possibly *gōdō̜); and a weak fem. with a stem *gōdōn- and a nom. sg. that is likewise difficult to reconstruct (possibly *gōdō̜). The paradigm can be constructed from the n-stem examples of nouns in 4.3.4 (ii).

It seems clear that the weak feminine inflection of present participles differed from the system just described in having a stem in *-īn- rather than *-ōn- (to judge from the testimony of Gothic and ON), evidently because the strong feminine was formed with the suffix *-ī ∼ *-ijō-. That raises the question of how the weak paradigms of i-stem and u-stem adjectives were formed, given that they seem to have exhibited the same strong fem. suffix. In Gothic, the only daughter in which they might have preserved a distinctive paradigm, the masc. and neut. are formed like those of ja-stems and the fem. like those of jō-stems; there is no trace of a fem. in *-ein-*. Whether that reflects the PGmc situation or is an innovation is uncertain.

4.3.5 (iii) *Comparison of adjectives* The most usual comparative suffix in PGmc seems to have been *-iz-Vn- (i.e. *-iz- plus weak inflection); the suffix *-iz- is clearly the zero grade of the PIE elative suffix *-yos- ∼ *-is-, preserved also in the Lat. adverb *magis* 'more'. Like present participles, comparatives exhibited weak feminines in *-īn-. The superlative was constructed with the same suffix followed by another, namely *-is-ta- (cf. Gk -ιστο- /-isto-/) and had both strong and weak forms, like an ordinary adjective. At least one adjective exhibited the Verner's Law alternation between the positive and the other forms, implying that the pre-Gmc accent fell on the root in the comparative and superlative; that tallies with the similar accentuation of cognate forms in Vedic Sanskrit. These reconstructable paradigms are typical:

positive	*comparative*	*superlative*	
*jungaz	*junhizō	*junhistaz	'young'
*langaz	*langizō	*langistaz	'long'
*hauhaz	*hauhizō	*hauhistaz	'high'
*hrainiz	*hrainizō	*hrainistaz	'clean'
*harduz	*hardizō	*hardistaz	'hard'

Note especially examples in which an obvious suffix has been deleted before the addition of the comparative and superlative suffixes (as also in Vedic Sanskrit):

positive	*comparative*	*superlative*	
*niwjaz	*niwizō	*niwistaz	'new'
*irzijaz	*irzizō	*irzistaz	'astray'
*sinīgaz	*sinizō	*sinistaz	'old'

It appears that all (i)ja-stems followed this pattern. The comparison of *feluz 'many' also might have been irregular. The comparative and superlative survive only in ON *fleiri, flestr* and might have been altered by lexical analogy with *meiri, mestr* 'bigger, biggest' (see below; the ON positive has been replaced by *margr*). But some ultimate connection with Lat. *plūs, plūrimus* (Old Lat. adv. *ploirumē*) and Gk πλέων /pléǫ:n/, πλεῖστος /plêistos/ remains likely.

Some a-stem adjectives instead had comparatives in *-ōz-an- and superlatives in *-ōs-ta-, the original suffix having contracted with a preceding vowel. (The exact preform of these formations is not recoverable; it seems clear that this suffix complex spread by morphological remodeling.) Reconstructable examples include:

positive	*comparative*	*superlative*	
*armaz	*armōzō	*armōstaz	'poor'

*frōdaz	*frōdōzō	*frōdōstaz	'wise'
*hailagaz	*hailagōzō	*hailagōstaz	'holy'

This eventually became the default pattern in most daughters, though it is not in Gothic.

At least four adjectives exhibited suppletive comparison. The securely reconstructable paradigms are:

positive	*comparative*	*superlative*	
*mikilaz	*maizō	*maistaz	'big'
*lītilaz	*minnizō	*minnistaz	'little'
*gōdaz	*batizō	*batistaz	'good'
*ubilaz	*wirsizō	*wirsistaz	'bad'

This may not have been the whole story, however. In Gothic there is attested once a completely isolated comparative *iusiza* which appears to mean 'better' (*ni und waíht iusiza ist skalka* (Galatians 4: 1) 'not at all better is [he] than a slave' [?; or 'he is not at all different from a slave', *οὐδὲν διαφέρει δούλου*?]). This is reminiscent of Ancient Greek, in which we find several comparatives meaning 'better' in use in a single dialect; the same could have been true of PGmc, though we do not have enough evidence to reconstruct such a situation with confidence.

One of the reconstructable words for 'old' (etymologically *'fully grown') also poses an interesting puzzle, but one for which a probable solution can be suggested. In Gothic we find *alþeis, alþiza, alþists* (as if < PGmc *alþijaz, etc.); in PWGmc we instead have *ald, *aldirō, *aldist (as if < PGmc *aldaz, *aldizō, *aldistaz). ON comparative *ellri* is cognate with the Gothic form (the shape of superlative *elztr* is etymologically indeterminate), but the positive has been replaced by the innovative *gamall*. The probable PGmc paradigm was *aldaz, *alþizō, *alþistaz, with the same Verner's Law alternation as *jungaz 'young' (and probably modeled on the latter, since the two were antonyms); Gothic has probably remodeled the positive on the other forms (as an ija-stem; why?), in WGmc the remodeling has proceeded in the other direction, and in ON the comparative and superlative survived when the positive was replaced.

That comparatives and superlatives were originally independent lexemes is demonstrated not only by the old suppletive paradigms, but also by the fact that in all the daughters we find comparative and superlative adjectives formed to various adverbs to which no positive adjective is also formed; an example found in several languages is *airizō 'forebear' (Goth. *airiza*, OE *ærra*, OHG *ēriro*), formed to *airi 'before'.

Finally, there were a handful of weak adjectives made to stems in *-ma-n- that were more or less comparative in meaning; the greatest variety is preserved in Gothic. Reconstructable examples are *frumō̄ 'first' (Goth. *fruma*, OE *forma*, OS *formo*); *aftumō̄ 'last' (Goth. *aftuma* 'latter', *aftumists* 'last', OE *æftemest* 'last'); *uhumō̄ 'highest' (Goth. *aúhuma* 'higher', *aúhumists* 'highest', OE *ȳmest* 'highest'); *innumō̄ 'inner, inmost' (Goth. *innuma*; OE *innemest*). These are reminiscent of such Latin examples as *summus* 'highest'; but whereas in Italic and Celtic the suffix *-mo- was integrated into the paradigm of comparison as the superlative suffix, in Germanic that function was instead adopted by *-to-, leaving *-mo- marginal to the system.

4.3.6 *The inflection of other PGmc nominals*

These are grouped together simply because they are small, closed classes that do not readily fit into any of the categories already discussed.

4.3.6 (i) *Numerals* The numeral 'one', PGmc *ainaz, was inflected like an ordinary strong adjective. Plural forms in the meaning 'some' are attested in various daughters; so are weak forms in the meaning 'alone'. Both those usages could have existed already in PGmc.

Reconstructing the inflection of 'two' is extremely difficult. The dat. and inst. are reconstructable as *twaimaz and *twaimiz (i.e. with normal strong endings) on the testimony of all the languages. The gen. was clearly *twajjǭ̄ (cf. Goth. *twaddje*, ON *tveggja*, OHG *zweio*), with an unparalleled *jj before the ending. Beyond that the languages diverge. Cowgill has argued persuasively that Gothic neuter nom.-acc. *twa* reflects an old uninflected form (Cowgill 1985*b*: 13–14). OS neuter nom.-acc. *twē* can hardly reflect anything other than PGmc *twai < PIE neut. dual nom.-acc. *dwóy(h_1) (ibid. 19). Most of the other attested forms are clearly inflected as plurals, but that can easily be a parallel innovation. Possibly we should posit a relic dual inflection for 'two' in PGmc, as well as an uninflected form of uncertain function. Further evidence for dual inflection, however, is elusive. It has been usual to reconstruct the preform of OE *twēġen*, Northumbrian *twæġen* as *twō-jVnō or the like (cf. Ross and Berns 1992: 568–9 with references), reflecting a PGmc masc. dual nom.-acc. *twō < PIE *dwóh$_1$. Seebold has made a strong case for the contention that the vowel in the first syllable of these OE forms was actually short in some dialects (Seebold 1968); but his explanation of the metrical length which had led Sievers to posit a long vowel in the first place (ibid. 426–8) is unconvincing. Under the circumstances we cannot safely rely on the OE forms to support any argument. In short, we are unable to reconstruct the nom. and acc. forms of PGmc 'two' with confidence.

There was clearly a form of the collective 'both' that rhymed with 'two'; its stem was *ba-. But extended forms of this word are also attested widely in the daughters: we find Goth. *ba-* and *bajoþ-*, ON *báðir* (inflected as a normal strong adj., except that the neut. nom.-acc. was *báði* and the gen. was the unextended *beggja*), OF *bēthe*, OS *bēðia*, OHG *bēde, beide;* only OE lacks such an extended form. The formations do not correspond perfectly and must therefore have been at least partially independent parallel developments.

By contrast, 'three' was an ordinary i-stem. Its inflection can be reconstructed without difficulty:

	masc.-fem.	*neut.*
nom.	þrīz	þrijō
acc.	þrinz	þrijō
gen.	þrijǭ	
dat.	þrimaz	
inst.	þrimiz	

It is striking that this quantifier does not exhibit 'pronominal' endings.

The PGmc inflection of 'four' has been convincingly reconstructed by Stiles 1985–6. All three genders had undergone syncretism under the form of the PIE neuter; thus there was only one set of forms:

nom.-acc.	fedwōr
gen.	feduro̅̄
dat.	fedurmaz
inst.	fedurmiz

(cf. ibid., *NOWELE* 7: 18). At some point, however, the oblique pl. endings *-imaz, *-imiz began to spread from 'three' to 'four' and higher numerals (ibid. 13–14). Since the (limited) i-stem paradigm that resulted is attested both in Gothic and in WGmc, it would be simplest to suppose that this development had already begun in PGmc (ibid. 18–19), though it is natural enough that parallel innovation cannot be excluded.[17]

The succeeding numerals up through 'twelve' can be reconstructed as follows (except that the endings of 'eleven' and 'twelve' are unrecoverable):

'five'	*fimf	'nine'	*ne(w)un
'six'	*sehs	'ten'	*tehun
'seven'	*sebun	'eleven'	*ainalif- (*-b-?)
'eight'	*ahtōu	'twelve'	*twalif- (*-b-?)

[17] The ON paradigm, which differentiates gender in the nom. and acc., is innovative; see Stiles, *NOWELE* 6: 95–104, 7: 19.

These were uninflected, at least when preceding a noun within a noun phrase, though they eventually acquired i-stem endings in some syntactic environments (see above). 'Thirteen' through 'nineteen' were compounds of units and *-tehun 'ten', though not all the details are clear. In particular, the languages disagree on the compounding form of 'three' (masc. acc. in ON, Noreen 1923: 193; neut. in OE, Brunner 1965: 254; masc. nom.-acc. in OHG, Braune and Eggers 1975: 232; 'thirteen' is unfortunately unattested in Gothic). A reasonable guess is that these are all replacements for an original compounding form of 'three', probably *þri-. 'Fourteen' was certainly constructed with the compounding form of 'four', and must have been *feþurtehun (cf. Stiles 1985–6, *NOWELE* 7: 25–7). The remaining forms can only have been *fimftehun, *sehstehun, etc.

The formation of the decads was bizarre (see Szemerényi 1960: 27–44). Up through 'sixty' the terms were phrases composed of units and the plural of a masc. u-stem noun *teguz 'decad', thus *twai (twō?) tigiwiz, *þrīz tigiwiz, *fedwōr tigiwiz, *fimf tigiwiz, *sehs tigiwiz; naturally these phrases were fully inflected. Beyond that point the decads were compounds: *sebuntēhunda, *ahtō(tē)hunda, *ne(w)untēhunda; in all the daughters they are uninflected, and I have therefore reconstructed forms with a neut. nom.-acc. sg. ending, though the PGmc situation could have been different. 'Hundred' was a neuter a-stem noun *hundą, apparently fully inflected. 'Thousand' was a fem. ī/ijō-stem *þūsundī, likewise fully inflected.

As in many IE languages, the lower ordinals were suppletive or irregular but the higher ordinals were constructed by rule. The reconstructable forms are *frumō 'first' (weak adj.), *anþeraz 'second' (also 'other (of two)'; strong adj.), *þridjō 'third' (weak adj., so all subsequent ordinals), *feurþō (Stiles 1985–6, *NOWELE* 3: 5–6), *fimftō, *sehstō, *sebundō, *ahtudō (*ahtōþō?; the daughters disagree), *ne(w)undō, *tehundō, *ainaliftō, *twaliftō, etc.

Other sets of numerals—distributives, multiplicatives, and so on—no doubt existed in PGmc but are of little importance in a history of English.

4.3.6 (ii) *'Pronominal' inflection* By far the most important member of this inflectional class was the unmarked demonstrative 'that'; its inflection exerted repeated analogical influence on adjective and noun inflection in PGmc and its daughters. The reconstructable paradigm is:

		masc.	*neut.*	*fem.*
sg.	nom.	sa	þat	sō
	acc.	þanǭ	þat	þǭ
	gen.	þas		þaizōz
	dat.	þammai		þaizōi (?)

	inst.		þana (?)		þaizō
pl.	nom.	þai		þō	þōz
	acc.	þanz		þō	þōz
	gen.			þaizǭ	
	dat.			þaimaz	
	inst.			þaimiz	

The initial alternation of *s- and *þ- was inherited from PIE. The endings were nearly identical with those of the strong adjective. Note the gender syncretism in the oblique pl.

'This' was *hi- ∼ *he-; in the daughters it is preserved in that meaning only in fixed phrases in Gothic and OHG, though in northern WGmc it became the 3rd-person pronoun. The original 3rd-person pronoun, preserved in Gothic and OHG, rhymed with 'this' but lacked the initial *h-. Both paradigms were inherited from PIE. The inflection of the 3rd-person pronoun was the following:

		masc.		*neut.*	*fem.*
sg.	nom.	iz		it	sī
	acc.	inǭ		it	ijǭ
	gen.		es		ezōz
	dat.		immai		ezōi (?)
	inst.		???		ezō
pl.	nom.	īz		ijō	ijōz
	acc.	inz		ijō	ijōz
	gen.			ezǭ	
	dat.			imaz	
	inst.			imiz	

I have reconstructed *e- in forms in which it would be expected from a PIE viewpoint, but hard evidence for its persistence in Gmc can be cited only for the non-fem. gen. sg. (OHG neut. gen. sg. *es;* in Gothic, of course, *i and *e merged by regular sound change). It is possible that *(-)ez- had been replaced by *(-)iz- in this pronoun and in *hi- ∼ *he- 'this' already in PGmc. However, some developments in the daughters are easier to explain if we suppose that *e persisted beyond the PGmc period; see vol. ii for discussion. Note that the initial consonant of 'that' has spread to 'she' in the fem. nom. sg., a development that also occurred in Celtic (probably independently), where it spread to the entire paradigm.

It seems clear that PGmc inherited both the interrogative pronoun *k^{w}i- ∼ *k^{w}e- 'who?, what?' and the interrogative adjective *k^{w}o- 'which?'. But at some point the difference in function was lost, so that both contributed forms to the paradigm of the pronoun. Only singular forms are reconstructable:

	masc.	*neut.*	*fem.*
nom.	h^waz (h^wiz?)	h^wat	$h^wō$
acc.	$h^wanǭ$	h^wat	$h^wǭ$
gen.	h^wes (h^was?)		$h^wezōz$
dat.	h^wammai		$h^wezōi$ (?)
inst.	$h^wē$, $h^wī$		$h^wezō$

(The feminine paradigm rests solely on the testimony of Gothic, but comparable paradigms are attested in other IE languages.)[18] This is one of very few PGmc paradigms for which it is difficult to avoid reconstructing doublets. To be sure, OE gen. sg. *hwæs* is isolated and could be an innovation, and the generalization of *(h)we-* throughout the OHG masc. paradigm is clearly innovative (though it would be easier to explain if there had been an i-stem nom. sg. to start with). But a neuter inst. sg. *hve* is solidly attested in Gothic, while an alternative *$h^wī$ has left reflexes throughout NWGmc (OE *hwȳ*, ON neut. dat. *hví*, and probably OHG *(h)wiu*).

Other PGmc pronominals were inflected as strong adjectives; they included at least *sumaz 'some', *h^warjaz 'which?', *$h^waþeraz$ 'which (of two)?', and at least one demonstrative in *-na- whose exact shape is difficult to reconstruct. A considerable number of pronominals in the daughters are constructed from the above paradigms with clitic particles, and it seems likely that PGmc did the same, though the details are not recoverable. The PIE relative pronoun did not survive; apparently demonstratives and pronouns with clitics were used to introduce relative clauses in PGmc.

4.3.6 (iii) *Pronouns (proper)* The best discussion is Katz 1998, to which the reader is referred. I here give the reconstructable PGmc paradigms.

		1st person	*2nd person*	*3rd reflexive*
sg.	nom.	ék ∼ ik	þū	
	acc.	mék ∼ mik	þék ∼ þik	sék ∼ sik
	dat.	miz	þiz	siz
du.	nom.	wét ∼ wit	jut	
	acc.	unk	ink^w	
	dat.	unkiz	ink^wiz	
pl.	nom.	wī́z ∼ wiz	jūz	
	acc.	uns	iz ??	
	dat.	unsiz	izwiz	

[18] The syntactic peculiarities in the use of the Gothic feminine forms described by Matzel 1983 are difficult to evaluate; they do raise the possibility that the Gothic fem. is an innovation, but they might also be the result of its obsolescence.

The strikingly reduced paradigm is typical of archaic IE languages, as Katz's study shows in detail. The reflexive pronoun was probably bound by NPs of all numbers, as in Latin.

Possession was normally expressed not by genitive forms but by derived adjectives, which were inflected according to the strong paradigm. These are reconstructable as 1sg. *mīnaz, 2sg. *þīnaz, 3rd reflexive *sīnaz, 1du. *unkeraz, 2du. *ink^{w}eraz, 1pl. *unseraz, 2pl. *izweraz. Other uses of the genitive seem to have been expressed by forms of these adjectives with default inflection, i.e. neut. acc. sg.; thus 'they waited for me', with an object in the genitive, was probably expressed as *mīna bidun. Again the Latin situation is similar.

4.4 PGmc word formation

The system of word formation continued to be large and complex; only some of the more important details can be treated here. For further information see especially Meid 1967.

4.4.1 *Compounding*

It seems clear that at least some combinations of verb and preverb had become separate lexemes in PGmc, because some such compounds are widely attested in the daughters with distinctive meanings; typical examples include *andi-bindaną 'to untie', *bi-bindaną 'to wrap up', *fra-beudaną 'to forbid' (*beudaną 'to offer, to command'), *uz-drībaną 'to drive out', *fra-etaną 'to consume', etc. But it is also clear that univerbation of the finite forms of compound verbs was still incomplete, because in Gothic clitics can still intervene between preverb and verb (e.g. *ga-u-ƕa-sehvi* 'whether he could see anything'; *ga-saíhvan* 'to catch sight of', *-u* '?').

The PIE system of nominal compounding survived in PGmc without substantial alteration. It appears that, as in Latin, compound adjectives were often i-stems (see 4.3.5 (i) for examples). Agentive compounds ending in verb roots continued to be formed, but instead of root-nouns the final elements were now n-stems formed to the zero grade of the verb root (if it ablauted); examples have been adduced in 4.2.1 (in the discussion of Verner's Law).

4.4.2 *PGmc derivational suffixes*

As in PIE, many types of verbs were derived with suffixes which characterized distinctive inflectional classes; they have been discussed in 4.3.3 (ii). However, there were also a number of longer verb-forming suffixes in PGmc. Verbs in *-atjaną (weak class I) are attested in Gothic and well attested in WGmc.

Typical Gothic examples include *lauhatjan* 'to flash' (of lightning; cf. OHG *lohazzen* (*-ō-?) 'to be fiery' and *lougizzen* 'to flash', neither of which matches the Gothic form perfectly) and *swogatjan* 'to sigh'; WGmc examples will be discussed further in vol. ii. The attestation of verbs in *-isōną (weak class II) exhibits a similar pattern: in Gothic we find only *walwison* 'to roll', while WGmc examples (also to be discussed in vol. ii) are more numerous. At least one verb in *-inōną (weak class II) can be reconstructed for PGmc, namely *lēkinōną 'to heal' (Goth. *lekinon*, ON *lækna*, OE *lācnian*, OHG *lāhhinōn*), derived from *lēkijaz 'physician' (Goth. *lekeis*, OE *lǣċe*, OHG *lāhhi*). Other examples, all derived from nouns denoting human beings, are attested in Gothic (e.g. *reikinon* 'to rule', *skalkinon* 'to serve', *horinon* 'to commit adultery'); the WGmc pattern of derivation was different and presumably innovative (see vol. ii).

4.4.2 (i) *PGmc noun-forming suffixes* Most of the PIE types mentioned in 2.4.2 (i) have left at least traces in Germanic, but for the most part new formations have become productive. This section will concentrate especially on the latter.

Few PIE agent nouns of the type exemplified by Gk *τροχός* survived in PGmc, but action/result nouns of the type *τρόχος* are fairly well represented; in addition to such examples as *snaiwaz 'snow' and *daigaz 'dough', which could have been inherited from PIE, we find others such as *baugaz '(arm-) ring' whose derivational bases (in this case *beuganą 'to bend') have no extra-Germanic cognates. The corresponding oxytone feminines, representing PIE collectives, are also well attested; examples have been adduced in 4.2.1 (in the discussion of Verner's Law). But derived nouns of both classes with e-grade roots are also not rare; in fact, two of the most widely attested deverbative nouns are *gebō 'gift' and *helpō 'help'. Neuter a-stem action nouns are even more numerous; all ablaut grades of the root are found, though zero grades seem to predominate (see 4.2.1 for examples). A new and productive formation were masculine nouns made by adding originally stressed *-i- to the zero grade of the roots; typical examples include *kumiz 'coming', *runiz 'running', *k^{w}idiz 'saying' (with e-grade functioning as zero grade between obstruents), and *slagiz 'stroke, blow' (with a largely non-ablauting root; note the Verner's Law voicing in the last two examples).

PGmc z-stems, which reflect PIE acrostatic neuters in *-es-, survived in some numbers (see 4.3.4 (i)), but it is not clear that the class remained productive. PIE neuters in *-men- scarcely survived at all, but there was a new class of masculine nouns in *-man-; well-attested examples include *blōmō 'flower', *malmō 'sand', *skīmō 'light' (*skīnaną 'to shine'), and

*hleumō̄ 'hearing' (whose base verb probably did not survive in Germanic).[19] The relation between the two formations remains unclear; the masculines look like an amphikinetic type, but a few amphikinetic neuter collectives appear to have survived in PGmc too (notably *sēmō̄ 'seed'; cf. the discussion of Jasanoff 2002).

PIE feminine action nouns in *-ti- (> PGmc *-þi- ~ *-di- ~ *-ti- ~ *-(s) si-) remained common and productive; examples have been adduced in 4.3.4 (i), 3.2.3 (i), and especially 3.2.4 (iv). The corresponding masculines in *-tu- were less common on the whole (though cf. e.g. *lustuz 'desire', *dauþuz 'death', and *flōduz 'flood'), but action nouns in *-ō-þu- formed from class II weak verbs remained common and productive (e.g. *fiskōþuz 'fishing' to *fiskōną 'to fish'). A similar suffix complex was *-assu-, which must originally have formed nouns of this type to verbs in *-atjaną (see the discussion of Meid 1967: 159–62). One such derivation is still discernible: from the verb *ebnatjaną 'to level' (cf. OE *emnettan*) was derived *ebnassus 'leveling' (cf. OE *emness, efness,* Goth. *ibnassus*). But the attested reflexes of the noun actually mean 'levelness', as though it were derived directly from the adj. *ebnaz 'level'; apparently the suffix had become decoupled from its derivational base already in PGmc. In Gothic it became associated with class II weak verbs, especially those in *-inon* (see the end of the preceding subsection); thus we find *lekinassus* 'healing', *horinassus* 'adultery', and so on. In WGmc this suffix underwent important developments which will be discussed in vol. ii.

Inherited instrument nouns and their collectives survived fairly well in PGmc (e.g. *rōþrą 'oar', *hlīþrō 'lean-to, tent'); there was also a competing formation in *-ila- (masc., e.g. *tugilaz 'cord, bridle', *bautilaz 'hammer'). A homonymous suffix was used to form diminutives (e.g. neut. *kurnilą 'little grain'); when the noun denoted a person, the suffix was extended to n-stem *-ilan-, *-ilōn- (e.g. *mawilōn- 'little girl').

The PIE agent noun suffix *-ter- scarcely survives in Germanic. It seems to have been replaced, in the first instance, by *-(i)ja-, of which a few examples survive in Gothic (e.g. *faúramaþleis* 'chief, leader', derived from *maþljan* 'to speak'); but it was the extended n-stem form *-(i)jan- that became productive in PGmc. Most examples seem to have been formed from nouns (*murþrijō̄ 'murderer' to *murþrą 'murder', *fiskijō̄ 'fisherman' to *fiskaz 'fish', *gudjō̄ 'priest' to *gudą 'god', etc.), though there are also some examples at the end of

[19] OHG *irhleonēm,* which glosses Latin *gregāriīs* on p. 142 of the *Abrogans* glossary, appears to reflect a past participle *uzhlewanaz 'heard of, renowned'; but it is possible that this was a fossilized adjective already in PGmc. I am grateful to Patrick Stiles for alerting me to this form and for helpful discussion.

verbal compounds (e.g. *-numjō 'taker' in Goth. *arbinumja* 'heir', OHG *nōtnumeo* 'robber'). The n-stem deverbal nouns that usually occurred at the ends of such compounds (see 4.2.1 and 4.4.1) were eventually extracted to form deverbal agentives more generally; a few examples are found already in Gothic (e.g. *nuta* 'fisherman' to *niutan* 'to gain', *skula* 'debtor' to *skulan* 'to owe'), but it is not clear whether such decompounding had already begun in PGmc.

There were several PGmc suffixes that formed abstract nouns, mostly feminine. The inherited suffix *-dūþi- survives only in Gothic (*gamaindūþs* 'community', *ajukdūþs* 'eternity', etc.) and might already have been unproductive in PGmc. By contrast, inherited *-iþō- remained very productive (cf. *hauhiþō 'height', *triwwiþō 'trustworthiness', *mildiþō 'gentleness', etc.); it competed with an equally productive suffix *-īn- which was a Germanic innovation (cf. *hauhīn- 'height', *managīn- 'multitude', etc.). A number of neuter abstracts in *-(i)ja- can also be reconstructed (e.g. *rīkiją 'kingship, kingdom', *arbiją 'inheritance', *þiubiją 'theft').

4.4.2 (ii) *PGmc adjective-forming suffixes* Both the Caland system and the PIE suffix *-yó- have left only lexical relics in Germanic, as have most of the other adjective-forming suffixes that were prominent in PIE. A partial exception is PIE *-tó-. In addition to numerous lexicalized examples, mostly formed to verb roots (*daudaz 'dead', *kaldaz 'cold', *rehtaz 'straight', etc.; cf. Meid 1967: 142; Krause 1968: 177), denominal formations in *-ōda-, sometimes extended as *-ōdija-, are well attested; typical examples are *huf(e)rōdaz 'hump-backed' (OE *hoferod*, OHG *hoferōt*; *huf(e)raz 'hump') and *hringōdijaz 'ringed' (OS *hringodi*; *hringaz 'ring'). Though there seem to be no Gothic examples, these 'pseudo-participles' were clearly inherited, as examples can be cited from other branches of the family (e.g. Lat. *barbātus* 'bearded', Homeric Gk *ἀπύρωτος* /apúrɔ:tos/ 'untouched by fire').

A suffix *-isko- is widespread in the European branches of IE, but its function is difficult to determine. In Greek such a suffix is used to make diminutives. In PGmc *-iska- formed adjectives of characteristic (e.g. *manniskaz 'human', *þiudiskaz 'tribal').

Whether a suffix *-īno- or *-eyno- should be reconstructed for PIE is not clear (cf. Brugmann 1906: 273–9); Italic, Balto-Slavic, and Germanic provide especially numerous examples, but parallel development and/or post-PIE contact might account for the pattern of data. In any case, adjectives of material in *-īna- were clearly very common in PGmc (e.g. *gulþīnaz 'golden', *stainīnaz 'of stone', *irþīnaz 'of earth', etc.).

A number of innovative suffixes ending in *-ga- likewise became very productive in PGmc. Probably the most widespread, and the most important for the history of English, was *-aga- (e.g. *stainagaz 'stony', *mōdagaz 'angry', *hailagaz 'holy'); there are also reconstructable examples in *-uga- (e.g. *handugaz 'dexterous, capable, clever') and in *-īga- (e.g. *mahtīgaz 'powerful').

4.4.2 (iii) *The formation of adverbs* Gothic derives adverbs from adjectives productively with a suffix *-ba;* but while the suffix is probably inherited (Meid 1967: 139), its PGmc shape cannot be reconstructed because it has been lost in all the other daughters. PGmc deadjectival adverbs in trimoric *-ō̄ are securely reconstructable (e.g. *galīkō̄ 'similarly'). Comparative adverbs ended in *-iz and *-ōz, the usual comparative suffixes minus the n-stem extension (see 4.3.5 (iii)). Reconstructable examples include especially the suppletive ones (*maiz 'more', *minniz 'less', *batiz 'better', *wirsiz 'worse'), but cf. also *framiz 'further', *haldiz 'rather', *nēh^{w}iz 'nearer', *aljalīkōz 'otherwise', etc. For superlative adverbs the acc. sg. neut. of the adjective seems to have been used. PGmc clearly had an elaborate system of adverbs denoting place, formed from the pronominal stems *þa-, *hi-, *h^{w}a- and a range of adverbial roots; a reference grammar of any early Germanic language will give a good idea of the system (see e.g. Krause 1968: 206; Braune and Ebbinghaus 1973: 123–4; Brunner 1965: 251).

4.5 PGmc syntax

It appears that PGmc syntax reflected the PIE situation with little change, aside from the development of prepositions (see 4.3.1). The underlying word order of the clause was still S-O-V-I, with COMP elements to the left rather than to the right. Constituent scrambling persisted, as did the rule that raised interrogative and relative elements to some position within CP; various right-shifting rules, such as extraposition, also seem to have operated. Wackernagel's Law continued to operate (and is still very much in evidence in attested Gothic).

4.6 The PGmc lexicon

Shifts in the meanings of words and the replacement of old lexemes by new ones are universal types of language change; it is therefore not surprising that the lexicon of PGmc, like that of all IE languages, included many words of doubtful or unknown origin (e.g. *blōþą 'blood', *bainą 'bone', *handuz

'hand', *regną 'rain', *stainaz 'stone', *gōdaz 'good', *drinkaną 'to drink', etc.). Much more interesting are PGmc lexemes that can be shown to have been borrowed from other languages, because they reveal something about the prehistory of PGmc; that is the phenomenon that will be discussed here.

Celtic loanwords in PGmc included at least *rīk- 'king', *īsarną 'iron', *ambahtaz 'servant', *brunjōn- 'mailshirt', *lēkijaz (*lēkijaz?) 'physician', *gīslaz 'hostage', *Rīnaz 'Rhine', and *walhaz 'foreigner' (an adaptation of the Celtic tribal name that appears in Latin as *Volcae*). The first is identifiable as Celtic because of its vowel: if it were cognate with Lat. *rēx, rēg-* the PGmc vowel would be *ē, but in Celtic (alone among the languages of ancient Europe) *ē merged with *ī. The same argument might apply to 'iron', if was originally a vr̥ddhi-derivative of PIE *ésh$_2$r̥ 'blood' (Cowgill 1986: 68, n. 10). The other loans are identifiable as distinctively Celtic words or formations. 'Physician' appears to reflect *leagis, the preform of OIr. *liaig;* if the vowel sequence *ea was treated like native vowel sequences (which of course is not certain), the PGmc word might have had a trimoric vowel in its root syllable. 'King', 'physician', and 'foreigner' were clearly borrowed before Grimm's Law applied; since the *b's and *g of the other words reflect, or could reflect, original breathy-voiced stops, it is possible that all these words were borrowed before Grimm's Law applied. The preponderance of words indicating social and political relations (including warfare) is obvious, suggesting that the Celts enjoyed a higher level of 'civilization' at the time of the loans. There are also quite a few words shared only by Celtic and Germanic, which might or might not be loanwords; typical examples include *tūną 'fortified enclosure', *aiþaz 'oath', *rūnō 'secret', *marhaz 'horse', and *rīdaną 'to ride'. For further discussion see de Vries 1960.

Latin loanwords in PGmc were, by contrast, very few (though the daughter languages exhibit very many; see vol. ii). In addition to *Rūmōnīz 'Romans' (see 3.2.7 (i), probable examples include *pundą 'pound', *katilaz 'kettle', a family of words denoting trade made to a root *kaup- (cf. Lat. *caupō* 'merchant'), and perhaps a few others. These words were clearly borrowed after Grimm's Law had run its course; it is striking that all have something to do with trade. The fact that a number of fairly early Latin loans are found only in the more southerly languages (typically Gothic and OHG) strongly suggests that they were borrowed after the PGmc period; *kaisaraz 'emperor' must also be a post-PGmc loan for obvious historical reasons.

PGmc exhibited few loanwords from more easterly languages; Baltic and Slavic seem to have borrowed words from Germanic rather than the other way around (though there are some distinctive shared words that do not appear to be loans; cf. the discussion of 'eleven', 'twelve', and 'thousand' in 3.4.5 (ii)). An

obvious loan from Iranian is PGmc *paþaz 'path' (see Mayrhofer 1970), clearly borrowed after Grimm's Law had run its course; a probable second example is *wurstwą 'work', whose *-s- makes no sense in Germanic terms but could reflect Iranian *š (cf. Av. *vərəštuua-*; Warren Cowgill, p.c. *c.*1980). Two pre-Grimm's Law loans from some more easterly language are *hanapiz 'hemp' (cf. Gk *κάνναβις* /kánnabis/, borrowed from a language spoken somewhere to the north of Greece) and *paidō 'cloak' (cf. Gk *βαίτη* /báitę:/ 'shepherd's cloak', likewise a loanword).

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Index

I. Reconstructed forms.

A. Proto-Indo-European.

Post-PIE reconstructions (and pre-PGmc reconstructions in pre-Grimm's Law shape) are given in brackets. Forms of the same lexeme are given in the same entry *in alphabetical order;* for passages in which a whole paradigm is given only one form is indexed, with the notation '(parad.)'. Occasionally related lexemes discussed together are listed in a single entry. Suppletive forms of personal pronouns which are discussed separately are listed separately. Alphabetical order:
a ā b b^h d d^h e ē ə g g^h g^w g^{wh} ǵ $ǵ^h$ H h_1 h_2 h_3 i ī k k^w ḱ l l̥ m m̥ n n̥ o ō p r r̥ s t u ū w y.

B. Daughters of PIE.

1. Proto-Germanic.

Forms in PGmc shape which are clearly not reconstructable for PGmc. are given in brackets. Entries are arranged as in the PIE index, except that nouns are normally listed under the nom. sg., adjectives under the nom. sg. masc., and verbs under the pres. inf. Tables of present stem vowels are given on pp. 175 and 235–6, of verb endings on pp. 237, 238, 239, 251, 255, 256, and 258, and of noun endings on pp. 269, 272, and 274; the items in those tables are not listed separately here. Alphabetical order:
a ą ā b d e ē ē̄ f g g^{w} h h^{w} i į ī į̄ j k k^{w} l m n ō ǭ ō̄ ǭ p r s t þ u ų ū ų̄ w z.

2. Daughters of PGmc.

Forms are Proto-West Germanic unless marked otherwise.

3. Other reconstructed forms.

Forms are Proto-Celtic unless marked otherwise.

II. Attested forms.

A. Germanic languages.

1. Gothic.

2. Old Norse.

Forms are Old Icelandic unless marked otherwise. Note that in this list þ, æ, œ, ø, ǫ are at the end of the alphabet in that order.

3. Old English.

Forms are West Saxon unless marked otherwise.

4. Old Frisian.

5. Old Saxon.

6. Old High German.

7. Other Germanic languages.

B. Non-Germanic languages.

1. Anatolian languages.

Forms are Hittite unless marked otherwise. Note that in this list *g* is alphabetized with *k* and *d* is alphabetized with *t*.

2. Baltic languages.

Forms are Lithuanian unless marked otherwise.

3. Celtic languages.

Forms are Old Irish unless marked otherwise.

4. Greek.

Forms are Classical Attic unless marked otherwise.

5. Iranian languages.

Forms are Avestan unless marked otherwise.

6. Italic languages (other than Latin).

Forms are Oscan unless marked otherwise.

7. Latin.

8. Sanskrit and Middle Indic.

The lone Middle Indic form is marked. Alphabetization follows the Roman order (not the Indic); aspirates follow the corresponding unaspirated consonants, and letters with diacritics follow the corresponding unmarked letters.

9. Slavic languages.

Forms are OCS unless marked otherwise.

10. Tocharian languages.

The languages are called A and B; forms are B unless marked otherwise. Alphabetization of this list is as for Sanskrit (see section 8 above).

11. Other Indo-European languages.

12. Finnish (Uralic family).