Studies in Germanic Linguistics 3

Chapter 10: Numerals

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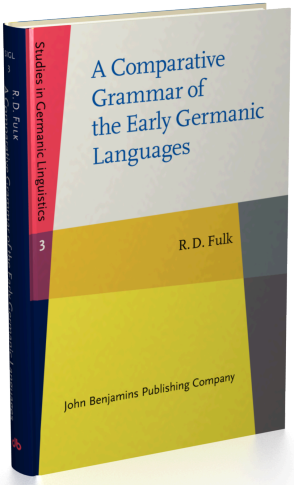

Pages 222–236 of
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CHAPTER 10

Numerals

I. Cardinals

10.1 The numerals 1–4

In PIE the first four cardinal numbers were fully declined as adjectives which could be used as substantives, and they continued to be declined in PGmc., though, as in most IE languages, no gender distinctions are observed outside of the nom. and acc. ('1' aside), and '4' is inflected consistently only in ON.[1]

1. The PIE *o*-stem **oinos* '1' (Gk. *οἰνός*, Lat. *ūnus*) by regular development yields Go. *áins*, OIcel. *einn*, OE *ān*, OS *ēn*, OHG *ein*, declined as a Gmc. *a/ō*-stem adj., but OE has acc. masc. *ǣnne*, also shortened to *enne* (beside analogical *ānne*), from **aininō*^{n}, an *i*-stem case form.[2] Inflection as an *i*-stem is a Gmc. innovation, but an old one, as Go. '11' probably requires **aini*- (§10.3). Despite the singular meaning, '1' could be inflected in the plural, in constructions like Go. *þans frijondans izwis áinans* 'only those loving you' (acc.) and OE *ānra gehwilc* 'each one', literally 'each of ones'. In NWGmc. it may take weak inflections, usually with the meaning 'alone',[3] always with that meaning in ON, though in OHG it is inflected weak in definite constructions.

2. PIE had for '2' the form masc. **d(u)u̯oh₁*, neut. (and fem.?)[4] **d(u)u̯oi̯*, initial **du̯*- appearing after a short vowel in sandhi, otherwise **duu̯*-; cf. Lat. *duo*, Gk. *δύο* (Homeric *δύω*), Vedic Skt. *d(u)vā́u*, *d(u)vā́*.[5,6] It was given the dual inflections of *o*-stems (masc., neut.) and *ā*-stems (fem.), which are imperfectly known: see, e.g., Szemerényi 1996: §7.6.7. The early Gmc. paradigms are these:

		Go.	OIcel.	OE	OS	OHG
m.	**nom.**	twái	tveir	twēgen	twēne, -a	zwēne
m.	**acc.**	twans	tvá	twēgen	twēne, -a	zwēne
n.	**nom./acc.**	twa	tvau	twā, tū	twē	zwei
f.	**nom./acc.**	twōs	tvær	twā	twā, twō	zwā, zwō
	gen.	twaddjē	tveggja	twēg(e)a, twēg(e)ra	tweio	zweio
	dat.	twáim	tveim(r)	twǣm, twām	twēm	zweim

The Go. endings are identical to those of plural *a/ō*-stem adjectives attached to a stem *tw*-, except that the gen. pl. has the stem *twaddj*- < **twajj*-, due to the Verschärfung (§6.10), the same PGmc. stem that underlies the case-form elsewhere in Gmc.[7] With that one exception, the OIcel. forms are made up of a stem *tv*- plus the same endings found in the plural of the pronoun *hann* (§8.7: *þeir*, *þau*, *þær*, etc.); the by-form dat. *tveimr* is analogical to *þrimr* '3'. In WGmc., where the nom. and acc. are identical, the vowel *ē* has not been satisfactorily accounted for. The usual explanation, developed from a suggestion by Sievers (1885b: 495–6 n. 1; so, e.g., Krahe & Meid 1969: II, §61, Euler 2013: 124) is that OE *twēgen* is analogical to *bēgen* 'both', which may be

regarded as a compound of PGmc. **bō-* (< PIE **bhō*, as in Gk. *ἄμφω*, Lat. *ambō* 'both') and pronominal **jen-*, as in OHG *jenēr* 'that' (§8.11). On the problems with this derivation, see the discussion of 'both' below.[8] It cannot be that OE *ē* is the umlaut of *ā* < *ai* (so, e.g., Prokosch 1939: §99a), since the umlaut of *ā* is *ǣ*, and although forms with *ǣ* do occur in OE, they represent a decided minority in the *DOE* corpus (Healey 2009): 45 *ǣ* : 779 *ē*.[9] Rather, Anglian OE *twǣgen* shows that *ē* in WS *twēgen* can only be the umlaut of *ō*.[10] In OS *twēne* the vowel *ē* is the regular development of *ai*, and the form can otherwise plausibly be explained as analogical to the nom./acc. pl. of '1', *ēne*, *-a*; but this will not account for *ē* in OHG *zwēne*.[11] OE nom./acc. fem. & neut. *twā* can directly reflect PIE **duọi*, as can neut. OS *twē*, OHG *zwei*; and OE *tū* (as well as OS *twō*, OHG *zwō*, though the former occurs just once) can reflect PGmc. **twōz* (> Go. *twōs*): see §4.11. More difficult to explain are fem. OS *twā*, OHG *zwā*; perhaps they align with Go. neut. *twa*, with lengthening under Prokosch's law (§2.5). Ross & Berns (1992: 562, 566) suggest instead that they represent the lengthening of re-stressed **twa*, the unstressed result of WGmc. **twō* < PGmc. **twōz*. But WGmc. **-z* was not lost in OHG monosyllables, and so Cowgill (1985: 16–18) derives *zwā* from PIE uninflected **duu̯o*, with lenghtening of final **-a*. Rare OE *twēg(e)a* is the etymological form, although again *ē* for expected *ǣ* (**twǣj-* < **twāj-* < **twaij-*, §6.10) remains to be explained; *twēg(e)ra* has acquired the pronominal/adjectival inflection. OE *twǣm* is etymological, from **twaimiz*, whereas *twām* is by analogy to *twā*; but cf. Ross 1954: 118, reconstructing **-muz*, **-maz* beside **-miz*.

Closely connected with '2' is 'both', the latter being semantically a definite form of the former. The surviving forms of Go. *bái* are precisely parallel in structure to *twái*; the pronominal form of the stem seen in nom. masc. *bajōþs*, dat. *bajōþum* was apparently inflected like a consonant-stem noun.[12] The usual forms in the other Gmc. languages are these:

		OIcel.	OE	OS	OHG
m.	**nom.**	báðir	bēgen	bēđia, -ie, -ea	bēde, beide
m.	**acc.**	báða	bēgen	bēđia, -ie, -ea	bēde, beide
n.	**nom./acc.**	bæði	bā, bū	bēđiu	bēdiu, beidiu, *CG* -(i)u
f.	**nom./acc.**	báðar	bā	bēđia, -ie, -ea	bēdo, beido
	gen.	beggja	bēg(e)a, bēgra	bēđero[13]	bēdero, beidero
	dat.	báðum	bǣm	bēđium	bēdēm, beidēm

The OIcel. stem contains *bá-* < acc. pl. **bans*; to this was added a pronominal stem in **þ-*, and thus perhaps masc. acc. *báða* reflects, in effect, **bans-þans* (so Prokosch 1939: §99a). The stem *báð-* is then inflected like the plural of *sjá* (§8.12: *þessir*, *þessi*, *þessar*, etc.). The umlaut in *bæði* resists explanation, but the discussion in §8.12 of *sjá* and its development suggests some possibilities.[14] Gen. *beggja* could be etymological, depending on how the Verschärfung is to be explained (§6.10), and on what the shape of this stem might have been before *báð-* was extended through the rest of the paradigm, but more likely it is analogical to *tveggja* '2'. It was remarked above that *ē* in the WGmc. forms of '2' presents difficulties; the same may be said in regard to 'both'. As noted above, OE *bēgen* is usually explained as a compound of **bō-* and pronominal **jen-*; Seebold (1968: 418–21, with references) objects on a variety of grounds, among them that 'both' should combine not with the pronoun **jen-* but the 'article' in **þ-* (as in ON, OS, and OHG).

3. PIE '3' was an *i*-stem **treu̯̯-* ~ **tri-*, reflected as Skt. *tráyaḥ*, Gk. *τρεῖς*, Lat. *trēs*. The usual Gmc. forms are these:

	Go.	OIcel.	OE	OS	OHG
m. nom.		þrír	þrīe	thria, -ie, -ea	drī
m. acc.	þrins	þrjá	þrīe	thria, -ie, -ea	drī
n. nom./acc.	þrija	þrjú	þrēo	thriu, thrū	driu
f. nom.		þrjár	þrēo	thria, -ie, -ea	drīo
f. acc.	þrins	þrjár	þrēo	thria, -ie, -ea	drīo
gen.	þrijē	þriggja	þrēora		drīo
dat.	þrim	þrim(r)	þrim	thrim	drim, drin

The Go. masc. and fem. nom. (both **þreis*) and fem. gen. (**þrijē*) and dat. (**þrim*) are unattested. The Go. word is declined like an *i*-stem noun, of which there are no neut. examples in Go.; neut. *þrija* precisely reflects PIE **tri(i̯)ā* (cf. Gk. *τρία*, Lat. *tria*), as do the corresponding forms in the other Gmc. languages. PIE nom. masc. **treii̯es* should have produced PGmc. **þri(j)iz* > **þrīz*, which yields the OIcel. and OHG forms; the OE and OS equivalents show analogical addition of adj. endings to **þrī-*. The cognates of OIcel. *þriggja* do not show gemination of PGmc. *j*; probably, then, it is analogical to *tveggja*, though some regard it as etymologically correct (e.g. Krahe & Meid 1969: II, §61; see §6.10 above on the Verschärfung). Certainly, OIcel. *þrim* is analogical, whereas *þrimr* < **þrimiz* is original (cf. *vinr* 'friend' < **winiz*). Nom./acc. fem. *þrjár* reflects the stem **þrī-* with the addition of the adjective inflection **-ōʀ* (§9.2), and the WGmc. languages show a comparable analogical development.[15] OE gen. pl. *þrēora* shows addition of the adj. ending, whereas OHG *drīo* is the expected equivalent of Go. *þrijē*.

4. PIE masc. *kʷetu̯ores* '4' (Skt. *catvā́raḥ*, Gk. *τέσσαρες*, Attic *τέτταρες*, Lat. *quattuor*) was declined as a consonant-stem.[16] The Gmc. forms (Go. *fidwōr*, OIcel. *fjórir*, OE *fēower*, OS *fi(u)war*, *fior*, OHG *fiur*, with PIE **kʷ-* > **p-* > *f-*, §6.5 *ad fin.*) for the most part show limited inflection. Go. *fidwōr*, with /ð/ < PIE *t* under Verner's law, is usually uninflected, though once there is a dat. *fidwōrim*. OIcel. *fjórir* is inflected thus:

	masc.	neut.	fem.
nom.	fjórir	fjǫgur	fjórar
acc.	fjóra	fjǫgur	fjórar
gen.	fjǫgurra	fjǫgurra	fjǫgurra
dat.	fjórum	fjórum	fjórum

That is to say, *fjórir* is declined the same way as the plural of *gamall* (§9.3), with the same inflections and the same distribution of mono- and disyllabic stems, the remarkable difference being that the distinction between the stems *fjór-* and *fjǫgur-* is more pronounced than that between *gaml-* and *gamal-*. The development is masc. **feðurēʀ* > **feuðreʀ* > **fjǫðriʀ* > *fjórir* but neut. **feðuru* > **feuður* > *fjǫgur* (§6.14).[17] The WGmc. forms are usually derived from a stem altered before the application of Grimm's and Verner's laws, **kʷetu̯ór-* > **kʷeku̯ór-* > **pekṷór-* > **fexwár-* > **feɣwar-* (Verner's law), with subsequent change of intervocalic *ɣw* to *w* after *e* (§6.4).[18] Yet this assumption requires a stem different from that found in Gothic, and so it is more economical to derive WGmc. **feuwar* from **feðwar* < **feðwōr*; OHG *fiur* (and OS *fior*) may then be derived from the ordinal (Stiles 1985–6: 6.89–92, with references). Synthesizing these reconstructions, Stiles concludes (7.18) that '4' was inflected thus in PGmc.: nom./acc. **feðwōr* (from the PIE neut.), gen. **feðurô^{n}* (from PIE **kʷetur-*; cf. Skt. *cátur*), dat. **feðurmiz*. Thus, Go. and WGmc. generalized the nom./acc. stem, adding *i*-stem inflections, whereas ON standardized the oblique stem, adding *a*- and *ō*-stem inflections.

WGmc. ‘4’ is usually uninflected when attributive; when predicative or substantive, in OS and OHG it is inflected as an *i*-stem, in OE as follows: nom./acc. *fēow(e)re* (with forms in *-o* in late Northumbrian), gen. *fēow(e)ra*, dat. *fēow(e)rum*. On Go. *fidur-*, OE *fiþer-*, see below (§10.10).

1. The literature on Gmc. numerals is treated extensively in Ross & Berns 1992. Schuppener 1996 deals mainly with numerical structures rather than the specifics of the development of individual numerals.

2. So Ross & Berns 1992: 560–1. The *i*-stem variant is also reflected in the OE word element *æn-* (*ænlic* ‘peerless’, *ænlīepe* ‘solitary’, beside *ānlic*, *ānlīepe*). Since the numerals ‘5’ and above, as well as ‘3’, declined as *i*-stems, it should not be surprising that ‘1’ acquired an *i*-stem alternant. Cf. Ringe & Taylor 2014: 18–20, positing a phonological change of **ainanō^{n}* (cf. Go. *áinana*) to NWGmc. **aininō^{n}*.

3. Rarely can OE weak *ānan* not be explained as a late form of *ānum*.

4. Cf. the nom. dual neut. fem. pronoun **toi̯* (§8.9).

5. The PIE alternation of syllabic and nonsyllabic glides after an initial consonant in sandhi is confined to monosyllables and is commonly referred to as Lindeman’s law: see Lindeman 1965.

6. For extensive references to the literature on Gmc. ‘2’, see Strunk 1992: 194–200,.

7. The unattested Go. fem. gen. probably would have been **twaddjō*. Cowgill (1985) argues that Go. neut. *twa* reflects an uninflected dual corresponding to Gk. *δύο* (also reflected in OIcel. *tvau*, with analogical addition of the neut. pl. inflection *-u* of *a*-stems), and this is possible, though the near-perfect conformity of the paradigm to that of Go. *a/ō*-stem adjectives is striking.

8. See Ross & Berns 1992: 568–9 for discussion and references, though their solution, deriving *twēgen* from **twai inae*, requires some unlikely phonological developments. For another view, see Bammesberger 2010.

9. Girvan (1931: 41–2) asserts that the texts with *twǣgen* are all Kentish, and in Kentish *ǣ* and *ē* have fallen together, resulting in hypercorrection. It must be said that the texts are not all Kentish, but nearly all the examples outside of Kentish charters occur in just two texts, Ælfric’s *Lives of Saints* and the Mercian portion of the gloss on the Rushworth Gospels. Girvan is thus surely right that *ǣ* cannot be original, *pace* Ross & Berns 1992: 568.

10. It is true that *ē* is commonly rounded to *œ̄* after *w* in Northumbrian, but this will not account for Mercian *twœ̄ga*.

11. So, e.g., Holthausen 1921: §380 Anm. 2. Cf. Prokosch (1939: §99a; so earlier Meringer 1887: 235), assuming the OS and OHG forms were originally like the OE one: “OS [for which he must mean OHG] *ē* was monophthongized from *ai* at a time, when the word was still felt as a compound, and *ai* therefore was in final position; cf. *wēnec* (by the side of *weinec*), from **wai-* ‘woe’.” Krahe & Meid (1969: §61) instead reconstruct for OS *twēne* and OHG *zwēne* an archaic adjectival distributive numeral PIE **du̯oi-noi* comparable to Lat. *bīnī* ‘twofold’, *ternī* ‘three at a time’; so earlier Hirt 1931–4: II, §93; see further Seebold 1968: 417. As for Seebold’s own argument, despite the impressive orthographic evidence he presents to show that OE *twēgen* originally had a short root vowel, such an interpretation is forbidden by the counterevidence of poetic meter, which he fails to explain convincingly. His argument also demands some questionable assumptions, e.g. the change of WGmc. **-aj-* to **-ej-* at an early date.

12. To the suffix *-ōþ-* Torp & Falk (1909: 255) compare Lat. *-āt-* in *nostrātes* ‘ours, of our country’. Krause (1971: 33–4) argues that the perplexing Runic **baijoʀ** (Kårstad cliff inscription, ca. 450; **o** is uncertain) is a form of ‘both’.

13. To OS *bēđia* there also occurs a gen. sg. neut. *bēđies*.

14. Ross & Berns (1992: 573) reconstruct a stem with the pronoun **þiu* attached, but whereas this is plainly attached to the stem in OS and OHG, there is no plausible source for it in ON.

15. On OHG nom./acc. fem. *drīo* in particular, see Eichner 1987: 196–200.

16. Szemerényi (1996: §8.5.2) suggests PIE fem. **k^{w}etesres*, neut. **k^{w}etu̯ōr*, masc. acc. **k^{w}eturn̥s*, gen. **k^{w}eturom*, loc. **k^{w}etu̯r̥su*.

17. So the handbooks of ON, as well as Stiles 1985–6: 6.97–104 (with references) and (probably) Voyles 1987: 489; Hirt (1931–4: II, §91) and Pokorny (1959–69: I, 643) instead derive the form from **k^{w}etwōr*, assimilated to **k^{w}ekwōr* in Pre-PGmc.

18. Mottausch (2015: 286) instead reconstructs WGmc. **feuwar-*, without *ʒ*, explaining the loss of PIE *t* as analogical to the ordinal Pre-PGmc. **péturto-*, by dissimilation (cf. Skt. *caturthá-*).

10.2 The numerals 5–10

Numerals above '4' were indeclinable adjectives in PIE, but this changed in Gmc. In general, these numerals are undeclined when they stand before a subtantive that they qualify; otherwise (i.e., when modifying a preceding noun or when substantive) they may be inflected as *i*-stem nouns, ultimately by analogy to '3', though exceptions occur. Contradicting the rule are ON, in which they are categorically indeclinable, and OE, where the inflected forms are like those of '4', except that the nom./acc. of '5' may end in *-e*, or (chiefly Northumbrian) *-o*. In Gothic they take inflections only in the gen. and dat., not in the nom. or acc.

5. PIE **pénkʷe* (Skt. *páñca*, Gk. *πέντε*, Lat. *quinque*) develops to Go. *fimf*, OE OS *fīf* (§4.11), OHG *fimf*, *finf*. On the change of *kʷ* to Gmc. *f*, see §6.5 *ad fin*. OIcel. *fimm* (for expected **fím*: §4.9) is usually explained as analogical to related forms (e.g. *fimtán* '15', *fimti* 'fifth'), though it has also been claimed to be a phonological development: see §6.14 n. 5.

6. PIE **séks* (Skt. *ṣáṣ*, Gk. *ἕξ*, Lat. *sex*) regularly yields Go. *saíhs*, OIcel. *sex*, OE *siex* (from *seox* by palatal umlaut, §4.13), OS OHG *sehs*. Boutkan (1995b: 376) reconstructs PGmc. **sexse*, by analogy to PIE **pénkʷe*, in order to explain why the word does not yield PNorse †*sexʀ*, but his assumption is that PGmc. final **-s* was always voiced.

7. PIE *septḿ̥* (Skt. *saptá*, Gk. *ἑπτά*, Lat. *septem*) lost *t* in Gmc. before the onset of Grimm's law, giving (by Verner's law) **seƀun* > Go. *sibun*, OE *seofon*, and, with raising of *i* before *u* in OS and OHG (if not earlier, §4.4), OS *siƀun*, OHG *sibun*. OIcel. *sjau* represents *-au* (borrowed from **āttau* '8') attached to the stem **se-*. The reason for the loss of *t* in PGmc. **siƀun* is probably the analogical influence of the ordinal **sep(t)ḿ̥tos* 'seventh', in which haplology (§12.33 n. 6) may be assumed to have induced its loss, though Sievers (1877–8: 5.119; likewise Ross & Berns 1992: 586) argues for phonological loss of *t* between *p* and *ḿ̥*; cf. van Helten 1905–6: 84, and, for an alternative explanation, Voyles 1987: 492–3. The retention of the final nasal consonant (with PGmc. change of final *m* to *n*, §6.11) is also attributable to the influence of the ordinal, although other explanations are possible.[1]

8. PIE **ok̑tṓ(u)* (Skt. *aṣṭā́u*, Gk. *ὀκτώ*, Lat. *octō*) develops regularly to Go. *ahtáu*, OIcel. *átta* (§4.9), OE *eahta* (§4.12), OS OHG *ahto*. The PIE word is formally a dual (referring to the fingers on two hands, thumbs aside): see Szemerényi 1996: §8.5.2 n. 14 for refs.

9. PIE **néu̯n̥* (Skt. *náva*, Gk. *ἐννέα* (on which see Sihler 1995: 415–16), Lat. *novem* (with *-m* for *-n* by analogy to *decem*, but cf. Szemerényi 1960: 171–3)) corresponds to Go. *niun* (disyllabic, with PGmc. loss of *w* before *u*, §6.11), OIcel. *níu*, OE *nigon*, OS *nigun*, OHG *niun*. These show several peculiarities. OIcel. *níu* should have become monosyllabic †*njú* (cf. *sjá* 'see' < *se-a*); the reason for the retention of disyllabicity is not known for certain, but perhaps *ní-* was retained by analogy to forms like *ní-tján* '19', *ní-tugr* 'ninety years old'.[2] PGmc. **niwun-* should have lost *w* (§6.11), with raising of *e* before *u* and subsequent vowel contraction in WGmc.[3] OHG *niun* thus appears to be etymological, whereas an inorganic *ȝ* replaced the lost *w* in NSGmc., probably to maintain parallelism with disyllabic NSGmc. **texan* 'ten'; cf. OHG *niwan* '9' (1×), likewise in agreement with OHG *zehan* (Braune 2004a: §271 Anm. 2). At all events, it is inadvisable to reconstruct Proto-WGmc. **newun* (Euler 2013: 126).

10. PIE **déḱm̥* (Skt. *dáśa*, Gk. *δέκα*, Lat. *decem*) is probably less archaic than PIE **déḱm̥t* (Old Prussian *dessīmpts*, Lith. *dẽšimt*, OCS *desętь*, Gk. *-κοντα*).[4] It appears to be the latter that corresponds to Go. *taíhun*, OIcel. *tíu* (to be explained the same way

as *níu* above), OE *tīen*, OS *tehan*, OHG *zehan*, since it accounts for the retention of the final nasal consonant (§5.2). The WGmc. forms correspond not to PIE **déḱm̥t* but **déḱomt*, which is unparalleled as such in IE; but cf. PIE **ḱm̥tóm* 'hundred' < **dḱm̥t-dḱom(t)* and Gk. *τριά-κοντα* '30', *τετταρά-κοντα* '40', and so forth.[5] OE *tīen* must show umlaut originating in the inflected forms (with *i*-stem inflections, as elsewhere in Gmc.; so Brunner 1965: §129 Anm. 6); the Mercian equivalent is thus correctly *tēn*. The uninflected form without umlaut is reflected in *hund-tēon-tig* '100' (§10.5).

1. Final *-un* could, e.g., be analogical to the ending on '10', which is phonological. Hirt (1931–4: II, §91) actually reconstructs a pre-Gmc. **septm̥*; the approach of Ringe 2017: 105 is similar. If these numerals were inflected in PGmc., as they are in Go. and WGmc. under the conditions mentioned above, that would also explain preservation of the final nasal consonant, with analogical extension to uninflected forms; but the cogent account of the PGmc. numerals and their inflection offered by Stiles (1985–6) renders it much likelier that inflection of the numerals above '4' is a post-PGmc. development.

2. Noreen (1970: §133b, 2) ascribes the noncontraction to a retained degree of stress on the final vowel, Prokosch (1939: §99a) to rhythmical patterns in counting. It is unnecessary to invoke analogy, as Prokosch does, to explain the long vowel, as a stressed antevocalic long vowel would be lengthened (Prokosch's law, §2.5). The development in *nítján* is **ni-u-* > **nī-u-* (Prokosch's law) > *ní-*. The same questions pertain to *tíu* 'ten'.

3. On **niwun-* rather than **newun-*, see §4.4 & n. 2.

4. The problem of which is older is complex and much contested: see Szemerényi 1960: 67–114 for an overview, arguing that the form with *-t* is older.

5. Szemerényi (1960: 101) supports the view of Brugmann (in Brugmann & Delbrück 1897–1916: II, 2.21–2) and others that *-an* in WGmc. **texan* is analogical to *-an-* in the decads (cf. Gk. *-κοντα*), whereas Voyles (1987: 489) regards it as borrowed from '11'.

10.3 The numerals 11–19

In terms of inflection these are treated the same way as the numerals 5–10, except that no inflected forms of 13–19 appear in OS, probably due simply to lack of attestation (Stiles 1985–6: 7.3). The majority of these are unattested in Go., where numerals are commonly expressed by alphabetic characters, as in Greek (§1.11). The relevant attested forms are these:

	Go.	OIcel.	OE	OS	OHG
11	*áinlif	ellifu	enlefan	el(l)evan, -en	einlif
12	twalif	tólf	twelf	twe-, twi-, twu-lif	zwelif
13		þrettán	þrēotīene	thriu-, thrū-tein	drīzehan
14	fidwōrtaíhun	fjórtán	fēowertīene	fiertein	fiorzehan
15	fimftaíhun	fimtán	fiftīene	fīftein	finfzehan
16		sextán	sixtīene	se(h)stein	sehszehan
17		sjaut(j)án	seofontīene	sivontein	
18		át(t)ján	eahtatīene	ahto-, ahte-tein	ahtozehan
19		nítján	nigontīene	nigentein	niunzehan

'11' and '12' stand apart, being formed of '1' and '2' with a suffix **-liƀ-* < **-lif-* (by Verner's law) < PIE **lik^{w}-* (cf. Gk. *λείπω*, Lat. *linquō* 'leave'), i.e. 'one, two left' (after counting on ten fingers). They are thus parallel to Lith. *venúo-lika*, *dvý-lika*, with *-lika* as the reduced grade of *liẽkas* 'left over'.[1] Go. **áinlif* is attested only as dat. *áinlibim*, probably reflecting **aini-* rather than **aina-* (cf. OE *ænne* < **aini-*, §10.1 *supra*), as *-a-* is more often retained (72×) than lost (21×) as a composition vowel in Gothic (Krause 1968: §68), whereas the loss of *-i-*, though irregular, is more frequent. OE *enlefan* also

requires **aini-*, but either **aini-* or **aina-* will explain the remaining forms, as those with *i*-umlaut may have it because of *i* in the second constituent. In ON there is the development **aina-liƀ-* > **ān-liƀ-* > **ālliƀ-* > **ǣlliƀ-* > **elliƀ-*, with final *-u* extended from '10'. Although the stress is initial in Modern Icelandic, the change *ai* > *ā* presupposes (subordinate?) stress on the second constituent (Noreen 1970: §51.1a), as in English and, in part, Dutch, though voiced *b* in Go. *áinlibim* suggests initial stress only. The OE and OS forms likewise show endings borrowed from '10'.[2] Beside OE *enlefan* occur *enleofan*, with back mutation (§4.8), and *endlefan*, with epenthetic *d* as a result of denasalization of *n* at the point of juncture before *l*. OIcel. *tólf* is lengthened from *tolf* (§4.9) < **twolf*, with loss of *w* before *o* (§6.14), resulting from postconsonantal rounding of *a* after *w* (cf., e.g., *sorta* 'black dye' < **swartôⁿ*, and cf. Go. *swarts* 'black'). OE *twelf* < **twaliƀ-* is always syncopated, like, e.g., *hwelc* 'which' (§8.13).

The numerals '13' to '19' are self-evidently compounds of '3' to '9' plus '10', as Go. plainly shows. This transparency is maintained in OE (where a plural suffix *-e* is added, with umlaut from a lost *i*-stem inflection; cf. Ross & Berns 1992: 591–2) and OHG, whereas OS *tein* is a rare spelling of OS 'ten', showing loss of *h* and weakening of *a* to *i* (Holthausen 1921: §§125, 380 Anm.), probably by analogy to the suffix, bearing less stress. The OIcel. forms present a number of difficulties. Various explanations have been offered for the alternation between *-tán* and *-tján*, none of them palmary.[3] The latter, at least, can certainly be derived from **texan-* (note the retention of final *-n*), the form known from West Germanic. OIcel. *þrettán* reflects **þrinn-tán* (§6.14) < **þrinz-* (cf. Go. *þrins*, §10.1). On *fjǫg(u)rtán* beside *fjórtán*, see Noreen 1970: §160 Anm. The interchange of *-tán* and *-tján* in *sjaut(j)án* is due to dissimilation (*ibid.*, §295 Anm. 1); the reverse dissimilation (*sautján*) occurs rarely.

1. But see Bednarczuk 1999: 44 on problems with the comparison. Ringe (2017: 229–30) proposes instead to connect the second constituent with PIE **leiƀ-*, as in OE *be-līfan* 'remain, be left'.

2. Voyles (1987: 489–90), rather implausibly, explains the different endings in Go., ON, and WGmc. as reflecting, respectively, zero suffixation, weak participial **-n̥t*, and *o*-grade **-ont*. He assumes that Go. **áinlif* is actually attested, and he attributes the non-application of Verner's law to secondary stress on the second constituent. Rather, see §6.12 on Go. final fortition.

3. The usual view is that there was a variant of PIE '10' with lengthened grade, and that this will account for both ON *-tán* and Go. *-tēhund* in the numerals '70' to '100'. But there is no other evidence for such a variant, and the Go. decads are probably to be analyzed differently (see below, §10.5). Moreover, if this explanation were correct it would be peculiar that the distribution of *-tán* vis-à-vis *-tján* in the teens is the reverse of the distribution of Go. *-tēhund* vis-à-vis *tigjus* in the decads. Szemerényi (1960: 102–3 n. 155) discusses some further proposals and their weaknesses; see also Ross & Berns 1992: 592–3.

10.4 The lower decads, 20–60

In PIE, numerals above '19' were indeclinable nouns taking complements in the genitive. The Gmc. decads show a difference in the formation of the lower and the upper series. The difference was identified by J. Schmidt (1891) as a remnant of a PIE sexagesimal system of counting, Babylonian in origin, an idea even now sometimes encountered, though the prevailing view currently is that this is a peculiarity of Germanic: see, e.g., Szemerényi 1960: 2–3, Mańczak 1985a, and see further Justus 1996, Schuppener 1998, von Mengden 2005. The relevant forms of the lower decads are these:

	Go.	OIcel.	OE	OS	OHG
20	twái tigjus	tuttugu	twēntig	twēntig	zweinzug
30	*þreis tigjus	þrír tigir	þrītig	thrītig	drīz(z)ug
40	fidwōr tigjus	fjórir tigir	fēowertig	fiuwartig	fiorzug
50	fimf tigjus	fimm tigir	fīftig	fīftig	finfzug
60	saíhs tigjus	sex tigir	siextig	sechstic	seh(s)zug

Go. ‘20’ to ‘60’ are formed by the relevant integer plus *tigjus*, a plural *u*-stem inflected in four cases, with the integer also inflected to the extent allowed in §§10.1–2, e.g. acc. *þrins tiguns* (on the basis of which nom. **þreis tigjus* is assumed), dat. *twáim tigum*. This *tigjus* reflects PIE **dekm̥t*, which, when it acquired inflections in PGmc., would have formed the dat. as athematic **teɣundmiz*, with suffixal accent, and this would result in Go. *tigum*. This last form is indistinguishable from a *u*-stem dat., and on that basis the word developed *u*-stem inflections in Gothic.[1] The Go. forms of these five decads are thus semantically and morphologically transparent. They do not, however, resemble the forms to be reconstructed for PIE, on which see §10.5, where the problem is discussed.

ON *tigir*, an *i*-stem, corresponds to Go. *tigjus*. OIcel. *tuttugu* (early *tottogo*) is in origin an acc. of this same *tigir*, hence **twanz tiɣunz* > **twonz-tiɣunz* > **tonn-tiɣunn* > **tottiɣun* (cf. the development of *tólf*, above), with replacement of *i* by *o/u*, probably due to the surrounding vowels, leading to *tottogo*.[2] There occurs an alternative form *tvítján*, like *áttján*, *nítján* but apparently multiplicative rather than additive. Later there arise indeclinables *þrjátigi*, *fjórutigi*, etc.

In WGmc. the equivalent of Go. *tigjus* is reduced to a suffix that is indeclinable in OS and OHG (where these decads are substantives taking a complement in the gen.), whereas indeclinables are a late development in OE. Unlike the adj. suffix *-ig* (§9.3), OE *-tig* never suffers syncope but is always a syllable even in early verse. OE OS *twēntig* perhaps reflects **twanz tigunz* with analogical replacement of the first vowel by the vowel of ‘2’; remarkably, OHG has only *zweinzug*, never †*zwēnzug*. Seebold’s derivation of the WGmc. forms from **twajintig-* (1968: 430–2), though brilliant, is closely tied to his explanation of ‘2’ (see above) and faces some of the same difficulties. The reason for the substitution of *u* for *i* in OHG *-zug* is unknown, but comparison is commonly drawn to OIcel. *tuttugu*.[3]

These decads are constructed the same way in Baltic: cf. Lith. *dvì-dešimt* ‘20’, *trìs-dešimt* ‘30’, etc. On the decads in other IE languages, see below.

1. Because a single case-form may seem insufficient basis for the construction of a *u*-stem paradigm, some have supposed that the acc. pl. would also have resembled a *u*-stem form (so, e.g., Prokosch 1939: §99a), but Szemerényi (1960: 41) is right that the correct form would be **teɣunduns*, which will not serve. He adduces parallels to the construction of an entire paradigm on the basis of a single form. Euler (2013: 127 n. 258, with further references) misinterprets Szemerényi’s argument and identifies the acc. as the case of origin for the *u*-stem forms, which Szemerényi declares to be impossible. Voyles (1987: 490) regards it as ambiguous whether the second constituent of these lower decads was originally an *i*-stem or a *u*-stem.

2. The alternative construction of a dual **twō-tugū* (so Krahe & Meid 1969: II, §64) leaves the medial geminate unexplained.

3. Streitberg (1896: §167) derives *u* here from PIE *ə*, i.e. *Ḫ*, and Krahe & Meid (1969: II, §64) seem to have something similar in mind when they call *-zug* a “Schwundstufenbildung.” But there cannot ever have been a laryngeal consonant in PIE ‘10’; see also §5.5 *ad fin.* on *u* as the reflex of a laryngeal. On OHG *-zug* see further Lühr 1977: 67.

10.5 The upper decads, 70–120

The relevant attested forms are these:

	Go.	OIcel.	OE	OS	OHG
70	sibuntēhund	sjau tigir	hundseofontig	antsibunta	sibunzo
80	ahtáutēhund	átta tigir	hundeahtatig	antahtoda	ahtozo
90	niuntēhund	níu tigir	hundnigontig	nichonte	
100	taíhuntēhund	tíu tigir	hundtēontig	hund	zehanzo
110		ellifu tigir	hundændlæftig		
120		hundrað	hundtwelftig		

ON *hundrað* refers to the 'great hundred', i.e. '120', a meaning in use in Scandinavia and Britain throughout the Middle Ages (see, e.g., Goodare 1993); *-rað* is related to Go. *raþjan* 'count', Lat. *ratiō* 'computation'. Although '120' is not attested in Gothic, that a duodecimal 'hundred' was in use must not be doubted.[1]

Except in ON, where *tigir* has been extended from the lower decads, the difference between the formation of the upper and lower decads is striking, as well as the differences among the languages represented. The origin and development of this series are still intensely debated. It was once the prevailing view (not yet entirely abandoned) that the Go. words should be divided *sibun-tēhund*, *ahtáu-tēhund*, etc., and the second constituent derived from a lengthened-grade variant of PIE *dékm̥t* '10'.[2] The chief alternative view, proposed independently by Wheeler (1885: 38) and Brugmann (Brugmann & Osthoff 1878–1910: V, 11–12) and laid out in detail by Brugmann (Brugmann & Delbrück 1897–1916: II, 2.35–40), is that the division should be *sibuntē-hund*, and so forth.[3] Surely the latter analysis is correct: there is no evidence outside of Gmc. for PIE **dḗḱm̥t*; although OE *hund-* (reduced in OS to *and-*) is prefixed rather than suffixed, its very mobility within Gmc. identifies the relevant morpheme; it has close parallels in Gk. *-κοντα* (e.g. *ἑξή-κοντα* '60'), Lat. *-gintī* (e.g. *vīgintī* '20' < **(d)wī-ḱm̥t-*), and Lith. *-dešimt* (e.g. *trìs-dešimt* '30'); and Go. *taíhuntē-weis* (on which see n. 1) shows that *-tē-* belongs to the first constituent of the Go. decads. There is no scholarly consensus how, precisely, *-tē-* arose in the Go. forms, but suggestive parallels in other IE languages are in evidence. Just as the method of forming the decads in Go. changes strikingly starting with '70', so, too, in Greek and Latin the formation changes starting at '70': in Greek and Latin, the decads to '60' add Gk. *-κοντα*, Lat. *-gintā* to the corresponding cardinal digit, with a long connecting vowel, e.g. *πεντήκοντα*, *quīnquāgintā* '50'; starting with '70', however, the digit changes in nature, resembling an ordinal rather than a cardinal, e.g. *ἑβδομήκοντα* '70' (cf. *ἕβδομος* 'seventh') *nōnāgintā* '90' (cf. *nōnus* 'ninth'). Sommer (1951) showed that the morphological change is an illusion, since initial constituents like *ἑβδομ-* are not ordinals but phonological variants of cardinals (cf. *ἑπτά* '7'), and Szemerényi (1960) showed that the apparently morphological change has a phonological starting point: the suffix **-ḱont-/-ḱm̥t-* is derived from **dékm̥t/dḗkomt* '10'. The initial *d* of **-dḗkomt-* (or *t*, devoiced by *ḱ*) was lost, with compensatory lengthening of any immediately preceding syllabic segment. The implications of this for Germanic are conveniently summarized in Szemerényi 1996: §8.5.3:

> The IE system survives in 70–90, e.g. Goth. *sibuntēhund*, *ahtautēhund*, *niuntēhund*. These continue the old **septm̥̄komt*, *oktōkomt*, *newn̥̄komt*, from which first arose **seftunhand*, **ahtōhand*, **newunhand*, preceded in the series by **fimfēhand* and **sehskand*; this original ending *-hand* was later adapted to conform with 20 and 100, thus becoming *-hund* in 30–90 also. Among these tens 60 stood out from the rest and

was modified to **sehsēhund* by analogy with 50. The influence of 50 and 60 led to **seftunēhund*, but since in 50, 60, and 80 the principle of formation was unmistakably unit + *-(ē)hund*, and 7 already had the form **sefun*, **seftunēhund* became **sefuntēhund*, **seƀuntēhund*. The metathesis thus led to a formation which synchronically could only be taken as 'seven' + *-tēhund*, and so led to the series *ahtautēhund—niun-tēhund—taihan-tēhund*.[4]

The pattern of changes thus proposed is not simple, but it accounts for the rise of Go. *-tē-* on a principled basis rather than as a morpheme of arbitrary derivation (cf., e.g., G. Schmidt 1970: 119, Lühr 1977: 64), and it has the particular virtue of explaining why the Go. decads are different starting at '70': *-tē-* originated in '70' and thus, in counting, was extended only to decads that followed in the course of counting (and see further below).

Although *-hund* is a suffix in Gothic, it is a prefix in OE and, in the reduced form *ant-*, in OS, whereas it is missing in OHG.[5] The reason for its loss in OHG is that it was superfluous, the meaning of each upper decad being unambiguous even without *hund* attached. Explaining the WGmc. upper decads is difficult in part because OE lends no etymological assistance, the suffix *-tig* of the lower decads having been extended to the upper (see Pijnenburg 1992), with a similar situation in ON. Several hypotheses have been proposed:[6] (1) Go. *taíhuntē-* is a gen. pl. 'of decads', so that *taíhuntēhund* means 'a decad of decads', and after it were formed *sibuntēhund*, etc. (Brugmann in Brugmann & Osthoff 1878–1910: V, 16; similarly Voyles 1987: 493–5). Thus, OHG *sibunzo* (etc.) is also a gen. plural. This hypothesis is objectionable on semantic grounds, in part because *-hund* cannot mean 'decad' (see Szemerényi 1960: 29–31), and at all events the OS forms cannot be genitives.[7] (2) Go. *sibuntē-* is an ordinal, and hence *sibuntēhund* means 'seventh decad' (Holtzmann 1856: 217–18, revived by Rosenfeld 1955c: 385–6). There is again the semantic problem; see further the criticisms of Brugmann (Brugmann & Osthoff 1878–1910: V, 13) and Szemerényi (1960: 31–2, 148–65). (3) WGmc. generalized not the *ē* of PGmc. **fimfēhund*, as in Go., but the *ō* of **ahtōhund*, and it is this that is reflected as OS *-a*, OHG *-o* (Szemerényi 1960: 33–8). This last is the only very plausible analysis. The OS and OHG endings could be explained instead as borrowed from weak masc. nouns, but such an analysis would leave unexplained the motive for the borrowing, and why these words are invariant rather than inflected like weak nouns. The OS and OHG forms did not remain stable: already in poetry OS *siƀuntig* appears beside *antsiƀunta*, and the forms given above for OHG are those found in the earliest texts, with replacement of *-zo* by *-zug* completed before the end of the 13th century.

As for why the lower decads of Gmc. do not resemble those reconstructed for PIE, once again the explanation of Szemerényi (1960: 39–44) is particularly cogent. After the upper decads were refashioned in the manner described, they appeared to be transparent formations, made up of digit + **-tē-* + **-hund-*. The lower decads, however, had grown morphologically opaque: the PIE forms may have been **u̯ī́kn̥tī* '20', **trī́kont-* '30', **kʷetwŕ̥kont-* '40', **penkʷḗkont-* '50', **s(w)eksḱont-* '60', which would correspond to PGmc. **wīxand-*, **þrīxand-*, **feðurxand-*, **fimfēxand-*, **sexskand-*, the last replaced by **sexsēxund-*, as above. The pressure to align the lower with the upper decads, especially starting with '20', would thus have been considerable. The Go. morpheme *-tē-* that arose in '70' could not be extended to the lower decads because **sexstēhund-*, **fimftēhund-* would have appeared to represent the ordinals **sexst-*, **fimft-*, making them confusing constructions,[8] whereas there was no possibility of such confusion in the upper decads (to Go. *ahtáutēhund* cf. *ahtuda* 'eighth'). Moreover, there

came into being the requirement that numerals above '4' be inflected, rendering it natural enough that there should arise a transparent combination of an inflected digit and an inflected form of '10'.

1. This is evident from the use of *taíhundtēhund* rather than *hund* for '100' and from the rendering *fimf hundam taíhuntēweis brōþrē* 'five hundred (decimally) brothers' for Gk. *πεντακοσίοις ἀδελφοῖς*, where *taíhuntēweis*, literally 'ten-ty-wise', is the explanatory addition of a glossator. Note that beside *taíhuntēhund* there occurs *taíhuntaíhund*, probably by attraction to the vowel of the initial syllable.

2. This view was defended most substantially by J. Schmidt 1891. For concise discussion and bibliography, see Jellinek 1926: 139–40.

3. For discussion and extensive bibliography, see Szemerényi 1960: 27–44, and for subsequent studies, see Szemerényi 1996: §8.5.3 n. 4, with brief summaries. See now also von Mengden 2010.

4. This last remark is dubitable, for the reasons given above. It is unnecessary to assume a unitary morpheme *tēhund* to explain why *-tē-* was extended past '70'. For support for Szemerényi's analysis, see H.F. Nielsen 1990. Instead of metathesis in **seftunēhund*, Ringe (2017: 230–1) assumes that '7' bore a final **-t* in PGmc. (see §10.2 n. 1 above), and when this consonant was lost in '7', **seƀunt-ēhund-* was reanalyzed as **seƀun-tēhund-* and **-tēhund-* extended upward in the decads. This is an appealing idea.

5. Szemerényi (1960: 38) argues that *-hund* was moved because, e.g., WGmc. **siƀuntē-hund-* (= Go. *sibuntēhund*) was in danger of being interpreted as '70 hundreds'.

6. On some further proposals, see Szemerénti 1960: 32–3 and Ross & Berns 1992: 609–11.

7. The reponse of Voyles (1987: 494) to this latter objection of Szemerényi's ("word-final and unstressed OS /o/ could, particularly if the immediately preceding syllable was unstressed as in a form like **siƀunto*, often be realized as [a]") does not persuade, since *-a* in the OS decads plainly is not an occasional form.

8. It is not plain to the present writer why Szemerényi regards the constructions 'sixth, fifth decad' as "impossible (!)" (1960: 39), but it is certainly the case that if the upper decads exerted pressure to make the first constituents in the lower decads transparent digits, constructing what would look like ordinals would run counter to that purpose. At all events, as remarked above, since *-tē-* originated in '70', it would be natural enough on the basis of counting for it to be extended to following but not preceding decads.

10.6 The higher cardinals

Gmc. inherited from PIE a word for '100', **ĥn̥tóm*, doubtless from earlier **tĥn̥-tĥóm* < **dĥn̥-dĥóm*, i.e. 'ten tens'. As discussed in §10.5, this was replaced by a compound belonging to the upper series of decads within a sexagesimal system of counting, but PGmc. **xunda*^{n} remained as an *a*-stem neuter noun in two uses:

(1) It is used in the pl. to form multiplicatives of '100', e.g. Go. *twa hunda*, OE *twā hund* (but also *twā hundred*), OS *twē hund* (also *hunderod* in the Freckenhorst tax roll), OHG *zwei hunt* '200'. Compare, however, OIcel. *tvau hundrað* '240'.

(2) Outside of OHG it may be used *per se* in WGmc. to mean '100'.

PIE probably had no word for '1000', though the Indo-Iranian and Hellenic words (Skt. *sahásram*, Avestan *hazaŋrəm*, Gk. *χīλιάς*) have in common an element PIE **ĝhéslo-*. The PGmc. word is reconstructed as **þūsund-*, a compound of **þūs-* < PIE **tū-s-* (cf. Skt. *tavás-* 'strong', Lat. *tōtus* 'all', OE *ge-þūf* 'thriving') and **xund-* '100', hence with the meaning 'strong hundred'. The construction is closely paralleled in Balto-Slavic: cf. Lith. *túkštantis*, OCS *tysąšta*, on which see Pijnenburg 1989. As '100' was originally uninflected, and PGmc. **-und-* must have lost its connection to **xund-* early, it is perhaps unsurprising that '1000' is inflected differently across the Gmc. languages: it is a *jō*-stem in Gothic, an *i*-stem in ON, a neuter *a*-stem in OE, an indeclinable in OS, and either an *ō*-stem or a neut. *a*-stem in OHG.

II. Ordinals and varia

10.7 ‘First’, ‘second’, and ‘third’

Except for the first three, the ordinals are all much alike, and all but ‘second’ and some forms of ‘first’ are declined weak.

‘First’ had no single means of expression in PIE, and so it takes a variety of forms in Gmc. The most archaic is a derivative of the PIE prepositional-adverbial stem **per-* (cf. Skt. *pári*, Gk. *περί* ‘around’, Lat. *per* ‘through’) in weak grade with the suffix **-m-*, usually regarded as superlative (§9.11; cf. Gk. *πρόμος* ‘leader’, i.e. ‘the foremost’; also OPruss. *pirmas*, Lith. *pìrmas* ‘first’ < **pr̥-m-*): hence Go. *fruma*, OE *forma*, OS *formo*. In Gmc., at least, the original meaning of this formation was ‘first’ only in the sense ‘the former of two’, as in Gothic. To this a superlative meaning ‘first’ was formed by the addition of the suffix **-ist-*, hence Go. *frumists*, OE *fyrmest*. The same root, without the suffix **-m-*, could be used with the superlative suffix **-isto-*: hence, OIcel. *fyrstr*, OE *fyrest*, OS *furist* may be either strong or weak, whereas OHG *furisto*, like other superlatives in that language, is always weak. There is also an OE (Anglian) *forþmest*, formally a superlative to *forþ* ‘forth’, on the formation of which see §9.11. A WGmc. form is the superlative to PGmc. **airi* ‘early’, OE *ǣrest*, OS *ērist*, OHG *ēristo*, the last declined only weak.

‘Second’ is Go. *anþar*, OIcel. *annarr*, OE *ōðer*, OS *āđar*, *ōđar*, *andar*, OHG *ander*, taking only strong inflections. It is identical to Skt. *ántara-*, OPruss. *antars*, Lith. *añt(a)ras* ‘other’, formed to the root **an-* (cf. Skt. *anyá-* ‘other’) by the addition of a comparative suffix **-ter-*, as in Lat. *alter* ‘second’ (formally a comp. to *alius* ‘other’), Gk. *δεύτερος* ‘second’. In OE the comparative *æfterra* is also used in this sense.

‘Third’ is the weak Go. *þridja*, OIcel. *þriði*, OE *þridda*, OS *thriddio*, OHG *dritt(i)o*, reflecting PIE **tri-ti̯o-*, reflected also in Avestan *θritya-*, Lat. *tertius*.

10.8 ‘Fourth’ to ‘twelfth’

These bear weak inflections and are formed by the addition of PIE **-t-* to the equivalent cardinal, as in Skt. *ṣaṣṭhá-*, Gk. *ἕκτος*, Lat. *sextus* ‘sixth’. This *t*-suffix originated in **dek̂m̥t-ós*, reanalyzed as **dekm̥-tós*, and in the decads containing this morpheme as a suffix, whence it could spread to the lower ordinals in some IE languages, and in ‘fifth’ and (probably) ‘sixth’ already in PIE: see Sihler 1995: 425–33. In Gmc. the suffix was extended to all ordinals above ‘third’, being added to the normal full-grade form of the cardinal. These ordinals are not well attested in Gothic, and in fact not all the Go. forms given below are attested in precisely this form. The relevant forms are these:

	Go.	OIcel.	OE	OS	OHG
4.		fjórði	fēorða	fiorđo	feordo
5.	fimfta	fimti	fīfta	fīfto	fimfto
6.	saíhsta	sétti	siexta	sehsto	sehsto
7.		sjaundi	seofoða	sivondo, sivotho	sibunto
8.	ahtuda	átti	eahtoða	ahtođo	ahtodo
9.	niunda	níundi	nigoða	nigunda, niguđa	niunto
10.	taíhunda	tíundi	tēoða	tehando, tegotho, -atho	zehanto
11.	ellifti	enlefta	ellifto, ellefta	einlifto	
12.		tólfti	twelfta		zwelifto

Go. *ahtuda* should perhaps be *ahtūda* (Szemerényi 1960: 89; cf. Stiles 1985–6: 8.12). The Go. forms (except perhaps for *ahtuda*: see §6.12 on Thurneysen's law) show the effect of Verner's law except where PIE *t* came into contact with a voiceless stop, whereas it is ambiguous whether OIcel. *-ð-* reflects PGmc. *ð* or *þ*. In OE, wherever *d* (< PGmc. *ð*) might have been expected on the basis of comparison to Gothic, instead is found the reflex of PGmc. *þ*. Originally (already in in PIE?) the suffix vowel bore the accent and all other syllables were in the reduced grade, e.g. **k^{w}tur-ó-* 'fourth' (cf. **k^{w}$_{e}$twor-* '4'), so that Verner's law should be expected to have produced *ð* from suffixal PIE *t*, as in Gothic. However, when the reduced-grade stems were replaced by the cardinals in their normal form, two possibilities may have arisen: (1) there may have existed doublets, alternately with original, suffixal accent and accent as normally placed on the cardinal, or (2) if these ordinals were accented the same way as the corresponding cardinals, in some instances the vowel preceding the dental suffix would have been accented (e.g. **septm̥to-*, **ókt̂ṓ(u)to-*), in others not (**néu̯n̥to-*, **dék̂m̥to-*).[1] In either event, in PGmc. there would have resulted alternation between *þ* and *ð* under Verner's law, and there may be assumed later generalization of one or the other alternant in the individual languages.[2] OS has forms like those of OE, but also alternative forms like those of Gothic. OHG *feordo* and *ahtodo* agree with the OE forms, but *sibunto*, *niunto*, *zehanto* seem to show extension of *-t-* from *fimfto*, *sehsto*, *einlifto*, *zwelifto*. OE *nigoða*, *tēoða*, OS *niguđa*, *tegotho* (the last with analogical *-g-*) show the NSGmc. loss of *n* before an originally voiceless fricative (§4.11).

1. Stiles (1985–6: 8.7–11, with references) would date the refashioning of 'fourth' and 'eighth' with accent on the syllable before **-to-* prior to the application of Verner's law, but he is unable to explain why just these two should have differed in this respect.

2. Compare the explanation of Prokosch (1939: §100), that "the rhythm of counting led to anomalous accent changes." See also Bammesberger 1986b for another explanation. Possibly OE has extended the suffix of *eahtoða* to the other forms with *-ð-* (so Euler 2013: 130), but this alone is not sufficient explanation if Go. *ahtuda* has *d* by Verner's law rather than Thurneysen's.

10.9 The higher ordinals

The only higher ordinal attested in Go. is dat. *fimftataihundin* 'fifteenth'. That is to say, the word is formed like the cardinal *fimftaihun*, but with ordinals rather than cardinals as constituents, though only the latter varies inflections. Compare Gk. *πέμπτος καὶ δέκατος*, Lat. *quintusdecimus* 'fifteenth' (cf. *πεντεκαίδεκα*, *quindecim* '15'), in which both constituents are also ordinals. The earliest OHG texts follow this pattern in the teens, as well, with forms like *finftazehanto* 'fifteenth', *sibuntozehanto* 'seventeenth'; beginning with Notker there appear new formations like *funfzēndo*, agreeing with OIcel. *fimtándi*, OE *fiftēoða*, i.e. compounds comprising a cardinal and an attached ordinal suffix, as in the lower ordinals (and with loss of *n* in OE, as in *tēoða*); no ordinals above 'eleventh' are attested in OS.

For the ordinal decads, OIcel. has *tuttugandi* 'twentieth', *þrítugandi* 'thirtieth', and so forth, with *-ug-* extended from '20' and 'twentieth', though no ordinal 'hundredth' or higher is recorded in ON. These forms coöccur with forms in ⟨onde⟩, i.e. *-undi*, apparently attesting to the occurrence of, beside normal reflexes of PIE **dék̂m̥t*, NGmc. reflexes of the variant **dék̂omt* found in WGmc. (§10.2; cf. Szemerényi 1960: 102–3 n. 155). Here *-andi* is cognate with OE *-oða*, as in *twēntigoða*, *þrītigoða*, etc., with variants *-tegoða*, *-teogoða*, *-tiogoða*, *-tigþa*. That is, the ending underwent the

NSGmc. development *-*anþ-* > *-*ā^{n}þ-*.[1] Synthetic ordinals for numbers higher than the decads are unrecorded in OE, for which circumlocutions are used (see Brunner 1965: §328). That there actually is a semantic relation between ordinals and superlatives (cf. Sihler 1995: 427) is demonstrated by OHG *zweinzugōsto*, *drīzugōsto*, etc., with variants *-zog-*, *-zig-*, *-zeg-*, *-zg-*; in ON, too, *-tugandi* later appears as *-tugti*, and finally *-tugasti*.[2] OHG 'hundredth' is *zehanzugōsto*; 'thousandth' is unrecorded.

1. The analyses of Cowgill (1970: 120) and Bammesberger (1986) are different. It may well be correct that ON *-undi* is analogical to *tíundi*, but this leaves *-andi* unexplained. Bammesberger assumes a word **teʒunþ-* with the meaning 'decad'. It is also possible that **-tiʒōþ-* throughout the decads arose by analogical extension to the following ordinals (in counting) of the desinence of NSGmc. **niʒōþ-* 'ninth'; such an explanation, at all events, seems necessary to account for OS *tegotho* beside OE *tēoða*.

2. On the relation of ordinals to superlatives cf. also the remark of Meier-Brügger (2003: 236): "In Proto-Indo-European, and naturally also later, ordinal numbers had the function of signaling the end of a series, e.g. "We traveled for nine days. But on the tenth…'."

10.10 Varia

Although distributive numerals are usually expressed by analytic forms in Gothic, the language preserves one synthetic distributive numeral, fem. acc. *tweihnōs*, dat. *tweihnáim* 'two each'. OE has the distributives *ānlīepig* 'one each' (cf. ON *ein-hleypr* 'single, unmarried', OS *ēnlōpe* 'single, alone', ON *hlaupa* 'leap') and *getwinne* 'two each'. OHG has the distributives *einluzze*, *zwiske*, *driske*, *feoriske*; cf. OS *twisk* 'double'.

Multiplicatives are formed by the addition of PGmc. **-faldaz* to the cardinals, hence, e.g., Go. *áinfalþs*, OIcel. *einfaldr*, OE *ānfeald*, OHG *einfalt* 'onefold, simple'; note also Go. *fidurfalþs* 'fourfold' (not *fidwōr-*) < **k^{w}ét^{w}$_{e}$r-*; cf. Skt. *cátur*), and cf. OE *fiðer-rīce* 'tetrarchy'.[1] An older type of multiplicative is represented by OIcel. *tvennr* 'twofold', OE *twinn* 'double' (cf. *be twēonum* 'between') < **twiznaz* (cf. MHG *zwirn* 'two-cored thread'), comparable to Lat. *bīnī* 'twofold' < **dṷisnoi̯*. Cf. further OIcel. *þrennr*, OE *þrinen* 'threefold'.

A fraction derivable from PGmc. is Go. *halba*, OE *healf*, OS *half*, OHG *halb* '½'; with a fem. suffix, ON uses *hálft* (cf. OFris. *helfte*, *halfte*) or *helming*, masc. *helmingr* < **halƀning-*. Older and used only in compounds is OE OS *sām-*, OHG *sāmi-* 'half' = Skt. *sāmí-*, Gk. *ἡμι-*, Latin *sēmi-*. Smaller fractions are formed in ON with a masc. suffix, as in *þrið(j)ungr* '⅓', *fjórðungr* '¼', *fimtungr* '⅕', *séttungr* '⅙', and so forth. OE has the fraction *twǣde*, *twǣdǣl* '⅔'; cf. OS *twēdi* '½'.

Most adverbial numerals, answering the question 'how often?', are expressed analytically with a cardinal and a reflex of PGmc. **sīþ-* 'time', but ON has *tysvar*, *tvisvar* 'twice' < **twis-wōz*, also *þrysvar*, *þrisvar* 'thrice'; to these correspond OE *twiwa*, *þriwa*, OS *twīo*, *thwī(w)o*, OHG *zwiro(r)*. For 'thrice' and upward OHG attaches *-stunt* (an adverbial form of *stunta* 'time') to cardinals, e.g. *driostunt* 'thrice'. Note also OE *ǣne* 'once, one time', rarely gen. *ǣnes*, like OS *ēnes*, OHG *eines*.

ON forms substantives referring to groups by attaching a fem. suffix *-d* or *-t* to a cardinal, thus *fimt* 'pentad', *sétt* 'sextet' (< **sex(s)t-*), *sjaund* 'septet' (with the nasal of PGmc. **seƀun* preserved), *þrítugt* 'group of thirty', etc., but also *tigr* 'decad(e)' (sg. equivalent to Go. pl. *tigjus*, §10.4). Compare the ON abstract nouns *eining* 'unity', *tvenning* 'duality', *þrenning* 'trinity'.

On 'both', see §10.1.

1. Stiles (1985–6: 7.15–16) explains that Gothic has eliminated the variation under Verner's law by extending the voiced *d* of *fidwōr* to *fidur-*. Euler (2013: 126) takes the coöccurrence of LWS *fyþer-* and Anglian *feoþur-* to require the reconstruction of WGmc. **feuþwari*. However, the latter OE form shows back mutation, which fails in WS after non-labial consonants (§4.8), and of course WGmc. *eu* would produce a long diphthong in OE.