

Major distinctive characteristics of Germanic: phonology.

1. As in most IE languages, laryngeals in the syllable coda were lost with lengthening of a preceding vowel. (*e had already been “colored” by an adjacent *h₂ or *h₃.)

In root-syllables the resulting long vowels merged with inherited long vowels:

PIE *séh₁m̥ ‘seed’ (cf. Lat. *sēmen*, OCS *sěmę*), collective *séh₁mō > PGmc. *sēmō (cf. OHG *sāmo*);

PIE *d^héh₁ti- ~ *d^hh₁téy- ‘act of putting’ (cf. Gk. θέσις /t^hésis/; Av. *zraz-dāti*- ‘belief’ (lit. ‘putting faith’), Skt. *vásu-d^hiti*- ‘bestowal of goods’) >→ *d^hētís > PGmc. *dēdiz ‘deed’ (cf. OE *dæd*; Goth. *missadēps* ‘misdeed, sin’);

PIE *g^wén ‘woman (nom. sg.)’ (cf. OIr. *bé*) >→ PGmc. *k^wēniz ‘wife’ (cf. Goth. *qens*; OE *cwēn* ‘queen’);

PIE *sēmi- ‘half-’ (cf. Gk. ἡμι- /hē:mi-/; Lat. *sēmi*-) > PGmc. *sēmi- (cf. OHG *sāmi*-);

PIE *peh₂- ‘to protect’ (cf. Hitt. iptv. 2sg. *pahsi*) > *pā- > *fō- in PGmc. *fōdra ‘sheath’ (cf. Goth. *fodr*, OE *fōdor*);

PIE *wréh₂d- ~ *w^rh₂d- ‘root’ (cf. Lat. *rādīx*) > *wrād- ~ *wurd- > PGmc. *wrōt- ~ *wurt- (cf. Goth. *waúrts*, ON *rót*; OE *wyrt* ‘plant’);

PIE *swā₂dus ‘pleasant, sweet’ (*swéh₂dus?; cf. Skt. *svādús*, Gk. ἡδύς /hē:dús/) > PGmc. *swōtuz → PNWGmc. *swōtiz (cf. ON *sætr*, OE *swēte*);

PIE *b^hāǵ^hus ‘arm’ (cf. Skt. *bāhús*; Gk. πῆχυς /pê:k^hus/ ‘forearm’) > PGmc. *bōguz ‘upper arm, shoulder’ (cf. ON *bógr*, OE *bōg*);

(post-)PIE *b^hleh₃- ‘bloom, flower’ (cf. Lat. *flōs* ‘flower’) > PGmc. *blō- (cf. Goth. *bloma* ‘flower’, OE *blōstm* ‘flower’, *blōwan* ‘to bloom’);

PIE *d^hóh₁mos ‘thing put’ (cf. Gk. θωμός /t^hq:mós/ ‘heap’) > PGmc. *dōmaz ‘judgment’ (cf. Goth. *doms*, OE *dōm*);

PIE *sóh₂w_l ‘sun’ (cf. Lat. *sōl*; for the laryngeal cf. Gk. ἥλιος /hē:lios/, Homeric ἥελιος /ē:lios/ < *sāwel- < *seh₂wel-) > *sōwul > ?PGmc. *sōl (cf. ON *sól*);

PIE *pód_s ‘foot (nom. sg.)’ (cf. Skt. *pāt*, Doric Gk. πός /pó:s/) > PGmc. *fōt- (cf. Goth. *fotus*, OE *fōt*).

In final syllables the same merger occurred, except that in absolute word-final position

- PIE *ō (but not *oH) became PGmc. “trimoric” *ō̄, which differed from *ō in some feature no longer recoverable. Note the following:
- PIE *k^wetwōr ‘four (neut.)’ (cf. Skt. *catvāri*, Lat. *quattuor*) >→ PGmc. *fedwōr (initial labial probably by lexical analogy with ‘five’; cf. Goth. *fidwor*, OE *fēower*);
- PIE *méh₁ns- ‘month’ (cf. Skt. *mās*, Lat. *mēnsis*) >→ *méh₁nos-, nom. sg. *méh₁nōs (cf. Lith. *mėnuo*) >→ PGmc. *mēnōþ- (cf. Goth. *menops*, OE *mōnaþ*);
- PIE thematic pres. indic. 1sg. *-oh₂ (cf. Lat. -ō, Lith. -ù) > PGmc. *-ō (cf. Goth. -a, ON Ø, OHG, Anglian OE -u);
- PIE eh₂-stem nom. sg. *-eh₂ (cf. Skt. -ā, Lith. -à) > PGmc. *-ō (cf. Goth. -a, ON Ø with u-umlaut, OE -u ~ Ø);
- PIE eh₂-stem acc. sg. *-eh₂m = *[-ām] (by Stang’s Law; cf. Skt. -ām, Lat. -am) > PGmc. *-ō̄ (cf. Goth. -a, OE -e, OHG -a);
- PIE eh₂-stem acc. pl. *-eh₂ns = *[-ās] (by Stang’s Law; cf. Skt. -ās) > PGmc. *-ōz (cf. Goth. -os, OE -e, OHG -a);
- but, with PIE word-final *-ō:
- PIE *h₃érō ‘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 *séh₁mō ‘seed (collective)’ > PGmc. *sēmō̄ (cf. OHG *sāmo*);
- PIE *h₁néh₃mō ‘nomenclature, names (collective)’ (cf. Skt. pl. *nāmā*) > *nōmō̄ >→ PGmc. *namō̄ ‘name’ (with analogical introduction of a root vowel shortened by Osthoff’s Law in the sequence *nōmn-; cf. Goth. *namo*, OE *nama*, OHG *namo*).
- Trimoric *ō̄ was also the outcome of contracted sequences of vowels at least one of which was PIE *o or *[a]; the following examples are especially clear:
- PIE o-stem nom. pl. masc. *-oes (cf. Skt. -ās, Oscan -ús) > PGmc. *-ōz (cf. Goth. -os, OE -as; the voiceless fricative of the northern WGmc. ending is puzzling);
- PIE gen. pl. *-oHom (cf. Skt. -ām (often disyllabic in the Rigveda), Gk. -ῶν /-ô:n/, Lith. -ū̃) > PGmc. *-ō̄ (cf. Goth. (fem.) -o, OE -a, OHG -o);
- PIE eh₂-stem nom. pl. *-eh₂es (cf. Skt. -ās, Lith. -ās) > PGmc. *-ōz (cf. Goth. -os, OE -a, OHG (adj.) -o).

The difference between the bimoric and trimoric vowels in final syllables is clearest in the West Germanic reflexes; the regular correspondences are the following:

PGmc.	Gothic	Old Norse	Old English	Old High German
*-ō	-a	*-u > Ø	-u ~ Ø	-u ~ Ø
*-ō̄	-a	-a	-æ > -e	-a
*-ō̄, *-ō̄̄	-o	-a	-a	-o
*-ōz	-os	-ar	-æ > -e	-a
*-ō̄z	-os	-ar	-a	-o

Presumably the contraction of vowel sequences also yielded trimoric vowels in other syllables; but if so, the bimoric and trimoric vowels merged either in PGmc. or independently in the daughters.

The distribution of bimoric and trimoric vowels is very similar to that of long vowels with acute and circumflex intonations respectively in Balto-Slavic; that could reflect a historically shared innovation.

2. PIE *m̥, *n̥, *r̥, *l̥ > PGmc. *um, *un, *ur, *ul; laryngeals in the syllable coda were lost. Examples are numerous:

PIE *sm̥H- ‘summer’ (cf. OIr. *sam*, Av. *ham-*) >→ PGmc. *sumaraz (cf. OE *sumor*);

PIE *dék̥md ‘ten’ (cf. Skt. *dáśa*, Lat. *decem*, Lith. *dėšimt*) > PGmc. *tehun (cf. Goth. *taihun*);

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

PIE *h₂n̥tbh̥í ‘on both sides of’ ?> *h₂mb̥h̥í (cf. Gk. ἀμφί /amphí/, 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 *n̥d̥h̥ér ‘under’ (cf. Lat. *īnfrā*, Skt. *ad̥h̥ár*) > PGmc. *under ‘under; among’ (cf. OE *under*);

PIE *dn̥ǵʰwéh₂- ‘tongue’ (cf. Old Lat. *dingua*) >→ PGmc. *tungōn- (cf. Goth. *tuggo*, OE *tunge*; the Gmc. form has been remodelled as an n-stem);

PIE *w̥l̥kʷos ‘wolf’ (cf. Skt. *vṛkas*, Lith. *vilkas*) >→ PGmc. *wulfaz (cf. Goth. *wulfs*, OE

wulf; the labial after the *l is irregular);

PIE *sprd^h- ‘contest’ (cf. Skt. *spṛd^h-*) > PGmc. *spurd- ‘racecourse’ (cf. Goth. *spaurds*);

PIE *wr̥gyéti ‘is working’ (cf. Av. *varəziieiti*) >→ PGmc. *wurkīpi ‘works, makes’ (the suffix has been adjusted by the reanalysis of Sievers’ Law; cf. Goth. *waúrkeip*);

(post-)PIE *k̥rn- ‘horn’ (cf. Skt. *śṛṅgam*, Lat. *cornū*) >→ PGmc. *hurną (cf. Goth. *haúrn*, OE *horn*);

(post-)PIE *w̥mis ‘worm’ (cf. Lat. *vermis*; most IE languages reflect *k^w̥mis, cf. e.g.

OIr. *cruim*, Skt. *k̥mis*, Lith. *kirmėlė*) > PGmc. *wurmiz ‘worm, serpent’ (cf.

Goth. *waúrms*, OE *wyrm*);

(post-)PIE *b^hṛḡh- ‘hill’ (cf. OIr. *brí*, *brig-*; the root is PIE ‘high’) > PGmc. *burg- ‘hill-fort’ (cf. Goth. *baúrgs*, OE *burg*, both ‘town’).

Examples with laryngeals in the syllable coda:

PIE *ǵnh₁tós ‘born’ (cf. Skt. *jātás*, Lat. *nātus*, Homeric Gk. *κασίγνητος* /kasígne̥:tos/ ‘brother’, lit. ‘co-gnātus’) > PGmc. *kundaz (cf. Goth. *air̥pakunds* ‘of earthly origin’, OE *godcund* ‘divine’);

PIE *p_lh₁nós ‘full’ (cf. Skt. *pūrṇás*, Lith. *pilnas*) > *pulnos > PGmc. *fullaz (cf. Goth. *fulls*, OE *full*);

PIE *h₂w̥h₁neh₂ ‘wool’ (cf. Hitt. *hulana-*, Skt. *úrṇā*, Lat. *lāna*, Lith. pl. *vilnos*) > *wulnā > PGmc. *wullō (cf. Goth. *wulla*, OE *wull*);

PIE *d_lh₁g^hós ‘long’ (cf. Skt. *dīrg^hás*, 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* /hr̥ē:ma/ ‘word’) > PGmc. *wurda ‘word’ (cf. Goth. *waúrd*, OE *word*);

PIE *ǵḡh₂nóm ‘crushed, ground’ (neut.; cf. Skt. *jīrṇám* ‘worn out’, Lat. *grānum* ‘grain’) > PGmc. *kurną ‘grain’ (cf. Goth. *kaúrn*, OE *corn*);

PIE *pr̥Hmós ‘first’ (cf. Lith. *pirmas*; parallel *pr̥Hwós in e.g. Skt. *pūrvas*, Toch. B *pärwešše*) > *purmós >→ PGmc. *fruma-n- (cf. Goth. *fruma*, OE *forma*).

The Balto-Slavic development was similar in general, but (1) the vowel that developed

was sometimes *i and sometimes *u, and (2) an intonation contrast developed (acute when there was a laryngeal in the syllable coda, circumflex otherwise). Developments in other subgroups were very different.

3. Several changes of consonants are typical of “western” IE languages but are too widespread to be significant:

- a) clusters of two dental stops developed into *ss, as in Italic and (eventually) in Celtic;
- b) PIE “palatals” and “velars” merged as velars (the “centum” development, found also in Celtic, Italic, Greek, Tocharian, and Hittite—but not the Luvian subgroup of Anatolian);
- c) sequences of dorsal + *w merged with labiovelars, as in Greek, Celtic, and Latin (but not Osco-Umbrian);
- d) labiovelars (including those that arose by (c)) were delabialized next to high back round vocalics (including those that arose by (2) above); ‘tongue’ is an example of both (c) and (d).

See Ringe, *From Proto-Indo-European to Proto-Germanic*, pp. 87-93 for examples of these changes.

4. Grimm’s Law.

Stops underwent a wholesale shift in manner of articulation and voicing as follows:

- *p, *t, *k, *k^w > *f, *p, *h, *h^w respectively, unless another obstruent immediately preceded;
- *b, *d, *g, *g^w > *p, *t, *k, *k^w respectively;
- *b^h, *d^h, *g^h, *g^{wh} > *b, *d, *g, *g^w respectively.

The voiced obstruents resulting from the last change were stops in some environments but fricatives in most.

Examples are very numerous. I arrange them by consonant, without repetition (so that examples must often be sought in preceding sections; see also (5) below):

PIE *p:

PIE *pélh₁u ‘much (neut.)’ (cf. OIr. *il*; Skt. *purú* with remodelled ablaut) > PGmc. *felu (cf. Goth., OHG *filu*, ON *ffol*-);

PIE *péku ‘cattle, property’ (cf. Skt. *pásu*, Lat. *pecū*) > PGmc. *fehu (cf. Goth. *faihu*, OE *feoh*);

PIE *pórkos ‘pig’ (cf. Lat. *porcus*; Lith. *pāršas* ‘barrow’) > PGmc. *farhaz ‘piglet’ (cf. OE *fearh*, OHG *farah*);

PIE *pénk^{we} ‘five’ (cf. Skt. *pāñca*, Gk. πέντε /pénte/) > PGmc. *fimf (cf. Goth. *fimf*, OE *fif*; the word-final labial is puzzling);

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

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’ (remodelled as an n-stem; cf. OE *nefa*, OHG *nefo*);

(see also ‘to protect’, ‘foot’, ‘full’, and ‘first’ in (1) and (2) above;)

PIE *t:

PIE *tóm ‘that’ (acc. sg. masc.; cf. Skt. *tám*, Homeric Gk. τὸν /tón/) >→ PGmc. *þanō (cf. Goth. *þana*, OE *þone*);

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

PIE *tríns ‘three (acc. masc.)’ (cf. Skt. *trín*, 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 *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. *þaurp* ‘field’);

(post-)PIE *tong- ‘to perceive, to think’ (cf. dialectal Lat. *tongitiō* ‘nōtiō, idea’, OIr. *tongid* ‘(s)he swears’) > PGmc. *þank- in *þankijaną ‘to think’ (cf. Goth. *þagkjan*, OE *þencan*), *þankaz ‘thanks’ (cf. OE *þanc*), coll. *þankō (cf. ON *þokk*);

- PIE *b^hréh₂tēr ‘brother’ (cf. Skt. *b^hrātiā*, Lat. *frāter*) > PGmc. *brōþēr (cf. ON *bróðir*, OE *brōþor*);
- PIE *kátus ‘fight’ (cf. OIr. *cath* ‘battle’; Luvian *kattawatnallis* ‘plaintiff’) > PGmc. *haþuz ‘battle’ (cf. OE *heapu-*, OHG *hadu-*; ON *Hqðr*, name of the god of battle);
- PIE *k^wóteros ‘which (of two)?’ (cf. Gk. *πότερος* /póteros/; Skt. *katarás*) > PGmc. *h^waþeraz (cf. Goth. *haþar*, OE *hwæþer*);
- PIE *nítyos ‘(one’s) own’ (cf. Skt. *nítayas*) > PGmc. *niþjaz ‘relative, kinsman’ (cf. Goth. *niþjis*, ON *niðr*);
- PIE *ánteros ‘other (of two)’ (apparently a derivative of *ályos ‘other’ (cf. Lat. *alius*, Gk. *ἄλλος* /állos/) with an archaic *l ~ *n alternation) > PGmc. *anþeraz (cf. Goth. *anþar*, OE *ōþer*);
- PIE *k̥ and *k:
- PIE *kím ‘this’ (acc. sg. masc.; cf. Lith. *šĩ*) >→ PGmc. *hinō (cf. OE *hine* ‘him’, Goth. *und hina dag* ‘until this day’);
- PIE *kér̥d- ~ *k̥rd- ‘heart’ (cf. Lat. *cord-*, Lith. *širdis*) >→ PGmc. *hertan- (cf. Goth. *hairto*, OE *heorte*);
- PIE *key- ‘to be lying down’ (cf. pres. 3sg. Skt. *śéte*, Gk. *κεῖται* /kêitai/) in *kóymos ‘resting place’ > PGmc. *haimaz ‘settlement’ (cf. ON *heimr* ‘world’, OE *hām* ‘home’; Goth. *haims* ‘village’ has been remodelled as an i-stem, but note a-stem pl. *haimos* ‘countryside’);
- PIE *swéku₂ros ‘father-in-law’ (cf. Skt. *śváśuras*, Lat. *socer*) > PGmc. *swehuraz (cf. OE *swēor*, OHG *swehur*);
- PIE *ék₂wos ‘horse’ (cf. Skt. *ásvas*, Lat. *equos*) > *ék₂wos > PGmc. *eh^waz (cf. OE *eoh*; Goth. *aíhxtundi* ‘thornbush’, lit. *‘horse-tooth’);
- PIE *swéks ‘six’ (cf. Av. *xšuuāš*, Gk. *ἕξ* /héks/, Boiotian *φέξ* /(h)wéks/) → *séks (by lexical analogy with ‘seven’; cf. Skt. *ṣát*, Lat. *sex*) > PGmc. *sehs (cf. Goth. *saihs*, OE *siex*);
- PIE *deks- ‘right(-hand)’ (cf. Gk. *δεξιός* /deksiós/, Av. *dašinō*) > PGmc. *tehswaz (cf. Goth. *taihs₂wa*, OHG *zeso*, *zesawēr*);

PIE *kud^ho- ‘treasure’ (cf. Lat. *custōs* ‘guardian’, Gk. κύσθος /kúst^hos/ ‘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 *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 *meorh*, OHG
marah);

PIE *uksén ‘bull, ox’ (cf. Av. *uxša*) >→ PGmc. *uhsō (ending remodelled; cf. OE *oxa*,
Goth. gen. pl. *auhsne*);

(see also ‘ten’, ‘hundred’, and ‘horn’ in (2) above, ‘cattle’ and ‘pig’ under *p, and ‘fight’
under *t;)

PIE *k^w:

PIE *k^wóm ‘which? (acc. sg. masc.; cf. Skt. *kám* ‘which?, whom?’) > *k^wón ‘whom?’
>→ PGmc. *h^wanō (cf. Goth. *hana*, OE *hwone*);

PIE *k^wód ‘which? (neut.)’ (cf. Lat. *quod*; Vedic Skt. *kád* ‘what?’) > PGmc. *h^wat
‘what?’ (cf. ON *hvat*, OE *hwæt*);

PIE *k^wyeh₁- ‘to rest’, derived noun *k^wyéh₁tis (cf. Lat. *quiēs*; Old Persian *šiyātiš*
‘peace’), zero grade *k^wih₁- in PGmc. *h^wīlō ‘time’ (cf. Goth. *hēila*, OE *hwīl*);

PIE *sek^w- ‘to see’ (cf. Alb. *sheh* ‘(s)he sees’; Hitt. *sākuwa* ‘eyes’) > PGmc. *seh^wana
(cf. Goth. *saihan*, OE *sēon*, OHG *sehan*);

post-PIE *ák^weh₂ ‘running water’ (cf. Lat. *aqua* ‘water’) > PGmc. *ah^wō ‘river’ (cf.
Goth. *ahva*, OE *ēa*, OHG *aha*);

(see also ‘which (of two)?’ under *t;)

PIE *b (very rare):

PIE *dhéwbu- ~ *dhúbéw- ‘deep’ (cf. Lith. *dubùs* ‘hollow’; *dhubrós 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);

(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*);

(see also ‘building’ under *t;)

PIE *d:

PIE *dóru ~ *dréw- ‘tree, wood’ (cf. Skt. *dāru*, gen. sg. *drós*) >→ PGmc. *trewą (cf. OE *trēo*; Goth. dat. pl. *triwam* ‘with clubs’);

PIE *dwóh₁ ‘two’ (masc. nom.-acc.; cf. Skt. *dvā*, Homeric Gk. *δύω* /dúo:/) > ?PGmc.

*twō, possibly in OE *twæġen* > *twēġen* (*twō inō??): or >→ ?PGmc. *twai (with plural inflection, cf. Goth. *twai*);

PIE *h₁dónt- ~ *h₁dñt- ‘tooth’ (cf. Skt. *dánt-* ~ *dat-*) > PGmc. *tanþ- ~ *tund- (cf. ON *tqnn*, OE *tōþ*; Goth. *tunþus* ‘tooth’, *aihuatundi* ‘thornbush’, lit. *‘horse-tooth’);

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

PIE *h₁ed- ‘to eat’ (cf. Homeric Gk. *ἔδειν* /éde:n/, Lat. *edere*) > PGmc. *etanaą (cf. Goth. *itan*, OE *etan*);

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

PIE subjunctive *b^héydeti ‘(s)he will split’ (cf. Skt. *b^hédati*) > PGmc. *bītidi ‘(s)he bites’ (cf. Goth. *beitip*, OE *bīt*);

PIE *skéydeti ‘(s)he will cut (it) off’ (cf. Rigvedic Skt. *mā c^hedma* ‘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 *h₃ósdos ‘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. *nīdás*), ‘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);

(see also ‘root’, ‘sweet’, ‘foot’, ‘ten’, ‘tongue’, and ‘long’ under (1) and (2) above,
‘heart’ and ‘right-hand’ under *k̑, and ‘which? (neut.)’ under *k^w);

PIE *ǵ and *g:

PIE *ǵómbʰos ‘row of teeth’ (cf. Skt. pl. *jámbhāśas*; Gk. γόμφος /gómpʰos/ ‘peg’) >

PGmc. *kambaz ‘comb’ (cf. ON *kambr*, OE *camb*);

PIE *ǵónu ~ *ǵnéw- ‘knee’ (cf. Skt. *jānu*, Gk. γόνυ /gónu/) >→ PGmc. *knewą (cf.

Goth. *kniu*, OE *cnēo*);

PIE *h₂éǵeti ‘(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’);

PIE *h₂éǵros ‘pasture’ → ‘field’ (cf. Skt. *ájas*, Lat. *ager*) > PGmc. *akraz (cf. Goth. *akrs*, OE *æcer*);

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

PIE *éǵh₂ ‘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. *kalana ‘to be cold, to freeze’ (cf. ON *kala*, OE *calan*) and *kaldaz ‘cold’ (cf. Goth. *kalds*, ON *kaldr*, OE *ċeald*);

PIE *glewbʰ- ‘to split’ (cf. Lat. *glūbere* ‘to peel’) > PGmc. *kleubana (cf. ON *kljúfa*, OE *clēofan*, OHG *klioban*);

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

(see also ‘is working’, ‘born’, and ‘crushed’ under (2) above, and ‘to cover’ and ‘to perceive’ under *t;)

PIE *gʷ:

PIE subjunctive *gʷémeti ‘(s)he will step’ (cf. Skt. *gámat*) > PGmc. *kʷimidi ‘(s)he comes’ (cf. Goth. *qimip*, OHG *quimit*);

PIE *gʷih₃wós ‘alive’ (cf. Skt. *jīvás*, Lat. *vīvos*, and with analogical full-grade root Gk. ζῶος /sdq:ós/) > *kʷikwós > PGmc. *kʷikwaz (cf. ON *kvikr*, OE *cwic*);

PIE *gʷrēh₂u- ~ *gʷr̥h₂éw- ‘heavy’ (cf. Lat. *gravis*) → *gʷr̥h₂ús (cf. Skt. *gurús*, Gk. βαρύς /barús/) > PGmc. *kuruz (cf. Goth. *kaúrus*);

PIE *h₁régʷos ~ *h₁régʷes- ‘darkness’ (cf. Skt. *rájas* ‘empty space’, Gk. ἔρεβος

- /érebos/ ‘hell’; for the meaning cf. the related formation *h₁rg^wónt- in Toch. B *erkeṃt* ‘black (obl. sg. masc.)’ > PGmc. *rek^waz ~ *rik^wiz- (cf. Goth. *riqis*, gen. *riqizis*, ON *røkkr*);
- PIE *h₃éng^wŋ ‘ointment’ (cf. Lat. *ungen*), collective *h₃éng^wō > PGmc. *ank^wō (cf. OHG *ancho* ‘butter’);
- (see also ‘woman’ under (1) above;)
- PIE *b^h:
- PIE *b^héreti ‘(s)he’s carrying’ (cf. Skt. *b^háratī*, Lat. *fert*) > PGmc. *biridi (cf. Goth. *bairip*, OE *birp*);
- PIE *b^huh₂- ‘to become’ (cf. aorist 3sg. Skt. *áb^hūt*, Gk. ἔφῦ /ép^hu:/) → pres. *b^huh₂-ye/o- > PGmc. *būanaŋ ‘to dwell’ (cf. ON *búa*, OE *būan*);
- PIE *h₃b^hrúHs ‘eyebrow’ (cf. Gk. ὀφρῦς /op^hrú:s/, Skt. *b^hrūs*) > *brūz → PGmc. *brūwō (cf. OE *brū*);
- PIE *web^h(H)- ‘to weave’ (cf. Skt. *vab^h(i)-*, Toch. B /wəpa-/ > PGmc. *webanaŋ (cf. OE *wefan*, OHG *weban*);
- PIE *skab^heti ‘(s)he’s scratching’ (cf. Lat. *scabit*) > PGmc. *skabidi ‘(s)he shaves’ (cf. Goth. *skabip*, OE *scæfp*);
- (see also ‘arm’, ‘bloom’, ‘on both sides of’, and ‘hill’ under (1) and (2) above, ‘brother’ under *t, ‘she will split’ under *d, and ‘row of teeth’ and ‘to split’ under *ǵ/*g;)
- PIE *d^h:
- PIE *d^hugh₂tér ‘daughter’ (cf. Skt. *duhitā*, Gk. θυγάτηρ /thugátē:r/) > PGmc. *duhtēr (cf. ON *dóttir*, OE *dohtor*);
- PIE *d^hwór- ~ *d^hur- ‘door’ (cf. Gk. θύρα /thúra:/, Lat. pl. *forēs*) > PGmc. *dur- (cf. OE *duru*; Goth. *daúr*, OE *dor* ‘gate’);
- PIE *h₁wid^héwh₂ ~ *h₁wid^hwéh₂- ‘widow’ (cf. Skt. *vidhávā*, Lat. *vidua*) >→ PGmc. *widuwōn- (cf. Goth. *widuwo*, OE *widuwe*);
- PIE *méd^hyos ‘middle’ (cf. Skt. *mád^hyas*, Lat. *medius*) > PGmc. *midjaz (cf. Goth. *midjis*, OE *midd*);
- PIE *sám^hdhos ‘sand’ (cf. Gk. ἄμθος /ámathos/) > *sámædhos > *sámdhos > PGmc. *samdaz (sic; cf. MHG *sam(b)t* beside ON *sandr*, OE *sand*, OHG *sant*);

PIE *misdhó- ‘reward’ (cf. Gk. μισθός /mist^hós/; Skt. *mīḍhám* ‘prize’) > PGmc. *mizdō
(cf. OE *mēd*, *meord*; Goth. *mizdo* has been remodelled as an n-stem);

(see also ‘act of putting’, ‘thing put’, ‘under’, and ‘contest’ under (1) and (2) above,
‘treasure’ under *k, ‘deep’ under *b, and ‘(s)he is asking for’ under *g^{wh} below;)

PIE *ǵh and *ǵh:

PIE *ǵhāns ‘goose’ (cf. Gk. χήν /k^hé:n/, Lith. *žąsis*) > PGmc. *gans (cf. OE *gōs*, OHG
gans);

PIE *ǵhelHwos ‘yellow’ (cf. Lat. *helvos* ‘bay (horse)’; for the palatal cf. OCS *zelenŭ*
‘green’) > PGmc. *gelwaz (cf. OE *geolu*, OHG *gelo*);

PIE *wéǵheti ‘(s)he’s transporting (it)’ (cf. Skt. *váhati* (aor. *ávāt* with reflex of palatal
cluster), Lat. *vehit*) > PGmc. *wigidi ‘(s)he moves’ (cf. OE *wigþ*, OHG *wigit*);

PIE *h₃méyǵheti ‘(s)he’s urinating’ (cf. Skt. *méhati* (past ptc. *mīḍhás* with reflex of
palatal cluster), Gk. ομείχει /oméik^hei/) > PGmc. *mīǵidi (cf. OE *mīǵþ*);

PIE *ǵhóstis ‘stranger’ (cf. Lat. *hostis* ‘enemy’, OCS *gostŭ* ‘guest’) > PGmc. *gastiz
‘guest’ (cf. Goth. *gasts*, OE *giest*);

(post-)PIE *ǵhayd- ‘goat’ (cf. Lat. *haedus* ‘kid’) > PGmc. *gait- (cf. Goth. *gaits*, OE *gāt*);

PIE *stéyǵheti ‘(s)he’s walking’ (cf. Gk. στείχει /stéik^hei/; Skt. *stigh-*, pres. 3sg.
stigh^hnóti) > PGmc. *stīǵidi ‘(s)he climbs’ (cf. Goth. *steigiþ*, OE *stīǵþ*);

PIE *léǵhyeti ‘(s)he’s lying down [eventive]’ (cf. OCS *ležetŭ* [stative], Homeric Gk. aor.
λέκτο /lékto/ ‘(s)he lay down’) >→ PGmc. *ligiþi (stative; cf. OE *ligþ*, OHG
ligit);

PIE *h₃nogh(w)- ‘claw, nail’ (cf. Gk. ὄνυχ- /ónuk^h-/, Lith. *nāgas*) >→ PGmc. *naglaz
(cf. ON *nagl*, OE *nægl*);

(see also ‘arm’, ‘tongue’, ‘hill’, and ‘long’ under (1) and (2) above, and ‘to grab’ under
*b.)

PIE *g^{wh} appears word-initially as PGmc. *b and medially as *g^w (after nasals), *w, or
*g (the conditions are unclear):

PIE *g^{wh}édhyeti ‘(s)he is asking for’ (cf. Av. *ǰadīieiti*, OIr. *guidid*; intensive in Gk.
ποθεῖ /pothêi/ ‘(s)he longs for’) >→ PGmc. *bidīþi, inf. *bidjana (cf. Goth.
bidjþ, *bidjan*, OE *bitt*, *biddan*);

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

PIE *g^{wh}reh₁- ‘smell’ (cf. Skt. *g^hrā-*) > PGmc. *brē- in OE *bræþ* ‘smell, vapor’;

PIE *seng^{wh}- ‘to chant’, derived noun *sóng^{wh}os (collective *song^{wh}éh₂ > *honk^{wh}ā > Gk. *ὀμφή* /omp^hḗ:/ ‘divine voice’) > PGmc. *sing^wana ‘to sing’, *sang^waz ‘song’ (cf. Goth. *siggwan*, ON *syngva*, OF *siunga*; labialization lost regularly in OE, OS, OHG *singan*; Goth. *saggws*, ON *sqngr*, 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));

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

PIE *neg^{wh}ró- ‘kidney’ (cf. pl. Gk. *νεφροί* /neph^hrói/, dialectal Lat. *nefrōnēs*) > PGmc. *neurō (n-stem, like the Latin word; *u = *w in the syllable coda; cf. ON *nýra*, OHG *nioro*);

post-PIE *kneyg^{wh}- ‘to bend, to droop’ (cf. Lat. *cōnīvēre* ‘to close the eyes’) > PGmc. ‘to bow’: *hnīwana (cf. Goth. *hneiwan*)? or *hnīgana (cf. ON *hníga*, OF *hnīga*, OE, OS *hnīgan*, OHG *nīgan*)? (The difference is probably the result of levelling within the paradigm, but the original loci of the alternants aren’t clear.)

There is also a possible example of PIE *ǵ^{hw}, which would have merged with *g^{wh} (see (3) above):

PIE *ǵ^{hw}ér- ~ *ǵ^{hw}ér- ‘wild animal’ (cf. Gk. *θήρ* /th^hé:r/, Lith. *žvėrīs*; Lat. *ferus* ‘wild’) > PGmc. *berō ‘bear’ (cf. OE *bera*, OHG *bero*).

Finally, here are some examples of PIE voiceless stops unshifted after obstruents:

PIE *spr₁-n-h₁- ‘to kick’ (cf. Lat. *spernere* ‘to despise, to reject’, pf. *sprēvisse*) > PGmc. *spurnana ‘to kick, to trample’ (cf. OE *spurnan*);

PIE *h₂stér- ‘star’ (cf. Hitt. *hasterz*, Gk. *ἀστέρ* /astér-/) > PGmc. *sternan- (cf. Goth. *stairno*, OE *steorra*);

PIE *stéh₂ti- ~ *sth₂téy- ‘act of standing, place to stand’ → *sth₂tís (cf. Skt. *sthitís*) >

PGmc. *stadiz ‘place’ (cf. Goth. *staps*, OE *stede*);

PIE *h₁esti ‘(s)he is’ (cf. Gk. ἐστί /esti/, Lat. *est*) > PGmc. *isti (cf. Goth., OHG *ist*);

(post-)PIE *pisk- ‘fish’ (cf. Lat. *piscis*) > PGmc. *fiskaz (cf. Goth. *fisks*, OE *fisc*);

PIE *kh₂ptós ‘grabbed’ (cf. Lat. *captus* ‘taken, caught’) > PGmc. *haftaz ‘captive’ (cf. OE *hæft*, OHG *haft*);

PIE *oktōw ‘eight’ (cf. Skt. *aṣṭáu*, Lat. *octō*) > PGmc. *ahtōu (cf. Goth. *ahtau*, OE *eahta*);

PIE *nók^wt- ~ *nék^wt- ‘night’ (cf. Gk. νύξ /núks/, νυκτ- /nukt-/; Hitt. *nekuz mēhur* ‘evening time’) > *nókt- > PGmc. *naht- (cf. Goth. *nahts*, OHG *naht*);

(see also ‘contest’ under (1) above, ‘(s)he will cut (it) off’ under *d, ‘(s)he’s scratching’ under *b^h, and ‘stranger’ and ‘(s)he’s walking’ under *g^h.)

5. Verner’s Law.

After Grimm’s Law had run its course, but before the inherited system of contrastive accent was lost, voiceless fricatives became voiced if they were not word-initial AND not adjacent to a voiceless sound AND the last preceding syllable nucleus was unaccented. PIE *s and the Grimm’s Law outcomes of the PIE voiceless stops were all affected.

For the most part I list synchronically underived examples.

PIE *s:

PIE *snusós ‘daughter-in-law’ (cf. Gk. νύος /nuós/) → *snuséh₂ (cf. Skt. *snusā*) >

PGmc. *snuzō (cf. OE *snoru*, OHG *snura*);

PIE *h₂k-h₂ows-iéti ‘(s)he is sharp-eared’ (cf. Gk. ἀκούειν /akóue:n/ ‘to hear’) > PGmc.

*hauzīpi ‘(s)he hears’ (cf. OE *hīerþ*, OHG *hōrit*);

PIE *mēms ~ *méms- ‘meat’ (cf. Skt. *mās*, Toch. B pl. *misa*) → *mēmsóm (cf. Skt.

māmsám) or *mēmsóm > PGmc. *mimzā (cf. Goth. *mimz*);

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

(see also numerous inflectional endings in the preceding sections, especially toward the

end of (1), and ‘darkness’ under (4, *g^w) above;)

*f < PIE *p:

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 *h₂wap- ‘evil’ (cf. Hitt. *huwappas*) suffixed in *h₂upélos > *ufélos > PGmc. *ubilaz
‘evil, bad’ (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 *solpéh₂ > *solfā > PGmc. *salbō
(cf. OE *sealf*, OHG *salba*), derived verb *salbōnā ‘to anoint’ (cf. Goth. *salbon*);

PIE *septm̥ ‘seven’ (cf. Skt. *saptá*, Lat. *septem*) > *seftún → *seftúnt > *sefúnt > PGmc.
*sebun (cf. Goth. *sibun*, OE *seofon*);

*p < PIE *t:

PIE *ph₂tér ‘father’ (cf. Skt. *pitā́*, Lat. *pater*) > *fapēr > PGmc. *fadēr (cf. ON *faðir*, OE
fæder);

PIE *meh₂tér ‘mother’ (cf. Skt. *mātā́*, Lat. *māter*) > *māpēr > PGmc. *mōdēr (cf. ON
móðir, OE *mōdor*);

PIE *h₂énh₂t- ‘duck’ (cf. Lat. *anat-*, Lith. *ántis*) > *ánuþ- > PGmc. *anud- (cf. OHG
anut, OE i-stem *ened*);

PIE *tewtéh₂ ‘tribe, people’ (cf. Oscan *touto*, OIr. *túath*, Lith. *tautà*) > *peuþá > PGmc.
*peudō (cf. Goth. *þiuda*, OE *þēod*);

(see also ‘act of putting’, ‘four’, ‘hundred’, ‘inside’, ‘born’, and ‘said’ under (1) and (2)
above;)

*h < PIE *k̑ and *k:

PIE *swekrúh₂ ‘mother-in-law’ (cf. Skt. *śvaśrúś*) > *swehrú > PGmc. *swegrū? or >→
*swegrō?; in either case, > PWGmc. *swegru (cf. OE *sweġer*, OHG *swigar*);

PIE *h₂yuHṇkós ‘young’ (cf. Skt. *yuvaśás*; Lat. *iuvencus* ‘steer’, i.e. ‘young bull’) >
*yunhós > PGmc. *jungaz (cf. Goth. *juggs*, OE *iung*, *geong*);

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

As expected, the Verner's Law outcomes for $*h^w < \text{PIE } *k^w$ are the same as those for (non-initial) $*g^{wh}$:

PIE $*k^{wh}ek^{w}los$ 'wheel' (cf. Gk. κύκλος /kúklos/; Toch. B *kokale* 'chariot') > PGmc.

$*h^{wh}eh^{w}laz$ (cf. ON *hvél*, OE *hwēol*); but PIE collective $*k^{wh}ek^{w}léh_2$ (cf. Homeric Gk. pl. κύκλα /kúkla/, Skt. neut. sg. *cakráṃ*) > PGmc. $*h^{we}ula-$ (cf. ON *hjól*);

post-PIE $*sek^{wn}ís$ 'sight' (derived from $*sek^w-$ 'see' > PGmc. $*seh^{w}ana$, see (4) above) > $*seh^{wn}ís$ > $*seg^{wn}ís$ > PGmc. $*siuniz$ (cf. Goth. *siuns* 'face', OE *sīen* 'appearance');

post-PIE $*ák^{we}h_2$ 'running water' (cf. Lat. *aqua* 'water') > PGmc. $*ah^{w}ō$ 'river' (see (4) above): pre-PGmc. derived noun $*ah^{wj}ā$ 'island' > $*ag^{wj}ā$ > PGmc. $*aujō$ (cf. ON *ey*, OE *īeg*);

PIE $*sók^{wh}oy-$ ~ $*sk^{wh}i-$ 'companion' (cf. Skt. *sákḥā*) > $*sok^{wy}ós$ (cf. Lat. *socius* 'ally') > $*sog^{wj}ós$ > PGmc. $*sagjaz$ 'retainer' (cf. ON *seggr*, OE *secg*);

PIE $*sek^w-$ 'to say' (cf. Homeric Gk. iptv. 2sg. *ἔννεπε* /énnepe/ 'tell!' < $*en-hek^w-$, Lat. *inquit* '(s)he said' < $*en-sk^w-$) in iterative (?) $*sok^{w}éy/o-$ (cf. Lith. *sakýti* 'to say') > PGmc. $*sagjana$ 'to say' (cf. ON *seg(g)ja*, OE *secgan*).

The last two examples probably show that the regular outcome before $*j$ was $*g$; the divergent outcome in 'island' is probably due to the fact that the word was synchronically derived and so was subject to the productive Verner's Law rule (see below).

The outcomes of Verner's Law merged with the reflexes of the PIE voiced aspirated stops and exhibit the same allophony; thus (for example) PGmc. $*d$ was a stop in $*hundā$ 'hundred' < PIE $*k^{wh}mtóm$, $*under$ 'among' < PIE $*ṇtér$ 'inside', and $*-kundaz$ '-born' < PIE $*ǵ^{wh}h_1tós$.

After Verner's Law had run its course, the inherited contrastive accent system was replaced by non-contrastive accent on the initial syllable of the word, which made Verner's Law phonologically opaque. However, it remained a productive phonological rule with morphological triggers, playing a major role in strong verb inflection and derivational morphology.

6. “Auslautgesetze” (sound changes affecting final syllables).

a) PIE word-final nonhigh short vowels were lost in polysyllables; preceding postconsonantal semivowels were also lost. Examples:

PIE *pénk^{we} ‘five’ (cf. Skt. *pāñca*, Gk. πέντε /pénte/) >→ *femf > PGmc. *fimf (cf. Goth. *fimf*, OE *fif*); the replacement of the labiovelar by a labial is irregular and poorly understood;

PIE o-stem voc. sg. *-e, e.g. in *wǵk^{we} ‘wolf!’ (cf. Skt. *vṛka*, Gk. λύκε /lúke/), > PGmc. -Ø, e.g. in *wulf (cf. endingless Goth. voc. *þiudan* ‘king!’);

PIE act. 2pl. *-te, e.g. in *bhérete ‘you (pl.) are carrying’ (cf. Gk. φέρετε /p^hérete/), > PGmc. *-d, e.g. in *birid (cf. Goth. *baíriþ*);

PIE pf. 1pl. *-mé ~ *-mē, 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.), 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. -Ø, e.g. in *wait (cf. Goth. *wait*, OE *wāt*);

PIE pf. 1sg. *-h₂e, e.g. in *wóydh₂e ‘I know’ (cf. Skt. *véda*, Gk. οἶδα /ôida/; for the laryngeal cf. Luvian past 1sg. -*hha*), > *-a > PGmc. -Ø, e.g. in *wait (cf. Goth. *wait*, OE *wāt*);

PIE pf. 2sg. *-th₂e, e.g. in *d^hed^hórsth₂e ‘you dare’ (cf. Skt. *dad^hárṣṭ^ha*), > *-ta > PGmc. *-t (after obstruents, then generalized to other verbs), e.g. in *darst (cf. OE *dearst*);

PIE *apo ‘away’ (cf. Skt. *ápa*; Gk. ἀπό /apó/ ‘from’) > PGmc. *ab (destressed, hence Verner’s Law; cf. Goth. *af*, *ab-u*, OE *of*, OHG *ab*);

PIE *tósyo ‘of that (masc./neut)’ (cf. Skt. *tásya*, Homeric Gk. τοῖο /tôio/) > PGmc. *þas (cf. OE *þæs*);

PIE *k^wésyo ‘whose?’ (cf. Homeric Gk. τεῖο /têio/) > PGmc. *h^wes (cf. Goth. *hvis*, OHG *wes*);

PIE *ḡsmé ‘us’ (cf. Aiolic Gk. ἄμμε /ámme/, Doric ἄμέ /ha:mé/) → *ḡswé > *unswé > *úns (with retraction of accent, hence no Verner’s Law) > PGmc. *uns (cf. Goth., OHG *uns*);

PIE *wé ‘we two’ → *wé-dwo (for the formation cf. Lith. *mù-du* ‘we two’) > PGmc.

*wet, unstressed *wit (cf. Goth., OE *wit*).

The most important consequence of this sound change was that the 1sg. and 3sg. of the strong past indicative became identical in form, an accidental syncretism which was reinterpreted as systematic by native learners in various daughter languages at various times.

b) PIE word-final *m > *n; subsequently word-final *n was lost in polysyllables with nasalization of the preceding vowel.

The certain monosyllabic examples all show the addition of a particle of unknown origin:

PIE *tóm ‘that’ (acc. sg. masc.; cf. Skt. *tám*, Homeric Gk. τόν /tón/) > *tón >→ PGmc.

*þanō (cf. Goth. *þana*, OE *þone*);

PIE *k^wóm ‘which? (acc. sg. masc.; cf. Skt. *kám* ‘which?, whom?’) > *k^wón ‘whom?’

>→ PGmc. *h^wanō (cf. Goth. *h^wana*, OE *hwone*);

PIE *kím ‘this’ (acc. sg. masc.; cf. Lith. *šĩ*) > *kín >→ PGmc. *hinō (cf. OE *hine* ‘him’,

Goth. *und hina dag* ‘until this day’);

PIE *ím ‘him’ (cf. Old Lat. *im*) > *ín >→ PGmc. *inō (cf. Goth. *ina*).

Polysyllabic examples include neuter o-stem nom.-acc. singulars, non-neuter acc. singulars, the gen. pl. ending, and two 1sg. verb forms:

PIE *yugóm ‘yoke’ (cf. Skt. *yugám*, Lat. *iugum*) > *yugón > PGmc. *juka (cf. Goth.

juk, OE *geoc*; 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 *w₁k^wom ‘wolf (acc. sg.)’ (cf. Skt. *v₁kam*, Lat. *lupum*) >→ *wúlpon > PGmc. *wulfa

(cf. Goth., OE *wulf*; vowel still written in Runic *-wulafa*);

PIE *h₂w₁h₁neh₂m = *[h₂w₁h₁nām] ‘wool (acc. sg.)’ (cf. Skt. *úr₁nām*, Lat. *lānam*) >

*wúlnān > PGmc. *wullō (cf. Goth. *wulla*, OE *wulle*);

PIE *stéh₂tim ‘act of standing, place to stand (acc. sg.)’, remodelled as *sth₂tím (cf. Skt.

st^hitím) > PGmc. *stadi ‘place’ (cf. Goth. *stap*, OE *stede*);

(post-)PIE *suHnúm ‘offspring (acc. sg.)’ (cf. Skt. *sūn₁úm* ‘son’) >→ PGmc. *sunu ‘son’

(with short root-vowel for unclear reasons; cf. Goth. *sunu*, OE *sunu*);

PIE *nók^wtm ‘night (acc. sg.)’ (cf. Lat. *noctem*, Gk. νύκτα /núkta/) > *nóktun > PGmc.

*nahtu (cf. ON *nótt* with u-umlaut);

PIE *b^hréh₂troHom ‘of brothers’ (gen. pl.; cf. Skt. *b^hrātrām*, Lat. *frātrum*) > PGmc.

*brōþrō (cf. OE *brōþra*; ON *bræðra*, OHG *bruodero* have innovative stems but the same ending);

PIE thematic optative 1sg. *-oyh₁-m̃ (cf. Arkadian Gk. -οια /-oia/ and, with analogically added -m, Skt. *-eyam*) > *-oyun > PGmc. *-au (cf. Goth. *-au*, e.g. in *baírau* ‘I may carry’);

PIE *d^héd^heh₁m = *[d^héd^hēm] ‘I was putting’ (cf. Skt. *ádadhām*, Gk. ἐτίθην /etít^hē:n/, both with the “augment” prefix) > *dedē > PGmc. (*dedā >) *dedō ‘I did’ (cf. OS *deda*, OHG *teta*).

c) PIE word-final *d was lost in polysyllables:

PIE thematic opt. 3sg. *-oyd, e.g. in *b^héroyd ‘(s)he would carry’ (cf. Skt. *b^háret*) > PGmc. *-ai, e.g. in *berai (cf. Goth. *baírai*, OE *bere*);

PIE thematic opt. 3pl. *-oyh₁end, e.g. in *b^héroyh₁end ‘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. φέποιεν /p^héroien/) > *-ajin > PGmc. *-ain, e.g. in *berain (cf. Goth. *baíraina*, OE *beren*, OHG *berēn*);

PIE impf. 3sg. *d^héd^heh₁t ‘(s)he was putting’ (or *-d after *h₁?; in either case, cf. Skt. *ádadhāt* with augment *é-) > *d^héd^hēd > PGmc. *dedē ‘(s)he did’ (cf. OHG *teta*; also weak past 3sg. Goth. *-da*, Runic Norse *-de*, ON *-ði*, OE *-de*, OHG *-ta*);

PIE impf. 3pl. *d^héd^hh₁nd ‘they were putting’ (cf. Skt. *ádadh^hur*, with the usual replacement of the zero-grade ending; for the final stop cf. Faliscan *f[if]iqod* ‘they made’, i.e. [-oⁿd]) > *dedun → PGmc. *dēdun ‘they did’ (cf. OHG *tātun*; also weak past 3pl. Goth. *-dedun*); 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 *-ō, e.g. in *paþrō ‘from there, from then on’ (cf. Goth. *þaþro*);

PIE *dékmd ‘ten’ (cf. Skt. *dása*, Lat. *decem*, Lith. *dėšimt*) > PGmc. *tehun (cf. Goth.

taihun);

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 levelled into the nom.-acc. sg.).

As ‘ten’ and the 3pl. endings show, *n which preceded word-final *d was not lost. The numerals ‘seven’ and ‘nine’ have *-n by lexical analogy with ‘ten’.

The change of word-final *m to *n and the loss of word-final *d are paralleled in Greek (for example), but they are obviously natural and repeatable changes.

7. Changes of front vocalics.

- a) After stress had been fixed on the initial syllable and word-final *-e had been lost, unstressed *e was raised to *i unless *r, or (probably) *w in the syllable coda, followed immediately.

In polysyllables this change is reconstructable mainly because the new *i’s triggered i-umlaut in various daughters. The following examples seem secure:

PIE consonant-stem gen. sg. *-és and nom. pl. *-es >(→) *-ez > PGmc. *-iz, e.g.: PIE *mús ‘mouse’, gen. sg. *mūsés, nom. pl. *muses (cf. Skt. *mūs*, *mūśás*, *mūśas*, Gk. μῦς /mû:s/, nom. pl. μῦες /mû:es/, Lat. *mūs*, gen. sg. *mūris*) > PGmc. *mūs, gen. sg. *mūsiz (with Verner’s Law alternants levelled), nom. pl. *mūsiz (cf. OE *mūs*, *mȳs*, *mȳs*);

PIE neut. s-stem suffix *-os ~ *-es- > PGmc. *-az ~ *-iz-, e.g.: PIE *h₂ég^hos ~ *h₂ég^hes- ‘emotional distress’ (cf. Homeric Gk. ἄχος /ák^hos/, gen. sg. ἄχεος /ák^heos/) > PGmc. *agaz ~ *agiz- ‘fear’ (cf. Goth. *agis* (remodelled as a neut. a-stem), OE *ege* (remodelled as a masc. i-stem));

late PIE *-éteh₂, suffix forming abstract nouns from adjs. (cf. Skt. *nagn-átā* ‘nakedness’; for the medial vowel cf. also Gk. ἀρετή /aretē:/ ‘virtue’, etc.), > *-epā > PGmc. *-iþō, e.g. in *strangiþō ‘strength’ (cf. OE *strengþ*);

PIE *uksén ~ *uksén- ~ *uksn̥- ‘bull’ (cf. Skt. *ukṣā́*, acc. sg. *ukṣāṇam*, gen. sg. *ukṣṇás*) >→ PGmc. *uhsō (nom. sg. remodelled; cf. OE *oxa*, OHG *ohso*) ~ *uhsin- (cf.

ON *yxn-*) ~ *uhsn- (cf. Goth. gen. pl. *aiúhsne*);

late PIE diminutive suffix *-el- (cf. Lat. *-ol-* ~ *-ul-*, e.g. in *filiolus* ‘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 ‘heavy’) >→ PGmc. *suniwiz (cf. Goth. *sunjus*, ON *synir*).

There are also some examples in unstressed alternants of personal pronouns, e.g.:

PIE *égh₂ ‘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*).

Before *r this raising did not occur; *e either remained or became *a (it’s difficult to tell which):

PIE *ánteros ‘other (of two)’ (see above under (4, *t)) > PGmc. *anþeraz or *anþaraz (cf. Goth. *anþar*, ON *annarr*, OE *ōþer*, OF *ōther*, OS *ōðar*, OHG *andar*).

Unstressed tautosyllabic *ew apparently > *ow, which eventually > PGmc. *au (see (8) below):

post-PIE gen. sg. *suHnéws ‘offspring’s’ (cf. Skt. *sūnós* ‘son’s’; for the vowel cf. Gk. masc. gen. sg. βαρέος ‘heavy’) >→ PGmc. *sunauz (cf. Goth. *sunaus*, ON *sonar*, OE *sunā*).

(Contrast the development of nom. pl. *-éwes above.)

b) After the raising in (a) had occurred, *e was raised to *i if a high front vocalic occurred in the next syllable. Note the following examples:

PIE *séghos ~ *séghes- ‘control, power’ (cf. Skt. *sáhas*, Av. *hazō*; the verb survives in Gk. ἔχειν /ék^he:n/ ‘to have’) > *segaz ~ *segiz- > PGmc. *segaz ~ *sigiz- ‘victory’ (cf. Goth. *sigis*, reanalyzed as an neut. a-stem; ON *sigr*, OE *sige*, OHG *sigi-*, reanalyzed as a masc. i-stem);

PIE *bhéresi ‘you are carrying’, *bhéreti ‘(s)he is carrying’ (cf. Skt. *bhāraṣi*, *bhāraṭi*, OCS *bereši*, *beretŭ*) > *berizi, *beridi > PGmc. *birizi, *biridi (cf. OE *birst*, *birþ*,

OHG *biris, birit*);

PIE *g^{wh}éd^hyeti ‘(s)he is asking for’, *g^{wh}éd^hyonti ‘they are asking for’ (cf. Av.

ǰaǰiieiti, ǰaǰiieinti) > *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. *náviyas*; derivative of *néwos, cf. Hitt. *nēwas*,

Lat. *novos*) > PGmc. *niwjaz (by the converse of Sievers’ Law; cf. Goth. *niujis*, OE *nēwe*, OHG *niuwi*);

PIE *méd^hynos ‘middle’ (cf. Skt. *mád^hyas*, Lat. *medius*) > PGmc. *midjaz (cf. Goth.

midjis, ON *miðr*, OE *midd*, OHG *mitti*).

Note especially an adverb which occurred with and without the deictic particle *-i:

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*).

If this was a phonetically natural change it should also have affected *ey, yielding PGmc.

*ī, and that is what we find. Examples are numerous; typical are:

PIE *deywós ‘god’ (cf. Skt. *devás*, Lat. *deus*, *dīv-*) > PGmc. *Tīwaz, name of the war

god (cf. OE *Tīw* in *Tīwes-dæg* ‘Tuesday’);

PIE *wéydwōs ‘knowing’ (pf. ptc., cf. Gk. εἰδώς /eidós:/ with shifted accent and Skt.

vidvān with more extensive remodelling) >→ PGmc. *wītōd- ‘witness’ (cf. Goth. *weitwod-*);

PIE *h₃méyǵ^honti ‘they’re urinating’ (cf. Skt. *méhanti*, Gk. ομείχουσι /oméik^ho:si/) >

PGmc. *mīgandi (cf. OE *mīgaþ*);

PIE *b^héy^honti ‘they trust’ (vel sim.; cf. Lat. *fīdunt* ‘they trust’, Gk. (mid.) πείθονται

/péit^hontai/ ‘they believe’) > PGmc. *bīdandi ‘they wait (for)’ (cf. Goth. *beidand*, ON *bíða*, OE *bīdaþ*, OHG *bītant*).

(Note that Gothic *ei* = /i/; it does not reflect retention of the diphthong.)

The last two examples are typical class I strong verbs, all of which are further examples.

This is the only “i-umlaut” which occurred in all Germanic languages. In Gothic the

direct evidence has been destroyed by a subsequent merger of *i and *e; but since this change preceded the ones in (c) below, which occurred before the PGmc. period (and are reflected in Gothic), we know that it was also a pre-PGmc. sound change.

This sound change remained a productive rule in PGmc., giving rise to a pervasive alternation between surface *e and *i.

c) After the change described in (b) had run its course, *j was lost whenever *i followed immediately (regardless of what preceded); *j was also lost between vowels, unless the preceding vowel was *i. In other words:

*Cji > *Ci; *iji > *ii; other *ijV did not change; other *VjV > *VV.

Most of the vowels brought into hiatus by the loss of *j subsequently contracted. If both were short, the result was a bimoric long vowel or a diphthong; if at least one was long, the result was a trimoric long vowel.

Examples of the loss of *j in the sequence *Cji (which is typically restored in Gothic):

PIE *g^{wh}éd^hyeti ‘(s)he is asking for’, *g^{wh}éd^hyonti ‘they are asking for’ > *bidjidi, *bidjondi >→ PGmc. *bidiþi, *bidjanþi (cf. Goth. *bidjip*, *bidjand*, ON *biðr*, *biðja*, OE *bitt*, *biddaþ*, OHG *bitit*, *bittent*);

PIE *légh^hyeti ‘(s)he’s lying down’, *légh^hyonti ‘they’re lying down’ > *ligjidi, *ligjondi >→ PGmc. *ligiþi, *ligjanþi (cf. OE *ligþ*, *licgaþ*, OHG *ligit*, *liggent*; ON inf. *liggja*);

PIE *h₂éryeti ‘he’s plowing’, *h₂éryonti ‘they’re plowing’ (cf. Lith. *ãria*, Mlr. *airid*) > *arjidi, *arjondi >→ PGmc. *ariþi, *arjanþi (cf. OE *ereþ*, *eriaþ*, OHG *erit*, *erient*; Goth. ptc. *arjands*);

PIE *kh₂piéti ‘(s)he is grasping’, *kh₂piónti ‘they are grasping’ > *kapyéti, *kapyónti (by the converse of Sievers’ Law, as also in Lat. *capit* ‘(s)he takes’, *capiunt* ‘they take’) > *habjiþi, *habjonþi > PGmc. *habiþi ‘(s)he lifts’, *habjanþi ‘they lift’ (cf. Goth. *haffip*, *haffand*, ON *hefr*, *hefja*, OE *hefeþ*, *hebbap*, OHG *hefit*, *heffent*);

PIE *woséyeti ‘(s)he clothes’, *woséyonti ‘they clothe’ (cf. Hitt. *wassezzi*, *wassanzi*, Skt. *vāsáyati*, *vāsáyanti*) > *wozijidi, *wozijondi > *wozjidi, *wozjondi (by the converse of Sievers’ Law) >→ PGmc. *waziþi, *wazjanþi (cf. Goth. *wasjip*,

wasjand, OE *wereþ*, *weriaþ*, OHG *werit*, *werient*).

Examples of *iji:

PIE *tréyes ‘three’ (nom. masc.; cf. Skt. *tráyas*, Gk. *τρεις* /trê:s/, Lat. *trēs*) > *þréjes > *þrijiz > PGmc. *þrīz (cf. ON *þrír*; OE *þrīe* has added the strong adj. nom. pl. ending);

PIE *wéy ‘we’ (cf. Skt. *vay-ám*) → *wéy-es (with the default nom. pl. ending, cf. Hitt. *wēs*) > *wijiz > PGmc. *wīz (cf. Goth. *weis*) ~ *wiz (with reduction of the vowel when unstressed, cf. ON *vér*, OE *wē*);

PIE nom. pl. *ghósteyes ‘strangers’ (cf. Lat. *hostēs* ‘enemies’, with the same contraction as in *trēs*) > *gostijiz > PGmc. *gastīz ‘guests’ (cf. Goth. *gasteis*, ON *gestir*, OHG *gesti*);

PIE *seh₂gieti ‘(s)he gives a sign’, *seh₂gionti ‘they give a sign’ (cf. Hitt. *sākizzi*, *sākianzi*; Lat. *sāgīre* ‘to be keen-nosed’) > *sākijīþi, *sākijonþi > PGmc. *sōkīþi ‘(s)he seeks’, *sōkijanþi ‘they seek’ (cf. Goth. *sokeiþ*, *sokjand*, OE *sēcþ*, *sēcāþ*);

PIE *h₂kh₂owsiéti ‘(s)he is sharp-eared’, *h₂kh₂owsiónti ‘they are sharp-eared’ (cf. Gk. *ἀκούειν* /akóue:n/ ‘to hear’) > *houzijīþi, *houzijonþi > PGmc. *hauzīþi ‘(s)he hears’, *hauzijanþi ‘they hear’ (cf. Goth. *hauseiþ*, *hausjand*, OE *hīerþ*, *hīerāþ*);

PIE *wr̥gýéti ‘(s)he is working’, *wr̥gýónti ‘they are working’ (cf. Av. *vərəziieiti*, *vərəzinti*) > *wurgíéti, *wurgíónti (by reapplication of Sievers’ Law) > *wurkijīþi, *wurkijonþi > PGmc. *wurkīþi ‘(s)he works/makes’, *wurkijanþi ‘they work/make’ (cf. Goth. *waúrkeiþ*, *waúrkjand*, OE *wyrçþ*, *wyrçāþ*);

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)wierþ*, *(for)wierdāþ*, OHG *arwertit*, *arwertent*).

Examples of the loss of *j in other *VjV-sequences:

PIE thematic optative 1sg. *-oyh₁-m̐ (cf. Arkadian Gk. -οια /-oia/ and, with analogically added -m, Skt. -eyam) > *-oyun > PGmc. *-au (cf. Goth. -au, e.g. in *bairau* ‘I may carry’);

PIE thematic optative 3pl. *-oyh₁-end (cf. Gk. -οιεν /-oien/) > *-oyin > PGmc. *-ain

(cf. OHG *-ēn*, OE *-en*, e.g. respectively in *berēn*, *beren*; extended with a particle in Goth. *-aina*, e.g. in *baírainā*);

PIE *áyeri ‘in the morning’ (cf. Av. *aiiarə* ‘day’, Gk. ἄριστον /á.riston/ ‘breakfast’ < *áyeri-h₁d-s-to- ‘eaten in the morning’) > *ajiri > PGmc. *airi ‘early’ (cf. Goth. *air*, ON *ár*, OE *ær*, 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 *steh₂- ‘to stand’ (cf. aor. 3sg. Skt. *ást^hāt*, Gk. ἔστη /éste:/ ‘(s)he stood up’), innovative pres. *sth₂-yé/ó- or stative *sth₂-h₁yé/ó- (cf. OCS 3sg. *stojitŭ*) > *staja- ~ *staji- > PGmc. *stā- ~ *stai- (cf. OF, OS, OHG *stān* beside OHG *stēn*);

PIE *b^huh₂- ‘to become’ (cf. aorist 3sg. Skt. *áb^hūt*, Gk. ἔφϋ /ép^hu:/), innovative pres. *b^huh₂-ye/o- (cf. Gk. φύεσθαι, Lat. *fieri*) > *būji- ~ *būja- ‘be’ > PGmc. *būi- ~ *būa- ‘dwell’ (cf. ON *búa*, 3sg. *býr*, OE *būan*, 3sg. *bȳþ*);

PIE pres. *snéh₁ye/o- ‘to spin’ (cf. Gk. νῆν /nê:n/, Lat. *nēre*; Skt. *snāyati* ‘(s)he wraps’, OIr. *sníid* ‘(s)he twists’) > PGmc. *nēi- ~ *nēa- ‘sew’ (cf. OHG *nāen*, *nāwen*);

PIE pres. *h₂wéh₁- ~ *h₂wéh₁- ‘to blow’ (cf. 3sg. Skt. *vāti*, Homeric Gk. ἄησι /áē:si/) > PGmc. *wēi- ~ *wēa- (cf. Goth. *waian*, OE 3sg. *wāwep*);

PIE *seh₁- ‘to sow’ (cf. Lat. perf. *sēvit* ‘(s)he sowed’), innovative pres. *séh₁ye/o- (cf. 3sg. Lith. *sėja*, OCS *sějetŭ*) > *sēji- ~ *sēja- > PGmc. *sēi- ~ *sēa- (cf. Goth. *saian*, ON *sá*, 3sg. *sær*, OE *sāwan*, 3sg. *sāwþ*, OHG *sā(j)en*, *sāwen*).

Contraction to a trimoric vowel occurred in forms of class II weak presents, e.g. (post-PIE?) denominative *solpeh₂yé/ó- ‘anoint’:

indic. 3sg. *solpeh₂yéti > *salbājiþi > PGmc. *salbōþi (cf. Goth. *salbop*, OE *sealfap*, OHG *salbōt*);

indic. 3pl. *solpeh₂yónti > *salbājanþi > PGmc. *salbōnþi (cf. Goth. *salbond*, OHG *salbōnt*);

opt. 3sg. *solpeh₂yóyd > *salbājait > PGmc. *salbō (cf. Goth., OHG *salbo*);

opt. 3pl. *solpeh₂yóyh₁end > *salbājajint > PGmc. *salbōn (cf. Goth. *salbona*, OHG *salbōn*);

opt. 1sg. *solpeh₂yóyh₁m̃ > *salbājajun > PGmc. *salbō̃ (cf. Goth., OHG *salbo*).

Note that the pre-PGmc. sequences *āji, *āja, *ājai, *ājaji, *ājaju all eventuated in PGmc. trimoric *ō̃, which was also the outcome of much older contractions.

Loss of intervocalic *y (*j) occurred fairly early in every subgroup except Indo-Iranian and Balto-Slavic, but it was obviously an independent parallel innovation.

8. Mergers of nonhigh back vowels.

*a and *o merged as *a; *ā and *ō merged eventually as *ō̃, but there is some evidence that the outcome of the merger was at first *ā̃, which was only subsequently rounded and raised to *ō̃. Presumably the trimoric vowels underwent the same changes. Examples can be multiplied almost indefinitely.

Examples of the short vowels (including *e “colored” by laryngeals):

PIE *átta ‘dad’ (cf. Gk. ἄττα /átta/, Lat. *atta*, both used as respectful forms of address for old men; Hitt. *attas* ‘father’) > PGmc. *attō̃ (cf. Goth. *atta* ‘father’);

PIE *h₂égros ‘pasture’ → ‘field’ (cf. Skt. *ájras*, Lat. *ager*) > PGmc. *akraz (cf. Goth. *akrs*, OE *æcer*);

PIE *h₂ówis ~ *h₂éwi- ‘sheep’ (cf. Lycian acc. sg. *xawā*, Skt. *ávis*, Lat. *ovis*) > PGmc. *awiz (cf. Goth. *awistr* ‘sheepfold’);

PIE *h₃érō, *h₃éron- ~ *h₃ṛn- ‘eagle’ (cf. Hitt. *hāras*, *hāran-*; Gk. ὄρνις /órni:s/ ‘bird’) > PGmc. *arō̃, *arn- (cf. Goth. *ara*, OE *earn*, OHG *aro*, *arn*);

PIE *h₃ósdos ‘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 *heapu-*, OHG *hadu-*; ON *Hqðr*, name of the god of battle);

PIE *sámh₂d^hos ‘sand’ (cf. Gk. ἄμαθος /ámathos/) > *sáməd^hos > PGmc. *samdaz (cf. ON *sandr*, OE *sand*);

PIE *ǵh₂ans ‘goose’ (cf. Gk. χήν /kʰé:n/, Lith. žąsis) > 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 *dayh₂wér ‘brother-in-law’ (cf. Skt. *devā́*, Homeric Gk. *dayawér > δᾱήρ /da:é:r/) > *taikwér > PGmc. *taikuraz (remodelled on *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. *hawwana ‘to chop’ (cf. ON *hoggva*, OE *hēawan*);

PIE *ǵhóstis ‘stranger’ (cf. Lat. *hostis* ‘enemy’, OCS *gostī* ‘guest’) > PGmc. *gastiz ‘guest’ (cf. Goth. *gasts*, OE *giest*);

PIE *konk- ‘to hang’ (cf. 3sg. Hitt. *gānki*; Skt. *śānkate* ‘is indecisive, worries’) > PGmc. *hanhana ‘to suspend (judgment)’; (cf. OE *hōn*, OHG *hāhan*; Goth. *hāhan* ‘to suspend (judgment)’);

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

PIE *wóyde ‘(s)he knows’ (cf. Skt. *véda*, Gk. οἶδε /ōide/) > 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’).

Examples of the long vowels:

PIE *swādus ‘pleasant, sweet’ (*swéh₂dus?; cf. Skt. *svādús*, Gk. ῥδύς /hₑ:dús/) > *swātuz > PGmc. *swōtuz → PNWGmc. *swōtiz (cf. ON *sætr*, OE *swēte*);

PIE *wréh₂d- ~ *wṛh₂d- ‘root’ (cf. Lat. *rādīx*) > *wrāt- ~ *wurt- > PGmc. *wrōt- ~ *wurt- (cf. Goth. *waurts*, ON *rót*; OE *wyr* ‘plant’);

PIE *h₂wǵh₁neh₂ ‘wool’ (cf. Hitt. *hulana-*, Skt. *úrṇā*, Lat. *lāna*, Lith. pl. *vilnos*) > *wulnā > PGmc. *wullō (cf. Goth. *wulla*, OE *wull*);

PIE *h₂wǵh₁neh₂m ‘wool (acc.)’ > *wulnām > *wullā > PGmc. *wullō (cf. Goth. *wulla*, OE *wulle*);

PIE *pód-s ‘foot (nom. sg.)’ (cf. Skt. *pád*, Doric Gk. πῶς /pó:s/) > *fāt- > PGmc. *fōt- (cf. Goth. *fotus*, OE *fōt*);

PIE *k^wetwōr ‘four (neut.)’ (cf. Skt. *catvāri*, Lat. *quattuor*) >→ *fedwār > PGmc. *fedwōr (cf. Goth. *fidwor*, OE *fēower*);

(post-)PIE *b^hleh₃- ‘bloom, flower’ (cf. Lat. *flōs* ‘flower’) > *b^hlō- > *blā- > PGmc. *blō- (cf. Goth. *bloma* ‘flower’, OE *blōstm* ‘flower’, *blōwan* ‘to bloom’);

PIE *d^hóh₁mos ‘thing put’ (cf. Greek θωμός /t^hq:mós/ ‘heap’) > *d^hómos > *dāmaz > PGmc. *dōmaz ‘judgment’ (cf. Goth. *doms*, OE *dōm*);

PIE *sóh₂w_l ‘sun’ (cf. Lat. *sōl*; for the laryngeal cf. Gk. ἥλιος /hē:lios/, Homeric ἥελιος /ē:élios/ < *sāwel- < *seh₂wel-) > *sōw_l > *sāwul > *sōwul > ?PGmc. *sōl (cf. ON *sól*);

PIE thematic pres. indic. 1sg. *-oh₂ (cf. Lat. -ō, Lith. -ù) > *-ō > *-ā > PGmc. *-ō (cf. Goth. -a, ON Ø, OHG, Anglian OE -u);

PIE h₁néh₃mō ‘nomenclature, names (collective)’ (cf. Skt. pl. *nāmā*) > *nómō >→ *namā > PGmc. *namō (cf. Goth. *namo*, OE *nama*, OHG *namo*);

PIE o-stem nom. pl. masc. *-oes (cf. Skt. -ās, Oscan -ús) > *-āz > PGmc. *-ōz (cf. Goth. -os, OE -as);

PIE gen. pl. *-oHom (cf. Skt. -ām (often disyllabic in the Rigveda), Gk. -ων /-q:n/) > *-ā > PGmc. *-ō (cf. Goth. (fem.) -o, OE -a, OHG -o);

PIE eh₂-stem nom. pl. *-eh₂es (cf. Skt. -ās, Lith. -ōs) > *-āz > PGmc. *-ōz (cf. Goth. -os, OE -a, OHG (adj.) -o).

Both mergers also occurred in Slavic (with opposite outcomes!), but only the merger of short vowels in Baltic. These were clearly independent parallel innovations.