THE SHARED LEXICON OF BALTIC, SLAVIC AND GERMANIC

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1. Introduction

The Baltic, Slavic and Germanic language families share some similarities that are not found in the other branches of Indo-European. The shared dative plural in *-*m*- instead of *-*b*^{h}- led 19th century scholars such as Schleicher to group Baltic, Slavic and Germanic together under one branch. A Baltic-Slavic-Germanic group was still assumed by Gamkrelidze and Ivanov in the later 20th century. The assumption of one Baltic-Slavic-Germanic branch is not unproblematic. It does not take into account isoglosses such as the *centum/satem*-division (Mallory 1989: 18-21), the notion that the dative plural *-*m*- does not necessarily have to be interpreted as a common innovation of Baltic, Slavic and Germanic, and the findings that contact between Germanic and Slavic speakers only started after the Proto-Germanic period, suggesting that these language families were not adjacent to each other during much of their prehistory (Pronk-Tiethoff 2012), (Kortlandt 2018).

Baltic, Slavic and Germanic share several lexical items that are not found outside of these language families. Stang (1972) gives an overview of many of these lexical forms that may constitute a Baltic-Slavic-Germanic isogloss. He finds, besides numerous forms he considers as uncertain, 68 forms common to all three language families, 66 forms limited to Baltic and Germanic and 54 forms limited to Slavic and Germanic. He does not find a semantic or chronological difference between these three groups of words. Many of the forms that are limited to Baltic and Germanic or Slavic and Germanic may have been present originally in all three language families (Stang 1972: 77-78). Semantically, the shared forms consist largely of natural terms, simple technological terms, often related to woodworking, and labour-related verbs. Social-cultural terms are few but important (e.g. *h_1*leud*^{h}*-i*- ‘people’) and agricultural terms are rare (Stang 1972: 70-76). Stang holds it for possible that the lexical similarities between Balto-Slavic and Germanic is a further (local) continuation of a “northwestern” Indo-European Sprachbund, to which Celtic and Italic also belonged (Stang 1972: 81). In the view that Balto-Slavic and Germanic were probably not adjacent to each other for much of their prehistory, Kortlandt suggests that the shared lexical similarities between Balto-Slavic and Germanic are due to a shared substrate, that possibly originates in the Corded Ware culture (Kortlandt 2018: 227).

The aim of this thesis is to obtain an updated overview of the shared lexicon between Baltic, Slavic and Germanic, and to place this in the context of the prehistory of the Baltic, Slavic and Germanic language families. In chapter two, I will discuss three topics that I consider relevant to the subject of the shared lexicon between Baltic, Slavic and Germanic: the non-lexical similarities between these language families, the (archaeological) prehistory of these language families, and the possible substrate layers in these language families. In chapter three, I will re-examine the shared vocabulary between Baltic, Slavic and Germanic given by Stang (1972), to which some forms provided by Oettinger (2003) and Matasović (2014) have been added. This will be done mainly through etymological research, for which I will especially utilize the *Indo-European Etymological Dictionaries Online* database (IEDO). The results of this research will be analysed in chapter four. Finally, taking into consideration the topics discussed in chapter one and the results of the etymological research executed in chapters two and three, a conclusion will be reached in chapter five.

2. Background topics

In order to obtain a feasible context in which the shared lexicon between Baltic, Slavic and Germanic may be understood, I will discuss three topics in this chapter that are relevant to the question of the shared lexicon. Firstly, I will treat the non-lexical similarities between Balto-Slavic and Germanic. Secondly, I will discuss the (archaeological) prehistory of the Balto-Slavic and Germanic language families, including the question of their homelands. Finally, possible substrate layers that may be shared between Balto-Slavic and Germanic will be considered.

2.1. Non-lexical similarities between Baltic, Slavic and Germanic

Besides similarities in the lexicon, Balto-Slavic and Germanic share a few other peculiarities. The dative plural ending **-mus* contrasts with **-b^{h}is*, **-b^{h}os* found in other Indo-European languages and has often been seen as a common innovation of Balto-Slavic and Germanic (e.g. Mallory 1989: 19). The use of the endings in **-b^h-* for the dative must however be secondary. Balto-Slavic and Germanic may therefore have retained an original dative plural **-mus*, eliminating the necessity of a Balto-Slavic-Germanic isogloss (Kortlandt 2018: 228). On the other hand, the ending **-mus* may have been secondary too, if it is derived from a basal "goal/recipient" case suffix **-m-* (Pooth 2014a: 5). Still, this does not imply that **-mus* was not already present in (late) Proto-Indo-European. A second grammatical similarity is the use of a suffix **-oro-* (Stang 1972: 88-89). However, this suffix is not widespread and far more often found in Balto-Slavic than in Germanic.

Phonetic similarities between Balto-Slavic and Germanic include the use of **a* for PIE **o*. This sound change is however is too general to be used as an argument in favour of a common innovation, since it also occurred in Indo-Iranian. Within Slavic, **a* shifted back to **o*. The *cot-caught* merger in Modern English may be compared too. The similarities between Balto-Slavic and Germanic may therefore be due to a parallel development. Within Baltic and Germanic, a sound change $*eh_2 > *\bar{o}$ can be observed. This shift too probably occurred within each language family independently, since Finnic borrowings from pre-Proto-Germanic still show $*\bar{a}$ (Kallio 2012: 229).

The non-lexical similarities between Balto-Slavic and Germanic may therefore be explained as the result of parallel developments or the coincidental conservation of archaic forms. The lack of any clear common grammatical innovations is an argument against the assumption of a common Baltic-Slavic-Germanic linguistic phase.

2.2. The prehistory of Balto-Slavic and Germanic

In this section, an overview of the prehistory of Balto-Slavic and Germanic will be discussed. First, I will treat "northwestern Indo-European". Subsequently, I will address the question of the Baltic, Slavic and Germanic homelands.

2.2.1. Northwestern Indo-European

Baltic, Slavic and Germanic are often included in a "northwestern group" of Indo-European branches, generally together with Celtic and Italic. There is no general agreement on the initial spread of these language families. Their origins have been connected to the Corded Ware culture (3200 – 2300 BC), which extended over the North European plain from the Netherlands in the west to Russia in the east, including southern Scandinavia, the Baltic coast and the area surrounding the Gulf of Finland (Mallory 1989: 107-109). The people of the Corded Ware culture display a close relationship, both culturally and

genetically, to the people of the neighbouring (probably late Proto-Indo-European) Yamnaya culture (Kristiansen et al. 2017).

It has been suggested that the northwestern Indo-European branches underwent one common linguistic phase (Oettinger 2003). Oettinger listed 65 vocabulary items that might reflect this common phase. In my bachelor thesis (van der Heijden 2016), I concluded that 22 of the suggested forms may indeed go back to one ancestral form. However, there is no reason to assume a common northwestern Indo-European linguistic phase, in particular because the 9 forms that are Indo-European in origin (e.g. **pleḱ-t-* 'to braid', **h₃reiH-dʰ-* 'to ride'), are formally undistinguishable from Proto-Indo-European formations. They may therefore have been created in the western part of the late Proto-Indo-European dialect area before the expansion of the Corded Ware culture. The same may hold for 8 shared forms that may have been borrowed from a neolithic substrate: **pleus-* 'fleece', **tenK(-)s-* 'drawbar', **u̯ol(H)t-* 'bush', **bʰar(s)-* 'barley', **lois-eh₂* 'furrow', **polḱ-eh₂* 'fallow land', **sku̯ei-h₂-* 'coniferous twig, needle', **sku̯erb⁽ʰ⁾-* 'thorn'. Neolithic cultures that neighboured the late Proto-Indo-European dialect area, such as the Tripolye culture, may have been a donor language. The contact with farmer cultures also led to the introduction of new agricultural terms by these Indo-Europeans themselves, such as the use of **ǵr̥h₂-no-* for 'corn' (< '(ripened) kernel') and perhaps **seh₁-* 'to sow' (< 'to press'; compare Hitt. *šai-*, *ši-* 'to press, seal' (Kloekhorst 2008)).

Other shared vocabulary of the northwestern Indo-European branches that probably has a neolithic substrate origin cannot be traced back to a single ancestral form (e.g. **(H)oḱet-* 'harrow', **ab(V)l-* 'apple' and **au̯iǵ⁽ʰ⁾-* 'oats') and must therefore have been borrowed by each branch separately, likely from different neolithic dialects. This layer of European neolithic forms is not unique to the northwestern Indo-European dialects, as can be observed from words such as '(chick-)pea' (OHG *arawīz*, Gk. *ἐρέβινθος*) and 'turnip' (OHG *ruoba*, Gk. *ῥάπυς*, *ῥάφυς*) (Iversen and Kroonen 2017: 516). I conclude that there is no linguistic evidence that favours the hypothesis of a unified northwestern Indo-European block after splitting off from late Proto-Indo-European.

The Italic and Celtic branches have probably not spread by means of the Corded Ware culture. Italo-Celtic is generally assumed to have split off from late Proto-Indo-European after Anatolian and Tocharian, but before the other branches. Their initial spread may be identified with a migration of Yamnaya people westward along the Danube (ca. 3100 – 2800 BC) (Anthony and Ringe 2015: 208). Subsequent migrations of Yamnaya people to the west, both along the Danube and the north of the Carpathians, may have brought late Proto-Indo-European to the emerging Corded Ware culture.

2.2.2. The origins of Baltic, Slavic and Germanic

The unity of a Balto-Slavic branch of Indo-European follows from several linguistic developments that are shared between the Baltic and Slavic languages (e.g. Winter's Law, Hirt's Law).[1] Proto-Balto-Slavic can approximately be dated to the 2nd millennium BC (Kortlandt 1982: 179). Based on the possible locations for the Proto-Baltic and Proto-Slavic homelands, its homeland was probably located in current-day Belarus, eastern Poland and western Ukraine. Pre-Proto-Balto-Slavic may have been spoken in the Middle Dnieper culture (ca. 2800 – 1800 BC), which developed out of a complex mixture of Yamnaya and Late Tripolye cultures, heavily influenced by the eastward expansion of the Corded Ware culture (Anthony 2007: 377). The Balto-Slavic homeland cannot be identified with the neighbouring Corded Ware-related Fatyanovo culture, because this culture had major interactions with Uralic people, while Proto-Balto-Slavic seemingly lacked Uralic loanwords (Kallio 2005).[2] An early split-up of Proto-Balto-

[1] see further (Kortlandt 2009: 2-5).
[2] Borrowings from Uralic are found in separate Baltic and Slavic languages, but they must stem from a time period after Proto-Balto-Slavic (Kallio 2005).

Slavic may be observed in the relatively similar Trziniec and Komarov culture (ca. 1500 BC), that can be found on both sides of the Pripet marshes (Gimbutas 1971: 35-36). Besides the incorporation of neolithic vocabulary that Balto-Slavic shares with most other European languages, it shares vocabulary with Germanic in particular. The existence of an Indo-European substrate, known as Temematic (Holzer 1989), is possible too, in particular for Slavic.

The reconstruction of Proto-Baltic is problematic because of the disputed position of Old Prussian within Balto-Slavic. Traditionally, it is viewed as a Baltic language of the West-Baltic branch, contrasting with the East-Baltic languages such as Lithuanian and Latvian. It may however also be possible that Old Prussian forms a separate third branch of Balto-Slavic, albeit closer to East-Baltic than to Slavic (Kortlandt 2009: 5). Another fourth "north Baltic" branch of Balto-Slavic has been suggested in order to explain several borrowings in Finnic (Kallio 2003: 231). In any case, all branches were probably not spoken very far from each other. The spread of Baltic hydronyms suggests that Baltic speakers had spread over the area between the lower Vistula in the west, Moscow in the east, the upper Volga in the north and Kiev in the south (Mallory 1989: 82). When the Balts spread towards the Baltic coast, they incorporated some Finnic vocabulary.[3]

Proto-Slavic or Common Slavic can be dated around 500 AD. Since this corresponds to the chaotic Migration Period, it is difficult to assign a specific homeland to the Proto-Slavic speakers. Hydronymic data suggest a homeland north of the Carpathians, between the upper Vistula and the middle Dnieper (Mallory 1989: 80). The Zarubintsy culture (ca. 200 BC – 200 AD), that largely overlaps with this area, is often seen as a good candidate for the Proto-Slavic homeland (Adams and Mallory 1997: 657). Within the subsequent Chernyakhov culture (200 – 500 AD), linguistic interaction between Proto-Slavic, Gothic and Iranic may have taken place (Mallory 1989: 79).

The Iron Age Jastorf culture in northern Germany (ca. 500 BC) is generally regarded as a Proto-Germanic homeland (Mallory 1989: 86-87). During the same time period, Proto-Germanic speakers may also have lived in southern Scandinavia (Kallio 2003: 236). The Jastorf culture continues the Bronze Age cultures of the same area without a major cultural shift. It is therefore probable that also pre-Proto-Germanic was spoken in the north of Germany. The adjacent Nordic Bronze Age culture of southern Scandinavia (ca. 1700 – 500 BC) was probably pre-Proto-Germanic-speaking too. This can be deduced from Finnic words that were likely borrowed from pre-Proto-Germanic (Kallio 2012: 229).[4] The emergence of the Nordic Bronze Age was accompanied by cultural contact and trade with Central Europe, the Carpathians and the Aegean (Kristiansen and Larsson 2005: 186-231). Pre-Proto-Germanic may have been introduced to southern Scandinavia during this time period. The Nordic Bronze Age culture declined significantly since the 8th century BC due to a cooling of the climate and the introduction of iron from the early Celtic Hallstatt culture in southern Germany (Rowlett 1968: 130). This may have caused a shift of the (pre-)Proto-Germanic cultural centre from southern Scandinavia to the northern German Jastorf culture. When around 250 BC the Roman Warm Period began, a new wave of (late) Proto-Germanic or Northwest-Germanic people may have spread into Scandinavia.[5]

It is not necessary to assume that Germanic directly continues the dialect of the Corded Ware-related Single Grave culture that was brought to southern Scandinavia already by 2850 BC. Up until the Nordic Bronze Age, which became the dominant culture in southern Scandinavia around 1500 BC, the

[3] The Finnic people of the Baltic coast had themselves incorporated a group of Corded Ware-related people, as can be observed from one of the many substrate layers in Finnic (Kallio 2003: 30).

[4] Kallio lists Finnish *kavio* 'hoof', *hakea* 'to seek', that must reflect pre-Proto-Germanic **kāpa-* 'hoof', **sāgja-* 'to seek' instead of Proto-Germanic **kōfa-*, **sōkja-*, that underwent the phonetic shift **ā* > **ō*.

[5] A migration of Proto-Germanic speakers from Germany into Scandinavia has been suggested by Udolph too, who places the Proto-Germanic homeland roughly between the Harz and the Erzgebirge based on onomastic and hydronymic data (Udolph 1994).

Single Grave culture, as well as the Battle Axe culture, lived next to the neolithic Funnel Beaker culture. As such, there was a long time period during which cultural and linguistic interaction could have taken place. Many neolithic terms may have entered these Indo-European dialects during this time period (Iversen and Kroonen 2017). The same type of interaction between Corded Ware-related cultures and neolithic cultures in northern Germany may be suggested for pre-Proto-Germanic. Additional substrate influences in Germanic may be attributed to (sub-neolithic) hunter-gatherer cultures such as the southern Scandinavian Pitted Ware culture (Iversen and Kroonen 2017)[6], and to Uralic, in particular Balto-Finnic (Hyllested 2014: 99-107).

The location of the putative homelands of Germanic, Baltic and Slavic, as well as the lack of Germanic borrowings into Slavic during the time period before Gothic and West-Germanic (Pronk-Tiethoff 2012) suggest that the Balto-Slavic and Germanic dialects were not adjacent during most of their prehistory. The existence of a Balto-Slavic-Germanic linguistic phase that may explain the amount of lexical similarities, is therefore unlikely. The lexical similarities between Balto-Slavic and Germanic may better be explained as the result of a shared substrate (Kortlandt 2018: 227-228).

2.3 Possible substrates in Balto-Slavic and Germanic

Since the shared lexical similarities between Balto-Slavic and Germanic are probably derived from a shared substrate, it is important to consider possible substrates that may have contributed to Balto-Slavic and Germanic. The prehistory of both language families suggest that they share a neolithic substrate layer with the other European branches that contributed vocabulary both during the late Proto-Indo-European period and after the splitting up of the branches. Furthermore, the Indo-European Corded Ware culture may have given rise to new vocabulary that entered both Germanic and Balto-Slavic (Kortlandt 2018: 228). Germanic (especially North Germanic) may contain a specific hunter-gatherer substrate. Within Balto-Slavic, an Indo-European substrate layer known as Temematic may have contributed vocabulary. Other specific Balto-Slavic vocabulary (e.g. **īni-* ‘hoar-frost’, **ledu-* ‘ice’) is more difficult to assign to a specific substrate layer (Matasović 2014).

2.3.1. Hunter-gatherer languages

The influence of hunter-gatherer languages on Germanic and Balto-Slavic was probably not large. Hunter-gatherer populations were small, and had therefore less impact than the larger neolithic groups. Furthermore, they were already driven back to the peripheries of Europe or partly incorporated by the neolithic populations. Finally, hunter-gatherers had not much material culture that the late Proto-Indo-Europeans were not yet familiar with. Any borrowed vocabulary is likely to be found in the semantic fields of nature, flora and fauna, geography and food. The language of the southern Scandinavian Pitted Ware culture hunter-gatherers may have contributed modestly to pre-Proto-Germanic (Iversen and Kroonen 2017), as well to North-Germanic (e.g. ON *æðr* ‘eiderduck’; compare Proto-Saami **ávda* ‘eiderduck’) (Kroonen 2013: “awadī-”). The Narva culture of the Baltic shore may have contributed to Balto-Slavic. It is possible that the languages of both the Pitted Ware culture and the Narva culture go back to the same mesolithic language family. However, the Narva culture shows similarities to the Pit-Comb Ware culture of northeastern Europe, that may have spoken a form of pre-Proto-Uralic or para-Uralic. The language of the Pitted Ware culture or a close relative may still be reflected in the substrate found in Saami and is certainly not Uralic (Kallio 2015: 83, 87). Therefore, it is improbable (although

[6] One example may be PGm. **selhaz* ‘seal’, that may be compared to Finnish *hylje* ‘seal’ (< Proto-Balto-Finnic **šülkeš*) (Iversen and Kroonen 2017: 519).

not impossible) that a shared form between Balto-Slavic and Germanic can be traced back to the same hunter-gatherer language.

2.3.2. Neolithic languages

Most neolithic languages in Europe seem to have been related to each other as a result of the slow expansion of one neolithic group from southeastern Europe to the rest of the continent. Typical linguistic elements that may have been present among these languages are the prefix **a-* and a suffix **-i(n)d$^{(h)}$-*, that is often found in pre-Greek words (Kroonen 2012: 240, 244). The neolithic cultures that may have contributed specifically to the vocabulary of Germanic and Balto-Slavic are most probably the Funnelbeaker culture and the Global Amphora culture.[7] Both may have done so indirectly through the Corded Ware culture after they were assimilated, although a period of direct linguistic interaction between Indo-European and the Funnelbeaker culture continued until 1500 BC near the pre-Proto-Germanic speaking area (Iversen and Kroonen 2017). Balto-Slavic could have received additional neolithic vocabulary from the Late Tripolye culture, although this culture itself had already been influenced by Yamnaya (Anthony 2007: 377).

2.3.3. The Corded Ware culture

The Corded Ware culture probably played a major role in the creation of the pre-Proto-Germanic language (e.g. Kristiansen 2017) and was an important factor in the creation of the Middle Dnieper culture, the putative Balto-Slavic homeland. This means that the language spoken by the people of Corded Ware culture is a plausible candidate for the origin of some of the vocabulary that is shared between Balto-Slavic and Germanic.

Genetic evidence suggests that the Corded Ware culture was mainly spread by men related to the late Proto-Indo-European Yamnaya culture (Haak et al. 2015). It is therefore almost certain that a late form of Proto-Indo-European accompanied them as they spread. Because of the role it probably played in the creation of the Germanic branch, this form of Indo-European was probably a *centum*-dialect. The early Corded Ware men often took women who were not of Yamnaya origin, but who hailed from local neolithic cultures, such as the Funnel Beaker culture and the Globular Amphora culture. Between approximately 3000 BC and 2400 BC, the Corded Ware culture and neolithic cultures lived next to each other, until the latter ones were assimilated into the later Corded Ware culture (Kristiansen 2017: 337-338). This long period of co-existention must without a doubt have left traces in the Corded Ware language. Borrowed vocabulary likely existed of agricultural terms, floral and faunal terms, some technological terms and geographical terms, that in particular should reflect a migration from the Yamnaya steppe environment to an area more dense in trees.

2.3.4. Temematic

Temematic is a hypothetical branch of Indo-European (Holzer 1989) that may explain several forms with an unclear etymology in Balto-Slavic. Holzer lists 62 forms, of which 45 discussed extensively, that may show a Temematic borrowing into Balto-Slavic. Most of the forms are limited to Slavic. A form may be recognized as Temematic when it may have undergone the proposed Temematic sound laws, and has plausible cognates elsewhere in Indo-European. Temematic is distinguished from other

[7] Gimbutas still viewed the Globular Amphora culture as Indo-European, but recent genetic evidence shows that its people were not closely related to Yamnaya people but resembled other neolithic people instead (Mathieson et al. 2017).

Indo-European branches most importantly by the development of PIE tenues *T into mediae *D and the development of PIE mediae aspiratae *D^h into tenues *T (Holzer 1989: 13).[8,9] Reconstructions containing a palatovelar show a sibilant outcome in Balto-Slavic, suggesting that Temematic may have been a *satem*-dialect too. However, it remains important to keep in mind that the Temematic reconstructions are based on Balto-Slavic borrowings and do therefore not directly reflect Temematic but a Balto-Slavic interpretation of the Temematic phonological system.

The validity of the Temematic branch depends on the quality of the forms attributed to it. Matasović discusses 11 of the forms shared by both Baltic and Slavic, and concludes that they do not necessarily have to go back on a Temematic form (Matasović 2014: 79-81). Other forms such as Slavic *zǫbrъ* 'wisent' are unlikely to go back on an Indo-European formation (Kroonen 2012: 252-255).[10] On the other hand, new Slavic forms have been suggested to have been borrowed from Temematic, such as *plodъ* 'fruit' (< *$b^h\underset{\circ}{l}(h_3)$-to-) (compare OHG *bluoen* 'to bloom', Lat. *flōs* 'flower') (Hyllested 2014: 156).

Holzer suggests that the Temematic speakers may be identified with the Cimmerians, based on several forms, such as Gk. *Κιμμερ(ι)οι* 'Cimmerians' (Temematic *$\acute{k}$mera- 'farmer' < PIE *$(d^h)\acute{g}^h$m-er-o- 'farmer'), that can be compared to Assyrian *Gimirri* 'Cimmerians', probably reflecting a pre-Temematic form (Holzer 1989: 180-187).[11] Another form, Gk. *Τάναϊς* 'Don river', may reflect Temematic *Tana(-$\underset{\breve{}}{u}$i)- (< PIE *d^hono-), contrasting with the Iranic name of the river *Dana- (Holzer 1989: 190-191). An identification of Temematic speakers with the Cimmerians would place their homeland somewhere north of the Black Sea during the first half of the first millennium BC. Kortlandt points to the fact that Temematic seems to have both lexical as phonetic similarities to Greek and Germanic (Holzer 1989: 165), (Kortlandt 2003: 258). The lack of voicedness in the Temematic reflexes of PIE *D^h may be compared to Gk. *T^h (< PIE *D^h).[12] This similarity to Greek suggests a (pre-)Proto-Temematic homeland near (pre-)Proto-Greek. Based on the similarities between Greek, Armenian, Phrygian, and between Greek and Indo-Iranian, the western area of the early Catacomb culture in Ukraine (ca. 2500 BC) is a probable candidate for a pre-Proto-Greek homeland (Anthony 2007: 369).[13] The sound change PIE *T > Temematic *D may be compared to Verner's Law in Germanic, albeit more rigorously. The pre-Proto-Germanic language probably emerged out of the Corded Ware culture. A Temematic homeland between the Dnieper and Dniester during the late 3rd millennium BC, largely overlapping with the later Proto-Slavic homeland, may account for its similarities to Greek and Germanic, and its impact on Balto-Slavic vocabulary. This area harboured the neolithic Cucuteni-Tripolye culture until people from the Yamnaya culture entered this area towards the end of the 4th millennium BC (Anthony 2007: 320). Proposed Temematic forms such as **proso-* 'barley' (< *$b^h\underset{\circ}{r}$(-)s-) and **tron-* 'drone' (< *d^hron-) may reflect this earlier neolithic culture.

It is possible that the Venedi (or Wenden) between the Elbe and the Vistula, an area that was probably not Germanic nor Balto-Slavic, were speakers of Temematic (Kortlandt 2018: 226). This area can be reached without much effort from the upper Dnieper and Dniester area. When the Slavs expanded westward, this provided another possibility for the incorporation of Temematic vocabulary into Slavic. If the Venedi indeed spoke a form of Temematic, it may be expected that Temematic forms can be found in Germanic too. Some Germanic forms that show an unexpected stop might be explained as a borrowing

[8] The Balto-Slavic reflexes of Temematic mediae do not seem to show any evidence of Winter's Law; within the glottalic theory, this means that the Temematic mediae were deglottalized (Kortlandt 2003: 259).
[9] A recently suggested Indo-European substrate shared by Italic and Greek, "Crotonian", has a similar treatment of PIE stops (Garnier and Sagot 2017).
[10] Compare PGm. **wisund-*, OPr. *wissambs*, Lit. *stumbras*.
[11] Compare Slavic *smьrdъ* 'farmer' < Temematic *$\acute{k}$mirda- < PIE *$(d^h)\acute{g}^h$mer-to- (Holzer 1989: 50).
[12] Adding the possible Cimmerian forms given by Holzer, it is interesting to note the rendering of (traditionally reconstructed) PIE *D^h as voiceless throughout Ukraine.
[13] There is however no archaeological evidence for a direct migration from this culture to Greece (Anthony 2007: 369).

from Temematic. Since the reconstruction of Temematic is based on borrowings into Balto-Slavic, the best candidates for a possible Temematic borrowing into Germanic are forms that are specifically shared between (Balto-)Slavic and Germanic. Temematic is not the only possible Indo-European substrate shared between Balto-Slavic and Germanic, considering forms such as *h_1leud^h-*i*- 'people' (< 'free'), that have not undergone the sound laws postulated for Temematic.

2.3.5. Uralic

The interaction between Uralic and Indo-European has a long history that can mainly be observed from Indo-European loanwords in (Proto-)Uralic. This period may have already begun during the 3rd millennium BC, when Indo-European cultures such as the Corded Ware-related Fatyanovo culture (2800 – 1900 BC) and the likely (Proto-)Indo-Iranian related Abashevo culture (2500 – 1900 BC) bordered the early Uralic speaking area (Kallio 2015: 79). Numerous borrowings from several stages of Germanic and Baltic can be found especially in Finnic (Junttila 2012). Uralic has influenced Baltic and (east) Slavic languages, but there is no evidence for a Uralic substratum in (pre-)Proto-Balto-Slavic (Kallio 2005). This is not surprising, since the Corded Ware-related Fatyanovo culture blocked any direct contact between the putative homelands of (pre-)Proto-Balto-Slavic and early Uralic speakers. When this culture had become assimilated by Uralic speakers, direct language contact between Balto-Slavic (especially Baltic) and Uralic had become possible. Direct contact between (pre-)Proto-Germanic and Uralic is suggested by the (pre-)Proto-Germanic borrowings found within Finnic (Kallio 2012: 229). There is not much evidence for Uralic (Finnic) borrowings into Germanic. Pre-Proto-Germanic was spoken next to the Funnelbeaker culture and the Pitted Ware culture, that were both almost certainly not Uralic speaking. Still, some Germanic vocabulary may have a Uralic (especially Balto-Finnic) origin.[14]

2.4 Recapitulation

The non-lexical similarities between Balto-Slavic and Germanic can be explained as the result of coincidental conservation of archaic forms or parallel developments, and does therefore not point to a common Baltic-Slavic-Germanic linguistic phase.

The northwestern Indo-European group of Indo-European, consisting of Celtic, Italic, Germanic, Baltic and Slavic, shares some (mainly agricultural) vocabulary that entered these language families both before and after splitting off from each other. The forms that were borrowed or created before splitting off are indistinguishable from Proto-Indo-European formations. These forms likely entered the western part of the later Proto-Indo-European area before the expansion of the Corded Ware culture. There is no reason to assume a specific northwestern Indo-European linguistic phase.

Balto-Slavic may have originated in the Middle Dnieper culture (ca. 2800 – 1800 BC), which developed from a mixture of Yamnaya and Late Tripolye cultures, heavily influenced by the eastward expansion of the Corded Ware culture. Uralic loanwords within Baltic and Slavic entered these branches only after Proto-Balto-Slavic. Early Proto-Slavic was probably spoken in the Zarubintsky culture (ca. 200 BC – 200 AD). Borrowings from Germanic and Iranic may have entered Proto-Slavic during the Chernyakhov culture period (200 – 500 AD). The Proto-Germanic homeland may be identified with the Iron Age Jastorf culture (ca. 500 BC). Pre-Proto-Germanic was likely spoken in Bronze Age northern Germany as well as in the Nordic Bronze Age culture. Pre-Proto-Germanic does not necessarily continue the Indo-European dialect that was brought to southern Scandinavia by the Single Grave culture (from

[14] Suggested borrowings are e.g. PGm. **hamara*- 'hammer' (< Balto-Finnic **hamara*- 'back of an axe'), and PGm. **halba*- 'half' (< Balto-Finnic **halpa*-/**halβa*- 'cheap, reduced') (Hyllested 2014: 99, 103).

ca. 2850 BC). Balto-Slavic and Germanic were likely not adjacent during most of their prehistory. This suggests that their shared lexicon is not the result of common innovations, but of a shared substrate.

Several substrates may have contributed to Balto-Slavic and Germanic. The most probable shared substrates are a neolithic substrate and a Corded Ware substrate. Furthermore, the hypothetical Indo-European branch of Temematic may have contributed vocabulary not just to Balto-Slavic, but also to Germanic. The contribution from Uralic languages is probably small and likely limited to Germanic, Baltic and northern Slavic. Any contribution from hunter-gatherer languages is probably limited. Such a substrate in Balto-Slavic likely reflects a different hunter-gathererer language than that in Germanic. An approximate overview of the archaeological and linguistic situation that is relevant for the substrate in Balto-Slavic and Germanic can be seen in figure 1.

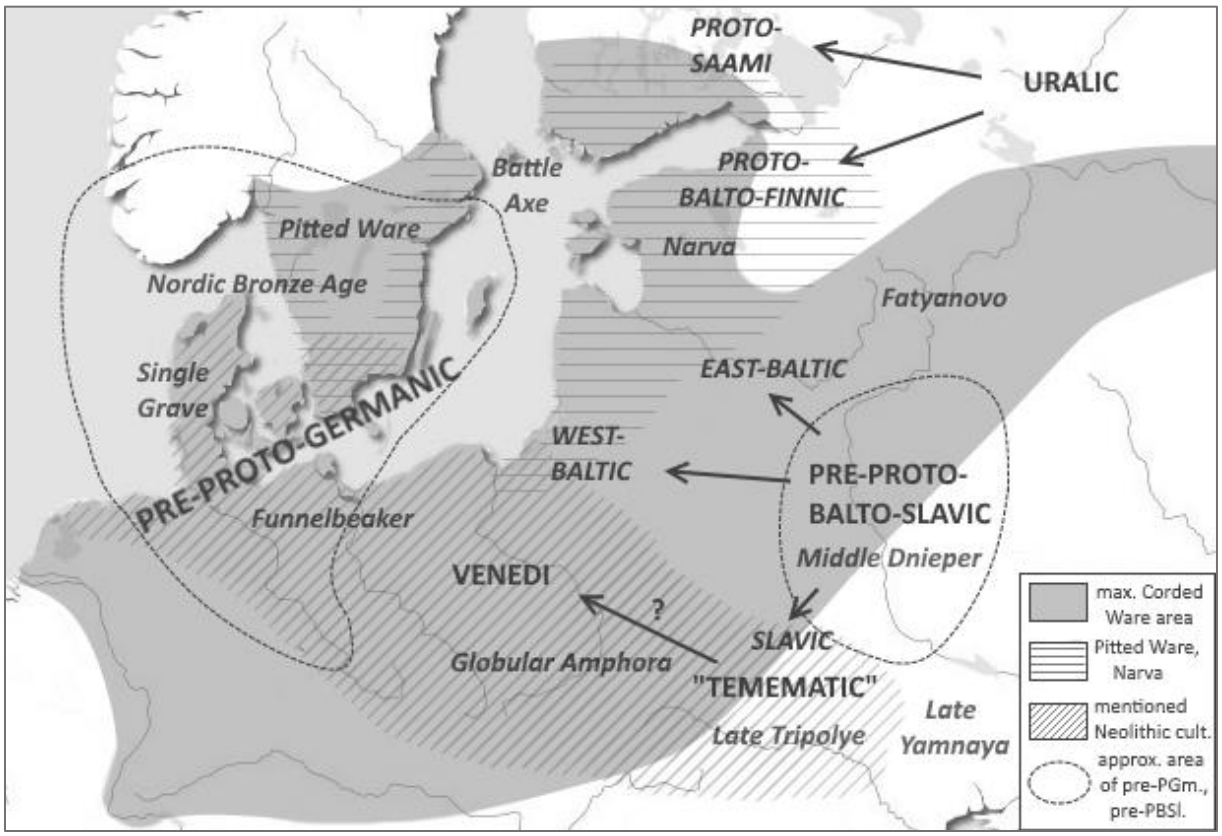

Figure 1 *The context in which the shared substrate of Balto-Slavic and Germanic may be understood. The map shows several archaeological cultures and languages, mainly from the period before Proto-Balto-Slavic and Proto-Germanic, that may be linked to the shared substrate.*

3. The shared lexicon of Baltic, Slavic and Germanic

In this chapter, I will examine the shared lexicon of Baltic, Slavic and Germanic. I will investigate all forms listed by Stang (1972), including those he regarded as uncertain. In a few cases, I merged two forms under one lemma (e.g. **(s)prend-*). Five of Stang's forms are also listed by Oettinger (2003). I will add two further forms from Oettinger (2003) that potentially belong to the shared lexicon (**b^{h}eh$_2$-i̯e-* 'to speak', **g$^{(w)h}$ou-* 'to venerate') as well as five forms from Matasović (2014) (**b^{h}oHg^h-* 'mud, swamp', **klenK-* 'to walk, kneel', **Pal-T-* 'marsh', **reg^h-* 'to stick out', **u̯Hl(g)-* 'golden oriole'). In total, 294 forms will be examined. It is not my intention to provide a complete overview of the shared lexicon; without a doubt, Baltic, Slavic and Germanic share more forms that are not included. Still, the amount of the forms that will be treated is large enough to get an idea of the shared lexicon's characteristics.

The forms will be examined through etymological research, for which I will mainly utilize the *Indo-European Etymological Dictionary Online* (IEDO) database. In some reconstructions, I will use **a*, especially when they have a clear non-Indo-European origin. A reconstruction with **o* or **h$_2$e* may in some of these forms be possible too.

The chapter is divided in two sections. First, I will discuss the forms that I consider as a shared isogloss between Baltic, Slavic and Germanic. Following Stang, I will divide these forms into three groups: forms shared by all three language families, forms limited to Baltic and Germanic and forms limited to Slavic and Germanic.[15] Secondly, I will discuss the forms that I do not consider as a shared isogloss between Baltic, Slavic and Germanic. I will divide these forms into four groups: forms with an Indo-European origin, forms limited to the European branches, forms that may constitute a Germanic borrowing into Balto-Slavic and forms that have an uncertain origin or constitute an invalid comparison. I will use (St: 1) to refer to Stang (1972) and the page number where he describes the form and (Oettinger 1) to refer to the first list item given by Oettinger (2003).

3.1. Forms that belong to the shared lexicon

In this section, forms will be discussed that are shared between Baltic, Slavic and Germanic. Firstly, forms are treated that are shared by all three language families. Secondly, forms are discussed that are limited to Baltic and Germanic. Finally, the forms that are limited to Slavic and Germanic are investigated.

3.1.1. Baltic-Slavic-Germanic forms

(1) ***aps-** 'aspen' (St: 13): Lit. *ãpušė*, Pol. *osa* (< **opsa-*), OHG *aspa*, all 'aspen'. The term is probably borrowed from a pre-Indo-European substrate. It can also be found in other languages that are spoken in regions where this tree grows, e.g. Turkic Teleut *apsak*, Fi. *haapa* < (**šapa*) (Kroonen 2013: "aspō- ~ apsō-"). Alternatively, it is possible that the Turkic forms have been borrowed from Iranian (e.g. Pahlavi *spyt-d'l* 'white poplar, aspen') (Blažek 2018: 27). The Pahlavi element *spyt-* does not reflect **aps-* but PIE **ḱu̯eit-* 'white'.

(2) ***b^{h}erg^h-e-** 'to keep safe' (St: 15): Lit. *bìrginti* 'to save', OCS *brěšti* 'to care', Got. *bairgan* 'to preserve'. The verb might have been derived from **b^{h}erǵ^h-* 'high place' (Hitt. *parku-*, Skt. *bṛhánt-*, both 'high'), assuming a semantic development 'to bring to high ground' > 'to keep safe' (Kroonen 2013:

[15] The term "Baltic" will be used in its traditional way, including both West-Baltic (Old Prussian) and East-Baltic (Latvian, Lithuanian).

“bergan-”). However, this requires an explanation for the pure velar of the Balto-Slavic forms. Considering forms such as Pol. *bróg* ‘stack, rick, shed’ (< *$b^h org^h$-o-) (Derksen 2008: “bôrgъ”), it seems more probable that all forms are derived from a Baltic-Slavic-Germanic root *$b^h erg^h$- ‘to keep, preserve’.

(3) ***b^hlei-** ‘to shine’ (St: 15): OCS *blědъ*, OE *blāt*, both ‘pale’. These forms continue a stem *b^hloi-d-, likely a derivation from a root *b^hlei-, to which also Lit. *blaĩvas* ‘whitish, sober’ (< *b^hloi-u̯o-) (Derksen 2015: “blaivas”), OE *blēo* ‘colour’ (< *b^hlei-u̯o-) belong, as well as OE *blīcan*, Ru. *blistát*, both ‘to shine’ (< *b^hlei-ǵ-) (Kroonen 2013: “blīkan-”). Both the root and its derivations are limited to Balto-Slavic and Germanic.

(4) ***b^hlend^h-** ‘to blend’ (St: 15): Lit. *blę̃sti* ‘to sleep, to stir flour into soup, to talk nonsense’, OCS *blęsti* ‘to talk nonsense’, ON *blanda* ‘to blend’. The original meaning is probably ‘to blend’. Within Balto-Slavic, a secondary meaning ‘to talk nonsense’ (< ‘to speak in a blended way’) was developed (Derksen 2008: “blęsti”).

(5) ***b^holǵ^h-(i)n-** ‘beam’ (St: 14): Lit. *balžíenas* ‘crossbeam’, Ru. *bólozno* ‘thick plank’, ON *bjalki* ‘beam’. Both Balto-Slavic and Germanic utilize a derived *-(i)n*-stem from *b^helǵ^h- ‘to swell’ for the specific meaning ‘beam’. Within Balto-Slavic, the word has a homophone with the meaning ‘bolster, pillow’ (e.g. OP *balsinis*) (Derksen 2015: “balžienas”). This word is either the result of a divergent semantic shift from the same stem, or a separate derivation from *b^helǵ^h- (compare Got. *balgs* ‘leather bag’) (Kroonen 2013: “balgi-”).

(6) ***b^hreud/h_1-** ‘to push, break’ (St: 16): Lit. *briáutis* ‘to penetrate into’, ON *brjóta* ‘to break open’. The Germanic form (< *breut-) may be a back-formation of *brut(t)ō- (<*b^hr̥d-néh$_2$-) derived from *b^hred- or *b^herd- (Kroonen 2013: “breutan-”), but the existence of this root depends on a connection of the forms with Lat. *frōns, frondis* ‘foliage’, which is uncertain (De Vaan 2008: “frōns”). This leaves open the possibility of *b^hreud- as origin for the Germanic forms. The Lithuanian form may continue *b^hreuh_1- with the change *d > *h_1.[16]

(7) ***doil-** ‘part’ (St: 17): Lit. *dailýti* ‘to divide’, RCS. *dělъ*, Got. *dails*, both ‘part’. The root cannot be derived from *deh$_2$-i-l- (compare Gk. *δαίομαι* ‘to distribute’) because of the Slavic accentuation and the Germanic onset *d- (Derksen 2015: “dailyti”). Therefore, the root remains restricted to Balto-Slavic and Germanic.

(8) ***dorg^h-** ‘edge’ (St: 17): Lit. *dar̃žas* ‘garden’, OCS *podragъ* ‘edge, seam’, OHG *zarga* ‘edge, rim’. The semantics ‘seam, edge’ can be inferred from Slavic and Germanic (Kroonen 2013: “targōn-”). The Baltic forms require a semantic development ‘edge’ > ‘enclosure’ > ‘garden’ (compare Latv. *dȁrzs* ‘garden, fence’).

(9) ***dreg$^{(h)}$-** ‘to pull’ (St: 19): Lit. *dìrginti* ‘to pull’, Ru. *dërgat'* ‘to jerk’, Du. *tergen* ‘to vex’. The Germanic forms with semantics ‘to vex’ continue *dorg^h-e̯ie- (Kroonen 2013: “targjan-”), that may be a variant of the root *dreg$^{(h)}$- ‘to pull’. The Baltic and Slavic forms continue this root too. Within Germanic, another derivation *dreg$^{(h)}$-n- can be found (e.g. OHG *trehhan* ‘to pull’) (Kroonen 2013: “trek(k)an-”).

[16] This sound change is further discussed by Lubotsky (2013).

(10) ***d^{h}elb^h-** ‘to delve’ (St: 17): OPr. *dalptan* ‘punch’, Ru. *dolbít’* ‘to chisel’, OE *delfan* ‘to delve’. A relationship with TochB. *tsälp-* ‘free from’ is doubtful (Derksen 2008: “dьlbiti”). The root is therefore limited to Balto-Slavic and Germanic.

(11) ***d^{h}ob^h-** ‘to fit’ (St: 17): Lit. *dabà* ‘nature, character’, Pol. *doba* ‘time’, OCS *dobrъ* ‘good’, Got. *gadaban* ‘to happen, be suitable’. The Slavic adjective *dobrъ* ‘good’ can be derived from **d^{h}ob^h-* assuming a semantic shift ‘fitting, timely’ > ‘appropriate, good’. This is similar to Germanic **gōda-* ‘good’ (< PGm. **gadan-* ‘to fit’) (Derksen 2008: “dobrъ”), (Kroonen 2013: “gadōjan-”). Lat. *faber* ‘craftsman’ is probably not related due to the different semantics.[17] The word must be kept separate from **d$^{(h)}$eb^h-* ‘large, big’ (e.g. Ru. *debélyj* ‘plump’) (Pronk 2013: 4). See also (20) ***g^{h}od^h-o-**.

(12) ***d^{h}reug^h-** ‘to work together’ (St: 19): Lit. *draũgas*, OCS *drugъ*, both ‘friend’, Got. *gadrauhts* ‘warrior’. Both Balto-Slavic and Germanic forms are derived from a verb **d^{h}reug^h-* (e.g. Got. *driugan* ‘to be up in arms’ (Derksen 2008: “drugъ”). The Balto-Slavic semantics ‘friend’ can be connected to the Gothic verb by assuming an original meaning ‘to work together’. A connection to **d^{h}reug^h-* ‘to deceive’ is semantically unlikely.

(13) ***d^{h}rob^h-** ‘to chop, hew’ (St: 20): OCS *drobiti* ‘to crumble, chop, break’, Got. *gadraban* ‘to hew out’. Within Germanic, secondary Kluge-variants (e.g. OHG *treffan* ‘to hit’) developed (Kroonen 2013: “drepan-”). The root is further found in Lit. *drebẽznos* ‘remnant’, Ru. *drébezgi* ‘remnants, splinters’ (Derksen 2015: “drebẽznos”).

(14) ***d^{h}rog^h-i̯eh$_2$-** ‘dregs’ (St: 19): OLit. *dragės* ‘yeast’, OCS *drožd̸ьję* ‘yeast’, ON *dregg* ‘dregs, yeast’. The connection to Lat. *fracēs* ‘olive pulp left after pressing’ is uncertain, since this form can be derived from *frangō* ‘to break’ (Kroonen 2013: “dragjō-”). Similar formations are OHG *trebir* ‘husks (< **d^{h}rob^h-es-*) (compare Gk. *τρέφω* ‘to coagulate, harden’) (Kroonen 2013: “drabiz-”) and OHG *truosana* ‘dregs’ (< PGm. **drōsna-*).

(15) ***d^{h}ronK-** ‘stick’ (St: 19): Lit. *drañgas*, OCS *drǫgъ*, both ‘pole’, ON *drengr* ‘boy, stick’. The forms may continue **d^{h}reng^h-* ‘to stick, to plant, to fasten’ (ON *drengja*, Av. *drəṇjaiti*, both ‘to fasten’ (Kroonen 2013: “dranga-”). However, forms such as Ru. *druk* ‘pole’ (< **d^{h}ronk-*) and Ru. *drogá* ‘wooden bar’ (< **d^{h}rog-*) suggest that the word originates in a substrate (Derksen 2008: “drǫ́gъ”).

(16) ***gleib^h-** ‘to stick’ (St: 22): Latv. *gliêbtiês* (<**gleib^h-i̯e-*), OHG *klīban*, both ‘to stick’. The root is further found in OCS *uglьběti*, OHG *klebēn*, both ‘to stick’ (< **glib^h-eh$_1$-*). The occurrence of a pure velar in the Balto-Slavic forms despite the following front vowel is remarkable (Kloekhorst 2011: 261, 262) and suggests that the word is probably borrowed from a substrate.

(17) ***golH-** ‘naked, bald’ (St: 24): Lit. *galvà* ‘head’ (< **golH-u̯(-)eh$_2$*), *OCS *golъ* ‘naked’ (< **golH-o-*), OHG *kalo* ‘bald’ (< **golH-u̯o-*). The semantic shift ‘bald’ > ‘head’ may be compared to Lat. *calva* ‘skull’ (< *calvus* ‘bald’) (De Vaan 2008: “calvus”). Although the stems **golH(-u̯)-* and **klH-u̯-* (Lat. *calvus*, Skt. *kulvá*, both ‘bald’) resemble each other, they cannot be directly related.

(18) ***g^{h}eid^h-** ‘to desire, expect’ (St: 21). Lit. *geĩsti* ‘to desire’, OCS *žьdati* ‘to wait’, OHG *gīt* ‘greed, desire’. The root is restricted to Balto-Slavic and Germanic. The pure velar of the Balto-Slavic forms suggests that the root does not have an Indo-European origin.

[17] Lat. *faber* may instead be related to OIr. *gobae* ‘smith’ (Blažek 2006).

(19) ***ǵ^{h}elh$_3$-to-** ‘gold’ (St: 64): Latv. *zẹ̀lts* (< **ǵ^{h}elh$_3$-to-*), OCS *zlato* (< **ǵ^{h}olh$_3$-to-*), Got. *gulþ* (< **ǵ^{h}l̥h$_3$-to-*), all ‘gold’. The forms are derived from **ǵ^{h}elh$_3$-(u̯)-* ‘yellow’ (OHG *gelo*, Lat. *helvus*, both ‘yellow’). Although the ablaut grade of the forms differ, the forms can be considered as one isogloss because of the similar suffix **-to-* and semantics. The formation can be compared to Vedic *híraṇya-* ‘gold’ (< **ǵ^{h}l̥h$_3$-en-i̯o-*) and Phrygian *γλουρός* ‘gold’ (< **ǵhl̥h$_3$-ro-*) (Blažek 2017: 269-270).

(20) ***g^{h}od^h-o-** ‘suitable’ (St: 23): Lit. *guõdas* ‘honour’, OCS *godъ* ‘time, year’, MHG *gaden* ‘to fit’. The Baltic semantics ‘honour’ can be derived from an adjective ‘honourable’ < ‘suitable’. Within Baltic, this meaning was expanded to ‘hospitality’, that is reflected in Latv. *gùods* ‘banquet, wedding’ (Derksen 2015: “guodas”). Within Germanic, a semanic shift ‘suitable’ > ‘good’ occurred (OHG *guot* ‘good’) (Kroonen 2013: “gōda-”), similar to Slavic *dobrъ* ‘good’ (see (11) ***d^{h}ob^h-**).

(21) ***g^{h}oil-** ‘intense, radiating’ (St: 21): Lit. *gailéti* ‘to pity’, *gailùs* ‘sharp, bitter’, OCS *džělo* ‘very, vehemently’, OHG *geil* ‘frolic’. The forms can be connected to each other through the assumption of an original meaning ‘intense, radiating’. The meaning ‘intense’ is best preserved within Slavic ‘very’. Within Baltic, a semantic shift ‘intense’ > ‘to feel intensely’ > ‘to pity, bitter’ must have occurred. The semantics ‘radiating’ are found in Latv. *gails* ‘voluptuous, slender, glowing’, *gaîlêt* ‘to shine, glow’ and OPr. *gaylis* ‘white’. (Derksen 2015: “gailus”). Within Germanic a semantic shift ‘intense, radiating’ > ‘happy, exalted’ has taken place.

(22) ***g^{h}reb^h-** ‘to dig, scrape’ (St: 24): Latv. *grebt* ‘to scrape’, OCS *greti* ‘to dig, scrape’, Got. *graban* ‘to dig’. It is unclear whether this root can be connected to **g^{h}reb^h-*, from which Lit. *grẽbti* ‘to seize’, Skt. *gṛbhnóti* ‘to grab’ stem.[18] The semantics ‘to dig’ are restricted to Balto-Slavic and Germanic.

(23) ***g^{h}reub^h-** ‘to grind’ (St: 24): Lit. *grubùs* ‘rough, uneven’, OCS *grǫbъ* ‘rough, uneducated’ (< **g^{h}ru-m-b^h-*), OHG *grob* ‘coarse’. The root is restricted to Balto-Slavic and Germanic. OHG *kropf* ‘crop’, *krampf* ‘convulsive’ may better be derived from **gre(m)b^h-* ‘to bend, curl (Kroonen 2013: “krimpan-”).

(24) ***g^{h}reud-** ‘to grind, crush’ (St: 24): Lit. *grū́sti* ‘to stamp’, Ru. *grúda* ‘heap’, OHG *grioz* ‘gravel’. W *gró* ‘gravel’ cannot be derived from **g^{h}reud-* (Stang 1972: 24), implying that the root is restricted to Balto-Slavic and Germanic.

(25) ***g^{w}eh$_1$d^h-** ‘shameful, evil’ (St: 21): Lit. *gẽda* ‘shame’, OCS *gadъ* ‘reptile, snake’ (< **g^{w}oh$_1$d^h-o-*), Du. *kwaad* ‘angry’. The original meaning was probably ‘shameful, evil’. Within Slavic, the word became used for reptiles although the original semantics are still reflected in SCr. *gȁd* ‘loathing’ (Derksen 2008: “gàdъ”). The word is not found outside of Balto-Slavic and Germanic.[19]

(26) ***h$_1$eng-** ‘to hurt’ (St: 25): Lit. *éngti* ‘to strangle, torture’, OCS *jędza* ‘disease’ (< **h$_1$eng-eh$_2$-*), OE *inca* ‘grievance’ (< **h$_1$eng-on-*). Baltic, Slavic and Germanic all show different derivations from this root, that is not found outside of these language families.

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[18] or **g^{h}rebH-* (LIV: 201).

[19] It is uncertain whether the word can be connected to **g^{w}eh$_1$b^h-* ‘marshy, slippery’. A semantic shift ‘slippery’ > ‘evil’ seems possible to me.

(27) ***$h_1$leud^h-i-** ‘people’ (St: 32): Lit. *liáudis*, OCS *ljudьje*, OHG *liut*, all ‘people’. The use of an *i*-stem of the root **$h_1$leud^h*- (Gk. *ἐλεύθερος*, Lat. *līber*, both ‘free’) combined with the meaning ‘people’ suggests that the forms may be considered as an isogloss.

(28) ***$h_1$old^h-** ‘hollowed out tree’ (St: 13): Lit. *aldijà*, *eldijà* ‘hollowed out tree, canoe’, OCS *ladii*, *aldii* ‘boat’, Nw. dial. *alde*, *olde* ‘trough’. Balto-Slavic continues an **-ih_2*-stem, Germanic an **-eh_2-(n)*-stem (Kroonen 2013: “aldō(n)-”). The word is not found outside of Balto-Slavic and Germanic.

(29) ***i̯eu-** ‘already’ (St: 25): Lit. *jaũ*, OCS *(j)uže*, Got. *ju*, all ‘already’. The Balto-Slavic forms may continue **i̯ou*, **i̯eu*, **eu*, the Gothic form **i̯u*, **eu* (Stang 1972: 25). The adverb most likely originated as a form of the pronoun **i*- ‘he, it’. The formation is not found outside of Balto-Slavic and Germanic.

(30) ***kerh$_3$-** ‘to burn’ (St: 16, 31): Lit. *kárštas* ‘hot, burning’ (< **korh$_3$-sto*-), Ukr. *čérenь* ‘hearth’, Got. *hauri* ‘coal’. The forms can be derived from a root **kerh$_3$*- ‘to burn’, to which further derivations exist, such as OHG *herd* ‘hearth’ (< **kérh$_3$-to*-) and possibly Ukr. *čérenь* (if < **kérh$_3$-no*-). A zero-grade **kr̥h$_3$*- is likely continued in PBSl. **kur*- (Kroonen 2013: “hurja-”), from which Lit. *kùrti* ‘to light’ descends. Ru. *kurít’* ‘to smoke’ continues a secondary full grade **kour*- (Derksen 2008: “kūrìti”). The connection with Lat. *carbō* ‘charcoal’ is uncertain (De Vaan 2008: “carbō”). The root must be considered as a Baltic-Slavic-Germanic isogloss.

(31) ***Kleh$_1$b$^{(h)}$-** ‘to constitute’ (St: 22): Lit. *glė́bti*, *klė́bti* ‘to embrace’, Pol. *głobić* ‘to squeeze, oppress’, OHG *klāftra*, MHG *lāfter*, both ‘to fathom’. The root is limited to Balto-Slavic and Germanic. The variety in phonetic shape (compare (75) ***gleub-i̯e-**) suggests a non-Indo-European origin.

(32) ***kliHk-** ‘to call’ (St: 29): Lit. *klỹkti* ‘to cry out’, OCS *klicati*, OE *hlīgan*, both ‘to call’. The circumflex accent in Lithuanian developed secondary, probably under influence of *kliẽgti* ‘to shout’, that might reflect another variant of the root (Derksen 2015: “klykti”). The root is limited to Balto-Slavic and Germanic.

(33) ***kleu(n)-/*klen-** ‘maple tree’ (St: 28): Lit. *klẽvas*, Ru. *klën*, ON *hlynr*, all ‘maple tree’. The Baltic forms continue **kleu*- the Germanic forms **kl(e)un*- and the Slavic forms **klen*- (Kroonen 2013: “hluni-”). The variety in forms and its semantics as a floral term suggest an origin in a pre-Indo-European substrate.

(34) ***komH-** ‘bumblebee’ (St: 26): Lit. *kamãnė* ‘bee’, Ru. *šmel’*, OHG *humbal*, both ‘bumblebee’. The term may be connected to Germanic **hummōn*- ‘to hum’, and Lit. *kìmti* ‘to become hoarse’ (Kroonen 2013: “humela-”). The word is restricted to Balto-Slavic and Germanic.

(35) ***krek-** ‘frog spawn, roe’ (St: 30): Lit. *krakulai*, *kurkulaĩ* (< **kr̥k*-), Ru. *krjak*, both ‘frog spawn’, ON *hrogn* ‘roe’. This word is restricted to Balto-Slavic and Germanic. Its semantics as a natural term suggests an origin in a pre-Indo-European substrate.

(36) ***kroup-** ‘rough’ (St: 30): Lit. *kraupùs* ‘rough, terrible’, Pol. *krupny* ‘coarse’, ON *hrjúfr* ‘rough, scabby’ (< **kreup*-). The root is limited to Balto-Slavic and Germanic.

(37) ***le(h$_2$)p-** ‘palm of the hand, paw’ (St: 33): Lit. *lópa*, Ru. *lápa*, both ‘paw’, Got. *lofa* ‘palm of the hand’. A reconstruction **leh$_2$p*- can account for Lit. *lópa* and Ru. *lápa*, but not for Latv. *lę̃pa* ‘paw’, which suggests **leh$_1$p*-. Furthermore, there seems conflation with a root **lep*- (Derksen 2015: “lopa”).

For Germanic, an *n*-stem **lōfō*, **lappaz* may be reconstructed (e.g. OHG *lappo* ‘palm of the hand’) (Kroonen 2013: “lōfan-~lappan-”). Despite the inconsistencies regarding the reconstruction of the root, the forms likely belong together.

(38) ***lent-eh$_2$** ‘lime tree’ (St: 34): Lit. *lentà* ‘plank’, Ru. *lut* ‘bark (of a lime tree)’ (< **lont-*), ON *lind* ‘lime tree’. The word is restricted to Balto-Slavic and Germanic. Because of its semantics as a natural term, it has likely been borrowed from a pre-Indo-European substrate language.

(39) ***leud-** ‘ugly, wrong’ (St: 34): Lit. *liū̃dnas* ‘sad’, CS *ludъ* ‘foolish’ (< **loud-o-*), ON *ljótr* ‘ugly’. The Lithuanian form contains a lengthened zero-grade; its palatalized lateral reflects an earlier form **leud-* (Derksen 2008: “lûdъ”). The root is not found outside of Balto-Slavic and Germanic.

(40) ***meld^h-n-** ‘lightning’ (St: 37): OPr. *mealde*, OCS *mlъni*, both ‘lightning’, ON *Mjǫllnir* ‘Thor’s hammer’. The forms are restricted to Balto-Slavic and Germanic. Remarkable is the use of this word as a mythological term, such as ON *Mjǫllnir* (< PGm. **meldun(i)ja-* < **meld^h-n̥-i̯o-*) and Latv. *milna* ‘hammer of the thunderer’ (Derksen 2015: “milna”).

(41) ***menHk-** ‘to soften, knead’ (St: 36): Lit. *mìnkyti* ‘to knead’, OHG *mengen* ‘to mix’. The Baltic and Germanic forms may be compared to Ru. *mjaknút’* ‘to become soft’. As such, the root is limited to Balto-Slavic and Germanic.

(42) ***merHk-** ‘dark, to light up’ (St: 36): Lit. *mirgė́ti* ‘to twinkle’, Ru. *morgát’* ‘to blink’, ON *myrkr* ‘dark’ (< **merg^w-*); Lit. *mérkti* ‘to close one’s eyes’, OCS *mrakъ* ‘darkness’, OHG *morgen* ‘morning’ (< **merHk-*). Lit. *mirgė́ti*, Ru. *morgát’* and ON *myrkr* can be derived from **merg^w-* (e.g. CLuv. *maru̯ai-* ‘dark’) (Kroonen 2013: “merkwu-”) and are Indo-European in origin. The forms Lit. *mérkti*, OCS *mrakъ* and OHG *morgen* (< **mr̥Hk-en-*) derive from a root **merHk-* ‘to become dark, to be dim’. This root is not found outside of Balto-Slavic and Germanic.

(43) ***mois-o-** ‘bag’ (St: 35): Lit. *maĩšas* ‘bag’, OCS *měxъ* ‘wine-skin’, ON *meiss* ‘basket’. The word is probably derived from **meis-* ‘sheep’ (Skt. *meṣá-* ‘ram’, Gk. *μεῖον* ‘sacrificial sheep’), assuming that the bag was initially made from sheep skin. The Germanic forms can be connected to the Balto-Slavic ones if a semantic shift ‘bag’ > ‘basket’ is assumed (Kroonen 2013: “maisa-”). Both the morphology as the semantics are common to Balto-Slavic and Germanic; the word can therefore be regarded as a Baltic-Slavic-Germanic isogloss.

(44) ***plei-** ‘bare’ (St: 42): Lit. *pleĩnė* ‘bare plain’, Nw. *flein* ‘bald, flat’. Besides forms in **-n-*, forms in **-k-* occur (Lit. *plìkas* ‘bald’) (Kroonen 2013: “flaina-”). CS *plěšь* ‘bald patch’ might be a cognate in **-s-*, or it might continue **ploi-kh$_2$-* with **kh$_2$* > **x* (Derksen 2008: “plê̆šь”). The stem **plei-* is limited to Balto-Slavic and Germanic. It seems possible to me that **plei-* is a derivation from a root **pel-*, from which also **pleh$_2$-* (e.g. Lat. *plānus* ‘plain’) may have been derived.

(45) ***rug^h-i-** ‘rye’ (St: 46): Lit. *rugiaĩ*, OCS *rъžь*, ON *rugr*, all ‘rye’. Within Germanic, a secondary form **rug^h-n-* is found (Du. *rogge* ‘rye’). A connection with Thracian *βρίζα* ‘emmer-wheat, rye’ is uncertain (Kroonen 2013: “rugi-”). The word is limited to Balto-Slavic and Germanic. It was probably borrowed from a pre-Indo-European farmer language.

(46) ***sig-** 'whitefish' (St: 47): Latv. *sīga*, *sīka*, Ru. *sig*, ON *síkr*, all 'whitefish'. The word has a limited spread around the Baltic Sea, suggesting a late spread. The term is also found in Uralic (Fi. *siika*, Vepsian *sīg*, both 'whitefish') (Stang 1972: 47).

(47) ***(s)kr(-)ei-** 'to circle' (St: 49): Lit. *skriẽti*, *skriẽsti* 'to circle, fly', OCS *krilo* 'wing' (< **(s)krid-lo-*), OE *skrīðan* 'to go, glide'. The Germanic forms continue **skrei-t-*, the Balto-Slavic forms continue **(s)krei-* and **(s)krei-d-* (Kroonen 2013: "skrīþan-~skrīdan-"). The stem was probably used originally to describe the movements of birds. Within Germanic, the semantics have been generalized. It seems possible to me that **(s)krei-* is derived from **(s)ker-* 'to cut, shave' (ON *skera* 'to cut, shave') (compare Du. *door de lucht scheren* 'to skim through the sky').

(48) ***sleid^h-** 'to slide' (St: 50): Lit. *slidùs* 'slippery', OCS *slědrъ* 'track', OE *slīdan* 'to slide'. The root is limited to Balto-Slavic and Germanic. It may have been derived from **sle(h_1)i-* 'slippery, slimy'. Scottish Gaelic *slaod* 'trail' doesn't belong here because of its vocalism.

(49) ***slob^h-** 'slack, weak' (St: 50): Lit. *slãbnas*, Ru. *slabъ*, both 'weak', OHG *slaf* 'slack'. The root is restricted to Balto-Slavic and Germanic. The Germanic forms derive from **slob^h-n-* (Kroonen 2013: "slapp/bōn-"). The vocalism of the Slavic forms is unexpected (Derksen 2008: "slàbъ"). This irregularity suggests that the word was borrowed from a substrate language.

(50) ***smeuk-** 'to creep, slide' (St: 51): Lit. *smaũkti* 'to roll up', *smùkti* 'to slide', ORu. *smykati sja* 'to drag oneself', ON *smjúga* 'to creep through'. This verb is limited to Balto-Slavic and Germanic.

(51) ***smog^h-** 'to strike' (St: 51): Lit. *smõgti* 'to swing, hurl, strike', Ru. *smagát'* 'to beat', OE *smacian* 'to strike, knock'. The circumflex accent in Lithuanian suggests a root-final **-g^h-*, which means that the Balto-Slavic forms probably continue a lengthened grade form PBSl. **smāg-*. The Old English form can be compared to Du. *smakken* 'to smack', which may reflect an iterative formation **smog^h-neh$_2$-*. It is probable that all forms belong together.

(52) ***sneuH-** 'to turn, warp' (St: 51): Latv. *snaujis* 'noose', Ru. *snovát'* 'to warp', ON *snúa* 'to turn'. The root is not found outside of Balto-Slavic and Germanic. It is uncertain whether Albanian *nus* 'thread' belongs here (Stang 1972: 52). It seems possible to me that the root is a metathesized form of **(s)neh$_1$-u-*, a derivation of **(s)neh$_1$-* 'to turn around'.[20]

(53) ***sōd-** 'soot' (St: 56): Lit. *súodys*, Ru. *sáža* (< **sōd-i̯-*), ON *sót*, all 'soot'. The root is restricted to Balto-Slavic and Germanic. The reconstruction with a lengthened *o*-grade is based on the assumption that the word is derived from **sed-* 'to sit' ('that what has settled down'). A non-Indo-European origin of the word can however not be excluded.

(54) ***sol-** 'dwelling place' (St: 46): Eastern Lit. *salà* 'village, field surrounded by meadows', OCS *selo* 'field, abode, village', ON *salr* 'hall, house'. The root is limited to Balto-Slavic and Germanic. It is uncertain whether Lit. *salà* 'island' belongs here (Derksen 2015: "sala").

(55) ***(s)prend-** 'to spin, stretch, jump' (St: 43, 53): Lit. *sprę́sti* 'to stretch, spread', OCS *pręsti* 'to spin', OE *sprindel* 'bird snare, tenterhook'. A secondary meaning 'to jump' (< 'to stretch'), that possibly arose under influence of **(s)preng^h-* 'to jump', may be found in Ru. *prjádat'* 'to jump, bounce', ON *spretta*

[20] For this root, see further Kloekhorst and Lubotsky (2014).

‘to jump’ (Derksen 2008: “pręsti”). It seems possible that the word is an extended form of **sper-* ‘to spread out’ (e.g. Lat. spargō ‘to strew’).

(56) ***(s)preng^h-** ‘to jump’ (St: 43): OCS *prǫgъ* ‘locust’ (< **(s)prong^h-o-*), OHG *springan* ‘to jump’. A connection to Gk. *σπέρχω* ‘to be impassioned’, Skt. *spṛhayati* ‘to strive’ is tempting, but does not account for the pure velar found in Slavic (Beekes 2009: “σπέρχομαι”). The forms may rather be connected to Lit. *spreñgti* ‘to tighten, clamp’ (LIV: 583). Like **(s)prend-* ‘to spin, stretch, jump’, this form may eventually be derived from **sper-* ‘to spread out’.

(57) ***sth$_2$-eb^h-oro-** ‘dry wood, pole’ (St: 54): Lit. *stãbaras* ‘dry wood’, SCr. *stoborъ* ‘pillar’, Nw. *stavar* ‘tree stump’. The word is likely derived from (230) ***sth$_2$-eb^h-o-**. According to Stang (1972), the suffix **-(o)ro-* is typical for both Balto-Slavic and Germanic.[21]

(58) ***steh$_2$-d^h(h$_1$)-o-** ‘herd (of horses)’ (St: 54): Lit. *stódas* ‘flock of horses’, OCS *stado* ‘herd’, OE *stōd* ‘herd of horses’. The forms are derived from **steh$_2$-* ‘to stand’. Both the morphology and the semantics of the Balto-Slavic and Germanic forms agree with each other. There is no compelling reason to assume a borrowing of the word from one language family into the other.

(59) ***streug^h-** ‘to stroke, scrape’ (St: 55): Lit. *strùgas* ‘cropped’, OCS *strъgati* ‘to scrape, shave’, ON *strjúka* ‘to stroke’. The Slavic forms do not show evidence of Winter’s Law, meaning that Gk. *στρεύγομαι* ‘to be exhausted’ is not related (Beekes 2009: “στρεύγομαι”). This means that the Germanic form **streuk-* (originally PGm. **streug-*) was remodelled after the iterative **strukkōn-* ‘to stroke’ (< **strug^h-néh$_2$-*) (Kroonen 2013: “streukan-”).

(60) ***stulP-** ‘pole, pillar’ (St: 55): Lit. *stulbas* ‘pole’, Ru. *stolb* ‘pillar, column’ (< **stlъb-*), ON *stolpi* ‘pillar’. The Balto-Slavic forms must continue **stulb^h-* because of the Lithuanian circumflex accent. Within Slavic, a variant form **stulp-* can be found (e.g. OCS *stlъpъ* ‘pillar, tower’). The Old Norse form continues **stVlb-*, if the voiceless ending is not a secondary Germanic development. It is difficult to view the forms as a derivation from **steh$_2$-*. Due to the variety of its forms, it is likely a borrowing from a substrate language. It is uncertain whether Du. *stelpen* ‘to stem’ belongs here.

(61) ***suH-ro-** ‘sour’ (St: 56): Lit. *sū́ris* ‘cheese’, OCS *syrъ* ‘damp, fresh’, OE *sūr* ‘sour’. The forms are restricted to Balto-Slavic and Germanic.

(62) ***tn̥g^h-** ‘heavy’ (St: 58): Lit. *tingùs* ‘lazy’, ON *þungr* ‘heavy’ (< **tn̥g^h-u-*), OCS *tęgota* ‘burden’ (< **tn̥g^h-ot-*). The root is not found outside of Balto-Slavic and Germanic.

(63) ***tuH(-)s-ent-** ‘thousand’ (St: 59): Lit. *tū́kstantis*, OCS *tysǫšti*, Got. *þusundi*, all ‘thousand’. The word is limited to Balto-Slavic and Germanic. Its exact etymology is unclear. One possibility is that the formation is a participle of a stem **teuH-(s)-* ‘to be strong’ (Skt. *tavīti* ‘to be strong’), denoting ‘the strong number’. A second possibility is that the formation continues **tuHs-dḱm̥t-o-* ‘the strong hundred’. This would explain peculiarities, such as the *-m-* in OPr. *tūsimtons*, and the *-s-* in the Slavic forms instead of expected *-š-* (OCS *tysǫšti*) (Kroonen 2013: “þūshundī”). However, these forms may have been influenced by *dḱm̥tom* ‘hundred’ instead (Derksen 2015: “tūkstantis”). A third possibility is that the word is borrowed from a non-Indo-European language (Stang 1972: 59), perhaps through trade. In this case, it may well be that the word became altered by folk etymology.

[21] Stang 1972: 88-89: “in den Bedeutungen ‘Hügel’, ‘Buckel’, ‘Ast’, ‘Säule’.”

(64) ***u̯eb^h-el-** ‘bug’ (St: 60): Lit. *vãbalas* ‘beetle’, Ru. *véblica* ‘(intestinal) worm’, OHG *wibil* ‘weevil’. The word is limited to Balto-Slavic and Germanic. A derivation from *h_1u̯eb^h- ‘to weave’ is semantically unlikely. Considering its semantics as a natural term, a borrowing from a substrate language is probable.

(65) ***u̯erǵ^h-** ‘to tighten’ (St: 63): Lit. *veržti* ‘to tighten’, OCS *povrěsti* ‘to bind’, OHG *wurgen* ‘to strangle’ (< *u̯r̥ǵ^h-i̯e-). A connection to Gk. *ἕρχατος* ‘fence’ is unlikely, since its variants such as *ἕρκατος* point to a pre-Greek origin (Beekes 2009: “ἕρχατος”). Connections to Albanian *zvjerdh* ‘to disaccustom’ or Hitt. *ḫurkil-* ‘perversity’ (< ‘twisted’) are possible, but uncertain.

(66) ***u̯Hl(g)-** ‘golden oriole’ (Matasović 2014: 87): Lit. *volungẽ*, Ru. *ívolga*, ME *wōde-wāle*, all ‘golden oriole’. The forms are not found outside of Balto-Slavic and Germanic. The Slavic form may have been originally **jьvo-vьlga*. The first lid **jьva* ‘willow’ is then comparable to the Germanic forms, in which the first lid ‘wood’ is used. It is difficult to reconstruct a Proto-Balto-Slavic form; the alternations between Lit. *volungẽ* and Slavic **vьlg-* resemble the alternations of Lit. *jerumbẽ*, *ìrbė* ‘hazel-grouse’ (Derksen 2015: “volungė”). The Germanic form is not directly comparable to the Baltic and Slavic forms. The word is likely borrowed from a non-Indo-European substrate language.

(67) ***u̯oḱsko-** ‘wax’ (St: 61): Lit. *vãškas*, OCS *voskъ*, OHG *wahs*, all ‘wax’. The reconstruction *u̯oḱsko- is necessary to explain the Lithuanian medial cluster *-šk-* (with *-š-* < **ḱ(s)*) (Kortlandt 1979: 59). The medial cluster was simplified in Germanic. The word cannot be derived from a known Indo-European root and has no cognates outside of Balto-Slavic and Germanic. It was likely borrowed from a pre-Indo-European substrate language.

3.1.2. Baltic-Germanic forms

(68) ***alk-** ‘holy site’ (St: 13): Lit. *alk̃as* ‘holy grove on a hill’, Got. *alhs* ‘temple’. There is no compelling reason to connect this word with Gk. *ἀλέξω* ‘to ward off’. The semantics and the root-declination in Germanic suggest a pre-Indo-European origin (Kroonen 2013: “alh-”).

(69) ***b^{h}rusgo-** ‘brushwood’ (St: 16): Lit. *brũzgai*, Nw. *brusk*, both ‘brushwood’. PGm. **bruska-* can be inferred from Norwegian and English *brush(-wood)*, itself derived from West-Germanic **bruska-* through an Old French borrowing *broche* (Kroonen 2013: “bruska-”). The history of the Lithuanian form is unknown.

(70) ***diH-r-eh$_1$-** ‘to shine’ (St: 18): Lit. *dyrė́ti* ‘to look at’, poss. Bulg. *dirjá* ‘to seek, strive’, Nw. *tira* ‘to shine’. The Baltic and Germanic forms are identical. The connection with the Slavic verb is uncertain. The forms may eventually go back to **deiH-* (compare Skt. *day^i-* ‘to shine’) (Derksen 2008: “diriti”). The enlargement with **-r-eh$_1$-* is common to Baltic and Germanic.

(71) ***d^{h}ak$^{(w)}$-** ‘type of bird’ (St: 19): OPr. *doacke* ‘sterling’, OHG *tahala* ‘jackdaw’. The forms in Germanic and Prussian seem similar, although the word is used for different species. The phonetics of the reconstructed form strongly suggest an origin in a pre-Indo-European substrate language.

(72) ***d^{h}ong-** ‘marshy land’ (St: 17): Latv. *danga* ‘marshy land’, ON *dǫkk* ‘depression’. Within Germanic, Du. *donk* ‘high spot in marshy area’ probably belongs to the same root (PGm. **dank-*/ **dunk-*). It is possible that forms such as Lit. *lénkė* ‘meadow’, *léngė* ‘small meadow between two hills’,

Ru. *lug* ‘meadow’ reflect different variants of the same word (Derksen 2015: “danga”). The semantics suggest that the word originates in a substrate language.

(73) ***d^{h}erHb^h-** ‘to labour’ (St: 18): Lit. *dìrbti* ‘to work’, OE *deorfan* ‘to work, perish’. Within Germanic, a secondary meaning ‘to ruin, perish’ can be found (e.g. MHG *verderben* ‘to ruin’ (< **d^{h}orHb^h-e̯ie̯-*)) (Kroonen 2013: “darbjan-”). The root is not attested outside of Baltic and Germanic.

(74) ***ǵeis-** ‘gravel, pebble’ (St: 66): Lit. *žìzdras* ‘gravel’ (< **ǵis-r-*), OHG *kisel* ‘pebble’ (< PGm. **kisila-*). The word must be considered as a Baltic-Germanic isogloss. It is likely borrowed from a substrate language. Similar forms are found outside of Indo-European (e.g. Komi *keža* ‘gravel’, Khanty *χĭš* ‘fine sand’) (Kroonen 2013: “kisila-”).

(75) ***gleub-i̯e-** ‘to clasp’ (St: 22): Lit. *glaũbti* ‘to clasp to one’s bosom’, OE *clyppan* ‘to embrace’. For Germanic, both **kleupijan-* (> ON *klýpa* ‘to clasp’) and **klupjan-* (OE *clyppan*) can be reconstructed, suggesting a proto-form **gleub-i̯e-*. However, this does not correspond to the circumflex accent in the Lithuanian form nor with an Indo-European origin. (Derksen 2008: “glaubti”). The form may be a variant of (31) ***Kleh$_1$b$^{(h)}$-**.

(76) ***gluH-n-eh$_1$-** ‘to stare’ (St: 23): Latv. *glũnêt* ‘to lour’, Swe. *gluna* ‘to stare’. The formation is identical in Baltic and Germanic. The word is likely connected to **g^{h}louH-* (OE *glēaw* ‘clear-sighted’, OIr. *gluair* ‘clear’) (Kroonen 2013: “glawwa-”).

(77) ***ǵniHb^h-** ‘to cut’ (St: 23): Lit. *žnýbti, gnýbti* ‘to pinch’, Du. *knippen* ‘to cut, clip’. The root is limited to Baltic and Germanic. The alternation of the Lithuanian onset *žn-/gn-* is remarkable. Before nasals, palatovelars were generally depalatalized in Balto-Slavic (Kloekhorst 2011), although this was not the case before syllabic nasals (e.g. Lit. *dẽšimt* ‘ten’ (< **deḱm̥t*)) (Kortlandt 2013: 13). This alternation may have spread to paradigms such as *žnýbti, gnýbti*. Within Germanic, several derivations of the root exist (e.g. Du. *knippen* (< *ǵniHb^h-néh$_2$-*), ON *knífr* ‘knife’ (< **ǵneiHb^h-o(n)-*) (Kroonen 2013: “knipp/bōn-”).

(78) ***ǵob^h-** ‘stick’ (St: 64): Lit. *žãbas* ‘branch, cane’, OHG *kabel* ‘piece of wood’ (< **ǵob^h-l-*). The root is not found outside of Baltic and Germanic.

(79) ***ǵog^h-** ‘stem, trunk’ (St: 64): Lit. *žãgaras* ‘twig, dry branch’ (< **ǵog^h-oro-*), Bavarian *Kag* ‘cabbage stump’, OHG *kegil* ‘pin, cone’ (< PGm. **kagila-*). OCS *žьzlъ* ‘stick’ may be compared, but cannot be related directly (Stang 1972: 65).

(80) ***g^{h}reib^h-** ‘to grasp, seize’ (St: 24): Lit. *griẽbti*, Got. *greipan*, both ‘to grasp’. The root is limited to Baltic and Germanic. The Germanic forms with *-p-* must have developed secondary through **g^{h}rib^h-néh$_2$-* (Kroonen 2013: “gripp/bōn-”). The root may be onomatopoeic in origin (LIV: 203).

(81) ***grenǵ^h-** ‘to turn around’ (St: 24): Lit. *grę̃žti* ‘to turn, bore’, ON *kringr* ‘circle’. The original meaning is likely ‘to turn around’. It remains unclear whether the root (125) ***kreng^h-** (ON *hringr* ‘ring’, OCS *krǫgъ* ‘circle’) is related. If it is, the variation in phonetic shape would strengthen the suggestion that the root is borrowed from a pre-Indo-European substrate.

(82) ***h$_2$eh$_1$-t-ro-** ‘quick’ (St: 40): Lit. *otrùs*, OHG *ātar*, both ‘quick’. The forms may be derived from the root **h$_2$eh$_1$-* ‘to burn’ (e.g. Av. *ātar-* ‘fire’). The Germanic forms must then derive from a lengthened

grade *$h_2ēh_1$- in which the vowel remained unaffected by the preceding laryngeal because of Eichner's Law. Kroonen suggests that the Baltic forms were borrowed from Germanic (Kroonen 2013: "ēdra-"). This is unnecessary with a reconstruction *h_2eh_1-*t-ro*-. Both the formation and semantics of the word are limited to Baltic and Germanic.

(83) ***keh$_2$u(-n)-** 'to scorn' (St: 27): Lit. *kuvétis* 'to be embarrassed', Latv. *kàuns* 'shame', Got. *hauns* 'humble'. The adjective **koh$_2$u-no-* from which the Latvian and Gothic forms are descended, is derived from the root **keh$_2$u-* 'to scorn', which stative **kh$_2$u-eh$_1$-* can be found in the Lithuanian verb *kuvétis* and ON *há* 'to mock' (< **hawēn-*) (Kroonen 2013: "hawēn-").

(84) ***Kelb-** 'to help' (St: 58): Lit. *šel̃pti* 'to help, support', Got. *hilpan* 'to help'. It is possible that the Lithuanian form was borrowed from Slavic **šelp-* (e.g. OCS *xlapъ* 'servant'), itself likely a borrowing from Germanic **help-* 'to help' (Kroonen 2013: "helpan-"). This explanation allows us to reconstruct a pre-Proto-Germanic form **kelb-*. Lit. *gélbėti* 'to help' is similar to these forms, although it contains a different onset. The word may be considered as a Baltic-Germanic isogloss. The variation in the onset suggests the forms are borrowed from a substrate.

(85) ***ḱel(-t)-** 'to incline' (St: 26): Lit. *kal̃ti* 'to lean', ON *hallr* 'leaning to one side'. Kroonen compares the Germanic form with Lit. *šalìs* 'side', and reconstructs **ḱel-* 'to lean', from which the well-known PIE **ḱl-ei-* 'to lean' (Kroonen 2013: "halþa-"). Lit. *kal̃ti* may have been derived from this root too if the form took its full velar from the zero-grade **ḱl̥-*, that was prone to depalatalization in Balto-Slavic (Kortlandt 2013).

(86) ***keub-** 'rose' (St: 27): OPr. *kaāubri* 'thorn', OHG *hiufo* 'rose hip' (< **keub-on-*) (Kroonen 2013: "heupa/ōn-"). The word is limited to Germanic and Old Prussian. Because of its semantics as a floral term, a borrowing from a substrate language is probable.

(87) ***kleup-** 'to leap' (St: 30): Lit. *klùpti* 'to stumble', ON *hlaupa* 'to leap, run'. The Germanic form must be a back-formation of **klup-néh$_2$-* to which Latv. *klupinât* 'to keep stumbling' can be directly compared (Kroonen 2013: "hluppōn-"). The root is limited to Baltic and Germanic.

(88) ***ḱorm-on-** 'ermine' (St: 57): Lit. *šarmuõ* 'wildcat, ermine, weasel', OHG *harmo* 'ermine'. The word is restricted to Baltic and Germanic. Its semantics as a natural term suggest that it was borrowed from a substrate language.

(89) ***kor(s)-** 'grayling' (St: 26): Lit. *kar̃sis* 'bream', *kiršlỹs*, Nw. *harr*, both 'grayling'. The Baltic forms may be derived form *kéršas* 'dark spotted' (Derksen 2015: "kéršas"). The same may be true for the Germanic forms, although a similar colour term is unattested in Germanic. It is difficult to connect Lit. *kéršas* to **kr̥s-no-* 'black' because of its acute accentuation. Ru. *kháriuz* 'grayling' is likely a borrowed from Germanic through Fi. *harju* 'grayling' (Derksen 2015: "karšis").

(90) ***k^{w}ol-** 'whale' (St: 26): OPr. *kalis* 'cat-fish', ON *hvalr* 'whale'. The word may have been derived from **k^{w}el-* 'to turn' (Kroonen 2013: "hwali-"), which is semantically comparable to Du. *tuimelaar* 'tumbler' for 'bottlenose dolphin', arch. Du. *wentelaar* 'turner' for 'cat-fish' (Philippa 2003: "meerval"). The Old Prussian form is probably not borrowed from Germanic, since then an onset **kw-* might be

expected.[22] It is uncertain whether Lat. *squalus* ‘type of sea fish’ belongs here. The word may have been derived from *squālus* ‘scale’ (De Vaan 2008: “squalus”).

(91) ***leig-** ‘similar’ (St: 32): Lit. *lýgus*, Got. *galeiks*, both ‘similar, equal’. This root is restricted to Baltic and Germanic.

(92) ***lug^h-neh$_2$-** ‘to allure, fondle’ (St: 34): Lit. *luginti* ‘to allure, fondle’, ON *lokka* ‘to allure, entice’. The forms are derived from **leug^h*- ‘to lie’ (Derksen 2015: “luginti”). The similarities in both derivation as semantics make this form a Baltic-Germanic isogloss.

(93) ***neud-** ‘to use’ (St: 39): Lit. *naudà* ‘property’ (< **noud-eh$_2$*), ON *njóta* ‘to use, enjoy’. This root is limited to Baltic and Germanic.

(94) ***peḱ-** ‘to tidy up’ (St: 44): Lit. *puõšti* ‘to brush, attire’ (< **pōḱ-i̯e-*), OS *fegōn* ‘to sweep, clean’. The original meaning of this Baltic-Germanic form was probably ‘to tidy up, sweep’. In both Baltic and Germanic a secondary meaning ‘proper, happy’ developed (OHG *gifehan* ‘to rejoice’, Got. *gafehaba* ‘properly’) (Kroonen 2013: “fehan-”). A connection to Gk. *πέκω* ‘to comb’ is tempting, but uncertain.

(95) ***pleu-k-** ‘to swim, fly’ (St: 42): Lit. *plaũkti* ‘to swim, float’, OHG *fliogan* ‘to fly’. The forms likely continue an extended form of **pleu-* ‘to swim’ (Gk. *πλέω* ‘to swim’). Because of the similarity in derivation and meaning, the forms can be seen as a Baltic-Germanic isogloss.

(96) ***pod-om** ‘pot, vessel’ (St: 43): Lit. *púodas* ‘pot’, OHG *faz* ‘vessel’. Stang suggests a connection with **ped-*/**pod-* (OPr. *pijst* ‘to carry’). The word is limited to Baltic and Germanic. It is probably not related to Germanic ‘pot’ (e.g. ON *pottr*), that may have a Latin origin. Based on the limited spread of the word and the occurrence of Fi. *pata*, Hu. *fazék*, both ‘pot’ < PFU **pata* (Kroonen 2013: “fata-”), the word is probably borrowed from a substrate language.

(97) ***skh$_2$-ei-b^h-** ‘slanted’ (St: 58): Latv. *šķìbs*, ON *skeifr*, both ‘slanted’. It is possible that the forms continue **skh$_2$-ei-b^h-*, a with **-b^h-* extended stem **skeh$_2$-i-* (e.g. Lat. *scaevus* ‘shaded, left’ (< **skeh$_2$-i-u̯o-*) Gk. *σκιά* ‘shade’). The semantic development ‘slanted’ < ‘shaded’ is similar to that of Lat. *scaevus* (‘left’ < ‘unfavourable’ < ‘shaded’). Because of the specific meaning ‘slanted’ and the specific extension **-b^h-*, the forms must be regarded as a Baltic-Germanic isogloss. Gk. *σκιμβός* ‘crooked’ has likely a pre-Greek origin (Beekes 2009: “σκιμβός”).

(98) ***slenk-** ‘to creep’ (St: 50): Lit. *sliñkti* ‘to creep, sneak’, OHG *slango* ‘snake’. The root is restricted to Baltic and Germanic.

(99) ***smog-** ‘tasty, enjoyable’ (St: 51): Lit. *smogùs* ‘tasty, enjoyable’, OHG *smecken* ‘to taste’. It is likely that the Baltic and Germanic forms belong together. The origin of the word is unknown.

(100) ***snop-** ‘beak’ (St: 51): Lit. *snãpas*, OHG *snabul*, both ‘beak’. The root is restricted to Baltic and Germanic. The Germanic form is probably derived from a verb **snab-* found in MHG *snaben* ‘to snoop’, Icel. *snefja* ‘to look for’, probably originally ‘to stick one’s nose in something’. A zero-grade form **snub-* may have been the origin for forms such as MHG *snūben* ‘to sniff, snort’. These forms suggest

[22] Because of its specific semantics, the Old Prussian form is probably not connected to Fi. *kala* ‘fish’, that has been inherited from Proto-Uralic (compare Hungarian *hal*, Nganasan *koli*, both ‘fish’).

that both *snãpas* and *snabul* might show a specialized meaning ‘beak’ (< ‘nose’) derived from a Baltic-Germanic verb **snep-* ‘to sniff’.

(101) ***spei-g-** ‘to be pointed’ (St: 52): Latv. *spaiglis* ‘crab fork’, ON *spík* ‘splinter’. The stem is widespread within Germanic (e.g. OHG *speihhe* ‘spoke’ (< **spaikōn-*), Du. *spijker* ‘nail’ (< **spīkr-*)). The Latvian word may belong here, together with Lit. *speigliaĩ* ‘thorns’. The forms are probably derived from a European root **spei-*, that can also be found in Lat. *spīca* ‘spike’, *spīna* ‘thorn’. Another derivation from this root is (252) ***spei-tl-**.

(102) ***spreg^h-** ‘to crackle, burst’ (St: 53): Lit. *spragė́ti* ‘to crackle, sputter’, ON *spraka* ‘to crackle’. Within Baltic, there was conflation with the verb *sprógti* ‘to burst’ (< **sb^{h}reh$_2$g-*), to which Gk. *σφαραγέομαι* ‘to crackle’ belongs (Derksen 2015: “spragėti”). The Germanic forms seem to continue **spreg^h-n-*. The West-Germanic development ‘to crackle’ > ‘to speak’ may be compared to OCS *govoriti* ‘to make noise’ > ‘to speak’ (Philippa 2003: “spreken”). I regard it as a possibility that the word is a derivation of **sper-* ‘to spread out’.

(103) ***stromb$^{(h)}$-** ‘stump’ (St: 55): OPr. *strambo* ‘stub’, MLG *strump* ‘stump’. The root is limited to Baltic and Germanic. Latv. *strumbulis* ‘bat’ may belong here too.

(104) ***su̯eib-** ‘to swing’ (St: 57): Latv. *sveĩbenât* ‘to swing around’, ON *sveipa* ‘to swing, fling’. This root can be considered as a Baltic-Germanic isogloss. It may be a variant of (106) ***su̯eip-**.

(105) ***su̯eig^h-** ‘to twist’ (St: 56): Lit. *svaĩgti* ‘to tumble, ON *sveigja* ‘to bend, turn’. Although the forms are not widespread within Baltic and Germanic, they agree with each other formally. As such, the existence of a Baltic-Germanic isogloss is likely.

(106) ***su̯eip-** ‘to swing, whip’ (St: 57): Latv. *svàipît* ‘to whip’, ON *svífa* ‘to swing’. The root is limited to Baltic and Germanic. Further forms within Germanic are OHG *swebēn* ‘to float’ (< **swibēn-*) and pobably Du. *zweep* ‘whip’ (< **swaipan* < **su̯oip-n-*). It is possible that the root is a variant of (104) ***su̯eib-**.

(107) ***su̯enk-** ‘to become heavy’ (St: 56): Lit. *sunkùs* ‘heavy’, OHG *swangar* ‘pregnant’ (< **su̯onk-ró-*). The root is limited to Baltic and Germanic. A connection with Lit. *señka* ‘to fall, sink’, as suggested by Fraenkel, is phonologically difficult (Stang 1972: 56).

(108) ***su̯er-** ‘to be heavy’ (St: 57): Lit. *sveŕti* ‘to weigh’, OHG *swār* ‘heavy’. This root is limited to Baltic and Germanic. Lat. *sērius* ‘serious’ cannot be related, because then **suērius* would be expected (De Vaan 2008: “sērius”).

(109) ***treu(H)k-** ‘vessel’ (St: 59): Lit. *traukai* ‘vessels, trays’, OE *þrūh* ‘gutter, casket’. It is possible that the Baltic and Germanic forms are derived from of **treuH-* ‘to rub’ (OCS *tryti* ‘to rub’, Gk. *τρύω* ‘to wear down’). However, considering its semantics, a borrowing from a substrate language is more probable.

(110) ***u̯eng-** ‘to turn (the eyes), give a sign’ (St: 62): *véngti* ‘to avoid doing’, OHG *winken* ‘to beckon’. The root is limited to Baltic and Germanic. I agree with Stang that Skt. *váṅgati* ‘to limp’ is difficult to connect semantically (Stang 1972: 63).

(111) ***u̯l̥n-i-** ‘burbot’ (St: 64): OPr. *wilnis*, Gotl. *ylle*, both ‘burbot’. Although not widespread, the word must be considered as a Baltic-Germanic isogloss; the forms are morphologically and semantically identical. Because of its semantics as a natural term, the word may have been borrowed from a substrate language.

(112) ***u̯ong^h-** ‘meadow, field’ (St: 60): OPr. *wangus* ‘oak forest, partly cleared woodland’, ON *vangr* ‘field’. The word is limited to Baltic and Germanic. Considering its semantics as a natural term, a borrowing from a substrate language is likely.

(113) ***u̯os-** ‘type of humid soil’ (St: 61): Latv. *vasa* ‘soil humidity, forest with humid loam soil’, OHG *waso* ‘humid soil’. The origin of this Baltic-Germanic form is uncertain. A derivation from **u̯es-* ‘spring’ seems unlikely to me because this is not necessarily the wettest season. I find it more probable that the word was borrowed from a pre-Indo-European substrate language.

(114) ***u̯reit-** ‘to twist’ (St: 45): Lit. *riẽsti* ‘to bend, warp’, OE *wrīðen* ‘to twist, ring’. The forms are limited to Baltic and Germanic. The Baltic form shows a common Balto-Slavic development **u̯r-* > **r-* (Stang 1972: 45). It is possible that **u̯reit-* is an extended form of **u̯rei-*, to which also (178) ***u̯reiḱ-** ‘to bend, turn’ may belong.

3.1.3. Slavic-Germanic forms

(115) ***alb^{h}o(n)d-** ‘swan’ (St: 31): Ru. *lébed* (< **elb^{h}ed$^{(h)}$-*), Slov. *labǫ́d* (< **olb^{h}ond-*), OHG *albiz*, all ‘swan’. Although the Germanic forms may point to a derivation from **h$_2$elb^h-* ‘white’ with the Germanic ‘animal suffix’ **-ut-* (Kroonen 2013: “albut-”), the variation of the Slavic forms suggests a substrate origin of the word. Especially of interest is the ending **-(n)d$^{(h)}$-*, that is often found in forms borrowed from a neolithic substrate (Kroonen 2012).

(116) ***b^{h}euH(-)s-** ‘to swell’ (St: 16): Ru. *búkhnut’* ‘to swell up’, Nw. *baus* ‘proud’ (< **b^{h}ouHs-o-*) (Kroonen 2013: “bausa-”). It seems possible to me that the forms reflect a derivation **b^{h}euh$_2$-s-*, a metathesized form of **b^{h}eh$_2$u-* ‘to grow’ (Gk. *φῦομαι* ‘to grow’). The forms are restricted to Slavic and Germanic.

(117) ***b^{h}oHg^h-** ‘mud, swamp’ (Matasović 2014: 83): Ru. *bagnó* ‘swamp’ (< **b^{h}oHg^h-no-*), Du. *bagger* ‘mud’ (< **b^{h}Hg^h-ro-*). The word is limited to Slavic and Germanic. E *bog* ‘bog, peat’ is probably borrowed from Celtic (e.g. OIr. *bocach* ‘bog, marsh’) and has a different history. OE *bece* ‘stream’ (< PGm. **baki-*) and its probable cognate MIr. *búal* ‘flowing water’ (if < PCelt. **boglo-*) probably continue a different root, since the semantics differ too much.

(118) ***b^{h}oru-** ‘(castrated) boar’ (St: 15): Ru. *bórov* ‘hog, castrated boar’, OHG *barug* ‘castrated boar’ The forms are limited to Slavic and Germanic. The Germanic form may contain the suffix **-ḱo-*, also found in e.g. OE *eolh* ‘elk’ (< **h$_1$el-ḱo-*) (Kroonen 2013: “baruga-”). This is disputed by Hyllested (2017: 192) who reconstructs PGm. **bargu-*, **bargwa-*. It is possible that the form is a variant of **porḱ-* ‘pig’, which entered Slavic and Germanic through a substrate.

(119) ***b^{h}oru-** ‘type of tree, forest’ (St: 15): RCS *borъ* ‘pine-tree, pine-forest’, OE *bearu* ‘grove’ (< **b^{h}oru̯-o-*). The word is limited to Slavic and Germanic. Its semantics as a natural term suggest an origin in a substrate language.

(120) ***b^{h}resg-** ‘to become sour’ (St: 40): RCS *obrězgnuti*, Nw. *briskna*, both ‘to become sour’. Although not widespread, the semantics are compelling enough to connect the Slavic and Germanic forms to each other.

(121) ***d^{h}usg-** ‘rain’ (St: 20): OCS *dъždь* ‘rain’, Nw. *dusk-regn* ‘drizzle’. It is difficult to derive the Slavic word from **dus-diu-* ‘bad sky’, because the prefix **dus-* does not occur in Slavic otherwise. It is easier to derive the form from **dusg-i̯o-*, which can be compared to Germanic **dusk-* (Kroonen 2013: “duska-”).

(122) ***gnet-** ‘to knead’ (St: 23): OCS *gnesti* ‘to press’, OHG *knetan* ‘to knead’. The word is limited to Slavic and Germanic. OPr. *gnode* ‘trough for kneading bread’ is probably borrowed from Germanic (Kroonen 2013: “knedan-”).

(123) ***gneuH-** ‘to press’ (St: 23): SCr. *gnjáviti* ‘to press, strangle’ (< **gneuH-eie-*), ON *knýja* ‘to press, push’ (< **gnuH-ie-*) (Kroonen 2013: “knūjan-”). The root is not attested outside of Slavic and Germanic.

(124) ***g$^{(w)h}$ou-** ‘to venerate’ (Oettinger 9): OCS *gověti* ‘to venerate, be pious’ (< **g$^{(w)h}$ou̯-eh$_1$-*), OHG *got* ‘god’ (< **g$^{(w)h}$u-to-*). A connection between the Slavic and Germanic forms is plausible (Kroonen 2013: “guda-”). Lat. *faveō* ‘to favour’ does probably not belong here. It may reflect the root **b^{h}eh$_2$u-* ‘to be favourable to’ (OIr. *báe* ‘to benefit’, Skt. *bhūṣ-* ‘to exert oneself for someone’) (De Vaan 2008: “faveō”).

(125) ***kreng^h-** ‘ring’ (Oettinger 29, St: 30): OCS *krǫgъ* ‘circle’, ON *hringr* ‘ring’. The root is limited to Slavic and Germanic. Umbrian *cringatro* ‘type of belt’ may not belong here; it might be related to Lat. *clingō* ‘to gird’ instead (De Vaan 2008: “clingō”). The semantics of the root are similar to (81) ***grengʰ-** ‘to turn around’. The non-Indo-European structure of the root suggests an origin in a pre-Indo-European substrate.

(126) ***krom-** ‘frame’ (St: 31): Ru. *zakromít’* ‘to frame’, OHG *rama* ‘frame’. The root is restricted to Slavic and Germanic.

(127) ***leh$_1$s(-u)-** ‘wood, pasture’ (St: 32): OCS *lěsъ* ‘wood’, OE *lǣs* ‘pasture’. The word is limited to Slavic and Germanic. OE *lǣs* continues a *u*-stem because of the genitive *lǣswe* (Derksen 2008: “lěsъ”). The word may further be found in place names such as Norwegian *Lesja* and Danish *-löse* (Stang 1972: 32). Because of its semantics as a natural term, the word probably originates in a substrate.

(128) ***mol-** ‘moth’ (St: 37): Ru. *mol’*, Got. *malo*, both ‘moth’. The forms are generally derived from **molh$_1$-* ‘to grind’. I agree with Stang that this is not straightforward. The word may have been borrowed from a substrate language.

(129) ***neuks-** ‘to sniff, spy’ (St: 40): Ru. *njúkhat’* ‘to smell, sniff’, Got. *biniuhsjan* ‘to scout, spy’. The root is limited to Slavic and Germanic. It is difficult to connect the forms with **neu-* ‘new’, because then the suffix **-ks-* remains unexplained.

(130) ***pelgʰ-** ‘rim of a wheel’ (St: 43): Ru. *póloz* ‘runner of a sled’, OE *fealg* ‘rim of a wheel’. The word was probably used for the part of a vehicle that touched the ground. Within South Slavic, these specific semantics expanded to ‘plow sole’ (e.g. SCr. *plâz* ‘plow sole’, Bulg. *plaz* ‘runner of a sled,

floorboard of a small boat, plow sole'), the hardened layer below ploughed soil. There can be no direct connection with *$pol(h_1)k$-eh_2 'fallow'.

(131) ***pn̥k^w-s-ti-** 'fist' (St: 42): OCS *pęstь*, OHG *fūst*, both 'fist'. The words are derived from *$pénk^we$ 'five'. Both the morphology as the semantics of the forms are limited to Slavic and Germanic.

(132) ***pol-o-** 'board' (St: 43): Ru. *pol* 'floor', OE *fala* 'board'. The morphology and semantics of the forms are restricted to Slavic and Germanic. The forms may be derived from the root **pel-* 'flat' as suggested under (44) ***plei-** (compare ON *fjǫl* 'board' (< *pel-eh_2)).

(133) ***roHd-o-** 'glad' (St: 44): OCS *radъ*, OE *rōt*, both 'glad'. The forms are limited to Slavic and Germanic (Kroonen 2013: "rota-"). A possible Slavic variant form **ard-* has been transmitted in Greek (e.g. *Ἀρδάγαστος* for **Radogostь*) (Stang 1972: 44).

(134) ***send^{h}r-** 'sinter' (St: 46): OCS *sędra* 'coagulated liquid', ON *sindr* 'sinter'. The forms are restricted to Slavic and Germanic. Because the semantics of the Slavic form are more general, it is probably not borrowed from Germanic.It is uncertain whether OE *sengan* 'to singe, scorch' may be connected.

(135) ***snoh$_1$-p-** 'loop' (St: 52): OCS *snopъ* 'bundle, sheaf', OHG *snuoba* 'necklace' (< 'loop'). The forms may belong together. It is possible that they are derived from the root **$(s)neh_1$-* 'to turn around'.[23]

(136) ***ste(n)g^h-** 'to sting' (St: 55): OCS *stegnǫti* 'to tie', Ru. *stegát'* 'to stitch, quilt', OHG *stehhan* 'to sting'. The Germanic forms may continue an as *e*-grade reinterpreted zero-grade **stikan-*, and can as such be compared with Lat. *instīgō* 'to incite', Gk. *στίζω* 'to stitch' (< **steig-*) (Kroonen 2013: "stekan-"). The Slavic forms may rather be compared to ON *stinga* 'to sting, stab' (Derksen 2008: "stegnò") and continue a Slavic-Germanic root *$ste(n)g^h$-.

(137) ***su̯erb^h-** 'to rub' (St: 57): Ru. *sverbét'* 'to itch', ON *sverfa* 'to file'. Within Germanic, the verb specialized from an original 'to rub' to mean 'to file' or 'to wipe (filings) away' (Got. *afswairban* 'to wipe away'). It is possible that the Slavic and Germanic forms belong together. I am uncertain whether Lit. *skveřbti* 'to pierce' (Derksen 2008: "svьrběti") and Latv. *svãrpsts* 'drill' belong here too.

(138) ***u̯eh$_2$(-)b-** 'call out' (St: 60): Ru. *vábit'* 'to call, lure', OHG *wuofan* 'to whine'. The forms are limited to Slavic and Germanic. The formation may be a variant of the wider attested roots (176) ***uHp-** 'to howl' and (233) ***(s)u̯eh$_2$g^h-** 'to make sound'.

[23] Similar semantics from this root are found in forms such as Gk. *νευρά* 'string, sinew' (< *$sneh_1$-ur/n-*) and OHG *snuor* 'cord' (< *$snoh_1$-r-*) (Philippa 2003: "snoer").

3.2. Forms that do not belong to the shared lexicon

In this section, forms will be discussed that I do not consider as a Baltic-Slavic-Germanic isogloss. Firstly, forms that are widespread in Indo-European will be treated. Secondly, forms that are limited to the European branches will be discussed. Subsequently, I will treat forms that are possibly Germanic borrowings into Balto-Slavic. Finally, forms will be discussed that either have an uncertain origin or constitute an invalid comparison.

3.2.1. Indo-European forms

The following forms are Indo-European in origin, which means that they often have cognates outside of Baltic, Slavic and Germanic. Some forms that seem morphologically unique to Baltic, Slavic and Germanic are included if they could have developed independently from each other.

(139) ***b^{h}elh$_1$-** 'to make noise' (St: 14, 15): Lit. *baĩsas* 'voice' (< **b^{h}ol-s-*), *bìlti* 'to speak', Ru. *boltát'* 'to babble', OHG *bellan* 'to bark'. The Germanic form may be a back-formation of *bullōn* 'to roar' (< **b^{h}l̥h$_1$-néh$_2$-*), a derivation from **b^{h}leh$_1$-* 'to bleat' (OHG **blāen*, Ru. *bléjat'*, both 'to bleat', Lat. *fleō* 'to cry') (Kroonen 2013: "blējan-"). The Balto-Slavic forms can also be derived from this root, although the circumflex accent of Lit. *baĩsas* remains unexplained in this case. The attestation of the root in Latin, and possibly in Hitt. *palu̯ae-* 'to cry out' (< **b^{h}lh$_1$-u̯o-i̯e-*) (Kloekhorst 2008: "palu̯ae-zi") shows that the word is not restricted to Balto-Slavic and Germanic.

(140) ***b^{h}erH-** 'brown' (St: 15): Lit. *bḗras* 'brown', OHG *bero* 'bear'. The bare adjective **b^{h}erH-* is only found in Baltic. The long vowel of the Lithuanian form may be secondary (Derksen 2015: "bė̀ras"). Two words denoting animals can be derived from the root **b^{h}erH-*: both PGm. **b^{h}erH-on-* 'bear' and PIE **b^{h}e-b^{h}rH-(u)-* 'beaver' are likely called after their colour (Kroonen 2013: "beran- 2"), (Derksen 2015: "bebras"). Since the word for 'beaver' is widespread, the root **b^{h}erH-* can be considered as Indo-European.

(141) ***b^{h}uHs-** '(to be) fast' (St: 16): OCS *bystrъ* 'quick', ON *bysja* 'to flow forward with force'. The Slavic form might be connected to Skt. *bhū́ṣati* 'to be active' (Derksen 2008: bỳstrъ), in which case it continues an adjective **b^{h}uHs-r-*. The Germanic verb might be connected too, if a semantic shift 'to be active' > 'to run actively' > 'to flow fast' is assumed.

(142) ***d^{h}oug^h-** 'strong, useful' (St: 17): Lit. *daũg* 'much, many', ORu. *djúžij* 'strong', Got. *daug* 'it is useful'. Both Balto-Slavic and Germanic retain the perfect present conjugation, but these forms could have been inherited. The root is not limited to Balto-Slavic and Germanic (e.g. Gk. *τυγχάνω* 'to succeed'). The semantic shift 'useful' > 'strong' > 'much' must be seen as a Balto-Slavic development. There is no reason to accept Stang's assumption of a Baltic-Slavic-Germanic isogloss based on semantic grounds.

(143) ***ǵ^{h}h$_2$-i-u̯-** 'to yawn' (St: 64): Lit. *žióvauti*, OCS *zěvati*, OHG *gewōn* (< **ǵ^{h}h$_2$-ei-u̯-eh$_2$-ie-*), all 'to yawn'. Next to the forms in **-u-* stand forms such as OCS *zijati* 'to open one's mouth' (< **ǵ^{h}h$_2$-i-eh$_2$-*) and OCS *zinǫti*, OHG *ginēn*, 'to yawn, open one's mouth' (< **ǵ^{h}h$_2$-i-n-eh$_1$-*). Forms in **-u-* are not limited to Balto-Slavic and Germanic, considering TochA. *śew-* 'to yawn' (Lubotsky 2011: 107-109).

(144) ***ǵ^{h}ieuH-** ‘to chew’ (St: 65): Lit. *žiáunos* ‘gills’ (< **ǵ^{h}ieuH-n-eh$_2$-*), Ru. *ževát’* (< **ǵ^{h}iuH-eh$_2$-*), OHG *kiuwan*, both ‘to chew’. The root is well attested outside of Balto-Slavic and Germanic (e.g. Modern Persian *ǰavīdan* ‘to chew’, Toch. *śuwā-* ‘to eat, consume’) (Adams 2013: “śu-”).

(145) ***ǵ^{h}or(H)-n-** ‘intestines’ (Oettinger 8, St: 65): Lit. *žarnà* ‘intestines, tube’, ON *gǫrn* ‘intestines’. The forms continue an *n*-stem to the root **ǵ^{h}er(H)-* ‘intestines’ (Lat. *haruspex* ‘haruspex’ (< **ǵ^{h}r̥H-u-*), Skt. *hirā́-* ‘vein’). The use of an *n*-suffix is not limited to Balto-Slavic and Germanic, considering Lat. *hernia* ‘hernia’ (< **ǵ^{h}er(H)-n-i̯eh$_2$-*) (Kroonen 2013: “garnō-”).

(146) ***h$_1$ol-ḱ-i-** ‘elk’ (St: 33): Ru. *los’*, ON *elgr*, both ‘elk’. The Slavic and Germanic forms are morphologically similar to Skt. *ṛ́śya-* ‘male antilope’ (< **h$_1$l̥-ḱ-i̯o-*) (Kroonen 2013: “algi- 1”). This points to an Indo-European origin of the word, originally denoting a certain type of deer. A different variant may be found in Gk. *ἔλαφος* ‘deer’.

(147) ***h$_1$os-r/n-** ‘harvest, autumn’ (St: 25): OPr. *assanis*, Ru. *ósen’*, both ‘autumn’, Got. *asans* ‘harvest’. The forms are related to Gk. *ὀπώρα* ‘end of summer’ (< **h$_1$opi* ‘at’ + **h$_1$os-r-* ‘end of summer’) (Beekes 2009: “ὀπώρα”). The variation of the suffix (*-r-*/*-n-*) suggests that this word was inherited as a neuter *r/n*-stem from PIE.

(148) ***h$_2$eḱ-mon-** ‘stone’ (St: 26): Lit. *akmuõ*, OCS *kamy*, both ‘stone’, OHG *hamar* ‘hammer’. Stang specifically connects the Slavic and Germanic words, based on their onset **ka-* (Stang 1972: 26). However, the Slavic form can best be explained as continuing **kaHmen-*, a metathesized form of PBSl. **Hakmen-*, as found in Lithuanian, Gk. *ἄκμων* ‘stone, anvil’ and Skt. *aśman-* ‘stone, heaven’ (Derksen 2015: “akmuo”). Within Balto-Slavic, the velar was depalatalized before the resonant (Kloekhorst 2011). The Germanic form may reflect **ḱh̥$_2$-mor-o-*, which must have undergone metathesis independently from the Slavic form. It may be compared to Gk. *καμάρα* ‘vault’ (Kroonen 2013: “hamara-”).[24] Another possibility is that the Germanic form was borrowed from Balto-Finnic (compare Fi. *hamara* ‘back of an axe’) (Hyllested 2014: 99).

(149) ***h$_2$eḱ-r-** in the meaning of ‘perch, bass’ (St: 13): Lit. *ešerỹs* ‘perch, fin’, ON *ǫgr* ‘(sea-)bass’ (< PGm. **agura-*). In both Baltic and Germanic, the fish was named after its typical sharp fin. The Baltic form can be a specialization of the wider attested PBSl. **eśer-* ~ **aśer-* ‘sharp piece’, considering Pol. *jesiory* ‘fishbone’ and *osiory* ‘awn, beard on wheat’ (Derksen 2008: “esera”). A similar semantic development may be found in Du. *voorn* ‘roach’ (< PGm. **furhnō-* ‘trout’ < **pr̥ḱ-néh$_2$-* ‘spotted’) (Kroonen 2013: “furhnō-”). The Baltic and Germanic forms may therefore have developed independently from each other.

(150) ***h$_2$loih$_1$-es-** ‘clay, loam’ (St: 31): OPr. *layso* ‘soil’, ON *leir* ‘clay, loam’. The Baltic and Germanic forms can be interpreted as *s*-stems from a widespread root **h$_2$loih$_1$-* (e.g. OHG *leimo* ‘loam’ < **h$_2$loih$_1$-mon-*, Gk. *ἀλίνειν* ‘to smear’) (Kroonen 2013: “laiman-”). Derivation with a suffix *-s-* is a common Indo-European phenomenon. The Germanic and Baltic forms could have been inherited or developed independently from each other.

(151) ***h$_2$po-h$_3$lh$_1$-** ‘to fall’ (St: 43): Lit. *pùlti*, OHG *fallan*, both ‘to fall’. Both forms can be compared to Gk. *ἀπόλλυμι*, Lat. *abolēre*, both ‘to destroy’ (Neri 2007). Forms without the prefix are Gk. *ὄλλυμι*

[24] The relationship between ‘stone’, ‘heaven’, ‘hammer’, ‘vault’ is probably based on a mythological worldview.

‘to destroy’, Hitt. *ḫallanna-i* ‘to trample down’ (Kloekhorst 2008: “ḫallanna-i, /ḫallanni-”). Therefore, the Baltic and Germanic forms have a solid Indo-European origin.

(152) ***h$_2$u̯olh$_1$-T-** ‘to rule’ (St: 61): Lit. *valdýti*, OCS *vlasti*, Got. *waldan*, all ‘to rule’. The forms are derived from **h$_2$u̯elh$_1$-* ‘to rule’ (e.g. Hitt. *ḫullezi*, *ḫullanzi* ‘to smash, defeat’, TochB. *walo* ‘king’, Lat. *valeō* ‘to be strong’). The similarity between the Balto-Slavic and Germanic forms is based on the dental suffix. The Balto-Slavic forms may reflect **h$_2$u̯olh$_1$-d^h(h$_1$)-*. ON *olla* ‘ruled’ (< **wulþō-*) reflects an old aorist **h$_2$u̯l̥h$_1$-t*, suggesting that Proto-Germanic did possess forms without a suffix. Germanic **waldan-* might therefore have developed secondarily, based on this aorist form (Kroonen 2013: “waldan-”).

(153) ***h$_3$erb^h-** ‘to serve’ (St: 44): OCS *rabъ* ‘servant’ (< **orbъ*), Got. *arbaiþs* ‘labour’. Stang doubts the relationship with Lat. *orbus*, Gk. *ὀρφανός*, both ‘orphan’, but it is reasonable to assume that orphans were expected to serve others in order to survive (Kroonen 2013: “arba-”). The meaning ‘servant, labour’ in Slavic and Germanic may be the result of a parallel evolution.

(154) ***h$_3$ri̯eǵ-** ‘to stretch’ (St: 44): Lit. *réižti* ‘to stretch’, OHG *reihhen* ‘to reach’. The forms may continue a secondary *e*-grade **h$_3$reiǵ-* based on a zero-grade **h$_3$riǵ-* from **h$_3$ri̯eǵ-*, possibly the original form of **h$_3$reǵ-* ‘to stretch’ (e.g. Gk. *ὀρέγω* ‘to reach out, stretch’) (Olsen 1993: 362).[25] In Germanic and Baltic, **h$_3$riǵ-* can be found next to **h$_3$reǵ-* (Lit. *rę́žti*, OHG *recken* (<**h$_3$roǵ-e̯e-*), both ‘to stretch’). OIr. *rigid* ‘he stretches’ continues either **h$_3$riǵ-* or **h$_3$r̥ǵ-* (Matasović 2009: “rig-o-”).

(155) ***h$_3$ri-nu-** ‘to run, stream, pour’ (St: 45): Pol. *ronić* ‘to drop, pour’, Got. *urrannjan* ‘to cause to rise’. The Germanic forms continue a causative to **rinnan-* ‘to run’ (< **h$_3$ri-nu̯-*) (OCS *rinǫti* ‘to push, shove’, Skt. *ríṇvati* ‘to make flow’) (Kroonen 2013: “rinnan-”). The Germanic causative form must have been derived from **rinnan-* after the inner-Germanic reanalysis of the suffix **-nu̯-* as root-final **-nn-*. Although the semantics of the Slavic verb is close, it is difficult to derive it from *rinǫti*. If it is derived from the same verb, it is probably a secondary formation.

(156) ***(H)reu(H)-k-** ‘to roar’ (St: 46): Lit. *rū́kti*, Ru. *rykát’*, OHG *ruhen*, all ‘to roar’. All forms continue the same stem **(H)reu(H)-k-*. This may be one variant of a verb ‘to roar’. Other variants may be **h$_3$reuH-* (Ved. *ruváti* ‘to roar’) (LIV: 306), **(H)reu-dH-* (Lat. *rudō* ‘to roar’) (LIV: 508), **h$_1$reuǵ-* (Lit. *ráugėti*, Gk. *ἐρεύγομαι*, both ‘to belch’) (Derksen 2008: “raugėti”). Because of this variety of forms, I find it unclear whether the variant in **-k-* must be regarded as specific for Balto-Slavic and Germanic.

(157) ***Ke-K(o)u(K)-** ‘cuckoo’ (St: 21): Lit. *gegužẽ*, ORu. *žegъzica*, ON *gaukr*, all ‘cuckoo’. The words are likely onomatopoeic, referring to the cuckoo’s song. Similar forms are found throughout Indo-European (Lat. *cucūlus*, Skt. *kokilá-*, Gk. *κόκκυξ*, all ‘cuckoo’) (De Vaan 2008: “cucūlus”). Although the Balto-Slavic and Germanic forms all contain **g$^{(h)}$* instead of **k*, it is difficult to ascertain an isogloss, in particular because of the onomatopoeic nature of the word.

(158) ***kseub^h-** ‘to rush’ (St: 50): Lit. *skubùs* ‘hasty’, Pol. *chybać* ‘to sway, rush’, OE *scēofan* ‘to shove’. The forms likely continue the root **kseub^h-*, which is found outside of Balto-Slavic and Germanic (Skt. *kṣóbhate* ‘to shake, tremble’) (Kroonen 2013: “skeuban-~skūban-”), OCS *skubati* ‘to tear’ does probably not belong here based on its semantics.

[25] A development of **ri̯V-* > **rV-* may be compared with the dissolution of the onset **li̯-* (e.g. **(l)i̯ek^w-r* ‘liver’) (Pooth 2014b: 17).

(159) ***kuHp-r-** ‘bump’ (St: 31): Lit. *kuprà* ‘bump, hunchback’, Ru. *kúp(e)r* ‘tail-piece’, OE *hofar* ‘bump’. The forms are *r*-stems derived from the root *****kouHp-* ‘heap’. The Baltic form seems to have an acute root, suggesting that the short *u* is secondary (Derksen 2015: “kupra”). The Germanic form continues a metathesized **kHup-r-*. Since the root **kouHp-* is attested outside of Balto-Slavic and Germanic (e.g. Av. *kaofa* ‘mountain’), and derivation by means of the suffix **-r-* was productive throughout Indo-European, the forms cannot be considered as specific Balto-Slavic and Germanic.

(160) ***k^{w}sel-** ‘to wash, rinse’ (St: 48): Lit. *skaláuti*, ON *skola*, both ‘to rinse’. Nw. *skvalpa* ‘to splash, lap’ suggests PGm. **skwal-*. ON *skola* may then continue PGm. **skul-*. To *skvalpa* may be compared Lit. *skalĩbti* ‘to do laundry’ (< **sk$^{(w)}$ol-b$^{(h)}$-*). Since **sk^{w}-* cannot have been a Proto-Indo-European onset because of the neutralization of velars after **s* (Beekes 2011: 125), the word must have been either a late development, or have possessed a different onset before. Skt. *kṣālayati* ‘to wash’ is supportive of the second possibility, suggesting an original root **k^{w}sel-* (Monier-Williams 1899: 327).

(161) ***leh$_1$(-)u-** ‘to let’ (St: 32): Lit. *liáuti* ‘to stop’, Cz. *leviti* ‘to reduce’, Got. *lewjan* ‘to deliver, betray’ (< ‘to let go’). This stem is limited to Balto-Slavic and Germanic. It may continue a *u*-present to the root **leh$_1$-* (LIV: 399), from which probably also Got. *letan* ‘to let’ is derived (Kroonen 2013: “lētan-”). Balto-Slavic and Germanic may both have continued or developed the *u*-present independently from each other. The semantics were already largely present in the Indo-European root **leh$_1$-*.

(162) ***les(H)-** ‘to pick, select’ (St: 31): Lit. *lèsti* ‘to pick, select’, OHG *lesan* ‘to collect, read’. Although this root is not widespread, the forms may be compared to Hitt. *lešš-zi* ‘to pick, gather’ (Kloekhorst 2008: “lešš-zi, lišš-”), suggesting an Indo-European origin.

(163) ***losi(-u̯o)-** ‘weak, bad’ (St: 34): Ru. *loš’* ‘bad’, Got. *lasiws* ‘weak’. An exact cognate of the Gothic form is TochB. *leswi* ‘attacks of weakness’ (Adams 2013: “leswi”) (< **lósi-u̯o-*). The Slavic forms can be connected as well (< **losi-*). The word is not a Slavic-Germanic isogloss.

(164) ***mog^{h}-** ‘to be able’ (St: 37): OPr. *massi* ‘he is able’, OCS *mošti*, Got. *magan* ‘to be able’. The root **meg^{h}-* is not limited to Balto-Slavic and Germanic, considering Skt. *maghá-* ‘power’, but the use of the preterite-present forms is (Kroonen 2013: “magan-”). Since the semantics ‘to be able’ are stative rather than durative, the use of the perfect (resultative, stative) is logical. That both Balto-Slavic and Germanic make use of the preterite-present forms may therefore be coincidental.

(165) ***mog^{h}-ti-** ‘might’ (St: 38): OCS *moštь*, Got. *mahts*, both ‘might, power’. The Slavic and Germanic forms are formally identical. They are verbal abstracts in **-ti-* derived from **mog^{h}-* ‘to be able’. Since the suffix **-ti-* is a productive way to derive verbal abstracts, the forms may have developed separately from each other.

(166) ***mosg-o-** ‘mesh’ (St: 35): Lit. *mãzgas* ‘knot’, OHG *masca* ‘mesh’. The forms may be compared to TochA. *masäk* ‘joint’. All forms can be derived from **mesg-* ‘to fasten together’ (e.g. Lit. *mègzti* ‘to knot’) (Adams 2013: “meske-”).

(167) ***nh$_2$-es-r-** ‘nostrils’ (St: 39): Lit. *nasraĩ* ‘snout, mouth of an animal’, OCS *nozdri*, G *Nüster*, both ‘nostrils’. In spite of the semantic shift within Lithuanian and the voicing of the Slavic forms, all forms are clearly Indo-European derivations from **nh$_2$-es-* ‘nose’. The Germanic form continues a dual **nustrī* (< **nh$_2$s-r-ih$_1$*) (Kroonen 2013: “nasō-~nusō-”). A cognate is Skt. *nasráḥ* ‘nose hole’, suggesting that the formation is Indo-European in origin.

(168) ***ped-/*pod-** ‘to carry, fetch’ (St: 42): OPr. *pijst* ‘to carry’, *pūdauns* ‘carried’, OE *fatian* ‘to fetch’. The Germanic forms derive from **pod-néh₂-* and have a Slavic cognate OCS *popasti* ‘to fetch’ (Kroonen 2013: “fat(t)ōn-”). Slavic and Germanic continue an *o*-grade **pod-*. Old Prussian continues **ped-/*pod-*. ON *fata* ‘to step’ suggests a connection with **ped-* ‘foot’. If so, the root may be identical to **ped-* ‘to fall’ (Skt. *pádyate* ‘to go, fall’), for which Rix suggested an original meaning ‘to put the foot down’ (LIV: 458). Both Germanic and Balto-Slavic forms can be derived from an original meaning ‘to step’.

(169) ***peiḱ-** ‘angry’ (St: 40): Lit. *pìktas* ‘angry’, OHG *fēhjan* ‘to hate’. The Baltic and Germanic forms are clearly related to Skt. *piśunaḥ* ‘angry’ and possibly to OIr. *oech* ‘enemy’ (Kroonen 2013: “faiha-1”), suggesting an Indo-European origin of the forms. The pure velar of the Baltic form has yet to be explained.

(170) ***per-n-** ‘last (year)’ (St: 42): Lit. *pérnai*, Got. *fairns*, both ‘last year’. The Baltic and Germanic forms share the *n*-suffix, which may be coincidental because of its productivity. Got. *af fairnin jera* ‘last year’ suggests that the semantics ‘last year’ only developed later from ‘last’ (Derksen 2015: “pernai”). The similarity between the Baltic and Germanic forms may therefore be te result of convergent evolution. A similar expression is found elsewhere in Indo-European (Gk. *πέρυσι*, Skt. *parút*, both ‘last year’ (< **per-ut-*)).

(171) ***ph₂-un-** ‘fire’ (St: 41): OPr. *panno*, Got. *fon*, both ‘fire’. Stang’s suggestion that these Baltic and Germanic forms constitute an isogloss cannot be upheld, since both forms are derived from **péh₂-ur*, obl. **ph₂-u̯én-/*ph₂-un-*. Gothic *fon* continues the Proto-Germanic nominative **fōr* (< **fōur*) with levelling of the oblique suffix **-n-* (Kroonen 2013: “fōr-~fun-”). The Old Prussian form may continue **pu̯an-* (< **ph₂-u̯on-*), although this is not certain.

(172) ***skelH-** ‘to split’ (St: 49): Lit. *skélti* ‘to split’, Ru. *ščel’* ‘split’, ON *skilja* ‘to separate’. The forms are not limited to Balto-Slavic and Germanic (e.g. Hitt. *iškall-* ‘to split’) (Derksen 2015: “skelti”).

(173) ***skh₁-ei-** ‘to shine’ (St: 47): OCS *sijati* (< **skh₁-i-eh₂-i̯e-*), Got. *skeinan*, both ‘to shine’. Stang doubts the connection to words for ‘shade, shadow’ (e.g. Skt. *chāyā́-* ‘shadow, reflection’), but the semantics ‘to shine’ has likely developed secondary within both Slavic and Germanic. A form such as Nw. *skina* ‘to shimmer’ might reflect the original semantics (Kroonen 2013: “skīnan-”).

(174) ***sph̥₁-ro-** ‘thriving’ (St: 53): OCS *sporъ* ‘abundant’, OHG *spar* ‘frugal’. Kroonen suggests that the Slavic word was borrowed from Germanic before Germanic underwent a semantic shift ‘rich’ > ‘frugal’ (Kroonen 2013: “spara-”). This is in my opinion unnecessary, considering Lat. *prosperus* ‘prosperous’, Skt. *sphirá* ‘fat’ (De Vaan 2008: “prosperus”).

(175) ***u̯elh₃-** ‘ghost, slain’ (St: 62): Lit. *vėlẽ* ‘soul, ghost’ (< **u̯elh₃-i̯eh₂-*), ON *valr* ‘the slain’ (*u̯olh₃-o-*). Both forms are derived from the wider attested Indo-European root **u̯elh₃-* ‘to slay’ (e.g. Hitt. *u̯alḫ(an)zi* ‘to hit, strike’, TochA. *wäl-* ‘to die’). The Baltic and Germanic forms show different root ablaut and suffixes, suggesting that the forms may have developed independently.

(176) ***uH(-)p-** ‘to howl’ (St: 59): Latv. *ũpêt* ‘to howl’, OCS *vъpiti* ‘to cry out’, OHG *ūfo* ‘eagle-owl’. The root is attested outside of Balto-Slavic and Germanic (Av. *ufyeimi* ‘to call out’) (Derksen 2008: “vъpìti”). Similar to the Slavic verb, this form must continue a metathesized **Hup-*. All forms probably continue a zero-grade of the root **u̯eh₂(-)p-* ‘to howl, cry out’, that may be compared to

(233) ***(s)u̯eh$_2$(-)g^h-** ‘to make sound’ and (138) ***u̯eh$_2$(-)b-** ‘to call out’. These formations might all be derived from a root **u̯eh$_2$-*, probably of onomatopoeic origin.

(177) ***upno-** ‘oven’ (St: 64): OPr. *wumpnis*, ON *ofn*, both ‘oven’. The forms may be compared to Hitt. *ḫapn-/ ḫappen-* ‘baking kiln’, Gk. *ὀπτάω* ‘to bake’ (< **h$_3$ep-*) (Kloekhorst 2008: “ḫapn-, / ḫappen-”). A connection to Gk. *ἰπνός* ‘furnace’ is tempting, but formally difficult.[26] Within Germanic, a form **ubn-/*umn-* is found besides **ufn-* (OSwed. *omn* ‘oven’). Lit. *ùblas* ‘oven to burn tar’ may have been borrowed from this variant (if < **ubnas*) (Stang 1972: 64). The Old Prussian form could reflect an inherited Baltic form **upn-*, or a borrowing from Germanic **ufn-* or **umn-*, in all cases involving an intrusive **-m-* or **-p-*. The *u*-vocalism of the Baltic and Germanic forms may reflect a secondary Germanic zero-grade, a Baltic zero-grade influenced by the labial, or a rare variant **u* for **h$_3$*.

(178) ***u̯reiḱ-** ‘to bend, turn’ (St: 45): Lit. *ríešas* ‘instep, wrist, knuckle’, OHG. *rīho* ‘instep’. Although both Baltic and Germanic forms show similar semantics, they continue different stems (**u̯reiḱ-o-* or **u̯reiḱ-i̯eh$_2$* for Baltic, **u̯reiḱ-on-* for Germanic) (Kroonen 2009: 285) from a stem **u̯reiḱ-* ‘to turn, bend’, that is also found in Gk. *ῥοικός*, *ῥικνός* ‘bent, crooked’, Av. *uruuisiia* ‘to turn around’ (Beekes 2009: “ῥικνός”). The meaning ‘joint, instep, wrist’ may have developed independently within Germanic and Baltic. The stem is probably derived from a root **u̯rei-*, to which (114) ***u̯reit-** ‘to twist’ may belong too.

3.2.2. Forms restricted to Europe

The following forms are restricted to the European branches of Indo-European (Celtic, Italic, Germanic, Baltic, Slavic, Albanian, Greek, Armenian). Some forms may have been borrowed from a non-Indo-European substrate. Other forms constitute a specific derivation from an Indo-European root.

(179) ***alu(-t)-** ‘ale’ (St: 13): Lit. *alùs* ‘beer’, ORu. *olъ* ‘fermented liquor’, OE *ealoþ* ‘ale’. The Baltic and Slavic forms may have been borrowed from Germanic, although not necessarily (Kroonen 2013: “aluþ-”). The forms may further be compared to Lat. *alūmen* ‘alum’ (a type of plant) and Gk. *ἀλύδ(ο)ιμον* ‘bitter’ (de Vaan 2008: “alūmen”). The forms may have been borrowed from a European substrate form **alu-* ‘bitter’.

(180) ***b^{h}oid-ei̯e-** ‘to force’ (St: 14): OCS *běditi* ‘to force, persuade’, Got. *baidjan* ‘to force’. The use of the causative is common to Slavic and Germanic. However, there is no reason to assume a Slavic-Germanic isogloss, since both language families could have inherited or developed these grammatical forms independently from each other as well. The root **b^{h}eid-* ‘to force, persuade’ also found in Gk. *πείθω* ‘to persuade’, and Lat. *fīdō* ‘to trust’. The original meaning of the word may have been ‘to suffer’ (ON *bíða* ‘to wait, suffer’) (Kroonen 2013: “bīdan-”).

(181) ***b^{h}olH-** ‘ill, evil’ (St: 15): OCS *boléti* ‘to be in pain, ill’, Got. *balwjan* ‘to torment’. Slavic continues **b^{h}olH-i-*, Germanic continues **b^{h}olH-u-*. A possible cognate is Old Cornish *bal* ‘illness’ (Derksen 2008: “bôlь”), suggesting that the root is not limited to Slavic and Germanic.

[26] Gk. *ἰπνός* ‘furnace’ should then reflect the development **CCC- > CiCC-*, e.g. *ἵππος* ‘horse’ (< **h$_1$ḱu̯os*), *πίτνημι* ‘to spread out’ (< *ptnéh$_2$mi*). A counterexample reflecting **h$_3$CC-* is *ὄσσομαι* ‘to look at’ (< **h$_3$ḱi̯e/o-*), unless this form was influenced by *ὄσσε* ‘both eyes’ (Kloekhorst 2014: 56-57).

(182) ***delg^h-** ‘to cut, scythe’ (St: 17): Lit. *dalgis* ‘scythe’, ON *telgja* ‘to cut, carve’. A similar root **d^{h}elg-* ‘to sting’ can be found in Lat. *falx* ‘hook, scythe’, ON *dálkr* ‘dagger, knife’, OIr. *delg* ‘thorn, pin’, Lit. *dilgùs* ‘stinging’ (Matasović 2009: “delgo-”). Both roots may belong together. Because of the variation in phonetic shape, the forms are likely borrowed from several European substrate dialects.

(183) ***dru(H)-eh$_1$-** ‘to trust’ (St: 20): OPr: *druwit* ‘to believe’, ON *trúa* ‘to believe, trust’. The forms can be interpreted as a stative formation to an adjective **dreu(H)-* ‘trustworthy’, as can be seen in OHG *trū(w)ēn* ‘to trust’ (Kroonen 2013: “trūēn-”) and OPr. *druwēmai* ‘we believe’ (Kortlandt 1985: 104). Because of the productivity of stative formations, these forms may have developed independently from each other. The adjective **dreu(H)-* may be compared to OIr. *derb* ‘certain, fixed’ (< **der-u̯o-*) (Matasović 2009: “derwo-”).[27]

(184) ***d^{h}olh$_2$-** ‘valley’ (St: 19): Bulg. *dol*, OHG *tal*, both ‘valley’. The word is not limited to Slavic and Germanic, as is shown by MW *dol* ‘meadow, dale’ and perhaps Gk. *θαλάμη* ‘den, lair’ (< **d^{h}l̥h$_2$-m-*) (Kroonen 2013: “dala-”). Based on its semantics, an origin in a European substrate language is likely.

(185) ***g^{h}ar(-s)-** ‘type of plant’ (St: 21): Lit. *garšas* ‘garden angelica’, *garšvė*, OHG *gers*, both ‘aegopodium podagraria’, Ru. *gorókh* ‘pea’. Although the word is not used for the same type of plant, similar forms are found throughout Europe (e.g. Arm. *gari*, OHG *gersta*, Gk. *κριθή*, all ‘barley’, Basque *gari* ‘wheat’, *garilar* ‘wild vetch’). The variation **gar-*~**gars-* may be compared with **b^{h}ar-*~**b^{h}ars-* ‘barley’. The forms were likely borrowed from pre-Indo-European farmer dialects.

(186) ***g^{h}eld^h-** ‘to compensate’ (St: 66): OCS *žlěsti* ‘to pay, compensate’, ON *gjalda* ‘to (re)pay’. It is possible that the Slavic word was borrowed from Germanic (Pronk-Tiethoff 2012: 185-186). Although Stang regards the connection to OIr. *geall* ‘pledge’ as dubious (Stang 1972: 66), I consider the semantics similar enough to regard a connection to the Slavic and Germanic forms as plausible.

(187) ***g^{h}lend-** ‘to shine’ (St: 22): Latv. *gleńst* ‘to perceive’, OCS *ględati* ‘to look at’, MHG *glinzen* ‘to shine’. Within Balto-Slavic, a semantic shift ‘to shine’ > ‘to look at’ took place. A similar development can be assumed for a probable Celtic cognate, OIr. *as-gleinn* ‘to examine’ (< **eks-gland-*) (Matasović 2009: “glan-n-do-”). Because of the Celtic form, the root is not limited to Balto-Slavic and Germanic.

(188) ***g^{h}lou-mo-** ‘joke, jubilation’ (St: 22): OCS *glumъ* ‘joke, game’, ON *glaumr* ‘jubilation’. Both Slavic and Germanic possess a *mo*-stem, derived from **g^{h}leu-* ‘to play’ (Lit. *gláuda*, Gk. *χλεύη* (< **g^{h}leu-s-*), both ‘joke’). The disagreement between the Slavic and Baltic suffixes suggest that the Slavic form may have only developed within Balto-Slavic. Therefore, there is no pressing reason to regard the Slavic and Germanic forms as one isogloss.

(189) ***ǵ^{h}olg$^{(h)}$-** ‘stake’ (St: 65): Lit. *žalgà* ‘stake, pole’, ON *galgi* ‘gallows’. Next to the Baltic and Germanic forms (< **ǵ^{h}olg^h-*) stands Arm. *jałk* ‘rod, stick’. This form may continue **ǵ^{h}olg-*. If it continues **ǵ^{h}olg^h-* instead, the *-k-* must be a secondary. The word may be compared to Fi. *salko* ‘stick, pole’ (< PFU **śalka-*) (Kroonen 2013: “galgan-”). Another variant may be found in Lit. *žúolis*, Arm. *joł*, both ‘pole’ (Martirosyan 2009: “jałk”). It is most probable that **ǵ^{h}olg$^{(h)}$-* has been borrowed from a European substrate language.

[27] The adjective **der-u̯o-* is probably derived from **der-u-*/**dor-u-* ‘tree’. The semantics ‘thrustworthy’ must then have developed from ‘strong, stable (like a tree)’. Lat. *rōbustus* ‘strong’ (< *rōbur* ‘oak’) has a similar semantic shift. (Kroonen 2013: “trewwu-”).

(190) ***g^{h}rend^h-** ‘beam, frame’. (St: 24): Lit. *grindà* ‘wooden floor in a barn, flooring of a bridge’, Ru. *grjadá* ‘ridge, flower bed’, ON *grind* ‘lattice door, fence’. The word is used for wooden bars (e.g. OHG *grintil* ‘wooden bar, plank’) and for wooden constructions (e.g. Lit. *grindà*, Ru. *grjadá*, ON *grind*). A probable cognate elsewhere in Indo-European is Lat. **grunda* ‘roof’ (De Vaan 2008: “grunda”).

(191) ***g^{w}eh$_1$b^h-** ‘marshy, slippery’ (St: 20): OPr. *gabawo* ‘toad’ (< *$g^wh_1b^h$-), Ru. *žába* ‘toad’ (< *$g^weh_1b^h$-eh_2), E *quab* ‘marshy place’. Based on the Germanic form and the possible Armenian cognate *kaw* ‘clay’ (Olsen 1999: 24), the original meaning of the word may have been ‘marshy, slippery’. Several forms denoting ‘marshy animals’ have been derived from this root (e.g. Baltic and Slavic ‘toad’, MLG *quabbe* ‘eelpout, gudgeon’). Lat. *būfō* ‘toad’, probably a borrowing from a Sabellic language, might belong to this root too, although its meaning is not entirely certain (De Vaan 2008: “būfō”).

(192) ***g^{w}elH-** ‘to hurt’ (St: 21): Lit. *gélti* ‘to sting, hurt’, Bulg. *žal* ‘grief, pity’, OHG *quelan* ‘to suffer’. A connection with Arm. *keł* ‘wound’ is possible. LIV (207-208) separates these forms from *g^welh_1- ‘to throw, hit’ (Gk. *βάλλω* ‘to throw, hit’, MW *aballu* ‘to die’ (< ‘to throw away’)). I see no reason why this separation is necessary, since an original meaning ‘to throw, hit’ can account for the semantics found in Baltic, Slavic, Germanic and Armenian.

(193) ***h$_1$en-sth$_2$-** ‘intestines, intestinal fat’ (St: 25): Lit. *įsčios* (< *$h_1n̥$-sth_2-$i̯eh_2$-), MHG *inster* (< *h_1en-sth_2-ro-), both ‘entrails’. Although composed from the same elements *h_1en- ‘in’ and *sth_2- ‘to be located’, the forms do not necessarily constitute a Baltic-Germanic isogloss. Firstly, the suffix differs (*-$i̯eh_2$-/*-ro-) (Kroonen 2013: “instra-”). Secondly, a similar formation is Lat. *intestīnum* ‘intestines’ (< *$h_1n̥ter$-sth_2-o-) (De Vaan 2008: “intestīnus”). More basal formations are ON *iðr*, Gk. *ἔντερα*, both ‘intestines’ (< *h_1en-ter- ‘interior’) (Kroonen 2013: “inþera-”).

(194) ***h$_1$reb^h-** ‘covering’ (St: 44): OCS *rebro* ‘rib, edge’ (< *h_1reb^h-ro-), OHG *rippi* ‘rib’ (< *h_1reb^h-$i̯o$-). The original meaning of the wider attested European root *h_1reb^h- must have been ‘to cover’ (e.g. Gk. *ἐρέφω* ‘to cover, provide with a roof’). OHG *hirni-reba* ‘skull’ (lit. ‘brain cover’) shows that this meaning was still present within Germanic. The derivation PGm. **rebja*- ‘rib’ may therefore represent an inner-Germanic development. In addition to the different suffix that is used by the Slavic and Germanic forms, this suggests that the forms likely developed independently from each other. The inital vowel of Gk. *ὄροφος* ‘roof’ must be secondary (Beekes 2009: “ἐρέφω”).

(195) ***h$_2$eng^{wh}-r-** ‘larva, maggot’ (St: 40): Lit. *inkštìras* ‘larva, blackhead’, Ru. *úgor’* ‘eel, blackhead’, OHG *angar* ‘maggot’. All forms are derived from *h_2eng^{wh}- ‘snake’. The Lithuanian example is a seconady form of *ankštìras*, in itself probably be a variant of *ungurỹs* ‘eel’, that can better be compared with the Slavic forms (< *h_2eng^{wh}-$r̥$-$i̯o$-) (Derksen 2015: “ankštiras”). The Germanic forms continue *h_2eng^{wh}-r-. The use of the root for ‘snake’ to denote eels, larvae or maggots (‘little snakes’) can also be found in Lat. *anguīlla* ‘eel’ (< *h_2eng^{wh}-in-l-) (De Vaan 2008: “anguis”).

(196) ***h$_2$oid-sth$_2$-** ‘testicle, kidney’ (St: 25): Lit. *ìnkstas* ‘kidney, testicle (dial.)’, OCS *istesa* ‘kidneys’, ON *eista* ‘testicle’. The forms can be derived from *h_2eid- ‘to swell’ with the same locational suffix *-sth_2- as in *h_1en-sth_2- ‘intestines’. A similar formation may be found in Albanian *eshke* ‘kidney’ (if < *h_2oid-sk-eh_2-) (Kroonen 2013: “aistōn-”). This suggests that the use of this root to denote a human organ is not limited to Balto-Slavic and Germanic. The nasal in the Lithuanian form arose by analogy to *įsčios* ‘entrails’ (Derksen 2015: “inkstas”).

(197) ***h$_3$lemh$_1$-** ‘to beat up’ (St: 33): Lit. *lìmti* ‘to break’ (< **h$_3$lm̥h$_1$-*), OCS *lomiti* ‘to break’, OHG *lemjan* ‘to cripple’. Slavic continues a causative, Germanic merged a causative and factitive (Kroonen 2013: “lamjan-”). Because the causative was a productive class, these forms may have developed independently from each other. Further cognates are OIr. *laime* ‘axe’ and Lat. *lanius* ‘butcher’.

(198) ***kab^{h}u(-K)-** ‘hawk, falcon’ (St: 30): Ru. *kóbec*, ON *haukr*, both ‘hawk’. The forms should not be separated from Lat. *capus* ‘falcon’, that may have been reshaped by analogy to *capere* ‘to take’ (Kroonen 2013: “habuka-”). The word can be seen as a European Wanderwort.

(199) ***kai-lo-** ‘whole’ (St: 25): OPr. *kailūstikan* ‘health’, OCS *cělъ*, Got. *hails*, both ‘whole’. The Old Prussian form may have undergone a semantic shift ‘to make whole’ > ‘to heal’. A further probable cognate is Lat. *caelum* ‘sky’ (< ‘the whole’). A secondary meaning ‘sacred’ can be found in OW *coilou* ‘omens, auguries’ and OHG *heilag* ‘holy’. Gk. *κοῖλυ* ‘good, beautiful’ is sometimes compared, but the semantics of this form are uncertain (Beekes 2009: “κοῖλυ”).

(200) ***ḱh$_1$-ei-ro-** ‘dark, grey’ (St: 47): OCS *sěrъ*, ON *hárr*, both ‘grey’. The forms can be compared to OIr. *cíar* ‘dark, murky’. The Slavic forms may have been borrowed from Germanic (Kroonen 2013: “haira-”), although this is not necessary. The forms are derived from the root **ḱeh$_1$-* ‘gray, spotted’ (Lubotsky 1989: 56-57).

(201) ***kemer-** ‘hellebore’ (St: 16): Lit. *kẽmeras* ‘hemp agrimony’, ORu. *čemerъ*, OHG *hemera*, both ‘hellebore’. This floral term is also found in Gk. *κάμ(μ)αρος* ‘aconite’, and is therefore not limited to Balto-Slavic and Germanic (Beekes 2009: “κάμαρος 1”). Because of its semantics as a natural term, the word has probable been borrowed from a European substrate language.

(202) ***kenh$_2$-k-** ‘knee, heel’ (St: 27): Lit. *kìnka*, *kenklẽ*, both ‘hollow of the knee’, ON *hǽll* ‘heel’ (< **hanhila-*). Both forms continue a root **kenh$_2$-* with an extension **-k-*. Forms that utilize an extension **-m-* are OHG *hama* ‘shank’, Latv. *cim̃slis* ‘hamstring, shank’, OIr. *cnáim* ‘bone’, Gk. *κνήμη* ‘shank’ (Beekes 2009: “κνήμη”). I consider it possible that all language families originally possessed both forms in **-k-* and **-m-*, as is the case in Germanic, but lost one of them due to the similar semantics of both forms.

(203) ***kleh$_2$-** ‘to cover, put, load’ (St: 29): Lit. *klóti* ‘to cover’, OCS *klasti* ‘to put, load’, OE *hladan* ‘to load’. The Slavic verb is extended with **-d$^{(h)}$-*, the Germanic verb with **-t-*. The semantics ‘to load, to put in’ are close to ‘to put over, to cover’. The verb **(s)kleh$_2$u-* ‘to close’ may well be derived from this root (Derksen 2015: “kloti”). If so, then **(s)kleh$_2$-u-*, **kleh$_2$-d$^{(h)}$-* and **kleh$_2$-t-* must be interpreted as several derivations of **kleh$_2$-*. The derivations **-d$^{(h)}$-*, and **-t-* must be specific Slavic and Germanic developments. The derivation in **-u-* is discussed below (204) ***kleh$_2$u(-D)-**. The bare root is retained only in Baltic.

(204) ***kleh$_2$u(-D)-** ‘to stick, get, obtain’ (St: 29): Lit. *kliū́ti*, *kliudýti* ‘to stick, obstruct’, OE *hléotan* ‘to obtain by lots’. The forms may continue a Baltic-Germanic root **kleuH-* with extensions **-d^{h}h$_1$-* for *kliudýti* and **-dh$_3$-* for *hléotan* (Kroonen 2013: “hleutan-”). However, it is possible to explain the forms as derived from **(s)kleh$_2$u-* ‘to close’ (Ru. *ključ’* ‘key’, OHG *sliozan*, Lat. *claudō*, Gk. *κλείω*, all ‘to shut’) (De Vaan 2008: “clāvis”). The meaning ‘to stick, obstruct’ found in the Lithuanian forms may then have developed from ‘to close in’. The meaning of the Germanic forms ‘to obtain by lots’ may have developed from ‘to get what is decided’ (compare Du. *besluiten* ‘to decide’). Because of the difference in suffixes used by Baltic and Germanic, and the spread of the stem elsewhere in Indo-

European, there is no reason to assume a Baltic-Germanic isogloss. The stem itself is probably derived from (203) ***kleh$_2$-**.

(205) ***ḱoi-m-** ‘village, home’ (St: 28): Lit. *kiẽmas*, *káimas* ‘village’, ON *heimr* ‘home’. The forms can be interpreted as a *mo*-stem to the root *ḱei-* ‘to lie’. The Lithuanian comparanda used by Stang must be understood as a Germanic borrowing because of the plain velar and the acute accent in *káimas* (Derksen 2015: “kiemas”). Better Balto-Slavic cognates to the Germanic form are Lit. *šeimà*, Ru. *sem'já*, both ‘family’. A further cognate is probably OIr. *cóim* ‘dear’ (< ‘homely’) (Matasović 2009: “koymo-”), suggesting that the word is not limited to Balto-Slavic and Germanic. A different derivation in *-*m-* is Gk. *κοιμάω* ‘to lay to rest’ (Beekes 2009: “κεῖμαι”).

(206) ***kouk-o-** ‘to bend, hill’ (St: 27): Lit. *kaũkas* ‘lump’, *kaũkaras* ‘hill’, Ru. *kúča* ‘heap’, Got. *hauhs* ‘high’. These words may continue **kouk-o-* from which also MIr. *cúar* ‘curved’ stems. A connection with TochB. *kauc* ‘high’ is not directly possible. The forms may be derived from a Proto-Indo-European word **keu-* ‘up, high’ (compare (273) ***koub-**, (274) ***koug-o-**) (Adams 2013: “kauc”).

(207) ***k^{w}eǵ$^{(h)}$-n-** ‘to back down’ (St: 16): Ru. *čéznut’* ‘to vanish’, Far. *hvøkka* ‘to be startled’. Both Slavic and Germanic forms continue nasal presents to the root **k^{w}eǵ$^{(h)}$-*. It is probable that Lat. *conquinīscō*, *conquēxī* ‘to crouch down’ belongs to this root too.

(208) ***lend^h-** ‘land’ (Oettinger 2, St: 33): OPr. *lindan* ‘valley’, Ru. *ljadá* ‘field’, Got. *land*, ‘land’. Stang is uncertain about the connection with the Celtic forms (OIr. *-land* ‘land’) because this would imply a paradigm with both quantitative and qualitative ablaut **lend^h-*/**lond^h-*/**l̥nd^h-* (Stang 1972: 33). Such an alternation may point to a disappeared verb **lend^h-* or to a borrowing from a European substrate.

(209) ***leug^h-** ‘to lie’ (St: 35): Lit. *lūgóti* ‘to request’, OCS *lъgati*, Got. *liugan*, both ‘to lie’. The semantics of the Lithuanian form are distant from the Slavic and Germanic forms. Got. *analaugns* ‘hidden’ may point to an original meaning ‘to hide’ (Kroonen 2013: “laugnjan-”). This makes a connection to OIr. *follugaid* ‘to hide’ plausible.

(210) ***lub^h-** ‘bast, plank’ (St: 34): Lit. *lubà* ‘plank’, Ru. *lub* ‘bast’ (< **loub^h-o-*), ON *loft* ‘loft, air’ (< **lub^h-tu-*). The semantics suggest that the early Proto-Germanic and Proto-Balto-Slavic speakers used to cover their roofs with tree bark (Kroonen 2013: “luftu-”). Related forms are OE *lēaf* ‘leaf’ (< PGm. **laub-*) and Lat. *liber* ‘tree bark, book’ (< **lub^h-ro-*) (De Vaan 2008: “liber”). Because of its semantics as a natural term, it is probable that the form has been borrowed from a European substrate language.

(211) ***meh$_3$-i̯e-** ‘to tire’ (St: 35): Ru. *májat’*, OHG *muoen*, both ‘to tire’. The continuation of a *-i̯e-*stem is common to Slavic and Germanic. Because of the productivity of the suffix **-i̯e-*, it is possible that the forms have developed independently from each other. The root **meh$_3$-* is further found in Gk. *μῶλος* ‘effort’ and Lat. *mōlēs* ‘burden’. Affinity with TochA. *māska-* ‘to be difficult’, as has been suggested by Peyrot, is uncertain (Adams 2013: “mesk-”).

(212) ***moin-ei̯e-** ‘to think’ (St: 36): OCS *měniti*, OHG *meinen*, both ‘to think, mean, believe’. Both Slavic and Germanic continue a causative formed to **mein-* ‘to think’ (e.g. OIr. *mían* ‘wish’) (Matasović 2009: “mēno-”). Because of the productivity of the causative, there is no pressing reason to assume a Slavic-Germanic isogloss.

(213) ***mVnoKo-** ‘many’ (St: 39): OCS *mъnogъ*, Got. *manags*, both ‘many’. The Slavic form continues **m(u)nog^{h}o-*, the Germanic form **monog^{h}o-*. A similar form is MW *mynych* ‘frequent, abundant’ (< **menekki-*) (Matasović 2009: “menekki-”). Because of the variation in phonology and the non-Indo-European structure of the word, it has probably been borrowed from a pre-Indo-European substrate language (Boutkan and Siebinga 2005: 257).

(214) ***neh$_2$u-i-** ‘to need, starve’ (St: 39): Latv. *nâve* ‘death’, OCS *navь*, Got. *naus*, both ‘corpse’. The Balto-Slavic forms continue **néh$_2$u-i-*, The Germanic forms continue **nh̥$_2$u-i-* (Kroonen 2013: “nawi”). The use of an *i*-stem is not limited to Balto-Slavic and Germanic, considering OIr. *naunae* ‘famine’ (< **neh$_2$u-in-*), and PCelt. **nāwito-* ‘need’ (Matasović 2009: “nāw(i)nyā-”, “nāwito-”).

(215) ***neh$_2$u-ti-** ‘need, distress’ (St: 39): OPr. *nautin*, Got. *nauþs*, both ‘need’. The forms continue a verbal abstract in **-ti-* from **neh$_2$u-* ‘to need, starve’. Because the formation of verbal abstracts in **-ti-* was a productive process within Indo-European, the forms may have been either inherited as part of the verb **neh$_2$u-* or created within both language families independently from each other.

(216) ***neu-D-** ‘to desire’ (St: 40): Lit. *panū́sti* ‘to crave’, OE *nēod* ‘desire’. The Lithuanian form may be connected with Slavic forms such as Cz. *nýti* ‘to yearn’, suggesting a reconstruction **nuh$_1$-*/**nud-* (Derksen 2008: “nyti”). This means that the Germanic forms (< **neud^h-*) remain isolated. It is possible that both Balto-Slavic and Germanic forms are derived from the root **neu-* ‘to nod’ (Gk. *νεύω* ‘to incline, nod’). If so, the Baltic, Slavic and Germanic forms may be interpreted as different derivations from this root.

(217) ***Pal-T-** ‘marsh’ (Matasović 2014: 83): Lit. *balà* ‘marsh’, OCS *blato* ‘swamp’ (< **balH-t-*), OHG *pfuol* ‘pool’ (< **bāl-*). The Slavic form can be compared to MoGk. *βάλτος* ‘swamp’, Albanian *baltë*, Romanian *baltă*, both ‘mud, swamp’, suggesting that the form in **-t-* was present in a Balkan substrate (Derksen 2008: “bòlto”). Lat. *palūs*, *palūdis* ‘fen, swamp’ probably belongs here too (Kroonen 2013: “pōl-”). I am uncertain of the connection between Lit. *balà* and *bãlas* ‘white’. The word has likely an origin in a European substrate.

(218) ***pon-i̯o-** ‘fen, swamp’ (St: 40): OPr. *pannean* ‘moor’, OHG *fenni* ‘swamp’. The forms may be compared to Gaulish *anam* ‘swamp’ (if from < **pn̥-Ho-*) and MIr. *enach* ‘swamp’ (< PCelt. *fenākos*) (Matasović 2009: “feno-”). Its semantics as a natural term suggests the term is borrowed from a European substrate language.

(219) ***plok-** ‘flat object’ (St: 42): Lit. *plãskana*, Nw. *flass*, both ‘scale’. The Lithuanian form can be connected to *plãkanas* ‘flat’. Within Latvian, a variation *plask-*/*plaks-* occurs. Both forms probably continue **plok-sk-* (OCS *ploskъ* ‘flat’) (Derksen 2015: “plasks”). These forms can be compared to OHG *flah* ‘flat’ (< **flakk-* < **plok-n-*) and Gk. *πλάξ* ‘plain’ (Kroonen 2013: “flaka-”). The root **plok-* is therefore attested outside of Balto-Slavic and Germanic. The origin of Nw. *flass* remains unknown.

(220) ***pug-** ‘to blow’ (St: 43): Latv. *pũga* ‘gust of wind’, Ru. *pugá* ‘snow storm’, ON *fjúka* ‘to be blown away’. All forms continue a root **peug-*/**pug-*. The possible Armenian cognate *p’uk(‘)* ‘breath, wind’ suggests that the root is not limited to Balto-Slavic and Germanic (Kroonen 2013: “fuk(k)ōn-”).

(221) ***selh$_1$-** ‘to take, hand over’ (St: 56): OCS *sъlati* ‘to send’ (< **slh$_1$-eh$_2$-*), Got. *saljan* ‘to lodge’ (< **solh$_1$-e̯i̯e-*). Stang is uncertain about the connection between these forms. However, both forms may be

compared to Gk. *ἑλεῖν* ‘to take, seize’ (Kroonen 2013: “saljan-”). I consider the semantic development ‘to hand over’ > ‘to send’ as found in Slavic as probable.

(222) ***sHl-u̯o-** ‘murky’ (Oettinger 22, St: 52): Ru. *solovój* ‘yellowish gray’, ON *sǫlr* ‘pale, yellow’. The forms may be connected to Lat. *salīva* ‘saliva’ if this form is derived from an unattested adjective **saluus* (compare *vocīvus* ‘vacant’, derived from *vacuus* ‘empty’) (De Vaan 2008: “salīva”). The stem may therefore not be restricted to Balto-Slavic and Germanic. The root **sHl-* is further found in W *halog* ‘dirt’ (Matasović 2009: “salā”).

(223) ***silVb^{h}r-** ‘silver’ (St: 47): Lit. *sidãbras*, OCS *sьrebro*, Got. *silubr*, all ‘silver’. Forms outside of Balto-Slavic and Germanic are Celtiberian *śilaPur* and Basque *zilharr*, both ‘silver’. The word has probably been borrowed from a pre-Indo-European language, possibly from the Iberian peninsula, where a large silver industry was present. A connection to Akkadian *ṣarp-* ‘silver’ is problematic. A connection with Proto-Berber **-z̥rVp-* ‘silver’ might be possible (Boutkan and Kossmann 2001: 3-11).

(224) ***(s)kel-** ‘to owe, be guilty’ (Oettinger 3, St: 48): Lit. *skelḗti* ‘to owe’, Got. *skal* ‘he owes’. The original meaning of the root is ‘bent, to be crooked’. The semantic development ‘crooked’ > ‘wrong’ > ‘guilty’ may have occurred in both language families independently from each other and has a parallel in Gk. *σκολιός* (‘crooked’ > ‘unjust’).

(225) ***sker-b^h-/*skr-eb^h-** ‘to scratch’ (St: 49, 58): Lit. *skeřbti* ‘to cut’, *skrebéti* ‘to rustle’, Ru. *ščerbá* ‘scratch’, *skrestí* ‘to scratch’, OE *sceorfan* ‘to scratch, bite’, ON *skrapa* ‘to scrape’. A Latin cognate is *scrobis* ‘pit, hole in the ground’, (De Vaan 2008: “scrobis”). The form is probably derived from the root **(s)ker-* ‘to cut’ (ON *skera* ‘to cut, shave’).

(226) ***sker-d^h-** ‘to cut off’ (St: 49): Lit. *skeřsti* ‘to butcher’, OCS *oskrъdъ* ‘pickaxe’, OHG *skurz* ‘cut off’. Old High German *skurz* (< **skurta-*) is derived from PGm. **skurtōn-* ‘to cut off’ (< **sk̥rd^h-néh$_2$-*) (Kroonen 2013: “skertan-”). The verb is further attested in OIr. *scerdaid* ‘to scrape, peel off’ (Matasović 2009: “skerd-(y)o-”). The form is probably derived from **(s)ker-* ‘to cut’ (ON *skera* ‘to cut, shave’).

(227) ***smelH-** ‘to smoulder, tar’ (St: 51): Lit. *smélti* ‘to smear oneself (with tar), to become opaque’, Ru. *smolá* ‘pitch, tar, resin’, Du. *smeulen* ‘to smoulder’. A further possible cognate is MIr. *smál*, *smól*, *smúal* ‘ember, ashes’, suggesting that the root is not limited to Balto-Slavic and Germanic.

(228) ***sont-ei̯e-** ‘to send’ (St: 48): Lit. *siųsti*, Got. *sandjan*, both ‘to send’. Both forms are causatives to **sent-* ‘to go’. Since the causative is a productive class, the forms may have developed independently from each other. The root is further found in OIr. *sét* ‘road’ (Matasović 2009: “sentu-”). The vocalism of the Baltic form remains difficult to explain (Derksen 2015: “siųsti”).

(229) ***spreud/h$_1$-** ‘to squeeze in, sprout’ (St: 53): Lit. *spráusti* ‘to squeeze in’, Latv. *sprauties* ‘to come through’ (< **spreuh$_1$-*), OHG *spriozan* ‘to sprout’. A further possible cognate is MW *ffrwst* ‘rush, haste’ (< **sprud-to-*) (Matasović 2009: “sfrusso-”).

(230) ***sth$_2$-eb^h-o-** ‘pole’ (St: 54): Lit. *stãbas* ‘post’, ON *stafr* ‘staff’. MIr. *sab* ‘shaft, pole’ may belong here too (Matasović 2009: “stabo-”). Considering its semantics, a reconstruction **sth$_2$-eb^h-o-*, a derivation from **steh$_2$-* ‘to stand’ is possible (compare Lit. *stãlas* ‘table’ (< **sth$_2$-el-*)).

(231) ***stog^h-o-** ‘pole’ (St: 54): Lit. *stãgaras* ‘dry stalk’, Ru. *stožará*, OCS *stogъ*, both ‘hay stack’ (< ‘pole (of a haystack)’), OHG *stacho* ‘pole’. The root is not limited to Balto-Slavic and Germanic, considering Gk. *στόχος* ‘brick pillar’. The forms with suffix **-oro-* are only found in Balto-Slavic. The Germanic forms continue a paradigm **stagō*, **stakkaz* (Kroonen 2013: “stakan-”). The word was probably originally used to denote a high pole, around which hay could be stacked (Stang 1972: 54).

(232) ***stoih$_2$-n-** ‘stone’ (St: 55): OCS *stěna* ‘wall’, Got. *stains* ‘stone’. Although both Slavic and Germanic forms show an *n*-stem, the forms could have developed separately from each other due to the productivity of the suffix. The root **steih$_2$-* may have already possessed the semantics ‘to become hard as rock’, considering Gk. *στία* ‘pebble’ (< **stih$_2$-i̯eh$_2$-*).

(233) ***(s)u̯eh$_2$g^h-** ‘to make sound’ (St: 56): Lit. *svagéti* ‘to make sound’, Got. *swegnjan* ‘to rejoice’, *gaswōgjan* ‘to sigh’. The forms may be compared to Gk. *ἠχη* ‘sound’ (Beekes 2009: “ἠχη”) and may therefore not constitute a Baltic-Germanic isogloss. Lat. *vāgīre* ‘to wail’ may belong here, although this form shows **-g-* instead of **-g^h-*. The root may be compared to (176) ***uH(-)p-** ‘to howl’ and (138) ***u̯eh$_2$(-)b-** ‘to call out’.

(234) ***su̯elH-** ‘to burn’ (St: 57): Lit. *svìlti* ‘to scorch, singe’, OE *swelan* ‘to burn’. The Baltic and Germanic forms can be compared to Gk. *εἴλη* ‘heat of the sun’ (Beekes 2009: “*εἴλη*”). The root may have a variant form **su̯eld-* (ON *svelta* ‘to starve’) (Kroonen 2013: “sweltan-”).

(235) ***teuHk-** ‘(bottom) fat’ (St: 59): Lit. *tùkti* ‘to become fat’, OCS *tukъ* ‘fat’, OHG *dioh* ‘thigh’. The Balto-Slavic and Germanic forms can be compared to MIr. *tón* ‘podex’, MW *tin* ‘bottom’ (< PCelt. **tuknā*, with a shortening of the **ū* because of Dybo’s Law) (Matasović 2009: “tuknā”).

(236) ***treh$_2$t-** ‘to exhaust’ (St: 59): Lit. *trótinti* ‘to irritate’ Ru. *trátit’* ‘to spend’, Got. *þroþjan* ‘to exercise’. All forms can be connected to each other through a meaning ‘to exhaust someone/oneself’. The forms can be further compared to MW *trawd* ‘weak’ (Kroonen 2013: “þrōdjan-”).

(237) ***treud-** ‘to push’ (St: 59): OCS *trudъ* ‘labour’, OE *þrēotan* ‘to weary’. The forms may be compared to Lat. *trūdō* ‘to push, thrust’ (De Vaan 2008: “trūdō”). It is probable that Latin preserves the original semantics. Within Germanic, semantics shifted towards ‘to harass, bother’ (Got. *usþriutan* ‘to harass, bother’) and ‘to sadden’ (Du. *verdrieten*) (Kroonen 2013: “þreutan-”). Within Slavic, the semantics became more physical (OCS *trudъ* ‘labour’). The accentuation of the Slavic forms is problematic, since it contradicts Winter’s Law (Derksen 2008: “trudъ”). It seems possible to me that the root is a variant of **treuH-* ‘to rub’.

(238) ***u̯eis-** ‘marshy plant, twig, wisp’ (St: 63): Lit. *viksvà* ‘sedge’, *vìksris* ‘sedge, bulrush, ORu. *višь* ‘marsh grass’, Cz. *viech*, *vích* (< **u̯is-*) ‘wisp’, ON *veisa* ‘marsh, puddle’, *vísir* ‘bud’, OHG *wisc* (< **u̯is-g-*) ‘wisp’. The original meaning of the root **u̯eis-* is probably ‘reed cane, twig’, which can explain Lit. *viksvà*, *vìksris* ‘sedge’, ORu. *višь* ‘marsh grass’ and ON *veisa* ‘marsh, puddle’. A secondary meaning ‘wisp’, a stick with straw attached on the top used in agriculture, can be explained by this original meaning as well. The derivation **u̯is-g-* is found in OHG *wisc*, Lit. *vizgà* ‘sedge’ (Derksen 2015: “vizga”) and Lat. *virga* ‘shoot, twig, rod’ (De Vaan 2008: “virga”), suggesting that the root **u̯eis-* is not limited to Balto-Slavic and Germanic. Within Germanic, a second derivation **u̯is-p-* can be found too (E *wisp*).

(239) ***u̯elH-n-** ‘to undulate’ (St: 63): Lit. *vilnìs*, OCS *vlьna*, OHG *wella*, all ‘wave’. The use of an *n*-stem to the Indo-European root **u̯elH-* is common to Balto-Slavic and Germanic. The Germanic forms may have developed within Germanic under influence of the *n*-present **u̯elH-n-* (ON *vella* ‘to seethe’) (Kroonen 2013: “wallan-”). The similarity between the Balto-Slavic and Germanic forms may therefore be due to coincidence. To the same root, an *m*-stem is found in ON *olmr* ‘raging’ (< ‘boiling’) (Kroonen 2013: “wulan-”) and Skt. *ūrmíḥ* ‘wave’ (< **u̯l̥H-m-*).

(240) ***u̯elK-** ‘wet’ (St: 63): Lit. *vìlgti* ‘to become wet’, RCS *vъlgъkъ* ‘moist’, OHG *welk* ‘damp’. Next to **u̯elg-* stands a similar form **u̯elk-*, that is also found in Celtic (ON *valgr*, Latv. *valks*, both ‘wet’, MIr. *folc* ‘heavy rain’) (Matasović 2009: “wolko-”). The forms are probably borrowed from a European substrate language.

(241) ***u̯er(-s)-** ‘elevation on the skin’ (St: 61): OPr. *warsus* (< **u̯or-s-u-*), ON *vǫrr* (< PGm. **war-z-ō-*), Got. *wairila* (< PGm. **wer-ila-*), all ‘lip’. The forms can be derived from a root **u̯er(-s)-* ‘elevation on the skin’, that is also found in OE *wearr* ‘callus’ (< **u̯or-s-o-*), ON *warta* ‘wart’ (< PGm. **war-tō(n)-*), Lat. *verrūca* ‘wart, hillock’ (< **u̯(e/o)r-s-*) (Kroonen 2013: “warza-”). The meaning ‘lip’ that is found within Baltic, Norse and Gothic, must have developed within each language independently, considering the differences in morphology.

(242) ***u̯og^{wh}-i̯o-** ‘wedge’ (St: 60): Lit. *vãgis*, ON *veggr*, both ‘wedge’. Since both forms contain an identical morphology and meaning, it is possible that one of the forms is a borrowing from the other (Kroonen 2013: “wagja-”). The root **u̯og^{wh}-* is further found in ON *vangsni*, OPr. *wagnis*, Gk. *ὀφνίς* (< **u̯og^{wh}-ni-*) and Lat. *vōmer* (< **u̯og^{wh}-(s)mi-*), all ‘ploughshare’ (De Vaan 2008: “vomer”).

(243) ***u̯olh$_1$-** ‘round’ (St: 60): OPr. *walis* ‘drawbar’ (< **u̯olh$_1$-i̯o-*), Lit. *ap-valùs* ‘round’, Got. *walus* ‘staff’ (< ***u̯olh$_1$-u-*). All forms can be derived from **u̯elh$_1$-* ‘to roll’ (Kroonen 2013: “walu-”). The forms do not necessarily constitute a Baltic-Germanic isogloss. The shared stem ***u̯olh$_1$-u-** ‘round’ may have formed already in (late) Proto-Indo-European, and is also found in Lat. *volvō* ‘to go around’ (< **u̯elh$_1$-u-*) (De Vaan 2008: “volvō”).

3.2.3. Possible Germanic borrowings into Baltic and Slavic

The following forms may be interpreted as Germanic borrowings into Balto-Slavic.

(244) ***graT-** ‘spiky object’ (St: 24): Ru. *grot* ‘spear’, MHG *grāt* ‘fishbone’. The word has a limited spread in Slavic (besides Russian in OPol. *grot* ‘spear’, Cz. *hrot* ‘spike’). Within Germanic, the word is problematic. PGm. **grēd-* can account for MHG *grāt*, G *Grat* ‘sharp ridge’, *Gräte* ‘fishbone’. In Middle Dutch, *graat* and *graad* ‘fishbone’ were used next to each other. A similar form PGm. **grat-* ‘spike’ may account for OHG *graz* ‘branch of coniferous wood’. It is possible that a form of **grat-* was borrowed into Slavic as a weapon term (Philippa 2003: “graat”).[28] This leaves **grēd-*/**grat-* as a specific Germanic problem. The variation of the forms is reminiscent of *n*-stems such as PGm. **snēgō*, **snakkaz* (Kroonen 2009: 209).

(245) ***kai-d-** ‘to become hot’ (St: 25): Lit. *kaĩsti* ‘to become hot’, ON *heitr* ‘hot’. The Baltic forms are possibly borrowed from Germanic (Kroonen 2013: “haj(j)a-”). This would explain the final root-dental **t* found in both language families and the occurrence of the pure velar in Baltic. The Germanic form

[28] Compare OHG *gart-* ‘prickle’.

**hait-* can be derived from **kai-* (from which OHG *hei* 'heat, drought'). The further etymology remains unknown.

(246) ***klein-** 'meagre, thin' (St: 29): Lit. *klíenas* 'thin', OE *hlǣne* 'meagre, lean'. The English word may be explained as a derivation from *hlǣnan* 'to cause to lean' ('caused to lean (by hunger)' > 'meagre') and must therefore have developed relatively late. This leaves the Lithuanian word isolated. I suggest the form may have been a late borrowing from a West-Germanic language (compare Du. *klein* 'small' (< 'slender')).

(247) ***lis-ti-** 'trick' (St: 33): OCS *lьstь* 'ruse, deceit', Got. *lists*, 'ruse, trick'. The word is a verbal abstract with the suffix **-ti-* from the verb **leis-* 'to track' (Got. *lais* 'he knows' (< **lisan-*)) (Kroonen 2013: "lisan-"). OHG *list* 'knowledge' (< **lista-*) is probably close to the original meaning. The semantic shift 'to track' > 'ruse, trick' is probably specific for Gothic. Based on this assumption, it is likely that the Slavic word is a borrowing from Gothic (Pronk-Tiethoff 2012: 145).

(248) ***por-mo-** 'freight' (St: 43): Ru. *poróm*, OHG *farm*, both 'freight'. This word is a *mo*-stem derived from **por-e-* 'to go' (OHG *faran* 'to go'). It is difficult to derive the Slavic form from PSl. **pariti* 'to fly, hover' (Derksen 2008: "pariti"). It must therefore have been an old form or a borrowing. Since the verb OHG *faran* has a specialized meaning 'to travel' (< 'to go, lead') (Kroonen 2013: "faran-"), it seems probable that the form **farma-* 'freight' developed within Germanic. It was then borrowed into Slavic, presumably through trade.

(249) ***rēp-** 'roof beam' (St: 45): OCS *rěpii* 'type of beam', ON *ráfr* 'roof'. Germanic continues an *s*-stem **rēp-es-* (Kroonen 2013: "rēfiz-"). It is semantically unlikely that the Old Church Slavonic form is related to Ru. *repéj* 'burdock'. I consider it possible that the Slavic form was borrowed from Germanic, in particular from Gothic, considering the vocalism (Pronk-Tiethoff 2012: 205). The further origin of the word remains unknown.

(250) ***ske(h_1)-i-r-** 'pure' (St: 58): Pol. *szczery* 'pure, honest', Got. *skeirs* 'clear'. Both forms are derived from the stem **ske(h_1)-i-* 'to shine' (OCS *sijati*, Got. *skeinan*, both 'to shine'). The Slavic forms show an onset with restored **sk-* next to forms with a regular outcome **š* (Ru. *ščíryj* 'true, open' vs. *širój* 'broad' (< **skei-r-*) (Matasović 2012: 474).[29] There is no good analogy for the restoration of **sk-* because the verb PSl. **sijati* 'to shine' had already lost the onset **sk-* in Proto-Balto-Slavic. Furthermore, one needs to explain why such an analogy had not taken place in Ru. *širój* 'broad' and its cognates. It seems therefore possible to me that the forms with onset **sk-/*šč-* reflect a borrowing from Germanic (**skīri-* 'pure').

(251) ***skūb^h-** 'brush' (St: 17): Ru. dial. *čup(r)* 'bush', OE *scēaf* 'sheaf'. The Germanic forms can be derived from PGm. **skūbō, *skuppaz* (OHG *scoup*, ON *skúfr*, both 'bundle, sheaf'). A derivation from **skeuban-* 'to shove' is uncertain. Within Slavic, besides Ru. *čup(r)* there exist forms ending in **-b-*. This suggests that these forms were borrowed from Germanic (Kroonen 2009: 121-122).

(252) ***spei-tl-** 'bar, pike, spoke' (St: 52): Lit. *spielóti* 'to pin up', MHG *spīle* 'bar, pike'. The word can be interpreted as a derivation from a European root **spei-* 'pointed object' (see also (101) ***spei-g-**).

[29] PIE **sk-* largely remained **sk-* in Proto-Balto-Slavic, except for **ski-* > **śi-* (OCS *sijati* 'to shine' < **sk(H)i-*) (Derksen 2008: "sijàti"). Within Proto-Slavic, remaining **sk-* > **x-* (> **š-* after the first palatalization). **sk-* (> **šč-* after the second palatalization) was reintroduced in some forms, likely by analogy to prefixed forms (Matasović 2012).

German dialectal forms such as *Speidel* ‘spoke’ suggest PGm. **spīþla-* (< **spei-tlo-*) (Kroonen 2017: 106). Du. *spijl* reflects **spīla-* with a loss of **þ*. The Lithuanian form was probably borrowed from a Germanic form **spīl-* (Stang 1972: 52), since otherwise Lit. **spiekla-* would have been expected

(253) ***sth$_2$-tlo-** ‘steel’ (St: 41): OPr. *pannu-staclan* ‘fire striker’, OHG *stahal* ‘steel’. Endzelin suggests that the Old Prussian form may have been borrowed from Germanic (Stang 1972: 41). If so, it is an interesting observation that the Prussian term denotes a tool. This could mean that the original Germanic form was **staþla-*, that later underwent the sound change **þl* > **hl* (Kroonen 2013: “stahla-”). An original meaning may have been ‘tool to make stand or create a fire’.

(254) ***strēlo-** ‘sharp pointed object’ (St: 55): Lit. *strėlà*, OCS *strěla*, OHG *strāla*, all ‘arrow’. Within Germanic, the semantics were expanded (e.g. OS *strāla* ‘arrow, thunderbolt’, Du. *straal* ‘beam’). The accentuation of the Slavic forms suggest a reconstruction without a laryngeal (under the assumption it is not a later borrowing) (Pronk-Tiethoff 2012: 197). OS *strāl* ‘comb’ (Kroonen 2013: “strēlo-”) suggests that the original semantics in Germanic was ‘sharp pointed object’. This opens up the possibility that the semantics ‘arrow’ developed only within Germanic, and that the Balto-Slavic forms were indeed borrowed from Germanic.

(255) ***u̯eK-ti-** ‘thing, entity’ (St: 63): OCS *vešt*ь ‘thing’, Got. *waihts* ‘thing, entity’. The morphology and semantics of the Slavic and Germanic forms are identical. They may continue **u̯eǵ^h-ti-* ‘that which is carried’ or **u̯ek^w-ti-* ‘that which is discussed’. Since the forms are identical, it seems possible to me that the Slavic forms were borrowed from Germanic.

(256) ***u̯orb-** ‘warp of a fabric’ (St: 64): Ru. *vórob* ‘reel’, ON *varp* ‘throw of a net, warp’. The Germanic forms can be explained as a derivation from **werpan-* ‘to throw’. The original semantics ‘throw of a net’ are found in Old Norse. The semantics ‘warp of a fabric’ could have developed due to the resemblance of a warp to a spread out net. Since the secondary semantics in the field of weaving may have developed within Germanic, the Russian forms (besides *vórob* also *voróba* ‘compass cord’, *voróby* ‘swift for yarn’), which are isolated within Slavic, are probably borrowed from Germanic. This suggests that a Germanic form in *-b-* must have existed, since Germanic *-p/f-* (OHG *warf* ‘warp’) would have resulted in Slavic *p* (Pronk-Tiethoff 2012: 211-214).

3.2.4. Uncertain forms and invalid comparisons

The following forms do either have an uncertain origin or form an invalid comparison.

(257) ***brang$^{(h)}$-** ‘to press, expensive’ (St: 15): Lit. *brangùs*, *brángti* ‘(to become) expensive’, Latv. *brangs* ‘exquisite’, MLG *prangen* ‘to press, flaunt’. The Germanic meaning ‘to flaunt’ is likely secondary, given Got. *anapraggan* ‘to press’, although the exact semantic shift remains unclear. The original semantics are difficult to compare to the Baltic forms. Latv. *brangs* may not be related to Lit. *brangùs* due to its late attestation. It may have been borrowed from MLG *wrancsch* ‘being strong, tough’ (> ‘being good’ > ‘exquisite’) (Vanags 2004: 238-9). This would leave Lit. *brangùs*, *brángti* isolated.

(258) ***b^{h}eh$_2$-i̯e-** ‘to speak’ (Oettinger 7): OCS *bajati* ‘to tell’, OE *bōjan* ‘to brag’. The suffix **-i̯e-* seems common to both forms. However, the Old English form may be a variant of *bōgan* (compare Du. *bogen* ‘to pride oneself on’) (Philippa 2003: “bogen”), and is as such unrelated to the Slavic form.

(259) ***drask-** ‘to tear’ (St: 19): Lit. *draskýti* ‘to tear apart’, Elfd. *trask* ‘dirt on the road’, Swe. *trasa* ‘rag’. The forms are not wide-spread and the semantics are not necessarily close to each other. It is best to regard a connection between the Baltic and Germanic forms as uncertain.

(260) ***d^{h}ouH-i̯e-** ‘to die’ (St: 18): OCS *daviti* ‘to suffocate’, Got. *afdauiþs* ‘tormented’. The Germanic form can be explained as a lengthened form **(af-)dōwjan-* from **daujan-* ‘to die’ < **d^{h}ouH-i̯e-*, an *o*-grade intensive form of **d^{h}euH-* (e.g. Got. *diwans* ‘mortal’). The verb can be compared to Hitt. *tuḫḫušzi* ‘to end’ (Kroonen 2013: “daujan-”). The Slavic form is not necessarily related, since a specialization ‘to die’ > ‘to strangle’ is not straightforward. The form may be related to Gk. *Ζεὺς θαύλιος* ‘the strangling Zeus (?)’ instead (Derksen 2008: “dāvìti”). It is therefore uncertain whether the Germanic and Slavic forms are related to each other.

(261) ***d^{h}reiT-** ‘to have diarrhea’ (St: 20): SCr. *drískati*, ON *dríta*, both ‘to shit’. The Slavic forms have to be derived from **d^{h}reiT-sk-* with loss of the root-final dental (Derksen 2008: “driskati, dristati”) in order to be connected to the Germanic forms. Lit. *tríesti* ‘to suffer from diarrhea’ and *trìdė* ‘diarrhea’ seem to continue **treid^h-*, which can be a metathesized form of **d^{h}reit-*. A root-final **t* requires that the Germanic form is secondary (**drīt-* < **drītt-* < **d^{h}reit-n-*) (Kroonen 2013: “drītan-”). Because of all the complications, it is better to regard the origin of the root(s) as uncertain.

(262) ***d^{h}rog^h-** ‘to carry’ (St: 20): Ru. *drogá* ‘centre pole of a wagon’, OHG *tragen* ‘to carry’. The Russian form is likely a variant of **drǫ́gъ* (see (15) ***d^{h}ronK-**) (Derksen 2008: “droga”), implying that it can probably not be compared to the Germanic form.

(263) ***(e)rV(m)b-** ‘grouse’ (St: 46): Lit. *jeru(m)bẽ* ‘hazel-grouse’, Latv. *rubenis* ‘black grouse’, ORu. *erjabь* ‘partridge’, ON *rjúpa* ‘grouse’. The Lithuanian and Slavic form may continue **erV(m)b$^{(h)}$-*, Latv. *rubenis* is closer to the Old Norse form, that both may continue **r(e)ub-n-*. However, it is possible that the Norse form was derived from PGm. **rup(p)ōn* ‘to belch’, which means that the similarity to the Latvian form is coincidental (Kroonen 2013: “rup(p)ōn-”). It is therefore uncertain whether the Germanic forms are connected to the Balto-Slavic forms, which were probably borrowed from a pre-Indo-European substrate language.

(264) ***ǵeiH-** ‘to blossom’ (St: 65): Lit. *žydéti* ‘to blossom’ (< **ǵeiH-d^h-*),OHG *kīnan* ‘to sprout, blossom’ (< **ǵei-n-eH-*). A possible Armenian cognate is *cil*, *cił* ‘bud, sprout, piece of wood’ (< **ǵiH-l-*, compare MHG *kil* ‘onion’) (Kroonen 2013: “kila-”), although this is not certain (Martirosyan 2009: “cil”). Depending on the validity of the Armenian cognate, it remains uncertain whether the root can be considered as a Baltic-Germanic isogloss.

(265) ***h$_1$róh$_1$-d^h-** ‘rod’ (St: 44): ORu. *rátišče* ‘lance shaft’, OHG *ruota* ‘rod’. The origin of the Slavic forms is unclear, especially given its alternations in form (OCS *rat(ov)ište*). The Germanic forms continue PGm. **rōdō*. Interesting is ME *rodde* ‘rod’. The variation in forms may reflect a Proto-Germanic *n*-stem **rōdō*, **ruttaz*, possibly derived from **rō-* ‘to row’ (< **h$_1$roh$_1$-*).[30] The original meaning of the Germanic formation may then have been ‘rudder’.

(266) ***kag-** ‘hook’ (St: 30): Ru. *kógot’* ‘claw’, OHG *hāko* ‘hook’. If the Slavic and Germanic words are related to each other, we have to reconstruct a Proto-Germanic nominative **hēkō* instead of **hēhō* (Kroonen 2009: 205-206). This would make OHG *hāho* ‘hook’ a secondary form. The Slavic forms

[30] The pattern of such an *n*-stem would fit within the **a*~**u* alternating class (Kroonen 2009: 171-185).

have a limited spread, being only found in Russian and in Sorbian *kocht* ‘thorn, spike’. It seems better to me to regard a connection between the Slavic and Germanic forms as uncertain.

(267) ***ḱerH-** ‘hair’ (St: 58): Lit. *šerỹs* ‘bristle’, OHG *hār* ‘hair’. Although the Germanic form may be related to the Baltic one, it is also possible that they are a derivation **kes-ró-* from **kes-* ‘to comb’ (Hitt. *kiš(an)zi* ‘to comb’, OCS *česati* ‘to pluck’). The lengthened vowel in PGm. **hēra-* may be the result of compensatory lengthening after the loss of **z* before **r* (< **hezra-* < **kes-ró-*) (Gąsiorowski 2012: 120). Because of the ambiguous etymology of the Germanic forms, it is unclear whether the Baltic and Germanic forms belong together.

(268) ***klenK-** ‘to walk, kneel’ (Matasović 2014: 85): Lit. *klénkti* ‘to walk with difficulty’, SCr. *kléčati* ‘to kneel’ (< **klenk-*), OHG *hlanca* ‘thigh’ (< **klong-*). It is difficult to compare the Baltic and Slavic forms to the Germanic ones. The meaning ‘thigh’ probably developed from ‘side’ (< ‘to bend’), as can be seen in MHG *link* ‘left’. (Kroonen 2013: “hlankjan-”). This adds a semantic difference to the difference in the root-final velar. The Germanic forms may be compared to Lat. *clingō* ‘to gird’, although this word is not widely attested.

(269) ***knaist-** ‘fire, spark’ (St: 30): OPr. *knaistis* ‘fire’, OHG *g(a)neista* ‘spark’. Stang suggests that the Germanic words may derive from **ga-hnaista-*, based on the attested OHG forms, meaning that a comparison with the Old Prussian word is possible (Stang 1972: 30). Kroonen assumes that the Germanic word was based on **gnaistōn-* ‘to gnash the teeth’ (ME *gnāsten*) based on the similar sound (Kroonen 2013: “gnaista(n)-”). If so, the semantics ‘spark, fire’ must have developed within Germanic. The Old Prussian form might then be a borrowing from Germanic, although an onset **gn-* is expected in that case. Because of the ambiguity regarding the origin of the Germanic forms, it is best to regard a connection between the Baltic and Germanic forms as uncertain.

(270) ***kolp-** ‘crossbeam’ (St: 26): Lit. *kálpa* ‘crossbeam’, OHG *halb* ‘handle’. Lit. *kálpa* must be related to OPr. *kalpus* ‘specific beam in a wagon’. The Germanic form is not necessarily related. It could also have been derived from **helpan-* ‘to help’ or **halba-* ‘half’ (implying a pair of handles). It is uncertain whether the Baltic and Germanic forms belong together.

(271) ***korb-** ‘to curve, contract’ (St: 30): Ru. *koróbit’* ‘to warp, contract’, Nw. *harpa, hurpa* ‘to draw together’. The etymology of both forms is uncertain. One possibility is to connect the Russian form to *kórob* ‘box, basket’. The Germanic forms might be connected to PGm. **harp-* ‘harp’, itself probably derived from **kerp-* ‘to pluck’ (if < **korp-n-*). The meaning ‘to draw together’ may have originally been used to denote the fingers or snares of the instrument drawing together while playing. Both explanations are unsatifying. It remains therefore uncertain whether the Slavic and Germanic forms belong together.

(272) ***ḱorH-m(n)-** ‘lye, urine’ (St: 57): Lit. *šármas* ‘lye’, MHG *harm, harn* ‘urine’. Because of the process of leaching lye from wood ashes, Derksen follows Būga in deriving the Lithuanian form from **ḱorH-* ‘grey’, to which also Lit. *šìrnas* ‘grey’ and *šarmà* ‘hoarfrost’ belong (Derksen 2015: “šarmas”). It is semantically difficult to connect this root with the Germanic forms.

(273) ***koub-** ‘heap’ (St: 27): Lit. *kaũbras* ‘hill’, OHG *houf* ‘heap’. Stang compares these Baltic and Germanic forms because of the direct agreement of the root-final consonant. However, the Germanic forms likely derive from **kouHp-no-* (Kroonen 2013: “haupa-”), allowing them to be compared with, OCS *купъ* ‘heap’ (< **kouHp-*), Lit. *kaũpas* ‘heap’, Av. *kaofa* ‘mountain’ (< **koupH-*) instead. Lit. *kaũbras* (and Latv. *kauburs* ‘hill’) might reflect **kou-b^h-r-*. Latv. *baũgurs* ‘hillock’ might reflect a

metathesized form of *kauburs* with a secondary *g*. Ru. *bugór* ‘hillock’ was probably borrowed from this form (see also Matasović 2014: 90). Compare further (206) ***kouk-o-** and (274) ***koug-o-**.

(274) ***koug-o-** ‘heap, hill’ (St: 27): Lit. *k(i)augė*, *kū́gis*, *kuogė* ‘heap, barn’, Latv. *kàudze* ‘heap, barn’, ON *haugr* ‘high’, *húka* ‘to squat’. Both comparisons of the Baltic forms with the Germanic ones cannot be upheld, since ON *haugr* may continue (206) ***kouk-o-** (Lit. *kaũkaras* ‘hill’, MIr. *cúar* ‘curved’) (Matasović 2009: “kukro-”), and ON *húka* can be connected to the root **kouk-*/**kuk-* ‘to bend’ too (Kroonen 2013: “hūkan-”). The Baltic forms may represent yet another stem from a root **keu-*. See also (273) ***koub-**.

(275) ***kreH(-s)-** ‘beauty’ (St: 30): Ru. *krasá* ‘beauty’, ON *hrósa* ‘to praise, boast’. The etymology of the Slavic forms is uncertain. It may be compared to Lit. *gražùs* ‘beautiful’ instead, suggesting it has been borrowed from a substrate (Derksen 2008: “krāsà”). The Old Norse form may best be compared to ON *hróðr* ‘praise, fame’ (< **kreH-*, compare Skt. *carkárti* ‘to praise’) and could have developed within Germanic. It is possible that the Slavic word is derived from **kreH-* too. However, because of the ambiguity of the etymology of the Slavic forms, it is best to regard a connection between the Slavic and the Germanic forms as uncertain.

(276) ***kreu-** ‘to fall’ (St: 31): OPr. *krūt* ‘to fall’, Latv. *kràulis* ‘precipice’, ON *hrynja* ‘to fall down, flow’, *hrjóta* ‘to fall, break’. Latv. *kràulis* may be connected to *kṛaũt*, *kṛàut* ‘to heap, pile’ (Derksen 2015: “krauti”). ON *hrynja* can be derived from PGm. **hrunjan-*. It is unclear whether this reflects an earlier **krun-* or **kr̥n-*, and the word has no further cognates within Germanic. ON *hrjóta* is derived from PGm. **hreutan-*, itself secondarily derived from **kr̥t-néh$_2$-*, and is therefore not related to the Baltic forms (Kroonen 2013: “hurton-~hruton-”). This leaves the Prussian form unaccounted for.

(277) ***krōp-** ‘roof’ (St: 55): OCS *stropъ* ‘roof’, ON *hróf* ‘roof, boat-shed’. The semantics of the Old Norse form can be compared to OIr. *cró* ‘enclosure, shed’ (Matasović 2008: “krāfo-”). The Slavic form has been explained by assuming a phonological development **ḱr-* > **sr-* > **str-*. However, an initial velar was depalatalized before **r* in Balto-Slavic (Kloekhorst 2011). It is therefore unlikely that the Slavic form is related to the Germanic and Celtic forms.

(278) ***leiHb^h-** ‘meagre, weak’ (St: 32): Lit. *láibas* ‘thin’, Ru. *libívyj* ‘weak’, OE *lēf* ‘weak, ill’. The Old English form may be related to Du. *laf* ‘weak, cowardly’, ON *lafa* ‘to hang loosely’ instead of the Balto-Slavic forms. This means it cannot continue a form **leiHb^h-*, **loiHb^h-* or **liHb^h-*. The Germanic forms are therefore probably not connected to the Baltic and Slavic ones.

(279) ***lup-** ‘lip’ (St: 34): Lit. *lū́pa* ‘lip’, MLG *lobbe*, *lubbe* ‘fat, hanging lips’. ON *lubba* ‘large stock fish’ suggests that the original meaning of the Germanic forms must have been ‘fat lobe-like (fish)’ (Philippa 2003: “lob”). Secondary semantics are found in MLG *lobbe* ‘stockfish, cuff, fat hanging-lips’, MDu. *lobbe* ‘stockfish, cuff, ruff’. PGm. **lubbō(n)-* ‘stockfish’ is probably borrowed from a substrate language. The form cannot be linked to **lip-* ‘sticky, fat’. Lit. *lū́pa* may perhaps be connected to *lùpti* ‘to peel’ if it originally denoted ‘peeled off lips’, although this is not certain. The semantics of the early Germanic forms are difficult to compare with that of the Lithuanian form.

(280) ***meh$_1$-l-** ‘point in time’ (St: 35): Lit *tuomẽl* ‘in one go’, ON *mál* ‘measure, point in time, meal’. The Germanic forms may be derived from **meh$_1$-* ‘to measure’. As Stang points out, the vowel and accent of the Lithuanian form are difficult to derive from the same root (Stang 1972: 36). As such, it is not possible to regard these forms as a Baltic-Germanic isogloss.

(281) ***mel-** ‘sandbank’ (St: 36): Ru. *mel’* ‘sandbank’, Elfd. *mjåg* (< PGm. **melg-*) ‘river bank’. The Slavic form may be related to Lit. *smẽlis* ‘fine sand’ (< **(s)mēlH-*) (Derksen 2008: “mělь”). The Germanic form continues **melh-*/**melg-* (< **mel-k-*), and may therefore be connected to the same root. It is however limited to North Germanic and a relationship with the Balto-Slavic forms can only be assumed on root-level.

(282) ***peil-** ‘knife’ (St: 41): Lit. *peĩlis* ‘knife’, Ru. *pilá* ‘file, saw’, OHG *fīhala* ‘file’. The Slavic form is borrowed from Low German (Pronk-Tiethoff 2012: 152-153). In order for the Germanic forms to be related to the Baltic ones, one has to assume that *fīhala* has replaced an older **fīla* by analogy to OHG *bīhal* ‘axe’ (Stang 1972: 41). However, it is better to derive the Germanic forms from **finhilō-* (< **pinḱ-el-eh₂*). The root **peiḱ-* ‘to carve out, ornament, paint’ is widespread in Indo-European (e.g. Gk. *πικρός* ‘sharp, pointed’, Skt. *piṃśáti* ‘to carve, ornament’). The comparison between the Baltic and Germanic forms is therefore invalid.

(283) ***ple(H)ḱ-** ‘to flay’ (St: 42): Lit. *plẽšti*, ON *flá*, both ‘to flay’. Kroonen derives the Germanic form from **plok-* ‘flat’ (Kroonen 2013: “flahan-”). This is semantically possible, imagining the “flattening” of an animal or the use of a flat board to flay an animal. Because the Lithuanian form possesses other semantics, such as ‘to plow, pluck’, it may better be connected with **pleh₁ḱ-*, **pol(h₁)ḱ-eh₂* ‘fallow’ (Oettinger 55).

(284) ***reg^{h}-** ‘to stick out’ (Matasović 2014: 86): Lit. *rãgas*, OCS *rogъ*, both ‘horn’ (< **rog^{h}-o-*), MHG *regen* ‘to stand upright’. The Germanic form may continue **krek-* (compare OHG *hragēn-* ‘to loom over’) (Kroonen 2013: “hrag/kkōn-”), and can as such not be compared to the Balto-Slavic forms. The connection with Gk. *ἄρχω* ‘to rule’ (LIV: 498) is unlikely, since this form seems to continue **h₂r̥-sk-e/o-* ‘to be first’ (Beekes 2009: “ἄρχω”).

(285) ***(s)ḱeuH-** ‘to shoot’ (St: 57): Lit. *šauti* ‘to shoot’, Ru. *sovát’* ‘to shove, thrust’, ON *skjóta* ‘to shoot’. The Balto-Slavic forms continue **ḱeuH-* ‘to shoot, shove’ (Derksen 2008: “sovati”). The Germanic verb **skeutan-* ‘to shoot’ can be interpreted as a secondary full-grade form of **skuttōn-* ‘to shoot’, itself likely a derivation with a secondary zero-grade **u* from **sket-* (Lit. *skàsti* ‘to jump’, Lat. *scatō* ‘to gush forth’) (Kroonen 2013: “skeutan-”). The comparison between the Balto-Slavic and the Germanic forms is therefore invalid.

(286) ***skrond^{h}-** ‘cattle stomach’ (St: 49): Lit. *skrañdis* ‘cattle stomach’, Nw. *skrott* ‘body’. The forms might be related, but they are not widespread. Therefore, it is too uncertain whether they form a Baltic-Germanic isogloss.

(287) ***slei-k-** ‘worm’ (St: 50): Lit. *slíekas* ‘earthworm’, OE *slāwyrm* ‘blindworm’. Stang briefly mentions Torp’s suggestion that the Germanic forms (also Nw. *(orm)slo*, Swe. *slå*, both ‘blindworm’) continue PGm. **slaihwō-*, in order to connect this stem to the Baltic forms. This would suggest a proto-form **slei-k-*, and for Germanic **sloi-k-u̯-*. However, it is possible that the Germanic forms continue a less complicated stem **sloi-u̯o-*. Although both Baltic and Germanic forms are probably derived from **sle(h₁)i-* ‘slippery, slimy’, it is uncertain whether they utilized the same derivational suffix(es).

(288) ***snorK-** ‘nose mucus, to snore’ (St: 51): Lit. *snarglỹs* ‘nose mucus’, Latv. *snerglis* ‘saliva’, MDu. *snorken* ‘to snore’. The Baltic forms may represent **snorg$^{(h)}$-l-i-*. The Germanic form is possibly an

iterative formation (< **snurk(k)ōn-*) to the verb **snerhan-* (e.g. MHG *snurren* 'to snore'). These forms may continue **snerk-* and can therefore not be linked directly to the Baltic forms.

(289) ***sping-** 'to spark' (St: 52): Lit. *spingéti* 'to flicker', OE *spincan* 'to sparkle'. The connection between both forms depends on the validity of the Old English form, which has been doubted by Napier (Napier 1900).

(290) ***steh$_2$-lo-** 'table, seat' (St: 55): Lit. *stãlas*, Ru. *stol*, both 'table', Got. *stols* 'seat'. The Balto-Slavic forms probably continue **sth$_2$-el-* (Derksen 2015: "stalas"). The Germanic forms may continue **steh$_2$-lo-*, **steh$_2$-d^{h}lo-* (Kroonen 2017: 108) or **sd-ōl-o-*.[31] It is therefore uncertain whether the Balto-Slavic and Germanic forms belong together.

(291) ***steh$_2$-ro-** 'big' (St: 55): Lit. *stóras* 'fat', OCS *starъ* 'old', ON *stórr* 'large'. The Baltic and Slavic forms continue **steh$_2$-ro-*. The Germanic forms display an alternation **stōr-/*stur-* (e.g. OE *stōr*, Elfd. *stur*, both 'large'), suggesting a continuation of **stéh$_2$-ur-o-/*sth$_2$-ur-ó-*, also found in Skt. *sthūrá-* 'big, strong' (Kroonen 2013: "stōra-~stura-"). Since the Balto-Slavic and Germanic forms have different origins, they cannot be compared to each other.

(292) ***su̯er-d^{h}l/r-** 'sword, drill' (St: 57): Ru. *svérdel*, *sverló*, both 'drill', ON *sverð* 'sword'. Both forms can be interpreted as instrumental nouns derived from a root **su̯er-*. Under this assumption, the Germanic forms underwent dissimilation (**swerda-* < **swerdra-*) (Kroonen 2013: "swerda-"). The root **su̯er-* 'to injure' (e.g. OHG *sweran* 'to ulcerate', Young Av. *x^{v}ara-* 'wound') is semantically compatible with the Germanic forms, that may have developed within Proto-Germanic. It is however difficult to connect the Slavic forms to the same root. These might be compared with Latv. *svãrpsts* 'drill' instead.

(293) ***tu̯ok-** 'to wash' (St: 59): OPr. *twaxtan* 'bathing brush' (< **tu̯ok-st-*), Got. *þwahan* 'to wash'. The Prussian form (Elbing Vocabulary item 553) may also be read as *cwaxtan* (Schmalstieg 1973), in which case it may be connected to Ru. *xvost* 'tail' or MLG *quast* 'brush, bundle of twigs'. This leaves the Germanic form isolated. A connection to OCS *tъknǫti* 'to thrust' appears unlikely to me. Because of the ambiguity regarding the reading of the Prussian form, it is uncertain whether the Baltic and Germanic forms belong together.

(294) ***u̯ed^{h}ro-** 'weather' (St: 61): OCS *vedro* 'clear sky', ON *veðr* 'weather'. The connection between the Slavic and Germanic forms is semantically unlikely. Within Slavic, the meaning points to 'clear (sky)' (e.g. OCS *vedrъ* 'clear'), whereas in Germanic, the meaning is closer to 'wind' (e.g. OS *wedar* 'weather, storm') (Stang 1972: 61). The Germanic forms may therefore continue **h$_2$uh$_1$-etr-o-*, a derivation of **h$_2$u̯eh$_1$-* 'to blow (of the wind)' (Kroonen 2013: "weþra-~wedra-"). It is semantically difficult, although not impossible, to derive the Slavic forms from the same root.

[31] A derivation from **sed-* (suggested by P.A. Kerkhof).

4. Analysis

In chapter three, 294 possible shared forms between Baltic, Slavic and Germanic have been examined through etymological research. I find that 138 of the forms do likely belong to the shared lexicon. Of these forms, 67 are found in all three language families (forms (1) – (67)), 47 are only found within Baltic and Germanic (forms (68) – (114)) and 24 are limited to Slavic and Germanic (forms (115) – (138)). Furthermore, 156 of the 294 forms do probably not belong to the shared lexicon. Of these forms, 40 have an Indo-European origin (forms (139) – (178)), 65 are found in other European branchs (forms (179) – (243)), 13 may be explained as Germanic borrowings into Balto-Slavic (forms (244) – (256)) and 38 have an uncertain etymology or form an invalid comparison (forms (257) – (294)). In this chapter, the characteristics of the 138 forms that probably belong to the shared lexicon of Baltic, Slavic and Germanic will be further analysed.

The following 67 forms are shared by Baltic, Slavic and Germanic: **aps-* 'aspen', **b^{h}erg^h-e-* 'to keep safe', **b^{h}lend^h-* 'to blend', **b^{h}lei-* 'to shine, **b^{h}olǵ^h-(i)n-* 'beam', **b^{h}reud/h$_1$-* 'to push, break', **doil-* 'part', **dorg^h-* 'edge', **dreg$^{(h)}$-* 'to pull', **d^{h}elb^h-* 'to delve', **d^{h}ob^h-* 'to fit', **d^{h}reug^h-* 'to work together', **d^{h}rob^h-* 'to chop, hew', **d^{h}rog^h-i̯eh$_2$-* 'dregs', **d^{h}ronK-* 'stick', **gleib^h-* 'to stick', **golH-* 'naked, bald', **g^{h}eid^h-* 'to desire, expect', **ǵ^{h}elh$_3$-to-* 'gold', **g^{h}od^h-o-* 'suitable', **g^{h}oil-* 'intense, radiating', **g^{h}reb^h-* 'to dig, scrape', **g^{h}reub^h-* 'to grind', **g^{h}reud-* 'to grind, crush' , **g^{w}eh$_1$d^h-* 'shameful, evil', **h$_1$eng-* 'to hurt', **h$_1$leud^h-i-* 'people', **h$_1$old^h-* 'hollowed out tree', **i̯eu-* 'already', **kerh$_3$-* 'to burn', **Kleh$_1$b$^{(h)}$-* 'to constitute', **kliHk-* 'to call', **kleu(n)-/*klen-* 'maple tree', **komH-* 'bumblebee', **krek-* 'frog spawn, roe', **kroup-* 'rough', **le(h$_2$)p-* 'palm of the hand, paw', **lent-eh$_2$* 'lime tree', **leud-* 'ugly, wrong', **meld^h-n-* 'lightning', **menHk-* 'to soften, knead', **merHk-* 'dark, to light up', **mois-o-* 'bag', **plei-* 'bare', **rug^h-i-* 'rye', **sig-* 'whitefish', **(s)kr(-)ei-* 'to circle', **sleid^h-* 'to slide', **slob^h-* 'slack, weak', **smeuk-* 'to creep, slide', **smog^h-* 'to strike', **sneuH-* 'to turn, warp', **sōd-* 'soot', **sol-* 'dwelling place', **(s)prend-* 'to spin, stretch, jump', **(s)preng^h-* 'to jump', **steh$_2$-d^h(h$_1$)-o-* 'herd (of horses)', **sth$_2$-eb^h-oro-* 'dry wood, pole', **streug^h-* 'to stroke, scrape', **stulP-* 'pole, pillar, **suH-ro-* 'sour', **tn̥g^h-* 'heavy', **tuH(-)s-ent-* 'thousand', **u̯eb^h-el-* 'bug', **u̯erǵ^h-* 'to tighten', **u̯Hl(g)-* 'golden oriole', **u̯oḱsko-* 'wax'.

The following 47 forms are common to Baltic and Germanic: **alk-* 'holy site', **b^{h}rusgo-* 'brushwood', **diH-r-eh$_1$-* 'to shine', **d^{h}ak$^{(w)}$-* 'type of bird', **d^{h}ong-* 'marshy land', **d^{h}erHb^h-* 'to labour', **ǵeis-* 'gravel, pebble', **gleub-i̯e-* 'to clasp', **gluH-n-eh$_1$-* 'to stare', **ǵniHb^h-* 'to cut', **ǵob^h-* 'stick', **ǵog^h-* 'stem, trunk', **g^{h}reib^h-* 'to grasp, seize', **grengǵ^h-* 'to turn around', **h$_2$eh$_1$-t-ro-* 'quick', **keh$_2$u(-n)-* 'to scorn', **Kelb-* 'to help', **ḱel(-t)-* 'to incline', **keub-* 'rose', **kleup-* 'to leap', **ḱorm-on-* 'ermine', **kor(s)-* 'grayling', **k^{w}ol-* 'whale', **leig-* 'similar', **lug^h-neh$_2$-* 'to allure, fondle', **neud-* 'to use', **peḱ-* 'to tidy up', **pleu-k-* 'to swim, fly', **pod-om* 'pot, vessel', **skh$_2$-ei-b^h-* 'slanted', **slenk-* 'to creep', **smog-* 'tasty, enjoyable', **snop-* 'beak', **spei-g-* 'to be pointed', **spreg^h-* 'to crackle, burst', **stromb$^{(h)}$-* 'stump', **su̯eib-* 'to swing', **su̯eig^h-* 'to twist', **su̯eip-* 'to swing, whip', **su̯enk-* 'to become heavy', **su̯er-* 'to be heavy', **treu(H)k-* 'vessel', **u̯eng-* 'to turn (the eyes), give a sign', **u̯l̥n-i-* 'burbot', **u̯ong^h-* 'meadow, field', **u̯os-* 'type of humid soil', **u̯reit-* 'to twist'.

The following 24 forms are limited to Slavic and Germanic: **alb^{h}o(n)d-* 'swan', **b^{h}euH(-)s-* 'to swell', **b^{h}oHg^h-* 'mud, swamp', **b^{h}oru-* '(castrated) boar', **b^{h}oru-* 'type of tree, forest', **b^{h}resg-* 'to become sour', **d^{h}usg-* 'rain', **gnet-* 'to knead', **gneuH-* 'to press', **g$^{(w)h}$ou-* 'to venerate', **kreng^h-* 'ring', **krom-* 'frame', **leh$_1$s(-u)-* 'wood, pasture', **mol-* 'moth', **neuks-* 'to sniff, spy', **pelǵ^h-* 'rim of a

wheel', *$pn̥k^w$-s-ti- 'fist', *pol-o- 'board', *roHd-o- 'glad', *$send^hr$- 'sinter', *$snoh_1$-p- 'loop', *$ste(n)g^h$- 'to sting', *$su̯erb^h$- 'to rub', *$u̯eh_2$(-)b- 'call out'.

4.1 Morphology of the forms

25 forms can be interpreted as derivations from an Indo-European root or stem.

- Baltic-Slavic-Germanic: *$b^holǵ^h$-(i)n- 'beam', *$ǵ^helh_3$-to- 'gold', *h_1leud^h-i- 'people', *mois-o- 'bag', *plei- 'bare', *(s)kr(-)ei- 'to circle', *sneuH- 'to turn, warp', *sōd- 'soot', *(s)prend- 'to spin, stretch, jump', *$(s)preng^h$- 'to jump', *$steh_2$-$d^h(h_1)$-o- 'herd (of horses)', *tuH(-)s-ent- 'thousand'.
- Baltic-Germanic: *diH-r-eh_1- 'to shine', *h_2eh_1-t-ro- 'quick', *$ḱel$(-t)- 'to incline', *k^wol- 'whale', *pleu-k- 'to swim, fly', *skh_2-ei-b^h- 'slanted', *$spreg^h$- 'to crackle, burst'.
- Slavic-Germanic: *b^heuH(-)s- 'to swell', *$pn̥k^w$-s-ti- 'fist', *pol-o- 'board', *$snoh_1$-p- 'loop', *$u̯eh_2$(-)b- 'call out', *$u̯reit$- 'to twist'.

5 forms can be derived from roots or stems only found within the European branches:

- Baltic-Slavic-Germanic: *$sleid^h$- 'to slide', *sth_2-eb^h-oro- 'dry wood, pole'.
- Baltic-Germanic: *gluH-n-eh_1- 'to stare', *lug^h-neh_2- 'to allure, fondle', *spei-g- 'to be pointed'.

15 forms have a clear non-Indo-European structure or show alternations that make an Indo-European origin doubtful:

- Baltic-Slavic-Germanic: *aps- 'aspen', *d^hronK- 'stick', *$Kleh_1b^{(h)}$- 'to constitute', *kleu(n)-/*klen- 'maple tree', *stulP- 'pole, pillar', *$tn̥g^h$- 'heavy', *$u̯Hl(g)$- 'golden oriole'.
- Baltic-Germanic: *alk- 'holy site', *$d^hak^{(w)}$- 'type of bird', *$grenǵ^h$- 'to turn around' (if connected to *$kreng^h$- 'ring'), *Kelb- 'to help', *keub- 'rose'.
- Slavic-Germanic: *$alb^ho(n)d$- 'swan', *$kreng^h$- 'ring', *$pelǵ^h$- 'rim of a wheel'.

These findings suggest that the shared lexicon of Baltic, Slavic and Germanic has origins in both Indo-European and non-Indo-European tongues. There is no discernable difference between the Baltic-Slavic-Germanic, Baltic-Germanic and Slavic-Germanic groups. The remaining 93 forms are formally not distinguishable from Indo-European roots and stems. However, their limited spread suggests that most of these forms probably have a non-Indo-European origin. It is conceivable that these non-Indo-European forms were borrowed into Balto-Slavic and Germanic through an Indo-European substrate, explaining their apparent Indo-European morphology. This is in accordance with Kortlandt (2018: 227).

4.2 Semantics of the forms

Following Stang (1972: 70-76), it is possible to divide the forms into several semantic categories. In this section, 88 forms will be categorized. The semantics of the 50 remaining forms are too general.

4.2.1. Natural terms

12 forms describe flora or certain ecosystems:

- Baltic-Slavic-Germanic: *aps- 'aspen', *kleu(n)-/*klen- 'maple tree', *$lent$-eh_2 'lime tree'.
- Baltic-Germanic: *b^hrusgo- 'brushwood', *d^hong- 'marshy land', *$ǵog^h$- 'stem, trunk', *keub- 'rose', *$u̯ong^h$- 'meadow, field', *$u̯os$- 'type of humid soil'.

- Slavic-Germanic: *b^hoHg^h- ‘mud, swamp’, *b^horu- ‘type of tree, forest’, *leh$_1$s(-u)- ‘wood, pasture’.

13 forms describe fauna:

- Baltic-Slavic-Germanic: *komH- ‘bumblebee’, *krek- ‘frog spawn, roe’, *sig- ‘whitefish’, *u̯eb^h-el- ‘bug’, *u̯Hl(g)- ‘golden oriole’.
- Baltic-Germanic: *d^hak$^{(w)}$- ‘type of bird’, *kor(s)- ‘grayling’, *ḱorm-on- ‘ermine’, *k^wol- ‘whale’, *snop- ‘beak’, *u̯l̥n-i- ‘burbot’.
- Slavic-Germanic: *alb^{h}o(n)d- ‘swan’, *mol- ‘moth’.

4 forms describe other elements of nature:

- Baltic-Slavic-Germanic: *ǵ^{h}elh$_3$-to- ‘gold’, *meld^h-n- ‘lightning’.
- Baltic-Germanic: *ǵeis- ‘gravel, pebble’.
- Slavic-Germanic: *d^husg- ‘rain’.

Only 2 of the 29 terms describing nature (*k^wol- ‘whale’, *ǵ^{h}elh$_3$-to- ‘gold’) have an analysable Indo-European morphology. The other forms probably possess a non-Indo-European origin. Most of these terms must have been borrowed into Indo-European after Indo-European speakers spread into Europe and encountered previously unknown natural environments. I do not find any outstanding differences between the Baltic-Slavic-Germanic, Baltic-Germanic and Slavic-Germanic groups.

4.2.2. Cultural terms

3 forms can be regarded as agricultural terms:

- Baltic-Slavic-Germanic: *rug^h-i- ‘rye’, *steh$_2$-d^h(h$_1$)-o- ‘herd (of horses)’.
- Slavic-Germanic: *b^horu- ‘(castrated) boar’

9 forms describe domestic products or related terms:

- Baltic-Slavic-Germanic: *b^herg^h-e- ‘to keep safe’, *d^hrog^h-i̯eh$_2$- ‘dregs’, *mois-o- ‘bag’, *sōd- ‘soot’, *suH-ro- ‘sour’, *u̯oḱsko- ‘wax’.
- Baltic-Germanic: *pod-om ‘pot, vessel’, *treu(H)k- ‘vessel’.
- Slavic-Germanic: *b^hresg- ‘to become sour’, *send^{h}r- ‘sinter’.

12 forms describe (predominantly wooden) tools, sticks and related terms:

- Baltic-Slavic-Germanic: *b^holǵ^h-(i)n- ‘beam’, *d^hronK- ‘stick’, *h$_1$old^h- ‘hollowed out tree’, *sth$_2$-eb^h-oro- ‘dry wood, pole’, *stulP- ‘pole, pillar’.
- Baltic-Germanic: *ǵob^h- ‘stick’, *spei-g- ‘to be pointed’, *stromb$^{(h)}$- ‘stump’.
- Slavic-Germanic: *krom- ‘frame’, *pelǵ^h- ‘rim of a wheel’, *pol-o- ‘board’, *snoh$_1$-p- ‘loop’.

No less than 23 verbs relating to labour, some more specific than others, are found:

- Baltic-Slavic-Germanic: *b^hlend^h- ‘to blend’, *b^hreud/h$_1$- ‘to push, break’, *dreg$^{(h)}$- ‘to pull’, *d^helb^h- ‘to delve’, *d^hreug^h- ‘to work together’, *d^hrob^h- ‘to chop, hew’, *g^hreb^h- ‘to dig, scrape’, *g^hreub^h- ‘to grind’, *g^hreud- ‘to grind, crush’, *kerh$_3$- ‘to burn’, *menHk- ‘to soften, knead’, *sneuH- ‘to turn, warp’, *(s)prend- ‘to spin, stretch, jump’, *(s)preng^h- ‘to jump’, *streug^h- ‘to stroke, scrape’, *u̯erǵ^h- ‘to tighten’.
- Baltic-Germanic: *d^herHb^h- ‘to labour’, *ǵniHb^h- ‘to cut’, *peḱ- ‘to tidy up’, *u̯reit- ‘to twist’.
- Slavic-Germanic: *gnet- ‘to knead’, *gneuH- ‘to press’, *su̯erb^h- ‘to rub’.

4 forms may be considered as ‘measurement’ terms:

- Baltic-Slavic-Germanic: **doil-* ‘part’, **d^hob^h-* ‘to fit’, **g^hod^h-o-* ‘suitable’.
- Baltic-Germanic: **leig-* ‘similar’

3 forms describe human body parts:

- Baltic-Slavic-Germanic: **golH-* ‘naked, bald’, **le(h_2)p-* ‘palm of the hand, paw’.
- Slavic-Germanic: **pn̥k^w-s-ti-* ‘fist’.

5 forms in the semantic field of social-cultural practices and religion are found:

- Baltic-Slavic-Germanic: **d^hreug^h-* ‘to work together’ (also mentioned at ‘verbs related to labour’), **$h_1$leud^h-i-* ‘people’, **sol-* ‘dwelling place’.
- Baltic-Germanic: **alk-* ‘holy site’
- Slavic-Germanic: **$g^{(w)h}$ou-* ‘to venerate’

1 particle is found:

- Baltic-Slavic-Germanic: **i̯eu-* ‘already’.

14 of the 59 cultural forms have an Indo-European origin or are derived from a form restricted to the European branches. There is no discernable difference in distribution between the Baltic-Slavic-Germanic, Baltic-Germanic and Slavic-Germanic groups. Furthermore, no clear distribution can be observed between the Indo-European and probable non-Indo-European forms. I consider **$h_1$leud^h-i-* ‘people’ as the most important form of Indo-European origin: its development from **$h_1$leud^h-* ‘free’ suggests that the Indo-Europeans responsible for part of the shared lexicon of Baltic, Slavic and Germanic, regarded themselves as “free” people. Such an awareness of belonging to a “free group” is only sensible if there existed an “unfree” group to which they could have compared their free status. With this idea in mind, it is interesting to note that the majority of labour-related verbs does not have a known Indo-European origin. It is certainly possible that a group of “free” Indo-Europeans, using **$h_1$leud^h-i-* as an endonym, incorporated a group of non-free non-Indo-European labourers. I will remain cautious on this point. At least, it can be said that Indo-Europeans that spread into Europe, acquired new terms from non-Indo-European people describing labour and simple technologies that they were not familiar with before.

Many of the labour-related verbs and terms describing tools suggest that wood had become an important source material. Other labour-related verbs describe mining (e.g. **d^helb^h-* ‘to delve’) and food production (**b^hlend^h-* ‘to blend’, **g^hreub^h-* ‘to grind’, **g^hreud-* ‘to grind, crush’, **menHk-* ‘to soften, knead’, **gnet-* ‘to knead’). The form **d^hreug^h-* ‘to work together’ may reflect the way labour was done. I consider it possible that the category that I have called “measurement terms” was originally part of the technological vocabulary too, only to abstrahize later on. The rising importance of wood as a source material may reflect a migration of Indo-Europeans from the steppe into parts of Europe that were richer in trees (the use of products such as **u̯ok̑sko-* ‘wax’ may also reflect this change in natural environment). The Corded Ware culture is a plausible candidate to be identified with such a migration.

Only three forms, of which one an Indo-European formation, are agricultural terms. Although this may seem surprising at first sight, the neolithic layer that is likely responsible for the majority of these terms, is not limited to Balto-Slavic and Germanic. Some agricultural terms that may have been part of the substrate shared by Balto-Slavic and Germanic, may not be included because they were borrowed by other European branches as well. The form **rug^h-i-* ‘rye’, that probably originates in the

same European neolithic layer, is not found outside of Balto-Slavic and Germanic, because the crop it denotes does not grow outside of the North European plain (e.g. Stang 1972: 79).

4.3. Origin of the forms

The morphology of the forms suggest that the shared lexicon of Baltic, Slavic and Germanic has both Indo-European and non-Indo-European origins. Since many forms of probably non-Indo-European origin are formally indistinguishable from forms of Indo-European origin, it is likely that they entered Balto-Slavic and Germanic through an Indo-European intermediate. The semantics of the forms suggest that the shared lexicon was the result of Indo-Europeans encountering new natural environments in which especially wood became an important source material. Forms such as *g^hreub^h- 'to grind', *g^hreud- 'to grind, crush', *menHk- 'to soften, knead' and *gnet- 'to knead' suggest that the non-Indo-European people that were encountered, were familiar with processing of grains and production of dough, and therefore neolithic in origin. The language of the Corded Ware culture is a probable source for much of the shared lexicon of Baltic, Slavic and Germanic (e.g. Kortlandt 2018: 227), because the linguistic forms correspond to archaeological findings such as a migration from late Proto-Indo-Europeans from the 'steppe-like' Yamnaya area into parts of Europe richer in trees and a subsequent blending of these people with people of neolithic origin.

Baltic and Germanic share 47 forms that are not found within Slavic. Slavic and Germanic share 24 forms that are not found within Baltic. In some cases, the forms may have been found in all three language families initially, but may then have been lost within either Baltic or Slavic. In other cases, forms may have entered Balto-Slavic after the split between Baltic and Slavic. This may be especially true for forms for which no single reconstruction can be made (e.g. *alb^{h}o(n)d- 'swan', *d^hronK- 'stick', *kleu(n)-/*klen- 'maple tree', *stulP- 'pole, pillar', *u̯Hl(g)- 'golden oriole') or for forms that have a limited spread, such as specific Prussian-Germanic forms (*d^hak$^{(w)}$- 'type of bird', *keub- 'rose', *k^wol- 'whale'). The amount of shared forms suggests that the substrate had a higher impact on Germanic and Baltic than on Slavic.

Many of the forms that probably were borrowed from this Corded Ware substrate may be neolithic in origin, since it were predominantly neolithic cultures such as the Funnelbeaker culture and the Globular Amphora culture that were absorbed by the Corded Ware culture. Still, not every shared form is necessarily derived from a Corded Ware substrate. It cannot be excluded that some forms were directly borrowed from remaining pockets of neolithic language speakers. Other possible substrates are a hunter-gatherer language, Temematic and Uralic, as discussed in section 2.3.

Possible forms of hunter-gatherer origin are *u̯l̥n-i- 'burbot' and *sig- 'whitefish'. These forms have a limited distribution around the Baltic Sea. Their semantics are also compatible with an origin in an hunter-gatherer language. The form *sig- might also be interpreted as a North European Wanderwort, or as a borrowing from Uralic, since it is also found within that language family. Further forms that are shared with Uralic are *aps- 'aspen', that is also found in Turkic, *ǵeis- 'gravel, pebble' that has not just been compared to Uralic forms, but also to Georgian *kviša* 'sand' (Kroonen 2013: "kisila-"), and *pod-om 'pot, vessel'. Based on these forms, the existence of both a hunter-gatherer substrate and a Uralic substrate is possible, but difficult to ascertain.

The final possible substrate that I discussed is Temematic. In section 2.3.4., I suggested that if Temematic speakers had migrated to the area between the Elbe and Vistula (Kortlandt 2018), we might expect that Temematic vocabulary was not just borrowed by Balto-Slavic, but also by Germanic. Since Temematic has been entirely reconstructed through possible borrowings into Balto-Slavic, the most plausible candidates for a Temematic borrowing into Germanic may be found among forms that are shared by Germanic and Balto-Slavic. I find two Slavic-Germanic forms that may have been borrowed

from Temematic. The first form is *b^horu- ‘castrated boar’. The Slavic forms point to *b^horu-, but the Germanic forms suggest PGm. *bargw- or *barug-. The form might be connected to *porḱ- (Hyllested 2017: 192). I suggest that a derivation *porḱ-u̯- may have resulted in Temematic *bor(g)w-, from which both Slavic and Germanic forms may have been borrowed.[32] The second form is its apparent homophone *b^horu- ‘type of tree, forest’, that might reflect Temematic *bor(g)w- (< *$pork^w$-) too. It may be compared to OHG *vorha* ‘fir’ (< *$pr̥k^w$-eh_2-) and Lat. *quercus* ‘oak’ (< *$perk^w$-).[33]

[32] As mentioned in footnote 9, the Temematic mediae were deglottalized, implying that these phonemes were borrowed into Balto-Slavic (and Germanic) as if they reflected PIE mediae aspiratae.

[33] PGm. *bargw- ‘(castrated) boar’ might reflect a Temematic cluster *-gw-, while *barw- ‘grove’ might reflect Temematic *-g^w-. For Slavic, it must then be assumed that these clusters were borrowed as *-w-. Note that initial Temematic *g^w- and *ǵw- are reflected as g- and gv- in Slavic gъrnъ ‘cooking pot’ and gvězda ‘star’ (Holzer 1989: 50). The river name *Agalingus* (probably the Dniester on the Tabula Peutingeriana) has been reconstructed as Temematic *$ag^wā$ lingā ‘curved stream’ (Holzer 1989: 198). However, this name might be (East) Germanic in origin instead (compare Du. *Linge* (river name)).

5. Conclusion

The goal of this thesis is to obtain an updated overview of the shared lexicon of Baltic, Slavic and Germanic, and to place this in the context of the prehistory of these language families. A prehistorical context for the shared lexicon of Baltic, Slavic and Germanic has been given in chapter 2. A re-examination and analysis of the shared lexicon of Baltic, Slavic and Germanic through etymological research has been executed in chapters 3 and 4.

Based on the non-lexical shared characteristics and the prehistories of the Baltic, Slavic and Germanic language families, it can be concluded that the shared lexicon was probably not the result of a common innovation or common linguistic phase, but of a shared substrate.

All forms that have been suggested to be part of the shared lexicon by Stang (1972), as well as a few forms given by Oettinger (2003) and Matasović (2014) were re-examined through etymological research. Of these 294 forms, 138 likely belong to the shared lexicon of Baltic, Slavic and Germanic. 67 of these forms are shared by all three language families, 47 are limited to Baltic and Germanic and 24 are only found within Slavic and Germanic. Of the 156 forms that do probably not belong to the shared lexicon, 40 are found throughout Indo-European, 65 are limited to the European branches of Indo-European, 13 may be interpreted as Germanic borrowings into Balto-Savic and 38 possess an uncertain etymology of constitute an invalid comparison.

An analysis of the 138 forms considered to be part of the shared lexicon of Baltic, Slavic and Germanic does not find any significant differences between the Baltic-Slavic-Germanic, Baltic-Germanic and Slavic-Germanic forms. A phonological and morphological analysis shows that 25 forms can be interpreted as a derivation from an Indo-European root or stem, 5 forms are derived form a root or stem restricted to the European branches of Indo-European and 15 forms show a clear non-Indo-European structure. The 93 remaining forms are formally indistinghuishable from Indo-European roots and stems, but have no cognates outside of Baltic, Slavic and Germanic. These results suggest the existence of a substrate that consisted of both Indo-European and non-Indo-European elements, and that many originally non-Indo-European forms were passed to Baltic, Slavic and Germanic through an Indo-European intermediate.

The shared lexicon covers several semantic categories. Of the 88 forms that possess specific enough semantics to be categorized, 29 describe nature and 59 describe culture. Noteworthy is the amount of forms that describe (wooden) tools (12 forms) and types of labour (23 forms). This is compatible with a migration of Indo-Europeans from the steppe into parts of Europe where trees were more abundant. Only 3 typically agricultural forms were found. This is expected, because many agricultural terms derived from a “European neolithic” layer are found outside of Balto-Slavic and Germanic too. Still, a neolithic origin for part of the shared lexicon is suggested by labour-related terms describing processing of grain and production of dough.

The majority of of the shared lexicon of Baltic, Slavic and Germanic likely originates in an Indo-European substrate that had incorporated vocabulary from a neolithic language, probably belonging to the European neolithic layer that is responsible for much agricultural vocabulary found throughout Europe. Considering the prehistory of Baltic, Slavic and Germanic language families, it is most likely that the form of Indo-European spoken by the people of the Corded Ware culture was the donor language. This is in accordance with Kortlandt (2018). Because of the existence of specific Baltic-Germanic and Slavic-Germanic vocabulary, the borrowing of forms may have occurred both before and after the split of Balto-Slavic into Baltic and Slavic. The difference in number of shared forms between Baltic and Germanic and between Slavic and Germanic suggests that the impact of the substrate was higher in Baltic and Germanic than in Slavic. The existence of an additional hunter-gatherer substrate or a Uralic substrate is difficult to ascertain, although a few forms suggest that limited contact with these

language groups may have occurred. Two forms shared by Slavic and Germanic may have been borrowed from Temematic, suggesting that there was a time period during which Temematic speakers lived close to both the Balto-Slavic and Germanic speaking areas. This is not incompatible with the identification of the Venedi between the Elbe and Vistula as Temematic speakers (Kortlandt 2018: 226).

Some final remarks may be made. Although I am certain that the amount of forms discussed is sufficient enough to draw conclusions from, these forms do by no means reflect all possible forms that may belong to the shared lexicon of Baltic, Slavic and Germanic. The identification of more of these forms may refine the findings of this thesis. It may be noted that the identification of a form as a Baltic-Slavic-Germanic one is not based on absolute certainty, but remains a question of plausibility. Further research may be executed on the nature of the Corded Ware substrate. It is, for example, an interesting question whether the substrate influenced Balto-Slavic and Germanic in the same way; after all, the environment in which pre-Proto-Germanic developed seems more directly connected to the Corded Ware culture than that in which pre-Proto-Balto-Slavic emerged. A second interesting question is whether this Corded Ware substrate can also be found within Celtic or Italic. The possibility that Temematic contributed vocabulary not just to Balto-Slavic but also to Germanic may be further researched by gathering more Germanic forms with an unclear etymology. The rapidly expanding knowledge provided by archaeological and genetic studies may not give direct answers to these questions, but can support linguistic data in providing a refined prehistorical context in which Indo-European spread throughout Europe.

Abbreviations

Arm.	Armenian
Av.	Avestan
Bulg.	Modern Bulgarian
CLuv.	Cuneiform Luvian
CS	Church Slavonic
Cz.	Modern Czech
Du.	Modern Dutch
E	Modern English
Elfd.	Elfdalian
Far.	Faroese
Fi.	Finnish
G	Modern German
Gk.	Greek
Got.	Gothic
Gotl.	Gotlandic
Hitt.	Hittite
Hu.	Hungarian
Lit.	Lithuanian
Lat.	Latin
Latv.	Latvian
ME	Middle English
MHG	Middle High German
MIr.	Middle Irish
MLG	Middle Low German
MoGk.	Modern Greek
MW	Middle Welsh
Nw.	Modern Norwegian
OCS	Old Church Slavonic
OE	Old English
OHG	Old High German
OIr.	Old Irish
OLit.	Old Lithuanian
ON	Old Norse
OPol.	Old Polish
OPr.	Old Prussian
ORu.	Old Russian
OS	Old Saxon
OW	Old Welsh
PBSl.	Proto-Balto-Slavic
PCelt.	Proto-Celtic
PGm.	Proto-Germanic
PSl.	Proto-Slavic
PIE	Proto-Indo-European
Pol.	Modern Polish
Ru.	Modern Russian
RCS	Russian Church Slavonic
SCr.	Serbo-Croatian
Skt.	Sanskrit
Slov.	Modern Slovenian
Swe.	Modern Swedish
Toch.	Tocharian
TochA.	Tocharian A
TochB.	Tocharian B
Ukr.	Ukrainian
W	Modern Welsh

Bibliography

Adams, D.Q. (2013). *A Dictionary of Tocharian B*, Brill, Leiden.

Adams, D.Q., Mallory, J.P. (eds.) (1997). *Encyclopedia of Indo-European Culture*, Fitzroy Dearborn Publishers, London/Chicago.

Anthony D.W. (2007). *The Horse, the Wheel, and Language*, Princeton University Press, Princeton/Oxford.

Anthony, D.W., Ringe, D. (2015). 'The Indo-European Homeland from Linguistic and Archaeological Perspectives', *Annual Review of Linguistics* 1, 199-219.

Blažek, V. (2006). 'Celtic 'smith' and his colleagues', in: Lubotsky, A.M, Schaeken, J., Wiedenhof, J. (eds.), *Evidence and Counter-Evidence, Festschrift for F. Kortlandt 1*, 35-53, Rodopi, Amsterdam/Atlanta.

Blažek, V. (2017). 'Indo-European 'Gold' in Time and Space', *The Journal of Indo-European Studies* 45, 267-312.

Blažek, V. (2018). 'Indo-European Dendronyms in the Perspective of External Comparison', *The Journal of Indo-European Studies* 46, 1-46.

Beekes, R.S.P. (2009). *Etymological Dictionary of Greek, with the assistance of Lucien van Beek*, Brill, Leiden.

Beekes, R.S.P. (2011). *Comparative Indo-European Linguistics, An Introduction, Second edition, revised and corrected by Michiel de Vaan*, John Benjamins Publishing Company, Amsterdam/Philadelphia.

Boutkan, D.F.H., Kossmann, M.G. (2001). 'On the Etymology of 'Silver', *North-Western European Language Evolution* 38, 3-15.

Boutkan, D.F.H., Siebinga, S.M. (2005). *Old Frisian Etymological Dictionary*, Brill, Leiden.

Derksen, R. (2008). *Etymological Dictionary of the Slavic Inherited Lexicon*, Brill, Leiden.

Derksen, R. (2015). *Etymological Dictionary of the Baltic Inherited Lexicon*, Brill, Leiden.

Garnier, R., Sagot, B. (2017). 'A shared substrate between Greek and Italic', *Indogermanische Forschungen* 122, 29-60.

Gąsiorowski, P. (2012). 'The Germanic reflexes of PIE *-sr- in the context of Verner's Law', in: Nielsen Whitehead, B., Olander, T., Olsen, B.A., Rasmussen, J.E. (eds.), *The Sound of Indo-European. Phonetics, Phonemics, and Morphophonemics*, Museum Tusculanum Press, Copenhagen.

Gimbutas, M. (1971). *The Slavs*, Thames and Hudson, London.

Haak, W., Laziridis, I., Patterson, N., […], Reich, D. (2015). 'Massive migration from the steppe was a source for Indo-European languages in Europe', *Nature* 522, 207-211.

van der Heijden, V.F. (2016). *Een Noordwest-Indo-Europese Taalfase?*, BA Thesis, Universiteit Leiden, Leiden.

Holzer, G. (1989). *Entlehnungen au seiner bisher unbekannten Indogermanischen Sprache im Urslavischen und Urbaltischen.* Verlag der Österreichischen Akademie der Wissenschaften, Wien.

Hyllested, A. (2014). *Word Exchange at the Gates of Europe: Five Millennia of Language Contact*, PhD Thesis, Københavns Universitet, Det Humanistiske Fakultet, Copenhagen.

Hyllested, A. (2017). 'Again on pigs in ancient Europe: The Fennic Connection', in: Sandgaard Hansen, B.S., Nielsen Whitehead B., Olander, T., Olander, B.A. (eds.), *Etymology and the European Lexicon: Proceedings of the 14th Fachtagung der Indogermanischen Gesellschaft, 17-22 September 2012, Copenhagen*, 183-196, Reichert Verlag, Wiesbaden.

Iversen, R., Kroonen, G.J. (2017). 'Talking Neolithic: Linguistic and Archaeological Perspectives on How Indo-European Was Implemented in Southern Scandinavia', *American Journal of Archaeology* 121, 511-525.

Junttila, S. (2012). 'The prehistoric context of the oldest contacts between Baltic and Finnic languages', in: Grünthal, R., Kallio, P. (eds.), *A Linguistic Map of Prehistoric Northern Europe*, 225-238, Société Finno-Ougrienne, Helsinki.

Kallio, P. (2003). 'Languages in the Prehistoric Baltic Sea Region', in: Bammesberger, A., Vennemann, T. (eds.), *Languages in Prehistoric Europe*, 227-244, Winter, Heidelberg.

Kallio, P. (2005). 'A Uralic Substratum in Balto-Slavic Revisited', in: Meiser, G., Hackstein, O. (eds.), *Sprachkontakt und Sprachwandel: Akten der XI. Fachtagung der Indogermanischen*

Gesellschaft, 275-283, Reichert Verlag, Wiesbaden.
Kallio, P. (2012). 'The Prehistoric Germanic Loanword Strata in Finnic', in: Grünthal, R., Kallio, P. (eds.), *A Linguistic Map of Prehistoric Northern Europe*, 225-238, Société Finno-Ougrienne, Helsinki.
Kallio P. (2015). 'The language contact situation in prehistoric Northeastern Europe', in: Mailhammer, R., Vennemann, T., Olsen, B.A. (eds.), *The linguistic roots of Europe*, Copenhagen Studies in Indo-European 6, 77-102, Museum Tusculanum Press, Copenhagen.
Kloekhorst, A. (2008). *Etymological Dictionary of the Hittite Inherited Lexicon*, Brill, Leiden.
Kloekhorst, A. (2011). 'Weise's Law: Depalatalization of palatovelars before *r in Sanskrit', in: Krisch, T., Lindner, T., Indogermanistik und Linguistik im Dialog, Akten der XIII. Fachtagung der Indogermanischen Gesellschaft vom 21. bis 27. September 2008 in Salzburg, 261-270, Reichert Verlag, Wiesbaden.
Kloekhorst, A. (2014). 'Proto-Indo-European 'thorn'-clusters', *Historische Sprachforschung* 127, 43-67.
Kloekhorst, A., Lubotsky, A.M. (2014). 'Hittite nai-, nē-, Sanskrit nī-, and the PIE verbal root *(s)neh$_1$-', in: Melchert H.C., Rieken E., Steer Th. (eds.), *Munus amicitiae. Norbert Oettinger a collegis et amicis dicatum*, 126-137, Beech Stave Press, New York.
Kortlandt, F.H.H. (1979). 'Three problems of Balto-Slavic phonology', *Zbornik za Filologiju i Lingvistiku* 22, 57-63.
Kortlandt F.H.H. (1982). 'Early dialectal diversity in South-Slavic I', *Studies in Slavic and General Linguistics 2: South Slavic and Balkan Linguistics*, 177-192, Rodopi, Amsterdam.
Kortlandt, F.H.H. (1987). 'The formation of the Old Prussian present tense', *Baltistica* 23, 104-111.
Kortlandt, F.H.H. (2003). 'An Indo-European Substratum in Slavic?', in: Bammesberger, A., Vennemann, T. (eds.), *Languages in Prehistoric Europe*, 253-260, Winter, Heidelberg.
Kortlandt, F.H.H. (2009). *Baltica & Balto-Slavica*, Rodopi, Amsterdam.
Kortlandt, F.H.H. (2013). 'Palatovelars before syllabic resonants: another look', *Baltistica* 48, 13-17.
Kortlandt, F.H.H. (2018). 'The Expansion of Indo-European Languages', *The Journal of Indo-European Studies* 46, 219-231.
Kristiansen, K., Larsson, T.B. (2005): *The Rise of Bronze-Age Society: Travels, Transmissions and Transformations*, Cambridge University Press, Cambridge.
Kristiansen, K., Allentoft, M.E., Frei, K.M., [...], Willerslev E. (2017). 'Re-theorizing mobility and the formation of culture and language among the Corded Ware Culture in Europe', Antiquity 91, 334-347.
Kroonen, G.J. (2009). *Consonant and vowel gradation in the Proto-Germanic n-stems*, PhD Thesis, Universiteit Leiden, Leiden.
Kroonen, G.J. (2012). 'Non-Indo-European root nouns in Germanic: Evidence in support of the Agricultural Substrate Hypothesis', in: Grünthal, R., Kallio, P. (eds.), *A Linguistic Map of Prehistoric Northern Europe*, 239-260, Société Finno-Ougrienne, Helsinki
Kroonen, G.J. (2013). *Etymological Dictionary of Proto-Germanic*, Brill, Leiden.
Kroonen, G.J. (2017). 'The development of the Proto-Indo-European instrumental suffix in Germanic', *Indogermanische Forschungen* 122, 105-110.
LIV: Rix, H. (2001). *Lexikon der Indogermanischen Verben*, 2nd edition, Reichert Verlag, Wiesbaden.
Lubotsky, A.M. (1989). 'Against a Proto-Indo-European phoneme *a', in: Vennemann, T. (ed.), *The New Sound of Indo-European: essays in phonological reconstruction*, 53-66, Mouton de Gruyter, Berlin/New York.
Lubotsky, A.M. (2011). 'The origin of Sanskrit roots of the type sīv- 'to sew', dīv- 'to play dice', with an appendix on Vedic i-perfects', in: Jamison S.W., Melchert H.C., Vine B. (eds.), *Proceedings of the 22nd Annual Indo-European Conference*, 105-126, Hempen, Bremen.
Lubotsky, A.M. (2013). 'The Vedic paradigm for 'water'', in: Cooper, A.I., Rau, J., Weiss, M. (eds.), *Multi Nominis Grammaticus. Studies in Classical and Indo-European linguistics in honor of Alan J. Nussbaum on the occasion of his sixty-fifth birthday*, 159-164, Beach Stave Press, New York.
Mallory, J.P. (1989). *In Search of the Indo-Europeans. Language, Archaeology and Myth*, Thames and Hudson, London.
Martirosyan, H.K. (2009). *Etymological Dictionary of the Armenian Inherited Lexicon*, Brill, Leiden.

Matasović, R. (2009). *Etymological Dictionary of Proto-Celtic*, Brill, Leiden.
Matasović, R. (2012). 'Proto-Indo-European *sk- in Slavic', *Rasprave Instituta za hrvatski jezik i jezikoslovlje* 37, 467-478.
Matasović, R. (2014). 'Substratum words in Balto-Slavic', *Filologija* 60, 75-102.
Mathieson, I., Alpaslan-Roodenberg, S., Posth, C., [...], Reich, D. (2017). 'The genomic history of southeastern Europe', *Nature* 555, 197-203.
Monier-Williams, M. (1899): *A Sanskrit-English Dictionary*, Clarendon Press, Oxford.
Napier, A.S. (1900). *Old English Glosses: chiefly unpublished*, Clarendon Press, Oxford.
Neri, S. (2007). *Cadere e abbattere in indoeuropeo: sull' etimologia di tedesco fallen, latino aboleo e greco ἀπόλλυμι*, Institut für Sprachwissenschaft, Innsbruck.
Oettinger, N. (2003). 'Neuerungen in Lexikon und Wortbildung des Nordwest-Indogermanischen', in: Bammesberger, A., Vennemann, T. (eds.), *Languages in Prehistoric Europe*, 183-193, Winter, Heidelberg.
Olsen, B.A. (1993). 'Vedic and laryngeals', in: Meiser, G. (ed.), *Indogermanica et Italica: Festschrift für Helmut Rix zum 65. Geburtstag*, 362-372, Stollfuß, Innsbruck.
Olsen, B.A. (1999). *The Noun in Biblical Armenian*, Mouton de Gruyter, Berlin/New York.
Pooth, R.A. (2014a). 'The Proto-Indo-European Case System' (ms.) version 17 November 2014, http://leidenuniv.academia.edu/RolandPooth.
Pooth, R.A. (2014b). 'More evidence for Proto-Indo-European transfixes: Two types of "lengthened grades"' (ms.) version 5 December 2014, http://leidenuniv.academia.edu/RolandPooth.
Pronk, T.C. (2013). 'Several Indo-European Words for 'Dense' and Their Etymologies', *The Journal of Indo-European Studies* 41, 1-19.
Pronk-Tiethoff, S.E. (2012). *The Germanic loanwords in Proto-Slavic: origin and accentuation*, PhD Thesis, Universiteit Leiden, Leiden.
Rowlett, R.M. (1968). 'The Iron Age North of the Alps', *Science* 161, 123-134.
Schmalstieg, W.R. (1973): 'Several Studies on Old Prussian', *Lituanistikos darbai* 3, 153-170.
Stang, C.S. (1972). *Lexikalische Sonderübereinstimmungen zwischen dem Slavischen, Baltischen und Germanischen*, Universiteitsforlaget, Oslo/Bergen/Tromsø.
Udolph, J. (1994). *Namenkundliche Studien zum Germanenproblem*, Reallexikon der Germanischen Altertumskunde (9), Berlin/New York.
de Vaan, M.A.C. (2008). *Etymological Dictionary of Latin and the other Italic Languages*, Brill, Leiden.
Vanags, P. (2004). 'Latvian braŋgs: From Lithuanian, Couronian, or German?', in: Baldi, P., Dini, P.U. (eds.), *Studies in Baltic and Indo-European Linguistics. In honor of William R. Schmalstieg*, 231-242, John Benjamins Publishing Company, Amsterdam/Philadelphia.