ROOT TRANSFORMATIONS IN PROTO-INDO-EUROPEAN

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Abstract

Proto-Indo-European roots may exhibit the *s*-mobile, vowel ablaut, or nasal infix with no change in semantic value. This paper suggests three additional types of regular variation that may occur in the phonetic structure of PIE roots without causing core semantic change: (1) Medial resonants can vary within a fixed consonant structure; (2) Radical metathesis can occur where the consonantal root structure inverts; and (3) Synonym pairs occur that differ only in that one of the members shows a reduction in voicing and aspiration similar to the changes that occurred in Tocharian. Recognition of these three types of root variation allows for a meaningful grouping of genetically related roots. This classification may aid in making valid long-range comparisons between PIE and outside language families.

I. INTRODUCTION

Attempts to demonstrate genetic links between Indo-European and outside language families have, so far, achieved only limited success, generally failing to convince a majority of scholars. The reasons for this cannot always be justly ascribed to the obstinacy of established academia, since all too often the evidence presented has been weak.

In a recent and well-reasoned article, Starostin, Zhivlov, and Kassian[2] assess the current state of the Nostratic Hypothesis, observing that, "Nostratic linguistics has remained in a state of permanent crisis." They recommend that further work in the field should focus on the quality of the putative correspondences rather than simply adding to their quantity. The article ends with the statement:

> Ultimately, it is our firm belief that Nostratic linguistics, while currently in a state of mild stagnation, may overcome this state by means of important methodological reforms—even if many of these reforms might not be for the liking of conservative supporters of the hypothesis... We also believe that these reforms, in the long run, will be useful not only for all the other promising hypotheses of long-distance relationship…, but also for further research on uncontroversial families of small time depth, including Indo-European itself.

Part of the problem may be that PIE, as currently reconstructed, reflects a time depth that is out of sync with the other languages to which it can be meaningfully compared. This problem was noted by Winfred Lehmann almost twenty-five years ago. He wrote,

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[2] Starostin, Zhivlov, and Kassian, "The 'Nostratic' roots of Indo-European," 392-415.

> Proto-Indo-European is reconstructed on the basis of languages attested in the second millennium B.C. It may then be dated in the third millennium, with possible extension to the fifth. No one assumes that date for Proto-Afroasiatic, since we have Egyptian and Akkadian texts from the third millennium. The two languages differ from one another considerably so that Proto-Afroasiatic must be dated from a much earlier time. *For reconstructing Nostratic, a far earlier form of Indo-European must then be reconstructed than that in the well-known handbooks*.[3]

What follows is a presentation of evidence suggesting the presence of grammatical or dialectical variants within the reconstructed roots of the PIE lexicon. By recognizing such variants and reconstructing their common source it may be possible to recover an earlier stage of the proto-language, one that is more amenable to longer-range comparisons.

This investigation is entirely focused on roots and root structure. It starts by noting three well-established phonetic variations that can occur in PIE roots that do not affect their semantic value: the *s*-mobile, vowel ablaut, and the nasal infix. It continues by suggesting three additional types of root modification that likewise do not change semantic values.

The examples cited involve roots that appear to reflect the deepest strata of the language. Their meanings involve primal human activities: breathing, hunting, social structure, conception and birth, preparing and sharing out food, seeing and knowing, fighting, and building with earth. This observation suggests that the phonetic mutations involved must have originated at a time-depth significantly older than the so-called "period of PIE unity" around 4,500 BC.

Another indication that these mutations are ancient is the degree of fluidity exhibited in the root structure. What we see is not mere tinkering around the edges of roots with prefixes and suffixes, but rather significant transformations in the very structure of the root itself. It would be surprising if such transformations were to occur in a later period when, by comparison, root structure in PIE had already become much more stabilized.

The argument for the existence of these fundamental root transformations is that they are consistent and widespread. The semantic values of roots, despite phonetic transformations, generally cluster in tight fields of meaning, typically not more divergent than that seen within individual roots widely accepted as part of the PIE lexicon. Occurrences of the universally recognized *s*-mobile, can, for example, be shown in sufficient quantity to establish its unquestioned place in the proto-language.[4] Like the *s*-mobile, the following three types of root-variation occur widely in the PIE lexicon.

1. Resonant Variation

Two earlier papers by the present author[5] suggested that resonant-variation within a fixed consonant structure can occur with little or no semantic effect on PIE roots. This is an archaic feature of

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[3] Lehmann, "What Constitutes Scientific Evidence in Paleolinguistics?" 76 (emphasis added).

[4] Out of the approximately 1050 roots listed in LIV, about 45 exhibit the *s*-mobile. Mann states: "For such a science [Indo-European linguistics], absolute and final proof is probably unattainable, but if a relationship can, in terms of Euclid, be 'demonstrated' by an adequate amount of analogy, the result can be both probable and convincing." Mann, *An Indo-European Comparative Dictionary*, viii.

[5] Haynes, "Resonant Variation in Proto-Indo-European," *Mother Tongue Journal* 22 (2020): 151-222; and Haynes, "Resonant Variations on Immortality," *Mother Tongue Journal* 23 (2021): 151-162 (both articles are available on-line at https://www.mother-tongue-journal.org/).

the language that must have occurred during the pre-Proto-Indo-European period. Despite the passage of time, the core semantic field of the roots remains narrow, intact and identifiable. The following briefly summarizes the conclusions of those earlier papers about the structure of the archaic Proto-Indo-European root:

- The root structure can be generalized as *(*s*)-C [+/- R (R)] -C-, where (*s*) is the *s*-mobile, C is any consonant, and R is any resonant or laryngeal (or a zero-grade of the same). Any additional element that follows the final consonant is a root-extension, a derivational ending, a suffix, or the remnant of some ancient compound that will not have been a part of the original root.
- The initial and final consonants together carry the semantic core of the root. Medial resonants may provide nuance but do not significantly change the underlying semantic value.
- Inside the stable consonant-structure are combinations of the neutral PIE vowel and either zero, one, or two resonants that act as vowel modifiers. These are represented in generalized form as *(R)* in the descriptions that follow.[6]
- The resonants may include any of the following: *r, l, n, m, u̯, i̯, h₁, h₂, h₃,* or ∅ = zero-grade. Inside the root, laryngeals function as do the other resonants.[7] The resonant ***m***- most typically reflects an ***n***- that has been assimilated to a following labial.
- All of these resonants functioned as semivowels. That is, in addition to their ability to modify the vowel, they could at times act as an unchanging consonantal element. Resonants do not vary when they function as consonants in the root-initial or root-final positions of closed roots (CRC-) nor do they vary when they stand in the initial position of open roots (CR-).
- Regarding the source of these resonant variants, two possible explanations readily present themselves: (1) Pre-Proto-Indo-European employed resonant infixes grammatically in order to form derivatives, or (2) The observed resonant variation is the result of a fusion of closely related dialects.[8]
- Over time, the genetic affiliations of the root-variants were forgotten. These are the PIE roots as we know them today.[9]

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[6] Very rarely a root with two medial resonants and a laryngeal is encountered.

[7] This has been noted by Todd B. Krause and Jonathan Slocum, who write, "Given the ability of the laryngeals to vocalize between consonants, it is occasionally convenient to think of the laryngeals likewise as resonants." https://lrc.la.utexas.edu/eieol/tokol/20.

[8] "We can anyway not [completely] reconstruct the actual phonetics of PIE which moreover, was not A LANGUAGE, but a dialect cluster..." Igor Diakonoff, *Mother Tongue Newsletter* 8, question 4 (1989): 27.

[9] A much fuller description of this resonant variation dynamic can be found in those earlier works (Haynes 2020, Haynes 2021). After publishing those articles, I discovered an article by Roger Williams Wescott which anticipated me in certain aspects. The following is a quote from that article:

> "In terms of typological evolution, the most archaic type of additive affixation is probably infixation of an asyllabic type. In both attested and reconstructed languages, asyllabic infixes most commonly consist of non-obstruent consonants known as sonorants — that is, nasals, linguals, or glides. These sonorants may either precede or follow the monophthongal vocalic nucleus of a base or word. In the former case, the sonorant may be termed prenuclear; in the latter case, postnuclear."

2. Radical Metathesis (Inversion)

A root in the form C_1RC_2- can change to the form C_2RC_1- without semantic alteration. This is not an unfamiliar concept since several widely accepted PIE roots are noted for exhibiting this feature. The following are a few examples:

- **dʰégʰ-om-*, the PIE term for *earth* was for many years analyzed as **gʰđem*, with the dental element in final position as reflected in Grk *χθών* 'earth.' With the 20th century discoveries of Hittite and Tocharian (Hit *tēkan* 'earth,' TochA *tkaṃ* 'earth') this root became re-analyzed with the dental as the initial element. Consequently, those attestations of the root with the dental in the final position are considered to be instances of metathesis.[10]
- **dn̥ĝʰu̯h₂-*, the PIE term for *tongue*, is attested in Old Irish as *tengae*, Old Latin as *dingua*, and in Modern English as *tongue*. But Tocharian A shows an inverted form *käntu*, Tocharian B *kantwo*, both from Proto-Tocharian **käntwo*, where the dental element appears in final position.[11]
- **pekᵘ-*, a PIE term for 'cook, boil, bake' is widely attested: Av *pačaiti* 'cooks,' OCS *pek* 'bake, roast,' Alb *pjek* 'bake,' Skt *pácati* 'cooks,' TochAB *päk* 'become ready for eating,' and many others. But also included within that root are Lith *kepù* 'bake,' and Latv *cepu* 'bake,' with the initial and final consonants in inverted position.[12] As with the previous examples, these are semantically identical with the non-inverted forms.
- **kannabis*, the generalized term for *hemp* among the Indo-European languages, although somewhat irregular in its various formulations, shows a fairly consistent phonetic pattern: OIr *cnāip* 'hemp,' Lat *cannabis* 'hemp,' ON *hampr* 'hemp,' OE *hænep* 'hemp,' OPrus *knapios* 'hemp,' Grk *κάνναβις* 'hemp,' Arm *kanap'* 'hemp.' But the Sanskrit attestation *bhanga* 'hemp' shows inversion, with the labial first and the velar last.[13] This would also be an instance of Phonetic Reduction as described below in Section 3.
- **(s)peḱ-* is a common PIE term for *see*. It is attested in Ved *páśyati* 'behold, see, look, consider,' Lat *speciō* 'see, look at,' OHG *spehōn* 'spy, watch, be on the lookout for,' Av *spasyeiti* 'spies,' and TochAB *päk* 'intend.' But Greek cognates show the root in inverted form: *σκέπτομαι* 'look at,' *σκοπέω* 'look at, spy.'[14]
- **ḱeu̯dʰ-* 'to hide' shows reflexes in Germanic, Greek, and Armenian: OE *hȳdan* 'to hide,' Grk *κεύθω, κευθάνω* 'to hide, Arm *suzanem* 'hide.' But inverted (metathesis) forms exist alongside these and are considered attestations of the same root: OE *dēog* 'he concealed himself,' *dēagol* 'secret, hidden, mysterious,' OHG *tougan* 'hidden,' *tougali* 'secret,' TochB *tuk-* 'be hidden,' all from **dʰeu̯ḱ-*.[15]

Wescott, "Consonantal Apophony in Indo-European Animal Names," 127; see also Wescott, "An Editorial for Mother Tongue III," 95-98; and Wescott, *Protolinguistics*, 113.

[10] IEW 414; Mallory and Adams 120; Buck 16; Beekes 1632-1633; NIL 86-99; Ringe 19.

[11] Mallory and Adams 175; IEW 223.

[12] LIV 468; EIEC 125; IEW 798; Mallory and Adams 259.

[13] EIEC 266; Mallory and Adams 166.

[14] LIV 575-576; Mallory and Adams 326; IEW 984; EIEC 505.

[15] EIEC 268; Mallory and Adams 281.

- Lat *forma* 'form,' Grk *μορφή* 'form.'[16]
- **h₂ék̑-mōn* 'stone' is represented by Lith *akmuō* 'stone,' Grk *ἄκμον* 'anvil,' Hit *aku* 'stone,' Skt *āśman* 'stone,' but also OCS *kamy* 'stone,' and Serbo-Croatian *kamēn* 'stone.' These last two "are isolated and point to **keh₂mōn* which would seem to represent a metathesis of **h₂ék-*…".[17]
- **bʰag-* 'beech/oak/elm/a tree with edible acorns' as attested in Grk *φηγός* 'a sort of oak with edible acorns,' Lat *fāgus* 'beech,' Germanic *bōkō* 'beech, oak,' but Lith *guoba* 'elm' with the initial and final consonants in metathesis position.[18]
- **pn̥kʷst-* 'fist,' as attested in OCS *pęstĭ* 'fist,' and NE *fist*, but Lith *kùmstė* 'fist.'[19]
- **dʰeiǵʰ-* 'form, build, mold mud or clay, knead, smear, plaster; wall of mud bricks' as attested in: Skt *déhmi* 'spread, fill,' *déhī* 'wall, rampart, dam,' Goth *digan* 'form, fashion, knead, make pottery,' ON *deig* 'dough', *digr* 'thick,' NE *dough*, TochB *tsikale* 'to form,' Lat *fingō, finxī* 'form, shape,' *figūra* 'form, shape, figure,' *fictilis* 'fashion out of clay, made of earth or clay,' *figulus* 'potter,' Av *pairi-daēza-* 'enclosure' (> NE *paradise*); Grk *τεῖχος, τοῖχος* 'wall, embankment,' OIr *digen* 'build, firm, solid, hard, strong, fixed.' But metathesis forms (from **ǵʰeidʰ-*) include: Lith *žiedžiù* 'form from mud,' *žiēsti* 'make clay pots, form, shape,' Latv *zìežu* 'smear,' OCS *zіždǫ*, *zъdati* 'build.'[20]

In all of these examples the attested metathesis-variants are recognized alongside the non-inverted forms as genetically related descendants of the PIE roots cited. But in addition to these cases, there are numerous instances where distinct synonymous roots in the lexicon differ only in the inverse order of the initial and final consonant. In some cases this structure is obscured by variations in the medial resonants as described above, but once these obscurities are resolved the parallelism becomes evident. More such examples will be cited below.

Although regular metathesis is not uncommon in world languages, this type of radical metathesis with inversion in the ordering of non-contiguous root consonants is considered rare. One significant exception can be found in the Salish language family spoken by indigenous people in the Pacific Northwest. This language group shares many features with PIE and is more fully described in the Appendix.

3. Phonetic Reduction

Another type of root mutation could be called *reduction*. This concept is also familiar, since something very close to it is seen in Tocharian (and to some extent in Hittite) where the rich PIE obstruent inventory has been reduced to include only the simple, unvoiced, unaspirated (lenis)

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[16] OLD 722; de Vaan 233-234.
[17] EIEC 547; The laryngeal notation of EIEC has been regularized to the three-laryngeal system used here. Numerous other Slavic languages retain derivatives of this metathesis form; see Derksen 220.
[18] Václav Blažek, "The Ever-green 'Beech'-argument in Nostratic Perspective," 85, see also Václav Blažek, "Indo-European Dendronyms in the Perspective of External Comparison," 21-25 (especially 22n23).
[19] Jaan Puhvel, "All our 'yesterdays', 318n12.
[20] LIV 140; IEW 245; Mallory & Adams 223, 224, 228; Watkins 18; EIEC 283, 649; ALEW 1509-1510; Fraenkel 1306-1307.

forms.[21] It has been suggested that this change may have been due to the influence of a substrate language with a similarly limited range of obstruents.[22] This same dynamic can be seen in distinct synonymous PIE roots. Obvious examples are often remarked upon in the standard handbooks such as, for example:

- **gol(H)u̯os* 'bare, bald' — **kl̥Hu̯os* 'bald'[23]
- **-dʰro-, *dʰlo-* = instr. suffix — **-tro-, *-tlo-* = instr. suffix[24]
- **h₂eng-* 'bend' — **h₂enk-* 'bend'[25]
- **peh₂ĝ-* 'fasten securely' — **peh₂ḱ-* 'fasten securely'[26]
- **pei̯ĝ-* 'draw, color' — **pei̯ḱ-* 'draw, color'[27]
- **sredʰ-* 'boil, be agitated, move' — **sret-* 'boil, be agitated, move noisily'[28]
- **bʰendʰ-r̥ros* 'relation' — **pent-h₂r̥ros* 'father-in-law'[29]
- **h₂eu̯g-* 'increase, become strong' — **h₂eu̯k-s-* 'grow, become large'[30]
- **greh₂bʰ-* 'hornbeam' — **karp-* 'hornbeam'[31]
- **gʰabʰ-* 'take, seize' — **kap-* 'have, hold, seize'[32]
- **pleh₂g-* 'strike, beat' — **pleh₂k-* 'strike, beat'[33]
- **ḱu̯oi̯dis* 'white' — **ḱu̯oi̯tós* 'white'[34]
- **sab-* 'sap' — **sap-* 'sap'[35]
- **stei̯b-* 'make stiff' — **stei̯p-* 'make stiff'[36]
- **dei̯ĝ-* 'teach, show, indicate' — **deiḱ-* 'preach, say, index'[37]
- **u̯ei̯bʰ-* 'vibrate, be agitated' — **u̯ei̯p-* 'move back and forth, vibrate'[38]
- **gʰebʰōl* 'head' — **kapolo-* 'head'[39]
- ** ĝʰr̥d-* 'heart' — **ḱr̄d-* 'heart'[40]

[21] See EIEC 14, 28, 592. See also Kloekhorst, "Chapter 5: Anatolian," in Thomas Olander, ed., *The Indo-European Language Family*, 2022, "…the merger of PIE mediae and aspiratae into a single series that is called lenis (PIE*d,*dʰ > PAnat.*/t/)…" See Hodge, "Indo-European Consonant Ablaut," 143-162, for an early attempt to systematize some of these features along with a good survey of the prior literature on the subject.
[22] Peyrot, "The deviant typological profile of the Tocharian branch of Indo-European may be due to Uralic substrate influence," 72-121.
[23] EIEC 45; IEW 554.
[24] EIEC 52; IEW 692; Mallory and Adams 57.
[25] EIEC 61; IEW 45-46.
[26] EIEC 64; IEW 787-788.
[27] EIEC 64; IEW 794-795; LIV 464.
[28] EIEC 76; IEW 1001-1002.
[29] EIEC 196; IEW 127; Beekes 1171.
[30] LIV 274-275, 288-289; EIEC 248; IEW 84-85.
[31] EIEC 273; de Vaan 94; Mallory and Adams 161.
[32] EIEC 563; IEW 407-409, 527-528; Watkins, s.v. "*kap-*" 38.
[33] LIV 484-485, see 485n1 regarding the original identity of these roots.
[34] Mallory and Adams 332; Watkins 46; IEW 628-629; see below, Table 19.
[35] Mallory and Adams 158; IEW 880.
[36] LIV 592, 594.
[37] Watkins 15; IEW 188.
[38] de Vaan 674; IEW 1131; LIV 671.
[39] See below, Table 18.
[40] IEW 580; EIEC 262-263; Mallory and Adams 187; Michael Witzel, "Comparison and Reconstruction," 48.

Many more examples of this dynamic can be observed once the variation of medial resonants in PIE roots is allowed for. The evidence suggests that an ancient dialectical subset of PIE speakers experienced a phonetic influence similar to that which occurred in Tocharian, and then, during a later period of reunification with a group that had not experienced this linguistic change, the dialects became merged. The result is that, after this merger, synonymous pairs (doublets) coexisted within the basic vocabulary of PIE and these have persisted down into the various daughter languages. These synonyms are now considered separate roots, but they should, it will be argued, be seen as variants of an ancient original.

In their most strict formulation, these phonetic reductions can be summarized as follows:

- d, d^h became t
- b, b^h became p
- $\hat{g}, \hat{g}^h$ became $\acute{k}$,
- g, g^h became k
- $g^{\underline{u}}, g^{\underline{u}h}$ became k or $k^{\underline{u}}$

This is the system of correspondences that has been followed in the present paper even though there is evidence for crossover between /*g*/ and /*ĝ*/ in some cases, and /*k*/ and /*ḱ*/ in others. Such exceptions are often acknowledged in the standard handbooks, for example, in the root **peiḱ/peiḱ.*[41] In this paper, the intention is to argue *a fortiori*, adhering to the sound-relationships described above in all but the rarest of cases (and then only when on good authority), but once these root-dynamics are conclusively demonstrated, it may be possible to allow more latitude going forward. Note that the reduced forms of the root could also undergo radical metathesis and resonant variation as described in the proceeding sections.

II. EXAMPLES OF PIE ROOT VARIANTS

None of these observations alter the inventory of PIE roots as they have been identified and catalogued by historical linguists over the last two hundred years. They merely assist in forming a meaningful grouping of those roots into more or less distantly related families. One benefit of this analysis would be to help facilitate longer-range comparisons with more distant language families, as these can meaningfully be compared only by using the earliest form of the proto-language.

The following examples will illustrate the three types of root variations as described above.

[41] EIEC 289, 795; There are many examples of this, e.g., **moko/*moḱo* 'gnat, stinging insect' (EIEC 312); **g^{h}el-/*ĝ^{h}el-* 'yellow' (EIEC 654); **g^{h}órd^{h}os/ĝ^{h}erd^h-* 'court, yard, enclosure, garden' (EIEC 199, 224); **kseros/*ḱseros* 'dry' (Mallory and Adams 125, 348); etc.

*ḱ(R)eḭ- and Its Root Variants

Table 1: *ḱ(R)eḭ- 'lie down, persons to lie down with, place to lie down'

PIE Root	Initial	R1	R2	Final	Ref	Semantic Value
*1.*ḱeḭ-*	ḱ			ḭ	1	lie (down), rest, lie dead, (matrimonial) bed, nest, sleep, sleeping room, village, home, family
**ḱeḭ-u̯-os-*	ḱ			ḭ-u̯	2	citizen, household, wife, sleeping partner, dear, kind, auspicious
**ḱóḭ-mos-*	ḱ			ḭ	3	household, village, world, home, cohabit with, marry, have intercourse with, dear, family, sleep, farmstead
*2.*ḱeḭ-*	ḱ			ḭ	4	fall (< "fall into horizontal positon")
**ḱleḭ-*	ḱ	l		ḭ	5	lean, rest, recline, lie down, fall, bed, cabin, shelter, house, dwelling, sleep
**ḱleḭ-s-*	ḱ	l		ḭ	6	cling to, embrace, attach to, unite, join, be connected
METATHESIS VARIANTS (of **ḱeḭ-u̯-os-*)						
** u̯iḭḱ-s-, *u̯eḭḱ-*	u̯		ḭ	ḱ	7	household, village, tribe, hamlet (Metathesis variant of **ḱeḭ-u̯-os-*, above)
**u̯reḭḱ-*	u̯	r	ḭ	ḱ	8	protect, conceal, cover, unite, build, put together, construct; a band

1. *l.*ḱeḭ-* 'lie (down), rest, lie dead, bed, sleeping room'
   Cluv *zīyar(i)* 'lie (down),' Hit *kitta(ri)* 'lie (down),' Grk *κεῖμαι* 'lie (down), lie dead, rest, remain, lie sick or wounded, have a fall (wrestlers),' *κείω* 'I will lie (myself) down,' *κοῖτος* 'layer, bed, sleep,' *κοῖτη* 'matrimonial bed, nest,' *κοῖτών* 'sleeping room.'[42]

2. **ḱeḭ-u̯-os-* 'belonging to the household (hence > friendly, intimate, dear), wife, citizen, auspicious'
   Lat *cīvis* 'citizen,' Osc *ceus* 'citizen,' OE *hīwan* 'household,' Latv *sieve* 'wife,' Skt *śéva-* 'trusty, friendly, kind, auspicious, dear,'[43]

Mallory and Adams write: "Some derive this word from **ḱeḭ-* 'lie,' i.e. either 'those who lie together (in sleep)' or 'those who depend on one another'." See below for a metathesis version of this root (*u̯iḭḱ-s-*, *u̯oḭḱ-os-*).

[42] LIV 320; Mallory and Adams 223, 296; EIEC 352; IEW 539-540; Beekes 663-664; LSJ 934; Monier-Williams 1065, 1077. ***Note**: The representative attestations listed for the roots cited in this paper are primarily for identification purposes; space limitations here do not allow for completeness. Note also that the listed semantic values of the attestations cited are not exhaustive, but rather are selected from the Lexicon as evidence of semantic continuity. Likewise, reference citations are limited to a small sampling, however all listed attestations and difinitions can be found in the references cited.

[43] Mallory and Adams 204; Monier-Williams 1074, 1088; EIEC 214, 622; de Vaan 116; Möller (1970:113) compares Arab *šahiḭa* (iḭ < iu̯) 'desire, long for, love.'

3. **ḱói̯-mos-* ‘household, village, home, cohabit with, marry, dear, family, sleep, farm’
   OIr *cāem* ‘dear,’ MWels *cu/cuf* ‘dear,’ ON *heimr* ‘abode, world,’ *heima* ‘home,’ OE *hām* ‘home,’ *hēman* ‘have intercourse with, cohabit with, marry,’ Goth *haims* ‘village, country,’ NE *home*, OPrus *seimīns* ‘household servants,’ Lith *šiemà* ‘family,’ Latv *sàime* ‘family,’ OCS *sěmija* ‘household servants,’ *sěmĭja* ‘family,’ Grk *κώμη* ‘village,’ *κοιμάομαι* ‘sleep.’[44]

4. *2.*ḱei̯-* ‘fall’
   Ved *áva-śīyate* ‘fall out or away, *śad* ‘fall, fell, throw down, slay, kill, destroy,’ Cymr *cwydd* ‘fall.’[45]

Falling typically results in a horizontal (lying) position; hence the semantic connection to *1.*ḱei̯-*. Some parallel English expressions are: “He fell into bed,” or “She fell asleep.” LIV suggests that this root may well be part of *1.*ḱei̯-* ‘lie (down)’ since semantically *lie* can be seen to be the result of *having fallen*.

5. **ḱlei̯-* ‘bend, incline, lean on, recline, rest, lie down, fall, bed, sink, hut, nuptial bed’
   Lat *clīvus* ‘hill, slope, declivity,’ NE *lean*, Lith *šliẽti* ‘lean against,’ Rus *sloj* ‘layer, level,’ Grk *κλίνω* ‘cause to lean, incline, lean on, sink, bend, make one thing lean against another, lean it, rest it, recline, lie down, fall, fallen (leaves), fall (on knees), lie near, (med.) decline or wane,’ *κλισία* ‘place for lying down or reclining, sitting down to meals, hut, shed, booth, cot, cabin, couch, nuptial bed,’ *κλίσις* ‘bending, lying down, place for lying on, region,’ *κλινικός* ‘of or for a bed, a physician who visits his patients in their beds, bed ridden,’ Ved *śráyate* ‘lean oneself on,’ *śrāyá* ‘refuge, reliance, shelter, protection, house, dwelling, abode,’ OHG *hlinēn* ‘lean,’ Alb *fle* ‘sleeps.’[46]

6. **ḱlei̯-s-* ‘cling to, embrace, attach to, unite, join, be connected’
   Ved *ā-śliṣyet* ‘remain attached to,’ *-śliṣya* ‘adhere, attach, cling to, clasp, embrace, unite, join.’[47]

7. **u̯i̯ḱ-s-* , *u̯oi̯ḱ-os-* ‘household, village, tribe, hamlet’ (Metathesis variant of **ḱei̯-u̯-os-*)
   Grk *οἶκος* ‘house, home, dwelling, room, chamber, household, servant, housemate,’ *οἰκέω* ‘live, dwell, inhabit, be situated,’ Lat *vīcus* ‘group of dwellings, village, hamlet,’ Ved *véśa* ‘house, dwelling, brothel,’ *veśya* ‘neighborhood,’ Skt *viśáti* ‘sit down, settle, enter,’ *vaiśya* ‘a man of the third caste,’ OCS *vьsь* ‘village, field,’ Rus *ves’* ‘village.’[48]

This and the following root conform closely to the semantic field as seen in the foregoing roots. They are metathesis formations of **ḱei̯-u̯-os-* (no. 2, above). The /u̯/ of the root extension in **ḱei̯-*

[44] EIEC 622; IEW 539-540; Mallory and Adams 223; Beekes 814; DELG 583.
[45] LIV 321 (see note #1 for possible connection to *1.*ḱei̯-*); LIV Add. 45; Monier-Williams 1051, 1077.
[46] LIV 332; LIV Add. 46; IEW 601-602; Mallory and Adams 296; Beekes 716-717; de Vaan 122; LSJ 961; OLD 337-338; Monier-Williams 1096; EIEC 348.
[47] LIV 333 (See notes 1 and 2 for probability that this root is an extension of **ḱei̯-*); Monier-Williams 1104.
[48] LIV 669; IEW 1129, 1131; Mallory and Adams 205, 221; LSJ 1202, 1204; OLD 2058; Beekes 1055-1056; Monier-Williams 989, 1019; EIEC 193, 622; de Vaan 675.

u̯-os- was apparently taken at one point as the final consonantal element of the original root and then subjected to metathesis.

8. ***u̯reḭḱ-*** ‘cover, protect, construct, conceal’
   OE *wreón* ‘protect, conceal, clothe, cover,’ Lith *rišù* ‘bind, unite, combine, a band, compingō (‘fix, attach, fix together, bind, together, build, construct, put together,’), introligō (fasten, bind, unite in harmony or kinship),’ YAv *uruuaēsaiieiti* ‘turn, twist.’[49]

The semantic field encompassed by this root seems to refer to the communal process of constructing the shelters that comprise the *oi͂koς* or *vīcus*. Notions of turning and twisting could refer to the techniques of building with wattle and daub, where withies are twisted and woven to create a lattice which can then be filled by a mixture of clay and straw.[50]

Semantic Commonality in this Series

Table 2: Semantic map for **ḱ(R)eḭ-* ‘lie down, persons to lie down with, place to lie down’

	1 1.**ḱeḭ-*	2 **ḱeḭ-u̯-os-*	3 **ḱóḭ-mos*	4 2.**ḱeḭ-*	5 **ḱleḭ-*	6 **ḱleḭ-s-*	7 *u̯iḱ-s-*	8 **u̯reḭḱ-*
Semantic Values								
lie, lean, rest, recline, sit down, settle, sink, sleep	**x**		**x**	**x**	**x**		**x**	
fall (“assume a lying position”)	**x**			**x**	**x**			
bed, sleeping place, room, household, home, village	**x**	**x**	**x**		**x**		**x**	**x**
embrace, cling to, unite, join, wife, family, tribe, citizen, dear, friendly, kind, auspicious	**x**	**x**	**x**			**x**		**x**

Table 2 illustrates the large degree of semantic overlap that each root shares with the other roots in this resonant series. These can be summarized as follows:

[49] LIV 699; IEW 1158-1159; ALEW 999-1000; Bosworth and Toller 1274; OLD 376, 1030; de Vaan, “Wrestling with metathesis,” 184-190.

[50] “[Around 6000-5500 B.C.] a population increase is shown in the Mediterranean and Aegean regions, the central Balkans, and central Bulgaria by agglomerations of houses built of bricks on stone foundations (in the Aegean), and of timber uprights and clay daub (in the temperate zone).” –Gimbutas, “Old Europe in the Fifth Millennium BC, 2.

1. *1.*ḱei̯-* shares some semantic values with 7 other roots in the series.
2. **ḱei̯-u̯-os-* shares some semantic values with 6 other roots in the series.
3. **ḱói̯-mos-* shares some semantic values with 7 other roots in the series.
4. *2.*ḱei̯-* shares some semantic values with 4 other roots in the series.
5. **ḱlei̯-* shares some semantic values with 6 other roots in the series.
6. **ḱlei̯-s-* shares some semantic values with 4 other roots in the series.
7. **u̯i̯ḱ-s-* shares some semantic values with 6 other roots in the series.
8. **u̯rei̯ḱ-* shares some semantic values with 6 other roots in the series.

Estimate of Statistical Validity

Disregarding medial resonants, the entire PIE lexicon contains eight roots with the consonantal form **ḱ—i̯*.[51] As shown in the table above, six of those roots share a semantic field that includes the concepts:

- lie down, fall down, recline, rest
- persons to lie down with (wife, family, friends, tribe, community), or terms that relate to such people (dear, friendly, kind; embrace, cling to, unite)
- place to lie down (bed, home, room, village)

These six roots then represent 75% of all roots with this consonantal form in the PIE lexicon. Taking any one of these six roots as a starting point, what are the chances that seven roots, selected at random from the approximately 1,500 roots in the PIE lexicon, would yield five more that fall within this semantic field? No doubt, the chances would be extremely small. This suggests that some other factor accounts for their higher than expected frequency. That factor is very probably that they are ultimately cognate.

It remains to analyze the metathesis forms **u̯i̯ḱ-s-* and **u̯rei̯ḱ-*. Disregarding medial resonants, the entire PIE lexicon contains only two roots with the consonantal forms *i̯—ḱ* (none) or the extended form **u̯— i̯ḱ*.[52] Of those two roots, both share a semantic field that includes the concepts:

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[51]In addition to those listed in Table 1, these include **ḱei̯s-* and **ḱrei̯H.* Counts are based on roots appearing in either LIV (verbal only) or Mallory and Adams (verbal and nominal). An argument could be made that **ḱei̯-s-* (LIV 321) also falls within the above semantic field. It denotes "those left over, the others, the remnant, survivors, directed, ordered, commanded" (see Monier-Williams 1076, 1088). These meanings could very well be subsumed under the category "civilians" (as opposed to warriors), which would then connect the root to **ḱei̯-u̯-os-*, the source of Lat *cīvis* 'citizen, civilian.' But because this concept would represent a slight semantic shift, it is not at this time included in the list of cognates shown in the table above.

[52] Forms in **u̯—ḱ-* (without /i̯/) would include **u̯eḱ-* (see below) and **u̯oḱeh₂-* 'cow,' Not included in this list are: **u̯eḱs* 'six' (because of its multiple phonetic forms: **ksu̯eḱs, *kseḱs, *(s)u̯eḱs, *seḱs,* and **u̯eḱs,* see Mallory and Adams 313) and **u̯īḱm̥tih₁* 'twenty' (because it can be analyzed as **du̯ī* 'two' + *ḱm̥tih₁* 'tens,' see Mallory and Adams 308). It could be argued that the root **u̯eḱ-* 'a docile and obedient subject, willing, voluntary' could be included in the semantic field of Table 1. It is attested by the following: Ved *váṣṭi* 'desire, wish for, willing, eager, zealous, obedient, *vaṣya* 'to be subjected, subdued, tamed, humbled, being under control, obedient to another's will, dutiful, docile,' *vaṣyaka* 'obedient, dutiful,' *vaṣyakā* 'an obedient wife,' *vaṣīkara* 'bring into subjection, subjugating, making anyone subject to one's will,' Grk *ἑκών* 'deliberate, willing, voluntary,' *ἑκοτής* 'volunteer,' Hit *wēkmi* 'wish, desire,' Av *vasəmi* 'wish' (LIV 672; Monier-Williams 929; Beekes 400; IEW 1135; Mallory and Adams 341; Turner 667). This root combines somewhat contradictory notions of "free will," "subjugating," and "being subject to the will of others." Perhaps the common referent is that of villagers subject to a king or chief,

- house, dwelling, village, tribe
- cover, protect, construct (the characteristics of a house or dwelling)

Combining all instances of roots showing either the direct or metathesis forms (**ḱ—u̯, u̯—ḱ,* and the extended form **u̯— u̯ḱ*) results in ten roots, with eight sharing the semantic field of Table 1. Thus 80% of the phonetic forms share in this semantic field, vastly more than would be expected from a random sampling of roots in the reconstructed PIE lexicon.

* * *

**p(R)eu̯-* and Its Root Variants

The following table illustrates a resonant series composed of elements that are each traditionally considered separate roots in PIE. The semantic field is tightly concentrated on notions of breathing, blowing, panting, gasping, snorting, wind and spirit. Those roots that reference lungs, floating, and swimming can be included here because the lungs are the organ of breathing, and both floating and swimming require the lungs to be filled with breath. While the ultimate source of these roots was no doubt onomatopoeic[53], its elaboration using resonant variants is clearly derivative.

Note that the root-final /*u̯*-/ does not act as a variable resonant, but rather as a fixed final consonant that is consistent across all the roots in this series. Any element following this final consonant is a root extension or suffix. As mentioned above, semi-vowels have the ability to function either as vowels or consonants, and in this case the function is unvaryingly consonantal and structural.

volunteers in times of external conflict, "civilians" as opposed to regular warriors or soldiers, inhabitants of the *oἶκος* or *vīcus*.

[53] Consider Maya K'iche' *ajpu* 'hunter' (*aj-* is agentive, and *pu* is 'blowgun') literally, 'he of the blowgun.'

Table 3: **p(R)eu̯-* 'breathe, breathe heavily, pant, lungs, float, wind, vapor, spirit, scent'

PIE Root	Initial	R1	R2	Final	Ref	Semantic Value
**preu̯-th₂-*	p	r		u̯	1	pant, blow, breathe heavily, gasp, snort, inflate, foam, froth
**pneu̯-*	p	n		u̯	2	blow, breathe, fragrance, pant, snort, sneeze, wind, breath, puff, blast, soul, spirit
**pleu̯-mon-*	p	l		u̯	3	lungs, right lung, float, swim, sail
**pleu̯-d-*	p	l		u̯	4	swim, flow, wash
**pleu̯-k-*	p	l		u̯	5	swim, push, set in motion, float, throw, fly, rush
**peu̯-*	p			u̯	6	pant, gasp, puff, wheeze, lungs, breath, wind, spirit, soul, foam, blast, bellows
**peu̯-k-*	p			u̯	7	breathe, exhale, respire, pant, gasp
2.**peu̯-H-*	p			u̯	8	to stink, rot, putrefy, decay
**peu̯-t-*	p			u̯	9	breathe, blow, swell, exhale
METATHESIS VARIANTS						
**u̯ep-* **u̯ap-ōs*	u̯			p	10	vapor, steam, exhalation, blow

1. **preu̯-th₂-* 'pant, blow, breathe heavily, gasp, snort, inflate, foam, froth'
   Ved *próthati* 'pant, blow, breathe heavily, gasp, snort,' *pra-prōthati* 'pant, blow up, inflate,' YAv *fraoθaṯ.aspa-* 'with snorting horse,' OE *ā-frēoðan* 'foam, froth,' ON *frauð* 'foam.'[54] Note that Pokorny also analyzes this root as **preu-t(h)-*.

2. **pneu̯-* 'blow, breathe, fragrance, pant, snort, wind, breath, blast, soul, spirit'
   Grk *πνέω* 'blow, breathe, draw breath, fragrance,' *πνεῦμα* 'blast, wind, breath, spirit, soul,' ON *fnýsa* 'pant, blow, breathe heavily, snort,' OE *fnēosan* 'sneeze,' *fnæst* 'puff, blast, breath.'[55]

3. **pleu̯-mon-*, **pleu̯-* 'lungs, right lung, float, swim, sail'
   Skt *klóman-* 'right lung,' Grk *πλεύμων* 'lung,' Lat *pulmō* 'pl. lungs,' Lith *plaũčiai* 'lungs,' ORus *pljuča* 'lungs,' Ved *plávate* 'swim, float,' Grk *πλέω* 'to sail, to swim,' TochB *plyewsa* 'float.'[56]

[54] LIV 494; IEW 810; Monier-Williams 711; Bosworth and Toller 27; de Vries 140.
[55] LIV 489; IEW 838-39; LSJ 1424-25; Beekes 1213; de Vries 136; Bosworth and Toller 296.
[56] Mallory and Adams 187; IEW 837; OLD 1518; EIEC 359, 561; LIV 487; Beekes 1207-1208; de Vaan 497. Compare also the unrelated PIE root **ḱu̯ésHmi* 'breathe deeply, sigh, lungs' for a parallel and similarly encompassing semantic field, i.e., *breathe* and *lungs* (EIEC 82, 518; IEW 631-632). One could also cite external evidence attested in Shabo *pʰu* 'blow with the mouth' and *pʰuh* 'lungs' (Ehret's 654 and 656) quoted in Bürgisser, "Some thoughts about Shabo, Ongota and the Kadu family of languages," 192.

The lungs are the instruments (organs) for breathing, panting, blowing, gasping and snorting, therefore they legitimately fit into the semantic field defined by the other roots in this series.

PIE **pleu̯-* 'float, swim' has been seen as the source for Latin *pulmō* 'lungs' etc., but this is unlikely. Names for parts of the body generally do not derive from abstract concepts, rather the contrary is much more common. We say, for example, "the mouth of the river," "the foot of the mountain," "the head of the department," "the heart of the artichoke." For this reason, the concept "floating" is much more probably derived from the notion, "breath, breathe air into the lungs." The following two roots are clearly derivatives of **pleu̯-* 'float, swim.'[57]

4. **pleu̯-d-* 'swim, flow, wash'
   ON *fljóta* 'flow, wash, swim,' Lith *pláudžiu* 'to wind, to coil, wash,' OIr *lúaidi* 'move, put in motion, agitate,' ON *fleyta* 'push, lift up.'[58]

5. **pleu̯-k-* 'swim, push, set in motion, float, throw, fly, rush'
   ON *fliúga* 'fly, rush,' Lith *plaukiù* 'swim, push, set in motion, float,' ON *fleygja* 'throw.'[59]

6. **peu̯-* 'pant, gasp, puff, wheeze, lungs, breath, wind, spirit, soul, foam, blast, bellows'
   Skt *phupphukāraka* 'pant, gasp, puff, wheeze,' *phuphusa* 'lungs,' Arm *(h)ogi* 'breath, spirit, soul,' MIr *ūan* 'foam,' Grk *φῦσα* 'breath, wind, blast, bellows,' Latv *pũga* 'squall of wind.'[60]

7. **peu̯-k-* 'breathe, exhale, respire, pant, gasp'
   Arm *p'č'em* 'breathe, exhale, respire, pant, gasp.'[61]

8. 2.**peu̯-H-* 'to stink, rot, putrefy, decay'
   Ved *pū́yati* 'decay, rot, stink,' YAv *puiieti-ča* 'putrefy, decompose, decay, molder, rot,' ON *fúa, fúinn* 'rot, putrefy,' *feyja* 'allow to rot,' Lith *pūnù (pū́ti)* 'rot, decay.'[62]

The sensation of odors is carried by the breath, hence the semantic connection to this archaic root.

9. **peu̯-t-* 'breathe, blow, swell, exhale'
   Lith *pučiù* 'breathe, blow,' *puntù* 'swell, exhale.'[63]

10. **u̯ep-, u̯apōs-* 'vapor, steam, exhalation, blow'
    Lat *uapor* 'an exhalation, vapor, steam,' *uaporium* 'a room in which steam circulates for heating part of a bath suite,' *uaporifer* 'producing steam or hot vapor,' Skt *vāpáyati* 'causes to blow,' Skt *vāṣpá / bāṣpá* 'vapor, steam.'[64]

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[57] See LIV 488, footnote #1 to each of these roots, which state that they are root extensions of **pleu̯-*.
[58] LIV 488; IEW 837; de Vries 132.
[59] LIV 488; IEW 837.
[60] IEW 847; Mallory and Adams 386; LSJ 1963; EIEC 72; Beekes 1599; Bomhard 137.
[61] LIV 481; IEW 847.
[62] LIV 480; IEW 848-49.
[63] LIV 481; IEW 848.
[64] IEW 1149-1150; Mallory and Adams 128-129; OLD 2010-2011; Monier-Williams 730, 934, 949.

Semantic Commonality in this Series

All of the members of this series share in a tight semantic field denoting: breathe, breathe heavily, pant, lungs, float, wind, vapor, spirit, scent. It appears that closed roots ending in a semi-vowel tend to attract (mostly obstruent) root-extensions to provide a kind of psychological closure in cases where that final could be mistaken for a medial resonant as in the various extended forms seen above.

Estimate of Statistical Validity

In addition to the nine roots listed in Table 3, five other PIE roots share in the closed consonantal structure **p—u̯-* (or in a structure that could possibly be analyzed to that form).[65] Therefore nine out of fourteen roots (64%) bearing that consonantal structure share this semantic value. Taking any one of the roots in Table 3 as a starting point, a random sampling of thirteen additional roots out of the approximately 1,500 in the PIE lexicon would likely yield less than one semantic match. Eight matches would be improbable in the highest degree. How could this be explained other than by concluding that these roots are cognate?

In addition to the root **u̯ep-, u̯apōs-* 'vapor, steam, blow,' six other PIE roots bear the consonantal structure **u̯—p*, none of which shares this semantic value.[66] The argument that this root is cognate to the others in Table 3 rests only on the observation that their consonantal structures are inverses of each other and that they share comparable semantic values. The level of confidence of this root being cognate to the others should perhaps be equal to our confidence that Latin *speciō* 'see, look at,' is cognate to the Greek words in inverted form: *σκέπτομαι* 'look at,' *σκοπέω* 'look at, spy.' If that is the case, then the likelihood of **u̯ep-* being cognate to **peu̯-* is high.

* * *

**g$^{u̯h}$e(R)i̯d-* and Its Root Variants

The semantic field encompassed by the following series of roots includes two primary concepts:

- shine, be bright
- see, find, know

The connection between these two concepts is readily apparent: Objects can be seen because they are bright, and once they have been seen, they are known. Some of the roots in this series combine both notions, others either one or the other. Together they form a tight sematic field.

They also share similar phonetic features:

- 11 out of 13 roots continue the initial labiovelar in one of the following three forms:
  1. Intact ($g^{u̯h}$, $k^{u̯}$)

[65] **peh₂u̯-* (LIV 462), **peu̯(ə)g-* (LIV 480), 1.**peu̯H-* (LIV 480), **pneu̯H-* (LIV 489, probably identical to **pneu̯*), **preu̯-* (LIV 493).
[66] **u̯rep-* (LIV 701), **u̯ep-* (LIV 689), **su̯ep-* (LIV 612), **u̯ei̯p-* (LIV 671), **u̯elp-* (LIV 680), **u̯erp-* (LIV 690).

2. Separated (kṷ)
3. Loss of one element (labial or velar) and retention of the other (k or ṷ).

- 12 out of 13 show a medial resonant (R2) in /i̯/.
- 11 out of 13 show a root-final consonant /d/, or /t/ in the reduced variants. Of the remaining two, one could be considered a /t/ that has decayed into a sibilant and the other as a dental that has become lost.[67]
- The other medial resonant (R1) shows limited variability: Those in /ṷ/ reflect the labial element of the separated initial labiovelar and should therefore technically be considered as a medial resonant (R1) in /ø/. One root shows a medial resonant in /h₂/. In conclusion, 12 out of 13 are essentially R1 in /ø/.

It is not unusual for single PIE roots to encompass the two semantic values *see* and *bright*. Consider the root ***leṷk-***, for example:

> NWels *amlwg* 'evident,' OPrus *laukīt* 'seek,' OCS *lučiti* 'meet someone,' Grk *λεύσσω* 'see, look, examine,' Skt *lókate* 'see, behold, perceive, shine, *locana* 'illuminating, brightening,' *ruc* 'shine, be bright, radiant, to be splendid or beautiful or good,' Lat *lūceō* 'shine,' *lux* 'light,' Hit *lukke-* 'shine,' TochAB *luk-* 'shine.'[68]

Another example can be found in Tocharian, where TochB [1]*pälk* 'see' corresponds to TochB [2]*pälk* 'shine.'[69] See also ****b^{h}eh₂-*** 'light, bright, shine, light up, make visible, white' (Table 16 below).

Table 4: **g^{ṷh}e(R)i̯d-* 'be bright, shine, clear, be visible, see, know'

Root	Initial	R1	R2	Final	Ref.	Semantic Value
**g^{ṷh}eh₂i̯d-*	g^{ṷh}	h₂	i̯	d	1	bright, clear
**ṷeid-*	ṷ		i̯	d	2	see, find, know, seek
**(s)ṷeid-*	(s)ṷ		i̯	d	3	shine, gleam, sparkle, clear, star, look at
METATHESIS VARIANTS (from **ṷeid-, *(s)ṷeid-*)						
**di̯eṷ*	d		i̯	ṷ	4	bright sky, heaven, god
**di̯eṷ-t*	d		i̯	ṷ	5	shine, be bright, star, see
**dei̯-*	d		i̯		6	shine, bright, clear, is seen

[67] The conventional view sees the /t/ as a root extension, but the pervasive presence of dentals in the other roots of this series argues strongly in favor of the alternative explanation.
[68] LIV 418-419; Mallory and Adams 326; Beekes 851-852; Monier-Williams 881-882, 906-907; de Vaan 355; EIEC 505; Adams 549-550; Hoenigswald, *Language Change and Linguistic Reconstruction*, 39-40. Beekes (2009: 852) observes: "The meaning 'to see' arose from 'to light up'." See also Blažek, "Indo-European Astronomical Terminology," 138-139.
[69] Adams (377-378) states these are from PIE ****b^{h}leg-*** 'burn, singe, ignite, flame, blaze, shine' as seen in Grk *φλέγω* (Beekes 1575-1577).

REDUCED VARIANTS (from *$g^{\underline{u}h}e(R)\underline{i}d$-)						
*$k^{u}e\underline{i}t$-	k^{u}		$\underline{i}$	t	7	shine, appear, observe, know
*$k\underline{u}e\underline{i}t$-	k	$\underline{u}$	$\underline{i}$	t	8	shine, glisten, sparkle, bloom
*$\acute{k}\underline{u}e\underline{i}t$-	$\acute{k}$	$\underline{u}$	$\underline{i}$	t	9	light up, shine, be bright
*$ke\underline{i}t$-	k		$\underline{i}$	t	10	be bright, shine, lighten
*$k^{u}e\underline{i}$-	k^{u}		$\underline{i}$		11	observe, take notice
*$k^{u}e\underline{i}s$-	k^{u}		$\underline{i}$	s	12	see, observe, take notice
METATHESIS VARIANTS						
*$t\underline{u}ek$-	t	$\underline{u}$		k	13	be visible, visible form

1. *$g^{\underline{u}h}eh_2\underline{i}d$- ‘bright, clear, shining’
   Grk *φαίδιμος* ‘shining, noble,’ *φαιδρός* ‘bright, clear, joyous,’ *φαιδύνω* ‘to make bright, cleanse, cheer up,’ *φαιδυντής* ‘purifier,’ *φαιδιμόεις* ‘shining, radiant, glistening,’ Lith *giẽdras* ‘clear, bright,’ *gaidrùs* ‘fine, clear, bright, limpid,’ *gaidrà* ‘cloudless heaven, clear weather.’ Latv *dziedre* ‘clear, cloudless heavens.’[70]

2. *$\underline{u}e\underline{i}d$- ‘see, find, know, seek’
   Lat *uīdī* ‘see,’ *videō* ‘to see,’ Ved *ávidat* ‘have found,’ *vindáti* ‘find,’ *véda* ‘to know,’ Grk *εἶδον* ‘see, perceive,’ *εἴδομαι* ‘appear, seem, resemble,’ *ἰδανός* ‘fair, good-looking,’ *ἰδέα* ‘appearance, form,’ *ἰδεῖν* ‘behold, recognize,’ *ἰδυῖοἰ* ‘witnesses,’ *οἶδα* ‘to know,’ Goth *wait, witum* ‘know,’ OCS *vědě* ‘to know.’[71]

3. *$(s)\underline{u}e\underline{i}d$- ‘shine, gleam, sparkle’
   Lith *svidėti* ‘shine, gleam,’ Latv *svîstu* ‘become bright,’ *svīst* ‘break of day,’ OE *switol* ‘clear,’ Av *$x^{v}aēna$* ‘glowing,’ Lat *sīdus* ‘star, planet, constellation, heavenly body,’ *consīderō* ‘to observe, examine, look at.’[72]

4. *$d\underline{i}eu$-*os* ‘heaven, divine, god, the light of day’
   Grk *δῖος* ‘belonging to heaven, godlike,’ *Ζεύς* ‘Zeus, heaven, god of heaven,’ Lat *deus* ‘a god, deity,’ *Iūpiter* ‘Jupiter,’ *Diespiter* ‘Father Jupiter,’ *diu* ‘by day,’ *diēs* ‘day, daytime,’ Lith *diẽvas* ‘god,’ Hit *sius* ‘god,’ Skt *devá* ‘god,’ *dív* ‘heaven, the sky,’ *dívā* ‘day,’ *divyá* ‘divine,

[70] IEW 488; Beekes 1544; Mallory and Adams 330; LSJ 1911-1912; DELG 1127; Frisk 981; ALEW 366-367; EIEC 83; Václav Blažek, “Indo-European Astronomical Terminology,” 145.
[71] LIV 665-666; IEW 1125-1127; Beekes 379-381, 576-577, 579; de Vaan 676; Mallory and Adams 321-322; EIEC 337; OLD 2058-2060; Dolg 2548. The attestations of Grk *ἰδεῖν* and *οἶδα* (from *ϝἰδεῖν* and *ϝοἶδα*) suggest that the root *$g^{\underline{u}h}eh_2\underline{i}d$- probably originally had resonant variants in the forms *$g^{\underline{u}h}eh_3\underline{i}d$- and *$g^{\underline{u}h}e\underline{i}d$-. For the initial /w/ in Goth *witum* (<*$g^{\underline{u}h}$?), see Polomé, “Initial PIE *$g^{w}h$- in Germanic,” 303.
[72] LIV 608 s.v. “2.*$s\underline{u}e\underline{i}d$-”; IEW 1042; Mallory and Adams 329; OLD 414, 1757; ALEW 1153-1154; EIEC 514; Václav Blažek, “Indo-European Astronomical Terminology,” 144. The initial /s/ of this root is not generally attributed to the *s*-mobile, but is considered so here in alignment with the other roots in this series.

heavenly, celestial, wonderful, charming, beautiful,' ON *Tyr*, 'god of war,' OE *Tīw* 'god of war,' NE *Tuesday*.[73]

5. **dḭeu̯-t* 'shine, be bright, star, to see'
   Ved *dyutānā́* 'to shine, be bright or brilliant,' *dyút* 'shining, splendor, ray of light,' *dyota* 'light, brilliance,' *dyótana* 'shining, illuminating, enlightening, seeing, sight,' *jyótis* 'light, brightness (of the sky), the heavenly bodies, planets, stars,' Palaic *Tiyat-* 'the sun.'[74]

6. **deḭ-* 'bright, shining, seen'
   Grk *δέατο* 'is seen, appeared, seemed,' *δῆλος* 'clear, visible,' Skt *dīdeti* 'shines, is bright,' ON *teitr* 'glad.'[75]

This root is traditionally seen as the basis for the previous two roots in this series. The fact that the others show a final consonant in /u̯/ (including the metathesis forms) raises the question of whether or not they were all constructed on an extended form in /u̯/, or whether, on the other hand, the final was lost in this root. The latter explanation is most likely.

7. **k^{u}eḭt-* 'shine, appear, observe, know'
   Ved *cétati* 'perceive, observe, take notice, understand, know, appear,' *cikitvás* 'knowing, understanding, shining,' Latv *škìetu* 'to shine, to think,' Rus *čitát'* 'read,' Czech *čítati* 'read, count.'[76]

As noted above, roots sharing the semantic values *bright*, *visible*, *see*, and *know* are not uncommon in PIE.

8. **ku̯eḭt-* 'shine, glisten, sparkle, bloom'
   Latv *kvitu* 'shine, sparkle,' OCS *cvisti* 'bloom.'[77]

9. **ḱu̯eḭt-* 'light up, shine, be bright, white'
   Skt *śvíndate* 'to lighten,' *śvetá* 'white, bright,' *śvitrá* 'whitish,' Av *spaēta* 'white,' Lith *švitėti* 'shine shimmer,' *švaitaũ* 'make bright,' OCS *svьěti* 'shine,' ORus *svьnuti* 'become bright, dawn,' NE *white* (< **ḱu̯eḭd-*).[78]

LIV calls **ku̯eḭt-* the "Kentum-Form of *ḱu̯eḭt-*" implying that the two are ultimately cognate (LIV 375n1 of lemma **ku̯eḭt-*). Based on that authority, *ḱu̯eḭt-* is included in this series despite the initial /ḱ/.

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[73] Mallory and Adams 329, 408-409; Beekes 338, 498; IEW 184-186; de Vaan 167, 170, 172, 315; Monier-Williams 478-479, 499; OLD 534-535; Frankel 193-194; Ringe 127; Bomhard 235; Dolgopolsky 2241; Haynes 2009: 211-213; EWKS 158 "Kartvelian **tew-* 'white, star, moon, sunrise, awake'."
[74] LIV 125; IEW 185; Monier-Williams 427, 500; de Vaan 172-173; Václav Blažek, "Indo-European Astronomical Terminology, 133. The final /t/ is a root extension of the previous root as per LIV 125n1.
[75] Mallory and Adams 301, 305 328, 329, 408; Beekes 307, 324; LSJ 372; de Vries 586; IEW 183-187; Monier-Williams 480-481, 492.
[76] LIV 382-383; IEW 637; Monier-Williams 395; Derksen 90; EWAia 547-548.
[77] LIV 375; IEW 629; Mallory and Adams 332; etc.
[78] LIV 340; IEW 628-629; Derksen 478; Mallory and Adams 332; Monier-Williams 1106; EWAia 678-679; Watkins 46; AHD 2034. NE *white* (< **ḱu̯eḭd-*) per Mallory and Adams.

10. **keid̯-* ‘be bright, shine, lighten’
    Ved *cetati* ‘shine, appear, stand out,’ *citrá* ‘visible, shining, bright, appearance,’ *ciketa* ‘has lightened,’ Av *ciθra-* ‘shining, visible,’ Goth *haidu-* ‘appearance,’ ON *heið* ‘clear heavens,’ *heiðr* ‘clear,’ OHG *heitar* ‘radiant, shining.’[79]

11. **k^{u}eid̯-* ‘observe, take notice, perceive, see’
    Ved *cā́yati* ‘take notice, observe,’ *cinóti* ‘perceive,’ Grk *τηρός* ‘guardian,’ *τηρέω* ‘observe, watch over, guard, give heed to,’ OIr *ad-ci* ‘sees,’ Lith *skaitaũ* ‘count, read,’ OCS *čĭtǫ* ‘count, reckon, read.’[80]

This root is traditionally seen as the basis of the extended root **k^{u}eid̯t-* ‘shine, appear, observe, know.’ Considering, however, that the vast majority of the roots in this series show a final dental, it is more likely that **k^{u}eid̯-* reflects an instance where the original final was lost.

12. **k^{u}eid̯s-* ‘see, take note, perceive’
    OAv *cōišt* ‘decide,’ OIr *:ac-castar* ‘was seen,’ *:ac-cae* ‘saw, has seen,’ *ad:cichestar* ‘will be seen,’ Gall *pissíiumí* ‘will see.’[81]

According to LIV (381n1), this root is cognate to **k^{u}eid̯-* ‘observe, take notice, perceive, see.’ The final in /s/ may indicate a /t/ in process of being lost, as seen in the previous root.

13. **tu̯ek-* ‘be visible, the visible form’
    Hit *dukkāri* ‘is visible, is seen, is important,’ *tuekk(a)* ‘the body,’ Ved *tvāc-* ‘skin.’[82]

* * *

**g$^{u̯}$e(R)b^{h}-* and Its Root Variants

Table 5: **g$^{u̯}$e(R)b^{h}-* ‘womb, woman, act of conception, embryo, offspring’

PIE Root	Initial	R1	R2	Final	Ref.	Semantic Value
**g$^{u̯}$reb^{h}-, *g$^{u̯}$erb^{h}-*	g$^{u̯}$		r	b^{h}	1	fetus, embryo, child, newborn babe, cub, nestling, foal
**g$^{u̯}$elb^{h}-*	g$^{u̯}$		l	b^{h}	2	womb, uterus, menstruation, young child or animal, newborn
**g$^{(u̯)}$emb^{h}- (*g$^{(u̯)}$enb^{h}-)*	g$^{u̯}$		m	b^{h}	3	womb, vulva, slit, deeply excited, sexual intercourse, depth, to know carnally
**g$^{u̯}$ei̯b^{h}-*	g$^{u̯}$		i̯	b^{h}	4	dive, covet, seek, female pudenda, vibrate fornication, lewdness (Proposed root)
**g$^{u̯}$eh$_{1}$b^{h}- (*g$^{u̯}$ēb^{h})*	g$^{u̯}$		h$_{1}$	b^{h}	5	something slimy, young animal, woman, wetness, vibrate, emit fluid or liquid

[79] LIV 347; IEW 916-917; EWAia 542-543, 548-549; de Vries 216-217. Möller (129) compares Ethiop. *gahada* ‘open, clear, lucid, manifest.’
[80] LIV 377; IEW 636-637; Mallory and Adams 327; LSJ 1789; Beekes 1480; DELG 1076; Monier-Williams 393; EWAia 531.
[81] LIV 381; IEW 637.
[82] LIV 654; Joseph, “On the Etymology of Hittite *tuqqāri* ‘be visible,” 205-513.

$g^{u}eh_2b^{h}$- ($g^{u}\bar{a}b^{h}$)*	g^{u}		h_2	b^{h}	6	dive, plunge, dip, deep, become hard, dye with blood or other colorants
*$g^{u}eb^{h}$-	g^{u}			b^{h}	7	have sexual intercourse, masturbate, soften with the hand (Proposed root)
METATHESIS VARIANTS (female sexual organs and stereotypical female characteristics)						
*$b^{h}eg^{u}$-	b^{h}			g^{u}	8	womb, vulva, clitoris, desire for sexual pleasure, woman, wife, sister, flee, fear
*$b^{h}org^{u}$-os	b^{h}		r	g^{u}	9	foolish, silly, stubborn, capricious, raw, tart, unrefined, ignorant, angry, furious
*$b^{h}erg^{u}$-	b^{h}		r	g^{u}	10	feed, nourish, tend (Proposed root)
*$b^{h}leg^{u}$-	b^{h}	l		g^{u}	11	swell up, inflate, expand, blood flow, vulva, buttocks, fetus
REDUCED VARIANTS *$k^{(u)}e(R)p$- (womb, vulva, uterus, vibrate, sexual excitement, desire)						
*keup-	k		u̯	p	12	desire, covet, shake, tremble, vibrate, be in a passion, vulva
*kuelp-	k	u̯	l	p	13	womb, vagina, gulf, arched or vaulted room
*$k^{(u)}$lep-	k	u̯	l	p	14	desire
*krep-	k	r		p	15	body, belly, womb, uterus, midriff
*$k^{(u)}$emp-	k	(u̯)	m	p	16	tremble, shake, quiver, vibrate
*$k^{(u)}$Rep-H	k	(u̯)	R	p	17	yearn for, desire, lament
METATHESIS VARIANTS						
*$pleh_2k$-	p	l	h_2	k	18	appease passions and appetites, find favor
*(s)plek-	(s)p	l		k	19	copulate (Proposed root)
*preK-	p	r		K	20	fear, be afraid, feel fear, frighten

1. *$g^{u}reb^{h}$-, *$g^{u}erb^{h}$- ‘fetus, embryo, child, foal’
   Grk *βρέφος* ‘babe in the womb, fetus, newborn babe, foal, whelp, cub, nestling,’ *βρεφόω* ‘form into a fetus, engender,’ OCS *žrēbę* (< *$g^{u}erb^{h}en$-) ‘foal,’ MIr *brommach* ‘foal.’[83]

2. *$g^{u}elb^{h}$- ‘womb, uterus, young animal’
   OE *cilfor-lamb* ‘ewe lamb,’ OHG *kilbur* ‘ewe lamb,’ Grk *δελφύς* ‘uterus,’ *δέλφαξ* ‘young pig,’ *δελφάκειος* ‘female pudenda,’ *δελφίς* ‘dolphin (fish with womb, i.e. mammal),’ Av *gərəbuš*- ‘newborn animal,’ and from *$g^{u}olb^{h}o$- ‘womb, fruit of womb,’ ON *kalfr* ‘calf,’ OE *cealf* ‘calf,’ NE *calf*, OHG *chalb, chalp* ‘calf,’ Goth *kalbō* ‘calf,’ Grk (Hesychius) *δολφός* ‘womb,’ Av

[83] EIEC 615; IEW 485; LSJ 329; Monier-Williams 349-50; DELG 186; Bomhard 539. Möller compares Hebrew *ḳirb*- ‘womb, inside, middle,’ Assyrian *kirbu* ‘in the middle,’ Arab *ḳ-r-b*- in *ʿaḳrabat* ‘she was near to bringing forth,’ see Möller, *Vergleichendes indogermanisch-semitisches Wörterbuch*, 91, 101. Militarev (2005: 45) compares Proto-Afrasian **garab*- ‘stomach, belly, body, womb.’

garəwa- 'uterus,' Skt *gárbha-* 'to conceive, womb, uterus, fetus, embryo, child, brood offspring, a woman's courses,' Lat *volba* (& variants *volva, vulva*) 'womb,' Gall *galba* 'pot-belly,' Ukr *helevo* 'belly.'[84]

3. *$g^{(u)}emb^h$- 'womb, vulva, slit, deep down, sexual intercourse'
Skt *gabhīrá-, gambhīrá-* 'deep,' *gambha-, gámbhan-, gambhára-* 'depth, slit, vulva,' *gambhvepas* 'moved deeply or inwardly, deeply excited,' *gabhi-shák* 'deeply down, down or within,' *jambh* (also *jabh*) 'to know carnally,' *jambhana* 'sexual intercourse.'[85]

4. *$g^{u}e\underset{\cdot}{i}b^h$- 'dive, covet, female pudenda, vibrate, fornication, lewdness' (Proposed root)
TochA *kip* 'female pudenda,' TochB *kwīpe* 'female pudenda,' Lat *uibrō* 'vibrate, become excited, catamite, be homosexual,' Grk *δῖφάω* 'dive, covet, seek,' YAv *vaēpaiiaṇt* 'fornication, lewdness.'[86]

5. *$g^{u}eh_1b^h$- 'something slimy, young animal, woman, wetness, vibrate, emit fluid'
OSax *quappa* 'eel pout,' MHG *quappe* 'tadpole, belly,' ON *kvap* 'something slimy or gelatinous' (IEW 466), Swed-dial *(s)kvebba* 'fat woman,' NE *quab* 'bog, mire,' NE *quaver* 'shake, vibrate,' Norw-dial *kvapa* 'emit a fluid or liquid,' Old Prussian *gabawo* 'toad,' OCS *žaba* 'toad.'[87]

6. *$g^{u}eh_2b^h$- 'dive, plunge, deep, become hard, dye with blood or other colorants'
ON *kafa* 'dive, plunge,' *kvefja* 'dip, submerge, OSwed *kvaf* 'depth,' Grk *βάπτω* 'dip, plunge, dip a sword into a liquid in order to temper the steel, become hard, to dye, to dye someone with their own blood (cutting by sword), draw water by dipping.'[88]

7. *$g^{u}eb^h$- Proposed Root: 'sexual intercourse, masturbate, soften with the hand'
Grk *δέφω* 'soften by working with the hand, masturbate, have sexual intercourse,' present tense variant (taboo deformation?) *δέψω* 'work or knead a thing until it is soft,' Lat *depsō* 'work up into a paste, knead, soften by rubbing or squeezing in one's hands, to pound or beat in an obscene sense, shamelessness in sexual conduct, "apparently of sexual intercourse."[89]

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[84] EIEC 615; IEW 473; Watkins 34; LSJ 377-78; DELG 250; de Vries 298; Mallory and Adams 184; Bomhard 462; Mann 354; Beekes 313-314. Note that Germanic forms in initial /k/ represent a variant where *g^{u}- > *g-.

[85] IEW 466; Monier-Williams 346, 348, 412; EWAia *gabhá* 463.

[86] Watkins (2000) 2030, s.v. "**ghwībh*"; OLD 2054; Fortson 282-283, 402-403; AHD 1915; LIV 671; IEW 1132; DELG 275; Autenrieth 78; Homer, *Iliad* 16.747, Murry, trans., 216; Hesiod, *Works and Days*, 373-374, Evelyn-White, trans., 30-31; LSJ 438; Beekes 314; Adams, s.vv. "*kwīpe, kwipe, onkipṣe*"; de Vaan 674. See discussion in Haynes (2020) Table 28 for proposed root-status of *$g^{u}e\underset{\cdot}{i}b^h$-. See also: Winter, *Lexical Archaisms*, 347-348 for the semantic development: shame > place to be ashamed of > genitals in TochB *kwipe*.

[87] Watkins 34; IEW 466; A. Christenson, *K'iche' – English Dictionary*, s.v. "*t'ot*"; Kluge s.v. "*Quappe*" 572; *New Cassell's German Dictionary* (defines *Kröte* as: 'toad, malicious person; bitch; jade, wench... (vulg.) niedliche kleine Kröte, pretty wench') s.v. "*Kröte*" 280; Nesselmann, s.v. "*gabawo*" 41.

[88] Watkins 34; IEW 465-466; LIV 205; EIEC 160; DELG 156; LSJ 305-306; Mallory and Adams 403.

[89] LSJ 382-383; Beekes 320; Frisk 372-373; DELG 256; OLD s.v. "*depsō*" 521. The comic poet Eubulus (4th century B.C.) is quoted in a fragment: "ἀλλ' οὐδὲ μίαν ἀλλ' ἑταίραν εἶδέ τις αὐτῶν, ἑαυτοὺς δ' **ἔδεφον** ἐνιαυτοὺς δέκα." referring to the sexual practices of the Greeks at Troy. —G. Kaibel, *Athenaei Naucratitae deipnosophistarum libri xv*, Book 1, Paragraph 46, Line 10. For a rough translation, see Kock, ed., *Comicorum Atticorum Fragmenta*, vol.2, 207. A raw translation might run something like, "Nor did any one of them ever see a prostitute, but they f—ked each other for ten long years." See also Jones and Wilson, *Prolegomena de comoedia. Scholia in Acharnenses, Equites,*

Latin *depsō* is considered to be from the Greek, but it preserves the original sexual denotation as attested in Grk *δέφω*. Neither of these words has a known PIE etymology.

8. **b^{h}eg$^{\mu}$-* 'womb, vulva, desirous of sexual pleasure, woman, wife, sister, flee, fear'
Ved *bhága* 'love, affection, sexual passion, amorous pleasure, dalliance, the female organ, pudendum muliebre, vulva,' *bhága-deva* 'whose god is the female organ, lustful, a libertine,' *bhágam-dara* 'lacerating the vulva,' *bhága-bhakshaka* 'living by the vulva, a procurer, pander,' *bhagâṅkura* 'the clitoris,' *bhagâsya* 'whose mouth is used as a vulva,' *bhaginī* 'sister (sibling with a womb),' *bhagaḥ* 'female sexual organ, vulva,' Grk *φέβομαι* 'to flee,' *φοβέω* 'frighten away,' OLith *bėgmi* 'run, flee,' ORus *běgu* 'run,' Hindi *bhāgnā* 'flee.'[90]

In ancient (and in modern tribal) societies, in case of enemy attack, the men grab their weapons and run to meet the foe, while it is the responsibility of the women to gather up the children and to flee to safety in the surrounding forest. Hence, whether justified or not, the propensity to flee in fear is commonly ascribed to members of the female gender.[91]

Since Sanskrit is a satem language, the reflex of this root would have been *bhag*, which is identical to the form taken by another root **b^{h}eg-*, **b^{h}ag-* 'divine apportioner, God (Slavic *bogŭ* 'God,' Rus *bog* 'God,' Av *baγa-* 'God,' Skt *bhága-* 'lord'), Av *bag* 'distribute,' Skt *bhájati* 'divides, distributes, portion,' Grk *φάγειν* 'eat,' TochB *päke* 'share, portion.'[92] Over time these two roots have fallen together in Sanskrit because of their identical phonetic form, but semantically they are quite distinct. For this reason I have here treated them as two separate roots. The root **b^{h}eg-*, **b^{h}ag-* 'share, portion,' has been analyzed below in Table 11.

9. **b^{h}org$^{\mu}$-os* 'foolish, silly, stubborn, capricious, unrefined, ignorant, angry, furious'
Arm *bark* 'furious,' OIr *borb, borp* 'foolish, silly,' MIr *borb* (**burbo-*, PIE **b$^h{}_o$rg$^{\mu}$o-*) 'unrefined, ignorant,' Latv *barĝs* 'stern, unfriendly, unmerciful,' Swed dial. *bark* 'stubborn, capricious, unfriendly,' *barkun* 'coarse.'[93]

In this case again, ancient female stereotypes are expressed.

10. **b^{h}erg$^{\mu}$-* 'feed, nourish, tend'
Grk *φέρβω* 'nourish, feed, tend, preserve,' *φορβὰς κόρη/γυνή* 'prostitute,' Myc *po-qa /p^{h}org^{w}ā/* 'feed, nourish,' *φέρβήτης* 'herdsman.'[94]

Nubes [*Scholia in Aristophanem* 1.2. Groningen: Wolters-Noordhoff, 1969]: 1-277, "***δεφόμενος*** *· ξυνουσιάζων, ἀποδέρων τὸ αἰδοῖον"* 'to have sexual intercourse (LSJ 1723), to rub the sexual organs,' (LSJ 36, 196).

[90] Monier-Williams 743-744; KEWA 459-460; IEW 116; LIV 67; Mallory and Adams 398; ALEW 109-110; Beekes 1559; EIEC 491; DELG 1140-1150; LSJ 1920, 1946. For parallel semantics, compare **péses* 'penis,' Hit *pisna-* 'man' (< 'one provided with a penis') EIEC 507, EDHIL 670.

[91] This is not uncommon in ancient thought. With regard to gender attitudes concerning left-handedness, for example, EIEC writes, "Thus, the semantic associations of 'left' in the various IE stocks… are broadly feminine and negative, i.e., left indicates the female side, matrilineality, chthonic, unlucky, unordered, weakness, and is expressed in polar opposition as 'north'"—EIEC 349. A semantic parallel in Modern English: A man who runs away in fear from danger is liable to be called a vulgar term designating the female sexual organ, (p_ssy).

[92] LIV 65; IEW 107; Mallory and Adams 274, 318, 410.

[93] IEW 163; Mallory and Adams 340.

[94] Beekes 1561-1562, 1554; DELG 1144-1145; LSJ 1921, 1950.

Greek *φέρβω* is considered by Beekes to be an agricultural term without PIE etymology. Women are, however, anatomically adapted to provide nourishment to their children: to feed, nourish, and tend them. This biological and social dynamic conforms to the general semantic field of the resonant series under discussion here.

11. **b^{h}leg$^{\mu}$-* 'blood vein, womb, vulva, buttocks, embryo, fetus'
Grk *φλέψ, φλεβός* 'vein,' *φλεβοτομέω* 'bleed, let blood,' *φλεβάζονες · βρύοντες* (Photius, *Etymologicum Magnum* 795.43: *βρύω* 'to swell, teem with,' *βρυασμός* 'pleasure,' *ἔμβρυον* 'newborn (lamb), fetus, that which grows inside the womb,' English *embryo*), OHG *bolca, bulchunna* (**b^{h}l̥g$^{\mu}$-*) 'bulla,' Lat *bulla* 'bubble, "compare Lith *bulìs*" (OLD 244). Lith *bulìs* 'buttocks, arse, vulva.'[95]

According to both Beekes and DELG, there is no known PIE etymology for Grk *φλέψ, φλεβός*, with Frisk stating that it is an unsolved riddle. The semantics of this particular root, however, intersect very directly with the overall trends within this series: female anatomy, sexual functioning, reproduction, child bearing, and the woman's place in society. First, a highly marked female characteristic is the swelling of their bodies that occurs during pregnancy. Second, the monthly flow of blood from their reproductive organs strongly distinguishes them from males. Third, the sexual act is linked to feelings of pleasure. Fourth, women are unique in that they are able to bring forth young from their bodies.

12. **keu̯p-* 'desire, covet, vibrate, be in a passion, vulva'
ON *hjúfa* 'moan,' Skt *kupyati* 'shake, tremble, thrill, vibrate, to be moved, be excited, be agitated, be in a passion,' Lat *cupiō* 'wish, want, desire,' *cupiditās* 'passionate desire, longing, yearning, lust, passion, the object of one's desire,' *cupidus* 'eager for carnal pleasure, wanton, lecherous, passionately longing,' *cupītus* 'that which one desires, beloved,' Ved *kopáyati* 'shake, quake, vibrate, be in a passion,' Slav **kъpъ*, Czech *kep* 'vulva.'[96]

13. **ku̯elp-* 'womb, vagina, gulf, arched or vaulted ceiling'
Grk *κόλπος* 'bosom, lap, vagina, womb, bay, gulf, fold of garment,' ON *holf* 'the domed, arched, curved, or vaulted ceiling of a room,' OHG *be-welben* 'surround, encircle, curve or arch over.'[97]

14. **k$^{(u̯)}$lep-* 'desire'
Av *xrap-* 'desire,' TochAB *kulyp-* 'desire.'[98]

15. **krep-* 'body, belly, womb, uterus, midriff'
OHG *(h)rëf* 'belly, womb, uterus,' OFris *href* 'belly,' OE *hrif* 'womb, uterus, belly,' *mid(h)rif* 'midriff,' Grk *πραπίς* 'diaphragm,' Lat *corpus* 'the body, the generative powers, to live by

[95] IEW (*bulla*) 99 (**b^{h}leg$^{\mu}$-*) 155; LSJ (*βρύω*) 332, (*φλέψ, φλεβός*) 1944; Beekes (*βρύω*) 246, (*φλέψ, φλεβός*) 1578; Frisk (*βρύω*) 274-275, (*φλέψ, φλεβός*) 1025; DELG (*βρύω*) 190-191, (*φλέψ, φλεβός*) 1167-1168; OLD (*bulla*) 244-245; ALEW (*bulìs*) 167-168; Monier-Williams (*buri, buli*) 735.
[96] LIV 359; IEW 591, 596; Monier-Williams 291; de Vries 233; OLD 472-73; Watkins 47.
[97] LIV 375; IEW 630; LSJ 974; de Vries 247; Kluge 869; Mallory and Adams 384; EIEC 62.
[98] Mallory and Adams 342; EIEC 158.

prostitution (*corpore quaestum facere*), the center of certain physiological needs and desires, especially as representing the grosser elements in human nature,' Skt *kr̥pá* 'form, beauty,' Av *kəhrpəm* 'form, body,' MIr *crī* 'body' (< *kr̥pes*).[99]

16. **k$^{(w)}$emp-* 'tremble, shake, quiver, vibrate'
Ved *sam-pra-kampante* 'tremble, shake, quiver, vibrate, to be in excited motion,' *kampáyāmi* 'let shake, tremble, vibrate,' YAv *kafsąn* 'shake, tremble, quiver, vibrate.' Possibly Lat *concumbō* 'to lie together (for sexual intercourse).'[100]

17. **k$^{(w)}$Rep-H* 'yearn for, desire, lament'
Ved *akr̥payat* 'yearn for, desire, lament,' *Kr̥ipaṇya* 'wish, desire, pray for,' *cakr̥pánta* 'desire, wish for, long for, hanker after, crave.'[101]

18. **pleh$_2$k-* 'appease passions and appetites, find favor'
Lat *placeō* 'to be pleasing, to be sexually attractive to, to find favor,' *complacēre* 'to capture the affections of,' *plācāre* 'to make favorably disposed, appease,' *plācō* 'to make a person calm, to soothe, to appease passions and appetites,' TochB *plāktsi* 'agree,' TochA *plākäm* 'permission.'[102]

19. **(s)plek-* 'copulate' (Proposed Root)
Grk *σπλεκόω, κατασπλεκόω* 'to copulate, have sexual intercourse,' *σπλέκωμα* 'sexual intercourse,' *πλεκοῦν* 'have sexual intercourse.'[103]

Beekes states that there is no known PIE etymology for these Greek terms.

20. **preK-* 'fear, be afraid, frighten, danger'
TochB *parskaṃ* 'be afraid,' *prāskaṃ* 'will be afraid,' TochA *praskatär* 'fear,' *proskiye* 'fear, danger,' *pärsk-* 'feel fear, be afraid,' *parski* 'fear,' Goth *faurhts* 'frightened,' *faurhtjan* 'fear,' OHG, OSax *forhta* 'fear,' OE *forht* 'frightened.'[104]

Those Tocharian attestations in /*rsk*/ are originally from *prk-ske/o*. The velar at final could be from *k* or from *G$^{(h)}$*, see LIV 491n1. Note that the meaning *fear* in this root corresponds to one semantic value of **b^{h}eg$^{\mu}$* (as seen in Greek *phobia*) in root #8 above.

[99] Mallory and Adams 178; IEW 620; OLD 448; Bomhard 530.
[100] LIV 351; [IEW 525; Mallory and Adams 384]; OLD 392, 464.
[101] LIV 370; Monier-Williams 305.
[102] IEW 831; OLD 1385-1386; de Vaan 469; LIV 485; Beekes 1384; Mallory and Adams 337; EIEC 334.
[103] LSJ 913, 1415, 1628; Beekes 1384; DELG 881; Frisk 769.
[104] LIV 491; IEW 820; Adams 360, 375, 422.

Table 6: Phonetic Grid Showing *$g^{u}e(R)b^{h}$- and Its Root Variants

Root: *g^{u}—b^{h} 'womb, woman, act of conception, embryo, offspring'											
	Initial	Ø	r	l	n/m	u̯	i̯	h_1	h_2	h_3	Final
Voiced/ aspi-rated	g^{u}	*$g^{u}eb^{h}$-	*$g^{u}erb^{h}$	*$g^{u}elb^{h}$	*$g^{u}emb^{h}$		*$g^{u}ei̯b^{h}$	*$g^{u}eh_1b^{h}$	*$g^{u}eh_2b^{h}$		b^{h}
Inverted	b^{h}	*$b^{h}eg^{u}$	*$b^{h}org^{u}$ *$b^{h}erg^{u}$	*$b^{h}leg^{u}$							g^{u}
Lenis	k		*krep *$k^{(u)}Rep$-H	*$ku̯elp$ *$k̂^{(u}lep$	*$k^{(u)}emp$	*$keu̯p$					P
Inverted lenis	p		*preK	*(s)plek *$pleh_2k$							k

Using the Phonetic Grid as a Heuristic Guide

There is reason to believe that the presently reconstructed lexicon of PIE amounts to only about 10% of the spoken language that must have existed before the break-up of the daughter languages.[105] In the best case scenario there is evidence from eleven or twelve different stocks to support PIE root reconstructions, but many lexical items are reconstructed with far less support, some with as few as one or two stocks. No doubt there are many roots that have survived with only a trace or two here and there, but with insufficient evidence to be confidently accepted as established roots in the lexicon.

If, however, a word can be placed somewhere in the grid of a table like the one above, with a strong semantic conformity to the series as a whole, then it may be possible to assign a plausible and even convincing etymology for it.

In this way, new roots can be identified with a reasonable degree of confidence, since using gaps in the grid as a guide often leads to the discovery of attestations that would otherwise have escaped notice. Drawing from the history of another scientific field as a paradigm, empty gaps in the early development of the periodic table, in several instances, led chemists to discover the missing elements in question because they then knew what they were looking for.

Estimate of Statistical Validity:

1. Aside from the seven roots listed in Table 5, there are no other roots with the consonantal form *g^{u}—b^{h} in the reconstructed proto-language. Statistically, the chances of seven roots with this phonetic form all carrying similarly related semantic values (womb, woman, act of conception, embryo, off-spring) are infinitesimal when compared to a random sampling of PIE roots. One must therefore conclude that other factors are involved, the most probable being that of genetic relation-

[105] Dictionaries of non-literate languages tend to have between 15,000 and 20,000 headwords. The reconstructed lexicon of PIE (as listed in Watkins or EIEC) show approximately 1,500 roots. Additionally, about 58 plant and tree names can be reconstructed for PIE, whereas studies of traditional farming societies tend to have an average of approximately 520 botanical items in their vocabulary. Here again, the ratio is somewhere around 10% (see Mallory and Adams 117-119).

ship, i.e., they are cognates. Note: An extensive discussion about the semantic connections between some of these roots can be found in Haynes (2020: Table 28). Space does not allow that discussion to be reproduced here.[106]

2. Aside from those four roots listed in Table 5, the only other root with the consonantal structure *b^h— g^{μ} in the PIE lexicon is *$b^h e\underline{i}g^{\mu}$-, the meaning of which is obscure.[107] Four semantic matches out of five roots with this phonetic shape, despite some limited semantic divergence, far exceeds what would be expected in a random sampling.

3. Five of the six roots of the resonant series *$k^{(\underset{\sim}{u})}e(R)p$- show /$\underset{\sim}{u}$/ in the phonetic structure, either in the character of the initial labiovelar or as a separate resonant element. It is doubtful that this is merely the result of coincidence; on the contrary, it raises the likelihood that these roots share a genetic connection. In all, there are about twenty roots (depending on how they are counted) with the phonetic form *$(s)k^{(\underset{\sim}{u})}e(R)p$ in the PIE lexicon,[108] six of which show a semantic value related to: *womb, woman, vulva, vibrate, sexual excitement, desire, act of conception, embryo, offspring,* as shown in Table 5. These six roots then represent 30% of all roots with this phonetic form in the PIE lexicon. Note especially that roots comprised of lenis consonants (p, t, k, ḱ) are more plentiful since they represent both those roots that carry such consonants organically, as well as roots whose consonantal elements are derived by reduction from voiced/aspirated originals.

In a random selection of twenty PIE roots, how many would be expected to carry this or a related semantic value? It is very unlikely that more than fifty PIE roots could be found with meanings that fall within this semantic field.[109] If it is assumed that the PIE lexicon contains approximately 1,500 entries,[110] then fifty items would represent approximately 3% of the distinct semantic values in the lexicon. Therefore it would not be unreasonable to say that this correlation, by limiting selections to roots in the form *$(s)k^{(\underset{\sim}{u})}e(R)p$*, is about ten times greater than if the selection were random.

* * *

[106] An on-line version can be found at https://www.mother-tongue-journal.org/MT/mt22.pdf (p. 181).

[107] It is sometimes explained as 'pure, clear, bright,' because it is used as an epithet for water, fire, and the light of the sun and moon, but is without any clear PIE etymology. Derivatives include: *Φοῖβος* 'epithet and name of Apollo,' *φοιβάς* 'priestess of Phoibos, inspired woman, prophetess,' *φοίβη* 'daughter of Ouranos and Gaia,' *φοιβάζω* 'to prophesy, inspire,' *φοιβάω* 'to purify,' *φοίβησις* 'inspiration,' *φοίβήτρια* 'purification, also the name of a goddess, perhaps Isis' (Beekes 1582-1583; IEW 118; LSJ 1947; DELG 1172-1173; Frisk 1031). An argument could be made that *$b^h e\underline{i}g^{\mu}$- (in the sense of daughter, priestess, inspired woman, prophetess, a goddess perhaps Isis) also reflects the feminine behaviors and characteristics as seen in the other attestations of the consonant structure *b^h— g^{μ} in Table 5, but because of semantic uncertainties it is not included there at this time. Note also that IEW (495) alternatively assigns *Φοῖβος* and its derivatives to a different root, *$\hat{g}h\underset{\sim}{u}oig^{\mu}$.

[108] *$ke\underset{\sim}{u}p$-,*$k\underset{\sim}{u}elp$-,*$k^{\mu}lep$-,*krep-,*$k^{(\underset{\sim}{u})}emp$-,*$k^{(\underset{\sim}{u})}RepH$-, *kamp-, keh₂p-, $k\underset{\sim}{u}ep$- $k\underline{i}eh_2p$-, klep, *$k^{(\underset{\sim}{u})}re\underline{i}p$-, *$k\underset{\sim}{u}eh_1p$-, 1.*(s)kep-, 2.*(s)kep-, *(s)kerp-, *KrepH-, $k^{\mu}erpH$-, *$k\underset{\sim}{u}Hp$-, *kelp-.* As stated above, the canonical form of the primitive root is (*s*)CRRC-. Following elements are considered to be later accretions.

[109] Based on the word count of terms relating to this semantic field (*womb, woman, vulva, vibrate, sexual excitement, desire, act of conception, embryo, offspring,* etc.) in Mallory and Adams 2006: 523-564.

[110] This is an approximation of the number of items in the PIE lexicon given in Mallory and Adams (2006: 117-119).

*$h_2(R)e\hat{g}$- and Its Root Variants

Table 7: *$h_2(R)e\hat{g}$- 'hunt animals; herd, drive, raid for, breed, raise, care for, milk, maintain and protect animals; hunting tools: spear, arrow, sharp point; hunting and pasturing lands'

PIE Root	Initial	R1	R2	Final	Ref	Semantic Value
*$h_2(R)e\hat{g}$- 'hunt animals, herd, breed, and maintain them'[111]						
1.*$h_2e\hat{g}$-	h_2			$\hat{g}$	1	drive cattle, drive off cattle as booty, lead, guide, manage, keep
*$h_2e\hat{g}$-reh_2	h_2			$\hat{g}$	2	hunt, fish, the chase, prey, game, net, hunter, wild game, battle
*$h_2(\hat{g})$-er-	h_2			$(\hat{g})$	3	gather, collect, take, seize, capture
*$h_2e\hat{g}$-ros	h_2			$\hat{g}$	4	countryside, field, plain, pasture
*$h_2le(\hat{g})$-	h_2	l		$(\hat{g})$	5	look after, care for, give careful attention to, gather up
*h_2melg-	h_2	m	l	$\hat{g}$	6	squeeze out, press out, milk animals
*h_2merg-	h_2	m	r	$\hat{g}$	7	squeeze out, gather up, wipe clean, graze animals
*$h_2reh_1(\hat{g})$-	h_2	r	h_1	$(\hat{g})$	8	help, aid, support, be concerned about, care for, pay attention to
*h_2erg-	h_2		r	$\hat{g}$	9	white, white as color of sheep
*$h_2e\underline{i}g$-(s)-, *$h_2e\hat{g}$-os-	h_2		$\underline{i}$	$\hat{g}$	10	goats and sheep, small cattle
*$h_2e\hat{g}$-inom	h_2			$\hat{g}$	11	leather, hide
2.*$h_2e\hat{g}$-	h_2			$\hat{g}$	12	order, command, say ('verbally lead or drive men, slaves, soldiers')
*$s(e)h_2(\hat{g})$-	(s)h_2			$(\hat{g})$	13	track, scent, trail, seek, lead, direct, drive
METATHESIS VARIANTS						
*$\hat{g}e(R)h_2$- 'steal animals, drive them home, breed them, feed them, and raise them to maturity'[112]						
*$\hat{g}\underline{i}eH$-	$\hat{g}$	$\underline{i}$		H	14	steal, deprive someone of property, overpower, rob, grow old

[111] Some of these roots were originally included in Haynes (2020: Table 37). For this root see especially Anttila, *Greek and Indo-European Etymology in Action: Proto-Indo-European *ag-*. For a further discussion on the antiquity of these roots see Anttila, "Beating a Goddess out of the Bush?", 1.

[112] This resonant series should probably include a hypothetical root *$\hat{g}eh_2$- that would account for Grk *γῆ,* 'earth, land, country, ground, native land,' *γαία* 'land, country, earth,' *γεωργέω* 'to be a husbandman, farmer, literally "earth worker," till, plough, cultivate,' *γᾶ* 'Dor. and Aeol. for *γῆ*,' *γαιών* 'heap of earth, boundary-heap.' This root would be semantically parallel to *$h_2e\hat{g}$-ros 'countryside, field, plain, pasture' but in metathesis form, (Beekes 254-255, 269-270; LSJ 335, 347; Mallory and Adams 392; DELG 210; and for the Attic change of original *$\bar{a}$ to $\bar{e}$, see EIEC 240).

**ĝeu̯H-*	ĝ		u̯	H	15	set in motion, drive, rouse, impel
**ĝemH-*	ĝ		m	H	16	breed, mate, marry, copulate
**ĝi̯eu̯H-*	ĝ	i̯	u̯	H	17	eat, consume, devour, chew, masticate
**ĝerh₂-*	ĝ		r	h₂	18	ripen, mature, cause to grow old, become old
REDUCED VARIANTS						
**ḱe(R)h₂-* 'care for animals, toil over them, settle them down, skin them, clean them, drive them to pasture, carry them off as prize or booty, horned animals'						
**ḱemh₂-*	ḱ		m	h₂	19	carry off as prize or booty, care for, look after, attend to animals or men, toil, to calm, pacify, soothe, or settle
**ḱleu̯H-*	ḱ	l	u̯	H	20	wipe, sweep, brush, clean, purify
**ḱei̯h₂-*	ḱ		i̯	h₂	21	set in motion, drive, arouse, urge on, excite
**ḱrh₂-*	ḱ		r	h₂	22	horn, stag, hornet, cow, claw, talon
**(ḱ) u̯eh₂-*	ḱ	u̯		h₂	23	gain, obtain, acquire, earn, win (animals as wealth)
METATHESIS VARIANTS						
**h₂e(R)ḱ -* 'feed animals, soothe, and protect them; animals with antlers, sharp, sharp objects, lead or drive wheels (axle)'						
**h₂eḱ-h₃-*	h₂			ḱ	24	lead or drive to pasture, consume, eat up, tend, feed, graze
**Hmelḱ-*	H	m	l	ḱ	25	stroke lightly, touch, soothe, appease, caress, fondle
**h₂er(ḱ) -*	h₂		r	(ḱ)	26	keep, keep away, fend off, shut up, guard, ward off, defend
**Hólḱ-is*	H		l	ḱ	27	elk, wild sheep, antelope
**h₂eḱ-*	h₂			ḱ	28	sharp, pointed, sharpen, pungent, sour, needle, grinding stone, sharp edge, hunting spear, prick, sharpen
**h₂ei̯ḱ-(smeh₂)*	h₂		i̯	ḱ	29	spear, spit, pointed stick, point of spear, arrow, impale, run through with sword, put on a spit
**h₂eḱ-s*	h₂			ḱ	30	axle, axis, (literally 'leads or drives the wheels')
**h₂ei̯ḱ-*	h₂		i̯	ḱ	31	possess, property, earnings, rule over, (animals as wealth)

1. *$h_2eĝ$- ‘lead, carry, fetch, bring; drive cattle, fight’
   Lat *agō* ‘drive cattle, drive off cattle as booty, plunder, of men: to force to move on, set in motion,’ *agitō* ‘set in motion, drive or ride horses, propel forcefully, drive before one,’ Grk *ἄγω* ‘of living creatures: lead, carry, fetch, bring; carry off as captives or booty, lead, guide, manage, keep,’ *ἀγός* ‘leader,’ *ἀγών* ‘gathering, assembly, battle,’ *ἀγέλη* ‘herd; herd of horses, oxen or kine; any herd or company, bands in which boys were trained,’ *ἀγελικός* ‘of the flock,’ Ved *ájati* ‘to drive,’ *ajá* ‘a drove, a troop, driver, leader, the leader of a flock, a he-goat, ram,’ (with instrumental suffix *-trā*) *aštrā* ‘whip, lash, scourge,’ Skt *ājí* ‘race, fight,’ Arm *acem* ‘leads,’ OIr *-aig, -agat* ‘drive, lead,’ *tāin* (from **to-ag-no*) ‘raid,’ ON *aka* ‘go, travel, drive,’ MIr *āg* ‘fight, warrior’s ardor,’ TochAB *āk-* ‘lead, guide, drive,’ *āśäṃ* ‘lead.’[113]

Leading or driving the flocks to fresh pastures and clean water sources is central to the semantic field denoted by this root series. Cattle raids were also clearly a part of ancient practice.[114] The application of animal herd nomenclature to young human beings is common, as for example, the English use of the word, *kids*, to refer to human children.

2. *$h_2eĝ$-reh_2- ‘hunt’
   OIr *ār* ‘carnage (especially by dogs), battlefield,’ Wels *aer* ‘battle,’ Grk *ἄγρα, ἄγρη* ‘hunting, the chase, way of catching, quarry, prey, game, fish,’ *ἀγρεμῶν* ‘hunter,’ *ἄγρευμα* ‘that which is taken in hunting, prey, means of catching, hunting or fishing, net, take by hunting or fishing, catch,’ *ἀγρηνόν* ‘net,’ *ἀγριμαῖος* ‘wild, wild game,’ Av *azrō* ‘hunt.’[115]

Of this root, EIEC states: “Although all are derived from **$h_2eĝ$-* ‘drive,’ the antiquity of this loose set of comparisons is not clear. The Avestan term occurs in a compound hapax *-azro-daiδim* as an epithet of a she-wolf and is also translated as ‘roaming in the fields’.”

3. *$h_2(ĝ)$-er- ‘gather, collect, capture’
   Grk *ἀγέροντο* ‘collect, get together, fetch,’ *ἀγρόμενοι* ‘collected,’ *ἀγρέω* ‘take, seize, capture,’ *ἀγορά* ‘assembly, place of assembly, marketplace,’ TochB *karāre* ‘gather, collect.’[116]

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[113] LIV 255-56; IEW 4-6; LSJ 8, 14, 17-18; OLD 85, 87; Monier-Williams 9; DELG 9, 16; Bosworth and Toller 5 (see LIV 256n3); Mallory and Adams 280, 403; Buck 191; EIEC 201, 284, 348; Frisk I-18, II-348; EWAia 50-52; Beekes 18-19; de Vries 3; Adams 36; Anttila 1ff and Anttila, “Aggression and Sustenance, 121; NIL 267-270; Watkins 1; Bomhard 706, 707; Dolgopolsky no. 17. An interesting possibility for the origin of the PIE term for *king* (usually given as **$h_3rḗĝ$-* ‘stretch out the arm’) is that it is also derived from this proto-root (**$h_2(R)eĝ$-*) with medial resonant in /r/. EIEC (330) suggests this possibility: “It is possible that this **$h_3reĝ$-* is distinct from **$h_3reĝ$-* ‘stretch out the arm.’ (In which case we should reconstruct **(H)reĝ-* for ‘king’).” Perhaps originally from **$h_2reĝ$-* ‘leader.’ For comparanda in outside language families, see Bjørn, *Foreign elements*, no. 43-44, pp. 68-69.

[114] “Many of the IE stocks preserve traditions of cattle raiding. In some cases, these are almost central to their epic literature, e.g., in early Ireland the *tāna* ‘cattle raids’ were a recognized narrative category and in a society where wealth was reckoned in cattle, cattle-rustling was regarded as the most appropriate activity for young male warriors. That the practice of cattle raiding might be earlier and postulated for PIE itself rests on several bodies of evidence. There are a number of correspondences among the various IE stocks for cattle stealing that are built on the verb 'to drive': OIr *tāin* (< **to-aĝ-no-*) *bō* ‘cattle raid,’ Lat *bovēs agere* ‘to drive or raid for cattle,’ Av *gam varətam az-* ‘drive off cattle (as) booty’” –EIEC 138.

[115] EIEC 284; lEW 6; Watkins 1; Mallory and Adams 403; Buck 191; LIV 255; Frisk I 18, Frisk II 348; EWAia 50-52; Beekes 15; DELG 14.

[116] LIV 276; LIV Add. 36-37; IEW 382; LSJ 13-14; Beekes 10, 14. For another voice suggesting that these roots belong with **$h_2eĝ$-*, see Anttila, *Beating a Goddess out of the Bush*, 2.

Rounding up animals for protection, milking, shearing, slaughter, or sale is a necessary part of normal animal husbandry. Seizing them is part of traditional cattle raiding.

4. **h₂eĝ-ros* 'field'
   Lat *ager* 'land, field, countryside,' Skt *ájra* 'field, plain,' Grk *ἀγρός* 'field,' OE *æcer* 'field,' NE *acre* 'field,' Arm *art* 'field.'[117]

Integral to the tending and care of flocks is providing them with adequate pasturage. The root **h₂eĝ-ros* probably originally denoted *hunting ground*, which was later expanded to include *animal pasture*, and then any kind of field. It is not surprising that this resonant series combines notions of hunting and pasturing, since both concepts are tightly connected with the habitat of animals. Compare the unrelated OHG *weidōn* 'hunt, pasture' (Buck 191).

5. **h₂le⁽ĝ⁾-* 'look after, care for, give careful attention to, gather up'
   Grk *αλέγω* 'to mind, look after, care for,' Lat *-legō, legere* 'look after, care for,' *dīligens* 'fond of, careful, attentive, diligent,' *dīligentia* 'carefulness, attentiveness, give careful attention to,' *legō* 'gather up, count up, follow the track of.'[118]

6. **h₂melĝ-* 'squeeze out, press out, milk animals'
   Grk *ἀμέλγω* 'squeeze out, press out, to milk,' MIr *bligim* 'to milk' (< *mligim*), OE *melcan*, OHG *melchan* 'to milk,' Lith *mélžu* 'to milk,' Alb *mjel* 'to milk,' Lat *mulgeō* 'to milk,' TochA *mālk* 'milk.'[119]

7. **h₂merĝ-* 'squeeze out, gather up, harvest, wipe clean, drive and graze animals'
   Grk *ἀμέργω* 'squeeze out, pluck, gather, harvest,' *ὀμόργνυμι* 'wipe off,' *ἀμοργός* 'press out,' *ἀμόργη* 'the liquid that runs out when olives are pressed' (also Lat *amurga, amurka*), Ved *mā́rṣṭi* 'wipe off, clean,' YAv *marəzaiti* 'touch, strip off, take off,' Arm *meržem* 'expel, drive cattle out to graze.'[120]

8. **h₂reh₁⁽ĝ⁾-* 'help, aid, support, be concerned about, pay attention to, care for'
   Grk *ἀρήγω* 'help, aid, succor, be good for, ward off,' ON *røkja* 'to be concerned, pay attention to, take care of,' OHG *ruoh, ruohha* 'pay attention to, take trouble for, care, attention, conscientiousness,' NE *reck-* (opposite of *reckless* 'carelessness').[121]

9. **h₂erĝ-* 'white' **h₂erĝ-n̥t-om* 'white metal: silver'
   Skt *árju-na-ḥ* 'light, white,' *rajatá* 'white,' *rajatám* 'silver,' TochB *ñkante* 'silver,' Grk *ἀργός* 'white,' *ἀργεννός* 'white ("in Homer almost always of sheep" –LSJ 235), of woolen cloths,'

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[117] Mallory and Adams 163-64; LSJ 15-16; OLD 82; Monier-Williams 10; Starostin (2009) 98; Beekes 16; EIEC 8, 200-201; Watkins 1; de Vaan 29; Anttila, *Greek and Indo-European Etymology in Action*, 3; Starostin, "Indo-European – North Caucasian Isoglosses," 120.
[118] LIV 276; IEW 658; LSJ 61; OLD 543-44, 1014; Haynes (2020) Table 37.
[119] LIV 279; IEW 722-723; Mallory and Adams 261-262; LSJ 80; Bomhard 850; Haynes (2020) Table 37. See also, Garnier, Sagart, and Sagot, "Chapter 13. Milk and the Indo-Europeans"; Ruhlen and Bengtson, "Global Etymologies," 308-309.
[120] LIV 280; IEW 738; Mallory and Adams 169; LSJ 81, 1227; OLD 125; EIEC 258; Haynes (2020) Table 37.
[121] LIV 284; IEW 857; LSJ 238; de Vries 457; Haynes (2020) Table 37.

ἄργυρος 'silver,' TochA *ārki* 'white,' OIr *argat* 'silver,' Lat *argentum* 'silver,' Av. *ərəzatəm* 'silver,' Arm *arcat* 'silver,' Hit *harkis* 'white.'[122]

The use of this root to denote the concept *white* would be a result of observing the white fleecy sheep and lambs against the green pastures. This would then be applied to other white or light colored materials such as the metal, silver. For an outside linguistic connection between *lamb* and the color *white* in Basque, see Trask.[123]

10. **h₂eiĝ-(s)- *h₂eĝos-* 'goat'
Skt *aja-karṇa* 'goat's ear,' *aja-kshīrá* 'goat's milk,' *ajajīvana* 'goat herd,' *ajapa* 'goat herd,' *ajaví* 'goats and sheep, small cattle,' Alb *edh* 'kid,' Grk αἴξ 'goat,' αἰγο-βάτης 'goat slayer,' αἰγο-βοσκός 'goatherd,' αἰγο-φάγος 'goat eating,' Arm *ayc* 'she-goat,' Av *izaēnā* 'goat hide.'[124]

Ancient flocks were most often composed of goats and sheep.

11. **h₂eĝ-inom* 'hide, leather'
OCS *(j)azno* 'hide, leather,' Skt *ajinam* 'hide.'[125]

12. **h₂eĝ-* 'proclaim, order, command, say' ('verbally lead or drive men, slaves, soldiers')
Grk *ἦ* 'say,' *ἄν-ωγα* 'command, order (especially of kings and masters), advise, urge, bid,' Lat *aiō* 'say, (of law) prescribe, lay down,' Arm *asem* 'say,' TochB *ākṣäṃ* 'announce, proclaim, instruct, issue a proclamation, recite.'[126]

Since the root 1.**h₂(R)eĝ-* 'lead, drive' was applied figuratively to groups of people, soldiers, troops, young boys, etc., as well as originally to animals, this may represent a semantic split where *to order* soldiers or slaves was conceptually equivalent to *driving or leading* them.
If this is true, then every PIE root with the structure **h₂(R)ĝ-* is devoted to terms originally indicating the hunting, herding, feeding, tending, protecting, pasturing, leading, driving, gathering, and milking of flocks of animals. References to both goats and sheep (with their characteristic color) are evident.[127]

13. **s(e)h₂(ĝ)-* 'track, scent, trail, seek, lead, direct'
OIr *-saig* 'trace something, search, seek,' Goth *sokjan* 'seek, search, attack,' Lat *sāgiō* 'trace, track down, get the scent of,' Hit *sākiya* 'discover,' Grk *ἡγέομαι* 'lead, direct, drive.'[128]

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[122] Mallory and Adams 242, 332; IEW 64-65; LSJ 235; NIL 317-318; Watkins 5; Starostin, "Indo-European – North Caucasian Isoglosses," 121.
[123] R. L. Trask, "Basque and Dene-Caucasian: A Critique from the Basque Side," and Xabier Zabaltza, "Comments on R. L. Trask's Article "Basque and Dene-Caucasian: A Critique, 18, 166.
[124] Mallory and Adams 141; IEW 6, 13; LSJ 35, 40; Monier-Williams 9; EIEC 229; Watkins 2; Starostin, "Indo-European – North Caucasian Isoglosses," 105-106.
[125] Mallory and Adams 179; IEW 7.
[126] LIV 256; IEW 290-291; Mallory and Adams 353; Beekes 110-111, 519; LSJ 169, 771; Watkins 1; OLD 91-92; de Vaan 31-32; Adams 38-39. For the linguistic link between speaking and driving, see Raimo Anttila, *Greek and Indo-European Etymology in Action*, 111.
[127] Another potential reflex of this root is Grk *ἀγαθός* 'good, fit, noble,' possibly originally indicating the desirability of herds of animals (Beekes 7, DELG 5-6) with disputed etymology; see also *ἄξιος* 'worth' (Beekes: 111).
[128] LIV 520; IEW 876-877; Beekes 508; Mallory and Adams 327; de Vaan 534; Watkins 75; Balg 384-385; OLD 1679; LSJ 763.

A word with uncertain etymology is Grk *ἀγαπάω* 'to regard with affection, to love, especially when directed toward children.' Later Christian terminology used the nominal, *ἀγάπη* to denote 'the love of God for man, and of man for God.' It has been suggested (DELG 1264, Beekes 8) that this word is a compound, *ἀγά-πη*, where *–πη* is the care and feeding denoted in the PIE root, **peh₂-* (Haynes 2020: Table 68). The first element of this compound is conjectured to be the Greek intensive prefix *ἀγά*, but I suggest that it is more likely a reflex of the resonant series described above. Thus *ἀγάπη* is the care that a shepherd shows for his flock. The numerous instances in the scriptures where God is compared to a shepherd and human beings to his flock, would tend to support this hypothesis.[129]

Some of the following terms were, in later times, commonly applied to human social behavior but probably originally referred to aspects of animal husbandry. This type of adaptation of language is well-attested, for example:

- NE *kid* 'young goat' applied to human children.
- PIE **u̯rētos* 'flock, herd,' in OE *wrǣþ* 'herd of swine,' Skt *vrā́ta-* 'flock, swarm' applied to war bands of young men (NG *Männerbünde*) in ancient Indian society (*vrātya*).[130]
- Lat *grex* 'assembly of animals, flock, herd, group of sheep, a litter, a brood,' was later expanded to include "a group of people assembled together, band, troop, company, dense mass of people, crowd, or (contemptuously) the undistinguished crowd, the ruck."[131]

14. **ĝi̯eH-* 'steal, deprive someone of property, overpower, rob, grow old'
Ved *jināti* 'grow old, rob, deprive of,' YAv *zināt* 'rob, deprive of.'[132]

15. **ĝeu̯H-* 'drive, rouse, impel, be quick, animate, inspire'[133]
Ved *junā́ti, jávati* 'press forwards, hurry on, be quick, impel, urge, rouse, drive, incite, excite, promote, animate, inspire,' *apī-jū́* 'impelling,' *dhī-jū́* 'inspiring the mind, rousing devotion,' *yatú-jū́* 'incited or possessed by a *yatú*,' *vayo-jū́* 'exciting or increasing strength,' *viśva-jū́* 'all-impelling,' *sánā-jū́* 'nimble or active from of old.'[134]

16. **ĝemH-* 'mate, marry, copulate, breed'
Grk *γαμέω* 'marry, copulate, have sexual intercourse,' Skt. *jārá* 'a paramour, lover, become old,' *jā́mātṛi* 'maker of new offspring.'[135]

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[129] See, for example, Pss. 44.22; 100.3; Isa. 53.6; Jer. 23.1-4; 50.6; Ezek. 34.2-23; Matt. 10.6; Jn. 10.2-4, 7-8, 14-16, 25-27; 21.17; Heb. 13.20. Compare also Skt *ajapa* 'goat herd,' in root number 10, above.
[130] Mallory and Adams 136; EIEC 268; Haynes and Witzel, "Of Dice and Divination," 2, 21-24, https://www.academia.edu/44802729/Of_Dice_and_Divination.
[131] OLD 777.
[132] Monier-Williams 426; LIV 167; IEW 469.
[133] Note: this root was included in Haynes (2020: Table 21). Meanings overlap somewhat.
[134] LIV 166; IEW 399; Monier-Williams 424.
[135] Mallory and Adams 206-207; LSJ 337; IEW 369; Monier-Williams 419; Beekes 259.

17. **ĝ̥ieu̯H-* 'eat, consume, devour, chew, masticate'
    TochB *śuwā-, śāwā-*, TochA *śuwat-, śuwaṃ* 'eat (at), consume, devour,' TochB *śwātsi-* 'food,' *eśuwatte* 'not having eaten, having gone hungry,' NE *chew*, Rus *žujú* 'chew,' *ževat'* 'to chew,' NPers *jāvīdan* 'chew.'[136]

18. **ĝerh₂-* 'ripen, cause to grow old, become old'
    Ved *járanti* 'allow to become old,' OCS *–zoriti* 'let ripen,' *–zьrěti* 'ripen,' Grk *γηράω* 'become old, ripen, bring to old age,' *γηράσκω* 'to get old.'[137]

In Modern English we say, "I raise cattle for a living." This means that I breed cattle and nurture the young animals until they are mature (old) enough to sell in the market. I would suggest that the application of this root to old human beings is secondary.

19. ** ḱemh₂-* 'carry off as prize or booty, care for animals or men, toil, calm, soothe, settle'
    Grk *κομέω* 'attend to, take care of (horses or men),' *κομίζω* 'take care of, provide for, attend, give heed to, carry off as a prize or booty,' *κάμνω* 'work, labor, toil, be weary from toil,' *ἱπποκόμος* 'who takes care of horses, groom,' Ved *śamáyati* 'pacify, calm, soothe, settle,' *śaśamé* 'toil at, become tired, rest, be quiet or calm or satisfied or contented,' *śama* 'tranquility, calmness, rest.'[138]

20. **ḱleu̯H-* 'wipe, sweep, brush, clean'
    Lat *cluere, cloare* 'purify, Lith *žemait* 'wipe, sweep, brush, clean' OE *hluttor* 'clean, pure.'[139]

21. **ḱei̯h₂-* 'arouse, set in motion, urge on, drive'
    Lat *cieō* 'move, set in motion, rouse to exertion, urge on, excite, stir up,' Grk *κίω* 'set in movement, move away,' *κῑνέω* 'drive away, set in movement, move to and fro, shake.'[140]

22. **ḱrh₂-*, **ḱerh₂-* 'horn, head, deer, stag, cow, goat, horn for blowing and drinking'
    Myc *ke-ra* 'horn (material),' Hit *karāwar* 'horn,' Grk *κέρας* 'the horn of an animal,' *κάρα* 'cattle, tame goat,' TochB *karse* 'deer, stag.'[141]

23. ** ḱ̓u̯eh₂-* 'gain, obtain, acquire, earn, possession'
    Grk *ἐπασάμην* 'gain, obtain, acquire, earn, win,' *πέπαμαι* 'possession.'[142]

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[136] Adams 98, 631-632, 645; LIV 168; IEW 400; Mallory and Adams 255.
[137] Monier-Williams 423-424; LIV 165; IEW 390-391; Mallory and Adams 163, 189, 190; LSJ 348; Beekes 271; EIEC 248, 410; Illič-Svityč (No. 165) I 297.
[138] LSJ 872, 975; Beekes 632, 743; LIV 323; IEW 557; Monier-Williams 1053-1054; Mallory and Adams 195.
[139] LIV 335; IEW 607; OLD 338.
[140] OLD 313-314; Beekes 700, 707; Mallory and Adams 391; LIV 346; IEW 538.
[141] Beekes 641, 676; Mallory and Adams 137; LSJ 877, 941; Adams 145; IEW 574-577; Alan J. Nussbaum, *Head and Horn in Indo-European*.
[142] LIV 375; IEW 593.

24. **h₂eḱ-h₃-* ‘lead or drive to pasture, consume, eat up, tend, feed, graze’
ON *ęja* ‘lead or drive to pasture, tend, feed, graze,’ *agn* ‘bait food for fish,’ *ējа* ‘lead or drive to pasture, tend, feed, graze, rest, repose,’ Ved *āśayati* ‘cause to eat, feed,’ *aśnāti* ‘eat, consume,’ *āśa* ‘food, eating.’[143]

25. **Hmelḱ-* ‘stroke lightly, touch, soothe, appease, caress, fondle’
Ved *mr̥śáti* ‘touch, stroke, handle,’ Lat *mulceō* ‘touch lightly, stroke, caress, soothe, pacify, quiet, appease.’[144]

26. **h₂er(ḱ)-* ‘keep, keep away, fend off, shut up, guard, ward off, defend’
Hit *harzi, harkanzi* ‘have, hold, keep, retain,’ Lat *arceō* ‘keep close, contain, hold in, control, prevent from approaching, keep away, repulse, protect,’ *arca* ‘box, chest,’ Grk *ἀρκέω* ‘ward off, defend, keep off, assist,’ Arm *argehum* ‘hinder, restrain, hold back.’[145]

27. **Hólḱ-is* ‘elk, wild sheep, antelope’
NE *elk*, Lat *alcēs* < West Germanic ‘elk,’ Grk *ἄλκη* < from West Germanic ‘elk,’ Rus *losĭ* ‘elk,’ Khot *rūś* ‘sheep (*Ovis poli*),’ Skt *r̥śya* ‘male of antelope.’[146]

28. **h₂eḱ-* ‘sharp, pointed, sharpen, sour, needle, grinding stone, hunting spear, prick’
MCymr *hogi* ‘sharpen, hone,’ OHG *eggen* ‘harrow,’ Lat *aceō* ‘be sour,’ *acus* ‘needle,’ Lith *aš(t)rùs* ‘sharp,’ OCS *ostrŭs* ‘sharp,’ Alb *athët* ‘sour,’ Grk *ἀκή* ‘point, sharp,’ Arm *aseln* ‘needle,’ NPers *ās* ‘grinding stone,’ Skt *áśri* ‘sharp edge.’[147]

29. **h₂eiḱ-(smeh₂)* ‘spear, pointed stick, point of spear, arrow, impale, put on a spit’
Lith *iẽšmis* ‘spit, spear,’ Grk *αἰχμή* ‘point of a spear, spear, point of an arrow, war, battle,’ Lat *īcō* ‘wound, injure, hurt, strike with a weapon.’[148]

30. **h₂eḱ-s* ‘axis, axle, literally: *leads or drives (the wheels*)’
Lat *axis*, OE *eax* ‘axle,’ Lith *ašìs* ‘axle,’ OCS *osĭ* ‘axle,’ Grk *ἄξων* ‘axle, axis,’ Skt *ákṣa-* ‘axle, axis.’[149]

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[143] LIV 261; IEW 18; Monier-Williams 112, 157; de Vries 102, 681.
[144] Monier-Williams 831; LIV 226; IEW 724; OLD 1140.
[145] LIV 273; IEW 65-66; OLD 162; Mallory and Adams 271; DELG 105; LSJ 242; EIEC 270.
[146] Mallory and Adams 139; OLD 94; Beekes 71; LSJ 67; Monier-Williams 226.
[147] LIV 261; IEW 18-22; Mallory and Adams 147, 298; NIL 287-290; EIEC 418, 509; Watkins 2; Bomhard 738; Beekes 50-51; LSJ 49; Greenberg no. 18; Illič-Svityč (1965: 353); Illič-Svityč (1971: 251 no. 113). Less certain because of the ambiguous laryngeals, are the following three roots which probably belong to this series: (a) **ḱeH-(i)* ‘sharpen’ Lat *cōs* ‘whetstone,’ NE *hone*, NPers *san* ‘whetstone,’ Skt *śāna* ‘whetstone,’ *śān* ‘whet, sharpen.’ (Mallory and Adams 244; EIEC 510; Monier-Williams 1064; de Vaan 139; LIV 319; LIV Add. 45); (b) **kúH-los* ‘spear, spit, pike, dagger, arrow, javelin’ Arm *slak* ‘pike, spear, dagger, arrow,’ Skt *śū́la* ‘sharp iron pin or stake, spike, spit, lance, pike, spear, javelin’ (Watkins 2, Mallory and Adams 271); and (c) **ḱel(H)-* ‘spear, arrow, staff, point of shaft, nail, spike, arrowhead’ ON *hali* ‘point of shaft, tail,’ OPrus *kelian* ‘spear,’ Alb thel ‘big nail, spike,’ Grk *κῆλον* ‘arrow, shaft of an arrow,’ Skt *śalyá* ‘spear, arrowhead’ (Mallory and Adams 245; LSJ 947; IEW 552-553; Beekes 685). Also note that this root occurs in 12 IE language families, indicating very wide distribution (Bird, *The Distribution of Indo-European Root Morphemes*, 16.
[148] LIV 259; Mallory and Adams 246; IEW 15; Beekes 91; LSJ 45; OLD 818.
[149] Mallory and Adams 248; NIL 259-260; Watkins 2; Beekes 111; EIEC 39-40, 516; de Vaan 66-67. I suggest that this root may have originally been a compound of **h₂eĝ-* ‘drive’ plus **sel-*, **su̯el-* ‘post, beam’ (Mallory and Adams 227; EIEC s.v. “plank” 431; IEW 2**sel-*, **su̯el-* 898), hence **h₂eĝ-sel-* (or **h₂eḱ-*sel-*) ‘drive post, drive shaft, axle.’

31. **h₂eiḱ-* ‘possess, property, earnings, rule over’ (animals as wealth)
OE *āgan* ‘possess,’ ME *own*, Av *ise* ‘is lord of,’ Skt *īśe* ‘owns, possesses,’ TochB *aik-* ‘know.’[150]

Semantic Development of **h₂eĝ-* and its Variants

Languages experience phonetic change over time, but the semantic fields to which words refer are more persistent. Clearly those fields expand to encompass innovations and newly encountered geographical and social elements, but the older lexical items often survive the changes. Not only do old words continue in use, but the many neologisms are cobbled out of their substance.

Given its semantic range, the evidence suggests that the root **h₂eĝ-*, whatever phonetic transformations it has undergone over the millennia, goes back semantically to the earliest stages of language development. What could be more primal than hunting? What combination of sounds (aagh!) could be more fundamentally expressive of the agony of combat with wild animals? When but at the earliest stages of language, would that primitive guttural expression of anguish have come to express the whole range of the semantic field connected with hunting and killing animals?

Stages in the Semantic Development of **h₂eĝ-* and its Variants

Original Semantic nucleus: hunt
Original Semantic Field: hunt, fight and kill animals, drive hunted animals, hunting tools, hunting grounds, hunted animal, hunter.[151]
Diachronic Semantic Field: See table below.

Table 8: Three Stages in the Semantic Development of **h₂eĝ-* and Its Variants

Hunter-gatherer Stage					
hunt, track, pursue animals; hunter	hunted animal	fight and kill wild animals	drive animals into nets, pits, or ambush	tools for hunting: spear, net, arrow	hunting grounds, countryside
Pastoral Stage					
collect, round up animals; cattle-raider	domestic animals	fight	herd flocks, raid for and lead away stolen animals	sharp tools	pastures
Agricultural Stage					
breed, care for, raise, feed, eat, milk & protect animals; shepherd	farm animal names and characteristics	fights, wars, battles, contests	lead army, drive or command soldiers and slaves; leaders in general	sharp tools, weapons	cultivated fields, animal markets, general markets and gatherings

[150] Watkins 2; Mallory and Adams 271; EIEC 270.
[151] Compare the unrelated PIE root **ĝʰu̯ér* ‘wild animal, bear, hunter, hunt, wild, bold, fierce, uncultivated land, hunting device, net,’ which exhibits a parallel and similarly broad semantic field (EIEC 23; de Vaan 215; OLD 693; Mallory and Adams 136; Beekes 547; ALEW 1545; Derksen 549; IEW 493; Ringe 106).

Table 9: Semantic Map of *$h_2(R)e\hat{g}$-

Semantic Map for *$h_2(R)e\hat{g}$- and Its Root Variants

Root Reference Number:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Semantic Value																															
Hunt, fish, chase, track, scent, hunter		X			X								X																		
Fight, battle, contest, battlefiled, carnage,		X																											X		
Wild game, prey, goats, sheep, cattle, stag, animal organs and characteristics, herd of animals, band of men	X	X							X	X	X											X				X					
Hunting tools: net, spear, spit, pike, dagger, arrow, arrowhead, sharp, sharpen, antler, horn, claw, talon		X																									X	X			
Drive, lead, drive off cattle as booty, guide, manage, keep, command, steal or possess property, set in motion, gather, capture	X		X		X		X					X	X	X	X				X		X		X	X					X	X	
Countryside, field, plain, pasture, assembly place, gathering, market			X	X																											
Look after, care for, feed, milk, clean, be concerned about, breed, raise up, eat, protect from harm, mature					X	X	X	X						X		X	X	X	X					X	X	X					

Table 10: Summary of the Semantic Map of *$*h_2(R)e\hat{g}$- and Its Root Variants

Ref	Root	This root shares some semantic values with ? other roots in this series	Semantic Values (abbreviated)
1	1.*$h_2e\hat{g}$-	19	drive animals, lead, carry, fetch, drive, command, herd, battle
2	*$h_2e\hat{g}$-reh_2	10	hunt, fish, game, battle, net, catch, battlefield
3	*$h_2(\hat{g})$-er-	14	collect, take, seize, capture, place of assembly, marketplace
4	*$h_2e\hat{g}$-ros	1	countryside, field, pasture, plain, land
5	*$h_2le(\hat{g})$-	22	look after, care for, gather up, follow the track of
6	*$h_2mel\hat{g}$-	12	squeeze out, press out, milk animals
7	*$h_2mer\hat{g}$-	21	squeeze out, gather up, wipe clean, drive and graze animals
8	*$h_2reh_1(\hat{g})$-	12	help, support, be concerned about, pay attention to, care for
9	*$h_2er\hat{g}$-	6	white, color of sheep, white metal (silver), wool clothing
10	*$h_2ei\hat{g}$-(s)-	6	goat, kid, sheep, cattle
11	*$h_2e\hat{g}$-inom	6	hide, leather, goat hide
12	2.*$h_2e\hat{g}$-	13	proclaim, order, command, say (“verbally lead or drive men”)
13	*$s(e)h_2(\hat{g})$-	14	track, scent, trail, seek, search, lead, direct, attack
14	*$\hat{g}ieH$-	21	steal, deprive someone of property, overpower, rob, grow old
15	*$\hat{g}eu̯H$-	13	drive, rouse, impel, be quick, animate, inspire
16	*$\hat{g}emH$-	12	mate, breed, marry, copulate
17	*$\hat{g}ieu̯H$-	12	eat, consume, devour, chew, masticate, food
18	*$\hat{g}erh_2$-	12	ripen, cause to grow old, become old, mature
19	*$\acute{k}emh_2$-	21	carry off as booty, care for animals or men, toil, calm, soothe
20	*$\acute{k}leu̯H$-	12	wipe, sweep, brush, clean
21	*$\acute{k}ei̯h_2$-	13	arouse, set in motion, urge on, drive
22	*$\acute{k}rh_2$-	6	horn, head, deer, stag, cow, goat
23	*$\acute{k}^{(')}u̯eh_2$-	13	gain, obtain, acquire, earn, possession
24	*$h_2e\acute{k}$-h_3-	21	lead or drive to pasture, consume, eat up, tend, feed, graze
25	*Hmel$\acute{k}$-	12	stroke lightly, touch, soothe, appease, caress, fondle
26	*$h_2er(\acute{k})$-	12	keep, keep away, fend off, shut up, guard, ward off, defend
27	*Hól$\acute{k}$-is	6	elk, wild sheep, antelope
28	*$h_2e\acute{k}$-	2	sharp, pointed, sour, needle, grinding stone, hunting spear
29	*$h_2ei̯\acute{k}(smeh_2)$	2	spear, pointed stick, point of spear, arrow, impale
30	*$h_2e\acute{k}$-s	12	axle, axis, (literally: leads or drives the wheels)
31	*$h_2ei̯\acute{k}$-	12	possess, property, earnings, rule over (animals as wealth)

$*b^h e(R)g$- and Its Root Variants

Table 11: *$*b^h e(R)g$-* 'food: its desirability, its preparation, its sharing, and its satisfaction'

PIE Root	Initial	R1	R2	Final	Ref	Semantic Value
			$*b^h(R)g$-			
*$*b^h ag$-, *$*b^h eg$-	b^h			g	1	get a portion, share with, partake, enjoy, wish, desire, long for
*$*b^h eh_3 g$-	b^h		h_3	g	2	wish for, desire, long for, want, crave, roast, toast, bake
*$*b^h e\underline{u} g$-	b^h		$\underline{u}$	g	3	eat, feed, drink, enjoy, nourish, support, maintain, use, possess
*$*b^h re\underline{u} H(\hat{g})$-	b^h	r	$\underline{u}$H	$(\hat{g})$	4	need, want, require, use, enjoy, be blessed with, delight in, roast, fry`
*$*b^h re\underline{i}(\hat{g})$-	b^h	r	$\underline{i}$	g	5	roast, cook, bake
REDUCED VARIANTS						
			$p(R)k^{(\underline{u})}$-			
$*pek^{(\underline{u})}$-	p			$k^{(\underline{u})}$	6	cook, boil, bake, ripen, become ready for eating, cook a decoction, bubbles given off by boiling liquid, stew, concoct, distribute largess of cooked food, produce a meal by boiling or baking, melt, extract metal by smelting
**perk-*	p		r	k	7	fill, satisfy, sate, satiate, mix, put together with, bestow richly, food, nourishment, refreshment, quench, allay thirst and hunger
METATHESIS VARIANTS						
			$*k(R)p$-			
$*k\underline{u} eh_1 p$-	k	$\underline{u}$	h_1	p	8	boil, simmer, seethe, bubble, froth over, steam, smoke, fume, boil up
$*k\underline{u} ep$-	k	$\underline{u}$		p	9	be fragrant, smell, aroma, scent
$*k\underline{u} Hp$-	k	$\underline{u}$	H	p	10	cup, beaker, goblet, big-bellied drinking vessel, milk vessel
**kelp-*	k		l	p	11	jug, pot, pitcher, drinking vessel

1. *$*b^h ag$-* 'get a portion, share with, partake, enjoy, wish, desire, long for'
   Grk *ἔφαγον, φαγεῖν* 'eat, devour, Ved *bhájati* 'divide, distribute, allot, share with, receive a portion, obtain as one's share, partake of, enjoy, possess, have, prefer, choose,' *abhakṣayam* 'enjoyed, drank,' *bhíkṣate* 'wish, desire, long for,' YAv *baxšaiti* 'divide out,' *baxšaite* 'get a share.'[152]

[152] LIV 65; IEW 107; LSJ 1911; Monier-Williams 743. The PIE root **bhāg(o)-* 'oak, beech, tree with edible fruits' should probably be included here. For an interesting treatment of that subject, see Blažek, "The Ever-green 'Beech'-argument in Nostratic Perspective," 83, https://www.mother-tongue-journal.org/MT/mt6.pdf.

2. **b^{h}eh$_3$g-* ‘wish for, desire, long for, want, crave, roast, toast, bake’
   Rus *bažítь* ‘wish, desire, long for, want, hanker after, crave,’ Grk *φώγω* ‘roast, toast, parch,’ OE *bacan* ‘bake,’ Czech *bažiti* ‘to long for something.’[153]

3. **b^{h}eu̯g-* ‘eat, feed, drink, enjoy, nourish, support, maintain, use, possess’
   Ved *bhójate* ‘have eaten, have enjoyed,’ Arm *bowci* ‘nourish, feed,’ Ved *bhunákti* ‘enjoy, use, possess, enjoy a meal, eat, eat and drink, consume, take possession of,’ *bhuñjáte* ‘enjoy,’ Arm *bowcanem* ‘nourish, feed, support, maintain.’[154]

4. **b^{h}reu̯Hg-* ‘need, want, require, use, enjoy, be blessed with, delight in’
   Goth *brūkjan* ‘need, want, require, use,’ OE *brūcan* ‘need, want, require, use,’ Lat *fruor* ‘avail oneself of, enjoy, to have as one’s lot something good, to be blessed with, to derive pleasure from, delight in.’ To these I would add Grk *φρύγω* ‘roast, fry.’ Formally, it is equivalent, and semantically, it parallels other roots in this series.[155]

5. **b^{h}rei̯(ĝ)-* cook, bake, roast’
   Lat *frīgō* ‘to roast,’ MPers *bryz, brēz* ‘to roast.’[156]

6. **pek$^{(u̯)}$-* ‘cook, boil, bake, ripen, become ready for eating, distribute cooked food, smelt’
   Av *pačaiti* ‘cooks,’ OCS *pek* ‘bake, roast,’ Alb *pjek* ‘bake,’ Skt *pácati* ‘cook, bake, roast, boil, ripen, melt,’ Grk *πέσσω* ‘ripen, cook, bake, concoct, distribute largess of cooked food,’ To-chAB *päk* ‘become ready for eating,’ Lat *coquō* ‘prepare food, boil, bake, brew, concoct, smelt ore, extract metal by smelting,’ Lith *kepù* ‘bake,’ Latv *cepu* ‘bake.’ Note the metathesis forms of the Baltic attestations.[157]

7. **perk-* ‘fill, satisfy, sate, bestow richly, food, nourishment, refreshment, quench,
   Ved *pr̥ṇákti* ‘mix, put together with, fill, sate, satiate, give lavishly, grant bountifully, richly bestow,’ *pr̥íksh* ‘refreshment, satiation, nourishment, food,’ Lat *compescō* ‘confine, close, hold in, restrain, calm, subdue undesirable things and qualities, quench, allay thirst and hunger.’[158]

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[153] LIV 70; IEW 113; L&S 1967; Bosworth and Toller 65.
[154] LIV 84; IEW 153; Monier-Williams 759.
[155] LIV 96; IEW 173; OLD 739-40; Bomhard 52; Beekes 1593.
[156] de Vaan 243; OLD 736; Watkins 11; IEW 137; LIV Add. 16, (footnote no. 1 of this entry suggests a possible cognate in **b^{h}erĝ-* ‘roast, bake’) LIV 78.
[157] LIV 468; EIEC 125; IEW 798; Mallory and Adams 259; Monier-Williams 575; Adams 368, 407; ALEW 550-551; LSJ 1396; OLD 443; de Vaan 134; Greenberg no. 76. Möller, *Vergleichendes indogermanisch-semitisches Wörterbuch*, 136 puts Grk *ἀρτο-κόπος* ‘bread-baker’ (LSJ 250, *ἄρτος* is ‘bread’) as a metathesis-form parallel to Lith *kepù* ‘bake’ with this root. He then compares them to Semitic forms in *χ-b* as, for example, Arab./Ethiop. *χabaza* ‘prepare bread.’ Neither Beekes, Frisk, nor DELG provide an etymology for *ἀρτο-κόπος*. Beekes, *Etymological Dictionary of Greek*, 748 cites *κόπος* ‘stroke, pain, trouble, labor’ as a derivative of *κόπτω* ‘pound, strike’ but this is questionable.
[158] LIV 476; IEW 820; Monier-Williams 645; de Vaan 445; OLD 375, 1294-1295. The LIV citation of Lat *parcō* is disputed on semantic grounds by de Vaan 445.

8. **ku̯eh₁p-* ‘boil, simmer, seethe, bubble, froth over, steam, smoke, fume, boil up’
   OCS *kypě* ‘bubble, simmer, boil, seethe,’ Lith *kūpėti* ‘bubble, boil up, froth over,’ Latv *kûpu* ‘smoke, fume, steam,’ possibly Grk *Κύπρος* ‘Cyprus,’ Lat *Cyprius* ‘of Cyprus,’ *cuprium* ‘Cyprian copper,’ OE *copor* ‘copper (loan from Latin?),’ Latv *kapars* (loan from Low German?).’[159]

A Greek name with unknown etymology, *Κύπρος* ‘the island Cyprus,’ was famous for its copper in antiquity, and may be related to **ku̯eh₁p-* in this resonant-group. Copper was one of the first metals discovered and utilized by humans that usually required smelting from mineral ores in order to render it pure enough to work. Could that smelting (which is a form of boiling) be the link to PIE words denoting *bubble, boil, seethe* as seen in the Baltic forms analyzed here? The metathesis-form **pek$^{(u)}$-* has, as one of its explicit semantic values, ‘melt, smelt ore, extract metal by smelting.’ Was the copper (literally, *the smelted*) and the island (literally, *smelter island*) named for this process? This suggestion is supported by an unrelated but parallel word for copper, Greek *πυρίτης* ‘copper ore, ore.’ The root of this word, *πῦρ-* ‘fire,’ probably refers to the use of fire to smelt the copper metal.[160]

9. **ku̯ep-* ‘be fragrant, smell, aroma, scent’
   Lith *kvepiù* ‘be fragrant, smell,’ *kvimpù* ‘aroma, scent.’[161]

10. **ku̯Hp-* ‘cup, beaker, goblet, big-bellied drinking vessel, milk vessel’
    Lat *cūpa* ‘cup,’ OE *hýf* > NE ‘hive,’ Grk *κύπελλον* ‘cup, beaker, goblet,’ Skt *karpara-* ‘cup, pot, bowl.’[162]

11. **kelp-* ‘jug, pot, pitcher, drinking vessel’
    OIr *cilorn* < **kelpurno-* ‘pitcher,’ Grk *κάλπις* ‘pitcher, cup, kind of drinking vessel.’[163]

These last two roots carry a closely related semantic value. Such vessels would have been instrumental in performing the cooking and boiling operations referred to in the roots **ku̯eh₁p-* and **pek$^{u̯}$-* and so fit tightly into a narrow semantic field along with them.

In the aforementioned root, **pek$^{u̯}$-* ‘cook, boil, bake, ripen,’ the structure consists simply of initial and final consonants without intervening medial resonants. This root can be compared with the semantically equivalent but inverted root **ku̯eh₁p-* ‘boil, simmer, seethe.’ The presence of the sequence /*ku̯*/ in one root, as opposed to the labiovelar /*k$^{u̯}$*/ in the other, could naturally result from the transposition of this element from initial to final position or vice versa.

The medial resonant (in this case the laryngeal *h₁*) acted as a vowel modifier but did not affect the semantic value of the root. As described above, the presence or absence of such resonants is semantically neutral.

[159] LIV 374; IEW 596; EIEC 379; Illič-Svityč no. 240.
[160] LSJ 1012; Beekes 805, 1260; Watkins 38; Mallory and Adams 241; OLD 482.
[161] LIV 376; IEW 596; ALEW 629-630.
[162] Mallory and Adams 240; IEW 591; Beekes 804; LSJ 1011; Monier-Williams 258.
[163] Mallory and Adams 240-241; Beekes 627; LSJ 870.

Semantic Commonality in this Series

Root Ref. Number:	1	2	3	4	5	6	7	8	9	10	11
Semantic Values of Roots											
cook, boil, bake, prepare food, ripen, brew, refreshment, nourishment		x	x	x	x	x	x	x		x	x
mix, concoct, put together						x	x			x	x
distribute largess of cooked food, bestow richly, give lavishly, grant bountifully	x					x	x			x	x
be pleasing, find favor, calm, soothe, appease passions and appetites, fill, satiate, allay thirst and hunger, wish for, long for	x	x	x	x			x		x		
instruments for preparing and serving food, cup, bowl, pot										x	x
smoke, fume, steam, smell, aroma, scent, be fragrant								x	x		
melt, smelt ore						x		x		x	x

Table 12: Semantic Map of the Roots Shown in Table 11

Table 12 illustrates the large degree of semantic overlap that each root shares with the other roots in this resonant series. These can be summarized as follows:

1. **b^{h}ag-* shares some semantic values with 8 other roots in the series.
2. **b^{h}eh$_{3}$g-* shares some semantic values with 10 other roots in the series.
3. **b^{h}e̯ug-* shares some semantic values with 10 other roots in the series.
4. **b^{h}re̯uHg-* shares some semantic values with 10 other roots in the series.
5. **b^{h}re̯i̯(ĝ)-* shares some semantic values with 7 other roots in the series.
6. **pek$^{(u̯)}$-* shares some semantic values with 9 other roots in the series.

7. **perk-* shares some semantic values with 10 other roots in the series.
8. **ku̯eh₁p-* shares some semantic values with 9 other roots in the series.
9. **ku̯ep-* shares some semantic values with 6 other roots in the series.
10. **ku̯Hp-* shares some semantic values with 9 other roots in the series (as instr.)
11. **kelp-* shares some semantic values with 9 other roots in the series (as instr.)

Note that pots, bowls, cups, pitchers, and such receptacles are instrumental in preparing, mixing, cooking, and distributing food. No doubt some type of pot was also used as a crucible for smelting metals. In the semantic map above, the assumption was made that **ku̯eh₁p-* 'bubble, simmer, boil, seethe' was also used in the sense 'smelting.'

* * *

**pe(R)t-* and Its Root Variants

Table 13: **pe(R)t-* 'spread out, stretch out, be wide, be open, attack (with out-stretched arms), fly, rush; a road or path that is open and without obstacles'

PIE Root	Initial	R1	R2	Final	Ref	Semantic Value
**(s)pet-h₂-*	p			t	1	spread out, stretch out the arms, be open, extend, deploy troops, a road
**plet-h₂-*	p	l		t	2	spread, extend, become wider, broaden, spread itself out, a street
**pet-*	p			t	3	fly, fly up, run, move toward, reach out for, attack, flight, path, road, fall, fall upon, hurry, overthrow, ruin, destroy
**pert-*	p		r	t	4	to fight, to combat, battle, contest, strife, army, rush in to fight
**pért-us*	p		r	t	5	passage, way, ford, bridge
**pent-*	p		n	t	6	walk, tread on, find a path, dwell in, path, way, platform, floor
**plu̯t-*	p	l	u̯	t	7	plank, board, wide and broad piece of wood, roof rafter, beam

1. **(s)pet-h₂-* 'spread out, stretch out the arms, be open, extend in space'
   Grk *πίτνημι* 'spread out, stretch out the arms, open,' *πετάνυμι* 'spread out, unfold, open, the open sea, spread wide, opened wide,' *πέταλον* 'leaf, metal or gold plating,' Lat *pandō* 'to spread out, splay, extend the hands, open, open out, to deploy or extend troops,' Osc *patensíns* 'open,' Lat *pateō* 'to be open, to extend in space, cover a wide field, of a road: to offer unimpeded passage,' *spatium* 'expanse of ground, area, space.'[164]

[164] LIV 478; IEW 824-825; LSJ 1396, 1409; Beekes 1181; DELG 858-859; OLD 145, 1289, 1307, 1798-1799; Buck 227, 321; EIEC 539; Bomhard 121. For this series in general, see: Dočkalová, Lenka & Blažek, "On Indo-European Roads," 299-341.

2. **plet-h₂-* 'spread, extend, become larger or wider, broaden, spread out'
   Ved *práthate* 'spread, extend, become larger or wider,' YAv *fraθa.sauuah-* 'the spreading power,' Lith *plečiù* 'to broaden, spread itself out,' Grk *πλατύς* 'broad, wide, flat, level, wide-spread, a street.'[165]

3. **pet-* 'run, move toward, reach out for, attack, fly, fall, fall upon, fly, hurry, attack, overthrow, ruin, destroy'
   Hit *piddāi* 'run, flee, fly,' Arm *ən-t'ac'aw* 'ran,' *t'ert'* 'leaf,' Grk *ἔπτατο* 'fly up,' *πέτομαι* 'fly, rush, fall' *πίπτω* 'to fall, fall violently upon, attack,' *ποτάομαι* 'fly hither and thither,' *πωτάομαι* 'fly about,' Lat *petō, -ere* 'to direct one's course to a person or place, to reach out for, go in the direction of, move towards in falling, to attack, to make for with hostile intent, to attack or menace with actions, words, etc., to make an attempt on the life of someone, to aim at or strike with a weapon, to go after, chase, pursue, to go in quest of, to hunt out,' NWels *hedeg* 'fly,' Ved *pátati* 'fly, soar, rush on, fall, bring down, overthrow, ruin, destroy,' Skt *páttra* 'wing, feather, flight,' *pátman-* 'flight, path, road,' YAv *pataiti* 'fly, hurry.'[166]

LIV (479n1) suggests that this root may be related to the first root listed above, **(s)pet-h₂-*, since *to spread the wings* is identical to *fly*. This is very likely to be the case because,

- The semantic value *to reach out*, recorded for **pet-*, corresponds to the sense 'stretch out the arms, extend the hands' noted for **(s)pet-h₂-*.
- The semantic value, 'leaf,' attested in the Armenian *t'ert'* corresponds to the general concepts, 'broad and wide,' that are explicit in the root **(s)pet-h₂-*.
- Skt *páttra* 'wing, feather,' refers to objects that are also broad and wide.
- As remarked in LIV, the act of flying, a concept that is strongly represented in **pet-*, requires that wings be 'spread out, extended, opened up, and stretched out,' which is the primary sense of **(s)pet-h₂-*.
- When a flock of birds is disturbed, it both 'takes flight (**pet-*),' and 'spreads out, covering a wide field' (**(s)pet-h₂-*).
- Semantically, *attack* (**pet-*) and *deploy or extend troops* (**(s)pet-h₂-*) both refer to the hostile engagements of combat.
- Both roots refer to roads, streets, or paths.

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[165] LIV 486; IEW 833; Monier-Williams 678; EIEC 83, 133, 539; Mallory and Adams 388; LSJ 1413-1414; Beekes 1205; ALEW 910; Bomhard 88.

[166] LIV 477, 479; LIV Add. 63-64; LSJ 1397, 1406, 1453, 1562; OLD 1369; IEW 825-826; Mallory and Adams 399-400; EIEC 208; de Vaan 464; Beekes 1193-1194; Monier-Williams 580. The de Vaan citation referenced here makes the following comment, "It is generally assumed that the root is laryngeal-final, but a simple thematization of **pet-* would also yield the attested Lat. present… [and according to some authorities]… the Greek, too, points to a mere root **pet-*." Note: while this root was formerly divided into the roots **peth₁* and *2.*peth₂* in LIV, LIV Add. 63-65 brings them together as **pet-*. De Vaan further makes the observation that, "The etymology of the verb as 'to fly' is not self-evident, but may be defended by assuming a shift 'to fly' > 'fly up towards' > 'make for, try to get'." I suggest that this rather tortured chain of semantic shifts is implausible, and that the notion 'fly' is more likely to have been derived from the outstretched wings of birds as they are extended in flight. See also EDHIL 659 for identity of roots #1 and #3.

4. **pert-* 'to fight, to combat, battle, contest, strife, army, rush in to fight'
   YAv *parətaŋte* 'fight, battle,' *pāpərətāna* 'being in battle,' Ved *pr̥it,* 'battle, contest, strife,' *pr̥itanā* 'battle, contest, strife, a hostile armament, army, rushing to or in battle,' *pr̥itanājya* 'rushing together in battle, close combat, fight.'[167]

This root conforms phonetically to the paradigm. It also shares semantic values with **pet-* ('attack...') and with **(s)pet-h₂-* ('deploy or extend troops...'). This semantic overlap suggests that **pert-* should also be included in this resonant series. After all, the most successful strategy in any attack would be for fighters to 'spread out' and attack the enemy from all sides. This also conforms to the meaning, 'run,' given for the Armenian attestations of **pet-*, especially considering that, in many languages, *fly* can mean either *fly through the air* or *run quickly*.

Perhaps it should not be surprising that, in the semantic development of this resonant series, 'stretching out the arms' is linked with combat. No doubt, the first fights between early humans involved striking with the fists and out-stretched arms.[168]

5. **pértus* 'passage, way, ford, bridge'
   OWels *rit* 'ford,' Gaul *ritu-* 'ford,' Lat *portus* 'harbor,' *porta* 'city gate,' ON *fjǫðr* 'estuary,' OHG *furt* 'ford,' NE *ford*, Av *pərətu-* 'ford, bridge.'[169]

6. **pent-* 'walk, tread on, find a path, dwell in; path, way, platform, floor'
   Goth *finþan* 'find, learn, discover,' Grk *πατέω* 'walk, tread on, dwell in,' *πάτος* 'way, path, floor, dirt, field,' Arm *hown* 'ford,' Lat *pōns* 'bridge,' Skt *pathin* 'road, way, path, reach,' OCS *pǫtь* 'road,' OPrus *Pintis* 'road.'[170]

This root overlaps in semantic value with Lat *petō, -ere* (**pet-* above: 'to direct one's course to a person or place, to reach out for, go in the direction of, move towards'). Furthermore, paths are said to 'extend in space or stretch for long distances. Most importantly, the concept *path* suggests a course of travel that is open and free of obstacles. This corresponds semantically to the sense of **(s)pet-h₂-* ('of a road: to offer unimpeded passage'). In addition to this root, three of the previous roots (**(s)pet-h₂-*, **plet-h₂-*, and **pet-*) refer to roads, streets, or paths. Grk *πάτος* also refers to objects that are 'wide' such as floors or fields.

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[167] LIV 477; IEW 818; Monier-Williams 645.
[168] Compare Calvert Watkins, Appendix I of the *American Heritage Dictionary*, fourth edition, s.v. "*ar*", page 2021 where *arm* and *army* are derived from the same PIE root.
[169] Mallory and Adams 250; EIEC 487-488; IEW 816-817. In the handbooks, this root is typically derived from **per-* 'to cross over.' But given the large number of roots in this series with semantic values 'road, path, way, bridge, street,' the final /t/ is more likely to have been intrinsic to the root.
[170] LSJ 1347-1348; Beekes 1221; OLD 1402; LIV 471-472; IEW 808-809; Monier-Williams 582; EIEC 202, 487. Compare also the PIE root **pant-* 'belly, paunch, guts, stomach' Lat *pantex* 'belly, paunch, guts,' Hit ^{UZU}*panduha* 'stomach' (EIEC 2). A belly or paunch expands the girth and so conforms to the semantic field of **plet-h₂* (#2 above) 'spread, extend, become larger or wider.'

7. **plu̯t-* 'plank'
   Lat *pluteus* 'movable penthouse, shed,' Lith *plaūtas* 'plank,' Latv *plāuts* 'wall plank,' ON *fleyðr* 'roof rafter,' Norw *flauta* 'cross beam.'[171]

This root refers again to objects that are broad and wide.

Table 14 illustrates the large degree of semantic overlap that each root shares with the other roots in the resonant series. These can be summarized as follows:

1. **(s)pet-h₂* shares some semantic values with 6 other roots in the series.
2. **plet-h₂-* shares some semantic values with 6 other roots in the series.
3. **pet-* shares some semantic values with 6 other roots in the series.
4. **pert-* shares some semantic values with 5 other roots in the series.
5. **pertus* shares some semantic values with 5 other roots in the series.
6. **pent-* shares some semantic values with 5 other roots in the series.
7. **plu̯t-* shares some semantic values with 3 other roots in the series.

Table 14: Semantic map for **pe(R)t-* 'spread out, stretch out, be wide, be open, attack, fly, rush; an open road or path that is without obstacles'

Root Ref. Number:	**1** ****(s)pet-h₂-***	**2** ****plet-h₂-***	**3** ****pet-***	**4** ****pert-***	**5** ****pertus***	**6** ****pent-***	**7** ****plu̯t-***
Semantic Value							
stretch out arms, extend hands, reach out, spread out, broaden, extend in space, became larger or wider, cover a wide field, be open, flat, wide and flat object	**x**	**x**	**x**				**x**
fly (spread out wings), fly up, flight, wing, feather		**x**	**x**				
deploy or extend troops, attack, rush in to fight, move toward, contest, strife, battle, army, combat, fall, fall upon, run, hurry, overthrow, ruin, strike with weapon, destroy	**x**	**x**	**x**	**x**			
street, road, path, way, platform, floor, to offer unimpeded passage, walk, tread on, dwell in, ford, bridge, field, find a way, direct a course toward	**x**	**x**	**x**	**x**	**x**	**x**	

[171] Mallory and Adams 226; IEW 838. Compare Lat *prātum* 'meadow,' which should probably be included in this resonant series (de Vaan 487; OLD 1450). This is a word of dubious origin that fits tightly both formally and semantically with the notions of *spreading out*, *be wide, be open, be extended.*

Semantic Change

Semantic development ordinarily proceeds in the following three logical steps:

1. The Personal: body, body parts, bodily functions, close personal relations
2. The Natural: animals, plants, human social relations, geographical characteristics
3. The Abstract: general concepts such as width, extension, height; kindness, indifference

The semantic development of **pe(R)t-*, beginning from the primitive root underlying all these resonant variants, may have proceeded in something like the following manner:

- Individuals extend hands and stretch out arms. The leader stretches out his arm to direct the migrating tribe toward the path to be taken. The leader of the hunt stretches out his arms to direct the hunting band's course. The war leader silently directs warriors to their positions with his outstretched arm.
- Paths extend into the distance. They are open, unimpeded, and passable, stretching far out into the fields and the spreading pasture-lands.
- Raptors spread their wings, fly up, and then fall upon their prey.
- Hunters run and spread out to surround the hunted animal and fall upon it from all sides.
- Warriors spread out and attack the enemy. They run as they spread out, then fall upon the enemy like a bird of prey falls upon the animal it hunts. They stretch out their arms and attack the enemy with their fists or with weapons.
- The huts in the village spread out from the center. The fields spread out from the village. The pastures spread out from the cultivated fields.
- The territory of the tribe stretches to the river, to the mountain range, to the sea.
- The plain extends to the horizon. The earth extends forever.
- Extension, breadth, and width become abstract concepts that can be applied to spatial relations.

* * *

**me(R)d^{h}-* and Its Root Variants

Table 15: **me(R)d^{h}-* 'mead, honey, honey bee, rob (rob a hive/collect honey), chew'

Root	Initial	R1	R2	Final	Ref.	Semantic Value
**med^{h}-u̯*	m			d^{h}	1	mead, honey, intoxicated, wine
REDUCED VARIANTS 'Steal, rob, take honey from hive, honey bee, honey'						
**mli̯t-ós*	m	l	i̯	t	2	honey, honey bee, rob a hive (< "gather honey")
**mei̯t-h$_2$-*	m		i̯	t	3	take away, rob, cohabit sexually, release, change
**met-h$_2$-*	m			t	4	steal, rob, snatch sway, chew

1. **med^{h}-u̯* ‘mead, honey, wine, intoxicated’
   OIr *mid* ‘mead,’ Wels *medd* ‘mead,’ OIr *medb* ‘intoxicated,’ ON *mjǫðr* ‘mead,’ OE *meodo* ‘mead,’ OHG *metu* ‘mead,’ OPrus *meddo* ‘honey,’ Lith *medùs* ‘honey,’ Latv *medus* ‘honey, mead,’ OCS *medŭ* ‘honey, wine,’ Grk *μέθυ* ‘wine,’ Av *maδu-* ‘berry wine,’ Oss *myd* ‘honey,’ Sogd *mδw* ‘wine,’ Skt *mádhu* ‘honey, wine, mead, milk, butter, ghee, sweet, delicious, charming, delightful,’ TochB *mit* ‘honey.’[172]

2. **mli̯t-ós* ‘honey, honey bee, rob a hive < gather honey’
   OIr *mil* ‘honey,’ Wels *mêl* ‘honey,’ Lat *mel* ‘honey,’ OE *mildēaw* ‘mildew,’ Goth *miliþ* ‘honey,’ Grk *μέλι* ‘honey,’ *μέλισσα* ‘honey bee,’ *βλίττω* ‘rob a hive, gather honey,’
   Arm *meł*r ‘honey,’ *meł*ui ‘bee,’ Hit *militt-* ‘honey,’ Luv *mallit-* ‘honey,’ Iranian *μελίτιον* ‘a kind of Scythian drink.’[173]

3. **mei̯t-h$_2$-* ‘take away, rob, cohabit sexually, change, exchange’
   Ved *mithatí* ‘unite, pair, couple, copulate,’ *mithuná* ‘pairing, copulation, honey and ghee (lex.),’ *mithunī* ‘become a pair, cohabit sexually,’ OAv *mōiθai̯t* ‘rob, be deprived of,’ Lat *mittō* ‘release, let go, emit,’ *admissārius* ‘stallion or ass kept for breeding,’ *admissiō* controlled mating,’ *admissūra* ‘copulation, breeding,’ *committere* ‘to entrust to, commit, join,’ *ēmissus* ‘emission,’ *prōmittere* ‘to send forth, promise, guarantee,’ *mūtō* ‘change,’ Goth *maidjan* ‘change, falsify,’ TochB *mit-* ‘go, set out.’[174]

This root presents some confusion in its many and diverse semantic values. I propose that two different roots have fallen together here. One of these is cognate to the previous cited roots in this resonant series relating to robbing bee hives, honey, and sweetness. There then seems to have been a semantic jump from notions of honey and sweetness to the more abstract notion of a male and female pair “becoming sweet” on each other, leading to extended notions of cohabitation and emissions of fluids. Whether this led further to notions of mutual exchange, promises, and trust, or whether these were a semantic contribution from another root (poss. 2. **mei̯-* ‘exchange, barter, change’[175]) it is difficult to say.

Monier-Williams lists honey and ghee as one definition for Skt *mithuná*, but this appears only lexographically. The Old Avestan *mōiθai̯t* ‘rob, be deprived of’ links this root to Greek *βλίττω* (*βλ* < *μλ*) ‘rob a hive, gather honey’ and that concept is further attested in the following root.

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[172] EIEC 271; IEW 707; Adams 461; Monier-Williams 779; Mallory and Adams 262. Möller, *Vergleichendes indogermanisch-semitisches Wörterbuch*, 157, compares Assyr *m-t-ḳ-* ‘sweet, honey,’ Hebrew *mæθæḳ* ‘sweetness.’ See also Starostin, “Indo-European – North Caucasian Isoglosses,” 123-124.
[173] EIEC 271; IEW 723-724; Mallory and Adams 262.
[174] IEW 715; LIV 430; Adams 461; Monier-Williams 816-817; de Vaan 383-384; OLD 1119-1120; EIEC 184.
[175] LIV 426, see also footnote #1 under that heading; Mallory and Adams 272; EIEC 184.

4. **met-h₂-* 'steal, rob, snatch away, chew'
   Ved *máthīt* 'rob, steal,' *mathnắti* 'rob, snatch away,' Lat *mandō* 'chew, bite, glutton,' *mandūcāre* 'chew, eat,' *māsūcius* 'voracious,' Grk *μασάομαι* 'chew, bite.'[176]

* * *

**h₂e(R)bʰ-* and Its Root Variants

It has been suggested that the combination of attested meanings of the PIE roots **h₂ep-* 'water' and **h₂ebʰ-* 'water' specifically denote "living water, i.e. water on the move."[177] If this is correct, it may be because such water typically shows a characteristic white color, as in English: *white water rafting*.[178] This observation leads to the possibility that **h₂ep-* and **h₂ebʰ-* may have originally referred to the color *white* rather than to the element we call water. That this is likely the case is confirmed by comparing these roots with other roots also denoting the concepts *white* or *white objects* as shown in the table below.

Table 16: **h₂e(R)bʰ-* 'white, light, shine, fire; white objects: swan, cloud, elf, rushing water, snowy mountains, barley'

Root	Initial	R1	R2	Final	Ref.	Semantic Value
**bʰeh₂-*	bʰ			h₂	1	light, bright, shine, light up, make visible, white
METATHESIS VARIANTS						
**h₂ebʰ-*	h₂			bʰ	2	river, moving water (white water?), white, white objects
**h₂elbʰ-ós*	h₂		l	bʰ	3	white, cloud, swan, rivers
**h₂(e)l̥bʰ-*	h₂		l	bʰ	4	elf (the shining one)
**h₂elbʰ-it*	h₂		l	bʰ	5	barley (white grain)
REDUCED VARIANTS						
**peh₂-u̯er*	p			h₂	6	fire
METATHESIS VARIANTS						
**h₂ep-*	h₂			p	7	river, living or moving water (white water?)
**h₂elp-*	h₂		l	p	8	white, the Alps (snowy white mountains), snowy mountain meadow (Proposed Root)

[176] IEW 732; LIV 442; de Vaan 361; Mallory and Adams 257.
[177] Mallory and Adams 126; Witczak 12-17.
[178] AHD, 1963, defines *white water* as "Turbulent or frothy water, as in rapids or surf."

1. *b^heh_2- ‘light, bright, shine, light up, make visible, white’
   OIr *bān* ‘white,’ Ved *bhā́ti* ‘shine, be bright or luminous, to be splendid or beautiful,’ YAv *fra-uuāiti* ‘shine forth,’ Grk *φάντα* ‘shine, bring to light, appear,’ *φάσις* ‘appearance of stars above the horizon,’ Arm *banam* ‘open, reveal, allow to be seen.’[179]

2. *h_2eb^h- ‘river (white water?), white, white objects’
   Hit *hapa*- ‘river,’ OIr *ab* ‘river.’[180] In addition to these, I suggest that the following Greek words with dubious etymologies are reflexes of this root: *ἀφρός* ‘foam,’ *ἀφρέω* ‘to foam,’ *ἄφρα* ‘a kind of plaster,’ *ἀφύω* ‘to become white or bleached,’ *Ἄφριος* ‘an epithet of Zeus in Thessaly,’ *Ἀφροδίτη* ‘the goddess Aphrodite (‘the white goddess’).’[181]

3. *h_2elb^h-*ós* ‘white, swan, white-barley, white leprosy, (white) river’
   Lat *albus* ‘white,’ *albēscere* ‘become white,’ Hit *alpā* ‘cloud’ (possibly from *h_2olb^h-*o*-), Grk *ἀλφούς* ‘white,’ *ἀλφός* ‘white leprosy,’ OHG *albiz* ‘swan,’ OCS *lebedĭ* ‘swan,’ Umbr *alfu* ‘white,’ possibly the following toponyms: Lat *Alba* ‘a town,’ *Albula* ‘an earlier name for the Tiber River,’ *Albis* = ‘NHG Elbe,’ ON *elfr* ‘river,’ Grk *Ἀλφιός* ‘a river-name.’[182]

4. *$h_2(e)l̥b^h$- ‘elf (< the shining one)’
   ON *alfr* ‘elf,’ Skt *ṛbhú* ‘one of a group of gods, divine craftsman.’[183]

5. *h_2elb^h-*it* ‘barley (the white grain)’
   Grk *ἄλφι* ‘barley-groats,’ *ἄλφιτα* ‘barley meal,’ Alb *elb* ‘barley,’ Pashto *ōrbaš* ‘barley,’ Wakhi *arbəsi* ‘barley.’[184]

6. *peh_2-(u̯er) ‘fire, fever, digestion, ashes’
   Umb *pir* ‘fire,’ NE *fire*, OPrus *panno* ‘fire,’ Grk *πῦρ* ‘fire,’ *πυρετός* ‘fever,’ Arm *hur* ‘fire,’ Hit *pahhur* ‘fire,’ TochB *puwar* ‘fire, digestion,’ and Czech *pýř* ‘ashes.’[185]

PIE *$peh_2u̯er$ (or *$peh_2u̯r$) contains two syllables, and so would typically be composed of two separate monosyllabic roots. The first, *peh_2-, may be a reduced variant of *b^heh_2- ‘light, bright,

[179] IEW 104-105; LIV 68; Monier-Williams 750; LSJ 1912, 1918; Mallory and Adams 330; NIL 7; EIEC 513; Bomhard 13; Dolgopolsky 177a, 179. Numerous other roots, apparently related to *b^heh_2-, show the medial resonant in /l/, as do some of the roots in this series. See Haynes (2020): Table 7.
[180] EIEC 636, s.v. “*h_2ep-”; Mallory and Adams 126; IEW s.v. “*ab-1”; EDHIL 294-295.
[181] Beekes 178-180; LSJ 293-294. The name Zeus itself is based upon the root *$di̯eu̯$ ‘bright, shining,’ so an epithet signifying ‘the white one’ would not be unexpected. There is evidence that Zeus, as well as Aphrodite, were originally identified with the galaxy, which was particularly noted for its white appearance (as in “Milky” Way). See Haynes (2009: 211-213).
[182] Mallory and Adams 55, 332; EIEC 114, 641; de Vaan 32; Beekes 77; IEW 30; OLD 93; LSJ 74; Bomhard 690. Note that the laryngeal notation adopted by LIV is used in this paper (Mallory and Adams h_2, h_4, h_a = h_2).
[183] EIEC 177; Mallory and Adams 411; IEW 30. Note that Mallory and Adams analyze this root as *$h_4(e)l̥b^h$-, and EIEC as *$(a)l̥b^h$- and suggest that these words are related “originally as ‘the shining one’ or the like.”
[184] IEW 29; Beekes 77. EIEC 51 suggests that this root is a derivative of the word for ‘white,’ and points out that Germanic languages derive the words for grain from the word for ‘white’ as, for example, ON *hveiti*, OE *hwǣte*, ME *wheat*, OHG *weizzi*, Goth *ƕaiteis*.
[185] Mallory and Adams 123; IEW 828; NIL 540-545; EIEC 202; Adams 392-393; Beekes 1260-1261.

shine, light up, make visible, white,' while the second could be from, **u̯er* 'warm, burn, cook, boil.' If this is correct, the full compound could be glossed as, 'that which shines and warms.'[186]

7. **h₂ep-* 'river, living or moving water (white water?)'
   OPrus *ape* 'river,' Lith *ùpė* 'river,' Av *āfš* (gen. *apō*) 'water,' Skt *ā́p-* 'water,' TochAB *āp-* 'river.'[187]

8. **h₂elp-* 'white, the Alps (snowy white mountains)' Proposed Root
   Sabine *alpus* 'white,' Lat *Alpis* 'the mountain range of the Alps,' Occitan dialect *alp* 'mountain,' *alpage* 'meadows in high altitude that are covered in snow in winter and where herds are sent in summer.'[188]

**dʰégʰ-om-* and Its Root Variants

Early humans built dwellings out of mud bricks. The craftsmen who mastered this art were the first *technicians* (**teḱ-s* < **dʰégʰ-* 'earth' through reduction). Later, construction methods incorporated the mud and wattle system, where earth (mud) was daubed onto a lattice created by twisting withies (wood) into a woven pattern. At that point, a technician was someone who had mastered the use of both raw materials: earth and wood. When buildings began to be fashioned out of wood alone, the former terminology was again applied to the workers who became experts in this craft (Grk *τέκτων* 'carpenter, craftsman, artist'). The pattern of terminology continues to this day, where computer workers are employed in *high-tech* industries or in the *technology* sector.

Because earth was the first building material, PIE words for building, making, and fabricating were derived from words signifying *earth*, as were the words for various types of (initially earthen) constructions: walls, enclosures, fences, houses, towns, etc.

The great mass of common folk and slaves who were often employed in gathering and assembling the various forms of earth (mud, clay, stones) or in the cultivation of the earth (soil) were called "earth workers," and this term became, in time, the generic word for "man" as in Lat *homo*. It is doubtful whether this word was initially ever applied to the rulers and aristocracy. A parallel development can be seen in the Grk *γεωργέω* 'to be a husbandman, farmer' (modern name *George*, literally 'earth worker' from *γῆ* + *ἔργον*). References to 'man' in this resonant series therefore probably reflect, not man in general, but rather man as 'earth worker, commoner, vassal, slave (as in the Phrygian attestation below).'[189]

The process of colonizing, settling an area of land, building dwellings, and cultivating crops was also designated by a derived term **tḱ-ei̯-*, as was also the control and dominion of the earth, as in the term *land holders*.

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[186] For **u̯er*, see EIEC 88; IEW 1166; Mallory and Adams 260.
[187] EIEC 636; IEW 51-52; Mallory and Adams 126.
[188] de Vaan 32; Pierre Bancel, personal communication.
[189] The distinction continues to the present day where, in the military, the officers are a class apart from "the men."

Table 17: **dʰégʰ-om-* 'earth, earth works, fabrication, earth workers, cultivation of soil, domination of earth'

PIE Root	Initial	R1	R2	Final	Ref	Semantic Value
**dʰégʰ-om-*	dʰ			ĝʰ	1	earth, ground, land, man (as earth worker), human being, slave
**dʰeu̯ĝʰ-, *dʰi̯ĝʰs*	dʰ		i̯	ĝʰ	2	work clay, fashion, stroke, knead (clay, mud, dough), build, build wall; wall, earthen wall
**dʰeu̯gʰ-*	dʰ		u̯	ĝʰ	3	make, build, produce something useful, knead, fit into place, strong; common or vulgar men
**dʰerĝʰ-*	dʰ		r	ĝʰ	4	make firm, strong, tough, tenacious, enclosure, garden, yard
METATHESIS VARIANTS						
**ĝʰerdʰ-*	ĝʰ		r	dʰ	5	fence, enclosure, house, town, city
REDUCED VARIANTS						
**teḱ-s, *te-tḱ-*	t			ḱ	6	establish, produce, hew, cut, fabricate, fashion, axe, craft, skill
**tḱ-ei̯-*	t			ḱ	7	cultivate soil, settle, dwell, linger, build on, work land, settlement, people a country
**tḱ-eh₁-*	t			ḱ	8	gain control of, possess, gain power over, rule, kingdom, dominion
**tu̯erḱ-*	t	u̯	r	ḱ	9	carve, cut, form, fashion, mold, shape, maker, creator

1. **dʰégʰ-om-* 'earth, ground, man (as earth worker), slave'
   Hit *tēkan* 'earth, ground,' Ved *kṣám-* 'earth, ground,' Grk *χθών* 'earth, ground, land,' Lat *humus* 'earth,' *homo* 'human being,' OE *guma* 'man, (bride)groom,' Lith *žēmė* 'earth,' OCS *zemlja* 'earth, land,' Phrygian *zemel* 'slave,' TochA *tkaṃ* 'earth, ground.'[190]

2. **dʰeu̯ĝʰ-, *dʰi̯ĝʰs-* 'form, build, mold mud or clay, knead, smear, plaster; wall of mud'
   Skt *déhmi* 'spread, fill,' *déhī* 'wall, rampart, dam,' Goth *digan* 'form, fashion, knead, make pottery,' ON *deig* 'dough', *digr* 'thick,' NE *dough*, Lith *žiedžiù* 'form from mud,' TochB *tsikale* 'to form,' Lat *fingō, finxī* 'form, shape,' *figūra* 'form, shape, figure,' *fictilis* 'fashion out of clay, made of earth or clay,' *figulus* 'potter,' Av *pairi-daēza-* 'enclosure' (> NE *paradise*); Grk *τεῖχος, τοῖχος* 'wall, embankment,' possibly Grk *θιγγάνω* 'touch with the hand,' OIr *digen* 'build, firm, solid, hard, strong, fixed.'[191]

Mallory and Adams (223-224, 371) write, "The underlying semantics of **dheu̯ĝh* indicate that it was specifically associated with the working of clay (e.g. Lat *fingō* 'fashion,' Skt *déhmi* 'smear, anoint,' TochAB *tsik-* 'fashion [pots, etc.],' hence the English cognate *dough*; in Greek and Indo-Iranian it is also associated with building walls, e.g. Av *pairi-daēza* 'build a wall around' ... but

[190] IEW 414-16; EIEC 174; NIL 86-88; Mallory & Adams 120; Watkins 20; DELG 143; Ringe 19; EDHIL 858-862; Bomhard 145; EIEC 247-48; Illič-Svityč no. 69; Ruhlen and Bengtson 323-326; Fortson 461 (*zemel*).
[191] LIV 140; IEW 244; NIL 118; de Vries 194; Mallory & Adams 223-224, 228; Watkins 18; EIEC 283, 649; Bomhard 166.

there are also cognates of more general meaning, e.g. OIr *con-utainc* 'builds,' Lith *diežti* 'whip, beat,' Arm *dizanem* 'heap up'." And in EIEC (629) they write: "The substance from which the walls were made, [earth] came to be applied both to the finished product, e.g., Grk *τοῖχος* 'wall', Av *uz-daēza-* 'wall', and clay-like substances, e.g. Germanic *dough.*"

3. **dʰeu̯ĝʰ-* 'make, build, make ready, prepare, produce something useful, suitable, fit, touch, knead, big, strong; common or vulgar men'
   Grk *τεύχω* 'make, prepare, build, produce by work or art, form, create, well made, of fields: tilled,' Grk *τυγχάνω, ἔτυχον* 'gain one's end or purpose, succeed, attain, obtain a thing, of men: common, every-day, vulgar' (compare **dʰégʰ-om* above), Goth *daug* 'be useful,' OIr *dúal* 'suitable, fit,' NIr *dual* (< *dʰugʰ-lo-*) 'right, proper, natural,' ON *duga* 'to suit,' NHG *taugen* 'to be useful or fit,' Slav **dugъ* 'strength,' Pol *duży* 'strong, big.'[192]

4. **dʰergʰ-, *dʰeregʰ-* 'become hard, strong, firm; garden, yard, enclosure'
   Skt *dṛhyati* 'make firm,' Lith *diržmas* 'strong,' *daržas* 'garden,' Latv *dārz* 'garden, yard, enclosure,' OPrus *dīrstlan* 'powerful,' *diržti* 'tough, tenacious, become hard.'[193]

5. *ĝʰerdʰ-* 'fence, corral, enclosure, granary, house, town, city'
   OPrus *sardis* 'fence,' Lith *žarđis* 'corral,' *žárdas* 'fence, enclosure,' Rus *zoród* 'granary,' Phryg *–zordum* 'city.'[194]

6. **teḱ-s, *te-tḱ-* 'establish, produce, hew, cut, fabricate, fashion, axe'
   Lith *tašýti* 'hew, trim,' OCS *tesati* 'hew,' Skt *tákṣati* 'fashions, creates, carpenters, cuts,' Grk *τέκτων* 'architect,' *τέχνη* 'art, craft, skill, technique,' Skt *tákṣan* 'carpenter,' Hit *taksanzi* 'undertake, prepare, cause, joint,' OHG *dehsa* 'axe.'[195]

7. **tḱ-ei̯-* 'cultivate soil, settle a land, dwell in a place'
   Ved *kṣéti* 'dwells, lingers,' Myc *ki-ti-je-si = /ktiⁱensi/* 'to build on, cultivate, or work land,' Lat *pōnō* 'put, place, sit down,' Grk *κτίσις* 'settlement,' *κτίζω* 'people a country and build houses and cities in it,' Av *šiti* 'settlement,' Arm *šēn* 'dwell, build on, farm, town.'[196]

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[192] LIV 148; IEW 271; Mallory & Adams 370; LSJ 1783, 1882.
[193] IEW 254; Mallory & Adams 381.
[194] EIEC 199, 224; LIV 197; IEW 444. According to EIEC, this root is cognate to those non-palatalized forms derived from **gʰórdʰos*: ON *garðar* 'fence, hedge, court,' OE *geard* 'enclosure, yard,' Lith *gardas* 'fence, fold, pen,' Rus *górod* 'town, city;' from *gʰr̥dʰó-*: Hit *gurtas* 'citadel,' Luv *gurta-* 'citadel,' Skt *gr̥há-* 'house, habitation, home,' ON *gyrða* 'to gird;' and from **gʰórtos*: Lat *hortus* 'garden,' *cohors* 'enclosure, yard, court,' Grk *χόρτος* 'enclosed place, feeding place.' These forms are equivalent semantically and originally stem from the concept of building with either earthen (mud) bricks or with daub (mud) and wattle construction.
[195] LIV **tetḱ-* 638; IEW **tekʹþ-* 1058-59; Watkins 92; Mallory and Adams 220, 243, 283; Bomhard 206; EIEC 139; Beekes 1460; EDHIL 813-814.
[196] LIV **tḱei-* 643; IEW 626; Watkins 95; Mallory and Adams 223; EIEC 622. Compare possible metathesis form: TochB [2]*keta* 'parcel of land, estate, field,' Adams, *Dictionary of Tocharian B*, 191; and Adams, *History and Significance of Some Tocharian B Agricultural Terms*, 373.

8. **tḱ-eh₁-* ‘take hold of a piece of land, gain control of, land allotment, rule, kingdom’
   Skt *kṣáyati* ‘possess, rule over, govern, control,’ Av, OPers *kšaθra* ‘dominion, control, command,’ Grk *κτάομαι* ‘gain, acquire, earn, win,’ Myc *ki-ti-me-na-ko-to-na* ‘land allotment,’ *ki-ti-je-si* ‘clear, bring into cultivation.’[197]

9. **tu̯erḱ-* ‘carve, cut, form, fashion, mold, shape’
   YAv *θβərəsaiti* ‘carve, cut, form, fashion, shape,’ OAv *θβarōždūm* ‘have formed, have shaped,’ Skt *tváṣṭar* ‘maker or creator god,’ Grk *σάρξ* ‘flesh, piece of flesh.’[198]

**gʰebʰōl* and Its Root Variants

Table 18: **gʰebʰōl* ‘head’

Root	Initial	R1	R2	Final	Ref.	Semantic Value
**gʰebʰ-ōl*	gʰ			bʰ	1	Head
REDUCED VARIANT						
**kap-u̯t, *kapolo-*	k			p	2	Head

1. **gʰebʰ-ōl* ‘head, top, skull, gable’
   ON *gafl* ‘gable, gable-side,’ OHG *gibil* ‘gable,’ *gebal* ‘skull, gable,’ Goth *gibla* ‘gable,’ Grk *κεφαλή* ‘head, top,’ Macedonian (Illyrian?) *κεβ(α)λή* ‘head,’ TochA *śpāl* ‘head,’ TochB *śpāl-mem* ‘excellent.’[199]

2. **kap-u̯t, *kap-olo-* ‘head, skull, cup’
   Lat *caput* ‘head,’ ON *hǫfuð* ‘head,’ OE *hafud* ‘head.’ “Related in some fashion are ON *haufuð* ‘head,’ OE *hēafod* ‘head’ (> NE *head),* OHG *houbit* ‘head,’ Goth *haubiþ* ‘head,’ OE *hafola* ‘head,’ Skt *kapála-* ‘cup, bowl; skull.’[200]

**de(R)h₂-* and Its Root Variants

The English word *season* originally signified the act of sowing and is cognate to English *seed*.[201] Thus the sowing time, which is just one of the yearly seasons, is taken for the cycle of seasons in general. Other “seasons” such as the spring thaw, summer heat, or the abundance of the autumn harvest time could serve the same function—marking a recurring memorable point in the divisions of the yearly cycle. Rotations, wheels, especially the wheel of time and its incremental divisions,

[197] IEW **kþē(i)-* 626; Watkins 95; Mallory and Adams 269; EIEC 490 “…the Greek form suggests that the underlying meaning pertained to ‘the procurement of a piece of land’ …”
[198] LIV 656; IEW 1102.
[199] lEW 423; EIEC 260; Mallory and Adams 174; Watkins 29; Beekes 662.
[200] IEW 529-530; EIEC 260-261; Mallory and Adams 174; OLD 274; Watkins 38; de Vaan 91; Illič-Svityč no. 195 cites Afrasian *qP* ‘head,’ Kartvelian *ḳep-a* ‘skull, back of the head,’ poss. Uralic **koppa* ‘cavity, skull,’ see Greenberg 92.
[201] AHD 1571, 2045 s.v. “*sē̆*” ‘to sow.’

divisions in general, and the sum of the cycles lived (a person's age) are represented by **de(R)h₂-* and its root variants.

Table 19: **de(R)h₂-* 'Wheel, cycle, year, season of the year, time (conceived as rotation of celestial bodies); a division of time, divisions in general'

Root	Initial	R1	R2	Final	Ref.	Semantic Value
**deh₂-, *deh₂-(i̯)-*	d			h₂	1	time and other divisions, cut up, divide, old age
METATHESIS VARIANTS						
**h₂ed-*	h₂			d	2	dry, parch, dryness, heat (< hot and dry season, summer?)
REDUCED VARIANTS						
2.**teh₂-*	t			h₂	3	thaw, melt (< the season of year when the ice melts, springtime)
**teh₂-ḱ*	t			h₂	4	Melt (< season of year when the ice melts, springtime)
**telh₂-*	t		l	h₂	5	rise of stars, lift up, turn, tolerate, endure, rotate, spin
**terh₂-*	t		r	h₂	6	go across, above, over, to transit (< cross the sky in diurnal motion or rotation)
**teu̯h₂-*	t		u̯	h₂	7	abundance, fat (< harvest season, autumn)
METATHESIS VARIANTS						
**h₂eu̯t-*	h₂		u̯	t	8	autumn (< season of harvest and abundance), year (Proposed root)
**h₂ert-us*	h₂		r	t	9	season of the year, epoch, period, division of the year, fixed order
**(H)ret-h₂-*	H	r		t	10	Wheel, circle, round, ring, cart, chariot, run
**h₂et-nos*	h₂			t	11	Year, revolution of the sun, age
**h₂et-*	h₂			t	12	Go, wander
**h₂elt-*	h₂		l	t	13	Old, age (< number of cycles lived), a period, high (< tall because old)
**h₂ŕ̥t-ḱos*	h₂		r	t	14	Bear, Ursa Major, north, (a compound: **h₂ŕ̥t-* 'wheel' + **h₂eḱ-(s)* 'axis,' literally: '(located at) the axis of the (cosmic) wheel'

1. **deh₂-, *deh₂-(i̯)-* 'time and other divisions, cut up, divide, division of people'
   Alb *për-daj* 'distribute, divide, scatter,' Grk *δαίομαι* 'to divide, to feast,' *δαίς* 'portion, meal, *δαιθμός* 'division, divided land,' *δῆμος* 'a political subdivision of the people,' Ved *dáyate* 'divide,' OE *tima*, ON *tími* 'hour, time,' OHG *zīt* 'time,' Arm *ti* 'old age, time,' NE *tide* and *time*.[202]

[202] Mallory and Adams 269, 318; Beekes 297-298; LIV 103; AHD 1809; Watkins 14; EIEC 160-161; IEW 175; EDHIL 805-806. The numerous river names built on a homonymous root (Don, Dniepr, Dniestr, etc.) may, in fact, be derived from this root (IEW 175), either in the sense of "running high at the season of the spring thaw' or in the sense of "rivers being natural divisions of territories."

2. **h₂ed-* 'dry, parch, dryness, heat (< season of the year with dryness and heat, summer?)'
   Grk *ἄζω* 'to dry,' *ἄζομαι* 'to parch (mostly intransitive),' *ἄζα* 'dryness, heat,' *ἀζαλέος* 'barren, arid,' Hit *hādu* (*ḫāt-*) 'to dry up, become dry.'[203]

3. **teh₂-* 'thaw, (season when the ice melts, spring time?)'
   Arm *t'anam* 'to wet, moisten,' Oss *taj-* 'thaw, melt,' OCS *tajati* 'melt, thaw,' Cymr *tawdd* 'melted.'[204]

4. **teh₂-(ḱ)-* 'melt (season when the ice melts, spring time?)'
   Grk *τήκομαι* 'melt,' *τέτηκα* 'is melted.' An extension of the previous root per LIV 617n1.[205]

5. **telh₂-* 'raise, lift, cause to rise into the air, uphold, turn, spin, endure, rise (of stars)'
   Lat *tollō* 'lift, cause to rise into the air, endure' TochAB *täl* 'uphold, raise,' Grk *τέλλω* 'come into being, accomplish, turn, to rise (of stars).'[206]

LSJ writes of Greek *τέλλω*: "The sense *rise* is perhaps derived from that of *revolve* as used of stars." That this is correct can be seen from the name, *Anatolia*, signifying Asia (or more particularly, Asia Minor), as the place (the East) where the stars "up-turn" (*ανα* 'up,' *τέλλω* 'turn'), or, as we commonly say in English, "where the stars come up." But the ancients were well-aware that the stars move in a circular motion, i.e. that they turn.[207] Other attestations of this root have drifted into the metaphorical realm: Grk *ταλάσσαι* 'bear, suffer,' Goth *þulan* 'bear, suffer, endure,' etc., but evidence that the original sense of this root was, as suggested by LSJ, *turning up, revolving, spinning*, can be seen from the fact that a group of related Greek words indicate just that: *ταλασήϊος* 'of wool spinning,' *ταλασίουργέω* 'spin wool,' *ταλασίουργός* 'wool spinner.'

Another Greek word, *Ἄτλας* 'the titan, Atlas,' who is said (by Hesychius) to be the "axis of the earth," is often ascribed to this root (*ἀ-* euphonic, and *τλάς* from **τλάω*). Since "axis of the earth" is, by definition, "axis of rotation," this supports the notion that this root ultimately shares the fundamental semantic value of *revolve, rotate*, as do the other roots in this resonant series.

6. **terh₂-* 'pass over or across, above, transit (go across in a diurnal motion)'
   OIr *tar* 'across, above,' Lat *trāns* 'across, on the other side,' Av *taro* 'over, to,' OHG *durh* 'through,' Hit *tarhu-ᶻⁱ* 'to prevail,' Ved *tṛī, tárati* 'to pass across or over, to overcome,' *tārá* 'carrying across, save, protect, shining, radiant, a fixed star, asterism,' *tāraka* 'causing to pass over, belonging to the stars,' *tārakatvá* 'the condition of a star,' *tārakāmāna* 'sidereal measure, sidereal time,' *tārakiṇī* 'starry night,' *tārā-gaṇa* 'a multitude of stars,' *tārā-pīḍa* 'star-crowned, the moon,' *tārā-valī* 'a multitude of stars,' *stṛī* 'a star, a mark or star-like spot (on the forehead of a bull or cow).'[208]

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[203] LIV 255; Beekes 26-27; EDHIL 328-329.
[204] LIV 616; IEW 1053-1054.
[205] LIV 617; IEW 1053.
[206] LIV 622; IEW 1060; Mallory and Adams 406; LSJ 271, 1754, 1772; Bomhard 212; EIEC 352; Haynes (2020): Table 80; Adams 296.
[207] See *Iliad* XVIII, 483-489.
[208] LIV 633; IEW 1074-1075; Mallory and Adams 290; EIEC 4; Friedrich 213; de Vaan 627; OLD 1961; EWAia I 629; Monier-Williams 443-444, 454, 1260.

The evidence suggests that, fundamentally, this root expresses the motion of the stars as they pass over, across, and above the terrestrial plane. In the Polar Regions, these stars never drop below the horizon so that their course is obviously circular; they rotate around the pole. This rotation is in accordance with the basic concept represented in this root series. Later, the idea of this stellar motion was transferred to any movement from one side of anything to the other in analogy to the rising of the stars in the east and their setting in the west.

Monier-Williams suggests that Ved *stṝ* 'a star' is cognate to other PIE terms denoting stars, i.e., Lat *stella* (< Proto-Latin *stērlā*), German *Stern* (< Germanic *sterzōn*), ME *star* (< OE *steorra*), etc. Most authorities give the original form as **h₂ster-* 'star' as in Grk *ἀστήρ* and Hit *hašter(a)-*.[209] It may be reasonable, however, to further analyze this two-syllable word into component roots: *h₂eh₁s-* 'burn, glow, hearth, altar'[210] plus **(s)terh₂-* 'to cross over, to cross above,' yielding something like "glowing embers that cross over above." Forms without the initial syllable may simply be attestations of *terh₂-* with the *s*-mobile ("they that rotate and cross over above").[211]

7. **teu̯h₂-* 'abundance, fat (< season of abundance, autumn?), swell'
   Ved *tavīti* 'to be or make strong,' *tavás* 'strong, energetic, courageous,' Av *tav-* 'to be capable of,' ORus *tyju* 'to be fat,' Grk *σῶς* 'safe, healthy, intact, keep alive, stay alive, saving, preserving,' *σωρός* 'heap (of corn), that which is heaped up, epithet of Demeter,' NE *thousand,* Lith *túkstantis*, OCS *tysęšta* 'thousand,' (< **tuHs-ḱm̥to-* 'literally 'fat hundred' or 'abundant hundred'), TochB *tumane* 'ten thousand.'[212]

8. **h₂eu̯t-* 'autumn' (Proposed Root)
   Lat *autumnus* 'autumn, year, harvest,' *autumnitās* 'the autumn season, autumn fruits.'[213]

9. **h₂ert-us* 'season of the year, epoch, period, division of the year, fixed order'
   Skt *ṛ́tu-* 'season of the year, any settled point of time, fixed time, time appointed for any action (especially for sacrifices and other regular worship), an epoch, a period, especially a division or part of the year, the cyclical menstrual discharge in women, fixed order, rule,' *ṛtavyà* 'relating or devoted to the seasons,' *ṛtá* 'proper, right, fit, apt, suitable, able, brave, honest,' *ṛtá-van* 'keeping within the fixed order or rule,' *ṛti* 'going, motion,' *ṛt-víya* 'being in proper time, observing or keeping the proper time, a woman in or after her courses, a woman during the time favorable for procreation,' *ṛtu-nātha* 'lord of the seasons, the spring,' *ṛtu-paryāya* 'the revolution of the seasons,' *ṛtu-vṛitti* 'revolution of the seasons, a year,' *ṛtu-saṃdhi* 'junction of two seasons, transition from one season to the next one,' Lat *artus* 'joint, limb, juncture,' Av *ratu*

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[209] Watkins 89; de Vaan 585; IEW 1027; EDHIL 326.
[210] As mentioned in Mallory and Adams 93, 129; IEW 68; de Vaan 49; OLD 158.
[211] See Václav Blažek, "Indo-European Astronomical Terminology," 141-142.
[212] LIV 639-640; Mallory and Adams 385-386; Beekes 1440, 1456; Monier-Williams 441, 449; IEW 1080-1081; Adams 301.
[213] de Vaan 64; EIEC 504; Watkins 93 s.v. "*temə-*[1]"; OLD 220-221. See also: Dočkalová, Lenka and Blažek, "The Indo-European Year," *Journal of Indo-European Studies* 39, nos. 3 and 4 (2011): 431, 437-438.

'section of time, period,' *arəta-* 'order,' Grk *ἀρτύς* 'ordering, arranging, arrangement,' Arm *ard* 'order,' OHG *art* 'innate feature, nature, fashion.'[214]

10. ***(H)ret-h₂-*** 'wheel, circle, round, ring, cart, chariot, run'
Lat *rota* 'wheel, wagon' *rotula* 'small wheel,' *rotundus* 'round,' OIr *roth* 'wheel, circle,' OWel, OBret *redec* 'to run, flow,' Lith *rãtas* 'wheel, circle, ring, cart, wagon' Latv *rats* 'wheel, cart,' OHG *rad* 'wheel,' Skt *rátha-*, YAv *raϑa-* 'chariot, wagon,' TochB *retke* 'army (< 'chariotry').[215]

11. ***h₂et-nos*** 'year, a revolution of the sun, age'
Lat *annus* 'year, the period of the sun's apparent revolution, a unit for expressing age, old age' < Proto-Italian **atno-* 'year,' Umb *acnu* 'year,' Goth *aþna-* 'year,' Ved *atasi* 'travel, wander,' Av *xᵛāϑra* 'well-being.'[216]

12. ***h₂et-*** 'go, wander'
OHG *ātar* 'quick,' Lith *otrùs* 'lively.' Said to be related to the previous root. (Compare Grk *πλάνητος* 'wandering stars, planets').[217]

13. ***h₂elt-*** 'old, an age, a period, high'
OHG *alt* 'old,' OSax *ald* 'old,' Goth *alds* 'age, period, lifetime,' OE *ield*, ON *ǫld*, Goth *alþeis* 'old, period, interval, space of time,' ON *aldr* 'age, lifetime,' OE *ealdor* 'life,' Lat *altus* 'old, high, deep.'[218]

14. ***h₂ŕ̥tḱos*** 'bear, the constellation Ursa Major, north'
Skt *ṛ́kṣa-* 'bear, the constellation Ursa Major,' Av *arəša* 'bear,' Grk *ἄρκτος* 'bear, the constellation Ursa Major, north,' Alb *ari* 'bear,' Arm *arǰ* 'bear,' Lat *ursus* 'bear, the constellation Ursa Major,' MIr *art* 'bear, hero, warrior,' Wels *arth* 'bear,' OBret *Ard-, Arth-* 'bear,' Gaul *Artio* (theonym), Hit *ḫartakka-, ḫartagga* 'wild animal, bear-man.'[219]

The true name of the bear was taboo in the Indo-European languages, resulting in a wide variety of euphemisms: OIr *mathgamain*, literally "the good calf," Lith *béras* "the brown one," Lith *lokys*, Lat *lācis*, OPrus *clokis*, SCr *dłaka* "the hairy or shaggy one," OCS *medvědĭ* "honey-eater." Many authorities believe that PIE ***h₂ŕ̥tḱos*** was the non-euphemized original term for bear, but the evidence may suggest otherwise. The word contains two syllables and so is most likely a compound consisting of two roots. This compound could be analyzed as: ***h₂ert-*** 'wheel' + ***h₂eḱ-(s)*** 'axis,' literally "(at) the axle of the wheel" (see Table 7, ref. 30 above). This would be in reference to the bear (Ursa Major) the constellation located near the axis point of the starry heavens (the north

[214] de Vaan 55-56; Monier-Williams 223-224; Beekes 143-144; IEW 55-56; Mallory and Adams 276; Adams 51; EWAia I 257; Buck 1016.
[215] de Vaan 527; Mallory and Adams 248; IEW 866; LIV 507; LIV Add. 68.
[216] Mallory and Adams 303; LIV 273; IEW 69; de Vaan 43-44; OLD 136; Dočkalová, Lenka, and Blažek, "The Indo-European Year," 435, 440, 445.
[217] Mallory and Adams 303; LIV 273; IEW 69.
[218] de Vaan 35; OLD 110; IEW 26; Dočkalová, Lenka, and Blažek, "Indo-European Year," 461, 466, for "year = old."
[219] Friedrich 61; Mallory and Adams 138; Frisk 141-142; IEW 875; Watkins 74; Ringe 106; Beekes 133; de Vaan 645; Buck 186; Monier-Williams 224; EWAia I 247; KEWA I 118; ALEW 1545; EDHIL 68, 76, 316.

celestial pole) which was regarded in ancient times as a great wheel because of its daily cycle of rotation. If this is the case, then **h₂ŕ̥tḱos* would be yet another euphemistic circumlocution for the taboo animal. The Hittite form would seem to most accurately preserve the full compound.[220]

Ringe (2006: 106) suggests an interesting alternative for the Proto-Germanic derivation of **berō* > OE *bera*, OHG *bero*, ME *bear*, usually glossed as 'the brown one.' He points out that, "… an actual PIE word of that shape and meaning is not recoverable, whereas 'wild animal' is securely reconstructable." The root that he refers to is PIE **ĝʰu̯ér-, ĝʰu̯ḗr-* > Grk *θήρ* 'wild animal, beast of prey,' Lith *žvėrìs* 'wild animal,' Lat *ferus* 'wild,' and PGmc **berō.* If Ringe is correct, then perhaps **ĝʰu̯ér* is the original PIE term for *bear*.

III. CONCLUSIONS

1. The foregoing discussion lists twelve examples of root-families that are genetically linked despite surface differences in medial resonants, metathesis, and/or reduction. In every case, the consonant structure is persistent and the semantic core is intact. In the overwhelming majority of cases the number of synonymous roots sharing a given consonant structure far exceeds the number that would be expected from a random sampling of roots in the PIE lexicon. The only reasonable explanation for this statistical anomaly is that of genetic relationship, i.e., the roots share a common ancestor.

2. This list is by no means exhaustive. More could be provided, and many more, no doubt, await discovery. Because so much of the proto-language has been lost over the millennia, there must exist a large number of roots that have persisted into one or another of the daughter languages, but which have left no traces in other branches. These are often dismissed as "substrates," "pre-Greek," or "borrowings from unknown sources." By recognizing the possible root transformations described above, many such words can be assigned secure PIE etymologies.[221]

3. In the physical world, despite the wide diversity of form and structure, everything on earth—animal, vegetable, or mineral—is composed of combinations of only ninety-four naturally occurring chemical elements. By way of analogy, it is not inconceivable that a limited number of primitive roots may underlie the PIE lexicon. If this is the case, then the identification of such primitive roots would be the first essential step in any attempt to relate PIE to outside language families, as for example, with the Nostratic Hypothesis.

4. The semantic fields of the root variations presented here are well within the range normally found in PIE roots in general. The root **kerp-*, for example, contains attestations that include actions, instruments, time indications, and objects of actions:

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[220] For an alternative view, see Václav Blažek, "Indo-European Astronomical Terminology," 154-155; see also Václav Blažek, "Indo-European 'bear'," 148-192.

[221] Space here does not permit a detailed analysis of additional examples, but consider: **terk-*, **terkᵘ* 'to spin' with **kert-*, **kᵘert-* 'to spin'; **trep-* 'turn,' with **derbʰ-* 'turn, twist'; **per-* 'offspring of an animal,' with **bʰer-* 'offspring, bear a child'; **leng-* 'bend' with **lenk-* 'bend, traverse, divide'; **tu̯éks-* 'skin' with **(s)ku̯éHt-is* 'skin, hide'; **leh₂p-* 'light up' with **leip-* 'light, cause to shine'; **meith₂-* 'snatch away' with **meith₂-* 'remove, take away, rob'; **kend-* 'single out for distinction' with **keu̯d-s-* (Grk *κύδος* 'fame, honor, glory, renown'); **ḱu̯eH-* 'throw' with **ḱeu̯H-* 'throw, push'; **ḱelH-* 'be cold, freeze' with **ḱi̯eH-* 'freeze'; Italic smith-god, *Vulcan* with Lithuanian smith-god *Kaleva* (see Blažek, "Indo-European "Smith", 41-42, 67-68) among others.

MIr *corrān* 'sickle,' *cirrid* 'mangles, maims,' Lat *carpa* 'pluck,' ON *harfr* 'harrow,' OE *hærfest* 'autumn,' Lith *kerpù* 'cut, shear, clip (of hair or wool),' Latv *cìrpu* 'shear,' *cir̃pe* 'sickle,' OCS *črĭpǫ* 'ladle out,' Grk *καρπός* 'fruit,' Skt *kr̥pāṇī* 'dagger,' *kr̥pāṇa-* 'sword,' *karpara* 'rind, shard, skull.'[222]

These can be summarized as follows:

Actions:	Pluck, harvest, mangle, maim, harrow, cut, clip, shear, ladle out
Instruments:	Sickle, dagger, sword, harrow
Time indication:	Autumn
Object of action:	Fruit, rind, shard, skull

Many other examples of PIE roots could be cited with a similarly broad semantic range. The semantic diversity within the twelve root families presented above is generally comparable to these.

5. One-word or two-word glosses ascribed to roots in etymological dictionaries are almost always misleading and should rarely form the basis for semantic comparison. It is always necessary to consult the lexica of the individual languages involved because the meaning of the word that demonstrates semantic continuity will sometimes have become, over the millennia, one of its minor meanings, and may therefore have gone unmentioned in the short glosses given in the etymological dictionaries.

Most roots have attestations that span a field of related semantic values. Comparison with the full range of cognates, including those that have undergone root transformations of the kind described above, significantly aids in the identification of the semantic nucleus. This is because those root transformations must have occurred at an early stage of language development and they often better preserve the original core of the semantic field.

The evidence suggests that, in the early stages of language development, words were not used so analytically as at the present. For example, **ḱ(R)eu̯̯-*, a word meaning "lie down" did not merely represent the physical act of assuming the horizontal position, rather it was inseparable from the larger context of "who to lie down with," "where to lie down," and "what to do when lying down (rest, sleep, have intercourse, lie dead)."

Similarly, the ancient word **gᵘ̯e(R)bʰ-*, often glossed as 'womb,' did not merely represent the physical organ denoted by that word today, but rather encompassed a larger semantic field that included the feelings of desire, the vulva, the act of conception, the resulting embryo, and the young child (or animal) that was the outcome of this entire process.

The farther back in time that we try to push our understanding of language, and of the relationships between languages, the more we will need to expand our notions of semantics in this way—or so it seems to the present author.

6. Because resonants can vary when not in the root-initial position of open roots (*CR-), it is dangerous to compare them with similar forms in outside language families as is often done in Nostratic studies. Such comparisons are rarely convincing because they rely on what is essentially a single-consonant phonetic correspondence.[223]

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[222] IEW 944; EIEC 258; Mallory and Adams 168.

[223] "With only one relatively firm consonant in common, functional and also structural differences make inter-phyla comparisons too hazardous." —Item no. 128 (page 7) from A. Murtonen, "Comments on the Nostratic Reconstructions of Illič-Svityč.

APPENDIX

Notes on Typological Comparisons between Proto-Indo-European and Salish: Root Inversion

Evidence has been presented in the body of this paper suggesting that the radical metathesis of CVC root-consonants is far more common in PIE than is generally believed. If this is correct, then the questions naturally arise: Can such a feature be found in other language families, and if so, which ones? How does it function there, and what is the motivation for this type of inversion?

The literature on metathesis is substantial.[224] All authorities acknowledge that normal metathesis, the inversion of contiguous phonetic elements for euphonic purposes, occurs frequently in language typology. Two frequently cited examples are: *bridd* > *bird*, and *wæps* > *wasp*, which occurred in the transition from Old to Middle English.

But the type of radical metathesis, with inversion in the ordering of non-contiguous root-consonants as seen in PIE, is considered very rare. The only widely cited example of this feature occurring in significant numbers is the Salish language family, where such examples of root inversion are common. The Salish languages are/were spoken by twenty-three indigenous ethnic groups located in British Columbia, Washington, Oregon, northern Idaho, and western Montana.[225]

The following are some examples of CVC root-metathesis found in the Salish languages, along with comments and citations from leading Salishists on the subject:

> "Inversion of root-elements (e.g., $C_1VC_2 > C_2VC_1$) is remarkably frequent in Salish. When one or a few languages have a form deviating from all others they are considered the innovators…"[226]

* * *

> "One of the more striking features of the pan-Salish lexicon is the relatively large number of apparent cases of root inversion, i.e., pairs of cognate roots where the order of the consonants is reversed. So, for example, a C_1VC_2 pattern with a given meaning will have a counterpart in a C_2VC_1 pattern with the same or similar meaning in another language, or even within the same language. Thus we find BC *x*^{w}*ay* 'thaw' alongside Hl *yax*^{w} 'thaw'. Similarly, we find in CA the following items: *x*^{w}*aɬ* 'dart' and *x*^{w}*iɬ* 'hurry at' alongside *ɬax*^{w} 'rush' and *ɬex*^{w} 'move with weight and speed.'
>
> While I have had little difficulty in amassing a considerable list of examples of root inversion in Salish, I had a great deal of difficulty finding even a few plausible examples in other language families with CVC roots whose morphological structures and histories I am sufficiently familiar with to allow me to assess the reasonableness of a potential inverted root pairing. One such family is Tibeto-Burman, in particular the TB languages of Nepal. Hale (1973) is a comparative dictionary of approximately 4,000 entries for each of twelve Tibeto-Burman languages of Nepal (along with Indo-European Nepali). Looking through Hale (1973) and searching for cognate forms in my own dictionary of Chantyal (Tibeto-Burman: Tamangic) (Noonan et al., forthcoming), I was able

[224] An overview of the subject can be found in Elizabeth Hume and Scott Seyfarth, *Metathesis*.
[225] For relationship to surrounding language groups, see David Beck, "Grammatical Convergence and the Genesis of Diversity in the Northwest Coast Sprachbund."
[226] Aert H. Kuipers, *Salish Etymological Dictionary*, 5.

> to find only two plausible cases of root inversion. A search through my comparative Western Nilotic data base of approximately 900 entries yielded no examples. Something unusual seems to be going on in Salish."[227]

* * *

> "Before discussing a set of possible explanations for the existence of inverted root pairs, I should make clear one assumption I am making concerning inversion: the phenomenon of inversion does not seem to be a characteristic of a single language or of a single division within the family but seems rather to involve the entire Salish group. Examples can be found in the lexicon of any well-described Salish language. From this we can infer that, if its origins lie in a PROCESS of some sort, the process either affects or has affected the entire family or goes back to Proto-Salish."[228]

The following are some examples of Salish radical metathesis taken from the 100 cited by Noonan. Note that the infixes (ʔ, u, i, etc.) and vowel ablaut are semantically neutral. Note also that any elements following C_2 are suffixal.[229]

1. *q'... w* 'break, open'

Cv	*q'aw*	'crack'
Cm	*q'aw'*	'split'
CA	*q'ew'*	'break stiff object'
Ka	*q'aʔú*	'break'
Ti	*quul*	'crack'
Sh	*q'iw*	'break'

w ... q'

Sq	*wiq'*	'open' (about container)
Sh	*wiq'*	'undo, wreak'
CA	*q^{w}aq'*	'spread apart as to part hair'
Ld	*g^{w}əq'*	'open'
Se	*wəq't*	'open'
Ch	*waq'ɬ*	'open'

2. *q^{w} ... ʔ* 'water, drink'

Ld	*q^{w}uʔ*	'water'
	q^{w}úʔq^{w}a	'drink'
Ck	*qa·*	'water'

[227] Michael Noonan, "Inverted Roots in Salish," 475.
[228] Noonan, "Inverted Roots," 504.
[229] Noonan, "Inverted Roots In Salish, 476-504. Unless otherwise indicated, the abbreviations used in this paper are (per Noonan): BC [Bella Coola] (Kuipers Be), CA [Coeur d'Alene], Ch [Upper Chehalis], Ck [Chilliwack], Cl [Clallam], Cm [Columbian], CS [Coast Salish], Cv [Colville], Cw [Cowichan], Cx [Comox], Cz [Cowlitz], ESh [Eastern Shuswap], Fl [Flathead], Hl [Halkomelem], IS [Interior Salish], Ka [Kalispel], LCh [Lower Chehalis], Ld [Lushootseed], Li [Lillooet], Lm [Lummi], Ms [Musqueam], No [Nooksack], Ok [Okanagan], Pe [Pentlatch], PS [Proto-Salish], Qn [Quinault], San [Saanich] Kuipers Sn, Se [Seshelt], Sg [Songish], Sh [Shuswap], Si [Siletz], Sm [Samish], So [Sooke], Sp [Spokane], Sq [Squamish], StS [Straits Salish], Th [Thompson], Ti [Tillamook], Tw [Twana], We [Wenachee].

		qá·qa	‘drink’
	Cw, Ms	*qaʔ*	‘water’
		qáʔqá	‘drink’
	Cl	*qʷúʔ*	‘water’
	Tw	*qʷóʔ*	‘water’
	Sq	*qʷu(ʔ)*	‘water’
	Ti	*qœu*	‘water’
	Th	*qʷuʔ*	‘water’
	Ch	*qʷó·ʔ*	‘drink’
	Sg	*qʷáʔ*	‘water’
		qʷáʔqʷəʔ	‘drink’
ʔ ... qʷ			
	CA	*ʔəqʷ-s*	‘drink’
	Th	*ʔuqʷeʔ*	‘drink’[230]

3. *t’ ... kʷ* ‘dig’

Sq	*t’akʷ*	‘dig’
BC	*tkʷm*	‘dig clover roots’
kʷ ... t’		
Sh	*kʷt’-em*	‘dig wild potatoes’

4. *χ ... c* ‘dig’

Sp, Ka	*χec*	‘dig roots’
Ld	*χəc*	‘pull out, extract’
c ... χ		
BC	*ciiχ*	‘dig’

5. *χʷ ... y* ‘disappear’

Sh	*χʷey*	‘disappear’
y ... χʷ		
Tw	*yəχʷ*	‘disappear’

6. *k ... ɬ* ‘fall’

BC	*kɬ*	‘drop’
Sh	*kił, kɬ*	‘come off, come apart, be released’
	kɬ-ekst-m-n-s	‘drop, let go of’
ɬ ... k		
Cz	*ɬək-iq*	‘fall over’

[230] See also Kuipers, *Salish Etymological Dictionary*, 91.

7. *l ... p'* 'bend, wood'

Sh	*lép'*	'bend branch down'
Th	*láp'*	'bend something over'
Cm	*láp'*	'bend'
	sláp'	'stick'
Ok, Cv	*slíp'*	'wood'
CA	*líp'*	'wood'
Sq	*láp'*	'warped, skewed'
Cz	*yap'a*	'bend down' (a branch)

p'... l

Ld	*p'alq*	'turned out of shape; bent out of line'
CA	*palq'*	'be curved'[231]

Additional examples from other sources are listed below:

8. PS **k'ix*^{w} 'dry' **x*^{w}*ik'* 'dry'[232]

9. **p...x*^{w} 'lift up'

Be	*ʔapx*^{w}	'to lift up'

**x*^{w}*...p*

Li	*x*^{w}*əpn*	'to lift up'[233]

10. **cəq*^{w} 'to begin, set out'

Be	*cq*^{w}	'begin, start on something'

**q*^{w}*əc*

Li	*q*^{w}*əcac*	'set out, leave'
	q^{w}*əcəc*	'have started on st., be busy with'
	q^{w}*əcn*	'shake something'
	q^{w}*əcpulm'əxw*	'earthquake'
Th	*q*^{w}*əctes*	'activate, operate, make move'
	q^{w}*əctem*	'have convulsions'
Sh	*q*^{w}*əcec*	'set out, depart, begin'
	ʔstq^{w}*ic*	'stir, make movements'
	q^{w}*əcpul'əx*^{w}	'earthquake'[234]

11. **məq'*^{w} 'to pile up, lump, hill, bump'

Cw	*məq*^{w}*əyiʔyəsm*	'pile up'
Nk	*múq'wenes*	'clenches fist
San	*məq*^{w}*eyəčt*	'pile up'

[231] Examples 1-7 are from Noonan, "Inverted Roots," 476-477. Note also the *s*-mobile in the final set.
[232] Aert H. Kuipers, "Towards a Salish Etymological Dictionary," 63. Note: *x*° from the source documents (Kuipers) is here and henceforth transliterated as *x*^{w}.
[233] Kuipers, *Salish Etymological Dictionary,*18.
[234] Kuipers, *Salish Etymological Dictionary*, 25. Note: The symbol /c/ represents /ts/ in Salish.

Sg	*məqʷé*	‘pile up’
Cl	*məqʷəyečt*	‘pile up’
Tw	*ʔasbəqʷab*	‘piled up’ (*b* < *m*)
Cb	*ʔacməqʷ*	‘mountain, hill’
Cv, Ka, Sp	*mqʷ-*	‘mountain, bump, lump’
Cr	*maqʷ*	‘pl. objects lie, pile’[235]

**qʷum* ‘top, high, pile, lump’

Be	*qʷum*	‘high, large’
Cw	*qʷəmxʷəst*	‘wind wool into balls’
Ch	*qʷəmxʷ*	‘lumped, humped, scar’
Li	*sqʷum’c*	‘ball’ (with *s*-mobile)
Sh	*qʷm-*	‘higher ground’[236]

**kʷ/qʷəm* ‘lump, heap’

Be	*kʷm*	‘thick, bulky’
Se	*skʷəmʔit*	‘piled up in a lump, bulge’
Cw	*qʷəmxʷəst*	‘wind wool into balls’
Li	*sqʷəm*	‘mountain, pile’[237]

12. **məq’* ‘to swallow, eat one’s fill’

Cx, Sl	*məq’*	‘full from eating’
Se	*sməq’it*	‘full from eating’ (with *s*-mobile)
Cw, Ck	*məq’ət*	‘to swallow’
Sm	*məq’*	‘satiated from food’[238]

q’əm

Th	*q’məm*	‘glutton’
Cv	*q’mam*	‘greedy’
	sq’miltn	‘hunger’ (with *s*-mobile)
Tw	*k’əbədasdəxʷ*	‘swallow it!’ (*b* < *m*)[239]

13. *pəx / xəp* ‘to comb (out)’

Be	*px/xp*	‘squeeze water out of wet string’
Sh	*píxm*	‘unravel’
Cv	*pixm*	‘wool combing’[240]

[235] Kuipers, *Salish Etymological Dictionary*, 69.
[236] Kuipers, *Salish Etymological Dictionary*, 97.
[237] Kuipers, *Salish Etymological Dictionary*, 45.
[238] Kuipers, *Salish Etymological Dictionary*, 69.
[239] Kuipers, *Salish Etymological Dictionary*, 88.
[240] Kuipers, *Salish Etymological Dictionary*, 77.

14. **p'us* 'lungs'

Be	*ʔusp'əs*	'lungs'
Ch	*sp'us*	'lungs'
Ka	*spuʔús*	'heart, mind'[241]

**sup'* 'breath'

Se	*x^{w}əsəp'*	'get out of breath'
San	*sap'ət*	'suck in, draw in breath'
Li	*súp'um*	'breath, air'
Th	*sup'*	'breath, air'
Sh	*sup'*	'breath'[242]

15. **q'əl* 'to steam cook, sweat bath'

Be	*q'lst*	'steam cook'
Be	*q'lstcut*	'take a sweat bath'
Sq	*q'əlya*	'take a sweat bath'

**ləq'*

Ka	*səláq'i(st)*	'sweat bath'
Sp	*sláq'ist*	'sweathouse'
Cr	*hnléq'ncutn*	'sweathouse'[243]

16. **t'ax / *xat'* 'to ladle'[244]

17. **q'əlx̌* 'round, corral, circle'

Be	*q'lax̌*	'fence'
Sq	*sq'yáx̌úʔm*	'whirlpool'
Sh	*q'lx̌em*	'make a circle'[245]

x̌ələq' 'turn, whirl, roll'

Be	*x̌lq'iix̌^{w}*	'turn something around'
Sq	*x̌əlq'm*	'roll/fall down'
Li	*x̌əlq'*	'roll down'[246]

18. **c'it'* / **t'ic'* 'pitch, gum'[247]

19. **mat'áy / *t'amáy* 'horse clam'[248]

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[241] Kuipers, *Salish Etymological Dictionary*, 81.
[242] Kuipers, *Salish Etymological Dictionary*, 99.
[243] Kuipers, *Salish Etymological Dictionary*, 87.
[244] Kuipers, *Salish Etymological Dictionary*, 112.
[245] Kuipers, *Salish Etymological Dictionary*, 88.
[246] Kuipers, *Salish Etymological Dictionary*, 125.
[247] Kuipers, *Salish Etymological Dictionary*, 163.
[248] M. Dale Kinkade, "Prehistory of Salishan Languages," 6-7.

Although other Northwest language families show instances of radical metathesis (Chimakuan and possibly Wakashan), in the majority of cases these instances have apparent cognates in Salish, suggesting either common ancestry (unlikely unless very distant) or borrowing.[249]

Possible Explanations for the Inverted Root Phenomenon

Noonan enumerates eight possible explanations for the inverted root phenomenon observed in the Salish language family.[250] Of the eight, he discards seven as implausible and regards the eighth (reduplication) as only remotely influential. A simplified recounting of the possibilities that he considers, along with the objections he raises that weigh against them, are as follows:

- The pairs of roots are only accidentally similar: they are not cognate.

  Objection: The large number of metathesis pairs found in the languages suggest that accident alone cannot account for their existence.

- The inverted root pairs can be accounted for by some grammatical rule of metathesis.

  Objection: Metathesis typically occurs where adjacent consonants and vowels change places for phonetic reasons. But in Salish, root inversion occurs in non-contiguous situations where phonetic motivations are unlikely.

- Inverted root pairs are the product of a lexical composition process.

  Objection: This would be the case if each consonant of a CVC root were an independent semantic element that could be combined in a different order. But the fact that these purported separate elements do not occur elsewhere in the lexicon, argues against this explanation.

- Inversion is the product of a language game or of disguised speech.

  Objection: Although there are descriptions in the linguistic literature of word games or disguised speech that scramble the order of sounds, lack of evidence for such a process in the Salish languages renders this explanation possible, but unlikely.[251]

[249] Noonan, "Inverted Roots," 513.
[250] Noonan, "Inverted Roots," 504-514.
[251] John J. McCarthy, "A Prosodic Theory of Nonconcatenative Morphology," 379. Quoting from that article: "Another argument which supports the notion that the root consonantism is a single unit at some level of representation comes from a language game of Bedouin Hijazi Arabic, a fairly conservative modern Arabic dialect described by al-Mozainy (in preparation). In this game, the consonants of the root may be freely permuted into any order, though non-root consonants and the canonical pattern of the form remain unchanged. Vowel quality, which is subject to regular phonological effects under the influence of neighboring consonants, varies correspondingly. For example, the possible permutations of *difaʕna* 'we pushed' from the root *dfʕ* appear in *…daʕafna, fidaʕna, ʕadafna, faʕadna, ʕafadna*. These permutations can apparently be performed and decoded with some fluency. They clearly demand that the grammar treat the discontinuous string of root consonants as a unit…"

- Inversion is the product of consonant symbolism or word taboo.

Objection: It has been documented that, among Salish communities in the past, word taboo has been operative where, after the death of a high ranking person, any word in the lexicon that sounds like the name of the deceased becomes unspeakable. Consequently, a substitute had to be found for the word that was affected by the taboo. Two examples from Elmendorf (1951: 206-207):

> "The death of x̣a'twas, a man of the Duhlelap Twana village community, changed x̣a'tx̣at mallard duck to hɔ'hɔbšəd red foot. …Many common words in Twana have the appearance of non-original substitute terms, if this inference is correct. An example is sx̣^{w}e'ʔšəd deer, analyzable as split foot.

But since root inversion involves only a modification of the root, rather than its substitution, this process cannot adequately explain the metathesis so frequently seen in Salish roots.

- Inverted root pairs are the product of a phonologically conditioned process of metathesis.

Objection: Typically, metathesis reverses two adjacent sounds because they are easier to pronounce in the inverted position. If this were the explanation for the examples of root inversion in Salish, it would require the initial and final consonants to have appeared in a zero-grade formation, and then later be reanalyzed with full-grade vocalization. Additionally, such reversal would manifest only with certain phonetic combinations and not others. This is not seen to be the case, since frequently the metathesis forms are less sonorous than the originals.

- Reduplication is involved in the production of inverted root pairs.

Objection: It is well known that Salish roots often appear in a reduplicated form, either partial reduplication (where only one of the root consonants is repeated) or in full reduplication (where the entire root is repeated). If this process accounted for the many metathesis pairs observed in the lexicon, then two steps would have needed to occur: First, a full reduplication, and second, a selective loss of consonantal elements that would leave a remnant in root-reverse order. Using a PIE example, **(s)pek-* 'see' would, through full reduplication, have become **(s)pek-pek*. A following secondary loss of the first /*p*/ and the second /*k*/ would have resulted in the metathesis-form **(s)kep-,* which would account for the differing Latin and Greek attestations of this root. This is quite a convoluted process that probably would not have occurred more than once or twice in the evolution of the language, if at all. It is hardly likely to have been a regular development that could account for the extensive patterns observed in Salish.

- Random metathesis of syllable onsets, one that is neither grammatically nor phonologically conditioned, has produced inverted roots.

Objection: Metathesis of syllable onsets are not uncommon in world languages, but they typically occur randomly. Consequently, this cannot explain the unusually large number of metathesis root-pairs found in Salish as compared with other language groups.

Conclusions Concerning Root Inversion in Salish and PIE

This analysis by Noonan of the Salish root inversions could equally apply to the metathesis seen in the oldest stratum of PIE roots. In seeking a motivation for this feature, Noonan succeeds in considering the most likely possibilities. He concludes that only the process of reduplication could reasonably be expected to have influenced the root inversions seen in Salish, but he further concedes that even such an explanation is not very likely.

Of the alternatives that Noonan considers, the possibility of intentional root inversion through either taboo deformation or disguised speech deserves a further comment. Noonan discards these explanations because, quoting Dale Kinkade, no evidence of such a dynamic is known to have been an operative mechanism in the history of the Salish languages.[252]

One can point, however, to a lexical entry in the Squamish dictionary of Kuipers: Squamish *k^{w}uy̓* has the meanings 'joke, be funny,' and the related Coeur d'Alene *q^{w}ay* is defined as 'joke, talk backward.'[253] This would seem to constitute evidence that talking backward (presumably reversing the direction of root consonants) was a recognized activity, with a verb in the Salish vocabulary to denote it.

But while wordplay certainly could be a part of this process, it is probable that taboo avoidance would have been an even larger part of the motivation, especially given the large number of word inversions in Salish and because taboo avoidance played a significant role in Salish lexical development.

In addition to root metathesis, the Proto-Indo-European and Salish language families share a large number of typological characteristics. These include: vowel ablaut, vowel color influenced by other phonemes, a favored CVC root structure, reduplication, *s*-mobile, laryngeals or quasi-laryngeals, existence of full and zero-grade roots, variability of medial resonants, correspondence of accent systems, and possible lexical correspondences. These similarities have led some authorities to examine the possibility that PIE and Salish may be genetically related.[254]

The observation that root inversion in PIE is much more prevalent than previously believed adds strength to the arguments for such a relationship. Nater, in his list of linguistic characteristics shared by both Salish and PIE, does not even include root-inversion presumably because he is not

[252] Noonan, "Inverted Roots," 507.
[253] Aert H. Kuipers, *The Squamish Language*, 343. See also page 404, where Kuipers makes the same observation about "talking backward."
[254] An overview of similarities between Salish and Indo-European is provided in Kuipers, *The Squamish Language*, 401-405; and in Hank F. Nater, "Towards a Genealogy of the Bella Coola language," 225-243.

aware of its presence in PIE.[255] Kuipers mentions "occasional interchange of root consonants" in his list of shared characteristics. Although he is aware that this feature is very common in Salish, he can list only four examples in PIE (**pek$^{\mu}$-* : **k$^{\mu}$ep-* 'cook,' **spe$\acute{k}$-* : *s$\acute{k}$ep-* 'see, scrutinize,' **d^{h}ei̯ĝ^{h}-* : *ĝ^{h}ei̯d^{h}-* 'mould, build,' and **punkstè* : Lith *kùmstė* 'fist').[256]

I have listed eleven examples of root inversion that are generally recognized in PIE (above, Section I-2.) and have suggested dozens of additional examples in Section II. It appears that this very rare typological feature exists about as plentifully in PIE as it does in Salish.

Kuipers, after carefully noting the many shared features of Salish and PIE, suggests that, if the two languages were spoken in adjacent geographic locations, then the "…parallels and comparisons could be used to suggest a remote common origin." He concludes,

> However, as long as the descriptive spade-work largely remains to be done and intra-Salish comparison has not been worked out, genetic-comparative work must remain speculative where distant, and inexact where closer connections are concerned.[257]

Nater, while referring to the idea of a common origin between Salish and PIE as a "seemingly preposterous claim," proceeds to argue for "new, i.e., hitherto unsuspected, historical (genetic) connections."[258] In other words, he argues that PIE and Salish indeed shared a common ancestor.

While it is beyond the scope of the present investigation to consider this question in detail, without doubt the wide prevalence of root inversion in PIE should, in the future, be seriously factored into the discussion of its parallels with Salish.

ABBREVIATIONS OF LITERATURE

Adams	Douglas Q. Adams, *Dictionary of Tocharian B*
AHD	*American Heritage Dictionary*
ALEW	Hock, Wolfgang, *Altlitauisches etymologisches Wörterbuch*
CLL	Melchert, Craig, *Cuneiform Luvian Lexicon*
DELG	Chantraine, Pierre, *Dictionnaire étymologique de la langue grecque*
de Vaan	de Vaan, Michiel, *Etymological Dictionary of Latin & other Italic Languages*
Dolg	Dolgopolsky, Aharon, *Nostratic Dictionary*
EDHIL	Kloekhorst, Alwin, *Etymological Dictionary of the Hittite Inherited Lexicon*
EIEC	Mallory, James P., and Douglas Q. Adams, *Encycl. of Indo-European Culture*
EWAia	Mayrhofer, Manfred, *Etymologisches Wörterbuch des Altindoarischen*
EWKS	Fahnrich, Heinz, *Etymologisches Worterbuch der Kartwel-Sprachen*
IEW	Pokorny, Julius, *Indogermanisches etymologisches Wörterbuch*
KEWA	Mayrhofer, Manfred, *Kurzgefaßtes etymologisches Wörterb. des Altindischen*
LIV	Rix, Helmut, *Lexicon der indogermanischen Verben*. 2nd edition
LIV Add.	Kümmel, Martin, *Addenda und Corrigenda zu LIV²*

[255] Nater, "Towards a Genealogy."
[256] Kuipers, *The Squamish Language*, 401, 405.
[257] Kuipers, *The Squamish Language*, 405.
[258] Nater, "Towards a Genealogy," 225.

LSJ	Liddell, Scott, and Jones, *A Greek–English Lexicon*
Mallory and Adams	Mallory and Adams, *The Oxford Introduction to Proto-Indo-European and the Proto-Indo-European World*
NIL	Wodtko, Irslinger, and Schneider, *Nomina im Indogermanischen Lexikon*
OCD	*Oxford Classical Dictionary*
OLD	*Oxford Latin Dictionary*
Watkins	Watkins, Calvert, 2011, *American Heritage Dict. of Indo-European Roots*

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ABBREVIATIONS OF NAMES OF INDO-EUROPEAN LANGUAGES

Alb	Albanian	ME	Middle English
Arm	Armenian	MHG	Middle High German
Av	Avestan	MIr	Middle Irish
Bret	Breton	MPers	Middle Persian
Bulg	Bulgarian	MWels	Middle Welsh
CLuv	Cuneiform Luvian	Myc	Mycenaean Greek
Corn	Cornish	NE	New English
Cymr	Cymric	Norw	Norwegian
Gall	Gallo-Roman	NPers	New Persian
Gaul	Gaulish	NWels	New Welsh
Goth	Gothic	OAv	Old Avestan
Grk	Greek	OCS	Old Church Slavonic
HLuv	Hieroglyphic Luvian	OE	Old English
Hit	Hittite	OFris	Old Frisian
Illyr	Illyrian	OHG	Old High German
Khot	Khotanese	OIr	Old Irish
Lat	Latin	OLat	Old Latin
Latv	Latvian	OLith	Old Lithuanian
Lith	Lithuanian	ON	Old Norse
Luv	Luvian	OPers	Old Persian
Lyc	Lycian	OPrus	Old Prussian
Lyd	Lydian	ORus	Old Russian
Mcymr	Middle Cymric	OSax	Old Saxon

Osc	Oscan
Oss	Ossetic
OSwed	Old Swedish
OWels	Old Welsh
Phryg	Phrygian
PIE	Proto-Indo-European
Pol	Polish
Rus	Russian
SC	Serbo-Croatian
Skt	Sanskrit
Slav	Slavic
Sogd	Sogdian
Swed	Swedish
TochA	Tocharian A
TochB	Tocharian B
Ukr	Ukrainian
Umb	Umbrian
Ved	Vedic
YAv	Young Avestan