Kluge's Law: its place among the Germanic sound shifts and consequences for the PIE obstruent inventory

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Abstract

The traditional descriptions of the processes in Proto-Germanic of *Kluge's Law* and its interaction with Grimm's and Verner's Law lead to big problems with respect to chronological ordering and to a total misunderstanding of the nature of these processes.
With the adoption of Glottalic Theory and the view that Grimm's and Verner's Laws are part of a bifurcating chain shift, things fall into place.

The traditional view

(1) **Kluge's Law** (***KL***, Kluge 1884):

Total assimilation of *n* to a preceding consonant, *provided that it is part of a suffix which was accented in Proto-Indo-European (PIE).*

This law accounts for the origin of the Proto-Germanic (PGm.) geminates **kk*, **tt* and **pp*.

Examples (from Kroonen 2011):

- OE *bottm 'bottom'* < PGm. **butt-* ~ Skt. *buddná*, Lat. *fundus,* < PIE **b^{h}ud^h-no-*
- OE *friccea 'herald'* < PGm. **frekkjan* ~ Go. *fraihnan* 'to announce', Skt. *praśnín* < PIE **preḱ-n-*
- Faroese *hvøkka* 'to be startled, to diminish, to begin slowly' < PGm. **hvekkan-* cf. OCS *cežnǫti* < PIE **k^{w}eg^h-n-*
- Eastern Du. *lappen* 'to lick' < PGm. **lappōn-* ~ Lat. *lambō* < PIE **lHb^h-neh$_2$-*
- OE *liccean* 'to lick' < PGm. **likkōn-* ~ Anc. Gk. *likneúō,* Lat. *lingō* < PIE **liǵ^h-n-*
- ON *lokka 'to allure, caress'* < PGm. **lukkōn-* ~ *Lith. lù(n)ginti* < PIE **lug^h-n(e)h$_2$-*
- Du. *mikken 'to aim'* < PGm. **mikkōn-* < PIE **mig^h-néh$_2$* cf. Lith. *mingù, migtí*, Ru. *mignuť*
- OE *roccian* 'to rock', MHG *rocken* 'to drag, jerk' < PGm. **rukkōn-* < PIE **Hruk-neh$_2$-,* cf. Lat. *runcō*
- MDu. *roppen*, MHG *rupfen* 'to pluck, tear off' < PIE **Hruk-neh$_2$-*, cf. Lat. *rumpō*
- MHG *stutzen* 'to bump' < PGm. **stuttōn* < PIE **(s)tud-n-* (cf. Lat. *tundō*)
- Swiss Germ. *suckə* < PGm. **sukkōn-* < PIE **suḱ-neh$_2$-*, cf. Welsh *sugnaf*
- MDu. *stricken* 'to make fall' > PGm. **strikkōn-* < PIE **strig-n-,* cf. Lat. *stringō*
- Du. *wit* 'white' < PGm. **hwitta-,* Skt. *śvítna-* < PIE **ḱuit-nó-*

Examples of non-application of KL because of the fact that the following vowel is not stressed:

- Goth. *auhns*, OHG *ovan* 'oven' < PGmc. **ufna-* < PIE **úp-no-*
- ON *svefn*, OE *swef(e)n*, 'sleep', < PGmc. **swefna-* < PIE **suép-no-* cf. Skt. *svápna-*

(2) PIE obstruent inventory (Brugmann 1897)

T, D, D^h (in 4 or 5 places of articulation), ***s***

(T, D, D^h generalize over place of articulation)

(3) **Grimm's Law** (***GL***, Grimm 1822):

act 1. T > Þ (**spirantization** of voiceless stops)
Skt. ***p****itár* vs. Goth. ***f****adar* 'father'

act 2. D > T (**devoicing** of voiced stops)
Lat. ***d****ent-* vs. Goth. ***t****unthus* 'tooth'

act 3. D^h > D (**deaspiration** of voiced aspirates)
Skt. ***bh****rā́tṛ* vs. Goth. ***b****roþar* 'brother'

➔ Nowadays Grimm's Law is generally seen as a **chain shift**:
D^h > D ► D > T ► T > Þ

(4) **Verner's Law** (***VL***, Verner 1876):

Voiceless fricatives (***Þ)*** resulting from act 1 of GL (spirantization), become **voiced** (***Ð)*** unless preceded by (or being the final part of) a stressed syllable. (Resulting voiced spirants occlusivize in certain cases.)

T > (by GL) ***Þ > Ð*** (by VL) (> *D*, sometimes by occlusivization)
Ex. Skt. *bhrā́tṛ*, Goth. *broþar* vs. Skt. *pitár*, Goth. *fadar* (cf. Ger. *Bruder* vs. *Vater*)

(5) Traditional historical derivations (following Kluge 1884:174, here adapted from Kroonen 2011:50):

	Du. *wit*	**E. *bottom***	**MHG *stutzen***
PIE	**ḱuit-nó-*	**b^{h}ud^h-nó-*	**stud-néh$_2$*
GL, acts 1 & 3	**hwiθ-ná-*	**buð-ná-*	N.A. (but by other changes: **stud-nṓ-*)
VL	**hwið-ná-*	**buð-ná-*	N.A.
KL	**hwiðða-*	**buðða-*	**studdṓ-*
Occlusivization	**hwidda-*	**budda-*	N.A.
GL, act 2	**hwitta-*	**butta-*	**stuttō-*
PGm.	**hwitta-*	**butta-*	**stuttō-*

Problems of the traditional view

a. Chronological separation of GL's acts 1/3 and 2, with KL and Occlusivization intervening. This is extremely problematic for the generally adopted view that the three acts are part of a chain shift. Also, PIE **D^h* would end up in PGm. *T* just like PIE *D* > PGm. *T,* because GL act 3 (deaspiration) applies chronologically before GL act 2 (devoicing).

b. The derivation **ḱuit-nó* > **hwitta-* (see (5), 2nd column) is extremely cumbersome, using a **big detour**: *tn > θn > ðn > ðð > tt.* One would expect **direct assimilation *tn > tt*** . **The detour via the marked voiced fricative geminates is necessitated by the rest of the analysis.**

c. There is **no gemination of underlying sibilants.** One would expect that gemination in the following word would have applied:

(i) OE *wisnan, weornan* 'to wizen' < PGmc. **wis/znōn* < PIE **uis-neh$_2$*
(ii) OE *liornian* 'to learn' < PGmc. *liznōn* < PIE **lis- neh$_2$*
(Data adapted from Kroonen 2011:48)

In PGm., **sibilants do not undergo occlusivisation** either, see Noske 2012:70). This casts doubts in whether an analysis of KL

crucially relying on prior spirantization + voicing and subsequent occlusivization of original stops is correct.

d. It is strange that, in practice, *n* **only** assimilates to preceding **voiced** stops or fricatives, whereas research on geminates shows that voiced geminates are disfavoured, because they encounter aerodynamic difficulties (Dmitreeva 2012, Hayes and Steriade 2004; Jaeger 1978, Ohala 1983; Westbury & Keating 1986).

An alternative view

(6) **Glottalic theory**
(Hopper 1973, 1977a,b; Gamkrelidze & Ivanov 1973, 1995):
PIE ***T, D, D^h*** (traditional theory) **are replaced** by ***T, T', D***. (*T'* = Ejective).

(7) Under Glottalic Theory,
(i) GL act 2 (devoicing) is replaced by **deglottalization** (***T'*** → ***T***);
(ii) GL act 3 (deaspiration) no longer exists;
(iii) VL can now simply voice **plain stops** in the appropriate environment and chronologically precedes or is concomitant with GL;

(8) **Grimm 1/Verner as a single process**.

Noske (2009, 2012): **GL act 1 (spirantization) and VL are a single process**.

Bifurcating chain shift:

T' ⟶ T ▶ T ⟨ D (between voiced segments with preceding vowel unstressed), Þ (elsewhere)

(9) **The simultaneous Grimm-Verner Sound Shift (**Noske 2012:75)

	PIE	PGm.
a.	T	Þ
b.	D	D
c.	T'	T

(10) Historical derivation under the alternative view:

	Du. *wit*	**E. *bottom***	**MHG *stutzen***
PIE	**ǵuit-nó-*	**b^{h}ud-nó-*	**stut'-néh$_2$*
KL	**hwitta-*	**budda-*	**stutt'ṓ-*
Geminate devoicing	N.A.	**butta-*	N.A.
GL/VL (here: Deglottalization)	N.A.	N.A.	**stuttō-* (cf. 7i)
PGm.	**hwitta-*	**butta-*	**stuttō-*

- Note that in (10), there is **Geminate devoicing**. This is a **very common**, **phonetically grounded** process (Dmitreva 2012, Hayes and Steriade 2004; Jaeger 1978, Ohala 1983; Westbury and Keating 1986), found in many languages, e.g. Japanese (cf. Kawahara 2006 and the references cited there). The difference between traditional GL, act 2 (general devoicing of stops) and the Geminate devoicing proposed here is that the latter is restricted to geminates, in conformity with the behaviour of geminates in many languages.
- There is no spirantization of *tt* because it generally does not apply to geminates (known as geminate inalterability, e.g. Guersel 1976, Hayes 1986, Schein and Steriade 1986).

Conclusion 1: a non-problematic account of the Germanic sound changes involves: (i) Glottalic Theory and (ii) the chronological order: Kluge's Law, the Grimm/Verner chain shift.

(Other alternative analyses: Lühr (1988), Kortlandt (1991)

- Lühr (1988) adopts the traditional chronology, but instead of nasal assimilation assumes lengthening. Her approach involves the change of the location of accent. Major problems, like the separation of Grimm's acts 1/3 and 2, and the detour via spirantization, voicing, occlusivization and devoicing, remain.
- Kortlandt (1991) uses Glottalic Theory, but has the chronological order: VL, KL, GL, thus denying the unity of the the GL/VL chain shift)

The nature of Kluge's Law (my version)

For this process, three constraints can do the work together (if one wishes to adopt an OT framework):

(11) a. ***STOP-NASAL**: *{T,D,T'} n* (perhaps because of bad syllable contact)
b. **IDENT(SINGLETON)$_{\text{POST-STRESS STOP}}$** : a singleton stop in post-stress position should not become a geminate (a sort of post-stress anti-OCP)
c. ***VOIOBSGEM** prohibiting voiced obstruent geminates (Nishimura 2003, quoted in Kawahara 2006)

If a stop+nasal cluster is not in post-stress position, *STOP-NASAL in conjunction with *VOIOBSGEM will induce the change: *Dn* > *TT*. If the cluster is in post-stress position, the higher ranked constraint IDENT(SINGLETON)$_{\text{POST-STRESS STOP}}$ will block this change.

The accentual conditioning of KL bears resemblances of VL where voicing is blocked in post-stress position. This can be handled by a constraint:

(12) **IDENTPOSTSTRESSLAR**
"Consonants directly behind a stressed vowel should be faithful to the underlying laryngeal specific-ation" (Noske 2012:79), used for accounting for blocking VL in post-stress environments.

Phonetic studies like De Jong et al. (1993) show that stress environments reduce co-articulation effects in stressed environements. IDENT(SINGLETON)$_{\text{POST-STRESS STOP}}$ (11b) and IDENTPOSTSTRESSLAR (12) can both be considered as **constraints that block co-articulation**, and hence are expressions the phonologization of a single tendency. We can **combine** them:

(13) * **POSTSTRESS OBSTRUENTS IN COARTICULATION WITH FOLLOWING SEGMENTS**
"A stop in post-stress position may not change by co-articulation: e.g., it may not become part of a geminate and may not be changed w.r.t. its laryngeal specification."

This is a very general principle, prohibiting many post-stress changes (but **not** affecting Grimm's Law act 1 (spirantization), because this can hardly be seen as co-articulation).

Conclusion 2: Kluge's Law as well as the 'Verner' branch of the Grimm/Verner bifucating chain shift are conditioned by a single constraint, i.e. *POSTSTRESS OBSTRUENTS IN COARTICULATION WITH FOLLOWING SEGMENTS.

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