

Another attempt at a chronology for Grassmann's Law in Greek.

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1. Abstract.

This article takes another look at the chronology of Grassmann's Law (GL). It investigates the different dating suggestions -Indo-European, pre-Mycenaean, post-Mycenaean, post-Homeric- and assesses them critically. The article first holds that the evidence from Germanic, Latin and Iranian indicates that GL did not operate in PIE and secondly agrees with Ruijgh, Lejeune, Janko, Hajnal, Plath and Vine that GL only operated after the Mycenaean era. To prove this, the article uses the evidence from Mycenaean, Homeric scansion, and augmentation and reduplication in the Greek verbal morphology. The article finally finds that there are some indications to put GL after the period in which the Homeric poems were written down (somewhere between the end of IX^a - beginning VIII^a in our opinion).*

2. The Indo-European date of Grassmann.

When Grassmann stated his own Law, he ruled out the Indo-European date of his Law (Grassmann 1863b:112). Bopp (before it was called GL), and later also Wyatt and Butter, tried to prove that this was an Indo-European phenomenon.¹ Kiparsky considered it to be an Eastern-Indo-European phenomenon²: in spite of Grassmann's own skepticism about the Indo-European heritage of the Law, the fact that it occurred in Greek and in Sanskrit was used as evidence that this was of Indo-European date.³ Kiparsky argued that GL was typologically unlikely to have occurred independently in both Greek and Indo-Iranian: he tried to prove that GL had operated even before Greek devoiced the voiced aspirates, and therefore concluded that GL had to be of PIE date by using a number of examples such as:

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Upon finalising this article (September 29th 2014), Paul Russell informed us that Anna Morpurgo Davies had died. We therefore dedicate this article to her memory.

¹ Benary 1837 mentioned that Bopp had already stated this and followed Bopp closely in his (Be) entire second chapter, which dealt with Indo-European aspirations (with some minor changes and without explicitly outlining the phenomenon (as Bopp had not done either)); Wyatt 1968a:618; 1976:6-7; Butter 1974.

² Kiparsky 1973:133 (...) *makes it likely that G.L. was a rule shared by the Greek-Indo-Iranian dialect area of Indo-European before it split up into separate dialects.*

³ GL has also been used as evidence in favour of the *Glottalic Theory* by Salmons 1991, with reference to Iverson 1985 and Gamkrelidze-Ivanov, but Hopper 1973 did not specifically quote GL as evidence in favour of the Glottalic Theory. For the discussion of the Greek evidence for dating GL it is less relevant whether or not PIE had glottalised stops, and we will not discuss the issue in detail here. Joseph – Wallace 1994 showed that the Italic treatment of the PIE aspirates (and especially the treatment in Sabellic) posed a serious problem for the Glottalic Theory and its assumption of an Indo-European date for GL. See also Ringe 1990:78, and Barrack 2002 and 2003 for a critical discussion of the Glottalic Theory. We agree with Fortson 2004:54 that the absence of inherited glottalised stops in any Indo-European language casts doubt on the Glottalic Theory.

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- Greek βόθρος “hole, pit”, Latin *fodio* “I dig” (a link already made by Benary 1837:191) and Gothic *badi* “bed” from PIE $*b^h od^h$;
- Greek ἀγαθός “good” and English *good* from a root in the shape $*g^h Vd^h$ but without specifications as to the exact reconstruction;
- Greek βρεχμός “front part of the head” and Old English *brægan* “brain” from a root $*b^h reg^h$.

In order to reach the conclusion that GL was of Indo-European date, Kiparsky had to assume that in some cases of a root in the shape of $*b^h VD^h$, $*b^h$ was dissimilated into $*bVD^h$, whereas in others $*b$ as a result of the aspiratory dissimilation was further changed into $*p$ to avoid the rare –if existing– phoneme $*b$, although he could not explain why this would have happened in one word and not in another (Kiparsky 1973:132). In addition to Greek, Indo-Iranian and some examples in Latin and Celtic, Tocharian also underwent GL (Winter 1962, Ringe 1996:47). Some scholars assume Messapic to have reflexes of GL as well (Huld 1995, Woodhouse 1998), but as we know so little about this language, this has to remain doubtful. (none of the scholars defending the PIE date quoted Tocharian nor Messapic, nor did the scholars defending GL for Tocharian and Messapic use that fact to defend an Indo-European date for GL⁴).

There are several problems with an Indo-European date for GL, and even some for an Eastern-Indo-European (or Graeco-Indo-Iranian) date. Miller– later followed by Meier-Brügger and Vine– showed that GL was not so typologically unlikely as Kiparsky suspected, pointed to other non-Indo-European languages with a similar phenomenon,⁵ and tried to demonstrate that Kiparsky's examples were not so conclusive as initially assumed (Miller 1977a:132,136). He argued that the link between Greek βόθρος and Latin *fodio* was not convincing and preferred the link between βόθρος and βαθύς “deep” (as Szemerényi had already argued before Kiparsky).⁶ For ἀγαθός we believe a reconstruction that links ἀγαθός with μέγας, either as $*mgh_2- d^h h_1-os$, or as $mgh_2- d^h-os$, to be more likely.⁷ In either case there

⁴ Ringe 1990:77-79 explicitly rejected the Indo-European date of GL, and argued that the Tocharian GL was an independent development. Anreiter 1984, Adams 1998 and Malzahn 2010 did not address GL in Tocharian.

⁵ Miller 1977a:139, Vine 2002:2, Meier-Brügger 2003:138. See also MacEachern 1999, especially on page 5: *Arguments for the separate development of Grassmann's Law in Sanskrit and Greek, for example, have been buttressed by examples of similar phenomena in unrelated languages such as the Salish languages and Ofo* (we owe this reference to Michael Weiss), and Shosted 2007.

⁶ Miller 1977a:132, following Szemerényi 1960.

⁷ See Meier-Brügger 1987 and Pinault 1987. Chantaine 1968-1974:6 argued that the word originally meant “strong” but did not venture an etymology. Pinault 1987 suggested his etymology based on Chantaine's semantic analysis. Poultney made the reconstruction during the Bopp seminar at the HU Berlin (quoted in Panagl 1995 and Anttila 1996); Ruijgh 1996 II:378-395; Panagl 1995; Meier-Brügger 2004:186, with reference to Ruijgh and to Panagl. Beekes 1996:227-230, 234 criticised this etymology and in 1997:39 dismissed it as “an

is only one aspirate and no effect of GL. In addition to Miller's arguments, we believe that Kiparsky's assumption that a devoicing of initial $*b^h$ lead to b which was then changed to p to avoid the rare phoneme b in some words but not in others, is too ad hoc. There are several indications that GL was not an Indo-European phenomenon. Even if one accepts Kiparsky's etymology $*b^h od^h$ for Greek βόθρος and Latin *fodio*, this still indicates that GL did not occur at an Indo-European stage, because if it had occurred at that stage, the quoted Gothic and Latin forms would have been †*padi* and †*bodio*. Another important example is the root $*b^h end^h$ "to bind", which survives in Greek πενθερός "brother-in-law (the one who came into the family by binding with the wife)", German *binden* and English *bind*, and Sanskrit *bandh*.⁸ Germanic again disproves that GL had already worked in PIE: if GL had operated, the root would have been $*bend^h$ and the English would have been †*pind*. There are other examples that prove that Germanic never participated in GL, and that, consequently, an PIE date for GL is excluded. Besides the Germanic languages, the Italic languages did not regularly follow GL either: they generally ignore the effects but there are a few examples where Latin did in fact follow GL. The root $*b^h eid^h$ "to trust" survives in Greek πείθω "I convince", with the effects of GL, but in Latin the form is *fīdō* which can only be explained as a result from the root with both aspirates. This example therefore does not follow GL, but the following examples bear witness to a limited GL in Latin:

- The Latin word for "beard" is *barba* is such an example.⁹ It is related to the Germanic words, but here the root $*b^h ard^h eh_2$ cannot have been the basis for Latin, because the expected form would then have been †*farba*;¹⁰ *barba* indicates that in this specific instance Latin had undergone GL, but Germanic –again– did not participate in GL.
- Latin *glaber* "smooth, beardless" is linked with Old-English *glæd*, German *glatt* and Dutch *glad* and comes from $*g^h lad^h$, "smooth". Without aspiratory dissimilation this proto-form would have given **laber* in Latin (Walde 1906:98; Weiss 2009:156),

attempt to force an Indo-European etymology on a word which was obviously of Pre-Greek origin." We believe that Beekes's criticism would mean that words such as Latin *credo* were also of non-Indo-European origin, and it is our opinion that Beekes has taken his beliefs of a large non-IE stock in Greek a bit too far (especially in Beekes 1996 and 2010). In Beekes 2010:7 he stated that Pinault had also reconstructed $*mġh_2 - d^h h_1 os$, but that is incorrect, as Pinault did not make the link with the root $*d^h eh_1$ but made the connection with a suffix $*-d^h-$. For criticism of Beekes's reconstruction of ἀγαθός, see also Lindner 2011:43.

Meier-Brügger 1987 assumed that ἄγαν was related to μέγας and reconstructed it as $*mġh_2 m$, based on work by Ahrens 1868:253-257, Fick 1880:168 and Bezzemberger 1883:72.

⁸ See LIV: 75.

⁹ Weiss 2009: 156, 265, 292, 315.

¹⁰ We reconstruct the word with *a* as this is a body part and therefore more likely to have had an Indo-European $*a$, but for this discussion the *a* issue is irrelevant.

which proves the dissimilation in Latin. The Germanic words, however, did not undergo GL.

- Latin *trahit* is considered another example, as it is believed to originate from $*d^h rag^h eti$, and would be related with Old-English *dragan* and Modern English *draw*, and with German *tragen* “carry, bear” and Dutch *dragen* (id.) (Walde 1906:106; Weiss 2009:156). Latin *trahere* “pull, draw” has also been linked with Gothic *þragjan* and Greek $\tau\rho\acute{\epsilon}\chi\omega$ “run”, and was then believed to come from $*t^h reg^h$,¹¹ but if that etymology were correct, the difference between Greek *e* and the Latin and Germanic *a* would pose serious problems (the same applies to the linking of Gothic *þragjan* and Greek $\tau\rho\acute{\epsilon}\chi\omega$,¹² even without the inclusion of *trahere*).

Michael Weiss informs us that the Celtic languages did not undergo GL either, and points at the form *guidid* from $*g^{wh} ed^h$, which cannot have undergone GL, as a dissimilated $\dagger gwed^h$ would have given $\dagger bed$ -.

In addition, the Greek reduplicated presents prove that GL cannot have been of PIE date:¹³ if the reduplicated present of $*d^h eh_1$ had undergone GL in PIE already, the Greek result of $*d^h id^h eh_1 mi$ would not have been $\tau\acute{\iota}\theta\eta\mu\iota$ “I put”, but $\dagger\delta\acute{\iota}\theta\eta\mu\iota$. Anna Morpurgo-Davies points out that this argument might be less convincing than it seems, because a form $\dagger\delta\acute{\iota}\theta\eta\mu\iota$ would probably have been reformed into $\tau\acute{\iota}\theta\eta\mu\iota$, even if GL had already applied at the PIE stage. The verbal forms of $\acute{\epsilon}\chi\omega$ are, however, a stronger indication for a post-IE date for GL, because GL only applied after PIE $*s$ became $*h$ in Proto-Greek.

There are indications that GL occurred independently in Sanskrit and was not an Indo-European phenomenon. Sanskrit has *kumbha* “vessel” for which the Avestan pendant is *xumba*. These two forms can only be reconciled by assuming a Proto-Indo-Iranian form $*khumbha$.¹⁴ This word is related to Greek $\kappa\upsilon\mu\beta\acute{\iota}\omicron\nu$ “small cup, vessel”. This equation allows for three possible reconstructions. The first one is $*k^h umb^h os$: if that is correct, GL did not operate in PIE because the Proto-Indo-Iranian form still has two aspirates, but this reconstruction is somewhat problematic for Greek, as $*mb^h$ is rendered as *mph* and not as *mb*, while it normally preserves the PIE aspirates (both voiced and voiceless, if one accepts their existence). It has been argued that a preceding nasal in Greek could cause the loss of aspiration under certain (accent-based?) conditions, but the precise circumstances are not

¹¹ Zupitza 1896:140.

¹² Grassmann 1863a:81, 1863b:111,116; Geldner 1881:187.

¹³ Rix 1976:97, Mayrhofer 1986b:112-114.

¹⁴ Ringe 1990:78 mentioned that this had already been argued by Schindler in 1976 and Normier in 1977. This example was discussed in Normier 1977:178-179. Schindler 1976:626 used this example as evidence for a (partly specific) Indic phenomenon.

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entirely clear.¹⁵ One could, however, argue that the Greek word is a loanword from a neighbouring and/or closely related language (Macedonian or Thracian), where the aspirates of PIE lost their aspiration. The Greek word *φελλεύς* “stony ground” is related to the Macedonian capital *Πέλλα*: if the words are related, the proto-form would have been **p^hel*, in which the Greek word preserved the aspirate, while the Macedonian name had lost it (as this word is only attested in Helleno-Macedonian, its Indo-European origin is far from certain). This scenario is possible, but in our opinion not convincing. A second possible reconstruction is **kh₂umbh₂os*. In that case, the noun has no evidentiary weight for an Indo-European date of GL, but would then prove that GL also occurred at a later stage, namely in Sanskrit independently: a form **kh₂umbh₂os* would have become Proto-Indo-Iranian *kh(H)umbh(H)as*, which was dissimilated in (Proto-?) Sanskrit into *kumbha-*. If this scenario is correct, the Sanskrit evidence can no longer be used for PIE, as it can be the result of a later and specific Sanskrit evolution. A third possibility is a reconstruction **kh₂umb^h*, which did not have aspiratory dissimilation in PIE, and would have given Proto-Indo-Iranian *kh(H)umbhas*. In that scenario, the dissimilation would also have occurred in (Proto-)Sanskrit alone and not in Proto-Indo-Iranian, and would be an indication that GL was not a PIE phenomenon, but an independent evolution within Sanskrit. Kobayashi countered the value of this word for the chronology and application of GL, by stating that an initial cluster **#Ch₂* did not cause aspiration in (Proto-)Indo-Iranian, and pointed to Sanskrit *pita* from **ph₂ter-*.¹⁶ We believe that there are some problems with that assumption: first of all, there is the counterexample *khedati*, which is most likely related to Latin *caedo* and can be reconstructed as **kh₂eid* (Kobayashi admitted that this could be a counterexample). There is also *khādati* from **k^wh₂e/ēd-* “zerquetschen”.¹⁷ In favour of Kobayashi one can quote Avestan *tušna* “quiet”, as it originates from **th₂eus* “be quiet”,¹⁸ and lacks the aspirate. The lack of aspiration could be explained from a form **tuh₂s* with metathesis of the laryngeal, as is shown by Sanskrit *tūṣṇim* “quiet, not speaking”, but in that scenario the short vowel of Avestan becomes problematic.

¹⁵ The loss of aspiration after a nasal in Greek is known as “Miller’s Law”, based on Miller 1977a:137 and 1977b:36-37, and this was accepted by Hajnal 2000:11-12. See Verhasselt 2009:71-72 for a critical assessment. A similar evolution was also suggested for voiceless aspirates, see Zubaty 1892. Recently, Elbourne 1998, 2001 and 2012 reiterated and expanded this theory to all liquids, and to PIE **s* as well.

¹⁶ Kobayashi 2004:108 and 116.

¹⁷ There is actually no reason not to reconstruct that form with **k^{wh}*, except for the reluctance of reconstructing voiceless aspirates. We did not quote the example **k^wh₂eǵ* (LIV:360), which is suggested as etymology for Khotanese *khāś* “drinks”, because of the Armenian *xacanem*, as we are skeptical about evidence for laryngeal aspiration outside Indo-Iranian. In any case, this form would prove that an initial voiceless aspirate was not impossible in Indo-Iranian. In addition, the fact that this word is only attested in Iranian and Armenian (and not even in Greek nor in Sanskrit), casts doubt on the PIE or even East-IE origin; it might belong to the period when Iranian and Armenian were in close contact.

¹⁸ LIV: 642-644.

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Secondly, the noun *pita* from **ph₂ter-* does not display the environment *Ch₂V* in which the aspiration could occur, contrary to **steh₂*, where the 3rd persons singular and plural **stisth₂eti* and **sisth₂enti* were the starting points for the aspiration in Indic *tiṣṭhati* and *tiṣṭhanti*. Lastly, initial voiceless aspirates (inherited or not) do occur in Indo-Iranian, such as Avestan *θanjaiieiti* “er zieht” from **t^heng^h* “ziehen”,¹⁹ and it would be difficult to see why there would have been a constraint against the aspiration of an initial consonant. A final remark about *kumbha*, *xumba* and *κῠμβίον* involves their attestation: they are only attested in Eastern-Indo-European languages and are therefore not necessarily of common-PIE date. One could therefore argue that these words were “created” at a stage after GL had already operated in PIE. Even in that scenario, the problem remains that the Indic form *kumbha* did undergo aspiratory dissimilation and the Iranian form *xumba* one did not. This would then again prove that GL also operated in Sanskrit independently, and would cast doubt on those GL examples, which were said to be of PIE date. The Iranian word *haxā* “friend, companion” on the other hand, cannot be used with certainty to prove that GL did not operate in (Proto-)Iranian, because we do not know the exact chronology from PIE **sok^wh₂oi-*²⁰ and Proto-Indo-Iranian *sakh(H)āi* into Iranian *haxā*: if the evolution of Proto-Indo-Iranian **#s* into Iranian *h* was first, then this form could prove that GL did not operate in Iranian, but if the evolution of Proto-Indo-Iranian **kh* into Iranian *x* was first, the form would not prove anything, as in that case the word would no longer have had two aspirates and could not undergo GL anymore.

To conclude we believe the following elements contradict an Indo-European date for GL:

- The Greek evidence that could be used for it, is contradicted by the Latin and Germanic cognates that did not undergo GL.
- There is ample Greek evidence that contradicts an IE date and an explanation for these cognates has not been provided.
- The Latin evidence in favour of this assumption is contradicted by Germanic and only contains two or three examples, which are probably of West-Indo-European origin, as there are no cognates in Greek, Indo-Iranian nor Hittite.
- GL operated in Sanskrit later again but failed to operate in Iranian, which makes the assumption likely that GL only occurred in Proto-Sanskrit and not in PIE.
- Some of the Tocharian and Messapic evidence is contradicted by the Greek evidence.

¹⁹ LIV:657: in addition to the Germanic **pinglso* “Deichsel”, we think that also the Slavic *tęžo* “fragen, fordern” rules out the cluster **th₂-*. Adams (2013:306) reconstructed **teng^h*, without voiceless aspirate.

²⁰ We use the reconstruction with *o* as found in Mayrhofer 2005:114.

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- No Germanic cognate participating in GL exists; this means that an Indo-European GL would have had to operate after Germanic had left PIE already.
- An IE date for GL cannot explain the difference in consonantism between Greek $\tau\acute{\iota}\theta\eta\mu\iota$ and Sanskrit *dadhāmi*, and the fact that the verbal forms of $\acute{\epsilon}\chi\omega$ underwent GL after the change from PIE **s-* into Proto-Greek **h*.

3. The Mycenaean date of GL.

In spite of the well-known limitations of the Mycenaean script, many scholars have tried to interpret Mycenaean Greek with regard to GL. It was Ruijgh, followed by Lejeune, Janko, Risch, Plath and later also Heubeck,²¹ who first argued that GL had not yet operated in Mycenaean and adduced the following evidence to support the post-Mycenaean date:²²

- *ko to no o ko* “having a piece of land”: this is the *Paradebeispiel* for the assumption that GL had not yet operated. This word is a compound of *ko to na* ($\kappa\tau\acute{o}\iota\eta$) and $\acute{\epsilon}\chi\omega$, “having a piece of land”. The fact that this compound has *o o* proves that at the time of usage the *h* was still felt as a consonant and no contraction had taken place yet. If the *h* was a consonant, then the form was *hokhos* and, consequently, GL had not yet applied. In later Greek one finds words such as $\sigma\kappa\eta\pi\tau\acute{o}\upsilon\chi\omicron\varsigma$ “having a scepter”, with contraction.
- *a pi e ke* “he holds (around)”: this is a compound of $\acute{\alpha}\mu\phi\acute{\iota}$ and $\acute{\epsilon}\chi\omega$. If the *h* had not been a consonant anymore (and GL had already applied), the form would have been *a pe ke* as in later Greek, which has the form $\acute{\alpha}\mu\pi\acute{\epsilon}\chi\omega$.
- *po ro e ke*: the exact meaning of this word is debated, but there is agreement about the fact that this is an adjectival compound of $\acute{\epsilon}\chi\omega$. Chantraine read the word as $\pi\rho\omicron - \epsilon\chi\eta\varsigma$, which meant that the root **hekh* had not yet lost its initial aspiration, as otherwise there would have been a contraction. Ruijgh, on the other hand, read $\pi\omega\rho\omicron - \eta\epsilon\chi\eta\varsigma$ “having a poros”, in which the root **hekh* still had its initial aspiration.²³ Regardless of the exact interpretation, the absence of a contraction in this word proves that the *h* still counted as a consonant.
- *te o* “god(dess)”: this word is a strong example to prove that GL was post-Mycenaean. The Pre-Proto-Greek form was *transponat* **d^hh₁sos*, which became **thehos* in Proto-

²¹ Plath 1987:192 mentioned that Heubeck in 1986 had told him that he (H) agreed with Ruijgh's dating of GL as post-Mycenaean.

²² The examples are from Ruijgh 1967:44-45; Lejeune 1967; Janko 1977, 1992:10-11; Plath 1987 and 2002, and from Risch-Hajnal.

²³ Ruijgh 1996:612-613; this example was also quoted in the grammar of Risch-Hajnal.

Greek after the devoicing of the voiced aspirates. Ruijgh argued that in this form the intervocalic *h* is still a consonant, otherwise there would have been a contraction, leading to a Greek form †θoũς. The fact that the form has *th* in later Greek seems to indicate that at the Mycenaean period the form was still *thehos* (Ruijgh 1967:44-45, Meier-Brügger 2006). Wyatt argued that this form only proved that internal *h* was not a dissimilating factor, but was rather dissimilated itself.²⁴ This is doubtful: if the *h* had disappeared, there would have been a contraction. We therefore believe that Ruijgh was right.

- *ti ri se ro e*: this is a compound of **tri-* and **seroi-*.²⁵ The fact that there is no *w* in this form, proved that the root was an *i* or an *s* stem. In either case, it had already become *h* in intervocalic position. The absence of contraction between the *o* of the root and the ending *e* proves that the *h* was still felt as a consonant. This proves that GL had not yet operated, because the initial syllable started with *h* as well. In later Greek there are forms in which the ending and the root vowel contracted, such as the accusative singular ἦρω and the genitive singular ἦρωος, besides the “normal” forms ἦρωα and ἦρωος.²⁶

Some scholars have raised questions about this evidence, and asked if the *o* in *o ko* was not a simple compound marker (Hooker 1980:67) or a vowel in hiatus (as suggested to us by the reviewers of this journal) and also questioned if there was sufficient knowledge about Mycenaean composition in order to draw conclusions. Heubeck and Risch pointed to forms such as *a ni o ko*, which is ἠνίοχος in alphabetic Greek and *ko to no ko*, which would be κτοινούχος in alphabetic Greek to show that the *h* in Proto-Greek **hekho* was no longer felt as a consonant and that as a consequence contractions had already occurred: if the *h* were felt as a consonant, the expected forms would have been *a ni a o ko* and *ko to no o ko* (Risch 1983:383), although it is sometimes assumed that *ko to no ko* is a scribal error (Chadwick-Baumbach 1963:198, Chadwick-Ventris 1973:557). In spite of their reservations, Heubeck and Risch nevertheless accepted the post-Mycenaean date for GL. Lanszweert 1994 and Bartoněk (2003:147-148), however, built on this skepticism and dismissed the evidence as non-conclusive by arguing that there was not enough knowledge about the compounding in Mycenaean to make a founded analysis, and therefore concluded that GL was pre-Mycenaean. Bernabé and Luján (2006:97) argued that *a ni o ko* was no evidence against a pre-Mycenaean

²⁴ Wyatt 1976:7, see also Nussbaum 1998:140.

²⁵ Willi 2010:234 reconstructed **serH* but for our discussion the presence of a laryngeal in this root is irrelevant.

²⁶ See Smyth 1956:66-67, but he still reconstructed a root in **ōu-* which is logical, as the grammar had been written before the discovery of the Linear B tablets.

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GL, because if the compound had been *okhos* instead of *hokhos*, the expected form would have been $\dagger a ni jo ko$ with the *j* as *Hiatusstilger*. As such, they maintained that Mycenaean proved that GL had not yet operated. Recently, Melena (2014:92-98) showed that vowels in hiatus were written with a glide *j* (as had been argued for by Bernabé-Luján as well) and that the absence of a glide proved that the syllable started with an *h*. Plath responded to Lanszweert's objections by pointing at two additional Mycenaean words: *pu₂ ti a* and *a₂ pa a₂*. He interpreted the former as the Mycenaean form of the name Πυθίας, and the latter as a possible derivation of ἄπτω "I touch" or ἀφή "the act of touching, touch" (with two aspirates), or of the god Hephaistos. As the name *pu₂ ti a* is written with the *pu₂* sign, this means that the name had an initial aspirate, and that the aspiratory dissimilation of later Greek had not yet occurred, although an interpretation as Φυθίας is equally possible (as Plath observed himself). These names could be an additional indication that GL had not yet operated, although the exact interpretation of names remains problematic in light of the Mycenaean writing system. We believe that while we indeed do not know everything about compounding in Mycenaean, there are still enough indications that intervocalic *h* was still felt as a consonant and prevented contractions in roots that had another aspirate, the word θεός probably being the strongest example against a pre-Mycenaean GL, because there is no compounding in that word nor any analogy to explain the aspiration and lack of contraction. We now proceed to the Homeric evidence to see if it can shed additional light on the issue.

4. Homeric metrical evidence pertaining to the chronology of GL.

The Homeric language is an amalgam of different language stages and dialectal elements, but still it can provide some light on the chronology of GL. Before the discovery of Mycenaean it was not entirely certain when the sound change $*s > h$ ($>$ zero) occurred, and several scholars believed that an earlier sigma has still its effects on the metre.²⁷ After the discovery of Mycenaean (and especially by the works of Ruijgh) it became clear that the sound change PIE $*s >$ Greek *h* had already occurred before Mycenaean, but that *h* was still a full consonant. Ruijgh showed that in several Homeric phrases the *h* was still present as a full consonant in the scansion: sometimes the *h* was written, sometimes it was no longer written but left traces in the meter. That an *h* influenced the meter is visible from the following examples (where no GL is involved):

²⁷ Schulze 1892:173,224,232; Bond-Walpole 1898:33, Wainwright 1901:68.

- Πότνια Ἥρη “mistress Here”: the original form of this formula is **potnih₂ sēreh₂*, which would have become **potnia sērā* in Proto-Greek and then *potnia Hērā* in pre-Mycenaean times. The hiatus in this formula is prevented by the fact that the *h* in the name Ἥρη is still felt as a consonant, which means that the formula was created in a period when *h* was a full consonant.²⁸
- Πότνια Ἥβη “Mistress Youth”: the original form of this formula was **potnih₂ Hiēg^weh₂*, which became **potnia iēg^wā* in Proto-Greek and eventually (shortly before or maybe even during the Mycenaean period) **potnia hēg^wā*. The hiatus in this formula is prevented by the fact that the *h* in the name Ἥβη is still felt as a consonant, which means that the formula was created in a period when *h* was a full consonant. It is possible, however, that the two above mentioned formulae are reformations on the accusative Πότνιαν Ἥρην where the *h* would not have made position.
- Διὶ μῆνιν ἀτάλαντον: this is a very old formula, of which the original form was **diwei mēnin hatalanton* coming from **sm-talanton*, with the zero grade of the root **sem* “one”.²⁹ The *i* in μῆνιν is scanned long, as a consequence of the *h* that once was present in the formula.
- κασίγνητον ὁμογάστριον “brother born from the same womb”: in this formula the first *o* is followed by two consonants, and is therefore long; the *h* comes from the *s* in the root **som*, which is the *o* grade of **sem* “one”.
- ἐν ἅλι “in the sea” and εἰνάλιος “sea-“: these two examples come from the grouping of the preposition *en* with the noun *hals*, in which the *h* (coming from the *s* in PIE **sals*) caused the lengthening of the preceding vowel. In this form the original sequence **enh* is rendered by εἰν, just as **enw* is rendered by εἰν in the word στεινός (Ruijgh 1996 I:208-209). This is more than a simple metrical lengthening, as several Mycenaean compounds, such as *o pi a₂ ro* and *a pi a₂ ro* (Ruijgh 1967:53, Plath 1987:189), attest to the fact that *h* was felt as a consonant in this word. As such, this is an archaism and not a poetic licence. The irregular scansion of these forms had already been observed by Schulze (1892:224), who argued that the lengthening was due to the fact that an *s* had disappeared.

There are, however, also examples from roots which according to comparative evidence had two aspirates and in which the initial *h* still acted as a full consonant in the meter:

²⁸ Ruijgh 1967:53, 1978:301, 1969b:22, 1996:101, 223; Willi 2010:251 reconstructed **potnih₂ sērah₂* for this formula.

²⁹ Ruijgh 1967:53, 1978:301, 1996 I:223, 1996 II:240-241; in his review of Ruijgh 1967, Kerschensteiner (1969:86) also discussed this example.

- ἄλοχος: this word is a compound of **sem* and **log^h*, and means “lying together with, concubine” (Ruijgh 1996 I:223, 1996 II:254). The original Pre-Greek form would have been **hmlokhos* with two aspirates, but the initial aspiration disappeared as a consequence of GL. In the sequences such as πρὶν ἄλοχος and αὐτὸς ἄλοχος, however, the initial *h* is still felt as a consonant, which proves that the verses come from a period when GL was not yet active.
- βέλος ἐχεπευχές “sharp shooting arrow” (A51): in this specific verse, the second syllable of βέλος is long because it continues a (Mycenaean?) form **g^welos hekhe-* in which the *o* is followed by two consonants. That the *h* is still considered a consonant in the meter, is proof that this is a remnant of a pre-GL period.

- παρέχη “he provides (subj.)”:

- σῦνεχές “holding together”:

In the two words above, the initial vowels are long and these long vowels can be explained by the fact that the *h* still counted as a consonant in the scansion (Ruijgh 1996 II:257).

- ὑπείροχος “outstanding”: this form is famous, as it occurs in Akhilleus's famous speech in which he explains his choice between dying young and living on as a hero, or living long and being unknown. In this form the original sequence **erh* is rendered by εἶρ, just as **enw* is rendered by εἰν in the word στεῖνός (Ruijgh 1978:301). These instances were already observed by Schulze (Schulze 1892:173-174, 224), who –in absence of Mycenaean evidence- ascribed the lengthening to the lost sigma in both forms.

These examples prove that at a very early stage of the epic diction the form was still *hekh* with *h* being a full consonant, and that, consequently, GL had not yet occurred.³⁰ It does, however, not say anything conclusive about the Homeric diction itself, as it is possible that these forms represent a stage that was no longer spoken in the contemporary language of Homer (cf. *infra*). It also is not entirely conclusive with regards to Mycenaean either, because verbs in Homer frequently underwent *tnesis* while that phenomenon was not even in use anymore in Mycenaean: as such, the Homeric language contains pre-Mycenaean archaisms.³¹ Several scholars, however, doubt the value of the metrical evidence with regard to GL, and do not accept that an inherited prevocalic *s* could have influenced the scansion, contrary to the digamma (from an inherited *w* sound): they catalogue the above quoted examples as *metrical*

³⁰ Ruijgh 1967:52-54, 61, 1978:301; Janko 1992:10-11.

³¹ Morpurgo Davies 1985 and Hajnal 2004 noted that *tnesis* was inherited but also served poetic purposes. See De Decker 2014:60-66.

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lengthening,³² followed by Kirk (1985:58), who explained βέλος ἐχεπευχές as *an unusually violent case of metrical lengthening*.³³ Hackstein (2002:12-13) explained the forms as the result of a double pronunciation *nn* or *rr*. This is correct from a synchronic point of view,³⁴ but we nevertheless think that these forms are evidence for a language stage, when *h* was still a consonant. We therefore believe that ὑπίροχος is therefore a case of an “irregular” lengthening, with an historical explanation, and not a case of “metrical lengthening”.

5. The evidence from non-poetic Greek: the augment.

Although we cannot discuss the origin, usage and heritage of the augment here, we will take a look at its use in Greek, because we believe that it has useful information about the chronology of GL. In non-poetic Greek and sometimes also in poetry verbs form their past indicative tenses by adding an augment to the verbal form. If the verbal form started with a vowel, the augment contracted with the initial vowel. The contraction results are, however, different from those in later Greek (Hajnal 1990:52). We will refer to these contraction results as the first stage contractions. The contraction of ε and α yields a long *a* (η in Attic-Ionic), as is seen in the imperfect ἤγων of ἄγω “I drive”, originating from **e-ag-o-n*. The contraction of ε and ε yields η, as is seen in the imperfect ἤγειρον form ἐγείρω “I awake”, from **e-egeir-o-n*. Similarly, η is also the augment of the following verbs: ἀγείρω “I gather”, ἐσθίω “I eat” etc. That these are among the oldest contractions, is proved by the fact that the later contractions, such as the dative singular in the *s* stems and the present and imperfect of the contracted verbs had different contraction results: a contraction of ε and ε yielded εἰ. Our colleague Dieter Gunkel suggested a different scenario to explain the long initial vowels. He argued that the augment might have been added in a period when the initial laryngeals were still present. A form ἤγων of ἄγω would then have come from **h₁e-h₂eǵon*, which became **h₁ah₂agon*, which evolved into **aagon*, which could only become ἄγων or ἤγων in Greek. Similarly, an imperfect ὄρνυτο from ὀρνυμαι “I incite” would not have originated from **e-ornuto*, but from **h₁eh₃rnuto*, which became first **h₁oh₃rnuto* and then **ōrnuto*, and finally ὄρνυτο. This would then explain the long vowels in Greek. The only problem with this reconstruction might be that it assumes that the augmentation was already fully established in the East-Indo-European period, while it might have been still optional at that time, or that it assumes that at the time of the augmentation in Greek the initial laryngeals were still present.

³² Chantraine 1948:99-100; Wyatt 1969:40, 96; Rix 1976:56-58; MacLeod 1982:56-57; Kirk 1985:58

³³ In the Cambridge Commentary on Homer's *Iliad*, Kirk explained these forms as metrical lengthening, while Janko accepted the evidentiary weight of these forms to date GL in the same series.

³⁴ See for this explanation also Ruijgh 1978:301 and 1996 I:208.

When a verb started with a consonant, no contraction occurred. In Proto-Greek initial **s* and **j* became *h*, while initial *w* was still present, and this was the situation in Mycenaean. At this stage, *h* was still felt as a consonant. If the verbal form started with a *w* or an *h*, the augment *e* was added but no contraction took place. In a later stage, however, intervocalic *w* and *h* disappeared and the subsequently contiguous vowels contracted. The results of this “second stage contractions” were different from those of the first stage. The verbs starting with an *h* or *w* contracted *εε* into *ει*, which explain the “irregular” augments in:

- ἔπομαι “I follow” (from PIE **sek^w*): **e-hepomen* became **ἐεπόμην* which then became **ειπόμην* and eventually *εἰπόμην*. (we will discuss the issue of the *aspiration hop* after we have listed all the examples)
- ἔλκω “I drag” (from PIE **swelk*): **e(h)elkon* became **ἐέλκων* which then became **εἰλκων* and eventually *εἴλκων*.
- ἔρπω “I move (slowly)” (from PIE **serp*): **e(h)erpon* became **ἐερπον* which then became **εἶρπον* and eventually *εἴρπον*.
- This also explains the irregular augment of the pluperfect of the root **steh₂*: the perfect was **sestāka*, which became Greek ἔστᾱκα “I have been put and am now standing”. The pluperfect of this form was **ehestakein*, which lead to a form **eestakein*, which eventually became **εἰστᾱκειν* or Attic **εἰστήκειν*, and finally yielded *εἰστήκειν*. This proves that at the first-stage contraction the *h* was still a full consonant.

In the verbs quoted above, the aspiration is surprising as it should have been lost because the *h* had disappeared between the vowels. There are two possible explanations: either the aspiration was lost initially but was then restored by analogy with the present indicative, or the aspiration “hopped” from the 2nd *e* onto the word initial *e*: **ehe-* became *hee-* (Sommerstein 1973:11, Risch 1985:1).³⁵

All these examples imply that at the time of the first contractions the *h* was still felt as a consonant, as those verbs would otherwise have had different augment forms. Interestingly enough, we also see the irregular augment *ει* in the verb ἔχω, from the root **seǵ^h*. This means that the original imperfect form was **e-hekhon*, with a pre-GL form, at the time of the first stage contractions of the type ἦγον. The question now is if at the time of Mycenaean these first and second contractions had already occurred. The first contractions had undoubtedly occurred in the dative singular, as the writing system indicates that PIE **o-ei* had become *ōi*

³⁵ Ruijgh (1996:506-507) argued in his review of Sommerstein that the sequence **ehe* was transformed into **hehe*, but there is no real reason to see why there would have been an additional aspiration at a time when *h* was still present intervocalically (why would an augment form **ehe* have become **hehe* but a form **ewe* not **wewe*?).

already.³⁶ If one looks at the augment formation, it is possible that the first contractions could have occurred already here, but the writing system of Mycenaean does not allow for a conclusive assessment.³⁷ If the second contractions had not yet occurred, it means that at the Mycenaean period the form was still *ehekhōn* and that at that stage GL had not operated. Mycenaean has only three forms, where an augment can be assumed, namely *a pe do ke*, *e e to* and *a pe e ke*, and none of them contradicts the above-mentioned chronology. If *a pe e ke* is read as ἀφέηκε, the aorist of ἀφίημι “I send away, I throw away”,³⁸ this would prove that at the times of Mycenaean the intervocalic *h* still prevented the augment and the stem vowel to contract. As such, this means that the imperfect form of ἔχω must still have been *ehekhōn*. If one interprets *a pe e ke* as a perfect form, it would still prove that *h* acted as a consonant between the vowels: the expected reduplication is **ie-iē-ka*, which leads to **hehēka*, in which there is no contraction because of the intervocalic *h*. As *a pe e ke* has no contraction between the two vowels, it proves that the *h* still was present intervocalically and that the second-stage contractions had not yet occurred. The form *e e to* is highly unclear, as it could be interpreted either as an aorist or a pluperfect from ἵημι “I throw, I send”, or as an imperfect or an imperative from εἰμί.³⁹ If it is linked with the latter, it could be read as *e-hento* which would be a middle imperfect form (not uncommon), or as *e-hentōn* (an imperative 3rd person plural form).⁴⁰ Neither interpretation can then shed any light on the dating of GL. If it is a form of ἵημι, it can be used in this discussion: as an aorist, it would have to be read as *e-he-nto* and it would prove that there was no contraction yet between the stem vowel and the augment, and therefore would indicate that the intervocalic *h* was still consonantic and that the second-stage contraction had not yet occurred. Interpreted as a pluperfect, the form would have to be read as *e-he-nto* without contraction between stem vowel and augment. The form *a pe do ke* does not shed any light on this issue. If it is interpreted as ἀπέδωκε, then there was already an augment in Mycenaean times, which seems to be confirmed by *a pe e ke* but if it has no augment and is read as ἀπέκδωκε (Luria 1974:258), then it proves that the augment was only beginning to be established and could be an indication that there was no second stage contraction yet, as the augments had not yet been generalised. If one denies the existence of an augment for Mycenaean altogether (Luria 1974:258), and believes that it was only

³⁶ We owe this clarification to Anna Morpurgo-Davies.

³⁷ Vilborg 1960:104, Schmitt 1967:67, Duhoux 1987:164.

³⁸ This was the suggestion of Plath 1987:190.

³⁹ Chadwick-Ventris 1973:542.

⁴⁰ See Hajnal 1990 for a long and thorough analysis of the form as belonging to εἰμί.

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established later, the irregular augment of ἔχω proves automatically that GL was post-Mycenaean, as the root was **hekh* at the time of augmentation.

6. The evidence from non-poetic Greek: the perfect reduplication.

The next question is if there are reduplicated forms which can provide any help in determining the chronology of GL. At first sight the answer seems to be negative, as the reduplicated forms such as τίθημι and πέφηνα, were the ones that alerted to the existence of GL. There are, however, some examples indicating that GL happened only fairly late after the above-discussed contractions. In Mycenaean the cluster **-sm-* had not yet been simplified into *-hm-* under all circumstances (Wathelet 1973:198), as is proved by the word *a ka sa ma* which stands for *aikσμα* and which is in later Greek αἰχμή “spear”, with the evolution of **ksm* into *khm*. The root **smer* forms the following middle perfect **sesmrtai* with zero grade of the root. This form became **hesmartai* and then **hehmartai*. At the stage of the form **hehmartai* the *h* in the cluster **ehm* was lost with compensatory lengthening, leading to a cluster ηεῖμ, which survives in the form εἴμαρται “it has been announced by fate”. At the time when GL did apply, this form no longer had two aspirates and, consequently, did not lose its initial aspiration. As the cluster *-hm-* still existed in Mycenaean, this perfect form proves that GL had not yet operated in Mycenaean times.

The same applies to the perfect of the root **swed^h*. The reduplicated form is **seswōdha* with a long *o*,⁴¹ which then became **heswōtha* and then **hehwōtha*. At a stage when GL had not yet occurred, the cluster **ehw* lost the *h* with compensatory lengthening, leading to the form **heiwōtha*. Later, when GL did apply, this form lost its initial aspirate and became εἴωθα “it has been my habit and am now used to”, which is found in Homer and Attic. There is, however, also another explanation. If one reconstructs a reduplication with a long *e* as in the perfect **wēworaka* of ὀράω “I see”, the proto-form of the root **swed^h* would have been **sēswodha*. After the loss of the intervocalic sigma and digamma, the form would have become **ῥοθα*, which would have undergone quantitative metathesis leading to the form ἔωθα, a form which occurs in Homer, Ionic and in Herodotos. In that form, the first syllable could have undergone metrical lengthening, leading to εἴωθα. If that scenario is accepted, this form cannot be used in the discussion of the chronology of GL.

⁴¹ This is the opinion of Smyth 1956:177, who linked the long vowel with the long vowel of the noun ῥῆθος, and of Ruijgh 1996:212 (originally written in 1971) and of Meier-Brügger 2004:183, who also discussed the origin of the long vowel in the Greek noun.

7. Did GL apply before or after Homeric Greek?

Our final question is trying to determine if GL had occurred before or after the Homeric language. Generally, it is believed that GL occurred after Mycenaean, but few scholars pronounce themselves on an exact date: Janko 1977 posited a date of 1200^a,⁴² Vine 2004 argued for a pre-Homeric stage but no clear date, and Miller (1977a:151) and Plath (2001/2:248) reckon with a date around 800^a. This question cannot be easily answered as the Homeric language encompasses different language stages together with the spoken language of West-Ionia in VIII^a.⁴³ As we saw above, there are forms that indicate a pre-GL state in Homeric Greek, but they can be relics of an earlier (Mycenaean or maybe pre-Mycenaean language stage), and a non-GL form can therefore not be taken at face value to prove that GL is post-Homeric. There are nevertheless some indications that GL occurred in the Homeric or even shortly after the Homeric period. An important element is that Homer did not yet know the aspirated perfects, which means that they were a relatively new creation and that they were not yet fully developed in VIII^a. As we already mentioned above, there are some reduplicated forms, both aspirated and non-aspirated, where GL had not yet occurred. An important form here is the perfect εἴληφα of λαμβάνω “I take”, from the root **slag^w*. This perfect is **seslāg^{wh}a*, with the Greek perfect aspiration, and secondary ablaut leading to the long *a* of the root.⁴⁴ This form then became **heslag^{wh}a* and then **hehlag^{wh}a*.⁴⁵ In that form, the cluster **ehl* lost the *h* with compensatory lengthening leading to a cluster ειλ. At this stage GL could not yet have occurred, as otherwise both *h* would have disappeared, as is seen in the perfect τέτροφα from **thethropha* as perfect form from τρέφω, in which both initial aspirates are deaspirated. The form εἴληφα is not attested in Homer, Hesiod nor the Hymns⁴⁶ and only occurs in Sophokles (which does not mean that the aspirated perfect was only created in Attic Greek). It is therefore likely that this form is a recent formation, but apparently it was created at a time when GL had not yet operated. This would be an indication that GL occurred even after the Homeric period. Miller (1977a:146-147) pointed to the form καθειληφα in an inscription, which he used to prove that GL had not yet worked in VIII^a. Slings 1986 agreed that the original form was εἴληφα, but argued that the aspiration was lost during or after the Classical period, because the initial εἰ without aspiration was being felt as a reduplication,

⁴² Bernabé – Luján 2006:97 erroneously hold that Janko argued for a pre-Mycenaean date of GL, but in his 1977 article Janko clearly stated that he believed that GL occurred in 1200^a.

⁴³ Hackstein 2002:25, 2010, 2011b:37.

⁴⁴ Hackstein 2002:158-169.

⁴⁵ If the aspirated perfect had not yet been developed during the Mycenaean period, the labiovelar would obviously no longer be present in this form.

⁴⁶ Ebeling 1885; Wakker 1991; LSJ:1027.

most probably under the influence of the very common εἴρηται and εἴρηκα. He argued that the form εἶμαρται did not undergo this change, because it was a rare and poetic word, and therefore not used very often in everyday speech (Slings 1986:14).

Garrett (2006:141) used the reduplicated form τέθραμμαι “I have been fed” from *θέθραφμαι as additional evidence for a post-Mycenaean date of GL. The assimilation of φμ to μμ had not yet happened in Mycenaean. If GL had operated before Mycenaean, one would have had †τέτραφμαι, and this would have become †τέτραμμαι. Slings (1979:257-258), however, argued –before Garrett– that before *m* every labial was neutralised into **pm* and that therefore in the original cluster **-phm* the labial aspirate no longer existed. This explained why the perfect of the verbs in labial stems preserved one aspirate in the reduplication, while the verbs in gutturals and dentals did not have it, as was proved by πέπεισμαι “I have been convinced” from *πέπειθμαι and τέτυγμαι “I have been obtained” from *τέτυχμαι. If Slings's explanation is correct, Garrett's argument is no longer valid. The question is why the cluster **phm* would have lost its aspiration, while **khm* and **thm* did not.⁴⁷ The assimilation of *thm* (and of *dm* in the perfect) into *sm* is post-Homeric, as can be seen by forms such as ἐπέπιθμεν “we obeyed” and ἴδμεν “we know”. Moreover, we believe that the aspiration in τέθραμμαι can be (partially) explained by the desire to keep the verbs τρέπω “I turn” and τρέφω “I feed” separated. This is also visible in the passive aorists ἐτρέφθην and ἐθρέφθην (besides the more regular forms ἐτρέπην and ἐτρέφην). The only form that would contradict this theory is the perfect τέτροφα, which serves as perfect to both verbs, but this is only an apparent exception, as τέτροφα as perfect to τρέφω already occurs in the *Odyssey*, while it only occurs as perfect of τρέπω as of V^a: the perfect τέτροφα as perfect of τρέφω was thus created and underwent GL at a time when there were no aspirated perfects yet and thus no confusion with the aspirated perfect of would exist, hence the θ of the root lost its aspiration.

Plath (2001/2:248) used the form θυφλός “blind” in inscriptions to prove that GL was indeed fairly late, because in this specific form there was no possibility of an analogical restoration or influence on the fact that this word had two aspirates. Similarly Miller (1977a:143-144) had used θυφλός, ἐθέθην “I was placed”, ἐνθαφείς “buried in” and θυθέντος “of an offered piece” as evidence that GL could have been a recent innovation. The epigraphical form ΦΑΡΘΕΝΟΣ “young girl” could be used as evidence for a late GL as well. Most scholars believe that this word never had two aspirates,⁴⁸ but that notion depends on the

⁴⁷ A reviewer suggested that the fact that the cluster *phm* was homorganic while *thm* and *khm* were not, could account for the difference in treatment.

⁴⁸ Buck 1955:60; Vine *fit a*, with reference to Buck for the dissimilation and Beekes 2010 for the etymology.

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etymology. The commonly accepted etymology of this word is **pr-stenos* "with the breasts in front",⁴⁹ with an evolution from *-rst* into *-rth-*, but there are two problems with this etymology. The first one is phonological: this word would be the only one with an evolution *rst* into *rth* and is contradicted by *παστάς* "porch" (lit. "standing before") from *par-sta-*.⁵⁰ The second problem are the semantics: as one reviewer pointed out to us, the name would be too obvious anyway, because where would a girl carry her breasts if not in front. S/he suggested to etymologise the word as **b^hr – steno* "carrying breasts" and would then distinguish a young girl from a young woman that had starting to grow breasts. If this etymology is correct,⁵¹ the use of the two aspirates in the word would be an indication for a relatively late date of GL. While the word initial aspiration in *θυφλός* could have been triggered by the second aspirate,⁵² this is less likely for epigraphical forms such as *ΦΑΡΘΕΝΟΣ* and *ΦΕΡΣΕΦΟΝΗ*, because the aspirates appear in different syllables.

We would state that there are some indications that GL had not yet been completed in VIII^a, but that there are too few examples to prove it. The aspirated perfect *εἴληφα* is a strong example, but as we cannot be entirely certain that the aspirated perfects originated late, we cannot state with absolute certainty that GL was post-Homeric.

6. How reliable is the Mycenaean evidence and did *-h-* have dissimilating effects?

As there are no instances of a word internal *h* that caused dissimilation, the question is if the phoneme *h* was subject to GL in the first place.⁵³ We will now compare other non-Indo-European languages and try to determine if there are typological parallels. In this context, reference is sometimes made to the Amero-Indian language Ofo, where a GL like phenomenon occurred,⁵⁴ but did not apply to *h*. In her work on laryngeal co-occurrence restrictions, MacEachern showed that Ofo and Peruvian Aymara had aspiratory dissimilation, but that sequences with an *h* and an aspirate did not undergo deaspiration.⁵⁵ We believe, however, that the evidence of Ofo is not entirely conclusive with regard to the Greek

⁴⁹ Klingenschmitt 1974.

⁵⁰ As was noted already by Miller 1977a:148-149.

⁵¹ Frisk 1970:474-475 is skeptical about the correct etymology and stated that the word is *morphologisch und etymologisch isoliert*.

⁵² Buck 1955:60 had already argued for this; see also Vine 2004:4-5.

⁵³ Wyatt 1976:7. In addition, this observation was made –independently from one another– by Sam Zukoff, Michael Weiss and Anna Morpurgo-Davies. Nussbaum 1998:140 stated that *h* could be lost by GL, but could not trigger it.

⁵⁴ De Reuse 1981 was the first to note this. GL like phenomena had been attested for non-IE languages already before De Reuse's analysis of Ofo (see Salmons 1991:46).

⁵⁵ MacEachern 1999:7-12 for the Peruvian Aymara data and 38-43 for Ofo. She did not draw any conclusions from the Ofo evidence with regard to Indo-European.

situation. There are other non-Indo-European languages with GL like phenomena, where *h* is subject to an aspiratory dissimilation: in Cuzco Quechua and Souletin Basque the sequences involving an *h* ($\#T^h \dots h$ and $\#h \dots h$) were subject to deaspiration, or these languages did not possess such sequences (which means that such a sequence, if it ever existed, had been subject to dissimilation).⁵⁶ In addition, there is the Bantu language Makhuwa, where the first of two voiceless aspirates in two following syllables is dissimilated.⁵⁷ This phenomenon, which is called “Katupha's Law” by Schadeberg (1999:380), has a more restricted application than GL, but still displays dissimilation of aspirates. This means that there is in our opinion no conclusive evidence to state that GL never applied to *h*. We admit that there are indeed no Greek instances of a word internal *h* that caused dissimilation, but as initial *h* was subject to GL, it is our opinion that *h* was also subject to GL just as any other aspirate. It would be difficult to see why in an internal position *h* would not have been subjected to GL but in initial position it would have undergone it, especially in light of the fact that the other aspirates could both cause and undergo deaspiration.

9. Conclusion.

We started by arguing that GL happened independently in Sanskrit and Greek (and Latin), and was not a sound law from Indo-European times, as is proved by Celtic, Germanic and Iranian. With regard to the relative chronology of GL, not only the Mycenaean nominal compounds of $\check{\epsilon}\chi\omega$ are important, but also verbal forms from Mycenaean and later Greek. As Mycenaean had only a few –if any- certain syllabic augments yet, this means that the use of the augment was only in its initial stages, and that the second stage contractions had not yet been completed. This implies that GL had not yet operated in Mycenaean times. We reach this conclusion based on the fact that $\check{\epsilon}\chi\omega$ still had its initial aspirate at the time of the second contractions, which occurred after the period of Mycenaean Greek. Thus, $\check{\epsilon}\chi\omega$ was still *hekho* at Mycenaean times, as the many Mycenaean compounds in *o ko* already indicated. Some doubt is cast on the application of GL onto the phoneme *h* but we believe that there are non-Indo-European parallels to indicate that *h* was also subject to GL. Several reduplications, both of non-aspirated and the later (and post-Homeric) aspirated perfect –especially the form $\epsilon\check{\iota}\lambda\eta\phi\alpha-$, show a phonological evolution which can only be explained by the absence of GL. Since Homer had no aspirated perfects yet, it is reasonable, though not conclusively provable,

⁵⁶ MacEachern 1999:7-8; 25-26 for Souletin Basque and 29-33 for Cuzco Quechua.

⁵⁷ Schadeberg 1999, with reference to Katupha 1983: this is the MPhil Thesis of José Katupha at the SOAS in London, but we were unable to consult it ourselves; see also Dimmendaal 2011:31 with reference to Katupha 1983 and Schadeberg 1999. Dimmendaal 2011 and Katupha's law were also quoted in Vine *ftc* a.

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to assume that GL had not been completely operated in the period when the Homeric poems were being composed. We would therefore conclude that it is certain that GL occurred in a post-Mycenaean period, but that it occurred almost certainly later than 1200^a.

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