

IJDL

International Journal of
Diachronic Linguistics and
Linguistic Reconstruction

12th Volume
2·2015

|peniope|
München

IJDL - International Journal of Diachronic Linguistics and Linguistic Reconstruction
is edited by Eugen Hill, Martin Kümmel and Stefan Schumacher.

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IJDL is published semi-annually in June and December. Annual subscription rate is 44 Euro including VAT, excluding shipping costs. Please order at your bookseller or at the publisher: Verlag Anja Urbanek, Straubinger Str. 30g, 80687 München, Germany, tel +49-(0)89-88 98 89 01, fax +49-(0)89-88 98 89 02, anja@peniopo.de.

|peniopo| Verlag Anja Urbanek
www.peniopo.de
© 2016 Verlag Anja Urbanek, Straubinger Str. 30g, 80687 München
editors-in-chief: Eugen Hill, Martin Kümmel, Stefan Schumacher (address see above)
printing and binding: Bookstation GmbH, Gutenbergstr. 5, 85646 Anzing
Printed in Germany • ISSN 1614-5291

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What Is the Greek Counterpart of (Proto-)Indo-Iranian $(*)t^h?$ *

by Filip De Decker

Abstract: Almost since the beginning of Indo-European linguistics as a science, it has been noted that the voiceless aspirates (*Tenuis Aspiratae*, henceforth TA) were relatively infrequent and were only attested in very few languages (Indo-Iranian, Greek and Armenian). Usually, Indic and Greek agreed in having a TA, but in a number of instances a Sanskrit or Indo-Iranian aspirate corresponded to a plain plosive in Greek. In most of these instances a Sanskrit *th* corresponded to a Greek *t*, but there were instances where Sanskrit *th* was matched by a Greek *th*. The article therefore focuses mainly (but not exclusively) on the instances in which a *th* can be found in Indo-Iranian and discusses what the Greek counterpart is. First, we state the problem and give a brief overview of previous suggestions to solve this problem, but none of these explanations can explain the differences and agreements between the Greek and Indo-Iranian. After the overview we proceed to an analysis of all the instances and argue that the difference in aspiration between Greek *t* and (Proto-)Indo-Iranian $*t^h$ can be explained by the fact that the (Proto-)Indo-Iranian forms are the result of a cluster $*th,V$ or are due to evolutions, specific to Indo-Iranian, Indic or Iranian. Where the Greek counterpart of (Proto-)Indo-Iranian $*t^h$ is *th*, we argue that the aspirate has to be posited for PIE or — in case there is no related word in a Western language is lacking — for East-IE.

Keywords: historical phonology, Indo-Iranian, *Tenuis Aspiratae*

* The present article is the written version of the presentation *What is the Greek counterpart of Sanskrit th?* delivered during the third Conference *Greek and Latin from an Indo-European perspective*, which was held in Bratislava from July 8th until 10th 2010. We greatly benefitted from discussions on this topic before, during and after the conference. It is evident that for any inconsistencies, errors or shortcomings solely the author is to blame.

1. *Status quaestionis* and previous scholarship

Since the beginning of Indo-European linguistics as a science, it had been observed that the TA were relatively uncommon or even rare in comparison to the other plosive series. Many scholars tried to explain this problem. Scholars unaware of and/or disagreeing with the aspiratory force of laryngeals, tried to explain the Sanskrit and Greek aspirates in three different ways. The first explanation held that all voiceless aspirates (and not just $*t^h$) were an innovation within the specific language groups (mostly as result of a preceding *s*), and that therefore all differences and agreements were the result of an evolution within that particular language and that no further conclusions could be drawn from them.¹ The second suggestion was that in case of differences Greek innovated and lost the aspiration. This was the opinion of Meillet and Frisk, who argued that the regular reflex of PIE $*t^h$ in Greek was *t* (either always or in postconsonantal position).² The third suggestion was made by Grassmann, who argued that in

¹ This opinion has been held as early as the start of comparative philology, as can be seen in Bopp (1833: 23-25), Benary (1837), Kuhn (1852, 1854a and b, 1855a: 8, 1855b: 74); Curtius (1853), Schweizer (1854: 384), Weber (1856: 235), Benfey (1859: 90), Grassmann (1860: 33, 1867: 181), Roscher (1868), Fick (1870: 78), Schleicher (1871: 162). A complete overview can be found Wackernagel (1896: 122–123). Wackernagel also argued that the *sandhi* outcome *ch* out of *tś* was another indication that *s* had aspirating effects in Sanskrit, and added the evolution of PIE $*s\acute{k}$ into Sanskrit (*c*)*ch*. The main proponent of this theory was Hiersche (1964 and 1978). See also Michelini (1974). Some scholars adhering to the Glottalic Theory accepted this as well, see Bomhard (1981: 336, 1986 especially page 73), Hopper (1977a, 1977b), Iverson (1985). An anonymous reviewer of this journal pointed out to us that the *s* in Sanskrit only had aspiratory force when it disappeared (as is the case in (*c*)*ch* from $*s\acute{k}$).

² According to Meillet (1898: 276, 1908: 81–83), Frisk (1937) and Lejeune (1972: 31–32, but cf. *infra*) the Greek reflex was always *t*. Zubatý (1892a) and Uhlenbeck (1902/3: 219) argued that Greek rendered PIE $*t^h$ by *th* in intervocalic position, and by *t* in post-consonantic position. This was refined by Elbourne (2000, 2011: 43 and 2012) who stated that the Greek reflex of PIE $*t^h$ was *th* in intervocalic position and *t* if $*t^h$ followed a nasal, liquid or *s* (regardless whether the nasal or liquid was consonantic or vocalic). Hirt (1927: 244–246) believed that Greek preserved the original state in most cases, except for PIE $*st^h$, which was always rendered by *st* in Greek.

case of different treatment, the innovation was made in the Indo-Iranian branch.³

Scholars accepting the aspiratory force of laryngeals explained almost all Indo-Iranian aspirates as the result of a cluster of a plain voiceless plosive followed by a laryngeal (either by assuming the laryngeal could cause aspiration in Indo-Iranian alone or could also aspirate in Greek and Armenian). In 1892 (actually already in 1879)⁴ Ferdinand de Saussure posited that some cases of Sanskrit *th* could be explained by assuming that those cases were originally composed of a *t* followed by a schwa and a vowel,⁵ in which the schwa was elided and »replaced by« an aspirate.⁶ This suggestion was expanded by first Pedersen and then Kuryłowicz.⁷ They argued that the Sanskrit (and already the Proto-Indo-Iranian) aspirates were all — or almost all — caused by a cluster $*THV$,⁸ but that the laryngeal(s)

³ Grassmann (1863a: 100–101), Brugmann (1886: 406–408), Walde (1895: 531), Wackernagel (1896: 119–122), Bartholomae (1907/8). They ascribed the aspiration mostly to the immediate presence of an *n* or an *s*, or to aspiration in semantically or morphologically related words. See most recently Szemerényi (1980: 62–63, 152–153).

⁴ In his *Mémoire sur le système primitif* he argued that the *th* in e.g. *grathnati* and *granthitas* was possibly the reflex of the *i* elsewhere in the verbal inflection (de Saussure 1879: 244). See Mayrhofer (1981a) for a detailed analysis of de Saussure's reconstructions. Another study devoted to Ferdinand de Saussure's historical and comparative work is Gmur's analysis from 1986, in which he discussed the *Nachleben* in the 19th century of de Saussure's *Mémoire (non uidi)*.

⁵ De Saussure (1879: 244, 1892, quoted in Bally, Séchehay & Gautier 1922: 603). It is important to note that de Saussure never said that all cases of Sanskrit *th* could be explained this way. The summary in BSL mentions *certain cas*, but since we only have a summary of what he actually said, we will never know how he actually envisaged the Indo-European consonant system. This was also Meillet's reaction to Kuryłowicz's extension of de Saussure's theory to all TA (1928: 62 »on en saurait expliquer par l'action de ə toutes les sourdes aspirées, même si quelques-unes s'expliquent par là; 1930: 342 mais on ne saurait rendre compte ainsi de toutes les sourdes aspirées qu'atteste l'accord de l'indo-iranien, de l'arménien et du grec«).

⁶ Bally, Séchehay & Gautier (1922: 603).

⁷ Pedersen (1893: 269–273, 1926: 48, 63–64, 1938: 183), Kuryłowicz (1927: 202–204, 1928: 55–56; 1935: 46–52), Messing (1947: 180–184).

⁸ Usually, scholars only accept aspiratory force for $*h_2$. Initially, it was accepted that both $*h_1$ and $*h_2$ could cause aspiration (especially in light of the then accepted reconstruction $*ponte_h_1s$ for Sanskrit *panthās*), but Kuryłowicz (1927: 202–204,

did not aspirate in Greek.⁹ As such, the differences in consonantism between Greek and Indo-Iranian were explained by assuming that the aspiration in Indo-Iranian was caused by a laryngeal, but those instances where the two language families both had an aspirate remained problematic. Later, scholars assumed that a cluster $*th_2V$ could also cause aspiration in Greek. The cases where Greek and Indo-Iranian disagreed and Greek had no aspirate were explained by assuming analogical levelling with case or verb forms where the aspiration did not occur.¹⁰ This is now the accepted opinion.¹¹ In our opinion, the most important shortcoming of this theory is that there are instances where under similar circumstances different outcomes can be perceived. Explaining this by assuming levelling in two different directions (contrary to Sanskrit, where the aspirate was always generalised) is problematic, because it does not allow for falsification.

Lastly, while in most scenarios the acceptance of either laryngeal aspiration or inherited voiceless aspirates seemed to exclude the existence of the other, some scholars argued that laryngeals could aspirate and that PIE had voiceless aspirates at the same time. Although he initially rejected the existence of laryngeal aspiration and assumed that the Greek reflex of PIE $*t^h$ was *t*, Meillet later suggested that the cases where Greek and Sanskrit diverged, could be explained by de Saussure's explanation (i.e. the presence of a laryngeal with aspiratory force).¹² A second explanation was that

1928: 55–56, 1935: 105) restricted it to $*h_2$. Schindler (1969: 154) doubted the correctness of $*ponteh_1s$, suggested $*pentoh_2s$ and since Mayrhofer (1981b: 432) most scholars only accept aspiratory force for $*h_2$. The reconstruction of Greek *póntos* and Sanskrit *pánthās* is the only difference between Rix's historical grammar of 1976 and the one of 1992: in 1976 he suggested $*ponteh_1s$, but in 1992 he reconstructed $*pentoh_2s$.

⁹ Kuryłowicz (1935: 46–52).

¹⁰ Klingenschmitt 1982 (passim), Mayrhofer (2004: 42–44, 2005: 75, 113, but see also Mayrhofer 1986: 98), Isebaert (1988: 355), Peters (1993a and b), Vine (2006: 290), Nussbaum (*apud* Nikolaev 2010: 65).

¹¹ There are some scholars who remain more skeptical, such as Hill (2003: 11–12) and Clackson (2007: 42–44) who stated that the Greek picture is not as clear as it might seem.

¹² Meillet (1930: 342, 1937: 91). See also Juret (1938: 43), it is noteworthy that the book accepted the link between Greek *póntos* and Sanskrit *panthās*, but that the *Addenda et Corrigenda* stated that the words had nothing in common. Lejeune (1972: 31–32) noted that Sanskrit had *th* when Greek had *t* and ascribed some of

of Rasmussen, who assumed that there were voiceless aspirates in PIE, but that Greek also underwent the aspiratory force of laryngeals.¹³ This is also problematic, because there are instances where Greek clearly had a laryngeal but no aspiration could be found. We now proceed to the analyses of the individual examples.¹⁴

2. Greek has a t and Indo-Iranian a th and the laryngeal is certain in both language families.¹⁵

2.1 Sanskrit *tīṣṭhanti* versus Doric Greek *hístanti* (both forms mean ‘they make stand, they put’).¹⁶ The root is $*steh_2-$ and the form to which these two cognates go back is $*stisth_2enti$. Greek and Indo-Iranian treated this reduplication differently, but the important element here is that Greek showed no aspiration, whereas Sanskrit generalised the aspiration of the third person singular and plural throughout the entire paradigm. The question whether Iranian lost the aspiration after s (and n ?) or that Sanskrit alone aspirated, has to remain outside the scope of this article. The laryngeal in this root is shown by the verbal adjectives *sthítás*, Greek *statós*, Latin *státus* (all three mean ‘put, placed’) which can only be derived from PIE $*sth_2tos$. This example shows that the Indic forms had undergone laryngeal aspiration, whereas the Greek words did not. Peters, however, argued that the personal names *Orésthēs* and *Orestheús*, and the place names *Oresthásion* and *Oréstheion* indicated that Greek also had had aspiratory force of $*h_2$. He interpreted the name *Orésthēs* as $*ores-steh_2s$ ‘hav-

the Sanskrit aspirates to the presence of a laryngeal, but nevertheless stated that the rule was that Sanskrit th corresponded to Greek t .

¹³ Rasmussen (1999: 218).

¹⁴ The instances where Greek and Sanskrit differ can be found in Grassmann (1863a: 101), Meillet (1898: 276, 1910: 78–83), Hirt (1927: 244) and Lejeune (1972: 31–32). The analyses presented there differ from ours.

¹⁵ All these examples were used by Meillet (1898: 276) to prove that Greek rendered PIE $*t^h$ by t .

¹⁶ The Attic Greek form is *histāsi*. This form can be explained starting from the form *hístanti* in which assibilation of the t occurred, leading to $*histansi$ in which $*-ansi$ became $-āsi$ with loss of the nasal and compensatory lengthening.

ing his place in the mountain',¹⁷ and argued that the aspiration had come from the genitive **ores-sth₂os*. This explanation is now generally accepted.¹⁸ There are some observations to be made.¹⁹ First of all, if we suppose that laryngeals could aspirate in Greek, why is in most cases the non-aspirated form generalised and in this case the aspirated form? A second argument against the link between the *sth* in the names quoted above and the possible aspiration in the zero grade of the root **steh₂-* is the Greek adjective *dústos* 'difficult' (quoted by Peters himself as well). That adjective is a compound of **steh₂-*, namely **dus-sth₂os*, but has no sign of aspiration, in spite of the fact that **h₂* is standing in a cluster **Th₂V*. Thirdly, the names with aspirates are only found in regions where the Greek cluster *sth* was generally rendered by *st*. It is therefore possible that these names with *sth* are hypercorrections (an assumption Peters did not rule out himself). Fourthly, the name *Orestheús* does not mean 'having his place, residing in the refuge in the mountain', but 'receiving his strength from the mountains' and is (semantically) related to *sthénos* 'strength' and not to **steh₂-*. That name had a derogatory meaning (as all names in *-stheús*),²⁰ which fits the context as Orestes is not the hero in the story, but an instrument in the hand of Elektra and Athena. It is therefore at least possible (and in our opinion very likely) that the aspiration was taken from the suffix *-stheús* and not from a laryngeal.²¹ The place name *Oréstheion* cannot come from **steh₂-* either, because a noun **ores-sth₂(e)ḡom* would have become †*Orést(h)a(i)on* in Greek, as the vowel **e* would have been coloured into *a* under the influence of the contiguous **h₂*. It is more likely that *Oréstheion* is a derivation from the proper name *Orestheús*: **orestheuḡom* would regularly give *Oréstheion*. For other examples of such a derivation,

¹⁷ Risch (1974) and Leukart (1994: 157–159, 270–287, 298) used the reconstruction **ores-steh₂s* to explain the origin of the masculine *nomina actoris* in *-tās*: they assumed that after simplification of **oresstās* into *orestās*, the suffix *-tās* was extracted by false segmentation. Risch argued that the declension of *Aídēs* 'Hades' with genitive *Aídos* proved that there were parallels for the original declension of **ores-steh₂s* with a nominative **ores-steh₂s* and a genitive **ores-sth₂os*. Neither Risch nor Leukart discussed the aspirates in the personal names.

¹⁸ Mayrhofer (2004: 28–29, 42–44, 2005: 112–113).

¹⁹ See also De Decker (2011: 94–96).

²⁰ Ruijgh (1967: 193, 256–257).

²¹ De Decker (2011, 2014).

one can quote *basileion* ‘palace’ from an earlier **basileu̯jom*, derived from *basileús* ‘king’. There is another explanation for the nominative *Orésthēs* with the aspirate: the inherited accusative of the noun *Orestheús* would have been **Oresthén*, as is seen in the accusatives *basilé̃n* and *Zén* from *basileús* ‘king’ and *Zeús* ‘Zeus’. It is possible that out of that accusative a new nominative **Oresthēs* was created, a creation comparable to the Arcado-Cyprian nominative *basilés* ‘king’ which was formed on the accusative *basilé̃n*.²² The accent and declension could then have been changed under the influence of the form *Oréstēs*.²³ We believe that the deverbative and denominative derivations of **steh₂-* are the clearest examples that Greek did not undergo aspiration, while such secondary laryngeal aspiration did occur in Sanskrit

2.2 The 2nd example involves the superlative suffix, which is *-iṣṭhas* in Sanskrit and *-istos* in Greek. The superlative suffix is sometimes reconstructed as **-is-th₂os* based on the aspirate in Sanskrit.²⁴ Iranian lost the Proto-Indo-Iranian aspiration after an *s* sound and is therefore not relevant in this discussion. The problem is that assuming a laryngeal here is circular: there is no independent evidence for it as it hinges on the aspiration. The lack of the aspiration in Greek is sometimes explained by assuming a masculine form **-is-th₂os* and a feminine form **-is-teh₂*, in which Greek would have had aspiration in the masculine and neuter forms, but not in the feminine forms. The non-aspirated form would then have been generalised. This assumption is in our opinion wrong: the feminine of **-is-tos* is **-is-teh₂*, but the feminine of **-is-th₂os* is not **-is-teh₂* but **-is-th₂eh₂*, which would display aspiration (if one accepts laryngeal aspiration for Greek). As

²² Perpillou (1973: 59–64), Egetmeyer (2010: 414–417). Kühner & Blass (1892: 450) noted that the Arcado-Cyprian nouns were built as *ēs*-stems, but did not discuss the origin of this declension.

²³ A parallel development occurred in the transmission of the Homeric text: some manuscripts of *Iliad* 5,609 read *Menésthēn* as accusative of *Menestheús*, with an paroxytone accentuation. This is probably due to the influence of the *ēs*-declension, as was argued by Rau (2008, especially page 13). Rau (2008) is an extensive discussion of the accusative of the Greek *eu*-stems in Homer (without speaking out on the *Oréstēs* problem). Kirk (1990: 121) stated that *Menésthēs* was a shortened version of *Menesthēnēs* (just like *Menestheús*), and did not discuss the relation between *Menésthēs* and *Menestheús*.

²⁴ Kuryłowicz (1935: 48–49); Mayrhofer (2005: 115); Meier-Brügger (2010: 358).

a consequence, there was no environment where there would have been a non-aspirated form. The assumption of generalisation of the non-aspirated form is therefore unsustainable. There are other explanations possible: the most common one is that the sibilant caused the aspiration in some stage of Indic (or Indo-Iranian?).²⁵ The problem with this theory is that there are many counterexamples.²⁶ Another explanation is that the aspiration was expressive,²⁷ which given the nature of the superlative could be true, but there is always the question as to which words are »expressive«. In addition, the absence of aspiration in Greek remains unexplained, especially since the other »expressive words« such as *skhídzō* ‘I tear’ and *kakhádzō* ‘I laugh loudly’ display aspiration.²⁸ We would therefore suggest that the aspiration in Sanskrit was probably the result of the effects of a laryngeal and that Greek preserved the original PIE state without aspirate (although some doubt about the presence of the laryngeal remains).

It has to be noted that the theory assuming that Greek rendered PIE **st^h* by *st* (cf. *supra*) could explain these two instances.²⁹

²⁵ This was already argued for very early on (by Bopp, Benfey and others such as Kuhn (1855a: 8), and later also by Hiersche). In recent times it has been suggested also by Weiss (2009: 357). Fortson (2004: 122) reconstructed **istos* but did not address the aspiration in Indic.

²⁶ As was also pointed out by one of the anonymous referees of the journal.

²⁷ Rasmussen (1999: 220). The expressive explanation was also used by Meillet (1930, 1937: 90), Lejeune (1972: 31–32), Sommer & Pfister (1977: 136), but none of these scholars applied the expressive nature of the TA to the superlative suffix. Chantraine (1964: 108–109) reconstructed **isthos* without discussing the aspiration.

²⁸ For these expressive words, see Meillet (1930, 1935: 112). The explanation of the voiceless aspirates as expressive might be linked to the commonly accepted idea that the voiceless aspirates are more marked than the plain plosives. In recent times, doubt has been cast on this assumption, as can be seen in Vaux & Samuels (2005), who argued that the voiceless aspirates might actually be less marked than plain voiceless plosives.

²⁹ As was argued by Zubatý, Uhlenbeck, Hirt and Elbourne (cf. *supra*).

2.3 Sanskrit *-thás* and Greek *-tos* (cardinal suffix).³⁰ This suffix is probably the same as the *-thás* in the superlative suffix. If one assumes a suffix **-th₂os*,³¹ the aspiration in Sanskrit is accounted for, but as stated above, there is no independent evidence for the laryngeal. If there is a laryngeal involved, it is a strong example that proves that a Greek original plain plosive corresponding to an Indic aspirate of secondary and probably laryngeal origin. Elbourne (p.c.) argued that the Greek lack of aspiration was due to the fact that the suffix appeared in contexts where the aspiration was lost regularly (such as after a resonant) and that from those instances, the unaspirated form was generalised. The problem with this, is that it has to operate with analogical levelling in two different directions (in this instance, the unaspirated form would have been generalised, while in case of *oĩstha* ‘you know’ the aspirated variant was — cf. infra).

2.4 Avestan *paθana-* ‘broad’ and Greek *epétas(s)a* ‘I have spread’ (aorist). These forms are derived from the root **peth₂₋* ‘spread’. The present *petánnūmi* ‘I spread’ is a Greek innovation based on the aorist *epétas(s)a*. These words can be reconstructed from **peth₂₋*,³² continued by a Greek sigmatic aorist **peth_{2-s-}*,³³ by a Latin present *pandō* ‘I spread’, and in a noun **peth_{2-en-on}*, which survived in Avestan *paθana-*.³⁴ There are several Greek forms from another root **peth₂₋* ‘fly’ without aspiration, such as *pétamai* ‘I fly’ (in Pindar), *potáomai* ‘I fly’ and *pōtáomai* ‘I fly around and around’. These forms further prove the fact that laryngeals only aspirated in Indo-Iranian and not in Greek. This root might be related with

³⁰ There is also a suffix *-tama-*. The suffix *-thama-* (with aspirate) is a crossing of *-tha-* and *-tama-*, cf. Macdonell (1910: 311), Wackernagel & Debrunner (1930: 404–405, pointing out that Bopp and Pott had already noted this), Mayrhofer (1996: 179)

³¹ Kuryłowicz (1935: 48–49), Mayrhofer (2005: 111), Meier-Brügger (2010: 372–373).

³² Rasmussen (1999: 217).

³³ Harðarson (1993: 185) argued that the Greek sigmatic aorist was an innovation and that this verb originally had a root aorist. The link between Latin *pandere* and Greek *petánnūmi* was first made by Thurneysen (1883: 301–302). In this article, he also formulated the so-called *unda* rule, which stated that a sequence *tn* first became *nt* and then *nd*.

³⁴ Rasmussen (1989b: 307, 1999: 217).

the root **peth₂-* ‘spread’, via ‘spread the wings’ into ‘fly’.³⁵ If one accepts the theory of aspiration loss of the voiceless aspirate when it was preceded by a resonant or *s*,³⁶ this instance is a problem, because Greek has a plain plosive, although there is no preceding resonant or sibilant. We think that this is another example where Greek preserved the original consonantism, while the Proto-Indo-Iranian aspiration is secondary and due to a laryngeal.

2.5 Sanskrit *pr̥thús* ‘flat’, *pr̥thivī* ‘earth’, Avestan *pərəθu-* ‘flat’ and Greek *platús* ‘flat’ and *Plátaia* and *Plataiaí* (two variants of the same place name). The reconstruction of the adjective is **pl̥th₂us* and that of the place name is **pl̥th₂u̯ia*. The vocalism of *Plátaia* and *Plataiaí* proves that the laryngeal was in fact **h₂*. One can observe that Indo-Iranian has the aspiration (which has been generalised in Indo-Iranian), but that Greek has no aspiration. The lack of Greek aspiration is often explained by analogy with the form *platamón* ‘flat surface’, in which the sequence **th₂* was not followed by a vowel and could therefore not undergo aspiration.³⁷ If that were the case, the so-called laryngeal aspiration in Greek *katharós* ‘pure’ is unaccounted for, because **k̑r̥th₂ros* has no sequence **Th₂V* either (cf. infra). We therefore believe that this instance shows that Greek did not have laryngeal aspiration.³⁸ Elbourne used Greek *platús* to prove that Greek lost the Indo-European aspiration after a liquid or nasal (in this case, a sonantic liquid): PIE **pl̥t^hus* became **pl̥t^hus* in Proto-Greek, when the deaspiration of voiceless aspirates after a nasal, *s* or liquid occurred. Then the form became **pl̥tus*, after which the **l̥* vocalised in different fashions in the different dialects.³⁹ At first sight, this reconstruction seems to explain everything, but the Greek place names *Plátaia* and *Plataiaí* are a problem in this scenario, as the Greek *a* sounds (and also the Indic *i* in *pr̥thivī*) cannot be explained by Elbourne’s reconstruction (unless one assumes that it was **pl̥t^hh₂us*). Collinge denied the link between the names and the adjective in Greek, because of the lack of aspiration: he argued that

³⁵ Harðarson (1993: 185); Schirmer (2001a, 2001b). Pokorny (1959: 825–826) considered the roots to be different.

³⁶ As was argued by Zubatý, Uhlenbeck, Hirt and Elbourne (cf. supra).

³⁷ Peters (1993b: 95–98), Mayrhofer (2005: 113), Willi (2010: 255).

³⁸ De Decker (2011: §3).

³⁹ Elbourne (2011: 43).

Greek displayed laryngeal aspiration in a sequence **THV* if the plosive and laryngeal did not belong to the same syllable. This is the case in the reconstruction **p^hlth₂us*, so he denied the existence of a laryngeal in this word altogether and therefore rejected the link of Greek *platús* and Sanskrit *prthús*.⁴⁰ We, however, see no reason to deny the link between the Greek adjective, the place names and the Sanskrit words. As such, these set of cognates are a strong example of the fact that a laryngeal did not aspirate a preceding voiceless plosive in Greek. Rasmussen argued that the Greek word *pláthanon* ‘plate to flatten dough’ proved that Greek had laryngeal aspiration in this form as well,⁴¹ but this assumption is contradicted by the verb *pláttō* ‘I knead, I mould’: that verb is built by adding the *-*ǵe/o*-suffix to the root, and if the root had been **p^hlth₂-*, the verb would not have been *pláttō*, but **plátáō*. There is a (supposed) sound law that states that a laryngeal disappeared between a consonant and a yod in word internal position (the so-called Lex Pinault or Pinault’s Law).⁴² If this rule were correct, *pláttō* would be the regular outcome of **plath₂-ǵe/o-* respectively, but there are some doubts about the validity of this sound law for Greek.⁴³ First of all, there are counterexamples such as *aróō* ‘I plough’ from **h₂erh₃-ǵe/o-* and (*u*)*eméō* ‘I vomit’ from **ǵemh₁-ǵe/o-*, forms which Pinault explained as *thematische Umbildungen* of originally athematic verbs based on the aorist forms *érosa* ‘I ploughed’ and *émesa* ‘I vomited’. This would presuppose that all instances were analogically levelled out, which cannot be proved nor disproved. Secondly, there are several good examples that seem to confirm this sound law for Greek, but they can be explained differently.⁴⁴ The first example is the noun *aossētēr* ‘helper’ from **s^m-sok^wh₂i-* (literally ‘together-follower’).⁴⁵ This word is related to Latin *socius* ‘ally’ and Sanskrit *sákhā* and Old-Avestan *-haxā* (both words

⁴⁰ Collinge (1970: 77). The connection between *platús* and *pláthanon* had already been rejected by Kretschmer (1892: 435).

⁴¹ Rasmussen (1999: 217–218).

⁴² This had first been noticed by Wackernagel (1896: 81) for Indic. For PIE, see Pinault (1982), Ringe (2006: 15), Byrd (2015: 208–240 — admitting that there are still unexplained counterexamples, ftc: π).

⁴³ Lindeman (2004: 126–129), Piwowarczyk (2008 and ftc), Verhasselt (2014; §3 treats the Greek material).

⁴⁴ Piwowarczyk (ftc), Verhasselt (2014: §3).

⁴⁵ Pinault (1982: 271–272). This had already been noted by Peters (1980: 80–81).

mean ‘friend’). The indications for the laryngeal come from Indo-Iranian, namely the aspirate⁴⁶ and the absence of Brugmann’s Law.⁴⁷ If the reconstruction **sok^wh₂-i-* is correct, this would be an important example for Pinault’s Law, but there is no indication in either Greek or Latin that there had ever been a laryngeal, as Greek *aossētēr* and Latin *socius* can also be derivations of **sek^w-* without the involvement of a laryngeal.⁴⁸ In addition, the Greek verb *hépomai* ‘I follow’ (from **sek^w-o-mai*) has no laryngeal either. A second example is the comparative *meídzōn* ‘bigger’ from *mégas* (**megh₂s*). The expected comparative form would be **megh₂-ios-* and this would normally have given ***megaiōn*. At first, this seems a good example for the validity of the rule, but the loss of laryngeal does not necessarily have to be the result of the rule. As the positive was *mégas* and the superlative *mégistos* ‘biggest’, it is possible that a stem *meg-* was reintroduced to have a comparative and superlative **megiōn* ~ *mégistos* besides **kretiōn* ~ *krátistos* ‘better, best’ and **elakh-iōn* ~ *elákhistos* ‘fewer, fewest’.⁴⁹ A third example is the verb *teírō* ‘I annoy’.⁵⁰ This is generally reconstructed as **terh₁-iōh₂* and would confirm the rule, but Greek *térnon* ‘thorn’ shows that the root also existed without a laryngeal and the connection with English *thorn* indicates that the laryngealless form might have existed in PIE already.⁵¹ A fourth example is the verb *eírō* ‘I speak, declare’ from **uerh₁-je/o-*.⁵² This present is rare and might well be a later

⁴⁶ As we stated above, an Indo-Iranian voiceless aspirate can — in most cases — be explained as the result of a plain plosive and a laryngeal.

⁴⁷ This law, first formulated in Brugmann (1876: 380, note 9), states that an Indo-European **o* became *ā* in Indo-Iranian in an open syllable. That this lengthening did not happen in this word, means that the verb did not end in **k^w* followed by a vowel but in **k^w* and a laryngeal (as the laryngeal counts as a consonant). There are nevertheless several exceptions to this sound law and the literature on the topic is enormous, but the issue cannot be addressed here. The most in-depth analysis is Volkart (1994).

⁴⁸ As is argued by Verhasselt (2014, example 32 in his article).

⁴⁹ Piwowarczyk *ftc.* also assumed that the stem *meg-* was used to form the comparative and superlative.

⁵⁰ Pinault (1982: 270).

⁵¹ See Verhasselt (2014, example 30).

⁵² Pinault (1982: 270).

creation based on the future *eréō* ‘I will say’.⁵³ As there are no unambiguous examples for Pinault’s Law in Greek, it is likely that it was not an Indo-European sound law.⁵⁴ As such, *pláthanon* cannot be linked with $*pl(e)th_2-$ and is thus no evidence for the aspiratory force of laryngeals in Greek.

We have 5 (4, if one assumes that the superlative and cardinal suffix are the same) examples where a Sanskrit/Indo-Iranian *th* matches a Greek *t* and where a laryngeal can be reconstructed. These examples show that Greek preserved the Indo-European plain voiceless plosive and did not undergo aspiratory force by laryngeals, while the Indo-Iranian aspiration was secondary and caused by the presence of a preceding laryngeal.

3. Greek has a *t* and Indo-Iranian a *th*; a laryngeal can be reconstructed for Greek and Indo-Iranian, only if one accepts the sound law $*-CH.CC > *-C.CC$

The following two instances can be reconstructed with a laryngeal, only if the suggested sound law that the laryngeal was dropped in the (non-initial) sequence $*-CH.CC > *C.CC$ (Schmidt-Hackstein’s Law) is accepted.⁵⁵

3.1 Young-Avestan *iriθiieiti* ‘he dies’ (literally ‘he passes into another life’); Tocharian *litk-* ‘withdraw’; Gothic *galeiþan* ‘to go’, Old-Norse *líða* ‘to go, to die’, Dutch *overlijden* ‘die’ (this is a euphemism for ‘to die’; literally, it means ‘to pass over, to go over (into another life)’), which can

⁵³ Chantraine (1948: 267, 1968: 325–326), Frisk (1960: 470), Kümmel (2001j), Piwowarczyk (ftc).

⁵⁴ Lindeman (2004: 126–129); Piwowarczyk (ftc and 2008: 37) pointed out that the rule only applied in younger languages and in Indo-Iranian, a language where the anaptyctic vowel between laryngeal and consonant was an *i*. He wondered if this could not have triggered the deletion. See most recently Verhasselt (2014).

⁵⁵ This sound law was first posited for Indo-Iranian by Schmidt (1973) and expanded to PIE by Hackstein (2002a). The issue of the Indo-European interconsonantic laryngeals in Indo-Iranian is a longstanding issue, see Hamp (1970b), Schmidt (1973), Ravnæs (1981), Mayrhofer (1981b: 435–438, 2005: 55–56, 98–104, 119–123) only stating the facts without mentioning possible solutions, cf. the criticism by Stüber 2008: 246), Tichy (1985).

all be reconstructed as **lejt^h-* ‘to go’.⁵⁶ Persson quoted the following glosses by Hesychios: *loitós loimós* ‘*loitós* means ‘plague, destruction’, *loiteúein tháptein* ‘*loiteúein* means ‘to bury’” and *loitē táphos* ‘*loitē* means ‘grave’” and linked the Greek words to the words of the other languages.⁵⁷ If the Greek words are to be connected with this root,⁵⁸ they have gone through the same semantic evolution as Iranian (i.e. from ‘to go’ into ‘to die’) and there is nothing conclusive that speaks against this evolution. The reconstruction, on the other hand, is more problematic. Rasmussen argued that a reconstruction **lejth₂-* was impossible because of the Tocharian, as the reconstruction with laryngeal would have given ***litāk* and reconstructed **lej^h-*,⁵⁹ and reconstructed Tocharian *litk* from *lit^h-sĕ-*.⁶⁰ Kümmel reconstructed **lejt-* without a laryngeal, because the Tocharian form ruled out a laryngeal, but with a plain plosive (and not an aspirate), as he assumed that the Avestan fricative originated in the forms where the *t* stood before a resonant.⁶¹ This is possible, but cannot be proved nor disproved. A third possibility is to reconstruct **lith₂-sĕ-* and to assume that the laryngeal was dropped in the (non-initial-syllable) sequence **-CH.CC*. If this reconstruction is correct and the sound law is valid, the difference between Greek *t* and Iranian *θ* would be explained, as the Greek *t* and Iranian *θ* would come both from a sequence **th₂* with Indo-Iranian having undergone aspiration and Greek having preserved the plain plosive. In favour of the reconstruction **lith₂-sĕ-* and the validity of the sound law (for Tocharian) is the Tocharian verb *plātĕ-* ‘to come forth, hervortreten’, from **pl^hth₂-sĕ-*. There are, nevertheless, some questions about the validity of this sound law for PIE:⁶² firstly, some of the examples of this sound law

⁵⁶ Pokorny (1959: 672), de Vries (1961: 354), Kümmel (2001e). Neither Pokorny nor Kümmel mentioned the Dutch word; the other Indo-European cognates were not mentioned in van Veen & van der Sijs (1997: 631). The Tocharian example was discussed in Hackstein (2002a: 8–9).

⁵⁷ Persson (1912: 222), Pokorny (1959: 672), Frisk (1970: 136).

⁵⁸ Chantraine (1974: 646) called the connection *tout cela douteux* and neither Rasmussen nor Kümmel (2001e) mentioned the Greek words.

⁵⁹ Melchert (1977: 116), Rasmussen (1989a: 155, 1999: 221 — the original dates back to an article from 1987).

⁶⁰ Melchert (1977) showed that the Tocharian *-tk*-verbs could be reconstructed as containing **-t-sĕ-*.

⁶¹ Kümmel (2001e).

⁶² Van Beek (2011a: 164–165).

might be explained by other sound laws (such as the so-called »Saussure Effect«);⁶³ secondly, as many examples of the sound law are from Tocharian and involve univerbations with $*d^h h_1-$ (the zero grade of the stem $*d^h e h_1-$ ‘to put’) and the iterative suffix $*-s\acute{k}-$, the laryngeal loss in that environment might be due to some kind of loss of laryngeals in compounds;⁶⁴ thirdly, there are several counterexamples in Latin and Greek,⁶⁵ such as Greek *térettron* ‘borer’ from $*terh_1.trom$ and Latin *tenebrae* ‘darkness’ from $*temh_1.sr-$, which lead Byrd to reformulate the law as $*-PH.CC > *-P.CC$, as not all counterexamples could be explained by analogy.⁶⁶ In spite of the fact that the validity of »Schmidt-Hackstein’s Law« has not been established yet, the reconstruction $*leijth_2-$ offers the best solution for all words attested.

⁶³ In its limited version, the Saussure Effect (SE, sometimes also called Saussure-Hirt) states that in a sequence #HRORC or CORHC the laryngeal was lost. This was first noted by de Saussure in 1905 (quoted in Bally, Séchehay & Gautier 1922: 582), without linking it to laryngeal loss, by Meillet (1908: 68) and by Hirt (1921: 185–186), who linked it with »schwa«. See Rasmussen (1989b: 175–230), Hackstein (2002a: 1), Nussbaum (1997), Weiss (2009: 113), Yamazaki (2009), Byrd (ftc: ρ). For a critical assessment, see van Beek (2011) and Pronk (2011, cf. *infra*). One example (taken from Hackstein 2002a: 14–15) that could be explained by the Saussure Effect, is Latin *cūdere* (from $*caudere$ ‘to hit’, from $*kouh_2d^h h_1e/o-$, in which the laryngeal could have been dropped by the Saussure Effect rather than the $*-CH.CC > *-C.CC$ rule (if the word is to be reconstructed from the e grade, the sound law would have operated).

⁶⁴ Weiss (2009: 113) observed (in another context and without addressing this sound law) that »there might have been a more general rule of laryngeal loss in non-initial syllables of ‘long’ forms« and referred to the Latin grain god *Cōnsus* from $*kom-d^h h_1tos$ (literally ‘put together’). The examples quoted in Hackstein (2002a: 10) seem to point in the same direction. For some further evidence for laryngeal loss in compounds, see Kuiper (1961 for Sanskrit), Normier (1980: 276), Neumann (1992: 75–80), Meier-Brügger (1995: 50–52), Fritz (1996: 7).

⁶⁵ Hackstein (2002a: 19) only briefly mentioned them but did not explain them, see also van Beek (2011a: 164–165). Some exceptions can be explained by analogy, but not all of them. For a list of Indo-Iranian instances of laryngeal deletion, one is referred to Mayrhofer (2005: 55–56, 98–104, 119–123), without specifically addressing the issue $*-CH.CC > *-C.CC$ (for which he was criticised by Stüber 2008: 246).

⁶⁶ Byrd (2015: 107; ftc: O); P stands for any plosive, C for any consonant, R for any resonant (l, m, n, r, j and ŋ), H for any laryngeal.

3.2 Sanskrit *śnathī*- ‘to stab, to pierce, to strike down’, Avestan *snaiθiš* ‘weapon’; Greek *kénsai* ‘having pricked’ (infinitive aorist), *kéntron* ‘any sharp point’, *kontós* ‘pole, crutch’,⁶⁷ *kentéō* ‘I pierce’; OHG *hantaz* ‘spitz’; Latvian *sīts* ‘Jagdspieß’.⁶⁸ These words are generally reconstructed from two different roots: **k̂neth₂-* ‘stoßen, stechen’ for Indo-Iranian and **k̂ent-* ‘stechen’ for the others,⁶⁹ although they mean the same. Mayrhofer and Kümmel thought that the Indo-Iranian words had no cognates outside Indo-Iranian,⁷⁰ while other scholars did not discuss them at all.⁷¹ Both roots mean the same and are very close in form. The question therefore is if the words might not have belonged to one and the same root after all. If they have, the question is how the root has to be reconstructed: **k̂enth₂-* / **k̂ent^h-* or **k̂neth₂-* / **k̂net^h-*,⁷² with *Schwebeablaut*.⁷³ The Indo-Iranian aspirate can only be explained by either a laryngeal or by an inherited aspirate, the Baltic and Germanic words allow for both, but the Greek is more problematic. The Greek present *kentéō* is not attested before the 5th century BC, but the infinitive *kénsai* is already attested in Homer.⁷⁴ This aorist form excludes a laryngeal, because a form **k̂enth₂s-ai* would have given ***kentasai* and not *kénsai*. The only possibility to explain these words in a laryngealistic fashion is to start from a root **k̂e/onth₂-* which would be visible in *kontós* and from which a **-trom* noun would have been derived. One would then have to suppose that Schmidt-Hackstein operated in **k̂enth₂.trom* and that it became **k̂ent.trom*, from which a root **kent-* was

⁶⁷ LSJ: 978 also translated ‘punting pole’, but the 1996 supplement stated that the translation ‘punting pole’ should be struck.

⁶⁸ The linking was made by Grassmann (1877: 1414–1415) and Hirt (1927: 244).

⁶⁹ Kümmel (2001b, 2001c).

⁷⁰ Mayrhofer (1964: 380–381, rejecting the possible connections outside Indo-Iranian, 1996: 669), Kümmel (2001c).

⁷¹ Pokorny (1959: 567), Frisk (1960: 820–821), Chantraine (1968: 515–516), Görtzen (1998: 364).

⁷² Anttila (1969: 140, without mentioning a laryngeal).

⁷³ Clackson (2007: 227) defines *Schwebeablaut* as follows: »term for a specific type of ablaut alternation hypothesised for PIE, in which the place of the ablaut vowel *e* in a root alternates between a position before and after one of the sounds **r*, **l*, **m*, **n*, **i* or **u*«. The standard book on this is Anttila (1969).

⁷⁴ Frisk (1960: 820), LSJ: 969. The Homeric instance is *Iliad* 23,337. Seiler & Capelle (1889: 325) stated that the aorist was taken from the ‘shorter’ stem, but did not elaborate any further. Nordheider (1991) also started from the stem *kent-*.

derived for the creation of the aorist *kénsai*. If Chantraine is right in positing that the verb forms and not the noun *kéntron* were the basis,⁷⁵ the Greek forms exclude $*\hat{k}enth_2-$ and only the reconstruction $*\hat{k}ent^h-$ seems possible. If this is the case (and this cannot be excluded, given the fact that the existence of the sound law $*-CH.CC > *-C.CC$ has not been conclusively established yet for Greek and Latin, cf. supra), *kontós* (and also *kentéō*) would be a good example for the theory that a sequence $*nt^h$ became *nt* in Greek, but the noun *pénthos* ‘suffering’ from $*k^w\text{ent}^h-$ (cf. infra) is a strong counterexample. The connection between the Indo-Iranian forms and the other languages is no longer accepted, but it would be a violation of Ockham’s Razor to separate the Indo-Iranian forms from those in the other languages, especially since meaning and root form can be reconciled, in spite of the (problematic) absence of an aspirate in Greek.

4. Greek has a *t* and Indo-Iranian a *th*; a laryngeal can be reconstructed for Indo-Iranian, but is not certain for Greek

In the following instances, the Indo-Iranian aspirates are almost certainly caused by the effects of a laryngeal, but the Greek words offer no absolute certainty on the presence of a laryngeal.

4.1 Sanskrit *pánthās* (nominative), *pathás* (genitive), Avestan *pantā* (nominative) and *paθō* (genitive), Old Persian *p[a]θim* (the Indo-Iranian words mean ‘road’); Greek *póntos* ‘sea’, *pátos* ‘road’; Latin *pons*, gen. sg. *pontis* ‘bridge’; OCS *potb* and Armenian *hun*, gen. sg. *hni* ‘road’. The only agreement about this set of words is the fact that they are related.⁷⁶ There are several problems in almost any reconstruction: a) how can the inflection of the Indo-Iranian nouns be compared to that of Greek, Latin, Slavic and Armenian; b) how can the aspiration in Indo-Iranian be explained; c) what was the colour of the stem vowel and d) what was the exact laryn-

⁷⁵ Chantraine (1968: 515).

⁷⁶ One can refer to all the different reconstructions that have been made to explain this noun in Mayrhofer (1996: 81–83). We hope to come back to this word later. The latest treatments of this word (Beekes 1989, Steer 2011 and De Decker 2012) all deal with the supposed *i*-stem forms of this noun in Old-Persian, Latin, Slavic and Armenian.

geal, if there was a laryngeal to begin with. The non-laryngealistic reconstruction was **pont^hōis* which became **pont^hōs* with the loss of the second element of a long vowel diphthong. It assumed that Greek rendered PIE **t^h* by *t*, that **póntōs* became *póntos* in Greek and that the other languages built their paradigms on the zero grade of the **ōi* diphthong.⁷⁷ This reconstruction does not have to address the nature of the laryngeal and explains the inflection in most of the languages, but it is problematic for the Greek and Indo-Iranian declension. Another problem in this scenario is that there are instances where Greek and Indo-Iranian both have *th* which renders the assumption of a Greek treatment of PIE **t^h* as *t* less likely (cf. *infra*). Initially, the common reconstruction was that by Pedersen, who reconstructed a nominative **ponteh₁s* and a genitive **pñth₁es*.⁷⁸ The aspiration in the Indo-Iranian forms can be explained by starting from the genitive, where the plain voiceless plosive came into contact with the laryngeal and was followed by a vowel. In Sanskrit the aspirate from that case was extended to all other cases where there was no cluster **THV*; the Avestan paradigm, however, preserved the exact distribution of the aspiration caused by the laryngeal: in the nominative there is no contact between the laryngeal and the plain plosive, hence it has no aspiration, but in the genitive there was contact and consequently, the Indo-European *tenuis* was aspirated.⁷⁹ Since Schindler the generally accepted laryngeal reconstruction is **pentoh₂s*,⁸⁰ but this is problematic because all the cognates outside Indo-Iranian display reflexes of PIE **o* rather than **e* in the root. Although we prefer to follow Pedersen, Beekes, Adams and Rasmussen (and initially Mayrhofer)

⁷⁷ Schmidt (1883: 407, 1885b), Bezenberger (1907).

⁷⁸ Pedersen (1926: 52–54).

⁷⁹ Some scholars (Bartholomae 1885: 130, 1889: 9–10; Zubatý 1892a: 1–3; Meillet 1908a: 78, 1915: 54 and Elbourne 2000: 16–20 and 2012) argued that there was already an aspirate in Proto-Indo-Iranian, and that Avestan lost the aspiration after *n* just as it lost the aspiration after *s* (see above), but this is contradicted by the existence of Avestan *zqθa-*, where the nasal is followed by an aspirate (as elaborated by Kuryłowicz 1927: 22 and 1935: 46–47). Elbourne (2000: 23–25) countered this by suggesting that the Iranian sound law **nt^h > nt* did not operate in this word because at the time when the sound law operated, the word was still **janH-t^ha-* and did not have the environment **nt^h*. Alternatively, he suggested that the aspirate could also be explained by the fact that the suffix **-t^ha-* was productive in Iranian. This does not affect the issue that we are addressing here.

⁸⁰ Schindler (1969: 154).

that the root vowel was *o*,⁸¹ and would with Adams reconstruct rather **pontoh*_{1/2s},⁸² it is equally possible to explain the declensions in the languages outside Indo-Iranian from a thematic *tomos* noun **pont-o-s* for Greek and a root noun **pont-* for the other languages. If the *i* in Latin *pontifex* is not secondary and the result of an internal Latin evolution, it could be an indication that the laryngeal was preserved outside Indo-Iranian.⁸³ If the laryngeal was preserved outside Indo-Iranian, Greek *pátos* is important in this discussion: it is built as a thematicisation of the zero grade, namely **p_hth₂os*, but has a plain plosive and not an aspirate, which is an indication that Greek did not undergo laryngeal aspiration. The assumption that Greek lost the aspiration after a nasal, is contradicted by *pénthos* from **k^went^h-* (cf. *infra*). As it cannot be ruled out that languages outside Indo-Iranian continued forms without a laryngeal, the probative value of this instance is limited: it only proves aspiratory force of laryngeals in Indo-Iranian. In any case, the Indo-Iranian aspirate is secondary, while the Greek plain plosive continues the original Indo-European consonant.

5. Greek has a *t* and Indo-Iranian a *th*; a laryngeal **h*₂ is possible in Indo-Iranian, but not in Greek

5.1 Sanskrit *ásthi*, gen. sg. *asthnás*; Greek *osté(i)on*,⁸⁴ Latin *os*, gn. sg. *ossis*; Hittite *ḫaštāi* (all words mean ‘bone’). There are two problems for these words: a) what was the original declension and b) was there a laryngeal involved? If one starts from one and the same declension for all words, the aspiration in Sanskrit is not readily explained, as assuming **h*₂ for the proto-form is excluded by Greek: a form **h₂osth₂₋* would have given Greek **ostá(i)on* (after thematicisation) and Latin **osta*, although such an aberrant neuter singular form would probably have been remod-

⁸¹ Pedersen (1926: 52–54 — he already suggested this in 1893 but did not explain the aspiration at that time), Mayrhofer (1953: 210–211, 1978: 54), Beekes (1969: 179).

⁸² Rasmussen (1987: 81 = 1999: 216), Adams (1984: 232, 1999: 19), we therefore would like to revise our opinion of De Decker (2012), where we reconstructed **ponteh_{1s}*.

⁸³ De Decker (2012).

⁸⁴ In Attic Greek, this form is contracted into *ostoûn*.

elled in Latin anyway.⁸⁵ The lack of assibilation in Hittite *ḫaštāi* could point at the presence of a laryngeal: if the Indo-European word had been an inherited *-tem* **h₂ostei/i-*, the expected Hittite form would have been **ḫašzāi*, as **-ti* became *-zi* and **-tHi* remained *-ti* as can be seen in *tūja-* ‘step, take one’s stand’ from (*transponat*) **(s)th₂-je/o-* and *eš-zi* from **h₁es-ti*.⁸⁶ While this certainly appears convincing, it is not entirely conclusive. Sturtevant and Kronasser argued that PIE **-ti-* only assibilated, if it was not preceded by *s*.⁸⁷ Joseph, following Sturtevant, showed that the lack of palatalisation in Hittite was not incompatible with the reconstruction **h₂ostei-* or **h₃estei-*,⁸⁸ and explained the ending *-zi* in the 3rd singular verbal form *ešzi* as analogy with all the 3rd person endings from all other verbs without a preceding *š*.⁸⁹ As such, the absence of assibilation is no argument for a laryngeal, but the problem of the Sanskrit aspirate remains. There are four possible solutions, two laryngealless and two laryngealistic solutions. First, one could argue that an Indo-European basis for the nouns was **h₃est(e)i-* or **h₂ost(e)i-*, which would be continued in Hittite (where it is an *i*-stem), in Greek (where it was thematicised, and in Latin (where it became an neuter *i*-stem, as would be proved by the not entirely conclusive genitive plural *ossium*). In that case the Sanskrit declension would have been the only remnant of an original heteroclitic declension with extension *-i/n-*, and the aspiration in *ásthi* would be due to the presence of a preceding *s*.⁹⁰ Explaining the aspiration as »expressive« in nature (as was done by Kellens)⁹¹ seems unnecessary. The problem is that the ‘sibilant-aspiration-theory’ has many exceptions. Second, one could argue that the original form had a **t^h* in PIE and that Greek rendered it by *t* (either because it

⁸⁵ Schrijver (1991: 110–111).

⁸⁶ Joseph (1984: 1), Kimball (1999: 290).

⁸⁷ Sturtevant (1933: 126, 1936: 47), Kronasser (1966: 52), Joseph (1984), Kimball (1999: 289).

⁸⁸ The issue of the Hittite and Anatolian treatment of initial **h₃* and **h₂o* remains outside the scope of this article. There is no agreement on the issue. The reader is referred to Melchert (1987), Ofitsch (1995), Zeilfelder (1997) and Kloekhorst (2006, 2008: 7 and *passim*) for different opinions.

⁸⁹ Joseph (1984: 1). Kimball (1999: 289) agreed with Joseph’s analysis of the assibilation (cf. *supra*), but nevertheless suggested **h₂ost(H)ei/i-* as etymology (1999: 142).

⁹⁰ Hiersche (1964: 59–60), Joseph (1984: 4–5).

⁹¹ Kellens (1974: 336).

always did so or because the $*t^h$ was preceded by s). Third, one could argue that the Vedic Sanskrit preserved the original heteroclitic declension of $*h_2osth_2/n-$, and that the other languages simplified the declension.⁹² The problem with this suggestion is that this does not really explain the Latin and Greek declensions. If they were simplified, why is the Latin form *os* and not e.g. *ossum*? If a noun $*h_2osth_2/n-$ were to be thematicised in Greek, would one not have expected a Greek form $*oston$ instead of one in $-ei-$? Fourthly, one could follow Kloekhorst and reconstruct $h_3esth_1-\bar{o}i/i-$,⁹³ with the assumption of aspiratory force for $*h_1$.⁹⁴ As evidence for this aspiratory force, the active 2nd person plural ending $-tha$ in Sanskrit and $-te$ in Greek is quoted (cf. infra), besides *pánthās* (cf. supra). This cannot be ruled out and there seems to be surprisingly little evidence against this assumption (but it is not *communis opinio*).⁹⁵ Moreover, it would fit the declension of the Greek word (the exact nature of the laryngeal is irrelevant for Latin, as all laryngeals became a in Latin anyway).⁹⁶ If one restricts aspiratory force to $*h_2$, there is no possibility to reconstruct a single paradigm for Greek, Hittite and Indo-Iranian. In that case, Indo-Iranian

⁹² Pedersen (1893: 255), Hamp (1960: 211, 1970a: 141 without clear indication as to which laryngeal, 1984: 197–199), Ravnæs (1981: 257–258); Mayrhofer (1992: 150, but on page 151 he was more skeptical), in his work on the treatment of the Indo-European laryngeals in Indo-Iranian (Mayrhofer 2005: 112), he admitted that there was no evidence outside Indo-Iranian that pointed at a laryngeal.

⁹³ Kloekhorst (2008: 379–380), a similar argument is made by Lubotsky in his forthcoming etymological dictionary.

⁹⁴ Kloekhorst (2008: 325).

⁹⁵ Since Kuryłowicz (1927 and 1928), Schindler (1969: 154) and Mayrhofer (1981b: 432), aspiratory force is only accepted for $*h_2$. See Mayrhofer (2005: 115). Stang (1949) argued that $*h_1$ and $*h_2$ had aspiratory effects in Indo-Iranian, while $*h_2$ had it in both Indo-Iranian as Greek.

⁹⁶ Latin *os* is generally (even by those who do not adhere to the laryngeal theory, or doubt a laryngeal in this paradigm) explained from $*oss$, which comes in turn from $*ost$ (Zubaty 1892a: 6; Sommer 1914: 278; Walde & Hofmann 1950: 226; Meid 1964: 235). Steinbauer (quoted in Schrijver 1991: 1110–111) argued that the original Latin nominative was $*ost$, to which an s was added. As parallel for the unusual concept of a sigmatic nominative within neutres, Steinbauer pointed at the active present participles of which the neuter nominative singular ends in $-ns$. This $*osts$ then regularly became $*oss$, and then *os*. The oblique cases with *oss-* were based on the nominative $*oss$ (as had been suggested already by Walde & Hofmann and by Sommer).

would have preserved an original heteroclitic paradigm and all other languages would have simplified the declension; if one attributes aspiratory force to $*h_1$ as well or explains the aspirate in Sanskrit to the preceding sibilant, a single paradigm for Greek, Hittite and Indo-Iranian can be reconstructed.

This example only proves that the Sanskrit aspirate is secondary.

5.2 The following example could be put in this category or in the category below ('a laryngeal is excluded in Greek') and is the active 2nd plural ending: *-tha* in Sanskrit, *-θā* in Avestan and *-te* in Greek. Several explanations have been adduced to explain this ending. In the non-laryngealistic theory, it was argued that the original ending was $*-t^he$ and that the Greek ending *-te* proved that Greek rendered PIE $*t^h$ by *t*. Elbourne (p.c.) elaborated further by pointing out that in certain conditions the ending was *-te* was generalised and in others the ending *-the*, but that eventually *-te* became the normal ending. We are skeptical towards this assumption, especially because we do not understand why Greek would have generalised the non-aspirated variant in this instance, while it would have generalised the aspirate form in the 2nd person singular of the perfect. A laryngeal explanation cannot account for both endings either, as a reconstruction $*-th_2e$ is excluded by Greek. Weiss suspected that the Sanskrit ending went back to $*-th_2e(s)$ and that this ending originated in the dual.⁹⁷ In a personal communication, he elaborated further and explained that the secondary ending was probably $*-te$ and the primary ending $*-th_2es$. In that scenario, Greek generalised the secondary ending for all forms, while in Sanskrit the primary endings were preserved. Tichy also suggested that the aspiration originated in the dual. She reconstructed $*-th_2oh_1$ for the 2nd person dual and $*-toh_1$ for the 3rd dual. The ending of the 2nd plural and the 3rd dual were both $*-tes$. To distinguish them, the 2nd person plural ending was changed into *-tha*.⁹⁸ In order to reconcile both the Indo-Iranian and the Greek endings, Stang suggested an ending $*-th_1e$ for the second person plural and $*-th_1es$ for the second person dual, in which only Indo-Iranian would have received aspiration: he believed that $*h_2$ aspirated in both Greek and Indo-Iranian, while $*h_1$ caused aspiration in Indo-Iranian

⁹⁷ Weiss (2009: 386).

⁹⁸ Tichy (2009: 90–92).

alone.⁹⁹ The reconstruction $*-th_1e$ has been accepted by some scholars,¹⁰⁰ but since Mayrhofer (1981b) it is no longer generally believed that $*h_1$ could aspirate. As we stated elsewhere already, the evidence against the aspiratory force of $*h_1$ is rather slim. The only certain example is $*peth_1-$ ‘fall’. In addition, many roots are reconstructed with $*h_2$ only because of an aspirate in Indo-Iranian, which makes the reasoning circular.¹⁰¹ Gray suggested that the aspiration was a sign of a 2nd person ending, and the aspiration was therefore extended to the 2nd person in the plural.¹⁰² Given the fact that the aspiration is the only distinction between the 2nd and 3rd person primary dual ending in Indic and Iranian, Gray’s suggestion might be right. In that case, the ending would be $*-te$ and no laryngeal would be involved. This has the ‘advantage’ that the aspiration can be explained as inner-Indo-Iranian innovation and that one does not have to assume aspiration by $*h_1$ (although there is no compelling reason to exclude this *a priori*), but the problem is that it does not explain why the aspiration was used as 2nd person sign in the primary endings but not in the secondary. All the above mentioned scenarios have their weak points, but it seems clear that Greek preserved the original non-aspirated situation, while the aspirate of Indo-Iranian is the result of a secondary evolution within (Proto-)Indo-Iranian. We personally believe Gray’s scenario to be more likely, and are skeptical about the endings $*-th_2e$ and $*-th_1e$. A last remark has to be made about the endings $-sthe$ and $-the$ in three Homeric perfect forms, namely *pépasthe* in *Iliad* 3,99 and *péposthe* in *Odyssey* 23,53 (both forms mean ‘you (pl.) suffered’) and *egrégorthe* ‘you (pl.) are awake’ in *Iliad* 7,371 and 18,299. They have an ending $-sthe$ which makes them look like middle forms.¹⁰³ The plural of the active perfect is built on the zero grade of the root (as are the middle forms). In later Greek this ablaut pattern is levelled

⁹⁹ Stang (1949).

¹⁰⁰ Beekes (1969: 179), Kortlandt (1981: 124), Lubotsky *fitc s.u. panthās*.

¹⁰¹ Already Kuryłowicz (1935: 48–49) admitted that several instances of aspiration occurred in instances where $*h_2$ was not corroborated by independent evidence, although he initially argued that all Indic cases of *th* originated in $*th_2$ (1928: 56).

¹⁰² Gray (1930: 238). Brugmann (1916: 639) suggested that the aspiration in the 2nd dual and plural endings were related and both an inner-Indic innovation, but did not try offer an explanation.

¹⁰³ Smyth & Messing (1956: 178), Hackstein (2002b: 247–253) is the only recent detailed analysis of these forms.

out, but Homer still observed the original situation. In case of *pépasthe* and *péposthe* the original form was *transponat* $*k^w ek^w \eta^h te$. This form became in PIE already $*k^w ek^w \eta^h ste$ and yielded Proto-Greek $*k^w ek^w \eta^h sthe$. In that form, the cluster $*-thste$ developed into $*-tsthe$ with spreading of the aspirate to the final plosive of the cluster and afterwards the first dental disappeared before the sigma yielding $-sthe$. A parallel for such a spread of the aspiration can be seen in *páskhō* ‘I suffer’, from an earlier $*p\eta^h skhō$ which in turn goes back to Proto-Greek $*k^w \eta^h skō$ and to PIE $*k^w \eta^h s\hat{k}-e/o-$,¹⁰⁴ and in *léskhē* ‘bed’ from $*lekhs\hat{k}ā$ which came from *transponat* $*le\hat{g}^h sheh_2$.¹⁰⁵ The two forms *pépasthe* and *péposthe* can be explained as zero grades: the form *pépasthe* with *a* is the normal treatment of Proto-Greek $*\eta$,¹⁰⁶ whereas *péposthe* displays the Aeolic treatment.¹⁰⁷ It is also possible, though, that *péposthe* received its *o* from the singular forms where the *o* vocalism was inherited.¹⁰⁸ For the form *egrégorthē* the explanation is less straightforward. Wackernagel suggested that this form was either built on a non-attested 2nd singular $*egr\acute{e}gortha$ which would have created a form *egrégorthē* after *pépasthe*.¹⁰⁹ Some scholars explained this form as a middle form, with extension of the ablaut grade from the active.¹¹⁰ This form can also be explained as an active form, although it cannot be explained from an ending $*-te$. To explain this form, one would have to assume that there was an ending $*-ste$: it is possible that from forms such as *iste* ‘you (pl.) know’ (from $*\mu idste$ coming from an earlier $*\mu idte$) an ending $*-ste$ was erroneously extracted which then became productive and was used in other verbs as well, creating a form $*egr\acute{e}gorste$ in which the cluster $*-rste$ was simplified. It is also possible that the influence

¹⁰⁴ For the reconstruction with $*\eta^h$ cf. infra.

¹⁰⁵ The aspiration analysis was made already by Pott (1883: 118–189), Walde (1897: 483), Brugmann (1900: 132) and Prellwitz (1905: 265–266), see also Hamp (1993), Hackstein (2002b: 252).

¹⁰⁶ Monro (1891: 24), Kühner & Blass (1892: 239).

¹⁰⁷ Chantraine (1948: 25), but he did not rule out that the *o* might have been caused by analogy with the the vocalism from the singular *pépontha* ‘I suffered’.

¹⁰⁸ Wyatt (1969: 112).

¹⁰⁹ Wackernagel (1895: 31–32).

¹¹⁰ Kühner & Blass (1892: 239), Wackernagel (1895: 31–32 — he suggested both an active as a middle analysis, but stated »letztere erklärung (sc. the analysis of *egrégorthē* as middle, FDD) ist mir wahrscheinlicher«, 1897: 32), Smyth & Messing (1956: 694), Kirk (1985: 287).

of an ending *-stha* from *oĩstha* played a role in the insertion of the *s* in this verbal form.¹¹¹ In his *Grammaire homérique* Chantraine argued that the original form was **egrēgorte* without aspiration, but that a no longer attested imperative **egrēgorthi* caused the aspiration to be transferred onto the 2nd plural form.¹¹² Hackstein reacted to that by stating that there were no certain parallels for such an evolution,¹¹³ although Frisk and Ruijgh used a similar argument to explain the aspiration in *oĩstha* as being caused by the aspirate in *ĩsthi* ‘know!’ (cf. infra). An important parallel for the explanation by Chantraine, Frisk and Ruijgh are the active perfect imperatives 3rd singular *anōkhthō* ‘let him order’ and 2nd plural *ánōkhthe* ‘you (pl.) order!’ from *ánōga* ‘I order, I proclaim’, which have the aspirate *khth* from the 2nd singular imperative *ánōkhthi* ‘order!’. An earlier explanation by Chantraine was that the perfect reduplication stem *egrēgor-* received a *-th*-extension, because it referred to an accomplished state as in forms such as *plē-th-ō* ‘I am full’, from the root **pleh₁-* ‘full’.¹¹⁴ As evidence, Chantraine pointed at the 3rd person plural form *egrēgórthāsi* ‘they are awake’ which is a form based on the reduplication and a *-th*-extension. If such root *egrēgorth-* was used for a 2nd person plural, it would have given **egrēgorthte* which would also have given *egrēgorthe*. To explain *egrēgorthe* Chantraine’s original scenario is more likely than the one from his *Grammaire homérique* but the explanation of the middle form with the stem of the active perfect cannot be ruled out either. In any case, the forms *egrēgorthe*, *pēpasthe* and *pēposthe* cannot be used as evidence for an active 2nd plural ending **-the* in Greek.¹¹⁵ In short, we believe that this is

¹¹¹ Hackstein (2002b: 248); in a personal communication Michael Meier-Brügger explained that he believed that the endings *-stha*, *-sthe* and *-sthai* in Greek influenced one another and lead to the spreading and creation of a separate 2nd person active ending *-stha* in Greek. He also believed that *-sthe* and *-sthai* might have played a role in the aspirate of *-stha*.

¹¹² Chantraine (1948: 429).

¹¹³ Hackstein (2002b: 248).

¹¹⁴ Chantraine (1932: 86–88).

¹¹⁵ This was first suggested by Bartholomae (1883: 48, 1895: 205) and Westphal (1871: 52, suggesting that the ending was **-tue* and that this yielded either *-te* or *-the*). It was already met with skepticism by Curtius (1881: 185–186) and Brugmann (1900: 350, 1916: 623). This ending was not mentioned in Meillet (1898: 276), Lejeune (1972: 31–32), Duhoux (1992: 477–478) or Elbourne (1998, 2012). Chantraine (1964: 299) noted the difference, but did not discuss it.

another instance of an Indo-Iranian aspirate with secondary origin, while the Greek form preserved the original non-aspirated form (either by laryngeal origin, in which case one would have to assume aspiratory force for $*h_1$ or as inner-Indo-Iranian indication for the 2nd person plural).

6. Indo-Iranian has an aspirate, Greek has not and a laryngeal is excluded

The following example has an aspirate in Sanskrit, but a plain plosive in Greek and the evidence of the other languages explicitly excludes a laryngeal regardless of colour (i.e. $*h_1$, $*h_2$ and $*h_3$ are all excluded).

6.1 Sanskrit *sthágati* and *sthágayati* ‘cover’; Greek *stégō* ‘I cover’, *stégos* and *tégos* ‘roof’; Latin *tegō* ‘cover’; Old-Icelandic *þak* ‘roof’; Lithuanian *stógas* ‘roof’. These cognates give the impression to be straightforward,¹¹⁶ and to point at a PIE form $*steg-$ with *s mobile*, in which the preceding sibilant caused the aspiration in Sanskrit, as the presence of a laryngeal is excluded.¹¹⁷ Kuiper, however, observed that the Sanskrit forms *sthágati* and *sthágayati* were only attested among grammarians and therefore assumed that they were borrowings, but did not elaborate as to **why** this would have been the case.¹¹⁸ A possible argument is that these two attested Sanskrit forms were at odds with the palatalisations of Indo-Iranian. If the root $*steg-$ had indeed been used here, the Proto-Indo-Iranian forms would be $*steg-e-ti$ and $*steg-e-je-ti$ and those two forms should have given $**st(h)ajati$ and $**st(h)ajayati$ in the same fashion as $*(H)ieug-e-je-ti$ yielded *yojayati* ‘he makes (someone) to yoke (something)’.¹¹⁹ This observation is now almost generally accepted and the Sanskrit cognate is no longer mentioned when the root $*steg-$ is discussed.¹²⁰ We are aware that Sanskrit usually generalised the palatalised form and not the non-palatalised form, but we still do not think that the

¹¹⁶ Uhlenbeck (1898: 345–346), Pokorny (1959: 1013–1014), Lejeune (1972: 32), van Veen & van der Sijs (1997: 202).

¹¹⁷ Hoenigswald (1965: 95).

¹¹⁸ Kuiper (1954: 249), followed by Beekes (2010: 1393 — without explanation).

¹¹⁹ Chantraine (1974: 1046).

¹²⁰ Kümmel (2001h); Weiss (2009) did not mention the Sanskrit cognate when discussing the Latin words *toga* and *tegere*.

objections made by Kuiper are strong enough to discard the Indo-European origin of the Sanskrit word. First of all, the meaning and the form of the root are too similar to be unrelated. Secondly, the fact that the forms were quoted among grammarians, could indicate that the words had some special feature and the lack of palatalization could be that special feature. We also would like to address the reconstruction with PIE $*t^h$ for these forms. The Greek forms would be a good illustration for the theory that Greek rendered PIE $*t^h$ by t but the reconstruction $*(s)t^h eg$ as basis for the Latin form is problematic, because word initial PIE aspirates are rendered by fricatives in Italic.¹²¹ Latin, however, has a plain plosive, and as such this reconstruction seems excluded as well. A reconstruction $*sth_2 eg-$ (if such a root form was allowed in the first place) would require aspiratory force of $*h_1$ and would mean that the deverbative adjective would be $*th_1 gtós$ ‘covered’ and this should give $*tagtus$ in Latin and then with Lachmann’s Law $*tāctus$, but the attested form in Latin is $tēctus$ and as such, a laryngeal is excluded. As a conclusion, we agree with Hoenigswald who reconstructed $*steg-$ and ascribed the Sanskrit aspiration to the preceding s .¹²² As such, this would be another instance where the difference between Sanskrit th and Greek t can be explained by the assumption that Greek preserved the original state and Sanskrit innovated.

7. Greek and Sanskrit have an aspirate and a laryngeal $*h_2$ is possible.

The next examples are is one of the few instances where there is nothing that rules out aspiratory force of a laryngeal in Greek, although alternatives are possible.¹²³

7.1 The example that is quoted the most to prove aspiratory force for laryngeals in Greek is the 2nd person singular ‘you know’: Sanskrit $véttha$ and Greek $oĩstha$. Elsewhere, we argued that both the reconstructions $*-th_2 e$ as $*-t^h a$ were possible.¹²⁴ If one reconstructs an ending $*-th_2 e$, the

¹²¹ Ascoli (1868b).

¹²² Hoenigswald (1965: 95).

¹²³ Since Peters (1993b), $katharós$ ‘pure’ is also quoted, but as we will argue below, the aspiratory force of a laryngeal in that word is not entirely certain.

¹²⁴ De Decker (2011: §3.1).

Greek aspiration does not necessarily have to be the result of the laryngeal presence: the original Greek form **oista* without aspirate could have been replaced by *oistha* with aspirate under the influence of the imperative *ísthi* ‘know!’,¹²⁵ and in the latter case, the Greek aspiration was inherited. The main argument for reconstructing **-th₂e* is that the Hittite ending *-ti* does not show assibilation: this is explained as a result of a cluster **tH* before the palatal vowel *e*.¹²⁶ We consider this argument to be convincing but not conclusive: if the ending had been **-t^ha*, there was no front vowel before the Proto-Anatolian or Proto-Hittite **t* and hence no reason for assibilation either. We consider the alternative scenarios by Kuryłowicz and Cowgill to be less likely. The former argued that the Indo-European ending was **-th₂e* and that this yielded regularly **-ta* in Greek.¹²⁷ He assumed that this ending *-ta* became *-tha* when it came in contact with stems ending in an aspirate, and saw this as evidence that Bartholomae’s Law applied in Greek as well.¹²⁸ He then argued that the aspirate variant was generalised throughout all forms and later disappeared in favour of the more regular ending *-as* which is a creation with the prototypical active 2nd person singular ending *-s* based on the first person in *-a*. We are skeptical towards this scenario, because assimilation in Greek is not progressive but regressive, as is shown by the deverbative adjectives in *-tós*. Cowgill argued that there were

¹²⁵ Ruijgh (1978: 302), based on a reconstruction of Frisk’s (1936: 43), who assumed that PIE **woid^ha* gave Greek **oista* which became *oistha* under the influence of *ísthi*.

¹²⁶ Kuryłowicz (1927/8: 103) was the first to note this. Somewhat surprising, Pedersen (1938: 87) did not agree with the reconstruction **-th₂e*.

¹²⁷ Kuryłowicz (1927: 202–204, 1927/8: 103, 1968: 341).

¹²⁸ Bartholomae (1883b, 1885:). Bartholomae’s Law states that in a sequence of an aspirate followed by a plain plosive, the plain plosive adopts the articulation (voiced or not) of the first one and takes over the aspiration of the first (Bartholomae 1885: 206 formulated it as such: »wenn in der wortbildung oder -flexion ein tönender aspirirter mit einem tonlosen geräuschlaut zusammentrifft, so wird letzterer tönend und übernimmt des erstem aspiration«). The *Paradebeispiel* is *buddhás* ‘the enlightened one’, from **b^hud^htós*, which is a deverbative adjective from the root **b^heyd^h-* ‘to awake, to be attentive, to acquire (knowledge)’. The validity of this sound law for Indo-Iranian is established, but remains uncertain if it applied in other Indo-European languages as well (Bartholomae 1883b: 24 doubted, was convinced of the Indo-European date in 1885: 206). See Collinge (1985: 7–11).

no endings starting with a consonant and a laryngeal. Consequently, he assumed that the ending was not $*-th_2e$ but $*-sta$, for which there were parallels in Latin and Tocharian. When that ending $*-sta$ came in contact with a consonant root, the s disappeared and caused aspiration of the t , leading to the creation of an ending $-tha$.¹²⁹ Personally, we are inclined to accept the ending $*-t^h a$ for the form in PIE, but there is nothing that argues against an ending $*-th_2e$ with secondary aspiration in Greek under influence of the imperative and secondary aspiration in Indic caused by the laryngeal. There is another possible equation, namely that of Sanskrit *āsitha* ‘you have been (2nd sg., perfect)’ and Greek *ēstha* ‘you were (2nd sg., imperfect)’,¹³⁰ but these forms are in all likelihood innovations in both Greek as Sanskrit:¹³¹ the perfect of Sanskrit *as-* ‘to be’ is recent and the Greek form *ēstha* was probably created to avoid ambiguity with the old 3rd person singular *ēs* ‘he was’ (from the imperfect form $*(h_1)e-h_1es-t$), which looked like a 2nd person singular.¹³² In addition, Greek extended the ending $-stha$ to other verbs and tenses,¹³³ such as the imperfect and pluperfect (rarely in Attic),¹³⁴ the optative, subjunctive and indicative present (in non-Attic dialects).¹³⁵ This is a case where the Greek and Indo-Iranian

¹²⁹ Cowgill (1965: 172–173).

¹³⁰ The equation of the forms ‘you were’ could be found in Bopp (1833: 655) and Brugmann (1900: 348) already. See also Chantraine (1964: 293).

¹³¹ Kümmel (2000: 56–57, 2001a), we owe this reference to an anonymous referee of the journal.

¹³² Schmidt (1885a: 316–317), Negri (1976: 247–248), we owe this reference to an anonymous referee of *IJDL*. The referee suggested that the replacement of $*ēs$ by *ēstha* in the 2nd person might have been related to *Wortumfang*, but this is in our opinion less likely, because the *Wortumfang* constraint only applies to short monosyllables, while a 2nd person *ēs* would have had enough weight to survive; the homophony-avoidance, as suggested by Negri, is therefore more likely (Wackernagel 1906 did not discuss *ēstha*).

¹³³ Bopp (1833: 655), Brugmann (1900: 348), Solmsen (1906: 205–208), Meier-Brügger (1992: 54–55 and p.c.).

¹³⁴ The ending $-stha$ in the pluperfect in Attic can be found in *ēidēstha* ‘you knew’ besides *ēideis* and in the imperfects *ēphēstha* ‘you said’, besides the regular *ēphēs* and in *ēieistha* ‘you went’ besides the regular *ēieis*. Brugmann 1900: 348 explained the extension of the ending $-stha$ by the fact that there were two forms *ēs* and *ēstha* which both meant ‘you were’ and argued that therefore besides *ēphēs* a form *ēphēstha* was created.

¹³⁵ Solmsen (1906: 205–208), Smyth & Messing (1956: 153).

aspirate could be explained by a laryngeal, but in which case alternative scenarios (that by Ruijgh or the inherited voiceless $*t^h$) are equally possible.

7.2 Sanskrit *śithirás* ‘locker’ and Greek *katharós* ‘pure’. The linking of these two words is not new,¹³⁶ and it might surprise that we treat the word among the »problematic correspondences«. Since Peters (1993b) these cognates have been used to prove that both Indo-Iranian and Greek underwent laryngeal aspiration.¹³⁷ Peters reconstructed $*\hat{k}rth_2ros$, and argued that the first *r* had been lost in Greek as a result of dissimilatory *r*-loss.¹³⁸ The Sanskrit word obliges us to reconstruct a laryngeal in the second syllable. As was discussed elsewhere, the link between the two adjectives is possible but not entirely certain. First, we think that there is no real Greek evidence ‘requiring’ a dissimilatory *r* loss in a sequence *Cr.CV.rV* (assuming that the laryngeal was already vocalised), as we see no difference between the structure of $*kratharos$ (the supposed Proto-Ionic-Attic forms) and *kraterós* ‘powerful’. Secondly, the Greek word appears as *kótharos* in Aeolic, which is in accordance with a reconstruction $*\hat{k}r-$, but is attested as *kotharós* in Doric.¹³⁹ Solmsen explained the Doric form as original and the Attic-Ionic as the result of assimilation.¹⁴⁰ Even if one accepts the dissimilatory *r*-loss, the Doric form in *ko-* remains problematic. Peters tried to explain the Doric *o* by assuming influence on Doric by lyric poetry or by suggesting that the word was originally a full grade (thus following Solmsen),¹⁴¹ but this does not solve the problem. First of all, why would the Doric forms have been influenced by lyric poetry? Second, is the oxytone accent not more in line with a form with a zero grade?

¹³⁶ Macdonnell (1916: 250), Hirt (1927: 244).

¹³⁷ Peters (1993b: 95–98); for $*\hat{k}rth_2ros$ as reconstruction for the Sanskrit form, see Kuryłowicz (1928: 53–55). See also Kümmel (2001d) and Mayrhofer (2005: 115).

¹³⁸ Dissimilatory *r*-loss in Greek has been intensively treated by Wackernagel (1897: 8–14), Grammont (1948: 164–166) and Vine (2006, 2011).

¹³⁹ LSJ: 850.

¹⁴⁰ Solmsen (1904: 7). The word was not discussed in Schmidt (1893 — an in-depth study on assimilation in Greek). The assumption that Greek did not know vowel assimilation, as argued by van Beek (2011b), seems radical, but the issue cannot be addressed here.

¹⁴¹ Peters (1993b: 98).

Thirdly, and most importantly, both *katharós* and *kathairō* ‘I purify’ are at odds with the suggested evolution of **th*₂*V* into *l*^h*V* as neither form has the environment **th*₂*V*: *katharós* is said to originate from **k̑ȓth*₂*ros* while *kathairō* comes from **k̑ȓth*₂*r-je/o*, with the verb being a deverbative from the adjective (and hence a secondary form).¹⁴² As we stated earlier already, Peters argued that the Greek lack of aspiration in *platús* was caused by the fact that the feminine form **pl̑th*₂*uih*₂ and the derivative **pl̑th*₂*mōn* did not have the environment **th*₂*V*, and that from those forms the non-aspirated form was generalised throughout the entire paradigm, but the adjective *katharós* does not display this environment either and yet it underwent aspiration. Peters argued that in **k̑ȓth*₂*ros* an anaptyctic was inserted between **h*₂ and the *r*, yielding **k̑ȓth*₂*əros*, thus creating the environment in which the aspiration could occur. If this is so, one has to ask why this did not happen in **pl̑th*₂*mōn*. We therefore believe that the reconstruction **k̑ȓth*₂*ros* better be abandoned. The question remains if we can reconcile these two words. If one were to reconstruct **k̑ȓt*^h*h*₂*ros*, the problem of the aspiration would be solved, but one would still be confronted with the issue of the missing *r* in the first syllable of the Greek and Sanskrit words, the Doric *o* and one would have to assume that both languages underwent the dissimilation separately and independently. The meaning might suggest some link between them, but the dissimilation in Greek remains remarkable. Some scholars have argued that the word was non-Indo-European. Starting from the meaning ‘purify’, Burkert argued that *katharós* was a borrowing from Semitic *qatāru* ‘to smoke’.¹⁴³ Because of the aspirate, the variation *a/o* between Attic and Doric and the suffix *-aros*, Beekes argued that the word was Pre-Greek.¹⁴⁴ This is not the place to

¹⁴² With regard to the Sanskrit forms we would like to point out that the existence of the Sanskrit form *śithiras* is in itself no evidence that Sanskrit underwent the same dissimilation as Greek. The evolution of *śȓ* or *śri* into *śi* is widely attested in the transition from Old-Indic into Middle-Indic (Macdonell 1910: 7, van den Bossche 1999: 14 with specific reference to this form), but — as was pointed out by one of the anonymous referees of the journal — the fact that the form without *r* is widely attested in the manuscript tradition makes the assumption of a Prakritism less likely.

¹⁴³ Burkert (1984: 64). Neumann (1985: 305–306) and Rosoł (2013: 174) rejected the fact that the word would have been borrowed from a Semitic language. It had not been discussed in Lewy (1895).

¹⁴⁴ Beekes (2010: 614–615, 2014: 141).

discuss the concept of »Pre-Greek« and the evidence used to support it,¹⁴⁵ but we personally believe that an Indo-European origin should be preferred, whenever the data allow for it. In short, if one accepts the connection between the Sanskrit and Greek words, it could be an example of a laryngeal causing aspiration in Greek, **if** one could come up with a good explanation for the absence of aspiration in *platamón* and for the phonological problems involving the first syllable in Greek.

Another instance (but not involving *th*) where a laryngeal could have caused aspiration in Greek is the verb *skháō* ‘I tear, I make an incision’, which is related to Indic *chyāti* ‘tear off, cut off (skin)’ and which could be reconstructed as **skh₂je/o-*.¹⁴⁶ As we argued elsewhere,¹⁴⁷ the fact that *spáō* has no aspirate while it appears under exactly the same conditions (i.e. **sph₂je/o-*) leads us to believe that the aspirate in Greek *skháō* was caused by an inherited voiceless aspirate.¹⁴⁸ An alternative explanation is that the present was a backformation on an aorist *skhásai* which would have been caused by a crossing between the aorist infinitives *skhísai* ‘to have cut’ and *khalásai* ‘to have let loose’ —¹⁴⁹ a scenario that we find highly unlikely.

8. Greek and Sanskrit have an aspirate and a laryngeal **h₂* is excluded

The following instances in Greek and Sanskrit both have a *th* but Greek rules out the reconstruction with a laryngeal.

8.1 Sanskrit *math^h*- ‘rob, take quickly’ and Greek *masáomai* ‘I chew’, *mástaks* ‘mouth’ and *mástiks*, gen. sg. *mástigos* ‘whip’.

¹⁴⁵ We refer to our critical assessment in De Decker (2015).

¹⁴⁶ Klingenschmitt (1982: 132), Isebaert (1988: 355), Mayrhofer (1992: 558). Frisk (1970: 835–836) was more skeptical about the relatedness of these words (let alone about the aspiratory force of laryngeals).

¹⁴⁷ De Decker (ftc §3.2), Klingenschmitt (1982: 132) tried to explain this difference by assuming that in one case, i.e. *spáō*, the unaspirated variant was generalised, and in the other, i.e. *skháō*, the aspirate was generalised. This is in our opinion too *ad hoc* and does not allow for falsification.

¹⁴⁸ See also Kümmel & Zehnder (2001).

¹⁴⁹ Frisk (1970: 836).

8.2 Sanskrit *manth^h*- ‘move heavily, move quickly’ and Greek *móthos* ‘battle din’ and *Moūsa* ‘Muse, goddess of inspiration’.¹⁵⁰

Before we discuss the etymologies, we first need to discuss the meaning of *móthos* and *Moūsa*. The word *móthos* appears in Homer and has the meaning ‘battle, carnage’ and ‘battle din, battle noise, tumult, intensity, impetus’.¹⁵¹ There is one passage where the word is better translated by ‘battle’ and the meaning ‘noise of the battle, battle din’ is less suited:¹⁵²

eí per adeiḗs t'esti kài ei móthou ést' akórētos
 ‘even if he is fearless and (even) if he is insatiable to (engage in)
 battle...’ (*Iliad* 7,117)¹⁵³

In the other instances, the meaning is ‘noise of the battle, tumult’. Starting from the fact that a battle (din) is something that is stirred up, this word can be linked to the root ‘to move, agitate’.

The question is if *Moūsa*, for which several suggestions have been made, can also be linked to a root ‘agitate, stir’. Brugmann interpreted the word as a compound of the root **men-* ‘think’ and a suffix **-tja*: the Muse would then be ‘the thinking one, the inspiring one’.¹⁵⁴ Wackernagel argued that a suffix **-tja* was not attested and suggested to link the word *moūsa* with Latin *mōns* ‘mountain’, namely **mont-ja*: the Muse would then be ‘goddess of the mountains’.¹⁵⁵ Ehrlich argued that the Muse was the goddess that agitated and inspired knowledge and reconstructed **mont^hja*.¹⁵⁶ Wackernagel’s ingenious suggestion has the problem that the root **mont-* is not attested in Greek.¹⁵⁷ We therefore prefer to link *Moūsa* to **mont^h*- rather than to **mont-*. *Moūsa* would then be another word

¹⁵⁰ Grassmann (1863a: 98), Brugmann (1897: 522).

¹⁵¹ It appears in the *Iliad*: 7,117; 7,240; 18,159; 18,537; 21,310 but not in the *Odyssey*. For the both meanings, see Ebeling (1885: 1113-1114), Seiler & Capelle (1889: 393). LSJ: 1140 only translates ‘battle din’. Montanari (2015: 1356) translates ‘tumult, impetus’.

¹⁵² Führer (1993e).

¹⁵³ The text is taken from the online Chicago Homer (which is based on van Thiel’s editions). The translations are our own.

¹⁵⁴ Brugmann (1894: 253-256), building on a suggestion by Theodor Benfey.

¹⁵⁵ Wackernagel (1895).

¹⁵⁶ Ehrlich (1907).

¹⁵⁷ Chantraine (1968: 716).

linked to the root **me/ont^h-* (a laryngealistic reconstruction **month₂i^h₂* for *Moūsa* is problematic, because — as was argued for earlier — Pinault's Law did not apply in Greek). Beekes argued that the word could either be reconstructed as **month₁ia* and be linked with *manthánō* 'I learn' or could be Pre-Greek because it did not have to be of Indo-European origin.¹⁵⁸ An anonymous reviewer of the journal pointed out to us that a reconstruction **mon-d^h-i^h₂* from the root **men-* meaning 'putting mental activity in' could be possible as well and linked the word with *manthánō* 'I learn'.¹⁵⁹ The question is if the reconstruction would then not have to be **mon-d^hh₁-i^h₂* (with the root **d^heh₁-* 'put'), in which case the problem of Pinault's Law surfaces again. Given the fact that the root **mont-* 'mountain' is not attested in Greek and that Pinault's Law did not apply in Greek, we are inclined to link *Moūsa* with **ment^h-* 'agitate', in the meaning that the Muse moves people to perform. We now turn to the other words. Beekes considered *móthos* and *mástiks* be Pre-Greek, because the suffix *-ig-* in *mástiks* was a »Pre-Greek suffix« and because he did not accept voiceless aspirates for PIE and ruled out that PIE **tH* became *th* in Greek.¹⁶⁰ Frisk and Chantraine rejected connection between the Greek words and the Sanskrit ones, because they thought that the Indo-European **t^h* was rendered by *t* in Greek.¹⁶¹ The words *máthuaia*, *masáomai* and *mástaks* are related to Latin *mandere* 'chew' and can be linked to either Sanskrit *math-* 'rob, take quickly' or *manthⁱ-* 'move heavily, move quickly'.¹⁶² The former continues PIE **math₂-* or **mat^h-*, while the latter continues **me/onth₂-* or **me/ont^h-*.¹⁶³ the Greek words could continue a zero grade from the root **me/ont^h-* or the full grade from **mat^h-*, but the Latin *mandere* cannot be reconstructed from the zero grade of a root with **e/o*. *Mástiks* and *móthos*

¹⁵⁸ Beekes (2010: 972–973).

¹⁵⁹ This connection was hesitatingly suggested by Chantraine (1968: 664) as well.

¹⁶⁰ Beekes (2010: 961).

¹⁶¹ Chantraine (1968: 669, 708), Frisk (1970: 248–249). See especially Frisk (1936).

¹⁶² Hofmann (1950: 191), Walde & Hofmann (1954: 26), Zehnder (2001b), Meiser (2005). For the difference between Sanskrit *mathⁱ-* and *manthⁱ-* see Narten (1960), Hackstein (1995: 29–30, who also discussed the Tocharian evidence), Mayrhofer (1996: 311–312, who pointed out that both roots were confused only in later texts and not in the Rig-Veda), Zehnder (2001b and 2001c). Fick (1890: 283) only mentioned the root 'quirlen' and not 'kauen'.

¹⁶³ We explain later on why we reconstruct the forms with **t^h* and not **th₂*.

can be linked to Sanskrit *mánthati* ‘agitates’, OCS *mętetъ* ‘causes confusion’ and Old-Norse *męndull* ‘Drehstock der Mühle’.¹⁶⁴ In case of *mástiks*, the word is built on the zero-grade (with Greek *a* being the reflex of a sonantic * η) and the meaning would be that a whip is a tool to drive and agitate animals. The word *móthos* is a bit more problematic: it is either a formation on the zero grade with Aeolic treatment of the vocalic * η (which would then be an Aeolism of the epic language, *móthos* first being attested in Homer),¹⁶⁵ or it is built on a nasalless form of the root **me/ont*^h- which is attested in Indic as well.¹⁶⁶ We believe that the Greek evidence excludes a laryngeal. Latin *mandere* and Sanskrit *math*ⁱ- could theoretically continue both PIE **math*₂- as **mat*^h-, while Sanskrit *manth*ⁱ-, the Germanic and Slavic cognates could continue both PIE **me/onth*₂- as **mo/ent*^h-,¹⁶⁷ but this is not the case for the Greek words. If we start from the forms with a laryngeal, we can theoretically explain the aspiration in *máthua* and *móthos*,¹⁶⁸ but we cannot arrive at *mástaks*, *mástiks*, *masáomai* or *Moûsa*. If one starts from **math*₂-, the forms *mástaks*, *mástiks* and *masáomai* cannot be explained, because the *transponat* **math*₂*taks* would have given Greek ***mátaks* and **math*₂*tiks* would have yielded ***matatiks*. The form *masáomai* is also difficult to explain starting from **math*₂- because that would have given **matat*-. The same applies to *Moûsa*: a laryngealistic reconstruction would be **month*₂- η ₂, but that

¹⁶⁴ For the listing of the cognates, see Fick (1890: 283 without the Greek words), Prellwitz (1905: 297), Boisacq (1938: 642–643), Pokorny (1959: 732–733), de Vries (1961: 401), Mayrhofer (1996: 311–312). Latin *mamphur* ‘Stück aus einer Drehbank’ (only attested in Paulus ex Festo) and *mentula* ‘dick, penis’ have been linked as well (Sommer 1914: 173; Pokorny 1959: 732), but they pose some problems and we will leave them out of the discussion.

¹⁶⁵ Wackernagel (1896: 120), Kuiper (1934: 104). That the Greek *o* continued a sonantic * η was not ruled out by Chantraine (1968: 708).

¹⁶⁶ According to Whitney (1885: 117), the Atharva-Veda has a form *máthati* ‘agitates’, but it is possible that this nasalless form is the result of inner-Indic evolutions (Narten 1960, Mayrhofer 1996: 311–312).

¹⁶⁷ For the laryngealistic reconstructions, see Mayrhofer (1996: 298–299 and 311–312), Zehnder (2001b and 2001c). The form **math*₂- was suggested to include the Greek personal name *Promátheús* but the long \bar{a} in that name might be a case of secondary ablaut *a/ā* with the Greek root *math*- from *manthánō* ‘I learn’.

¹⁶⁸ Pedersen (1926: 52–54) already alluded to the fact that the Greek aspirate might be due to a laryngeal.

would have given ***montaja*. *Moūsa* and *masáomai* would be regular outcomes from **month₂-īh₂* and **math₂-īe/o-* respectively if Pinault's Law were active in Greek, but as we argued above, this sound law is not valid for Greek,¹⁶⁹ and consequently, a reconstruction with a laryngeal cannot account for the Greek forms *masáomai* (and *Moūsa*). As the forms cannot be reconstructed with a laryngeal, the Greek aspirates needs to be accounted for in a different way: a reconstruction **mat^h-* and *me/ont^h-* (with an Indo-European voiceless aspirate) can solve the problem.

8.3 The 2nd person singular middle ending of the secondary tenses *-thās* in Sanskrit and *-thēs* in Greek. This Sanskrit ending was generally considered a hypercharacterisation of the 2nd person perfect ending *-tha* by adding *-as* to emphasise the second person element.¹⁷⁰ This was followed by other scholars in modern times, who linked the Sanskrit ending — but not the Greek — with the Old-Irish ending *-tha*.¹⁷¹ It has been argued that the perfect and middle endings were originally of the same origin, namely **-th₂e*, but that the middle ending was then recharacterised by adding **-as* in Indo-Iranian.¹⁷² The problem is that it is difficult to understand why exactly in the middle voice the ending would have been characterised by adding an active ending, especially since the ending *-tha* was already in use as an active ending in Indo-Iranian, namely in the 2nd active person singular perfect. Another explanation is therefore preferred. Some scholars argued that the Greek 2nd person forms in *-thēs* were not passive but middle, and could be linked with the Sanskrit ending *-thās*.¹⁷³ The Greek *-thēs* incorporates the passive aorist morpheme and the ending for the 2nd person singular and can synchronically be segmented into *-thē-s* and functions within the paradigm of the passive aorists, but it is unclear if

¹⁶⁹ Lindeman (2004: 126–129), Piwowarczyk (2008 and *ftc*), Verhasselt (2014, §3 treats the Greek material).

¹⁷⁰ Bopp (1833: 676), Benary (1837: 222–223, with reference to Bopp).

¹⁷¹ Kuryłowicz (1964: 59), Watkins (1969: 188), Ruijgh (2004: 62).

¹⁷² Bopp and Benary obviously did not yet operate with laryngeals.

¹⁷³ Bloomfield (1891: 441), Wackernagel (1890: 302–313, 1896: 120, following Behaghel), Zubaty (1892: 3, also with reference to Behaghel), Gray (1930: 223), Pedersen (1909: 249, 1913: 348, 383, 403). Thurneysen (1909: 342) and Pedersen (1913: 348 and 403) added the Old-Irish endings *-tha* and *-ther*, but this is problematic, because **-t^hēs* would have given †*-thi* in Old-Irish (Watkins 1969: 188).

this has always been the case. Greek has a passive aorist that is built by adding *-thē-* to the verbal stem. The origin of this suffix is unclear and separate forms for the middle and passive diatheses are relatively recent: there are no traces of this *-thē-* suffix in Mycenaean,¹⁷⁴ middle forms could have middle and passive meaning in Homer and forms in *-thē-* did not always have passive meaning in Homer nor in later Greek.¹⁷⁵ In later (post-epic) Greek a passive future in *-thēsomai* was created on this suffix *-thē-*. The question is where this suffix comes from. It has been linked with the Germanic *-d-* which builds the past tense for the weak verbs and is linked with the root **d^heh₁-* ‘put’.¹⁷⁶ The main problem with that reconstruction is that one would expect this suffix to be used with active forms and not with passive ones, but the Greek aorist in *-thē-* is never used as an active aorist with an active meaning with active verbs, while the Germanic *-d-*preterite is an active form, used with active verbs in an active meaning¹⁷⁷ (even if one assumes that the Greek *-thē-* forms were in origin not passive in meaning,¹⁷⁸ their subsequent use in passive would need an explanation). A link between the Germanic *-d-*preterite and the the Greek *-thē-*aorist is therefore not likely. Brugmann explained it as a crossing of the intransitive/stative *th-*presents as in *plēthō* ‘I am full’ with the endings of the *ē-*aorist.¹⁷⁹ The problem with this analysis is that for many *-thē-*aorists in Homer no present in *-thō* is attested and that many *-th-*verbs attested in Homer do not have a passive aorist in *-thē-* (*skhéthō* is derived from *ékhō* ‘I have, I hold’, but the passive aorist *eskhéthēn* is only attested in Hellenistic times and the passive aorist of the root **pleh₁-* ‘full’

¹⁷⁴ See the chapters on verbal morphology in Vilborg (1960) and Bartoněk (2003).

¹⁷⁵ An example of a middle form with passive meaning in Homer is the middle aorist *blēto* ‘he was hit’ from *bállō* ‘I hit’ and an example of a *-thē-* form without passive meaning in Classical Greek is *dielékhthēn* ‘I spoke with’ from *dialégomai* ‘I speak with, I converse’. More examples can be found in Wackernagel (1890: 302–313), Kühner & Blass (1892b: 243–246, 344–567), Hirt (1900: 556–559) and Smyth & Messing (1956: 219–225). The most complete treatment of Greek verbs is Veitch (1879). Jankuhn (1969) provides an analysis of the middle forms with passive meaning in Homer.

¹⁷⁶ Fick (1872: 359–360). According to Brugmann (1878: 78), this idea goes ultimately back to Franz Bopp.

¹⁷⁷ As was already noted by Brugmann (1878: 78–79).

¹⁷⁸ Hirt (1912: 556–559), Prévot (1934).

¹⁷⁹ Brugmann (1878: 78–82), Meillet & Vendryès (1948: 228–229).

is not *eplēthēn*, but *eplēsthēn*). This reconstruction has to be abandoned as well. If we assume that *-thēs* was in origin a middle ending, we could hypothetise that the original middle endings in proto-Greek were the following:¹⁸⁰

- 1st sg. **-mān*, visible (among others in) an aorist (*(e)húmān* ‘I loosened myself, I was loosened’),¹⁸¹
- 2nd sg. **-t^hēs*, visible in the aorist (*(e)lúthēs* ‘you were loosened, you loosened yourself’),
- 3rd sg. **-to*, leading to an aorist (*(é)luto* ‘s/he was loosened, s/he loosened her/himself’).

In origin, there was no distinction between passive and middle forms, and middle forms could have reflexive, passive and transitive meaning: in the earliest Greek texts (Homer, Hymns and even in Herodotos) passive and middle forms were often used interchangeably, and middle forms initially had both middle and passive meaning, so the separation between passive and middle in the aorist was not a PIE distinction.¹⁸² Initially, the forms in *-thēs* had no exclusive passive meaning,¹⁸³ as is still visible by aorist forms such as *eloidoréthēs* and *eloidorēsō* ‘you insulted’ and *apekríthēs* and *apekrínō* ‘you answered’, which even in Attic are used interchangeably. Initially, forms as *elúthēs* and *emígēs* ‘you were mixed’, and *hōrméthēs* ‘you hurried, you stormed forward’ and *emánēs* ‘you acted as a madman’ existed next to each other. It was then felt that *-ēs* were mostly used after consonants, while *-thēs* was generally used after a vowel. This

¹⁸⁰ This is based on the scenarios by Behaghel, Wackernagel and Elbourne.

¹⁸¹ We put the augment between brackets, because it was not yet mandatory in Homer and Mycenaean.

¹⁸² Cf. supra. See especially Jankuhn (1969) for an analysis of the middle forms in Homer. A more extensive list of verbs with middle and passive aorists without any distinction in meaning could already be found in Hirt (1900: 556–559). One can also refer to the deponent verbs that have passive aorists in Classical Greek but middle forms in poetry. The most complete treatment of verbs is Veitch (1879), but for a list one is referred Kühner & Blass (1892b: 243–246, 344–367) and Smyth & Messing (1956: 219–225) also provide lists of passive forms with middle meaning.

¹⁸³ One can refer to *Iliad* 5,12 where two *-thē*-aorists are used without passive meaning (the forms are put in bold face): *tó hoi **apokrinthénte** enantíō **hōrméthétēn*** ‘these two broke loose from the ranks and charged against him’.

led to the ending *-thēs* being reinterpreted as being the 2nd person singular ending of a passive *-thē-* aorist.¹⁸⁴ The fact that they both ended in *-ēs* accelerated this process. The form *elúthēs* was then segmented *e-lú-thē-s* instead of *e-lu-thēs* and from that a passive morpheme *-thē-* was extracted. The original 2nd person aorist ending was replaced by the »proper« middle ending, *-so*. That the creation of the passive morphemes is late, is proved by the fact that there are no passive aorists in *-thē-* in Mycenaean and no passive futures in *-thēsomai* in Homer (the only passive future form being *migēsomai* ‘I will be mixed’). We therefore believe that the Greek *-thēs* and Sanskrit *-thās* continue both an Indo-European middle ending $*-t^hēs$, with a voiceless aspirate.

An additional example (not involving a case of $*t^h$) is the connection between the Sanskrit adjective *phalgús* ‘weak’ and the Greek verb form *phelgúnei*, which in the lexicon by Hesychios *astheneĩ* ‘*phelgúnei* means ‘he is weak’’.¹⁸⁵ In this instance, the Greek *e* excludes a laryngeal, as Greek *phe* cannot come from $*ph_2e$. In modern times, this equation has been doubted: Frisk and Mayrhofer considered this connection »in jeder Sicht anfechtbar«,¹⁸⁶ but they did not say why, while Euler rejected the word because it started with a voiceless *ph* and because the Greek verb in *-únō* was not factitive and Sanskrit only had an adjective in *-ús*.¹⁸⁷ Already Debrunner had noticed these problems and suggested to change the gloss into either *phelgúnetai* (with a medio-passive form) or into *astheneĩs* ‘you are weak’, in which case *phelgúnei* would be a medio-passive 2nd singular form.¹⁸⁸ We nevertheless believe this link to be both semantically as phonologically possible: the meaning is the same and a rejection of a word with a voiceless aspirate because voiceless aspirates do not exist, is a circular argument. Moreover, the fact that the word is attested in Hesychios’s lexicon might mean that there is something peculiar about it and the fact that this verb form does not have the expected factitive meaning, could be this peculiarity?

¹⁸⁴ Chantraine (1928: 14–15 and 1932: 88) with reference to Wackernagel (1895).

¹⁸⁵ This equation goes back to Hoffmann (1892: 154), Wackernagel (1896: 120), Debrunner (1907: 78), Meillet (1935: 110). Fick (1909: 152) linked it with Lithuanian *blōgas* ‘weak’, in which case a link with the Sanskrit word is excluded.

¹⁸⁶ Frisk (1970: 1000), Mayrhofer (1996: 203).

¹⁸⁷ Euler (1979: 151).

¹⁸⁸ Debrunner (1907: 78).

In short, we have three examples where an Indo-Iranian *th* can be linked with a Greek *th*, but where a reconstruction **th₂* is excluded and where a phonemic voiceless aspirate is the only possible solution.

9. Onomatopoeic instances¹⁸⁹

9.1 Sanskrit (*ni-*)*ṣṭhīvati* ‘spits’, the Indic lexicographers also mentioned a word *thūthū* ‘the sound of spitting’, which they explained as the sound of spitting;¹⁹⁰ Avestan *spāma-* ‘saliva’; Greek *ptūō* ‘I spit’, Doric *epiphthūsō* (attested in Theokritos, 3rd century BC) ‘I spit’ and the Hesykhian gloss *psúttei ptúei psúttei* means ‘he spits’; Armenian *tuk* ‘spit’ and *tkanem* ‘to spit’; Latin *spuere* ‘to spit’; Gothic *speiwan* ‘to spit, to spew’, Old-Norse *spýja* ‘to spew’; OCS *pljъvati* ‘to spit’.¹⁹¹ Although all these words clearly describe the spit sound (*pt*, *sp* and *sth* can all refer to spitting), reconstructing a proto-form is not easy:¹⁹² with the exception of Sanskrit (and maybe Armenian), all languages seem to point at an anlaut with a *p* in it. Scholars reconstructed **(s)p(h)iēu-*, explained the Sanskrit anlaut *ṣth* as a dissimilation from the first labial in **sphīvati*,¹⁹³ and explained the Greek form as the result of a form without *s*, with **pī* yielding *pt*. The fact that the verb is mostly used in compound with the preverb *ni-* caused the cerebralisation of the *s* and *th* in Sanskrit¹⁹⁴ As Pedersen pointed out, the reconstruction with an anlaut **spī* (without a *t*) is problematic for Armenian: Armenian *t*’ could continue an older **pt*,¹⁹⁵ but not

¹⁸⁹ The most in-depth study of onomatopoeic words is Tichy (1983).

¹⁹⁰ Monier Williams (1899: 464, 563), Mayrhofer (1964: 409–410).

¹⁹¹ Pokorny (1959: 999–1000), Kümmel (2001g).

¹⁹² Prellwitz (1905: 390) considered it possible that all words were onomatopoeic creations of each language individually. A similar skepticism (related to the Germanic words) can be found in de Vries (1961: 539).

¹⁹³ Walter (1863: 409), Hübschmann (1885: 16, 1897: 450), Pokorny (1959: 999–1000), Mayrhofer (1964: 409). Osthoff (1881: 316) assumed that the evolution from PIE **spī* into Sanskrit *ṣth* was a sound law.

¹⁹⁴ Hübschmann (1885: 16), Wackernagel (1896: 236, pointing out that this observation went back to Pott), Pokorny (1959: 999–1000), Mayrhofer (1964: 409), Kümmel (2001g).

¹⁹⁵ This had been noted already by Bugge (1893: 39), see more recently Solta (1960: 38, 156–157) Weitenberg (1975: 73) and Greppin (1982b).

**p̥i*.¹⁹⁶ He therefore suggested an anlaut **spt̥ie̥u-*.¹⁹⁷ Walde and Hoffmann, on the other hand, suggested that the Sanskrit and Armenian forms were not related to the other words but were onomatopoeic, and reconstructed **spi* for Latin, Greek, Germanic and Balto-Slavic.¹⁹⁸ Mayrhofer reconstructed **sp(t)ie̥uH-*, interpreted the forms as »*Nachahmung des Spucklautes*«, and noted that the verb already had a complicated ablaut schema in PIE.¹⁹⁹ He followed the dissimilation theory and pointed at parallels for an Indic treatment *st* of an original **#sp*. Kümmel reconstructed **spt̥ie̥uH-* and assumed that the different languages simplified the anlaut, but remained doubtful about the Sanskrit aspirate: it either continued the original situation, in which case a reconstruction with **t*^h would be necessary, or the aspirate was due to the onomatopoeic nature.²⁰⁰ We believe that the suggestions by Pedersen and Kümmel are more likely, and that the anlaut was simplified in the individual languages.²⁰¹ If one reconstructs **spi* and not **spt̥i* the Armenian form cannot be related; in that case, one could argue that the Sanskrit *thūthū-* and Armenian *tuk*^c continued another onomatopoeia, namely **thu* (as was argued by the Indic grammarians).

9.2 Sanskrit *thuthukṛt* ‘name of a bird (literally ‘making the *thuthu* sound’), Greek *tūtō* ‘owl’ (only known in the gloss in Hesychios *tutō hē glauks* ‘*tutō* means ‘the owl’), Latin *tūtūbāre* ‘making the *tu* sound’.²⁰² These words are clearly onomatopoeic, but it is remarkable that Greek has a non-aspirate while Indic has the aspirate.

¹⁹⁶ Pedersen (1906: 342). See also Pokorny (1959: 1000).

¹⁹⁷ Pedersen (1906: 342), Schwyzler (1939: 325), Mayrhofer (1996: 682), Kümmel (2001g).

¹⁹⁸ Walde & Hofmann (1937: 581, against his own suggestion of Walde 1897: 479).

¹⁹⁹ Mayrhofer (1996: 682).

²⁰⁰ Kümmel (2001g).

²⁰¹ Already Schulze (1912a) had voiced doubts about this dissimilation.

²⁰² Schulze (1912b, 1913a) was the first to note the connection; see also Walde & Hofmann (1937: 721) and Schwendtner (1939, with reference to Schulze).

10. More problematic etymological connections

In this subsection we discuss etymological connections that were made in the past, but that are no longer universally accepted today.

10.1 Greek *epírrhōthos* ‘helper’; Sanskrit *rathī́-* ‘charioteer’, *ráthas* ‘chariot’, Avestan *raiθīm* ‘charioteer (acc.)’; Latin *rota* ‘wheel’, German *Rad* ‘wheel’, Old-Irish *rethid* ‘runs’. The relationship between the words outside Greek is not in doubt, and the usual reconstruction is **roth₂-o-* resp. **reth₂-*.²⁰³ Rasmussen, however, showed that the root should actually be **ret^h-*, for two reasons.²⁰⁴ First, he pointed at the Celtic aorist subjunctive *ressed* which could only be explained from a form (*transponat*) **ret^h-s-e-to*, as a sequence **th₂s* could not have given *ss* in Celtic; secondly, he argued that an ablaut pattern **roteh₂* for Latin *rota* and **róth₂os* for Sanskrit *ráthas* was unparalleled, because the thematic vowel in the suffix could not disappear: as the *-eh₂-* suffix is the feminine marker and **roteh₂* is the feminine form, the masculine form can only be **rotos* and not **roth₂os*. It is sometimes suggested that **roth₂os* was the result of an adjectival derivation:²⁰⁵ from **roteh₂* an adjective **roteh₂ós* would have been created with oxytone accentuation, which would have undergone syncope, leading to **roth₂ós* which in turn would have undergone accent retraction when the adjective became a noun, leading to **róth₂os*, but one could ask if it would not have been the laryngeal that would have been dropped between the two vowels rather than one of the vowels. In addition, this supposed accent retraction does not always occur. As such, we believe this explanation to be less suited. The question for our discussion is if there is a Greek cognate that can be linked to all these forms. Some added the Greek noun *epírrho-thos* to the equation,²⁰⁶ but according to most scholars *epírrhōthos* was a short form of *epitárrhōthos*, which was

²⁰³ Kuryłowicz (1927: 221), Burrow (1955: 71), Hoenigswald (1965: 94), Lindeman (1970: 78), Nussbaum (*apud* Weiss 1994: 153 note 58), Mayrhofer (1996: 429–430, 2005: 111), Beekes (1997: 21), Gippert (1997: 63), Weiss (2009: 300).

²⁰⁴ Rasmussen (1999: 221).

²⁰⁵ Mayrhofer (2005: 111).

²⁰⁶ Zubaty (1892: 3), Prellwitz (1905: 151). Their theory was elaborated, both semantically and phonologically, by Elbourne (2011). Hirt (1927: 244) linked *rhóthos* ‘noise of the roar’ as well.

explained by Schwyzer as a compound of *epí* ‘on top, on, in addition to’, *thársos* ‘courage’ and *thóos* ‘running’ from *théō* ‘I run’.²⁰⁷ Elbourne argued first that the phonology made the explanation of *epírrhōthos* as a short form of *epitárrhōthos* less likely, because the form with double *r* assumed that the cluster *rs* had been changed into the Attic *rr* during the transmission. This is not impossible, but it is less probable that this happened in such a rare word.²⁰⁸ Secondly, he explained the somewhat different meaning of *epírrhōthos* by stating that someone standing on the chariot was a helper, but that the original meaning ‘chariot’ was lost, because the Greeks used the word *hárma* ‘chariot’ instead. He explained the double *r* as a metrical device in poetry, because with a single *r* the word would have contained four short syllables. The double writing of consonants without etymological justification is common in Homeric poetry, as is shown by the aorist *éllakhe* ‘s/he obtained by chance, by fate (aor.)’, where there is no historical ground for the double *l* and which is due to analogy with *éllabe* ‘s/he took (aor.)’, which has an etymological double *l* from $*slag^w-$. Alternatively, words with an etymologically justified double consonant sometimes appear with a single one, as is shown by *kallíroos* ‘with beautiful streams’. Regardless whether one accepts that the Greek word is related or not, the Sanskrit *th* can only be explained by positing a PIE $*t^h$ in the respective cognate, as the presence of a laryngeal is ruled out by Celtic.

10.2 Sanskrit *mīthas* ‘wrong, different’, *mīthū* ‘wrongly’; Old-Avestan *miθahiia-* ‘wrong’, Young-Avestan *miθō* ‘wrong’; Old-Persian *miθa* ‘wrongly’; Latin *mūtuus* ‘mutual’ and *mūtāre* ‘exchange, change’; Gothic *inmaidjan* ‘interchange’, Old-Norse *meiðmar* ‘Kostbarkeiten’.²⁰⁹ The root can be reconstructed as $*meiθ_2-$ ‘exchange’.²¹⁰ There is no doubt about the relatedness of the words mentioned above, but the question is if the

²⁰⁷ Schwyzer (1923).

²⁰⁸ Elbourne (2011: 39).

²⁰⁹ Whitney (1885: 120 — without mentioning any cognate outside Sanskrit), Uhlenbeck (1898a: 231), de Vries (1961: 381 for the Old-Norse word, without ruling out that the word might have been borrowed from a West-Germanic language), Mayrhofer (1996: 355, 375–376), Zehnder (2001a), Steer (2007). The most extensive discussion of these cognates, both semantically as phonologically is Steer (2007).

²¹⁰ Mayrhofer (1996: 376), Zehnder (2001a).

Greek words *moĩtos* ‘thanks, favour’ and *mĩtos* ‘thread (of the weaving)’ can be added into this equation.²¹¹ The latter means ‘thread of the warp’ and is also used in the expression *katà mĩton* ‘in due order’, which can be reconciled with a meaning ‘interchange’ (the meaning would then be ‘in accordance with the interchange’, hence ‘in due order’),²¹² although some skepticism is warranted. Montanari explained the meaning of this expression as ‘following the web’, hence ‘second in order, second in a continuous series’.²¹³ The former was used by the Greeks in Sicily and has the *o*-grade, while Indo-Iranian cognates have the zero grade, but given the fact that it is only attested in Greek in Sicily,²¹⁴ the word might very well be a borrowing from Proto-Italic **moĩtos* at a time when the *oi* diphthong had not yet become *ū* in Latin.²¹⁵ If the etymological connection is accepted, it would be a clear example of the difference in treatment of a PIE sequence **th₂V*: in Indo-Iranian this cluster leads to *thV*, while Greek does not have the aspiration.²¹⁶ As the Indo-Iranian aspirate stands in intervocalic position, the theory of Zubatý-Elbourne cannot explain the difference either, as in that theory the Greek words would have to display the aspirate as well. However, given the fact that *moĩtos* could be a borrowing and that *mĩtos* has no clear link with ‘interchange’ (except for the expression *kata mĩton*), this etymological connection remains doubtful.

10.3 Hittite *paršdu-* ‘leaf, foliage’; Sanskrit *přthuka-* ‘young animal’ (cf. infra); Greek *pórtaks* and *pórtis* ‘calf’, Greek *p(t)óρθos* ‘branch (of a tree)’; Armenian *ort* ‘vine; young animal’.²¹⁷ These words belong to the

²¹¹ Prellwitz (1916: 305), Nowicki (1976: 91).

²¹² Prellwitz (1916: 305).

²¹³ Montanari (2015: 1353).

²¹⁴ The word is used in Sophron of Syracuse, who was a writer of prose dialogues in Doric and lived in the 5th century BC.

²¹⁵ Walde & Hofmann (1954: 137), Pokorny (1959: 715), Frisk (1970: 249), LSJ: 1141, Weiss (2009: 102).

²¹⁶ De Decker (2011, ftc).

²¹⁷ Treatments of (one of) these cognates can be found in Meillet (1898: 276, 1935: 112), Petersson (1916: 271–273), Walde & Pokorny (1927: 49), Mayrhofer (1957: 332–333, 1996: 161), Pokorny (1959: 818), Solta (1960: 200–201), Frisk (1970: 580, 617), Chantraine (1974: 928–929, 950), Weitenberg (1975), Hiersche (1977), Klingenschmitt (1982: 105), Greppin (1982a: 48, 1982b: 352), Kloekhorst (2008: 745–746), De Decker (ftc: §3.4).

same semantic field, but there is no agreement on how they are to be connected. Three suggestions have been made. The first one is that by Meillet, who argued that Sanskrit *pṛ̥thuka-*, Greek *pórtis* and Armenian *ort'* were related and used this as evidence for the fact that Greek rendered PIE $*t^h$ by *t*.²¹⁸ His suggestion was accepted by Chantraine and Elbourne.²¹⁹ Noting that the Sanskrit word *pṛ̥thuka-* which means 'rice or grain flattened' or 'young of any animal', was not attested in the oldest texts,²²⁰ Brugmann argued that the original meaning was 'flattened rice' and that it was a derivation from *pṛ̥thús* 'flat'. The word would have obtained the meaning 'young of animal' only later.²²¹ This suggestion was accepted by Mayrhofer, who doubted that the word was related to the Greek or Armenian words.²²² Pokorny linked the words with the root $*per-$ 'give birth' and assumed that the Sanskrit and Armenian words had been expanded by a suffix $*-thu-$, which Solta catalogued as Indo-Armenian isogloss (without linking the Greek word).²²³ Frisk accepted the connection between Greek *pórtis* and Armenian *ort'*, but followed Mayrhofer in doubting the connection with *pṛ̥thuka-* and stated that *póρθος* had no certain etymology.²²⁴ If the Sanskrit word is indeed a younger and language internal derivation, only the Greek and Armenian words remain. In that case, one could argue that the words *pórtis* and *pórtaks* are derivation from the root $*per$ and that Greek *póρθος* and Armenian *ort'* are related cf. infra). The second suggestion is that by Petersson, who stated that the *t* of Greek *pórtis* could not be reconciled with the *t'* of Armenian *ort'* and the *th* of the Sanskrit *pṛ̥thuka-*. He explained *pórtis* as derived from a root $*por-$, suggested to link Greek *póρθος* with the Armenian and Sanskrit word, and reconstructed $*pe/orth-$ 'sprießen, ausschlagen'. In his opinion, Sanskrit *kápr̥th-* 'penis' and Latin

²¹⁸ Meillet (1898: 276).

²¹⁹ Chantraine (1974: 928–929), Elbourne (1998: 24).

²²⁰ Monier Williams (1899: 646–647), Mayrhofer (1957: 332–333, 1961: 180).

²²¹ Brugmann argued this in 1916 in an article that we could not access (the reference to the article can be found in Mayrhofer 1957: 332–333).

²²² Mayrhofer (1957: 332–333, 1961: 180); later, he only discussed *pṛ̥thuka-* 'breitgedrückter Reis', but not the other meaning (1996: 161).

²²³ Pokorny (1959: 818), Solta (1960: 200–201).

²²⁴ Mayrhofer (1957: 332–333), Frisk (1970: 580, 617). Chantraine (1974: 928–929, 950) mentioned Mayrhofer's doubts, but was not as skeptical in doubting the etymological connection.

pertica ‘Stange’ could be linked as well.²²⁵ While this might be semantically possible, the formal elements of the connection with Latin and Sanskrit are more difficult:²²⁶ the origin of the suffix *-ica* is unaccounted for in Latin, Sanskrit *kápr̥th-* might be a compound of *ka-* and *prath-* ‘broad’ (the penis would then be ‘the thing that extends itself’)²²⁷ and, given the fact that Sanskrit *kápr̥th-* is also attested without aspirate, the Sanskrit aspirate might be secondary.²²⁸ This connection therefore seems excluded as well. The third suggestion is that by Weitenberg. He argued that Greek *ptóρθος* and Armenian *ortʻ* should be linked with Hittite *paršdu-*, which he translated as ‘*Knospe, Trieb*’.²²⁹ He reconstructed **porstʰos* and argued that a cluster **rstʰ* could become *rth* in Greek and Armenian.²³⁰ Hiersche accepted the etymological connection between the words, but explained the aspirates in Greek and Armenian as the result of a cluster **rst* and rejected the reconstruction **rstʰ*.²³¹ Kloekhorst pointed out that the Hittite word meant ‘leaf, foliage’ and not ‘shoot, sprig’, and therefore rejected the link between the Hittite *paršdu-* and Greek *póρθος* and Armenian *ortʻ*.²³² The meaning ‘leaf’ for the Hittite word does not necessarily have to render Weitenberg’s suggestion incorrect, because a leaf is something that springs from a branch or a tree. If Kloekhorst is right, the only certain element that remains is the connection between Greek *póρθος* and Armenian *ortʻ*, but as Greek and Armenian share many isoglosses, this might be another Helleno-Armenian isogloss. In any case, as *ortʻ* (and also *paršdu-*) are *u*-stems and *póρθος* is not, one has to assume that the Greek word underwent a secondary thematisation.

It seems that not all words cannot be linked: Greek *pórtis* and *pórtaks* probably belong to the root **per-* ‘to give birth’, Sanskrit *pṛthuka-* might

²²⁵ Petersson (1916: 271–273), Walde & Pokorny (1927: 49).

²²⁶ Pokorny (1959: 823) accepted the link with Latin *pertica* but not with *pṛthuka-* nor with *kápr̥th-*.

²²⁷ Grassmann (1877: 313).

²²⁸ Foy (1898) connected the word with *kápros* ‘wild boar’ (but this was doubted by Frisk 1960: 783–784); Mayrhofer (1957: 157 and 1992: 302) hesitated between Foy’s and Grassmann’s explanation, but did not mention Petersson’s.

²²⁹ Weitenberg (1975: 66).

²³⁰ Weitenberg (1975: 72–75).

²³¹ Hiersche (1977).

²³² Kloekhorst (2008: 645–646).

be a language internal derivation and Greek *p(t)óρθος* and Armenian *ortʿ* could either belong to Hittite *paršdu-* or be an Helleno-Armenian isogloss. If the former is correct, they would be a good example of a voiceless aspirate; if the latter is correct, one could reconstruct a Proto-Helleno-Armenian $*port^h-$, but this cannot tell us anything about the consonant inventory of PIE.

10.4 Greek *kálathos* ‘basket’. The Greek word has been interpreted in many ways. As the word referred to a woven basket, de Saussure linked it with the verb *klóthō* ‘I weave’.²³³ This has found acceptance among many scholars, but this is impossible for phonological reasons, because *kala-* and *klō-* cannot be reconciled. The verb goes back to $*k̑l(e)h_3dh-$ but from a zero grade $*k̑lh_3$ it is impossible to arrive at *kálathos*.²³⁴ Based on the entry in Hesychios’s lexicon *kálathos potérion* ‘*kálathos* means ‘drinking vessel, cup’’, Scheftelowitz linked the Greek word with Armenian *keltʿ* ‘*Hohlmaß*’, Sanskrit *kaṭhina-* ‘hardened vessel for cooking’,²³⁵ and reconstructed as $*k_e lth-$, but there are phonological and semantic difficulties: Sanskrit *th* cannot easily be reconciled with the *lth* in Greek and Armenian and the Greek *ala* does not correspond to Sanskrit *a* nor to Armenian *e*.²³⁶ In addition the Sanskrit word is only attested in this meaning as of the Mahābhārata,²³⁷ and the meaning ‘drinking vessel’ seems secondary in Greek.²³⁸ It is more likely that the Armenian word is a borrowing from Greek,²³⁹ and that the Greek word is of non-Indo-European origin. Lewy argued for Semitic origin (leaving out the Armenian and Sanskrit words) and linked it with *qāla*^c ‘to weave’.²⁴⁰ Bernal considered the word to be borrowed from Egyptian *qrht* ‘capital of a pillar’ and suggested the word

²³³ De Saussure (1879: 267). This suggestion was mentioned (and not rejected) in Prellwitz (1905: 204), Bechtel (1914: 196), Schwyzler (1939: 361), Frisk (1970: 759), Chantraine (1968: 482–483). Boisacq (1937: 396) was more skeptical.

²³⁴ As was also noted by Rosoł (2010: 76).

²³⁵ Scheftelowitz (1904a: 146, 1904b: 304, 1904c: 27). The link between the Greek and Armenian word had already been made by Bugge (1893: 50).

²³⁶ See already Boisacq (1937: 396) for criticism about the phonology.

²³⁷ Monier Williams (1879: 244).

²³⁸ Rosoł (2010: 78–79).

²³⁹ Pedersen (1906: 380).

²⁴⁰ Lewy (1895: 109).

was borrowed before the final *t* was dropped in Egyptian (which presupposes a borrowing in the 3rd Millennium BC).²⁴¹ Rosoł agreed that the word was of Semitic origin, but objected to the etymologies by Lewy and Bernal, and suggested that the word was borrowed from another Egyptian word, *krḥt* ‘container for fruit’. To prove the phonetics, he pointed at other borrowings from Egyptian into Greek where an Egyptian *r* was rendered by a Greek *l* and assumed that the cluster *ḥt* had become *th* in Greek.²⁴² Beekes ruled out a Semitic borrowing (without stating why) and considered the word to be Pre-Greek.²⁴³ Regardless of the exact origin, the word is in all likelihood a borrowing and as a link with Armenian and Sanskrit is excluded for phonological reasons, this word does not shed any light on the consonantism in PIE.

11. There is no Indic cognate, Greek has an aspirate, but a laryngeal is excluded²⁴⁴

The following words have no cognates in Indo-Iranian, but provide additional evidence for the reconstruction of phonemic voiceless aspirates, as the aspirate cannot be explained by a laryngeal.²⁴⁵

11.1 Greek *askēthēs* ‘unharméd’; Gothic *skabis* ‘harm’, English *scathing*, German *schade* ‘too bad’, *schaden* ‘to harm’,²⁴⁶ Old-Irish *scíth* ‘tiredness’. Since Osthoff, these words were reconstructed with a **t^h*.²⁴⁷ Klingenschmitt and Matzinger suggested that there was a noun **skeh₁th₂os* that disappeared in Greek but that led to the creation of adjective **skeh₁th₂es*

²⁴¹ Bernal (2006: 446–447).

²⁴² Rosoł (2010: 178–179).

²⁴³ Beekes (2010: 620), but the word was not discussed in Beekes (2014).

²⁴⁴ The examples are based on Rasmussen (1987, 1989a, 1999: 220–221).

²⁴⁵ Rasmussen (1987, 1989a). Skepticism about the aspiratory effects of laryngeals in Greek can also be found in Elbourne (2000) and Clackson (2007: 44).

²⁴⁶ The link was first made by Osthoff (1888: 459) and Feist (1888: 103). For the Germanic outcome *b* of an Indo-European **t^h*, see Kluge (1883: 88–92). See also Pokorny (1959: 950), de Vries (1961: 480), Rasmussen (1989a: 154), Kümmel (2001f).

²⁴⁷ Osthoff (1888: 459).

which became Greek $*skēthēs$.²⁴⁸ The opposite of this (not attested) adjective was $askēthēs$ and was preserved whereas the noun and original adjective disappeared. Rasmussen rejected the reconstruction $*skeh_1th_2os$ because of the Celtic form: a form with a laryngeal would have created Proto-Celtic $**skītatus$ which should have given Old-Irish $†scíthud$.²⁴⁹ Therefore the reconstruction has to be $*skeh_1t^h os$. Even scholars who do not accept the existence of phonemic voiceless aspirates for PIE, acknowledge that these cognates nevertheless point at PIE $*t^h$.²⁵⁰ As the Greek aspirate cannot be explained by a laryngeal, it is strong evidence for a phonemic voiceless aspirate.

11.2 Greek $páthos$ ‘suffering’, $pénthos$ ‘suffering’, $páskhō$ ‘I suffer’; Lithuanian $kenčiù$ ‘to suffer, to undergo’ and Celtic $cessaid$ ‘to suffer’: these words can be reconstructed as containing $*k^w ent^h$.²⁵¹ Cowgill tried to explain the aspiration in Greek by assuming an extension $*d^h$ for Greek and $*t$ for Celtic (and also Baltic).²⁵² Hamp suggested a noun $*k^w entHos$, with a genitive $*k^w ntHos$ for Greek $páthos$ and a noun $*k^w entos$, without laryngeal, as basis for the Celtic and Baltic forms.²⁵³ In his opinion, $páthos$ was built on the root $*k^w ntH$ with generalisation of the zero grade throughout the entire paradigm, while $pénthos$ was built on $*k^w ent-$ (with neither laryngeal nor aspiration), and received its aspiration from the related noun $páthos$ and also from the perfect form $pépontha$. Nussbaum reconstructed $*k^w enth_2os$.²⁵⁴ We believe that there are some observations

²⁴⁸ Klingenschmitt (1982: 83), Matzinger (2005: 47).

²⁴⁹ Rasmussen (1989a: 154), see also Kümmel (2001f).

²⁵⁰ Mayrhofer (1986: 98, 2004: 44); Meier-Brügger (2003: 125); Clackson (2007: 42–44). Stating that Mayrhofer did not accept voiceless aspirates is not entirely correct. In his works of 1986, 2004 and 2005 he stated that he accepted a very small series of expressive and/or affective words with voiceless aspirates, but that he did so merely out of typological necessity because languages with voiced aspirates but without voiceless aspirates are very rare. That issue cannot be dealt with either. It has to be stressed that Mayrhofer accepted the existence of laryngeal aspiration for Greek and pointed explicitly at Peters’s list of 1993a and b.

²⁵¹ Fick (1884: 331, 1890: 281), Bezzenger (1890: 253), Pokorny (1959: 641) and later also Bammesberger (1974).

²⁵² Cowgill (1965: 172).

²⁵³ Hamp (1981).

²⁵⁴ He was quoted in Nikolaev (2010: 65).

to make about the laryngealistic reconstructions. Firstly, reconstructed form **p₁nth₂s^hkō* would have given the Greek verb **pataskō*.²⁵⁵ Rasmussen showed that Celtic *cessaid* could not be explained from **k^wentHti* (as Hamp had already pointed out himself): if the form had been **k^wenth₂ti*, the Celtic form would have been ***cétaid*.²⁵⁶ Secondly, we question Hamp's reconstruction of a root with and a root without laryngeal, and consider this to be an *ad hoc* assumption to account for the aspiration. In light of these observations, we agree with Bammesberger and Rasmussen in reconstructing **k^went^h*, and this reconstruction is accepted in the handbooks of Meier-Brügger and Clackson. This is again an element in favour of the existence of phonemic voiceless aspirates. It is also an important example against the theory that a sequence **nt^h* became *nt* in Greek.

11.3 *pláttō* 'I knead, I make', aorist *éplas(s)a*, *koropláthos* 'maker of puppets' ; German *Fladenbrot* 'sort of flat bread', Middle Dutch *vlade* (Modern Dutch has *vlaai*) 'sort of flat cake'. The Germanic words could be linked with the root **pleth₂-* 'flat' as well, because the cakes and breads to which the words refer are indeed flat. As we argued above, the Greek words exclude a link with that root. The present *pláttō* and the aorist *éplassa* cannot be explained from **pleth₂-*, as the *transponats* **p₁lth₂jō* and **(e)p₁lth₂s_m* would have given ***plataiō* and ***eplátasa*. The aspirate from *(koro)pláthos* thus needs to be explained otherwise. A reconstruction **plat^h*- could solve the problem, but given that the word is only attested in Greek and maybe in Germanic, it cannot be stated with certainty that this word is of Indo-European origin.

12. There is no Greek cognate, Indo-Iranian has an aspirate, but a laryngeal is excluded.²⁵⁷

The following two examples also have an aspirate which cannot be explained by a laryngeal. In these instances, there is no Greek word that is related.

²⁵⁵ This had also been noted by Lühr (2001).

²⁵⁶ Rasmussen (1999: 220 — the original dates from 1987, 1989a: 153–155).

²⁵⁷ The first two examples are based on Rasmussen's analyses (1987, 1989a, 1999: 220–221).

12.1 If one assumes that Greek *epírrhotos* is not related to Indic *ráthas* (cf. supra), the Celtic and Indo-Iranian words nevertheless point at a voiceless aspirate, because Celtic *ressaid* cannot be explained from $*reth_2$ - but only from $*ret^h$ -.

12.2 The second instance are the following words: Young-Avestan *-θανjaiieiti* ‘to pull’; Old-Icelandic *þísl* ‘cover, lid’, OHG *dīhsala* ‘cover, lid’ (from Proto-Germanic $*þengslo$ -); OCS *tegnōti* ‘pull’.²⁵⁸ The Slavic and Germanic words rule out a cluster $*th_2$ because these forms are formed on proto-forms with an *e* in it.²⁵⁹ As such, the Avestan aspirate can only be explained by reconstructing $*t^heng^h$ - ‘ziehen’.²⁶⁰ Kümmel assumed that the original form has an *s mobile*,²⁶¹ but as no attested word has a trace of an *s* this cannot be (dis)proved. Pokorny and Kümmel in his *Addenda et Corrigenda* reconstructed the form with a $*t$ and not with $*t^h$,²⁶² but in that case, the Avestan aspirate remains unaccounted for.

To conclude, these are two examples where only a phonemic voiceless aspirate $*t^h$ can explain the consonatism of the different related words.

13. Results and conclusion of the investigation

The investigation on the correspondence of (Proto-)Indo-Iranian $(*)th$ in Greek has revealed the following. There are four (or five, if one considers the superlative suffix to be different from the cardinal one) instances where a laryngeal is certain and where Greek has a plain voiceless plosive *t* and Indo-Iranian a voiceless aspirate *th*. These instances are $*steh_2$ - ‘stand’, $*peth_2$ - ‘spread’, the suffix $*(is-)th_2os$ and $*pleth_2$ - ‘flat’. There are two

²⁵⁸ Zupitza (1899: 89), Walde & Hofmann (1954: 658), Pokorny (1959: 1067), Kümmel (2001i).

²⁵⁹ Kümmel (2001i).

²⁶⁰ In his *Addenda et corrigenda* Kümmel reconstructed the form without aspirate, but by doing so, the aspirate in Iranian remains unexplained.

²⁶¹ Kümmel (2001i).

²⁶² Pokorny (1959: 1067); Kümmel in the online *Addenda* to the LIV²; Weiss (2009: 183 — without discussing the Iranian forms).

instances, where Greek has a plain voiceless plosive *t* and Indo-Iranian a voiceless aspirate *th*, and where a laryngeal can only be reconstructed if one accepts the validity of the sound law *-CH.CC > *-C.CC, and in one instance, *Schwebeablaut* needs to be assumed as well (but this does not seem impossible to us): the instances are **leǵh₂-* ‘to go, to pass (away)’ and **k̑neth₂-* / *k̑enth₂-* ‘to pierce’. If a laryngeal cannot be reconstructed, the difference between the Indo-Iranian aspirate and the Greek plain plosive cannot be explained. There is one instance where where Greek has a plain voiceless plosive *t* and Indo-Iranian a voiceless aspirate *th*, and in which a laryngeal is certain in Indo-Iranian and possible (but not entirely certain) in Greek: **po/ent(H)-* ‘road’. There are two examples where Greek has a plain voiceless plosive *t* and Indo-Iranian a voiceless aspirate *th*, and where a laryngeal is possible in Indo-Iranian, but not in Greek: the word for ‘bone’, **h₂ost(h₂)* - and the 2nd person plural ending of the primary series, which is *-tha* in Indo-Iranian and *-te* in Greek. There is one instance where Greek has a plain voiceless plosive *t* and Sanskrit a voiceless aspirate *th*, but in which a laryngeal is excluded: **steg-* ‘cover’. There are two instances where both Greek and Indo-Iranian have a voiceless aspirate *th*, and in which a laryngeal cannot be ruled out: Greek *oĩstha* and Vedic *véttha* (both forms meaning ‘you know’), and Vedic *śithirás* ‘loose’ and Greek *katharós* ‘pure, clean’. In these instances, an alternative explanation is at least equally possible. There are three instances where both Greek and Indo-Iranian have a voiceless aspirate *th*, and in which a laryngeal is impossible. These are: **mat^h-* ‘to rob, to take quickly’, **me/ont^h-* ‘to agitate’ and the 2nd person singular middle ending **-thēs*. There are two instances where Greek has a plain voiceless plosive *t* and Indo-Iranian a voiceless aspirate *th*, and both are of onomatopoeic nature: the word for ‘to spit’ and the word for ‘owl’. There are two instances in which Greek has a voiceless aspirate *th* and there is no related word in Indo-Iranian, and in which a laryngeal is impossible: **skeh₁t^h-* ‘to harm’ and **k^went^h-* ‘to suffer’. There are two instances in which Indo-Iranian has a voiceless aspirate *th* and there is no related word in Greek, and in which a laryngeal is impossible: **t^heng^h-* ‘to pull’ and **re/ot^h-* ‘to run’ (if Greek *epírrhothos* is not related; if it is, the set of cognates are to be put under the list of words in which both Greek and Indo-Iranian have a voiceless aspirate *th* and in which a laryngeal is impossible). Finally, there are four instances in which the etymological connection between the Greek word(s) and that of other

languages was problematic: first, it is uncertain that *epírrhōthos* is related to Sanskrit *ráthas*, although the connection could be defended (if the Greek word is not related, the Celtic and Indo-Iranian words still require the reconstruction of a phonemic voiceless aspirate) second, the connection between Sanskrit *mīthás* ‘wrong’, Latin *mūtuus* ‘mutual’ and Greek *mítos* ‘thread’ and *moĩtos* ‘thanks’ is uncertain, because the meaning of *mítos* is uncertain and *moĩtos* could be a borrowing from Latin; third, Greek *pórtis* ‘calf’ and *p(t)óρθos* ‘twig, small branch’ have been linked with Armenian *ort*, Sanskrit *pṛthuka-* and Hittite *paršdu-*, but a connection only seems certain between Greek *p(t)óρθos* and Armenian *ort*; finally, *kálathos* was discussed, this word is a borrowing from Egyptian and can therefore not be linked to Sanskrit *káthina-* or Armenian *kelt* (which is itself a borrowing from Greek).

Our investigation of the (few) instances where an Indo-Iranian *th* can be matched to a Greek word, has shown that when Greek and Indo-Iranian agree in having a voiceless *th*, this should be reconstructed for PIE; when Greek has a *t* and Indo-Iranian has *th*, Indo-Iranian innovated, in most instances, the Indo-Iranian aspirate is then due to the sequence plain voiceless plosive followed by a laryngeal, but in some instances, this explanation is not valid. As such, we believe to have provided evidence for the reconstruction of a small set of phonemic voiceless aspirates in PIE (agreeing thus with the phonemic inventory used in Szemerényi 1996 and the observations of Barrack 2002 and 2003).

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Abbreviations

- LfgrE 14 = Meier-Brügger, Michael (ed.). 1991. *Lexikon des frühgriechischen Epos*. Lieferung 14: *καπνός* — *λωφάω*. Göttingen: Vandenhoeck & Ruprecht.
- LfgrE 15 = Meier-Brügger, Michael (ed.). 1993 *Lexikon des frühgriechischen Epos*. Lieferung 15: *μά* — *νεῖνις*. Göttingen: Vandenhoeck & Ruprecht.
- LIV² = Rix, Helmut, Martin Kümmel, Thomas Zehnder, Reiner Lipp & Brigitte Schirmer. 2001. *Lexikon der indogermanischen Verben*. Wiesbaden: Reichert.
- LSJ = Liddell, Henry, Robert Scott, Hugh Jones & Roderick McKenzie. 1996. *Greek-English Lexicon. With a revised supplement*. Oxford: Clarendon.

References

- Adams, Douglas Q. 1984. Greek (*h*)*ámaksa* ‘wagon-chassis’ and its cognates. *Zeitschrift für vergleichende Sprachforschung* 97. 230–232.
- Adams, Douglas. 1999. *A Dictionary of Tocharian B*. Amsterdam–Philadelphia: Rodopi.
- Ameis, Karl. & Hentze, Carl. 1922. *Ilias. Für den Schulgebrauch erklärt*. VII–IX. Leipzig: Teubner.
- Anttila, Raimo. 1969. *Proto-Indo-European Schwebelaute*. Los Angeles: University of California Press.
- Ascoli, Graziado. 1868a. Zur lateinischen Vertretung der indogermanischen Aspiraten. *Zeitschrift für vergleichende Sprachforschung* 17. 241–281.
- Ascoli, Graziado. 1868b. Zur lateinischen Vertretung der indogermanischen Aspiraten. *Zeitschrift für vergleichende Sprachforschung* 17. 321–352.
- Aura Jorro, Francisco. 1999. *Diccionario griego-español, diccionario micénico*. Madrid: CSIC.
- Austerfjord, Anders. 1979. Zur Vorgeschichte des germanischen starken Präteritums. *Indogermanische Forschungen* 84. 208–215.
- Baldi, Philip. 1983. *An introduction to the Indo-European languages*. Carbondale: Southern Illinois University Press.
- Bally, Charles, A. Sécheyay & Léopold Gautier. 1922. *Recueil des publications scientifiques de Ferdinand de Saussure*. Genève: Sonor.
- Bammesberger, Alfred. 1974. La formation du vieil irlandais *céssaid*. *Études Celtiques* 14. 205–206.
- Bammesberger, Alfred. 1984. *Studien zur Laryngaltheorie*. Göttingen: Vandenhoeck & Ruprecht.
- Bammesberger, Alfred. 1986. *Der Aufbau des germanischen Verbalsystems*. Heidelberg: Winter.
- Barrack, Charles. 2002. The Glottalic Theory: A negative appraisal. *Indogermanische Forschungen* 107. 76–98.
- Barrack, Charles. 2003. The Glottalic Theory revisited: A negative appraisal. Part II: The typological fallacy underlying the Glottalic Theory. *Indogermanische Forschungen* 108. 1–16.
- Bartholomae, Christian. 1879. *Der gâthâ dialekt*. Habilitationsschrift an der Universität Leipzig.
- Bartholomae, Christian. 1883a. *Handbuch der altiranischen Dialekte*. Leipzig: Breitkopf & Härtel.
- Bartholomae, Christian. 1883b. Die arische Vertretung von med. asp. + *t* und med. asp. + *s*. *Arische Forschungen* 1. 3–24.
- Bartholomae, Christian. 1885. $\theta\upsilon\gamma\acute{\alpha}\tau\eta\rho$. *Zeitschrift für vergleichende Sprachforschung* 27. 206–207.

- Bartholomae, Christian. 1888. *Beiträge zur Flexionslehre der indogermanischen Sprachen, insbesondere der arischen Dialekte*. Gütersloh: Bertelsmann.
- Bartholomae, Christian. 1895. *Grundriss der iranischen Philologie*. I. Straßburg: Trübner.
- Bartholomae, Christian. 1896. Beiträge zur altindischen Grammatik. *Zeitschrift der Deutschen Morgenländischen Gesellschaft* 50. 674–735.
- Bartholomae, Christian. 1904. *Altiranisches Wörterbuch*. Straßburg: Trübner.
- Bartholomae, Christian. 1907/8. Zu den arischen Wörtern für ‘der erste’ und ‘der zweite’. *Indogermanische Forschungen* 22. 95–116.
- Bartoněk, Antonín. 2003. *Handbuch des mykenischen Griechisch*. Heidelberg: Winter.
- Bechtel, Friedrich. 1892. *Die Hauptprobleme der indogermanischen Lautlehre seit Schleicher*. Göttingen: Vandenhoeck & Ruprecht.
- Bechtel, Friedrich. 1914. *Lexilogus zu Homer. Etymologie und Stammbildung homerischer Wörter*. Halle: Niemeyer.
- Bech, Gunnar. 1969. Das Schicksal der indoeuropäischen 2 Sg. Ind. Perf. im Germanischen. *Studia Neophilologica* 41. 75–92.
- van Beek, Lucien. 2011a. The ‘Saussure effect’ in Greek: a reinterpretation of the evidence. *Journal of Indo-European Studies* 39. 129–175.
- van Beek, Lucien. 2011b. Vowel assimilation in Greek: The evidence reconsidered. Krisch, Thomas & Lindner, Thomas (eds.). *Indogermanistik und Linguistik im Dialog*. Wiesbaden: Reichert. 49–58.
- Beekes, Robert. 1969. *The Development of the Proto Indo European Laryngeals in Greek*. The Hague–Paris: Mouton.
- Beekes, Robert. 1972. The nominative of the hysterodynamic noun-inflection. *Zeitschrift für vergleichende Sprachforschung* 86. 30–63.
- Beekes, Robert. 1985. The Origins of the Indo-European Nominal Inflection. Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck.
- Beekes, Robert. 1988a. Laryngeal developments, a survey. In Bammesberger, Alfred (ed.). *Die Laryngaltheorie und die Rekonstruktion des indogermanischen Laut- und Formensystems*. Heidelberg: Winter. 59–105.
- Beekes, Robert. 1988b. *A Grammar of Gatha-Avestan*. Leiden: Brill.
- Beekes, Robert. 1989. Old Persian *pθim*. *Münchener Studien zur Sprachwissenschaft* 50. 7–13.
- Beekes, Robert. 1995. *Comparative Indo-European Linguistics: An Introduction*. Amsterdam–Philadelphia: Benjamins.
- Beekes, Robert. 1997. Historical phonology of Iranian. *Journal of Indo-European Studies* 25. 1–26.
- Beekes, Robert. 1998. Een nieuw Indo-Europees etymologisch woordenboek. *Mededeling van de Koninklijke Nederlandse Academie van Wetenschappen* 61,9. 1–26.
- Beekes, Robert. 2010. *Etymological Dictionary of Greek*. 2 volumes. Leiden: Brill.
- Beekes, Robert. 2014. *Pre-Greek*. Edited by Stefan Norbruis. Leiden: Brill.

- Benary, Karl A.A. 1837. *Die römische Lautlehre vergleichend dargestellt*. Berlin: Jonas.
- Benfey Theodor. 1852. *Vollständige Grammatik der Sanskritsprache*. Leipzig: Brockhaus.
- Benfey Theodor. 1859. -κόλος, colere, κόρος, πέλομαι. *Zeitschrift für vergleichende Sprachforschung* 8. 90–96.
- Benfey Theodor. 1874. *Einleitung in die Grammatik der vedischen Sprache*. Göttingen: Dieterichsche Buchhandlung.
- Benfey Theodor. 1880. *Vedica und Linguistica*. Straßburg: Trübner.
- Bezenberger, Adalbert. 1883. Review Kluge 1882. *Göttingische Gelehrte Anzeigen*. 385–402.
- Bezenberger, Adalbert. 1890. Die indogermanischen gutturalreihen. *Beiträge zur Kunde der indogermanischen Sprachen* 16. 234–259.
- Bezenberger, Adalbert. 1908. Ar. pánthās und seine Flexion. *Zeitschrift für vergleichende Sprachforschung* 42. 384–385.
- Bloomfield, Maurice. 1891. Contributions to the Interpretation of the Veda: Fourth Series. *American Journal of Philology* 12. 414–443.
- Boisacq, Émile. 1938. *Dictionnaire étymologique de la langue grecque. Étudiée dans ses rapports avec les autres langues indo-européennes*. Heidelberg: Winter.
- Bomhard, Allan. 1981. A new look of Indo-European. *Journal of Indo-European Studies* 9. 332–337.
- Bomhard, Allan. 1986. The Aspirated Stops of PIE. *Diachronica* 3. 67–79.
- Bopp, Franz. 1833. *Vergleichende Grammatik des Sanskrit, Send, Griechischen, Lateinischen, Litauischen, Altslavischen, Gothischen und Deutschen*. Berlin: Dümmler.
- Bopp, Franz. 1856. *Vergleichende Grammatik des Sanskrit, Send, Griechischen, Lateinischen, Litauischen, Altslavischen, Gothischen und Deutschen*. I,1. Berlin: Dümmler.
- Bopp, Franz. 1857. *Glossarium comparativum linguae sanscritae, in quo omnes sanscritae radices et vocabula usitatissima explicantur et cum vocabulis graecis, latinis, germanicis, lituanicis, slavicis, celticis comparantur a Francisco Bopp*. Berlin: Dümmler. (third edition; the original edition — without Latin transcriptions — dates from 1832).
- van den Bossche, Frank. 1999. *A Reference Manual of Middle Prākṛit Grammar. The Prākṛits of the Dramas and the Jain Texts*. Ghent: Vakgroep Talen en Culturen van Zuid- en Oost-Azie.
- Brixhe, Claude. 1996. *Phonétique et phonologie du grec ancien. Quelques grandes questions*. Louvain-la-Neuve: Peeters.
- Brosman, Paul. 1992. The Greek Nouns in -ω. *Journal of Indo-European Studies* 20. 317–338.

- Brugmann, Karl. 1876. Zur Geschichte der stammabstufenden Declinationen. Erste Abhandlung: Die Nomina auf *-ar* und *-tar*. *Studien zur griechischen und lateinischen Grammatik* 9. 361–406.
- Brugmann, Karl. 1878. Das verbale suffix *â* im indogermanischen, die griechische passivaoriste und die sogen. aeolische flexion der verba contracta. *Morphologische Untersuchungen* 1. 1–91.
- Brugmann, Karl. 1879. Über einige altindischen verben der V und IX conjugationsklasse. *Zeitschrift für vergleichende Sprachforschung* 24. 286–393.
- Brugmann, Karl. 1886. *Grundriss der vergleichenden Grammatik der indogermanischen Sprachen*. I. Straßburg: Trübner.
- Brugmann, Karl. 1897. *Grundriss der vergleichenden Grammatik der indogermanischen Sprachen*. II.1. Straßburg: Trübner.
- Brugmann, Karl. 1900. *Griechische Grammatik*. München: Beck.
- Brugmann, Karl. 1904. *Kurze vergleichende Grammatik der indogermanischen Sprachen*. Straßburg: Trübner.
- Brugmann, Karl. 1916. *Grundriss der vergleichenden Grammatik der indogermanischen Sprachen*. II.3. Straßburg: Trübner.
- Brugmann, Karl. 1919. Homerisch ἐπιτάροθος, ἐπιροθος. *Berliner Philologische Wochenschrift* 39. 136–139.
- Buck, Carl. 1904. *A Grammar of Oscan and Umbrian*. Boston: Ginn.
- Buck, Carl. 1955. *Comparative Grammar of Greek and Latin*. Chicago: University of Chicago Press
- Bugge, Sophus. 1893. Beiträge zur etymologischen erläuterung der armenischen sprache. *Zeitschrift für vergleichende Sprachforschung* 32. 1–87.
- Burkert, Walter. 1984. *Die orientalisierende Epoche in der griechischen Religion und Literatur*. Heidelberg: Winter.
- Burrow, Thomas. 1955. *The Sanskrit Language*. London: Faber & Faber.
- Burrow, Thomas. 1957. *An archaic verbal termination in early Indo-Iranian*. *Indo-Iranian Journal* 1. 61–76.
- Burrow, Thomas. 1979. *The Problem of Shwa in Sanskrit*. Oxford: Clarendon.
- Byrd, Andrew. 2015. *The Indo-European Syllable*. Leiden: Brill.
- Byrd, Andrew. ftc. The Phonology of Proto-Indo-European. To appear in Fritz, Matthias & Jared Klein (eds.). *Indo-European Linguistics*.
- Chantraine, Pierre. 1925. Les verbes grecs en *-θω. In [no editor]. *Mélanges linguistiques offerts à M.J. Vendryès par ses amis et ses élèves*. Paris: Champion. 93–108.
- Chantraine, Pierre. 1928. Sur le rôle de l'élargissement *ē/ō* dans la conjugaison grecque. *Bulletin de la Société de Linguistique des Paris* 28. 9–39.
- Chantraine, Pierre. 1932. Deux notes sur des formes verbales grecques. *Bulletin de la Société de Linguistique des Paris* 33.77–90.
- Chantraine, Pierre. 1933. *La formations des noms en grec*. Paris: Klincksieck.
- Chantraine, Pierre. 1945. *Morphologie historique du grec*. Paris: Klincksieck.

- Chantraine, Pierre. 1948. *Grammaire homérique*. Tome I. *Morphologie*. Paris: Klincksieck.
- Chantraine, Pierre. 1968. *Dictionnaire étymologique de la langue grecque*. I. Paris: Klincksieck.
- Chantraine, Pierre. 1974. *Dictionnaire étymologique de la langue grecque*. II. Paris: Klincksieck.
- Clackson, James. 1994. *The Linguistic Relationship between Armenian and Greek*. Oxford: Blackwell.
- Clackson, James. 2007. *Indo-European Linguistics. An Introduction*. Cambridge: Cambridge University Press.
- Collinge, Nigel. 1970. *Collectanea Linguistica. Essays in general and genetic linguistics*. The Hague: Mouton.
- Collinge, Nigel. 1985. *The Laws of Indo-European*. Amsterdam–Philadelphia: Benjamins.
- Collinge, Nigel. 1999. The laws of Indo-European: The state of the art 1998. *Journal of Indo-European Studies* 27. 355–377.
- Cowgill, Warren. 1965. Evidence in Greek. In Winter, Werner (ed.). *Evidence for Laryngeals*. The Hague–Paris: Mouton. 142–180.
- Curtius, Georg. 1853. Die aspiraten der indogermanischen sprachen. *Zeitschrift für vergleichende Sprachforschung* 2. 321–337.
- Curtius, Georg. 1873. *Grundzüge der griechischen Etymologie*. Leipzig: Teubner.
- Curtius, Georg. 1880. *Das Verbum der griechischen Sprache seinem Baue nachgestellt*. Leipzig: Hirzel.
- Dal, Ingrid. 1952. Über die germanische Entsprechung von altind. *th*. *Norsk Tidsskrift for Sprogvidenskap* 16. 328–333.
- Debrunner, Alfred. 1907. Zu den konsonantischen *jo*-Präsentien im Griechischen. *Indogermanische Forschungen* 21. 13–98.
- De Decker, Filip. 2010. What is the Greek counterpart of Sanskrit *th*? Handout and lecture at the conference *Greek and Latin from an Indo-European Perspective 3*, Bratislava, July 8–10 2010.
- De Decker, Filip. 2011. Evidence for laryngeal aAspiration in Greek. Part 1: The ‘recent’ evidence. *Indogermanische Forschungen* 116. 87–109.
- De Decker, Filip. 2012. Are Latin *pons* and *pontifex* and the other Indo-European cognates evidence for an inherited *i*-stem? *Journal of Indo-European Studies* 40. 11–45.
- De Decker, Filip. 2014. The etymology of Greek *σθένος*. *Glotta* 90. 114–138.
- De Decker, Filip. 2015. A new book on Pre-Greek. *International Journal of Diachronic Linguistics and Linguistic Reconstruction* 12. 1–22.
- De Decker, Filip. ftc. Evidence for laryngeal aspiration in Greek. Part 2: The »older« evidence.
- Derksen, Rik. 2008. *Etymological Dictionary of the Slavic Inherited Lexicon*. Leiden: Brill.

- Duhoux, Yves. 1992. *Le verbe grec ancien*. Louvain-la-Neuve: Peeters.
- Ebeling, Heinrich. 1885. *Lexicon Homericum*. Leipzig: Teubner.
- Egetmeyer, Markus. 2010. *Le dialecte grec ancien de Chypre. Tome I: Grammaire*. Berlin–New York: de Gruyter.
- Ehrlich, Hugo. 1907. Zur Mythologie II. Μοῦσα. *Zeitschrift für vergleichende Sprachforschung* 41. 287–289.
- Elbourne, Paul. 1998. Proto-Indo-European voiceless aspirates. *Zeitschrift für vergleichende Sprachforschung* 111. 1–30.
- Elbourne, Paul. 2000. Plain voiceless stop plus laryngeal in Proto-Indo-European. *Zeitschrift für vergleichende Sprachforschung* 113. 2–30.
- Elbourne, Paul. 2001. Aspiration by *s* and devoicing of Mediae Aspiratae. *Zeitschrift für vergleichende Sprachforschung* 114. 197–219.
- Elbourne, Paul. 2011. ἐπίροθοις. *Glotta* 87. 37–57.
- Elbourne, Paul. 2012. A rule of deaspiration in Greek. In: Willi, Andreas & Philomena Probert (eds). *Laws and Rules in Indo-European*. Oxford: Oxford University Press.
- Ernout, Alphonse & Antoine Meillet. 1967. *Dictionnaire étymologique de la langue latine: histoire de mots*. 4ième ouvrage augmenté. Paris: Klincksieck.
- Euler, Wolfram. 1979. *Indoiranisch-Griechische Gemeinsamkeiten der Nominalbildung und deren Indogermanische Grundlagen*. Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck.
- Feist, Sigmund. 1888. *Grundriss der gotischen Etymologie*. Straßburg: Trübner.
- Feist, Sigmund. 1937. *Vergleichendes Wörterbuch der gotischen Sprache: mit Einschluß des Krimgotischen und sonstiger zerstreuter Überreste des Gotischen*. Leiden: Brill.
- Fick, August. 1868. *Wörterbuch der Indogermanischen Grundsprache in ihrem Bestande vor der Völkertrennung*. Göttingen: Vandenhoeck & Ruprecht.
- Fick, August. 1870. spūma, idus, lacertus. *Zeitschrift für vergleichende Sprachforschung* 19. 78–81.
- Fick, August. 1872. Allerlei. *Zeitschrift für vergleichende Sprachforschung* 20. 353–369.
- Fick, August. 1884. Etymologien. *Beiträge zur Kunde der indogermanischen Sprachen* 8. 330–331.
- Fick, August. 1890. Die laute der griechischen Sprache. *Beiträge zur Kunde der indogermanischen Sprachen* 16. 279–293.
- Fick, August. 1909. Hesychglossen VI. *Zeitschrift für vergleichende Sprachforschung* 43. 130–153.
- Fortson, Benjamin W. 2004. *Indo-European Language and Culture. An introduction*. Oxford: Blackwell.
- Foy, Willy. 1898. Altindisch kápr̥t : griechisch κάπρος usw. *Indogermanische Forschungen* 8. 295–297.
- Fraenkel, Ernst. 1913. Zur metaphorischen Bedeutung der Suffixe -τήρ, -τωρ, -της im Griechischen. *Indogermanische Forschungen* 32. 107–148.

- Frisk, Hjalmar. 1936. Suffixales *th* im Indogermanischen. *Göteborg Högskolas Årsskrift* 42. 3–46.
- Frisk, Hjalmar. 1960. *Griechisches etymologisches Wörterbuch. A–Ko*. Heidelberg: Winter.
- Frisk, Hjalmar. 1970. *Griechisches etymologisches Wörterbuch. Ko–Ω*. Heidelberg: Winter.
- Fritz, Matthias. 1996. Das urindogermanische Wort für ‘Nase’ und das grundsprachliche Lautgesetz RHV > RV. *Zeitschrift für vergleichende Sprachforschung* 109. 1–20.
- Führer, Rudolph 1993a. *μάλομα*. In LfgrE 15. 7–8
- Führer, Rudolph 1993b. *μασσάμενος*. In LfgrE 15. 42.
- Führer, Rudolph 1993c. *μάσσω*. In LfgrE 15. 42.
- Führer, Rudolph 1993d. *μάσταξ*. In LfgrE 15. 42.
- Führer, Rudolph 1993e. *μόθος*. In LfgrE 15. 243.
- Furnée, Ezard. 1972. *Die wichtigsten konsonantischen Erscheinungen des Vorgriechischen*. Amsterdam–Philadelphia: Benjamins.
- Gippert, Jost. 1997. Laryngeals and Vedic Metre. In Lubotsky, Alexander (ed). *Sound Law and Analogy. Papers in honor of Robert Beekes on his 65th birthday*. Amsterdam–Philadelphia: Rodopi. 63–79.
- Gordon, Randall. 2010. Beating, hacking, and spitting: Germanic contributions to the question of acrostatic *d*-presents in Proto-Indo-European. *Zeitschrift für vergleichende Sprachforschung* 123. 258–296.
- Görtzen, Jens. 1998. *Die Entwicklung der indogermanischen Verbindungen von dentalen Okklusiven mit besonderer Berücksichtigung des Germanischen*. Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck.
- Grammont, Maurice. 1948. *Phonétique du grec ancien*. Lyon: J.A.C.
- Grassmann, Hermann. 1860. Über die Verbindung der stummen consonanten mit folgendem *v* und die davon abhängigen erscheinungen. *Zeitschrift für vergleichende Sprachforschung* 9. 1–36.
- Grassmann, Hermann. 1863a. Über die aspiraten und ihr gleichzeitiges vorhandensein im an- und auslaute der wurzeln. *Zeitschrift für vergleichende Sprachforschung* 12. 81–110.
- Grassmann, Hermann. 1863b. Über das ursprüngliche vorhandensein von wurzeln, deren anlaut und auslaut eine aspirate enthielt. *Zeitschrift für vergleichende Sprachforschung* 12. 110–138.
- Grassmann, Hermann. 1867. Die italischen götternamen. *Zeitschrift für vergleichende Sprachforschung* 16. 161–196.
- Grassmann, Hermann. 1873. *Wörterbuch zu Rig Veda*. Leipzig: Brockhaus.
- Gray, Louis. 1930. The personal endings of the present and imperfect active and middle. *Language* 6. 229–252.

- Greppin, John. 1982a. The reflex of the Indo-European voiceless aspirates in Armeian. In Jahukyan, G.B. (ed.) *Mijazgayin Hayerenagitakan Gitazolov — International Symposium of Armenian Linguistics*. Erevan: Haykakan SSH. 35–48.
- Greppin, John. 1982b. Arm. *t*'-, Gk. πτ-. *Journal of Indo-European Studies* 10. 347–353.
- Hackstein, Olav. 1995. *Untersuchungen zu den sigmatischen Präsensstambbildungen des Tocharischen*. Göttingen: Vandenhoeck & Ruprecht.
- Hackstein, Olav. 2002a. Uridg. *CH.CC > *C.CC. *Zeitschrift für vergleichende Sprachforschung* 115. 1–22.
- Hackstein, Olav. 2002b. *Die Sprachform der homerischen Epen*. Wiesbaden: Reichert.
- Hamp, Eric. 1953. Indo-European nouns with laryngeal suffix. *Word* 9. 135–141.
- Hamp, Eric. 1960. Irish *srón*, Greek ῥίς, ῥῆνός. *Glotta* 38. 209–211.
- Hamp, Eric. 1970a. Albanian *djathë* 'cheese'. *Zeitschrift für vergleichende Sprachforschung* 84. 140–141.
- Hamp, Eric. 1970b. Sanskrit *duhitā*, Armenian *dustr*, and IE internal schwa. *Journal of the American Oriental Society* 90. 228–231.
- Hamp, Eric. 1981. πᾶθος. *Glotta* 59. 157–159.
- Hamp, Eric. 1984. Indo-European 'bone' reconsidered. *Zeitschrift für vergleichende Sprachforschung* 97. 197–201.
- Hamp, Eric. 1993. Stem finals in aspirate or laryngeal. *Zeitschrift für vergleichende Sprachforschung* 106. 305–306.
- Hamp, Eric. 2001. Diverse Indo-Iranian etymological notes. *Journal of the American Oriental Society* 121.89–90.
- Harðarson, Jón. 1993. *Studien zum indogermanischen Wurzelaorist*. Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck.
- Hiersche, Ralph. 1964. *Untersuchungen zur Frage der Tenues Aspiratae im Indogermanischen*. Wiesbaden: Harrassowitz.
- Hiersche, Ralph. 1977. Nachlese zu griechisch πτόρθος : armenisch *ort*: hethitisch *paršdu*. *Zeitschrift für vergleichende Sprachforschung* 91. 51–53.
- Hiersche, Ralph. 1978. Les sourdes aspirées en indo-européen. *Revue des Études Anciennes* 80. 5–15.
- Hill, Eugen. 2003. *Untersuchungen zum inneren Sandhi des Indogermanischen. Der Zusammenstoß von Dentalplosiven im indoiranischen, Germanischen, Italischen und Keltischen*. Bremen: Hempen.
- Hillebrand, A. 1895. Wurzel *asth* im Sanskrit. *Indogermanische Forschungen* 5. 388–389.
- Hirt, Herman. 1912. *Handbuch der griechischen Laut- und Formenlehre*. Heidelberg: Winter.
- Hirt, Herman. 1921. *Indogermanische Grammatik. Teil II. Der indogermanische Vokalismus*. Heidelberg: Winter.
- Hirt, Herman. 1927. *Indogermanische Grammatik. Teil III. Das Nomen*. Heidelberg: Winter.

- Hoenigswald, Henry. 1965. Evidence in Indo-Iranian. Winter, Werner (ed.). *Evidence for Laryngeals*. The Hague–Paris: Mouton. 93–99.
- Hofmann, Johann B. 1950. *Etymologisches Wörterbuch des Griechischen*. München: Oldenbourg.
- Hoffmann, Karl. 1960. Ved. *ucchavañká-*, *ucchlankhá-*, *pāli ussankha-*. *Indo-Iranian Journal* 4. 111–118.
- Hoffmann, Otto. 1892. Zur indogermanischen lautlehre. *Beiträge zur Kunde der indogermanischen Sprachen* 18. 149–159.
- Holst, Jan. 1998. Ein bisher unentdecktes Lautgesetz im Albanischen und damit im Zusammenhang stehende Fragen. *Zeitschrift für vergleichende Sprachforschung* 111. 83–98.
- Hopper, Paul. 1973. Glottalized and Murmured Occlusives in Indo-European. *Glossa* 7. 141–166.
- Hopper, Paul. 1977a. The Typology of the Proto-Indo-European Segmental Inventory. *Journal of Indo-European Studies* 5. 41–53.
- Hopper, Paul. 1977b. Indo-European Consonantism and the New Look. *Orbis* 26. 57–72.
- Hübschmann, Heinrich. 1879. Iranische studien. *Zeitschrift für vergleichende Sprachforschung* 24. 323–415.
- Hübschmann, Heinrich. 1882. Armeniaca III. *Zeitschrift der Deutschen Morgenländischen Gesellschaft* 36. 115–134.
- Hübschmann, Heinrich 1883. *Armenische Studien I. Grundzüge der armenischen Etymologie*. Leipzig: Breitkopf & Härtel.
- Hübschmann, Heinrich. 1885. Iranica. *Zeitschrift für vergleichende Sprachforschung* 27. 103–112.
- Hübschmann, Heinrich. 1897. *Armenische Grammatik. Teil I Armenische Etymologie*. Leipzig: Breitkopf & Härtel.
- Humbach, Helmut. 1956. Yasna 41,13. *Münchener Studien zur Sprachwissenschaft* 1. 23–27.
- Humbach, Helmut. 1977. Avestisch *raθa-* ‘Wagen’ und seine Ableitungen *raiθiia-* und *raiθi-*. *Münchener Studien zur Sprachwissenschaft* 36. 49–52.
- Isebaert, Lambert. 1988. La formation de latin *domāre*. In Arbeitman, Joel (ed). *A Linguistic Happening in Memory of Ben Schwartz*. Louvain-la-Neuve: Peeters. 349–359.
- Iverson, Gregory. 1985. Grassmann’s Law in Indo-European. *Folia Linguistica Historica* 6. 203–214.
- Jackson, Abraham. 1892. *An Avesta Grammar in Comparison with Sanskrit. Part I. Phonology, inflection, word formation*. Stuttgart: Kohlhammer.
- Jakobson, Roman. 1958. Typological Studies and their contribution to historical comparative linguistics. In Sivertsen, Eva (ed.). *Proceedings of the Eighth International Congress of Linguists*. Oslo: Oslo University Press. 17–35.

- Jamison, Stephanie. 1983. *Function and Form in the -áya-Formations of the Rig Veda and Atharva Veda*. Göttingen: Vandenhoeck & Ruprecht.
- Jankuhn, Harald. 1969. *Die passive Bedeutung medialer Formen untersucht an der Sprache Homers*. Göttingen: Vandenhoeck & Ruprecht.
- Joseph, Brian. 1984. A note on assibilation in Hittite. *Sprache* 30. 1–16.
- Juret, Jean. 1938. *Phonétique grecque*. Paris: Les Belles Lettres.
- Kalléris, Jean N. 1954. *Les anciens Macédoniens I*. Athènes: Institut Française d'Athènes.
- Kalléris, Jean N. 1988. *Les anciens Macédoniens II*. Athènes: Institut Française d'Athènes.
- Kellens, Jean. 1974. *Les noms-racines de l'Avesta*. Wiesbaden: Reichert.
- Kent, Roland G. 1941. The Greek aspirated perfect. *Language* 17. 189–193.
- Kent, Roland G. 1953. *Old Persian. Grammar, texts, lexicon*. New Haven: American Oriental Society.
- Kimball, Sara. 1999. *Hittite Historical Phonology*. Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck.
- Kirk, Geoffrey S. 1985. *The Iliad: A Commentary. Books I – IV*. Cambridge: Cambridge University Press.
- Kirk, Geoffrey S. 1990. *The Iliad: A Commentary. Books V – VIII. – IV*. Cambridge: Cambridge University Press.
- Klingenschmitt, Gert. 1982. *Das altarmenische Verbum*. Wiesbaden: Harrassowitz.
- Kloekhorst, Alwin. 2006. Initial laryngeals in Anatolian. *Zeitschrift für vergleichende Sprachforschung* 119. 77–108.
- Kloekhorst, Alwin. 2008. *The Inherited Hittite Lexicon*. Leiden: Brill.
- Kluge, Friedrich. 1882a. Sprachhistorische Miscellen. *Beiträge zur Geschichte der deutschen Sprache und Literatur* 8. 506–539.
- Kluge, Friedrich. 1882b. *Etymologisches Wörterbuch der deutschen Sprache*. Straßburg: Trübner.
- Kluge, Friedrich. 1883. Zur altgermanischer Sprachgeschichte. *Zeitschrift für vergleichende Sprachforschung* 26. 68–103.
- Kortlandt, Frederik. 1981. 1st sg. middle *H₂. *Indogermanische Forschungen* 86. 123–136.
- Kretschmer, Paul. 1892. Indogermanische accent- und lautstudien. *Zeitschrift für vergleichende Sprachforschung* 31. 325–472.
- Kronasser, Heinz. 1966. *Etymologie der hethitischen Sprache*. Wiesbaden: Harrassowitz.
- Kuhn, Adalbert. 1852. Über das alte s und einige damit verbundene lautentwicklungen. *Zeitschrift für vergleichende Sprachforschung* 1. 270–277.
- Kuhn, Adalbert. 1854a. Die aspirationen stummer consonanten. *Zeitschrift für vergleichende Sprachforschung* 3. 321–331.
- Kuhn, Adalbert. 1854b. Über das alte s und einige damit verbundene lautentwicklungen. *Zeitschrift für vergleichende Sprachforschung* 3. 426–440.

- Kuhn, Adalbert. 1855a. Über das alte s und einige damit verbundene lautentwicklungen. Artikel VI, VII und nachträge. *Zeitschrift für vergleichende Sprachforschung* 4. 1–46.
- Kuhn, Adalbert. 1855b. Miscellen III: Pfad, πάτος, πόντος, pons, pontifex. *Zeitschrift für vergleichende Sprachforschung* 4.73–77.
- Kühner, Raphael & Blass, Friedrich. 1892. *Ausführliche Grammatik der griechischen Sprache. 1: Formenlehre*. Hannover: Hahn.
- Kühner, Raphael & Gerth, Berthold. 1898. *Ausführliche Grammatik der griechischen Sprache. 2: Satzlehre*. Hannover: Hahn.
- Kuiper, Franciscus B.J. 1934. *Die indogermanischen Nasalpräsentia*. Amsterdam: Noord Hollandsche Uitg.
- Kuiper, Franciscus. 1942. Notes on Vedic noun inflection. *Mededelingen der Koninklijke Nederlandse Akademie van Wetenschappen* 5.4. 161–255.
- Kuiper, Franciscus B.J. 1954. Two Rigvedic Loanwords. In Gigon, O, K. Jaberg, H. Krahe, E. Risch & W. Theiler (Hgg.). *Sprachgeschichte und Wortbedeutung. Festschrift Albert Debrunner*. Bern. 241–250.
- Kuiper, Franciscus B.J. 1957. Avestan *Mazdā*. *Indo-Iranian Journal* 1. 86–95.
- Kuiper, Franciscus B.J. 1961. Zur kompositionellen Kürzung im Sanskrit. *Sprache* 7. 14–31.
- Kuiper, Franciscus B.J. 1966. Review Hiersche 1964. *Indo-Iranian Journal* 9. 218–227.
- Kümmel, Martin. 2000. *Das Perfekt im Indo-Iranischen*. Wiesbaden: Harrassowitz.
- Kümmel, Martin. 2001a. **h₁es*⁻¹ ‘dasein, sein’. In LIV². 241–242.
- Kümmel, Martin. 2001b. **k₁ent*- ‘stechen’. In LIV². 326–327.
- Kümmel, Martin. 2001c. **k₁neth₂*- ‘stoßen, stechen’. In LIV². 337.
- Kümmel, Martin. 2001d. **k₁reth₂*- ‘sich lockern’. In LIV². 338.
- Kümmel, Martin. 2001e. **lejt*⁻¹ ‘weggehen’. In LIV². 410.
- Kümmel, Martin. 2001f. **skeh₁^h*- ‘schädigen’. In LIV². 551.
- Kümmel, Martin. 2001g. **spt₁jeuH*- ‘spucken, speien’. In LIV². 583–584.
- Kümmel, Martin. 2001h. *(*s*)*teg*- ‘decken, bedecken’. In LIV². 589.
- Kümmel, Martin. 2001i. **^heng^h*- ‘ziehen’. In LIV². 657.
- Kümmel, Martin. 2001j. **uerh₁*- ‘sagen’. In LIV². 689–690.
- Kümmel, Martin & Zehnder, Thomas. 2001. **sk^heh₂(i)*- ‘aufschneiden, schinden’. In LIV². 547.
- Kuryłowicz, Jerzy. 1927. Les effets du *ə* en indo-iranien. *Prace Filologiczne* 11. 201–243.
- Kuryłowicz, Jerzy. 1927/8. *ə* indo-européen et *h* hittite. In [no editor]. *Symbolae grammaticae in honorem Ioannis Rozwadowski*. Kraków: Gebethner & Wolff. 95–104.
- Kuryłowicz, Jerzy. 1928. Le type védique *grbhāyati*. In Meillet, Antoine (ed). *Étrennes de linguistique offertes par quelques amis à Émile Benveniste*. Paris. 51–62.

- Kuryłowicz, Jerzy. 1932. Les désinences moyennes de l'indo-européen et du hittite. *Bulletin de la Société de Linguistique des Paris* 33. 1–4.
- Kuryłowicz, Jerzy. 1935. *Études indo-européennes*. Kraków: Gebethner & Wolff.
- Kuryłowicz, Jerzy. 1956. *L'apophonie en indo-européen*. Wrocław: Zakład Imienia Ossolińskich.
- Kuryłowicz, Jerzy. 1968. *Indogermanische Grammatik. Teil II: Ablaut*. Heidelberg: Winter.
- Lazzeroni, Romano. 1998. Sanskrit. In Ramat, Paolo & Anna Giacalone Ramat (eds.) *The Indo-European Languages*. London: Taylor & Francis. 98–124.
- Lehmann, Winfred P. 1959. *Proto-Indo-European Phonology*. Austin: University of Texas Press.
- Lejeune, Michel. 1972. *Phonétique historique du mycénien et du grec ancien*. Paris: Klincksieck.
- Leukart, Alex. 1994. *Die frühgriechischen Nomina auf -tās und -ās: Untersuchungen zu ihrer Herkunft und Ausbreitung (unter Vergleich mit den Nomina auf -eūs)*. Wien: Verlag der Österreichischen Akademie der Wissenschaften.
- Lewis, Charlton & Charles Short. 1891. *A Latin Dictionary*. Oxford: Clarendon.
- Lewy, Heinrich. 1895. *Die semitischen Fremdwörter im Griechischen*. Berlin: Gaertner.
- Lindeman, Fredrik. 1982. *The triple representation of schwa in Greek and some related problems of Indo-European phonology*. Oslo: Norwegian University Press.
- Lindeman, Fredrik. 1987. *Introduction to the 'laryngeal theory'*. Oslo: Norwegian University Press.
- Lindeman, Fredrik. 2004. On the vocalization of 'laryngeals' in Indo-European. *Zeitschrift für vergleichende Sprachforschung* 117. 118–133.
- Lipp, Reiner. 2001. **k^vend^h*- 'einen Eindruck empfangen, erleben, erleiden'. In LIV². 390.
- Lubotsky, Alexander. 1981. Review Burrow 1979. *Lingua* 55. 75–95.
- Lubotsky, Alexander. 1989. The Vedic -*áya*-formations. *Indo-Iranian Journal* 32. 89–113.
- Lubotsky, Alexander. 1995. Sanskrit *h* < **dh*, *bh*. In Gurov, N. & J. Vasil'kov (ed.). *Sthāpakaśrāddham. Professor G.A. Zograf Commemorative Volume*. St. Petersburg: Peterburgskoe Vostokovedenie. 124–144.
- Lubotsky, Alexander. ftc a. *The Inherited Lexicon of Indo-Iranian*. To appear in the Leiden *Indo-European Etymological Dictionaries Series*.
- Lubotsky, Alexander. ftc b. Historical phonology of Indo-Iranian. To appear in Fritz, Matthias & Jared Klein (eds.). *Indo-European Linguistics*.
- Macdonell, Arthur. 1910a. *A Vedic reader for students*. Oxford: Clarendon.
- Macdonell, Arthur. 1910b. *Vedic Grammar*. Straßburg: Trübner.
- Macdonell, Arthur. 1916. *A Vedic Grammar for Students*. Oxford: Clarendon.
- Macdonell, Arthur. 1927. *A Sanskrit Grammar for Students*. Oxford: Clarendon.

- Mallory, James & Adams, Douglas (eds.). 1997. *Encyclopedia of Indo European Culture*. London–Chicago: Fitzroy Dearborn.
- Mallory, James & Adams, Douglas. 2006. *The Oxford Introduction to Proto-Indo-European and the Proto-Indo-European World*. Oxford: Oxford University Press.
- Martinet, André. 1955. *Économie des changements phonétiques. Traité de phonologie diachronique*. Bern: Francke.
- Martirosyan, Hrach. 2008. *Studies in Armenian Etymology with special Emphasis on Dialects and Culture Indo-European Heritage*. PhD-Thesis, Leiden.
- Martirosyan, Hrach. 2010. *Etymological Dictionary of the Inherited Armenian Lexicon*. Leiden: Brill.
- Masica, Colin P. 1991. *The Indo-Aryan Languages*. Cambridge: Cambridge University Press.
- Matzinger, Joachim. 2005. *Untersuchungen zum altarmenischen Nomen. Die Flexion des Substantivs*. Dettelbach: Röhl.
- Mayrhofer, Manfred. 1953. *Kurzgefasstes etymologisches Wörterbuch des Altindischen — A concise etymological Sanskrit dictionary*. Heidelberg: Winter.
- Mayrhofer, Manfred. 1957. *Kurzgefasstes etymologisches Wörterbuch des Altindischen — A concise etymological Sanskrit dictionary*. Heidelberg: Winter.
- Mayrhofer, Manfred. 1961. Indogermanistische Randglossen zu ‘Kluge-Mitzka’. *Sprache* 7. 177–189.
- Mayrhofer, Manfred. 1964. *Kurzgefasstes etymologisches Wörterbuch des Altindischen — A concise etymological Sanskrit dictionary*. Heidelberg: Winter.
- Mayrhofer, Manfred. 1970. Germano-Indica. *Zeitschrift für vergleichende Sprachforschung* 84. 224–230.
- Mayrhofer, Manfred. 1976. *Kurzgefasstes etymologisches Wörterbuch des Altindischen — A concise etymological Sanskrit dictionary*. Heidelberg: Winter.
- Mayrhofer, Manfred. 1978. *Sanskrit-Grammatik mit sprachvergleichenden Erläuterungen*. Berlin–New York: de Gruyter.
- Mayrhofer, Manfred. 1981a. Ferdinand de Saussure. Nach hundert Jahren. *Sitzungsberichte der Heidelberger Akademie der Wissenschaften*. 7–38.
- Mayrhofer, Manfred. 1981b. Laryngalreflexe im Indo-Iranischen. *Zeitschrift für Phonetik, Sprachwissenschaft und Kommunikationsforschung* 4. 427–438.
- Mayrhofer, Manfred. 1986. *Indogermanische Grammatik. Teil I. Lautlehre*. Heidelberg: Winter.
- Mayrhofer, Manfred. 1992. *Etymologisches Wörterbuch des Altindoarischen*. Heidelberg: Winter.
- Mayrhofer, Manfred. 1996. *Etymologisches Wörterbuch des Altindoarischen*. Heidelberg: Winter.
- Mayrhofer, Manfred. 2004. *Die Hauptprobleme der indogermanischen Lautlehre seit Bechtel*. Wien: Verlag der Österreichischen Akademie der Wissenschaften.
- Mayrhofer, Manfred. 2005. *Die Fortsetzung der indogermanischen Laryngale im Indo-Iranischen*. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

- Meid, Wolfgang. 1964. Über *s* in Verbindung mit *t*-haltigen Suffixen, besonders im Germanischen. *Indogermanische Forschungen* 69. 218–255.
- Meid, Wolfgang. 1988. Einige persönliche und sachliche Bemerkungen zur Laryngaltheorie. Bammesberger, Alfred (ed.). *Die Laryngaltheorie und die Rekonstruktion des indogermanischen Laut- und Formensystems*. Heidelberg: Winter. 333–352.
- Meier-Brügger, Michael. 1992. *Griechische Sprachwissenschaft*. Zwei Bände. Berlin: de Gruyter.
- Meier-Brügger, Michael. 1995. Griechisch (ἀλγυ)πτόζ, vedisch (rj)pyá- und Verwandtes. *Zeitschrift für vergleichende Sprachforschung* 108. 50–55.
- Meier-Brügger, Michael. 2010. *Indogermanische Sprachwissenschaft*. Zweite erweiterte Ausgabe. Berlin–New York: de Gruyter.
- Meillet, Antoine. 1892a. Notes de phonétique. *Mémoires de la Société de Linguistique* 7. 161–165.
- Meillet, Antoine. 1892b. Notes arméniennes. *Mémoires de la Société de Linguistique* 8. 153–165.
- Meillet, Antoine. 1894. De quelques difficultés de la théorie des gutturales indo-européennes. *Mémoires de la Société de Linguistique* 8. 277–304.
- Meillet, Antoine. 1898. Étymologies arméniennes. *Mémoires de la Société de Linguistique* 10. 274–282.
- Meillet, Antoine. 1903. *Esquisse d'une grammaire comparée de l'arménien classique*. Vienne: Imprimerie des PP. Mékhitharistes.
- Meillet, Antoine. 1908. *Introduction à l'étude comparative des langues indo-européennes*. Paris: Hachette.
- Meillet, Antoine. 1910. *Les dialectes indo-européens*. Paris: Champion.
- Meillet, Antoine. 1913. *Aperçu d'une histoire de la langue grecque*. Paris: Hachette.
- Meillet, Antoine. 1925. Des présents grecs en -ῶ/-ῶ-. In [no editor] *Mélanges linguistiques offerts à M.J. Vendryès par ses amis et ses élèves*. Paris: Champion. 275–285.
- Meillet, Antoine. 1927/8. Un suffixe indo-européen méconnu. In [no editor]. *Symbolae grammaticae in honorem Ioannis Rozwadowski*. Kraków: Gebethner & Wolff. 105–108.
- Meillet, Antoine. 1928. Review Kuryłowicz 1927, 1927/8, 1928. *Bulletin de la Société de Linguistique des Paris* 29. 60–62.
- Meillet, Antoine. 1930. De la valeur des sourdes aspirées indo-européennes. In Bogholm, Niels, Carl Bodelsen & Aage Brusendorff (eds.). *A Grammatical Miscellany Offered to Otto Jespersen on his Seventieth Birthday*. Copenhagen: Levin & Munksgaard. 341–343.
- Meillet, Antoine. 1935. Les sourdes aspirées en arménien. *Bulletin de la Société de Linguistique des Paris* 36. 109–120
- Meillet, Antoine. 1936a. *Esquisse d'une grammaire comparée de l'arménien classique*. Vienne: Imprimerie des PP. Mékhitharistes.

- Meillet, Antoine. 1936b. Les sourdes aspirées en arménien. *Bulletin de la Société de Linguistique des Paris* 36. 109–120.
- Meillet, Antoine. 1937. *Introduction à l'étude des langues indo-européennes*. Paris: Hachette.
- Meillet, Antoine & Jean Vendryès. 1948. *Traité de grammaire comparée des langues classiques*. Paris: Champion.
- Meiser, Gerhard. 1999. *Historische Laut- und Formenlehre der lateinischen Sprache*. Darmstadt: Wissenschaftliche Buchgesellschaft.
- Meiser, Gerhard. 2003. Lat. *mando mandī* 'kaue'. In Marchesini, Simona & Paolo Poccetti (eds.). *Linguistica è storia — Sprachwissenschaft ist Geschichte. Scritti in Onore di Carlo De Simone — Festschrift für Carlo De Simone*. Pisa. 121–125.
- Melchert, Craig. 1977. Tocharian verb stems in *-tk-*. *Zeitschrift für vergleichende Sprachforschung* 91. 93–130.
- Melchert, Craig. 1984. *Studies in Hittite Historical Phonology*. Göttingen: Vandenhoeck & Ruprecht.
- Melchert, Craig. 1987. The Reflexes of $*h_3$ in Hittite. *Sprache* 33. 19–28.
- Messing, Gordon. 1947. Selected Studies in Indo-European Phonology. *Harvard Studies in Classical Philology* 56/57. 161–232.
- Michelini, Guido. 1975. Esisteva in Indoeuropeo una serie di occlusive sorde aspirate? *Studi Italiani di Linguistica Teorica ed Applicata* 4. 49–65.
- Monier Williams, Monier. 1899. *A Sanskrit-English dictionary, etymologically and philologically arranged with special reference to cognate Indo-European languages*. Oxford: Clarendon.
- Montanari, Franco. 2015. *The Brill Dictionary of Ancient Greek*. Leiden: Brill.
- Narten, Johanna. 1960. Das vedische Verbum *math-*. *Indo-Iranian Journal* 4. 121–135.
- Narten, Johanna. 1982. Die vedischen Präsensstämme *hṛ̥nāyá-*, *hṛ̥nīyá-* und Verwandtes. *Münchener Studien zur Sprachwissenschaft* 41. 139–149.
- Negri, Mario. 1976. Studi sul verbo greco II. *Acme* 29. 233–250.
- Neumann, Günter. 1985. Review Burkert 1984. *Zeitschrift für vergleichende Sprachforschung* 98. 304–306.
- Neumann, Günter. 1992. Griechisch $\mu\omicron\lambda\omicron\beta\rho\acute{o}\varsigma$. *Zeitschrift für vergleichende Sprachforschung* 105. 75–80.
- Nikolaev, Alexander. 2010. Indo-European $*dem(h_2)$ - 'to build' and its derivatives. *Zeitschrift für vergleichende Sprachforschung* 123. 56–96.
- Nordheider, Hans. 1991. $\kappa\acute{\epsilon}\nu\sigma\alpha\iota$. In LfgrE 14. 1381.
- Normier, Rudolph. 1980. Tocharisch *ñakt/ñakte* 'Gott'. *Zeitschrift für vergleichende Sprachforschung* 94. 251–281
- Nowicki, Helmut. 1976. *Die neutralen s Stämme im indo-iranischen Zweig der Indogermanischen*. Dissertation an der Julius-Maximilians-Universität Würzburg.
- Nussbaum, Alan. 1997. The Saussure Effect in Latin and Italic. In Lubotsky, Alexander (ed). *Sound Law and Analogy. Papers in honor of Robert Beekes on his 65th birthday*. Amsterdam–Philadelphia: Rodopi. 181–203.

- Ofitsch, Michaela. 1995. Zu den anlautenden Laryngalen im Hethitischen. *Zeitschrift für vergleichende Sprachforschung* 108. 16–29.
- Olsen, Birgit. 1994. The stages of Indo-European aspiration by laryngeal. In Dunkel, George (ed.). *Früh, Mittel- und Spätindogermanisch*. Wiesbaden: Reichert. 267–277.
- Osthoff, Hermann. 1881. Die tiefstufe im indogermanischen. *Morphologische Untersuchungen* 4. 1–490.
- Osthoff, Hermann. 1888. Etymologica I. *Beiträge zur Geschichte der deutschen Sprache und Literatur* 13. 395–463.
- O’Sullivan, John. 1993. $\mu\acute{\alpha}\sigma\tau\upsilon\zeta$. In *LfgRE* 15. 42.
- Pedersen, Holger. 1893. *r-n*-stämme. *Zeitschrift für vergleichende Sprachforschung* 32. 240–273.
- Pedersen, Holger. 1906. Armenisch und die Nachbarsprachen. *Zeitschrift für vergleichende Sprachforschung* 39. 334–485.
- Pedersen, Holger. 1909. *Vergleichende Grammatik der keltischen Sprachen. I. Einleitung und Lautlehre*. Göttingen: Vandenhoeck & Ruprecht.
- Pedersen, Holger. 1913. *Vergleichende Grammatik der keltischen Sprachen. II. Bedeutungslehre (Wortlehre)*. Göttingen: Vandenhoeck & Ruprecht.
- Pedersen, Holger. 1926. *La cinquième déclinaison latine*. København: Høst.
- Pedersen, Holger. 1938. *Hittitisch und die anderen indoeuropäischen Sprachen*. København: Levin & Munksgaard.
- Perpillou, Jean-Louis. 1973. *Les substantifs grec en -εύς*. Paris: Klincksieck.
- Persson, Per. 1912. *Beiträge zur indogermanischen Wortforschung*. Uppsala: Akademiska Bokhandeln.
- Peters, Martin. 1980. *Untersuchungen zur Vertretung der indogermanischen Laryngale im Griechischen*. Wien: Verlag der Österreichischen Akademie der Wissenschaften.
- Peters, Martin. 1993a. Ορεσθ- neben Ορεστᾶ . *Die Sprache* 35. 135–139.
- Peters, Martin. 1993b. Beiträge zur griechischen Etymologie. In Isebaert, Lambert (ed.). *Miscellanea Linguistica Graeco-Latina*. Namur: Société des Études Classiques. 85–113.
- Petersson, Herbert. 1916. Beiträge zur armenischen Wortkunde. *Zeitschrift für vergleichende Sprachforschung* 49. 240–291.
- Pinault, Georges. 1982. A Neglected Phonetic Law: The Reduction of the Indo-European Laryngeals in Internal Syllables before Yod. In Ahlqvist, Anders. (ed.). *Papers from the 5th International Conference on Historical Linguistics*. Amsterdam–Philadelphia. 265–272.
- Piowarczyk, Dariusz. 2008. *The Treatment of Laryngeals before Yod in Indo-European Verbs*. MA-Thesis, Leiden.
- Piowarczyk, Dariusz. ftc. Some remarks on Pinault’s rule in Greek.
- Polomé, Edgar. 1965. The Laryngeal theory so far: A critical bibliographical survey. In Winter, Werner (ed.). *Evidence for Laryngeals*. The Hague–Paris: Mouton. 9–78.

- Pott, August. 1883. Latein und griechisch in einigen ihrer wichtigen lautunterschiede. *Zeitschrift für vergleichende Sprachforschung* 26. 113–242.
- Prellwitz, Walther. 1905. *Etymologisches Wörterbuch der griechischen Sprache*. Göttingen: Vandenhoeck & Ruprecht.
- Prellwitz, Walther. 1916. Griechische Etymologien. *Zeitschrift für vergleichende Sprachforschung* 47. 295–306.
- Prévot, André. 1934. *L'aoriste grec en -θην*. Paris: Durond.
- Pronk, Tijmen. 2011. The Saussure effect in Indo-European languages other than Greek. *Journal of Indo-European Studies* 39. 177–193.
- Rasmussen, Jens. 1987. On the status of the aspirated tenues and the Indo-European phonation series. *Acta Linguistica Hafniensia* 20. 81–109.
- Rasmussen, Jens. 1989a. Die Tenues Aspiratae, Dreiteilung oder Vierteilung des indogermanischen Plosivsystems und die Konsequenzen dieser Frage für die Chronologie einer Glottalreihe. In Vennemann, Theo (ed.). 1989. *The New Sounds of Indo-European. Essays in phonological reconstruction*. Berlin–New York: de Gruyter. 153–176.
- Rasmussen, Jens. 1989b. *Studien zur Morphophonemik der indogermanischen Grundsprache. Phonology*. Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck.
- Rasmussen, Jens. 1999. *Selected Papers on Indo-European Linguistics, with a Section on Comparative Eskimo Linguistics*. Copenhagen: Museum Tusulanum.
- Rau, Jeremy. 2008. Δ 384 Τυδῆ, ο 339 Μηχιστῆ, and τ 136 Ὀδυσῆ. *Harvard Studies in Classical Philology* 104. 1–18.
- Ravnæs, Erling. 1981. The development of ə/interconsonantal laryngeals in Iranian. *Indo-Iranian Journal* 23. 247–273.
- Reichelt, Hans. 1909. *Awestisches Elementarbuch*. Heidelberg: Winter.
- Reichelt, Hans. 1927. *Die Erforschung der indogermanischen Sprachen: Iranisch*. Berlin: de Gruyter.
- Renou, Louis. 1934. Sur l'aoriste védique en -iṣ-. *Bulletin de la Société de Linguistique des Paris* 35. 1–14.
- Renou, Louis. 1952. *Grammaire de la langue védique*. Lyon–Paris: IAC.
- Ringe, Donald. 2006. *From Proto-Indo-European to Proto-Germanic*. Oxford: Oxford University Press.
- Risch, Ernst. 1974. A propos de l'origine des masculins grecs en -ᾱς. *Bulletin de la Société de Linguistique des Paris* 69. 109–119.
- Rix, Helmut (ed.). 1975. *Flexion und Wortbildung. Akten der V. Fachtagung der Indogermanischen Gesellschaft*. Wiesbaden: Reichert.
- Rix, Helmut. 1976. *Historische Grammatik des Griechischen. Laut- und Formenlehre*. Darmstadt: Wissenschaftliche Buchgesellschaft.
- Roscher, W. 1868. Deaspiratione vulgari apud Graecos. *Studien zur griechischen und lateinischen Grammatik* 1. 65–127.

- Rosol Rafał. 2010. *καλαθός*, ein ägyptisches Lehnwort? *Zeitschrift für vergleichende Sprachforschung* 123. 176–180.
- Rosol Rafał. 2012. *Frühe semitische Lehnwörter im Griechischen*. Frankfurt: Lang.
- Ruijgh, Cornelis. 1967. *Études du grec mycénien*. Amsterdam: Hakkert.
- Ruijgh, Cornelis. 1978. Review Rix 1976. *Mnemosyne* IV 31. 298–307.
- Ruijgh, Cornelis. 1988. Les laryngales en grec préhistorique. In Bammesberger, Alfred (ed.). *Die Laryngaltheorie und die Rekonstruktion des indogermanischen Laut- und Formensystems*. Heidelberg: Winter. 433–469.
- Ruijgh, Cornelis. 1996. *Scripta minora ad graecam linguam pertinentia*. Amsterdam: Gieben.
- Ruijgh, Cornelis. 2004. The PIE verbal suffix *eh₁. In: Penney, John (ed.). *Indo-European Perspectives. Studies in honour of Anna Morpurgo-Davies*. Oxford: Oxford University Press. 48–64.
- Safarewicz, Jan. 1972. Note sur l'évolution des occlusives aspirées en grec. *Eos. Commentarii Societatis Philologiae Polonorum* 60. 103–104.
- de Saussure, Ferdinand. 1879. *Mémoire sur le système primitif des voyelles dans les langues indo-européennes*. Leipsick: Teubner.
- Scardigli, Piergiuseppe. 1973. *Die Goten. Sprache und Kultur*. München: Beck.
- Scheffelowitz, Isidor. 1904a. Die begriffe für 'schädel' im Indogermanischen. *Beiträge zur Kunde der indogermanischen Sprachen* 28. 143–158.
- Scheffelowitz, Isidor. 1904b. Zur altarmenischen lautgeschichte. *Beiträge zur Kunde der indogermanischen Sprachen* 28. 282–313.
- Scheffelowitz, Isidor. 1904c. Zur altarmenischen lautgeschichte. *Beiträge zur Kunde der indogermanischen Sprachen* 29. 13–71.
- Schindler, Jochem. 1967. Das indogermanische Wort für Erde und die dentalen Spiranten. *Sprache* 13. 190–205.
- Schindler, Jochem. 1969. Die indogermanischen Wörter für 'Vogel' und 'Ei'. *Sprache* 15. 144–167.
- Schindler, Jochem. 1972. *Das Wurzelnomen im Arischen und Griechischen*. Inauguraldissertation an der Julius-Maximilians-Universität Würzburg.
- Schirmer, Brigitte. 2001a. *peth₂-¹, 'ausbreiten'. LIV². 478–479.
- Schirmer, Brigitte. 2001b. *peth₂-², 'fliegen'. LIV². 479.
- Schirmer, Brigitte & Kümmel, Martin. 2001. *peth₁- 'fallen'. In LIV². 477–478.
- Schleicher, August. 1871. *Compendium der vergleichenden grammatik der indogermanischen sprachen*. Weimar: Böhlau.
- Schmidt, Gernot. 1973. Die iranischen Wörter für 'Tochter' und 'Vater' und die Reflexe des interkonsonantischen H (ə) in den indogermanischen Sprachen. *Zeitschrift für vergleichende Sprachforschung* 87. 36–83.
- Schmidt, Johannes. 1883. Heteroklitische nominative singularis auf -ās in den arischen sprachen. *Zeitschrift für vergleichende Sprachforschung* 26. 401–409.
- Schmidt, Johannes. 1885a. Die personalendungen -θα und -σων im griechischen. *Zeitschrift für vergleichende Sprachforschung* 27. 315–329.

- Schmidt, Johannes. 1885b. Indogermanisches \bar{o} aus $\bar{o}i$ in der nominalflexion. Mit excurs: Zur bildung des nominativus singularis. *Zeitschrift für vergleichende Sprachforschung* 27. 369–397.
- Schmidt, Johannes. 1893. Assimilation benachbarter einander nicht berührender vocale im griechischen. *Zeitschrift für vergleichende Sprachforschung* 32. 321–394.
- Schmitt, Rüdiger. 1977. *Einführung in die griechischen Dialekte*. Darmstadt: Wissenschaftliche Buchgesellschaft.
- Schrijnen, Josef. 1924. *Handleiding bij de studie der vergelijkende Indogermaanse Taalwetenschap*. Leiden: Sijthoff.
- Schrijver, Peter., 1991. *The Reflexes of the Proto-Indo-European Laryngeals in Latin*. Amsterdam–Atlanta: Rodopi.
- Schulze, Wilhelm. 1912a. Ai. $\zeta\eta\eta\nu$. *Zeitschrift für vergleichende Sprachforschung* 45. 95–96.
- Schulze, Wilhelm. 1912b. Gr. $\tau\tau\acute{\omega}$. *Zeitschrift für vergleichende Sprachforschung* 45. 96.
- Schulze, Wilhelm. 1913. Ai. $k\bar{a}k\bar{a}h$. *Zeitschrift für vergleichende Sprachforschung* 45. 146.
- Schwendtner, Ernst. 1939. Ai. $thuthuk\bar{r}t$, $ghughuk\bar{r}t$ und Verwandtes. *Zeitschrift für vergleichende Sprachforschung* 66. 127.
- Schweizer, H. 1854. Review Bopp 1833. *Zeitschrift für vergleichende Sprachforschung* 4. 337–398.
- Schwyzler, Eduard. 1923. Deutungsversuche griechischer, besonders homerischer Wörter. *Glotta* 12. 8–29.
- Schwyzler, Eduard. 1939. *Griechische Grammatik, auf der Grundlage von Karl Brugmanns griechischer Grammatik*. München: Beck.
- Seiler, Ernst E. & Capelle, Carl. 1889. *Vollständiges Wörterbuch über die Gedichte des Homeros und der Homeriden*. Leipzig: Hahn.
- Shields, Kenneth. 1979. The Gothic verbal dual in *-ts* and its Indo-European origins. *Indogermanische Forschungen* 84. 216–225.
- Siebs, Theodor. 1904. Anlautstudien. *Zeitschrift für vergleichende Sprachforschung* 37. 277–324.
- Sihler, Andrew. 1969. Sievers-Edgerton phenomena and Rig-Vedic metre. *Language* 45. 248–273.
- Sihler, Andrew. 1986a. Germanic second person endings in *-st*. *Münchener Studien zur Sprachwissenschaft* 47. 193–215.
- Sihler, Andrew. 1986b. An explanation of Gothic *saisost* 2 sg. pret. of *saian* ‘to sow’. *Münchener Studien zur Sprachwissenschaft* 47. 217–222.
- Sihler, Andrew. 1995. *A New Comparative Grammar of Greek and Latin*. Oxford: Oxford University Press.
- Smyth, Herbert W. & Messing, Gordon M. 1956. *Greek Grammar*. Revised by Gordon Messing. Cambridge, MA: Harvard University Press.

- Solmsen, Felix. 1904. Beiträge zur Geschichte der lateinischen Sprache. *Zeitschrift für vergleichende Sprachforschung* 37. 1–26.
- Solmsen, Felix. 1906. Zur griechischen verbalflexion. *Zeitschrift für vergleichende Sprachforschung* 39. 205–232.
- Solta, Georg R. 1960. *Die Stellung des Armenischen im Kreise der indogermanischen Sprachen*. Wien: Mechitharisten-Buchdruckerei.
- Sommer, Ferdinand. 1905. *Handbuch der griechischen Laut- und Formenlehre*. Heidelberg: Winter.
- Sommer, Ferdinand. 1914. *Handbuch der lateinischen Laut- und Formenlehre*. Heidelberg: Winter.
- Sommer, Ferdinand & Pfister, Raimond. 1977. *Handbuch der lateinischen Laut- und Formenlehre. I Lautlehre*. Heidelberg: Winter.
- Sparreboom, Marcus. 1980. *Chariots in the Veda*. Dissertation at Leiden University.
- Stang, Christian. 1949. A quoi correspond en germanique le *th* sanskrit? *Norsk Tidsskrift for Sprogvidenskap* 15. 335–342.
- Steer, Thomas. 2007. Morphologisch-etymologische Untersuchungen zu ai. *methí* ‘Pfosten, Pflöck’, lat. *mūtō* ‘Penis’ und Verwandtem. *Zeitschrift für vergleichende Sprachforschung* 120. 142–158.
- Steer, Thomas. 2011. Zur Herkunft des altpersischen *i*-Stammes /paθī-/ ‘Pfad, Weg’. *Münchener Studien zur Sprachwissenschaft* 65. 243–259.
- Streitberg, Wilhelm. 1920. *Gotisches Elementarbuch*. Heidelberg: Winter.
- Stüber, Karin. 2008. Review Mayrhofer 2005. *Sprache* 47. 244–247.
- Sturtevant, Edgar H. 1933. *Comparative Grammar of the Hittite Language*. Philadelphia: Philadelphia: Linguistic Society of America.
- Sturtevant, Edgar H. 1936. *A Hittite Glossary. Words of known or conjectured meaning with Sumerian and Akkadian words occurring in Hittite texts*. Philadelphia: Linguistic Society of America.
- Sturtevant, Edgar H. 1940. The Greek aspirated perfect. *Language* 16. 179–182.
- Sturtevant, Edgar H. 1941. The Indo-European voiceless aspirates. *Language* 17. 1–11.
- Sturtevant, Edgar H. 1942. *The Indo-Hittite Laryngeals*. Baltimore: Linguistic Society of America.
- Szemerényi, Oswald. 1967. The new look of Indo-European. Reconstruction and typology. *Phonetica* 17. 65–99.
- Szemerényi, Oswald. 1973. La théorie laryngale de Saussure à Kuryłowicz, essai de réévaluation. *Bulletin de la Société de Linguistique des Paris* 68. 1–73.
- Szemerényi, Oswald. 1980. *Einführung in die vergleichende Sprachwissenschaft*. Darmstadt: Wissenschaftliche Buchgesellschaft.
- Szemerényi, Oswald. 1996. *Introduction to Indo-European Linguistics*. Oxford: Clarendon.
- Thumb, Albert. 1913. Über die Behandlung der Lautgruppe -σθ- in den nordwest-griechischen Dialekten. *Indogermanische Forschungen* 31. 222–229.

- Thumb, Albert & Ernst Kieckers. 1932. *Handbuch der griechischen Dialekte*. Zweite erweiterte Auflage von Ernst Kieckers. Heidelberg: Winter.
- Thumb, Albert & Anton Scherer. 1959. *Handbuch der griechischen Dialekte*. Zweiter Teil. Heidelberg: Winter.
- Thurneysen, Rudolph. 1883. Urspr. *dn, tn, cn* im lateinischen. *Zeitschrift für vergleichende Sprachforschung* 26. 301–314.
- Thurneysen, Rudolph. 1909. *Handbuch des Altirischen. I. Grammatik, Texte und Wörterbuch*. Heidelberg: Winter.
- Tichy, Eva. 1983. *Onomatopoeitische Verbalbildungen des Griechischen*. Wien: Verlag der Österreichischen Akademie der Wissenschaften.
- Tichy, Eva. 1985. Avestisch *pitar/ptar*: Zur Vertretung interkonsonantischer Laryngale im Indo-iranischen. *Münchener Studien zur Sprachwissenschaft* 45. 229–244.
- Tichy, Eva. 2009. *Indogermanisches Grundwissen für Studierende sprachwissenschaftlicher Disziplinen*. Bremen: Hempen.
- Uhlenbeck, Christianus C. 1896. *Kurzgefasstes Wörterbuch der gotischen Sprache*. Amsterdam: Müller.
- Uhlenbeck, Christianus C. 1898a. *Kurzgefasstes etymologisches Wörterbuch der altindischen Sprache*. Amsterdam: Müller.
- Uhlenbeck, Christianus C. 1898b. *A Manual of Sanskrit phonetics, in Comparison with the Indo-Germanic Mother Tongue, for Students of Germanic and Classical Philology*. New Delhi: Isha Books.
- Uhlenbeck, Christianus C. 1902/3. Die vertretung der Tenues Aspiratae im lateinischen. *Indogermanische Forschungen* 13. 213–219.
- Untermann, Jürgen. 2000. *Wörterbuch des Oskisch-Umbrischen*. Heidelberg: Winter.
- de Vaan, Michiel. 2008. *Etymological dictionary of Latin and the other Italic languages*. Leiden: Brill.
- Vaux, Bert & Samuels, Brigitte. 2005. Laryngeal markedness and aspiration. *Phonology* 22. 395–436.
- van Veen, P.A.F. & Noline van der Sijs (eds.). 1997. *Etymologisch Woordenboek. De herkomst van onze woorden*. Utrecht–Antwerp: Van Dale.
- Veitch, William. 1871. *Greek Verbs, Defective and Irregular*. Oxford: Clarendon.
- Vennemann, Theo (ed.). 1989. *The New Sounds of Indo-European. Essays in phonological reconstruction*. Berlin–New York: de Gruyter.
- Verhasselt, Gertjan. 2014. Lex Pinault: Eine indogermanische Lautregel? *Zeitschrift für vergleichende Sprachforschung* 127. 2–42.
- Vilborg, Ebbe. 1960. *A Tentative Grammar of Mycenaean Greek*. Göteborg: Göteborgs Universitets Årskrift.
- Villar, Francisco. 1971. El problema de las sordas aspiradas indo-europeas. *Revista española de lingüística* 1. 129–160.
- Vine, Brent. 2006. Gk. σφῆγ, Eng. *spoon*: A note on ‘Eichner’s Law’. *Münchener Studien zur Sprachwissenschaft* 62. 289–299.

- Vine, Brent. 2011. On dissimilatory r-loss in Greek. In Krisch, Thomas & Thomas Lindner (eds.). *Indogermanistik und Linguistik im Dialog*. Wiesbaden: Reichert. 1–18.
- Volkart, Marianne. 1994. *Zu Brugmanns Gesetz im Altindischen*. Bern: Institut für Sprachwissenschaft der Universität Bern.
- de Vries, Jan. 1961. *Altindisches etymologisches Wörterbuch*. Leiden: Brill.
- Wackernagel, Jakob. 1895. Miscellen zur griechischen Grammatik. *Zeitschrift für vergleichende Sprachforschung* 33.1–61.
- Wackernagel, Jakob. 1896. *Altindische Grammatik. I. Lautlehre*. Göttingen: Vandenhoeck & Ruprecht.
- Wackernagel, Jakob. 1897. *Vermischte Beiträge zur griechischen Sprachkunde*. Basel: Programm zur Rektoratsfeier der Universität Basel.
- Wackernagel, Jakob. 1927/8. Indo-Iranica 1. *pánthah* ‘Weg’. *Zeitschrift für vergleichende Sprachforschung* 55.104–109.
- Wackernagel, Jakob. 1953. *Kleine Schriften I. Herausgegeben von Kurt Latte*. Göttingen: Vandenhoeck & Ruprecht.
- Wackernagel, Jakob & Debrunner, A. 1930. *Altindische Grammatik. III. Nominalflexion — Zahlwort — Pronomen*. Göttingen: Vandenhoeck & Ruprecht.
- Walde, Alois. 1897. Die verbindungen zweier dentale und tönendes z im Indogermanischen. *Zeitschrift für vergleichende Sprachforschung* 34. 461–536.
- Walde, Alois. 1905. *Lateinisches Etymologisches Wörterbuch*. Heidelberg: Winter.
- Walde, Alois & Hofmann, Johann. 1937. *Lateinisches etymologisches Wörterbuch*. A–L. Heidelberg: Winter.
- Walde, Alois & Hofmann, Johann. 1954. *Lateinisches etymologisches Wörterbuch*. M–Z. Heidelberg: Winter.
- Walde, Alois & Julius Pokorny. 1927. *Indogermanisches etymologisches Wörterbuch*. Berlin–Leipzig: de Gruyter.
- Walter, K. 1863. Vocaleinschiebung im griechischen. Fortsetzung. *Zeitschrift für vergleichende Sprachforschung* 12. 401–420.
- Watkins, Calvert. 1968. *Indogermanische Grammatik*. Teil III. Heidelberg: Winter.
- Weber, A. 1856. *kru, mas, pus, svar*. *Zeitschrift für vergleichende Sprachforschung* 5. 232–235.
- Weiss, Michael. 1994. Life everlasting. *Münchener Studien zur Sprachwissenschaft* 55.131–156.
- Weiss, Michael. 2009. *Outline of the Historical and Comparative Grammar of Latin*. Ann Arbor: Beech Stave Press.
- Weitenberg, Jos. 1975. Armenisch *ort* ‘Weinstock, Rebe’, griechisch *πτόροθος* und hethitisch *paršdu*. *Zeitschrift für vergleichende Sprachforschung* 89. 66–75.
- Werba, Chlodwig. 1996. *Verba indoarica : die primären und sekundären Wurzeln der Sanskrit-Sprache*. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

- Westphal, Rudolph. 1871. *Methodische Grammatik der griechischen Sprache. Abteilung Verbum*. Jena: Mauke.
- Whitney, William. 1879. *A Sanskrit Grammar. Including both the classical language, and the older dialects, of Veda and Brahmana*. Leipzig: Breitkopf & Härtel.
- Willi, Andreas. 2007. Demeter, Gê and the Indo-European word(s) for ‘earth’. *Zeitschrift für vergleichende Sprachforschung* 120. 169–194.
- Willi, Andreas. 2010. Hera, Eros, Iuno Sororia. *Indogermanische Forschungen* 115. 234–267.
- Winter, Werner. 1962. Die Vertretung indogermanischer Laryngale im Tocharischen. *Indogermanische Forschungen* 67. 16–35.
- Wodtko, Dagmar & Brigitte Irlinger & Carolin Schneider. 2008. *Nomina im indogermanischen Lexikon*. Heidelberg: Winter.
- Yamazaki, Yoko. 2009. The Saussure Effect in Lithuanian. *Journal of Indo-European Studies* 37. 430–461.
- Zehnder, Thomas. 2001a. **meǵh*₂-. In LIV². 430.
- Zehnder, Thomas. 2001b. **menth*₂-. In LIV². 438–439.
- Zehnder, Thomas. 2001c. **meth*₂-. In LIV². 442–443.
- Zeilfelder, Susanne. 1997. Heth. *hapusa(s)*- ‘Schaft; Penis’ und die Frage des dritten Laryngals. *Zeitschrift für vergleichende Sprachforschung* 110. 188–210.
- Zubaty, Josef. 1892a. Die ursprachliche tenuis aspirata im arischen, griechischen und latein. *Zeitschrift für vergleichende Sprachforschung* 31. 1–9.
- Zubaty, Josef. 1892b. Die altindische tenuis aspirata palatalis. *Zeitschrift für vergleichende Sprachforschung* 31. 9–22.
- Zupitza, Ernst. 1899. Etymologien. *Beiträge zur Kunde der indogermanischen Sprachen* 25. 89–105.