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On Tocharian B *kents** and the origin of PIE **ǵʰans-**

ABSTRACT.— ADAMS (2011; 2013: 207) was the first scholar to identify and discuss Tocharian B *kents**, the presumed name of the “goose”. But a new discussion of this term is needed for two reasons: 1) despite the uncertainty expressed by ADAMS, it can be shown in the light of new evidences and parallel texts that TB *kents** matches Sanskrit *haṃsa-* and thus definitely means ‘goose’. 2) This term presents an interesting problem of phonology and morphology: TB *kents** cannot be the reflex of PIE **ǵʰans-*, which should result in TB **kāṃ*. Reviewing the explanations proposed by ADAMS, a new solution, based on the reconstructed inflection of root nouns in Common Tocharian, is here proposed.

In a second part, the problem of the origin of PIE **ǵʰans-* will be addressed: it is firstly argued that the usual etymology of this word, according to which **ǵʰans-* should be linked to the verbal stem of Greek *χάσκω* and Old Norse *gana* ‘to gape’, was probably influenced by a medieval Greek etymology, but is unlikely, because it does not match the general conception of this bird in ancient cultures. Then, the hypothesis of an onomatopoeic origin of **ǵʰans-* will be explored by a cross-linguistic study of the onomatopoeia for the goose call and by an analysis of their acoustic features compared to those of the call. Since there are several parallels for names of the “goose” in other languages, and since PIE **ǵʰans-* is rather close to onomatopoeias for the goose call, an onomatopoeic origin for this word appears possible.

1. TB *kents** as translation of Sanskrit *haṃsa-* ‘goose’

In another publication (HUARD forthcoming), I will show that the phrase *kentsänts wälo ramtt iprerne* “like the king of geese in the sky” in THT 1859 a3, in which ADAMS (2011) identified *kents**, corresponds to a fixed sequence of Buddhist literature, a comparison of an ascetic flying supernaturally, with a goose: *sa vitatapakṣa iva haṃsarāja upari vihāya samudgamya* “like the king of geese with outstretched wings, going up high into the sky” (Divy: 133; 239; 313). The TB word *kents** is also attested in a fragment of the Paris collection: *(pañā)kte kentsantso walo • śecakemts walo ra* “the Buddha, [like] the king of geese, like the king of lions” (PK NS 506 a4). This is again the translation of a fixed sequence, according to which the Buddha among his disci-

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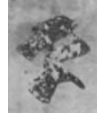
ples is compared to “leaders” of animals: *simha iva daṃṣṭraganaṇaparivārah*, *ha sarāja iva haṃsagaṇaparivṛtaḥ* “like a lion surrounded by the tribe of biters, like the king of geese surrounded by the flock of geese” (Divy: 96; 125; 148, etc.).

Therefore, it seems likely that *kents** was considered by the Tocharians as the counterpart of Sanskrit *haṃsa-*. But, as this bird has a somewhat mythical nature in Indian literature, one can further doubt the identification of *kents** to the species of goose (*anser*). Such a hypothesis would be suggested by the fact that *haṃsa-* was said by SIEG and SIEGLING to be rendered as *yāmutsi** [sic] in a translation of the *Udānavarga* in THT 29 a3 (1949: I, 48-49; II, 48). That word definitively belongs with Sogdian *ʼym ʼwtsy* and Chinese *yīngwǔzǐ* 鸚鵡子 ‘parrot’ (< Early Middle Chinese /ʔəiŋmuətsiʔ/, according to PULLEY-BLANK 1991: 326; 374; 420). Both scholars hence assumed a meaning ‘flamingo’ for *yāmutsi**, since *haṃsa-* was sometimes (wrongly) identified as the flamingo (VOGEL 1962: 1-3). But the Uighur-Tocharian bilingual text recently edited by PEYROT et al. (2019: 78, as first shown by ZIEME, see the reference) shows that the meaning of this word is definitely ‘parrot’, and that the nominative should be restored as *yamutse* or *yamuttse*. Nevertheless, in our context, the translation of the *Udānavarga* would confirm that *haṃsa-* was considered as a fabulous, exotic bird.

The manuscript is now lost, but, since the occurrence of THT 29 a3 is based on a restoration, one can question its validity. The editors read */// ·[u] [t]ts· nts· yt· rye ///* and restored it as *(yām)utts(i)nts(o) yt(ā)rye* “der Weg der Flamingos”. But if the upper part of the *akṣara* was destroyed, the vowel sign <-u> and the shaft of the <ka> would be indistinguishable. The same applies for <n> and <t> in ligature with <ts>, so that a reading *[k] · [n]ts·* is equally possible and a restoration *kentsantso* must be preferred:



<pu> PK AS 6C a5



<ka> PK AS 6C a4

One should then translate the passage as follows:

/// k(e)nts(a)nts(o) yt(ā)rye mkte yolmeś aittaṅka : māktā_u yonmasa rṣāke śakkeññe kakraupau-palsko : tawak klā(waṣṣām) ///

“[this the path which is] like the way of geese directed toward the pond; the very [path] that the wise of the Śākyas [= Śākyamuni] obtained with a composed mind, he proclaims it precisely...” (THT 29 a3).¹

This is the translation of:

eṣo ʼñjaso hy eṣa ca vai parākramas tv ekāyano haṃsapatho yathā hrade |

¹ The translation of SIEG and SIEGLING (1949: II, 47) was: “wie der Weg der Flamingos zum Teiche hin, welchen erreichte der Weise aus dem Śākya[-Geschlecht] gesammelten Geistes, den eben verkündet er ...”

yam adhyagāc chākyamuniḥ samāhitas tam eva cākhyāti gaṇeṣv abhīkṣṇaśaḥ ||
 “Dies ist der gerade Weg, dies ist der Weg der Tatkraft² / nur einer kann ihn
 gehen, / nur Gänse überqueren den See;³ / den Weg, den Śākyamuni einst
 gesammelt ging, / den lehrt er die Menschen stets aufs neue” (Uv: XII, 12;
 HAHN 2007: 48).

Hence, TB *kents** is the unequivocal counterpart of *haṃsa-*. As for its ornithological identification, it has been shown by VOGEL (1962; see also KRAGH 2010: 494-495), that *haṃsa-* must be identified with the *anser indicus*, the bar-headed goose, in the great majority of occurrences. This migrant species spent the winter season (from October to March) in the north of India or south of Tibet and the summer in Central Asia (Tibetan plateau or Mongolia), flying above the Himalaya until altitudes of 7000 meters. Most of the migration routes lead now from Northern India to Mongolia, but several flocks spent the summer in the West of the Tarim basin (TAKEKAWA et al. 2017: 15-16; 21). Although its geographical distribution may have changed in the course of time, one can reasonably assume that the same species was known to Tocharians as *kents**.

2. Comparative evidence

The reflexes of the PIE name of the “goose” are well-known and were studied in several publications (most complete accounts in GRIEPENTROG 1995: 211-32 and LARSSON 1999: 37-40; see also KEWA: III 571 for references). It suffices to provide here a brief summary. Given the correspondence between the N.pl. Greek γῆνες, Old English *gēs*, Old Norse *gæss*, dialectal Lithuanian *žqses* (and G.pl. *žqsũ*) < **ĝ^hans-es* and now TB Obl.pl. *kentsām**, an athematic stem **ĝ^hans-* is to be reconstructed for PIE. The athematic inflection of the word is preserved in Greek, Germanic, and Tocharian.

² *Parākrama* is a noun that means ‘attack, heroism, courage, power’ (MW: 598c); hence it should be here attribute ‘this is courage, exertion’. Yet, a more literal meaning could be considered if one takes it as an adjective, viz. *parā-krama* ‘going away, off’ or *para-ākrama* ‘coming to the other shore’, cf. the translation of the Tibetan by ROCKHILL (1883: 51): ‘it leads one to the other world’. Unfortunately, the Tocharian bilingual IOL Toch 122 b2 has only the translation of the beginning of the pāda.

³ HAHN (2007: 391) explains “Die Gänse stehen hier stellvertretend für die Wasserwesen, die allein einen Teich überqueren können”. The version of Subaṣi here reads: *haṃsa-patham va palvalam* (NAKATANI 1987: 39). The *anusvāras* are restorations of the editor, but since the manuscript is damaged, one could also read *palvale* (see plate 6). Since both terms refer to a ‘lake, pool’, one can interpret it as the place where the geese spent the winter, so that the way referred to has to be identified with the migration route. As the author of the *Udānalāmkāra*, the Tibetan translator takes it as a directional locative: “it is the one road to the ocean of purity” (ROCKHILL 1883: 51). The Tocharian commentary then (a6-a7) identifies the refreshing pond with the *nirvāṇa*. Since Śākyamuni, in the next pāda, teaches the path to others, the underlying metaphor is also that of the king of geese, who leads the flight formation and makes the flock cross the other shore (see the passage of Candrakīrti commented in KRAGH 2010: 486).

The N.sg. χήν (Doric χάν), instead of the expected *χᾱς, is analogical of the oblique cases, where the lengthening is expected after loss of *s* (e.g. N.pl. *ḡ^hanses > *k^hanhes > k^hānes > Attic k^hēnes; see ROBERT 1911: 31; FRISK: II 1094, among others).⁴

In other languages, this root noun was extended in several ways. The Latin form *ānser* shows a “vulgar” loss of **h*, possibly on the influence of *anas* ‘duck’, and a renewed suffixed stem, which is analogical of *passer* according to SZEMERÉNYI (1991; with references to previous explanations). The Balto-Slavic reflexes (Lithuanian *žąsis*, etc., cf. LARSSON 1999: 37-38) were re-made into *i*-stems, as it is usual for root nouns (*Grundriss*: II/1, 141). The Slavic reflexes (Russian *gus*’, etc.) show an irregular non-palatal reflex (on this matter, see below). The PIE word was thematized in the Indian branch, cf. Vedic *hamsá-*, which is, according to GRIEPENTROG (1995: 228), the masculinative of an athematic feminine stem **hams-*. The feminine *hamsī-* is a late formation and should not be brought together with the Baltic and Slavic *i*-stems (LARSSON 1999: 38).

There is no certain reflex of this word in Iranian languages (KEWA: III 571): the word for “goose” in modern languages was mostly borrowed from Turkic (DOERFER 1963-1975: III 385-7). In Germanic, there also exist two close related nouns that are based on a Proto-Germanic root **gan-*, namely **gan-era* > Old English *gan(d)ra*; Middle Low German *ganre* ‘gander’ and **gan-at-a(n)* > Old English *ganot* ‘water-fowl, gannet’; Old High German *gan(az)zo* ‘gander’ (GRIEPENTROG 1995: 217-20; KROONEN 2013: 166 reconstructs **ganazan-* for the former).

The PIE word was thus reconstructed as *ḡ^hans- since the beginning of comparative linguistics. Trying to explain the **a* vocalism by an adjacent laryngeal, KORTLANDT (1985: 119; followed by LUBOTSKY 1989: 60) postulated an alternant paradigm *ḡ^héh₂ns, *ḡ^hh₂éns-*m*, *ḡ^hh₂ns-ós. An indirect support would be the lack of the expected outcome of a palatal stop in Slavic languages that could be explained by depalatalization before a syllabic resonant.⁵ Yet, the *g* was also accounted by contact with Germanic languages (arguments in FRAENKEL 1952: 131; GRIEPENTROG 1995: 226; older explanations in FRAENKEL 1962-65: 1292). More generally, the paradigm postulated by KORTLANDT is questionable, since it entails an isolated vocalic alternation between nominative and accusative (see the doubts expressed by LUBOTSKY

⁴ Theoretically, it could be the direct reflex of *ḡ^hān, the expected outcome of *ḡ^hans(*s*) after SZEMERÉNYI’s law (SZEMERÉNYI 1991: 1073).

⁵ LUBOTSKY (2019: 151) also raises the possibility of a depalatalization before laryngeal. KROONEN (2013: 168) points out a dialectal German form (Luxembourg) *Gunz* ‘gander’ (also *Guntert*, cf. SUOLAHTI 1909: 412) < **gunuta-*, variant of **ganuta-*, which would have been linked to *ḡ^hh₂ns-élós. Yet, this late dialectal form has more likely another explanation. DWB¹ explains the vowels of *gunz* (Transylvania) and *gōēnz*, pl. *gōēnze* (Henneberger Land) as resulting from the long vowel *ā*, itself from *a* (s.v. “ganze”, 1; “gans” I, 3, c).

2019: 151). Besides, there is no trace of lengthened grade in the reflexes of the PIE word. In reaction, GRIEPENTROG adopted a more conservative position and reconstructed an *s*-stem with fixed a vocalism throughout the paradigm (animated acrostatic noun N.sg. **ǵʰáns-s*, G.sg. **ǵʰáns-s*, eventually normalized to **ǵʰáns-é/ós*; see 1995: 230). LARSSON (1999: 39) notes that we expect a paradigm N.sg. **ǵʰáns*, Acc.sg. **ǵʰáns-m̐*, G.sg. **ǵʰáns-é/ós*, but that no trace of the G.sg. is attested. Besides, the Greek form that she quotes as evidence cannot be the reflex of **ǵʰáns*, which should result in **χᾶς* (unless **ǵʰáns* > **ǵʰán*, by SZEMERÉNYI's law, was intended).

Therefore, I shall compare in the next section Tocharian *kents** with a stem **ǵʰans-*, which is the only form that could be safely reconstructed.

3. Explanation of TB *kents**

The nominative singular was set up by ADAMS (2011) as *kents**, since it is likely that the accusative plural was synchronically based on the nominative or oblique singular. As pointed out by ADAMS, this is problematical, because one expects a final consonant *-m̐* in light of Obl.pl. ending TB *-ām* < **-ns*, and secondly because PIE **a* should give TB *ā*. Hence, the expected outcome of PIE **ǵʰans-* is TB **kāṃ*.

3.1. The final cluster *-nts*

As for the first problem, ADAMS (2011) offered the following arguments: the final cluster **-ns* was preserved until Common Tocharian time, since the outcome of the PIE Acc.pl. ending **-ns* has different reflexes in TA and TB, viz. *-s* and *-m̐*. Then, ADAMS supposes that, since there is a strong tendency to preserve **-s* in monosyllables in Proto-TB (cf. TB *wes* 'we', *yes* 'you', and *škas* 'six'), the final cluster **-ns* was retained in **kāns* and developed an epenthesis *-nts*. On the other hand, *-ns-* would yield *-s* in intervocalic position, and he adduces as example (2011: 35, fn. 10; also 2013: 498) TB *mīsa* 'meat' < **mēns-h₂* (cf. Vedic *māms-*, etc.).

This account should be reviewed and extended to all available data on the development of the **ns* cluster in Tocharian. I will divide the matter between internal position and final position.

1) Before consonant, the group **-ns-* was reduced to **-s-* in the Common Tocharian stage, cf. TB *māsketār*, TA *māskatār* from **mānskæ-* < **mṇ-sko-* (RINGE 1996: 72); see also below TB *šeske* TA *sasak* 'alone' < **šænskæ*.⁶ In intervocalic position, this cluster was preserved until the Common Tocharian

⁶ According to these examples, one expects the retention of the *s* in TB Obl.pl. *alyenkām* < **ālyæns-kā*, but this should have been remade by analogy before the declension was "moved" to the particle. This is somewhat contradictory with the fact that the **kā* extension is shared with TA (in TA, the Obl. pl. *ālykes*, *ālyekās* is remade after the N.pl.).

period and was treated differently in TA and TB. In TA, *n* was dropped before *s*, but produced a glide as in *es* ‘shoulder’ < **āⁱs* < **āⁱns(æ)* < **ānsæ* < **Hōmso-* (cf. TB *āntse*) or in the genitive ending *-is/-es*, which corresponds to TB *-āntse/-entse* (PINAULT 2008a: 458, with references). In TB **ns* yielded in this position an epenthesis *nts*, cf. *kentsa*, Perl.sg. of *kem*, *auntsate*, pret. of *aun-*, etc. (PINAULT 2008a: 449). This evolution may not yet have been systematically carried out in archaic TB. In THT 241, we have *rinsatai* (a1) *wajrasansā* (a2), *semensa* (b2), *pratinsa* (b5), vs. *lantāntso* (a1), *etrentsa* (a3), *karuntsa* (b2), *astāmtsa* (b3). Nevertheless, this manuscript has other (late) irregular forms, such as simplification of geminated consonants (*arāñcāše* for *arāñcāšše* (a3), *arañcacu* for *arañcaccu* (a1)) or cluster reduction (*eške* for *eṃške* (b2)). In our case, however, this cannot be an early attestation of the reduction of *-nts-* as occurred in late TB, because at that stage, the regular evolution is *-nts-* > *-ts-*, as shown by PEYROT (2008: 69). He convincingly explains the late forms (*-ms-*, etc.) as analogical restoration of the nasal after the Obl.pl. since most of the occurrences belong to G.pl. Other instances of this phenomenon in archaic texts are in THT 280 *läklense* for *läklentse* (a1) vs. *orocēmts* (a3), *kāššintse* (a4), and in THT 248 a1 *švalwainsa* [*sic*, for *šwañcainsa*].

There is a group of apparent exceptions in the paradigms of *mān(t)sā-* ‘to be sorrowful’, *šāms-* ‘to count’ and *lāms-* ‘to work, do as service’. A fine explanation was proposed by MALZAHN (2010: 749). Observing the variations between *-nts-*, *-ms-* and *-mš-* in the paradigm of the verb *mān(t)s(ā)-*, she assumes an evolution *-nts-* before non-palatalizing vowels vs. *-mš-* in the opposite case, viz. *mantsanatār* vs. *memšīmar*. This variation was then reduced by leveling, leading to the restoration of *-ms-* before non-palatalizing vowels (as in *memsentār*). This also applies to *šāms-* and *lāms-*, which have generalized *-ms/mš-* throughout the paradigm (2010: 833; 925). Likewise, the absence of epenthesis in the 3rd sg. of preterit III, which occurs in classical texts, is due to analogical pressure from the other forms of the paradigm: *kālñsāte* (IOL Toch 19 b3); *rinsātene* (THT 88 b4, alongside *auntsantene* in a2); *rinsatai* (THT 89 a1); *kālñsāte* (THT 617 a4). As for TB *mīsa*, it could be explained by an irregular dissimilation of nasals at an early stage, viz. < **m’āsā* < **més-h₂* < **méms-h₂* (PINAULT 2008a: 492; likewise, MALZAHN 2010: 749).

2) As for the final cluster **-ns*, we should start from the reflexes of the accusative plural and postulate that CT **-ns* gives TB *-ṃ* and TA *-s*, as in TB *yakwem* and TA *yukas* ‘horses’ < **h₁ekyo-n_s*.⁷ On the other hand, ADAMS’

⁷ In light of the general loss of final consonants (for example, final *-s*, as in TB *yakwe* < **h₁ekyo-s*, TB *cake* ‘river’ < **tek^u-os*), RINGE (1996: 76, fn. 1) doubts that TB *-ṃ* and TA *-s* are the regular outcomes of the PIE ending **-ns* and tries to argue that they were restored analogically; but as he himself admits, there would be no convincing source of analogy. Moreover, the

claim that there was a trend to preserve final *-s* in monosyllables in Tocharian is less obvious and should be examined. TB *škas* ‘six’ is secondary (instead of **šak*, cf. TA *šāk*), remade after the ordinal *škaste* (PINAULT 2008a: 554). The preservation of final *-s* in the pronominal forms is more difficult to account for. TB *wes* TA *was* ‘we, us’ and TB *yes* TA *yas* ‘you’ should result from mutual analogical influences of the nominative and accusative of the PIE enclitic pronouns (PINAULT 2008a: 536). The evidence is thus not conclusive, since the preservation of final *-s* may be due to analogical reshaping.

Then, one should address other TB words for which a final **-ns* cluster⁸ can be postulated at the CT stage: *še* ‘one’, *lāms* ‘work, service’, *kwants* adj. ‘firm, resistant’; adv. ‘firmly, expensively’, and *wemts* ‘urine’.⁹ As will be shown, in all of these cases, the expected outcome was remade analogically. I address briefly each of these words.

The nominative singular of the numeral ‘one’ TB *še* TA *sas* is of some importance. To explain the TA forms, one has to set up a CT-form **šæns*, which was protected by a particle in TB *šeske* TA *sasak* ‘alone’ (< **šænskæ*). Its expected outcome in TB, viz. *šem**, which we can also infer from the TB feminine singular *šana* (on the issues posed by the **-ā* suffix, see PINAULT 2008a: 518), was replaced by a different form **šæ* > *še* for functional reasons (on this scenario, see PINAULT 2006: 88–92, with references).

In TB *lāms*¹⁰ (pl. *laṃsuna*), the absence of epenthesis¹¹ cannot tell us anything, since it can easily be explained as an analogical restoration after the verbal forms, for it was frequently paired with them in a *figura etymologica*; cf. (*bodhisattvā*)*ññai lāms śpālmeṃ k_wse sū lāṃṣtrā* ‘whoever will perform the excellent work of bodhisattva’ (PK AS 13A a7).

TB *kwamts* is more difficult. It is spelled *kwamts* (PK AS 8C a8; THT 1168b3), *kwams* (PK AS 13I a7), *kwānts* or *kwants* (THT 337 b3¹²) and, in a compound, *kwāntsa-pālsko* ‘firm-minded’ (THT 245 b5). The form *kwams* is probably a late simplification of the cluster, since this manuscript shows some late features (*cimpa(lle)*, a4)). The compound form suggests that the TB should go back to **kwānsā*, which can be analyzed as an *s*-stem to a root

preservation of final *-k* in TA *šāk* ‘six’ < **suek-s* shows that a final cluster could preserve one of its components.

⁸ Theoretically, a final *-(n)ts* cluster could also go back to **(n)tjV*, as TA *pats* ‘husband’, which comes from **potj-* (RINGE 1996: 79), viz. the oblique cases of the stem **póti-*, or was remade after the feminine stem seen in TB *epetsa** ‘consort’ (PINAULT 2016: 342–343).

⁹ One should set apart TB *piś* ‘five’ (TA *pāñ*) < **p’āñšā* < **pénk^he*, which could be an irregular treatment.

¹⁰ The singular is always spelled *lāms* (classical: IOL Toch 409 a2; PK AS 13A a7; THT 551 a4; late Ot 13.1 a2) and the plural *laṃsuna* (classical IOL Toch 48 a2; THT 15 b5; 218 a1).

¹¹ ADAMS 2013: 593 set up a proto-form **wlānāsā*, but this form should yield **lanas*.

¹² CEToM: “The form *kwāts* constitutes one of the three possible readings *kwāts*, *kwats* or *kwātsā* depending on whether the arc above the first of the two akṣaras represents <*ā*> a virāma stroke, or both, respectively.”

**kwän-*. For this root, two proposals are to be retained: **g^{uh}en-* ‘to swell, to be filled to the brim’ (cf. Greek εὐθενής ‘rich’, Vedic *ghaná-* ‘dense, thick’, etc., cf. IEW: 491), according to HILMARSSON (1996: 202-203) and **k_uen-* ‘holy’ (Avestan *spənta-* ‘holy, beneficent’, Vedic *śuná-* ‘growth, success’), according to PINAULT (2008a: 44; other references in ADAMS 2013: 252). Since that root may be connected (KEWA: III 355) with **k_uenhi-* ‘to swell’ (cf. Sanskrit *śváyati* ‘swell, increase’, see LIV²: 339), which better matches the meaning of the Tocharian word, and there also exists an *s*-stem in Vedic *śávas-* ‘strength, power’, one could postulate an adjective N.sg. **k_unhi-és*, G.sg. **k_unhi-s-és* ‘strong’. Then, the form of the oblique case would regularly give *kwants*, through epenthesis and loss of laryngeal after a syllabic resonant (RINGE 1996: 20-21).¹³

Less clear is TB *wemts* ‘urine’. Here, we are sure that we should start from a cluster **ns*, since it exists a suffixed form *wemšiye* ‘excrement’¹⁴ and its counterpart in TA is *wes*. To CT **wæns(V)* ‘excrement’, the soundest etymological connection would be PIE **uemh₁-* ‘to vomit’ (PINAULT, p.c.), to which one could posit a derivative **uom(h₁)-s-*, whose oblique cases would yield the TB and TA attested forms.¹⁵

For the TA, one can achieve some certainty. Since *sas* is isolated within the paradigm (Obl. sg. *soṃ*), one should assume that the **-ns* cluster did not develop a glide in absolute final position in contrast to **-ns-* > **-i_{ns}-* > **-i_s-* in intervocalic position. This is congruent with the reflexes of **-æns* > *-as*, as in *yukas* ‘horses’ and thus, an analogical refection of this form according to the nominative plural has not to be assumed.¹⁶ In TB, most of the items are ambiguous, because the expected outcome could in most cases have been replaced by paradigmatic leveling. Positive evidences for the treatment of final

¹³ HILMARSSON (1996: 203) proposes two ways to explain the final cluster: 1) this form was originally a first member of compounds with automatically added binding vowel and was only secondarily used as a free-standing adjective/adverb; 2) the final *-ä* is the remnant of some adverbial final. The first alternative is unlikely, because TB *kwants* is more often attested as a free-standing word and no parallel for such an evolution of a first-member of compound is known in Tocharian. A TB form *kwäntsäm* (THT 1859 b6), albeit remaining obscure, could reflect another adverbial ending.

¹⁴ TB *wemts* is almost always used in binomial pair with *wemšiye*. This should refer to a conceptual duality as in Pāli binomial phrases *uccārapassāva* ‘excrement and urine’ or *mutta-karīsa* ‘urine and excrement’. TA *wes* refers to both types: *āñc ka(psi)ññam wu lotas ruseñc-ām šom āsu wesi wcam lyi wesi(s)* ‘in his lower body, two holes are opened: one for dry excrement, the second for wet excrement’ (A 150 b6). According to *wemtsa yokalle* ‘[the remedy] should be drunk with urine’ (PK AS 3A b4), *kewiye wentsa* ‘with cow’s urine’ = Sanskrit *gomūtra-* (THT 497 b4), *wemts* is ‘urine’ and *wemšiye* ‘feces’.

¹⁵ These words appear as *wents weššiye* in one of the oldest TB manuscripts (THT 4122 b4; PEYROT 2014: 142), that is without final short vowel, albeit they are generally preserved in this manuscript, cf. *arāñca*, *allokā*, *troñcä*, *ñemä*, *šuktä* (PEYROT 2014: 128-130, only exception *kektseñ*). According to the TA form *wes*, one should assume a final vowel **ä* (see below).

¹⁶ See parallel discussion in ADAMS (2011: 41, fn. 27), but without the evidence of *sas*.

cluster **ns* are only the accusative plural ending and the traces of an old N.sg.m. **šem* ‘one’ in TB N.sg.f. *sana*. As argued by PINAULT about *še* (2006: 92), there is a functional motivation for the removal of this expected outcome, since a final consonant *-m* would have been formally identical with the Obl.sg. or Obl.pl. endings. To summarize, the following development of the nasal-sibilant cluster in Tocharian can be assumed:

- CT **VnsV* > TB *VntsV*, TA *VⁱS(V)*; before consonant: **VnsC* > TB/TA *VsC*.
- CT **NS#* > TB *-m*; TA **-s*.

As a consequence, a N.sg. *kents** should be explained by analogy of the oblique cases where **kaensV* regularly yielded an epenthesis. The motivation of this replacement would be the same as for the other examined items.

3.2. The root vocalism *e* < CT **æ*: borrowing?

Starting from **kaens-*, one should then try to explain the unexpected root vocalism either by an internal development or by language contact. Considering the usual source of borrowings in Tocharian, one may think of Iranian or Indic as source languages. Moreover, since connections of the IE name of “goose” with Turkic languages and Old Chinese have long been considered (KEWA: III 571), one should also study these lexemes to see if Tocharian could be an intermediary for these borrowings, as assumed by ADAMS for Turkic (2011: 39-41).

The vocalism TB *e* < CT **æ* recalls some of the earliest borrowings from Iranian, such as TB *perne* TA *parām* ‘glory’ from Old Iranian *farnah-*. But this hypothesis would raise several problems. In modern Iranian languages the name of the goose was mostly borrowed from Turkic (see above §2). But we could assume that the Indo-European name of the goose was preserved in Old Iranian and transpose Vedic *hamsá-* into Proto Iranian **janha-*, which cannot result in *kents**, because of the loss of the sibilant and the initial palatal. Such a form would have been borrowed in TB as **tsene* via Old Iranian **tsanha-*, as pointed out to me by Chams BERNARD.

CLAUSON (1972: 679-680) states that Proto-Turkic **qa:z* ‘goose’ (> Old Uighur *qāz*, etc.) is “almost certainly an early loanword from some Indo-European language, probably Tocharian (Agnean?)” (likewise, RÓNA-TAS 1974: 503, followed by ADAMS 2011: 40). Indeed, we have seen that *ns* yields *-s* in absolute final position, without producing a glide; the TA reflex of **ĝ^hans-* could hence be **kās*. The first problem raised by this assumption is to explain why *-s* would be borrowed as a voiced sibilant *-z*. As pointed out by C. BERNARD, there are cases of Turkic *z* for *s* in borrowings from Iranian or Tocharian, but these examples are not relevant here since this change occurs in intervocalic position.¹⁷ The second evidence is the transcription of TB in

¹⁷ Turkish *kālpāzā* ‘lizard’ ← Iranian (Persian?) *kalpasa* ‘id.’ according to BERNARD (2020: 36) (against DOERFER 1963-1975: IV 303). A second example is the borrowing of *anuvāsana-* ‘oily

Manichean script. We observe in the TB Manichean hymn an interesting distribution: intervocalic *s* is rendered as *s*, but the *-nts-* cluster, or rather its late simplified counterpart *-ns-*, is rendered as *-nz-*.¹⁸ This suggests that *s* was voiced by the adjacent nasal. But I am not sure that it could be used for the reconstruction of TA **kās*, since the manuscript shows inconsistencies in the rendering of voiced and unvoiced consonant even in Uighur words (GABAIN and WINTER 1958: 27), and this change may be connected to the affricate of TB (viz. **ns* > *nts* > *ndz* > *nz*). However, this point could be admitted, although more clear parallels would be desirable.

But there are serious issues against the assumption of a borrowing from TA. First, it is likely that, as in TB, the oblique stem, which should result in **kes* < **kæ'nsä*, was generalized in TA, cf. Greek *χῆν*, which is analogical of the plural forms as we have seen (cf. §2), or Seychelles Creole *zwa* 'goose' (Sg.) (WOLD, s.v. "goose") extracted from French *les oies* /lezwa/ (Pl.) by wrong segmentation. Since the goose is a highly social bird (see HEINROTH 1911: 618) and appears generally in flocks, this kind of leveling is to be expected. Besides TA *wes* 'excrement' and *wles* 'work,' which presents a very similar phonetic structure, have also generalized the stem of the oblique cases (cf. §3.1). Secondly, this hypothesis entails a problem of relative chronology. The counterpart of Old Uighur *qaz* in the Oghur branch is Chuvash *xor*, which means that this word goes back to Proto-Turkic, at any rate several centuries before the TA stage. This also raises the classical problem of rhotacism/zetacism of Turkic historical phonology. On this matter, I here follow DOERFER's line of argument, which defends the primacy **r* without committing to the Altaic hypothesis.¹⁹ In our case, the proto-form should thus be put

enema' in Uighur as *anuv(a)zan*, which presupposes a Tocharian and a Sogdian intermediary according to MAUE (2009: 294-295), who reconstitutes the following chain of transmission: Pkt. **anuvāzana* → TB *anuvāsām* [*anuvazān?*] → Sogdian **(')nwvz'n* /ānuβ(a)zān/ → Uighur *'nwvz'n* /anuv(a)zan/. In final position, we find: *kāpāz* 'cotton seed' from TA *kappās* (TB *kampās*), ultimately from a Prakritic form of Sanskrit *karpāsa-* (ERDAL 2002: 9). As suggested by MAUE (2009), this voicing probably occurred in Middle Indic since all instances collected here are Indian loanwords.

¹⁸ Here are the attested forms according to the revised edition of PINAULT (2008b): 1) *twš' = tusa* (115 [l. 249, 250]); *nys'lyy = nesalye* (115 [l. 272]); *ps'k = pässak* (115 [l. 248]); 2) *[yl'ynyq]tynzyy = ylaiñiktense* (116 [l. 246-47]); *bwšynt'nz = poyšintans* (115 [l. 260]); *kwm[ny]qtynz[yy] = komñiktense* (114 [l. 245]); *[wst'šm]ynč'nz = osta-šmeñcans* (114 [l. 274]).

¹⁹ DOERFER (1975-1976: 32-36) provides internal reasons of phoneme structure and evidences from early borrowings in Hungarian and Mongolian languages (e.g. Proto-Tukic **atarīV* > **atar* 'uncultivated land' > Turkmen *atiz*, etc., but borrowed/inherited Mongolian *atar*). See also the summary of debates by THERIEN 1999. RÓNA-TAS (1974), who supports the primacy of **z*, tried to establish a correspondence Proto-TB **s* > Proto-Turkic **-z*. But the alleged examples are all problematical: **yez* 'spring' is drawn from an unattested TB **yes*; **höküz* 'ox' cannot be borrowed from Tocharian because of the initial **p-* (DOERFER 1963-1975: I 539). In the other cases, the related words in the "Altaic" languages (whether considered as borrowings or inherited words) presuppose **r*: Turkish *omuz* 'shoulder' (brought together with TB *āntse*)

as **qār̥* (as done by DOERFER 1963-1975: III 385-7, and STAROSTIN et al. 2003: 532), which precludes any comparison with the Tocharian word.

It has been postulated since a century that the Chinese word for ‘wild goose’, *yàn* 雁 or 鴈, is somehow linked to the IE one (references in ADAMS 2011: 39; KEWA: III 571). The ancient forms are, according to the different reconstructions: Late Middle Chinese **ŋja:n*, Early Middle Chinese **ŋan^h / ŋɛ:n^h* (PULLEYBLANK 1991: 358); Middle Chinese *ngaenH*, Old Chinese **C.[ŋ]ʃrar-s* (BAXTER and SAGART 2014); Old Chinese **ŋrāns* (SCHUESSLER 2007: 556). As for our purpose, a borrowing of TB from Chinese at a later stage is also excluded on formal ground (one would need a retention of the final *-s*, and it is not sure that the vocalism was to be interpreted as CT **æ*).

3.3. The root vocalism *e* < CT **æ*: internal explanation

We should thus explain this proto-form **kæns-* without external sources. Before positing an Indo-European **ĝ^hons-*, one has to search for internal explanations in the history of Tocharian and to compare it with words similar in structure or in meaning.

Starting from the semantic part, I will review the other attested bird names in Tocharian; recall that Lat. *anser* was explained as an analogical refection according to *passer* by SZEMERÉNYI (1991: 1074). Unfortunately, most of Tocharian bird names show a structure quite different from that of *kents**: TA *špār** ‘sparrow (?)’; TB *krañko* ‘chicken’; *kokīl-šparā-yākre-seri-yam(utse)* (THT 575 b2); *krakre-sari*, *krakre-ñiwi*, *tsāktso** (PK AS 16.8 a5); *kerke**, *skrem**, *kāško** (PK AS 16.5 a3).²⁰ TB *skrem** ‘crow (?)’ shares the vocalism of *kents**, but remains unclear and could be of no help.²¹

comes rather from **omuř*, since it is represented in Middle Mongolian *omori’ut*, ‘collar bone, clavicle’, etc. (cf. STAROSTIN et al. 2003: 1052). The vocalism speaks against Proto-Turkic **yez* ‘copper’ ← TB **yāsā* ‘gold’. Besides, Proto-Tungusic **jirA* ‘anvil’ can be related to the Turkic word (cf. STAROSTIN et al. 2003: 1538).

²⁰ The second series (PK AS 16.8 a5) is placed in a watery environment, but it is not certain that all these words refer to birds. The majority of words are unclear: *ñiwi* and *sari* could be singulars or plurals; in the former alternative *krakre* could be an adjective. Some names are borrowed from Sanskrit: TB *kokīl* from Skt. *kokila-* ‘Indian cuckoo, koel’ and maybe *sari* from Skt. *sāri-* ‘a kind of thrush-like bird’ or *sārika-* ‘*turdus salica*’ (MW: 1209b) via a Prakritic form (cf. Pāli *sāliya-*). Other words seem to be genuine Tocharian formations: *yākre* could be the reflex of **yek^u-ro-* ‘garrulous’ (see ADAMS 2013: 730 for other proposals); *krakre* (or *krākre**) seems to be onomatopoeic (PINAULT in CETOm); *tsāktso** (pace ADAMS 2013: 798, who has *tsaktso**) is not to be derived from *tsākā-* ‘to pierce’ (cf. *tsakātstse* ‘thorny’), but from *tsāk-* ‘to glow’ and thus could refer to a white crane or egret; *ñiwi*, probably related to *newe* ‘cry’, may refer to the ruddy shelduck; lastly, *kerke** may come from the PIE name of the crow (**k^horh₂k-*, cf. Greek *kópaξ* ‘crow’, Lith. *šárka* ‘magpie’, etc.).

²¹ Attested in PK AS 8A b8; PK AS 16.5 a3 and W 32 b4. As assumed by ADAMS (2013: 774), this term may correspond to TA *sukrām** ‘crow’. It was shown by SCHMIDT (1994: 269) that TA *sukrām** translates *kāka-* in a gloss of the *Ṣoṣadhavastu* (SHT 1033), where *kākapāḍakā dātavyā* is rendered as *sukrāne pe oki sul* ‘the “foot of crow” [technical term of sewing] should

As for the morphological part, as pointed to by ADAMS (2013: 35-6), there are cases of analogical reshaping of CT $*\tilde{a}$ (< PIE $*a$ or $*h_2$) by CT $*\tilde{e}$ (< PIE $*o$): TB *kene*, TA *kan* ‘tune’ < $*k\tilde{a}n\tilde{e}$, abstract from the PIE root $*kan-$ ‘to sing’, cf. Latin *canere*, etc. and TA *an** ‘breath, sight’ (vs. TB *añiye* ‘id.’) < CT $*\tilde{a}n\tilde{e}$, abstract to the PIE root $*h_2enh_1-$ ‘to breath’ (cf. TB *ān(ā)sk-*, Skt. *āniti*, etc.). One may add TB *sepīy(e)*, gloss of *kaṣāya* ‘decay’ and ‘decoction’ (THT 538 b3), if to be compared with $*sap-$ (German *Saft*, etc.), but it can also belong to $*seu-$ ‘to press’ (Skt. *sunōti*). Yet, all these words belong to the well-defined pattern of τóμος-nouns, which is productive in Tocharian (MALZAHN 2013: 165-8),²² and cannot be invoked in the case of *kents**.

More promising is the comparison of *kents** with other inherited root nouns, namely all the nouns whose nominative singular was presumably monosyllabic in Common-Tocharian, before the loss of several vowels in final position.²³ According to this criterion, the following corpus can be gathered: TB *ek* (alt., N.Obl.dual *eś(a)ne*, Obl.pl. *eśaim*) TA *ak* ‘eye’; TB *wek* TA *wak* (m. in Sg.) ‘voice, speech’; TB Obl.sg. *ke_u* (N.pl. *kewi*) TA Obl.sg. *ko** ‘cow’ (N.pl. *kowi*); TB *ku* (Obl.sg. *kwem*) TA *ku* (Obl.sg. *kom*) ‘dog’; TB *kem* TA *tkam* (f.) ‘earth’; TB *āp* (f., Obl.pl. *āpām*) TA *āp* ‘body of water; river, stream’; TB *mekwa* TA *maku* (N.Obl.pl.) ‘nails’. One may also add: $*p\tilde{e}$ - ‘foot’ (in TB *paine* ‘both feet’); $*s\tilde{a}l-$ in TB *salyiye* TA *sāle* ‘salt’; and, allegedly, $*\tilde{a}-$ in TB *āyo* (Obl.sg. *āya*, N.Obl.pl. *āsta*) TA *āy* ‘bone’.²⁴

It is traditionally assumed that at some stage of PIE, the nominative singular was grammatically marked by a lengthening in root nouns (*Grundriss*: II/1, 131; and recently KÜMMEL 2015²⁵). This lengthening is evidenced by long vowels in Western languages, as in the case of Greek εἶς ὤπ-α ‘in the face’ vs. N.sg. ὄψ, G.sg. ὀπ-ός ‘eye, face’ (NIL: 374, fn. 2) or Greek (Dorian) πῶς (attic πούς) < $*p\tilde{o}(d)-s$ vs. Acc.sg. πῶδα < $*p\tilde{o}d-m$. On these evidences, a (late) PIE paradigm N.sg. $*h_3\tilde{o}k^u-s$, G.sg. $*h_3\tilde{o}k^u-(e)s$ (replacing $*h_3\tilde{e}k^u-(e)s$)

be sewed’ (the original text is now edited in HU-VON HINÜBER 1994: 146; 275). The traditional explanation of TA *sukrām* as a borrowing from Skt. *śukrāṅga-* ‘peacock, lit. having a brilliant body’ (MW:1080b) cannot explain the TB form.

²² MALZAHN (2013: 168, fn. 12): “The pre-PT pair $*ono-$ (abstract noun ‘breathing’)/ $*ana-$ (verbal root ‘to breathe’) suggests that at least in pre-PT times, $*a/*o-$ ablaut had not been abandoned synchronically.”

²³ In TB, several synchronic “root nouns” are historically suffixed stems, cf. *lyak* ‘thief’ (Obl.sg. *lykam*, N.pl. *lyši*) < $*le\tilde{g}-i-(n-)$, according to PINAULT (2008a: 508).

²⁴ Conversely, PIE root nouns ending in laryngeal probably yielded in Tocharian disyllabic nouns, cf. TB *pärwāne**, TA *pärwām* (N.Obl.dual) ‘brows’ < $*b^hruH-$ and TB *suwo* (Obl.sg. *suwa*) ‘pig’ < $*suH-$. But these nouns were possibly renewed by suffixes as postulated by ADAMS (2013: 400 and 763).

²⁵ KÜMMEL concludes his inquiry as follows: “Considering these cases outside Indo-Iranian [viz. Latin *ops*, *uōx*, etc.] and also the fact that we might then get a better starting point for the Indo-Iranian developments, it may seem better to assume that some nominatives of (o grade) monosyllabic stems had distinctive LG by the time of late PIE.” (2015: 288).

was proposed in NIL: 374, fn. 2. Similarly, one could postulate N.sg. **uǵʰkʷ-s*, G.sg. **uǵʰkʷ-(e)s* for “voice”. That this type of alternations was preserved in Tocharian is shown by the name of the “dog”.

For PIE, a paradigm N.sg. **kṷón*, Acc.sg. **kṷón-m̃*, G.sg. **kṷn-és* can be posited, which is secured by the agreement of Greek and Vedic: N.sg. *ś(u)vā́*, Acc.sg. *śvānam*, G.sg. *śúnas* and N.sg. *κύων*, Acc.sg. *κύνα*, G.sg. *κυνός* (NIL: 436). Its TB reflex shows that a lengthening in the nominative was maintained in Common Tocharian: N.Sg. *ku* < **k(u)wu* < **k(u)uō*, vs. Acc.sg. *kwem̃* < **kwænā* < **kṷon-m̃* (HILMARSSON 1988: 509-512). In protected vowel environment, it would yield an *Ablaut* **ā/œ*, viz. N.sg. **wāk* (< **uǵʰkʷ-s*), Acc.sg. **wækā(n)* (< **uǵʰkʷ-m̃*), **āk* (< **h₃ǵʰkʷ-s*), **ækā(n)* (< **h₃ǵʰkʷ-m̃*).

If this inflectional type existed in Common Tocharian, one can postulate that the reflex of **ǵʰans-* (N.sg. **kāns*, Acc.sg. **kānsä(n)*) was lined up with it according to a four-part analogy: N.sg. **wāk* : Acc.sg. **wækā(n)* : N.sg. **kāns* : Acc.sg. **kānsä(n)* → **kænsä(n)*. This entails that this replacement operates when the category of root nouns was still recognizable, before the loss of final vowels. At a later stage, only the oblique stem was retained, because it was more frequently used (cf. above §3.2). This solution would prevent the need to posit a PIE paradigm N.sg. **ǵʰóns-s*, G.sg. **ǵʰans-ós* (analogical of the acrostatic scheme N.sg. **nókʷt-s*, G.sg. **nékʷt-s*), as proposed by ADAMS (2011: 35), for which there is no external support.²⁶

Against this analogical explanation, one could adduce AB *āp* ‘body of water; river, stream’ < **h₂ep-*, which preserves an older **ā*. But the problem is more complex because this term may have been borrowed from Iranian or an Indian language and, if inherited, its PIE *Ablaut* was probably different from the pattern addressed above. It was argued that the feminine gender of this word speaks against a borrowing, but there are other cases of nouns retaining the genre of the Indian source as pointed out by HARTMANN (2013: 446). Therefore, it is not possible to decide between both alternatives. Moreover, according to Vedic N.sg. *áp*, Gsg. *apás*, N.pl. *āpas*, Acc.pl. *āpas* and similar forms in Avestan, one has to set a paradigm N.sg. **h₂ēp-s*, G.sg. **h₂ep-e/os* (NIL: 311) > **ēps* (with EICHNER’s law), **ape/os*. This would yield in Proto-Tocharian N.sg. **āep*, Obl.sg. **āp-ä(n)*, exactly the opposite of the *Ablaut* postulated above for other root nouns. Here the analogy could not apply since there is no point of intersection. Since in this case only the oblique stem was retained, we can assume that Tocharian generalized the degree of the oblique stem in all root nouns (except “dog”), since it is the most commonly used

²⁶ Besides, as suggested by Romain GARNIER (personal communication), the *-nts-* epenthesis, which is analogical of the oblique cases as we have seen, weakens the probability that the vocalism should be taken at its face value.

form.²⁷ The other cases of **ā* vocalism in older root nouns, TB *salyiye*, TA *sāle* ‘salt’ and, allegedly, TB *āyo*, TA *āy** ‘bone’, were renewed in Common Tocharian by suffixes and thus were not root nouns, which explains why the analogy does not apply here.²⁸

4. The etymology of PIE **ǵʰans-*

Regarding the etymology of PIE **ǵʰans-* ‘goose’, scholars were polarized between two options since the beginning of comparative linguistics. According to a first interpretation, **ǵʰans-* was connected to a root **ǵʰa(n)-* (in older reconstructions), reflected in Greek *χαεῖν*²⁹ and Old Norse *gana* ‘to gape’,³⁰ and was interpreted as “the gaping one”. According to a second interpretation, **ǵʰans-* was said to be onomatopoeic and to come from an imitation of the goose call. We will first examine the morphological part of the former proposal, and then address the semantic motivation of a name such as “the gaping one”. This requires an inquiry on the description of the goose according ancient texts in order to see if such a designation was conceivable in ancient times. Then I will address the second proposal and study **ǵʰans-* in comparison to onomatopoeias for the goose call in various language, and review possible parallels, names of “goose” that can be linked to a corresponding onomatopoeia.

²⁷ This applies to TB *wek*, TA *wak* ‘voice’ and to TB *(t)kem* TA *tkam* which have also generalized the outcome of the accusative < **iskænā* < **dʰǵʰón-ŋ* (full explanation of the form in PINAULT 2002: 127), and possibly to **pæy* which is usually backed to the dual **pod-h₂e* (PINAULT 2008a: 503). In the case of “cow”, one has to assume that the PIE weak stem was generalized to all the paradigm (PIE paradigm: N.sg. **gʷōus*, Acc.sg. **gʷōm*, G.sg. **gʷoues*, according to NIL: 190-1). The vocalism of TB *mekwa* TA *maku* ‘nails’ is problematical and cannot be old since an *Umlaut* (TB ***mākwa*) is expected in this context.

²⁸ Contrary to what was formerly postulated, the nominative should be put as *āyo*, not as *āy**, cf. PEYROT (2008:111) – which can be confirmed by a new reading of *oñkolmaññe āyo kác(c)ille* ‘a bone of elephant [tusk?] should be scoured’, W 20 b3; for *kätt-* ‘to scour’, see PEYROT at IOL Toch 7 a3 in CEToM, and the Obl.sg. as *āya*, cf. HARTMANN (2013: 45). This weakens earlier etymological proposals (for references, see HARTMANN 2013: 448). ADAMS (2013: 49) explains *āyo* as the renewal of **ā*, the alleged outcome of the PIE root noun for “bone”. He starts from an acrostatic root noun N.sg. **h₂óst*, G.sg. **h₂ést-* (cf. Luwian *hās-*, Avestan *ast-* (G.sg. *astō*) and Latin *os* (G.sg. *ossis*); one could also postulate **h₃*). Then he assumes that the *e*-grade was generalized throughout the paradigm, and that the plural yielded directly TB *āsta* and the nominative **h₂ést* > **ās(s)* > **ā*, which would have been remade into an **-ieh₂*-stem. But this phonetic evolution is not supported by parallels, and influence of other body parts with the same inflection should probably be assumed, namely *kantwo* (Obl.sg. *kantwa*) ‘tongue’, and *kātso* (Obl.sg. *kātsa*) ‘belly’.

²⁹ I give here the infinitive aorist, because it is attested since Homer (with the present *χάσκω*), whereas the present *χαίνω* is Hellenistic (SCHWYZER-DEBRUNNER: I 694).

³⁰ For other cognates in Greek, see FRISK (II 1076-1077); for Germanic, see KROONEN (2013: 166).

4.1. The goose as “the gaping one”: morphological analysis

The first step is to examine if **ǵʰans-* could be derived by a known morphological pattern from the root “to gap”. Two analyses are possible: either **ǵʰan-s-* or **ǵʰa-ns-*. In the former case, the word is derived by a *s*-suffix from **ǵʰan-* (reflected in Greek *χαίνειν*, Old Norse *gana* ‘to gape’), which is an extension of a more fundamental **ǵʰa-* (as per IEW: 412, who sets up **ǵʰan-s*, *-(ə)d-*, because of Germanic **gan-at-a(n)-*). A more favored option is to directly draw **ǵʰa-ns-* from **ǵʰa-* and to postulate a *-ns*-suffix which should be attested also in the word for “month”. As most clearly stated by PRELLWITZ (1905: 506), “**ǵʰans* gehört zu *gha* gähnen, den Mund aufsperrn in *χαίνειν*, wie **mēns* Monat zu *mē* messen”. According to BRUGMANN, both words should be included in the class of nouns suffixed in **-n-e/os-* (type of Vedic *rékṇas-*, etc.), with zero grade of the suffix (*Grundriss*: II/1, 526). Against this analysis speaks the fact that both words are of animate gender and that they would be the only instances of zero grade suffixes (except the **-Hs*-sequences in *s*-stem neuters, cf. Skt. *kraviṣ-*, etc.).

In order to conciliate the root of Greek and Germanic with Latin *hīscō*, etc. ‘to gape’ (in earlier reconstructions **ǵʰeh₁i-* and **ǵʰan-*, cf. LIV²: 173; 193), a unique root was convincingly set up as **ǵʰeh₂-* by LUBOTSKY (2011: 173-5; followed by LIV² add, s.v. “**ǵʰeh₂”*) and COVINI (2016). LUBOTSKY then posits **ǵʰh₂-(e)ns-* and takes over the old comparison with **meh₁-ns-*. However for “month” (as pointed out to me by Prof. PINAULT, personal communication), RIEKEN (2001; followed by VINE 2009: 219) argued that it can be interpreted as a secondary degenitival formation (amphikinetic stem **méh₁-n-ōs*, **meh₁-n-s-és*) from a G.sg. (of time) **meh₁-n-és* (N.sg. **méh₁-ōn*). **ǵʰans-* would therefore remain isolated. LUBOTSKY returned later (2019) on this issue and reconstructed, based on other evidences, a suffix **-ens-* for PIE, ultimately linked to the present participle.³¹ One can accept this analysis, but it should be noted that it would belong to a rare pattern.

4.2. The goose in Ancient Indo-European cultures

While some scholars consider this etymology of ‘the gaping one’ to be probable, they have not provided a detailed explanation in support of it.³² We find more elaborate explanations in the scholarship of the 19th century. There, “the gaping one” is interpreted as referring to the aggressive (or defensive)

³¹ A similar idea was assumed by PAULI (1865: 99-100): “*Curtius* (griech. etymol. I, 168) nimmt anstoß an dem *s*, jedoch glaube ich, daß es sich ungezwungen aus *t* erklärt (cf. Kuhn zeitschr. I, 271 sqq.), so daß *hamsa* für idg. **ghanta* stünde, eine participiale bildung der wurzel *gha* mit späterem übertritt in die *a*-deklinaton, der im griech. *χῆν* noch nicht einmal eingetreten ist.”

³² See for example, LUBOTSKY (2019: 151): “This etymology is very attractive both from the formal and semantic point of view, as the geese are ‘gaping’ birds.”

behavior of the goose, since it is “der vogel, der gegen den sich ihm nähern den den schnabel aufreißt und zischt” (PAULI 1865: 99). Such an interpretation would indeed seem attractive to anyone who came close to a goose (or rather a gander).³³ Nevertheless, no parallels or descriptions of the goose according to ancient sources or ornithologists are provided as evidence.

For this reason, I will review the ancient sources, to see if according to them, such a behavior is indeed a notable characteristic of geese. I will mostly consider Graeco-Latin and Indic cultures, because we find there the richest literature on geese. The following description is drawn for Mediterranean cultures from PAULY-WISSOWA (VII/1, 709-711) and THOMPSON (1936: 325-329), for the Indian culture from VOGEL (1962: 8-10). For Germanic and Celtic cultures, see respectively RGA: X 431-3, and GREEN (1992, *passim*).³⁴ One should first note that these descriptions refer to different species. In the Mediterranean world, the most frequent species is the greylag goose (*anser anser*), or its domesticated form (*a. a. domesticus*). Sometimes the bean goose (*anser fabalis*) is also evoked. In the Indian culture, as already said, *hamsa* mostly refers to the bar-headed goose (*anser indicus*), a wild species.

To begin with their physical appearance, their palmed feet were mentioned in both cultures; see Aristotle (*HA*: 499a 27) and the Skt. epithet *jālapāda*- ‘web-footed’ (MW: 420a). Besides, Aristotle notes their wide esophagus, but this is a feature shared with many other birds.³⁵ In Indian culture, the geese are traditionally considered as white (e.g. in the epithet *śitipakṣa*- ‘white-winged’, MW: 1071b). Their call is considered as unpleasant in Greek and Latin culture, often opposed to that of the swan, whereas it is highly esteemed in Indian culture, where it is used in ornamental similes, e.g., for the tinkling of the ankle rings worn by women. This leads to word plays such as *hāsa-hamsā* ‘who has the laughter of the goose’ as epithet of Sundarī (Saund: IV 4), in the *blason* of her body as a lotus pond.

As for their behavior, their two most prominent characteristics in the Mediterranean world are their voracity and their cackle (textual references in PAULY-WISSOWA: VII/1, 711). In India, the cackle is also retained (with a positive connotation), but the second key characteristic is their gait, which is considered as a model of gracefulness. This motivates the etymology given in the

³³ See BUFFON (1855: 431): “Mais elle a, de plus, d’autres accents brefs qu’elle répète souvent lorsqu’on l’attaque ou l’effraie, le cou tendu, le bec béant, elle rend un sifflement qu’on peut comparer à celui d’une couleuvre”.

³⁴ The description of the goose in Western European societies is rather similar (while adding the characteristic of silliness); see BUFFON (1855: 424-441) and ROLLAND (1883: 151-177), who gathers data from several languages.

³⁵ Νῆπτα δὲ καὶ χῆν καὶ λάρος καὶ καταρράκτης καὶ ὅτις τὸν στόμαχον εὐρὺν καὶ πλατὺν ὅλον, καὶ ἄλλοι δὲ πολλοὶ τῶν ὀρνίθων ὁμοίως “In the duck, the goose, the gull, the swooper, and the great bustard, the oesophagus is wide and spacious throughout; and similarly, in a great many other birds” (*HA* 509a).

grammatical tradition, which links *haṃsa-* to a root *han-* ‘to go’.³⁶ Besides, they are associated with water in both cultures. Their migration (and their V-shaped flight formation) is more often recorded in Indian culture, where they are said to spend the summer in the mythical lake Mānasa in the Himalaya. They are also renowned for their watchfulness (cf. the geese of the Roman Capitol). This is also noted in the *Rigveda*, where the geese are twice called *uṣarbúdh-* ‘awaken at dawn’, probably because they stay awake during the night (I 163, 10). At this occasion, the hissing gander is once evoked in a simile pertaining to Agni: *śvásiti apsú haṃsó nā sídan / krátvā cētiṣṭho viśám uṣarbhūt* ‘He hisses like a wild goose sitting in the waters; awakening at dawn, he is the most conspicuous to the clans by his intention’ (I 65, 9; tr. JAMISON and BRERETON 2014: 188). In the Celtic world, geese are found in warriors’ graves, probably as symbol of aggressive behavior and as guardians (GREEN 1992:87-8; 126; 214); in the Gallo-Roman period, they were associated with Mars (ALBARELLA 2005: 253).

Hence, the aggressive behavior of the goose is less often mentioned and, when it is the case, as in the *Rigveda*, it is rather described by the hissing (*śvas-*) than by a “gaping”. On the contrary, there are many mentions of the cackling goose, which would support the second hypothesis concerning the origin of **ǵʰans*-.

Yet, in the Greek grammatical tradition, we do find an etymology that relates χήν ‘goose’ to χαίνειν ‘to gape’. Eustathius of Thessaloniki (circa 1115–1195) in his commentaries of the *Iliad* and the *Odyssey* drew the same connection as modern scholars (*Ad Hom. Il.* I 387, on verse II 461):

Γίνεται δὲ ὁ μὲν χήν παρὰ τὸ χαίνειν, διότι τε βορός ἐστὶ καὶ ὅτι καὶ ἰδιότης αὐτῇ τῷ χηνὶ χαίνοντι τὰ πολλά, ὅτε ἢ θρασύνεται ἢ δειλιά.

“χην (‘goose’) comes from χαίνειν (‘to gape’), since it is gluttonous and also because of this peculiarity of the goose to gape most of the time, either when it is bold, or when it is afraid”

In the commentary of the *Odyssey*, Eustathius adds a further explanation of this etymology (*Ad Hom. Od.* II 95, on verse XV 161):

δηλοῖ δὲ καὶ διὰ τῆς κατοικιδίου ταύτης χηνὸς τοὺς μνηστῆρας. οἰκουρὸς γάρ καὶ αὐτὴ καὶ κατ’ ἐκείνους πολύφαγος καὶ ἀπὸ τοῦ χαίνειν καὶ χανδὸν ἐσθίειν καλουμένη. [...] Ἰστέον δὲ ὅτι χαίνειν λεγόμενον καὶ τοῦ λαλεῖν ὡς ἐκ τοῦ παρακολουθοῦντος τοῖς λαλοῦσι, καθὰ δηλοῖ Σοφοκλῆς ἐν τῷ μαστιγοφόρῳ, ἐκεῖθεν γίνεται προχάνη ἢ πρόφασις. καὶ εἰσὶ δύο αὗται λέξεις ταυτοδυνάμενοι.

“He points out through this domesticated goose to the suitors. Indeed [the goose] itself keeps the house, is voracious like these one, and is called after χαίνειν (‘to gape’) and χανδὸν ἐσθίειν (‘to eat with mouth wide open’). ...

³⁶ See PISCHEL (1909: 163), who quotes *Mahābhāṣya* III 21: *hammater haṃsaḥ | kaḥ punar āha hammater haṃsa iti | kiṃ tarhi | hanter haṃsaḥ | hantya adhvānam iti*. On the root *hamm-*, see references in KEWA: III 577.

And one must know that, since χαίνειν also means λαλεῖν ('to talk') because this action goes with the talk, as shown by Sophocles in *The Scourge-bearing* [= *S.Aj.* 1227 (?)]; hence πρόφασις ('motive, pretext') can be called προχάνη ('pretext'). And both words are synonymous."³⁷

This etymology is evidently based on the general principle of paronymy (LE FEUVRE 2015: 35-37), especially in the perfect κέχηνε. In order to account for it, Eustathius sums up well-known characteristics of the goose ("naturalistic principle" after LE FEUVRE 2015: 48): its cackle (λαλεῖν) and its voracity (πολύφαγος, χανδὸν ἐσθίειν, βορός), since χανεῖν means 'to gape in eager expectation' and sometimes 'to speak with open mouth' (LSJ: 1981a). Only the explanation as "because of this peculiarity of the goose to gape most of the time, either when it is bold, or when it is afraid" corresponds to the modern etymology. Besides, since it is placed in second position, it could indicate that Eustathius preferred the first explanation, cf. LE FEUVRE (2015: 13).

That this connection is older is shown by a fragment of the comic author Eubulus (4th B.C.), quoted by Athenaeus in *Deipn.* XII, 16 (519a):

Καὶ γὰρ πόσῳ κάλλιον, ἰκετεύω, τρέφειν
ἄνθρωπον ἔστ' ἄνθρωπον, ἂν ἔχη βίον,
ἢ χῆνα πλατυγίζοντα καὶ κεχηνότα,
ἢ στρουθόν, ἢ πίθηκον, ἐπιβουλον κακόν.
"Because how much better is it, please, for one human being
to take care of another, if he's got the wherewithall,
instead of keeping a splashing, honking goose,
or a sparrow, or a monkey – that's a mischievous pest!" (tr. OLSON 2010: 45)

The text produces a list of usual pets in antiquity as points of comparison to child-rearing. Here, the attributive participle κεχηνώς can be interpreted in several ways. It is usually taken, as in the translation of OLSON, as referring to the disturbing noise of the goose. We find it in the first reliable translation of the text by Jacques DALÉCHAMPS, *quam obstreperum, hiantem & clamore molestum anserem* "than a roaring, gaping and by its noise disturbing goose" (*apud* CASAUBON 1597: 519). Later the literal meaning "gaping" was dropped: "*que quelqu'oison qui bat l'eau de ses ailes et grasseie*" (VILLEBRUNE 1789-1791: IV 438). However, this translation was challenged by FRIEDRICH and NOTHERS (2000: 110), who rendered it as "*als eine Gans, die spritzt und schnappt*".

The traditional interpretation should be preferred for several reasons. The word πλατυγίζω, a quasi-hapax, means, according to Byzantine dictionaries, τοῖς πτεροῖς κρούει 'to beat with wings' (Ph. Lex: III 924); it should be here a

³⁷ For the translation of the last sentence, I am indebted to Claudio FELISI. As he pointed out, there is a parallelism λαλεῖν : χαίνειν = πρόφασις : προχάνη (προχάνη is analyzed by Eustathius as a compound of προ- and χαν- from χαίνειν, cf. *Ad.Hom.II.* IV 63).

verbum sonandi ‘to beat the water with its wings, splash about’ (LSJ: 1413b).³⁸ Hence κεχηνότα should be interpreted in the same way. Besides, as already said, χανεῖν sometimes means ‘to speak’, but never ‘to grab, to snap’ (LSJ: 1981a). Lastly, the perfect is frequently used for onomatopoeic verbs with a frequentative-intensive meaning (SCHWYZER-DEBRUNNER: II 264, fn. 1; TICHY 1983: 63-75). Here, this form was probably selected in order to produce an alliteration *k/kʰ*.³⁹

This shows that the connection of χήν with χανεῖν does hold up only if one assumes meanings such as ‘to open the beak in eager expectation’ or ‘to open the beak to produce a sound’, because these characteristics are considered as more typical of geese than their aggressive behavior. The explanation of Eustathius is thus isolated within the ancient tradition and should not be considered a supporting argument for an etymology of the goose as “the gaping one”.

Besides, other etymologies of the goose are reported. Since it is considered as noisy, the name of the goose is unsurprisingly said to be drawn from its call in the *Etymologicum magnum*, a 12th century Byzantine dictionary: Κοινόν ἐστι τῷ γενεῖ· ἔστι δὲ καὶ εἰδικόν. Γίνεται παρὰ τὸ ἡχή, ὃ σημαίνει τὴν βοήν, ἡχήν· καὶ ἀφαιρέσει τοῦ η χήν, κρακτικὸν γὰρ ἐστὶ καὶ φωνητικόν. ‘It is common gender (= male and female). It is specific. It comes from ἡχή (‘sound’), that points out the call ἡχήν, and, by the removal of the η, χήν. It is indeed noisy and garrulous’⁴⁰ (EM 811). On the same principle, Varro states *a vocibus pavo anser gallina columba* ‘the peacock, the goose, the chicken and the dove [are named] after their calls’ (Varr. *L.* 5,75). Lastly, for the sake of completeness, one should mention the etymology of the *Etymologicum Gudianum*, which is based on the aquatic nature of the goose: χηνάριον, διότι ἐν τοῖς νάμασι χαίρει ‘χηνάριον (‘small goose’): because it rejoices (χαίρει) in the streams’ (*Et.Gud.* 564).⁴¹

³⁸ Explained by FRISK (II : 553) as “Umbildung von πλαταγέω (*-γίζω) [‘to clap the hands’] nach πλατός [‘wide’], wenn nicht vielmehr nach περυγίζω [‘to flutter with the wings’] (Thierfelder briefl.).”

³⁹ Although it was not proposed, the verb χανεῖν could also refer to the greed of the goose. In the *Knights* of Aristophanes, we find, as description of the seal of the δήμος: λάρος κεχηνὸς ἐπὶ πέτρας δημηγορῶν ‘It’s a gull with beak wide open, haranguing on a rock’ (Ar. *Equ.* 956). The gaping gull is here an image intended for Cleon, probably combining an allusion to the flattering speeches of the demagogues haranguing on the βῆμα, to their greed and behavior of parasite (because of the gull, cf. Ar. *Nub.* 591; Athen. *Deipn.* IV 13 (134e); Luc. *Merc.cond.* 3: καθάπερ ὁ λάρος ὅλον περιχανὼν τὸ δέλεαρ), and to the fable of the crow and the fox (Phaedr. I 13; cf. Hor. *Sat.* II 4, 55 *corvum deludet hiantem*), since Cleon is being replaced by the sausage seller rightly at this moment.

⁴⁰ The adduced justification reappears in the etymology of the swan: Γίνεται δὲ παρὰ τὸ κλω, τὸ φωνῶ· κρακτικὸν γὰρ ἐστὶ τὸ ζῶον, ὡς καὶ ἡ χήν (EM 544).

⁴¹ The proper entry on χήν (*Et.Gud.* 563) adds the same etymology as EM 811: Χήν, ὄνομα θηλυκόν, κοινὸν τῷ γενεῖ, ὃ χήν καὶ ἡ χήν· κρακτικὸν γὰρ ἐστὶ καὶ φωνητικόν· γίνεται δὲ παρὰ

Hence, the two polarizing options attested in modern linguistics are already attested in grammatical texts of medieval period. It is even likely that the interpretation of the “the gaping one” was inspired by Eustathius, although this was subsequently forgotten, since the *παρὰ τὸ χαίνειν* etymology was known during the Renaissance (SYLBURG *apud EM* 811, see quotation in §4.3) and in the oldest testimony I could find for modern linguistics, in 1858, it is put forward as “assumed several times”.⁴²

4.3. A wild goose chase

The modern interpretation of “the gaping one” as referring to the aggressive, or defensive, behavior of the goose (as per PAULI, and others, see the introduction of §4), is not as straightforward as it may appear. Although this behavior seems indeed to be typical of the goose within the West-European poultry, this feature was rarely registered in older sources. It is only attested as such in the works of Eustathius, among several other explanations.

Besides, according to the description of ethologists, the opened beak is not the typical feature of the threatening posture of the wild goose. As important is the stretching of the neck and the raising of feathers. Geese have two postures of this kind, which are called “the Diagonal (or Erect) Neck” and the “Forward Neck” (JOHNSGARD 2008: 39-49; HEINROTH 1911: 617). These behaviors (opened beak and stretched neck) are also shared by other kind of waterfowl: the swans (with outstretched wings), the *brantae*, the ruddy shelduck, etc. (JOHNSGARD 2008: 29-36; 50-60; 80; HEINROTH 1911: 609), so that it is hardly a specific characteristic of geese. That is why such an explanation was almost unanimously rejected by those who devoted a specific study on birds’ names,⁴³ and THOMPSON, who is a well-known biologist, deemed the connection with *χαίνειν* as “more than doubtful” (1936: 325).

Moreover, at a PIE level, **ǵʰans-* probably referred to a kind of wild goose. According to the actual state of archaeology, when and where the goose was domesticated is still unclear, but there is no evidence of domestication before

τὸ ἡχή, ὃ σημαίνει τὴν βοήν. Χήν, καὶ χῆνα τὸ χηνάριον παρὰ τὸ ἡχεῖν, ἢ παρὰ τὸ χαίρειν, {τουτ’ ἔστι πέδον, πέδον} χηνάριον, διότι ἐν τοῖς νόμασι χαίρει· {ἢ παρὰ τὸ ἔζω, τὸ καθεζομαι· οἱ γὰρ δεδεμένοι κυρίως ἐπὶ τῆς γῆς κατακείνται}. The bracketed segments are interpolations, because they hardly match the context. They are used in Choerob. *Ep.in.Ps.* 188 as etymology of χειροπέδη ‘handcuff’ and hence should complete the broken entry on χειροπέδες in the next page of the *Gudianum*.

⁴² “Mit der wiederholt angenommenen Etymologie von *χαίνο*, die sachlich sehr gut passt, will nur das *s* nicht gut vereinigen, das unserm Wort in allen Sprachen zukommt” (CURTIUS 1858: I 168).

⁴³ SUOLAHTI (1909: 411); HAUSCHILD (1909: 160, fn. 1); ROBERT (1911: 30-32); THOMPSON (1936: 325). See also SCHMIDT (1913: 329); DOERFER (1963-1975: 387) for “Altaic” languages. SUOLAHTI argues in the following manner (1909: 411): “Jedenfalls sollte die alte Etymologie, die den Vogelnamen mit griech. *χάσσω* ‘gähne’ verknüpft, schon aus semasiologischen Gründen aufgegeben werden.”

the third millennium. Two likely candidates for this process are Egypt for the greylag goose (*anser anser*), and China for the swan goose (*anser cygnoides*).⁴⁴ In the oldest records in the Greek culture, the goose seems to be kept rather for enjoyment than for its flesh (*Odysseia* XIX 536-537). By Roman times, goose husbandry had become well established (as recorded in the Roman agricultural treaties). The breeding spread to the Central and Northern Europe with the Roman conquest, and there are little evidences of consumption of goose's flesh before that time (RGA: X 433; ALBARELLA 2005: 250-251).⁴⁵

This has several implications: the wild goose is a distant bird, difficult to reach and that can be chased only with snares (PAULY-WISSOWA: VII/1 710; GREEN 1992: 55; BUFFON 1855: 438-439). Hence an original meaning "the gaping one", which involves a species accustomed to humans and close contact, is unlikely. Likewise, a denomination "the greedily gaping one" would rather entail breeding context, and should be excluded.

Being aware of this difficulty, some scholars tried to combine this interpretation with an onomatopoeic one, assuming that **ĝ^ha(n)-* also imitates the hissing: "Daß idg. **ĝhan-s-*, *-(ə)d-* mit gr. *χαεῖν* (s. *ghan-*) und überhaupt mit der Sippe **ĝ^hē(i)-* „gähnen“ zusammenhängt [...], also von dem heisern Ausfauchen des Tieres bei aufgesperrtem Schnabel den Namen hat, ist um so glaublicher, als auch **ĝhē(i)-* „gähnen“ ursprgl. dasselbe mit dem Hauchlaut oder dem velaren Gutturalspiranten verbundene Ausatmen beim Gähnen bezeichnet hat" (IEW:412). But the sound produced to dispel aggressors is distinctly a "hissing" for which one expects a closed vowel and a sibilant or a fricative, which should hardly correspond to PIE **ĝ^hans-* (see the onomatopoeia for hissing in §4.4.1). This contradiction is patently disclosed in the explanation of Friedrich SYLBURG (1536-1596), who brought the etymology from *χαεῖν* together with the idea of an onomatopoeic nature of the name (*apud EM* 811): *Non male cum Eustathio παρὰ τοῦ χαίειν deducetur, praesertim quum verum τοῦ χι sonitum adversus invadentes effundat* 'It will be quite well be derived with Eustathius from *χαίειν*, since it throws the sound *χι* against those who attack'. Only a modern pronunciation of *χῆν*, namely /xin/, would imitate the hissing of the goose.⁴⁶

⁴⁴ References in ALBARELLA (2005: 251-253); MANNERMAA (2014); ALVES (2015: 41); see also GRIEPENTROG (1995: 211), for references assuming an earlier date of domestication. The first unquestionable evidence for domestication of the greylag goose in Egypt is a painting in a palace of Akhenaten (14th century BCE); see HOULIHAN (1986: 54-60).

⁴⁵ However, Pliny says that the geese from Germany, called *gantae*, were reputed for their feathers (Plin. *nat.* X 29). He also reports that geese were brought from Gaul to Rome (*ibid.* X 28); probably also for their feathers; see PAULY-WISSOWA: VII/1, 710).

⁴⁶ A neutral interpretation 'to open the beak in order to cackle' would be possible since it could find support in ancient sources; see ANDRÉ (1967: 29): "*il est sans doute apparenté au grec χαίνω « ouvrir la bouche, bailler » (quand les oies jacassent)*". But the meaning of the PIE

Hence the hypothesis postulating that **ġ^hans-* means “the gaping one” is not compelling, since it is not supported by the descriptions of the goose in ancient sources or in ornithological works. This etymology was uncritically taken from Eustathius and is ultimately based on the phonetic similarity of *χῆν* with *χαίνειν*. However, the *-n-* of the Greek and Germanic verbal forms (Old Norse *gana* ‘to be agape’) has at any rate an independent origin. LUBOTSKY (2011: 107) posits a root extension **ġ^heh₂-(e)n-*. This root extension can come from the reanalysis of an *n*-infix present **ġ^h-(e)n-H-*, secondarily thematized in Greek as traditionally assumed (SCHWYZER-DEBRUNNER: I 694 [**χά-vāμi*, **χά-vō*], and also FRISK: II 1077). KROONEN (2013: 166) provides a similar analysis for Old Norse *gana* (< Germanic **ganēn*), which, according to him, is the remodeling of a present **ġ^hh₂-néh₂-*. According to other scholars, Old Norse *gana* could also be a denominative of *gan* ‘yawn, throat’ < **ġ^hh₂-nó-* (COVINI 2016: 28; LIV²: 193). Therefore, the phonetic similarity that led to this etymology is ultimately a retrospective illusion.

4.4. **ġ^hans-* as an onomatopoeic denomination

We should thus examine the second hypothesis, according to which **ġ^hans-* has an onomatopoeic origin. This explanation was unanimously adopted by the authors of monographs on bird names (references in §4.2, fn. 43) without further substantiating this argument, except HAUSSCHILD (1909: 160), who quotes BUFFON’s description of the goose.⁴⁷ As we have seen, the noisy nature of the goose is frequently alluded to in ancient sources and this point does not require further explanation. Besides, since **ġ^hans-* probably refers to the wild goose, which is difficult to approach, its most conspicuous feature would be its call. But to demonstrate that indeed **ġ^hans-* has an onomatopoeic origin, one has to show that it is identical or partly identical with the onomatopoeia or a specific verb for the goose call. But due the antiquity of the name, the first option is impossible, and as for the second one, no verb of sound for the goose can be reconstructed for PIE. Consequently, one should go a step further and compare **ġ^hans-* to onomatopoeias for the goose call in several languages and to its actual call. To show that onomatopoeia indeed imitates natural sounds and how it transposes them in human language,⁴⁸ sev-

root seems to be only ‘to gape’ (cf. Latin *hiō*, *-āre* ‘to be wide open, gape’; Old Norse *gana* ‘to gape; gaze, stare’, etc.) and ‘to gape when/for shouting/speaking’ is a secondary development in Greek.

⁴⁷ “*Soit crainte, soit vigilance, l’oie répète à tout moment des grands cris d’avertissement ou de réclame ; souvent toute la troupe répond par une acclamation générale, et de tous les animaux la basse-cour, aucun n’est plus bruyant ni vociférant.*” (BUFFON 1855: 431).

⁴⁸ For a demonstration that onomatopoeia is an exception to the arbitrariness principle, see PHARIES (1985: 44-74). On “iconicity” in general, see e.g. the summary in CARLING and JOHANSSON (2014: 200-201). As for the definition of onomatopoeia, see GRAMMONT (1901: 98), according to whom onomatopoeia is a transposition, a “translation”, in human language of natural sounds,

eral methods were adopted in recent years: 1) cross-linguistic inquiries on onomatopoeias in order to identify recurrent patterns that cannot be explained by heredity or contact (PHARIES 1985: 70-73; RHODES 1994: 279); 2) use of spectrograms and comparison of the acoustic features of natural sound with the corresponding onomatopoeia (PHARIES 1985: 44-69; TSUR 2001); 3) acoustic analysis (with spectrograms or mathematical model) combined with a psycho-linguistics inquiry on the perception of sounds (MASUDA 2003; ASSANEO et al. 2011). For the present discussion, I will first study onomatopoeias for the call of the goose and *verba sonandi* in unrelated and distant languages to see if a common pattern can be found. Then this pattern should be compared by means of spectrograms to the call of the goose in order to understand why this pattern was chosen. In particular, I will try to provide distinctive arguments, namely why such a bird call is rendered by a vowel *u*, whereas another is usually rendered by the *a* vowel. Secondly, as an etymological inquiry, I will review the names of the goose whose origin can be recovered to draw a typology. The pattern identified in the first part will help to identify the names that are of onomatopoeic origin. Lastly, these data will be compared to **ǵʰans-* to examine if it can be said to fit this pattern.

4.4.1. Onomatopoeias for the goose call

The first step is to gather onomatopoeias for the call of the goose across different and unrelated languages. Such a task presents two kinds of difficulties. It is not easy to find reliable sources, because onomatopoeias for “goose” are not always registered in lexicographical works. This may be due to a general lack of consideration for this kind of words, and also to the fact that geese are less important than, e.g., the rooster. In several cases, such an onomatopoeia simply does not exist. That is why, when possible, I adduce also data taken from older literary sources. Besides, only one onomatopoeia is usually recorded, whereas there are several species of geese, which have similar but distinct calls. Besides, their call is sometimes confused with that of the duck, especially in countries where geese are not seen frequently. This is due to the fact that onomatopoeias are schematic imitations and thus can represent similar natural sounds. Since the geese live in temperate and arctic climates of the North Hemisphere, I limited my inquiry to Eurasia and Northern America where we find several species of geese, but also the brant and the barnacle

which entails that onomatopoeias are constrained both by the perception of sounds and the vocal apparatus that produces the imitation. In a more up-to-date phrasing, onomatopoeia can be defined as “*a direct mapping between the acoustic features of the sound itself and the phonological features of the word that labels that sound*” (RHODES 1994: 279). Theoretically, it should be the best approximation of these sounds in the system in which they are transposed (GRAMMONT 1901: 98 mentions “onomatopées parfaites”; ASSANEO et al. 2011:1), even if it should be conceded that it entails some degree of convention (PHARIES 1985: 64-65; RHODES 1994: 279, who defines a scale from precise (“wild”) imitations to (“tame”) approximations).

goose that have a rather similar call.⁴⁹ With these provisos in mind, we can now consider the following list:⁵⁰

Language	Onomatopoeia
Chinese	<i>gā gā</i>
Czech	<i>ga ga</i>
Dutch	<i>gak gak</i>
English	<i>honk</i> or <i>can cank</i> ⁵¹
French	<i>can can</i> ⁵²
German	<i>gack gack</i>
(Low) German	<i>da da</i> ⁵³
Hungarian	<i>gá gá</i>
Italian	<i>qua qua</i> (also for duck)
Japanese	<i>gā gā</i>
Korean	<i>kkwayk kkwayk</i> (also for duck)
Malagasy	<i>giaka</i>
Pāli	<i>gaggara</i> ⁵⁴
Portuguese	<i>qüem qüem</i> (also for duck) ⁵⁵
Romanian	<i>ga ga</i> ⁵⁶
Russian	<i>ga ga</i>
Swedish	<i>kakak</i> ⁵⁷
Turkish	<i>gak gak</i>

⁴⁹ The only exception is Malagasy, but domestic geese are bred in Madagascar.

⁵⁰ I thank Bai YU for Ch., and Štěpán PRINC for Cz.; D.; E.; F.; H.; J. are drawn ABBOTT (2004) and were provided by native speakers. K. is from RAKHILINA et al. (2017: 207); M. from BERNARD-THIERRY (1960: 248); I. from SAFFI (2008: 17).

⁵¹ *honk* is originally American English, cf. “*The faint honk or quack of their leader*” (Thoreau, *Walden*, quoted by OED, s.v. “honk”). D. H. Lawrence, *The rainbow*, chap. 2: “*The heavy, balanced birds [...] swayed off, producing the long, can-canking, protesting noise of geese, rocking their ship-like, beautiful white bodies in a line beyond the gate.*”

⁵² Registered in Loiret according to ROLLAND (1883: 155). See also, about a goose: “*Quoi que d’ordinaire / on l’entend faire / Can ! Can ! Can ! Can ! [...]*” (VAULABELLE 1854: 4). SAFFI (2008: 17), probably because *can can* is out of use now, adduces as French onomatopoeia *coin coin*, the usual onomatopoeia for duck.

⁵³ See the folk-song quoted in ¹DWB, s.v. “*dadern*”: “*die gens mit irem dadern / dada, dada, dada / mit irem geschrei und schnadern / dada, dada, dada.*”

⁵⁴ In the epithet *haṃsa-gaggara-* ‘who has the [sweet] cackling of the goose’ (*Jātaka* V 96). Pāli *gaggara-* is usually linked to Skt. *gargara-* ‘whirlpool; music instrument’, although the meaning of ‘gaggle’ is not attested in Sanskrit.

⁵⁵ João Gilberto, “O pato”: “*O ganso gostou da dupla e fez também qüem, qüem, qüem.*”

⁵⁶ Creangă, *Dănilă Prepeleac*: “*Cînd ajunge în tîrg, gînsacul, dorit de gîște, țipa cît îl lua gura: ‘ga, ga, ga, ga!’.*”

⁵⁷ See the text quoted in SAO, s.v. “*gås*”: “*När gåsen är död, så ropar hon icke kakak.*”

More data could probably be gathered, but I think that these items suffice to show that a certain pattern /ga/ recurs in the onomatopoeias for the call of the goose. Of 19 onomatopoeias, 17 have an /a/ vowel, and also 17 have a velar initial stop, usually /g/. The coda shows some differences, several languages have an open syllable, other a velar stop coda, or a nasal. The diversity of sources (six language families and four Indo-European subbranches) shows that this common pattern cannot be due to chance; see for example the identity of Hungarian *gá gá*, IPA [gä: gä:], and Japanese *gā gā*, IPA [gä: gä:]. Even within West-European languages, the similarities cannot be explained as inheritance since one would expect on the contrary differences predicted by sound laws. The hypothesis of borrowing is not satisfying either, because of the variations in each language (French *can can* vs. English *can cank*; Swedish *kakak* vs. German *gack gack*).⁵⁸ Accordingly, these onomatopoeias should be regarded as (re)creations of each language that converge to a certain pattern.

This corpus can be enlarged by a list of *verba sonandi* for the goose, which are better recorded in lexical works. But they are less reliable than onomatopoeias, since they show a higher grade of lexicalization. I will separate the material in two categories: 1) verbs that represent the call of the goose (partly overlapping with that of the duck), ranked according to their similarity with the pattern identified in onomatopoeias; 2) verbs that refer to the hissing (partly overlapping with that of the snake).

Language	Verb	Reference
Lithuanian	<i>gagėnti, gagėti</i>	FRAENKEL 1962-1965: 12
Polish	<i>gęgać</i> , dialectal <i>gagać</i>	FRAENKEL 1962-1965: 12
English	<i>cackle, gaggle, cank, keak, honk</i>	OED, s.v.
Dialectal German	<i>karken, jalpern, gilken, quaken</i> (Mecklemburg)	DESFAYES 1998: I 158
French	<i>cacarder, gratiler</i> ; Old French <i>jargonner</i> (for animals in general)	SAFFI 2008: 177; DESFAYES 1998: I 160; FEW: XXII/2, 20
Dialectal French	<i>canquener</i> (Morvan), <i>couquer, caquer</i> (Gallot); <i>cracasser</i> (Deux-Sèvres), <i>karake</i> (Bas-Maine)	DESFAYES 1998: I 160; FEW: XXII/2, 20

⁵⁸ See similar argument made by GRAMMONT (1901: 132-136) about the name of the cuckoo in Indo-European languages. Besides, as argued by TSUR (2001), if one is willing to explain these similarities by mutual influence, it should also be explained why this process does not take place in non-onomatopoeic names, such as *nightingale* vs. French *rossignol*, etc.

Hungarian	<i>gágog, gágol, gegeg</i>	BENKŐ 1993-1997: 440
Finnish	<i>kaakattaa</i> (also for hen)	ALANNE 1962: 226a
Romanian	<i>a gâgâi</i>	RAKHILINA et al. 2017: 46
Russian	<i>gogotat' / gakati</i>	RAKHILINA et al. 2017: 82
Latin	<i>gingrire, gratitare</i> or <i>graccitare, trinnire, sclingere, gliccire</i>	THOMPSON 1936: 325; PAULY-WISSOWA: VII/1, 709
Ancient Greek	<i>παπαύζειν</i> (normally said of children)	PAULY-WISSOWA: VII/1, 709
Dialectal German	<i>tottern, tateln, tadern, dadern</i> (also 'to chatter')	DESFAYES 1998: I 158
German	<i>schnattern</i>	RAKHILINA et al. 2017:88

One should set apart verbs that refer to hissing, which present a different phonetic structure, consisting of a sibilant (usually *s*) and a closed vowel (usually *i*):

Language	Verb	Reference
Komi-Zyrian	<i>sziszeg</i> (also for snakes)	RAKHILINA et al. 2017: 166
Romanian	<i>a fâsâi</i>	RAKHILINA et al. 2017: 207
French	<i>siffler</i> (also for snakes)	SAFFI 2008: 177
Occitan	<i>buffa</i> (lit. to blow) (Toulouse, Poumarède)	ROLLAND 1883: 155
Dialectal German	<i>zesen, zissen, zirsen</i> (Mecklemburg), <i>zussern</i> (Bavaria)	DESFAYES 1998: I 158

It would be difficult to draw statistics from the first list because the number of occurrences greatly depends on the type of the source (dialectological data are much more precise), or on chance (the majority of the listed Latin verbs are *hapax legomena*, which is expected due to the nature of our sources). Nevertheless, the majority of verbs use a velar stop and an /a/ vowel to render the call of the goose (taking each verb into account, 27 of 38 verbs have a velar consonant and 25 a vowel /a/). As for the hissing, languages use a sibilant and a closed vowel for the hissing.

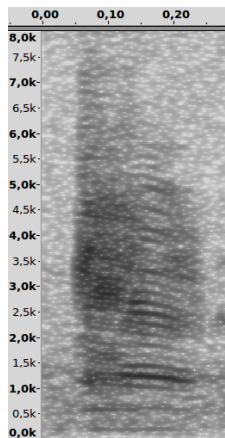
The “deviating” shape of some verbs can be explained by other factors. The most different verb is German *schnattern*, but this verb belongs to specific group of words with **sn-* initial in North West Germanic that are associat-

ed with the mouth or the noose (cf. English *to snap*, *sniff*, German *Schnabel* ‘beak’, etc.), and are sometimes presented as standard example of phones-theme (BLUST 2003: 187-189). Besides, as the goose call was associated with loud and meaningless talk, the *verba sonandi* of such meaning are transferred to the goose, as in the case of Greek *παπάζειν*, which normally refers to the speech of children (‘to say *pa pa*’) and the Low German *dadern*, etc. which means ‘to utter *da da*’ and refers to ‘chatter’ in general.

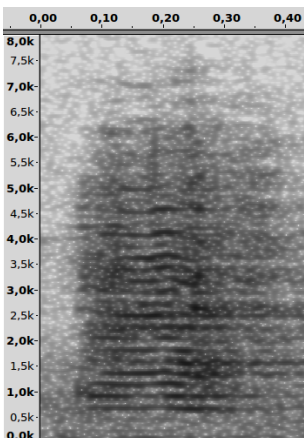
Now, we should try to explain why the call of the goose is rendered in a similar manner across languages, and compare the acoustic properties of the goose call with that of the syllable /ga/. The first step is to choose which sound produced by goose is rendered in such a manner, because geese can produce different “calls” with different functions (from alarm call to triumph call; see the typology in HEINROTH 1911: 615-617 and FISCHER 1965, with spectrograms). Most likely such an onomatopoeia renders the usual call, or the flight call, used by animals to ensure their mutual presence, since it is very frequent and is perceived from afar. Furthermore, one has to analyse calls of the several species that correspond to the collected data (for example the Japanese onomatopoeia is for the domesticated swan goose, whereas the European languages refer to the domesticated greylag goose).

Then, one should compare the spectrum signal of these goose calls to the syllable /ga/, that is the distribution and the height of the acoustic peaks of energy and the evolution of these peaks during the production of the sound. The most compelling comparison of bird calls to their respective onomatopoeias was provided by MASUDA (2003). She showed that the choice of vowel was intended to render a perceived variation in the call. For example, in *whew-oo* /wi: u:/, the onomatopoeia for the whew call, the rise of F2 in the transition from /w/ to /i/ and then its gradual fall to /u/ imitates the rise and the gradual fall of the harmonics in the bird’s call (2003: 80-81). MASUDA particularly insisted in the role of the front cavity resonance (corresponding to F2 for most vowels, but to F3 for high front vowels) in these imitations. Here I will follow this method by comparing the call of three species of geese to five syllables /ge/ /gɛ/ /ga/ /go/ and /gu/.⁵⁹

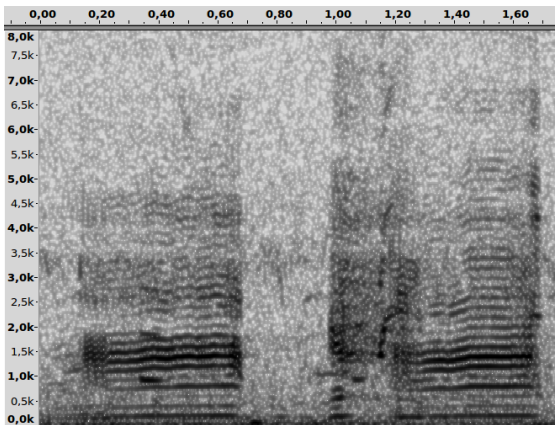
⁵⁹ The spectrograms were produced with the software Audacity 2.1.2 using a linear scale, the frequencies algorithm, a window length of 2048, and a Gaussian projection (a=4,5). Some measurements, especially the pitch, were checked in Praat 6.0.04. The recordings were found on www.xeno-canto.org. The references are, for the greylag goose: Albert NOORLANDER, XC561684; swan goose: Daniel HINCKLEY, XC541973; bean goose: Lars EDENIUS, XC562507; cuckoo (*cuculus canorus*): Eero PÄTSLI, XC477588; Eurasian eagle-owl (*bubo bubo*): Paweł MIRSKI, XC436593; carrion crow (*corvus corone corone*): Jarek MATUSIAK, XC535715. The syllables /ge/, etc. were pronounced by myself.



Call of the greylag goose



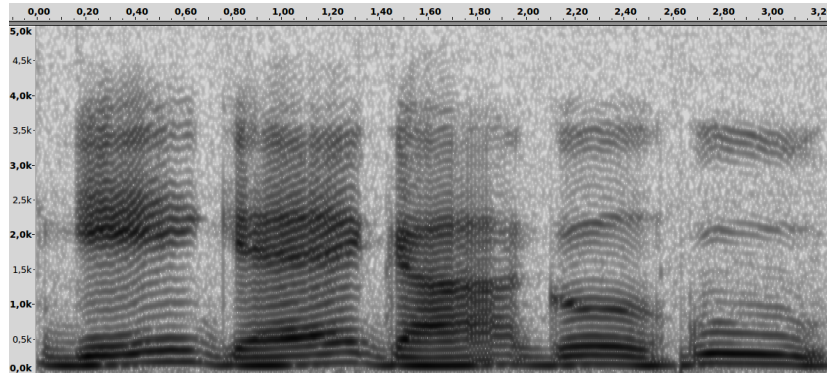
Call of the bean goose



Call of the swan goose

Phonetic analysis of bird calls							
	greylag goose	swan goose	bean goose ⁶⁰	carrion crow	cuckoo		Eurasian eagle-owl
					1 st note	2 nd note	
					680	520	
Peaks (Hz)	1200	1400	1200	1600	(1360)	(1040)	370
	2900	2500	2400	2800			720
		3900	3500				1120, 1500, etc.
Pitch	200	220	220	80	360	260	370

⁶⁰ For the bean goose, I give here the formant analysis of Praat, because the peaks of intensity are rather evenly distributed at regular intervals: viz: 680, 910, 1150, 1380, etc.



Pronunciation of the syllables /ge/ /gɛ/ /ga/ /go/ /gu/

Formants (Hz) ⁶¹	/ge/	/gɛ/	/ga/	/go/	/gu/
F1	350	530	680	400	300
F2	2000	1700	1240	930	800
F3	2400	2200	2070	2150	2000
F4	3400	3300	3310	3450	3400
Pitch	120-150				

The call of the greylag goose consists of elements of 0,1-0,2 s., repeated at the rate of 1 or 2 per second. Each element begins very sharp, with some noise (random peaks of intensity), and consists of a loud nasal honking,⁶² with a rather even distribution of the intensity across the frequency spectrum, although with two peaks at around 1200 Hz and 2900 Hz. The pitch is even, but may include breaking downward and upward. The call of the bean goose is rather similar, with a less sharp onset, and an even distribution of energy on each partial from 600 to 6000 Hz. The call of the swan goose is composed of two elements. The second one is preceded by a sort of hiccup, visible on the ascending resonance peaks before the second note, but the structure of both notes is rather similar to that of the greylag, with a broad and intense peak of resonance at around 1400 Hz.

I will first address the choice of the vowel /a/ across languages to render the call of the goose and then of the velar /g/. The overtone structure of /a/ is the most close to goose calls, because their first peaks of resonance are situated between 1000 and 1500 Hz, an area that is occupied by no other vowels

⁶¹ Cf. the reference formants for all French vowels in GEORGETON et al. (2012: 149).

⁶² Cf. the description of HEINROTH: “*das trompetend-schmetternde, nasale, auf der ersten Silbe betonte „Gagagag“ bzw. „Gigagag“*” (1911: 615).

than /a/ as shown by the comparison of spectrograms. If, as suggested by MASUDA 2003, F2 should be considered for the imitation of bird's call, then the F2 of /a/ is about 1500 Hz in French reference (GEORGETON et al. 2012: 149) or 1250 Hz in a Japanese corpus (HIRAHARA and AKAHANE-YAMADA 2004: 3289). This is closer to the first peak of resonance of the greylag goose and the bean goose (1200 Hz), as well as the swan goose (1400 Hz) than the F2 of other vowels. According to the same references, the F2 of /ε/ is at 2300 in French, that of /e/ is at 2000 Hz in Japanese; that of /o/ at 840 Hz in French, and at 1000 Hz in Japanese.

Correspondingly, bird calls that have lower peaks of resonance are rendered by vowels with lower F2. The call of the cuckoo, for example, is most frequently rendered across languages by a vowel /u/.⁶³ Indeed, it is composed of two elements, the first one with a peak at 700 Hz, the second one with a peak at 500 Hz. As argued by TSUR, this corresponds to the spectral structures of a vowel /u/ or /o/ (/u/ F1 at 290, F2 at 770; /o/ F1 at 400, F2 at 840, according to GEORGETON et al. 2012: 149): here /u/ and /o/ have a F2 that is under 1000 Hz, in contrast to all vowels, and are hence deemed closer to the cuckoo call. Thus, this analysis would confirm the importance of the front cavity resonant (or F2) in the imitation of bird calls.⁶⁴

The second point to address is the choice of the velar. A similar issue was already tackled in the discussions about the onomatopoeia of the cuckoo call, since as GRAMMONT pointed out, this bird does not produce any similar sound to a velar stop. Three answers to this problem were proposed: 1) a “functionalist” explanation; 2) two imitative explanations: a) “transposing” imitation; b) direct imitation.

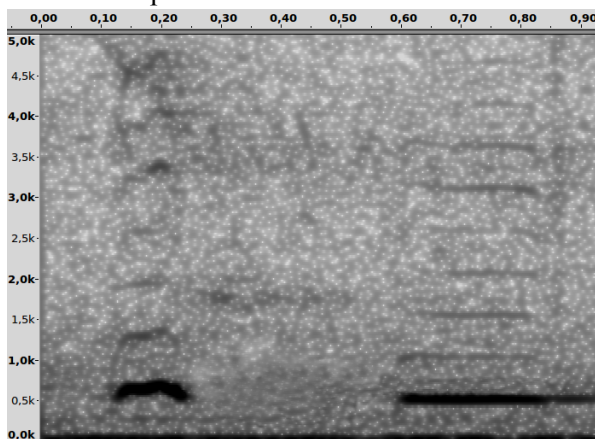
1) The explanation of GRAMMONT (1901: 98) proceeds in two steps: first he notes that with distance, the sound produced by stops is lost, and that we are used to restore them in such contexts. In the case of cuckoo, the actual imita-

⁶³ Here are some of onomatopoeia listed in ABBOTT (2004) (except Ch., for which I thank Bai YU): Chinese *bùgǔ* 布谷; Dutch *koekoek*; English *cuckoo*; Finnish *kukkuu*; French *coucou*; German *kuckuck*; Hungarian *kakukk*; Japanese *kakkō-kakkō*; Russian *ku-ku*. The Japanese *kakkō* is actually the name of the bird, probably borrowed from Chinese *guōgōng* 郭公 (Middle Chinese *kwak-kəwŋ*, cf. PULLEYBLANK (1991: 108; 116); see *Nikkoku*, s.v. “*kakkō*”). One should note that Japanese /o/ has a lower F2 (1000 Hz) than /u/ [ɯ] (1500 Hz); see HIRAHARA and AKAHANE-YAMADA (2004: 328). The Middle Chinese word should also be onomatopoeic, and as in Hungarian, the alternation *a ~ o/u* may render the falling minor third between the highest part of the first note and the second note.

⁶⁴ It seems that the goose call is rendered by a nasal vowel in languages that have it, as French *can can*, Portuguese *qüem qüem*, and Polish *gęgać*. This is interesting since the most important parameters identified by STYLER (2017) for perception of nasality operate in low frequencies, whereas goose calls display a first peak of resonance only above 1000 Hz. He states nevertheless that nasal resonance results in a broadening and a flattening of resonance peaks (especially in the region of F1), which fits with the rather even distribution of intensity in goose calls, as in other bird calls that are perceived as “nasal”.

tion, /u u/, would yield a succession of two vowels, which is rare and difficult to utter. There is thus a functional need for a stop to make the pronunciation easier. Secondly, the most close vowel to the point of articulation of /u/ was chosen to meet this need, that is /k/ or /g/. Since /g/ would have distorted the timbre of /u/, the voiceless velar /k/, as the most neutral, was chosen.

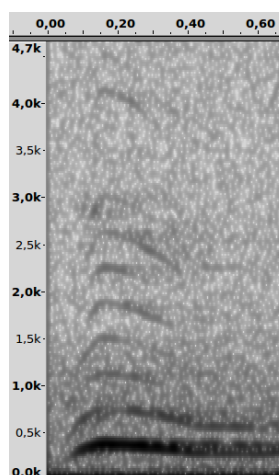
2) The second explanation, put forward by MASUDA (2003: 82) and TSUR (2001) is that the stop renders the “abruptness” of the onset of the call. TSUR (2001: §2) is more specific on this idea. According to him, this is the transposition of the cuckoo’s abrupt pitch onset into human language. Since variation of pitch is devoted to intonation in human language, the abstract quality “abruptness” would be transposed into an abruptly articulated consonant.



Call of the cuckoo

3) Before his explanation, TSUR proposed a slightly different idea, namely that the overtone structure of the call of the cuckoo was not only imitated by the formants structure of /u/, but also by the formant transitions between the consonant and the vowel. He seems interpret it later as in 2) and effectively, since a voiceless consonant was selected in most languages for the cuckoo call, the formant transition is not very conspicuous.

One could also approach the problem from the other end and try to explain why in most languages the call of the great owl (male) is rendered without stop, whereas it is rather similar in respect of timbre to that of the cuckoo (its call is usually rendered as /u u/).⁶⁵ The main difference, in my view, is that the call of the great owl is composed of single elements of about 0,5 s. with spaces of several seconds, whereas the call of the cuckoo is composed of two different elements of 0,1 s. In the onomatopoeia for the owl call, the double *u* indicates a lengthening of the sound, while in that of the cuckoo the stops allow to distinguish two units, and to facilitate their repetition. The explanation of TSUR seems here less relevant since also the owl call also has an initial rise of the pitch (from 260 Hz to 380 Hz in 0,01 s. vs. from 315 to 360 Hz in 0,015 s. for the cuckoo).



Call of the Eurasian great-owl

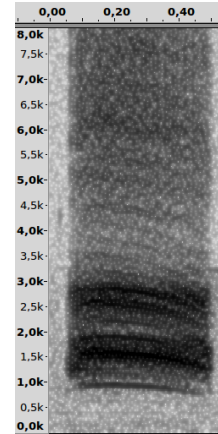
These approaches can be applied to goose calls. Since the call of geese is usually composed of several elements, separated by rather short silences, the addition of a stop allows to separate units and to imitate the sequence produced by the birds. The velar was then selected because its place of articulation is close to that of /a/. Moreover, the call of the goose has a very “abrupt” onset, with overtones spread on a large range of spectra and also with some noise, and this “abruptness” may be transposed to by the selection of a stop.

Yet, we have also to explain why for the cuckoo the voiceless consonant is preferred, whereas for geese voiced velars are usually chosen. A first explanation, according to 3) above, would be that the formant transition from /g/ to /a/ imitates a falling tone in goose calls. But it does not appear to be the case, because the calls are rather flat, even though “breaking” are sometimes produced. GRAMMONT explained the choice of the voiceless stop in the cuckoo onomatopoeia as follows: “cette dernière [g] comporte une sonorité qui est excellente pour rendre la résonnance prolongée d’une cloche dans l’onomatopée *ding-dong*, mais qui serait ici superfétatoire” (1901: 99). Actually, the contrast is somewhat biased since in *ding-dong*, the voiced stop is placed after the vowel; but the main idea, a rendition of the “resonance” of the sound can

⁶⁵ Cf. ABBOTT (2004): Japanese *hoh hoh*; Turkish *uuu uuu*; Urdu: *hoo hoo*; alongside: Dutch *oe hoe*; English *twit twoo/hoo hoo/whit woo/terwit terwoo*; Finnish *huhuu*; French *hou hou*; German: *uhu*; Hungarian: *hu*; Italian: *hu hu*; Russian: *uh! uh! uh!*. One should note that in several names of this bird, the *u* is preceded by an initial *b*:- lat. *būbō*, *būfō*, Greek βούας, Armenian *bu*, Persian *būm*; cf. ANDRÉ (1967: 45).

be upheld, given that we define it as a similarity to the ideal harmonic pattern, with peaks of resonance distributed at the partials of the fundamental note.

In this respect, it is interesting to compare the goose call to that of the crow, which is often rendered with a voiceless velar as /kra/ or /ka/.⁶⁶ Indeed, its call contains much noise, which is rendered in several language by the insertion of /r/ between the stop and the vowel. This explains why the voiced velar is avoided in this context, whereas in the goose call, whose peaks of intensity are more clearly distributed on harmonics, a voiced velar is retained. But, since in the crow calls, the first peak of intensity is situated between 1000 and 2000 Hz, the vowel /a/ was chosen as a center of syllable, as in the goose call.



Call of the carrion crow

We can conclude from this investigation that in most languages, the goose call is rendered by an onomatopoeia /ga/, because the F2 of /a/ is closer to the first peak of resonance of the goose call than that of other vowels. The choice of the voiced velar stop /g/, on the other hand, is to be explained as a segmenting device, allowing to render the succession of short elements, and as a rendition of the “resonance” of the goose call.

4.4.2. The names of the goose across languages

That the birds are named after an imitation of their calls is a longstanding idea (*de his [avibus] pleraeque ab suis uocibus* ‘many birds are named after their calls’, Varr. *L.* 5, 75). This process is difficult to study in ancient languages (see however ANDRÉ 1967: 11), but anthropologists have shown that in traditional societies about 30 or 40% of bird names are drawn from onomatopoeias.⁶⁷

In order to identify possible etymologies, I collected names of the goose whose origin can be recovered across various languages. They can be ordered according to the following typology: 1) borrowing; 2) from the physical ap-

⁶⁶ See Danish *kra kra*; Dutch *kra-kra*; English *kaak* or *caw*; French *croa croa*; German *kräh kräh*; Hungarian *kár-kár*; Italian *cra cra*; Japanese *kar-kar*, etc. (ABBOTT 2004).

⁶⁷ BERLIN and O’NEILL 1981 list about eighty birds names that are identical to their respective onomatopoeia in Aguaruna and Huambisa, two close related languages of the Jivaroan family in Peru. According to their calculation, 38% of the names in Aguaruna and 34% Huambisa are onomatopoeic (1981: 240). These data are corroborated by other inquiries of the same type, cf. BERLIN and O’NEILL (1981: 259); IBARRA et al. (2020: 93). ANDRÉ ascribed to 20% of Latin bird names an onomatopoeic origin (1976: 11).

pearance; 3) onomatopoeic: a) from the goose call; b) from the “call” used to attract geese.⁶⁸

1) Borrowings: One should first mention the possibility of borrowing since it was sometimes denied, in particular in the debate on Slavic **gqsĭ* (see FRAENKEL 1952: 131). I will here only select several examples to show that names for “goose” can easily be borrowed, even in places where the goose is a common bird: Finnish *hanhi* (ALANNE 1962: 100a) from Baltic (cf. Lithuanian *žąsis*); Romanian *gâscă* from Bulgarian *gŭska*; Spanish, Portuguese *ganso*, from Gothic **gans*; Malay *angsa* from Skt. *hamsa-* (ALVES 2015: 49); Hungarian *gúnár* ‘gander’, from Germanic, cf. Middle Low German *ganre* (BENKŐ 1993-1997: 484).

2) Physical appearance: Usually, these names are not the standard name for the goose but rather names for subspecies. Several examples can be found in Northern American languages: Munsee (Eastern Algonquian language) *wáp-θowé le* ‘wild goose (*branta*)’, lit. ‘white bird’, as well as *wámptogwe* (Penobscot), *wáptuk* (Malecite) ‘id.’ (SPECK 1946: 253); Cree (Central Algonquian language) *otsheekapasees* ‘white-fronted goose (*anser albifrons*)’, lit. ‘striped chest’; Chipewyan (Na-Dene language) *da t’eth* ‘id.’, lit. ‘burnt beak’ (HOHN 1973: 167). But such motivations also appear in dialectal data from Western Europe: dialectal French *bisette* ‘goose (female)’ (Yonne), *bisonne* ‘id.’ (Puisaye), after their color (cf. French *bis* ‘gray’, FEW: I 431); French *bernache*, *bernicle*, English *barnacle*, after a shell (FEW: XX 2); French *margée* ‘goose of Iceland’, whose wings are bordered with white (FEW: VI/1, 334). We may order here *auca*, which gives the name of the goose in many Romance languages (Italian *oca*, French *oie*, etc.), for it was explained as a back-formation of *aucella* ‘small bird’, since geese are the greatest birds within the poultry. An alternative explanation would be semantic specialization since few reflexes of the word refer to other bird species (FEW: XXV 771).

3) Onomatopoeic: I will divide this category into two parts: a) the names of the goose whose name is identical to an attested *verbum sonandi* or an onomatopoeia; b) names that are identical to “call” used to attract domestic animals.

a) We find in dialectal German an alternative name of the goose (often associated with children) that is identical with the onomatopoeia recorded above: *die Gacke* (Thuringia); *der Giegâk* (Leipzig); *Gagag*, *der Gager* ‘gander’, (Alsace), etc. (SUOLAHTI 1909: 415; HAUSSCHILD 1909: 159-60; IEW: 407).

⁶⁸ Compare the typology of IBARRA et al. (2020: 91-92) for the Mapuche language (south Chile). Of 135 collected etymologies (given in earlier literature): 47% of names are onomatopoeic; 21% according to the physical appearance; 16% from the behavior; 2% from the habitat; and 13% from sensory and/or symbolic perceptions. ANDRÉ (1967: 11) provides the following categories: borrowings; onomatopoeic; after a physical characteristic; after the behavior. The typology of ROBERT (1911: 8) is less clear.

Old Norse *gagl* ‘brant’ is to be linked with Low German *gagelen* ‘to honk’ and Middle German *gagel* ‘to cackle’ (IEW: 407; GRIEPENTROG 1995: 228). In Northern Germany, we find *totgōs*, *taatgoos*, *tatelgoos* ‘goose’, which is a (playful) renewal of the inherited name of goose with *tottern*, *tatern* ‘to honk’ (Est Frisia, Mecklemburg, cf. DESFAYES 1998: I 158). In Baltic, the *verbum sonandi* is also preserved with special designations for “goose”: Lithuanian *gagōnas* ‘honking’ (of the gander), *gagà* ‘eider’ from *gagēnti*, *gagēti* ‘to honk’, or Latvian *gāgars* ‘goose’, *gāgans* ‘gander’, from the same root (FRAENKEL 1962-65: 127). In dialectal French, we also find names that are probably derived from the attested onomatopoeia (*can can*) or the verb *can-caner* ‘to honk’⁶⁹: *caniche* ‘small goose’ (FEW: II 167) and *canehotte* ‘wild goose’ (Normandie, Valognes, cf. DU MÉRIL 1849: 57). One could also add French *jars* ‘gander’, *gar(s)* in Old French and dialectal French (Picardie), which can be interpreted as ‘honker’ (as the male is noisier than the female). This is the interpretation of DIEZ 1887: 620, who linked it to *garrīre* ‘to chatter’, which nevertheless yielded few reflexes in Gallo-Romania (FEW: IV 71). One could then consider the onomatopoeic root **garg-*, seen in Old French *jargon* ‘twittering of birds, call of animals’, from which a back-formation Middle French *jars* ‘chatter, cackle’ was derived (FEW: IV 59-60).⁷⁰

This kind of names is not limited to Western Europe. In Japanese, the domestic goose is called *ga* or *gachō* 鵞鳥 (MARTIN 1970: 866), which is identical to the onomatopoeia *gā gā* (*chō* is a general term for bird).⁷¹ Likewise, the name of the wild goose *kari* 雁 also refers to its call and is said to be derived of it.⁷² In Proto-Kartvelian, the name of the goose is reconstructed as **γaryad-* (Georgian *γeryerd-*, etc.) and is connected to the verb **γar-* ‘to cry, to sing’ (Georgian *myer-*, etc.) (KLIMOV 1998: 222). One may interpret it a lexical derivation ‘singer’. However, the reduplication of the stem and its likeness to the onomatopoeia of the goose (velar+vowel **a*) strongly suggests an onomatopoeic origin. Lastly, one may quote Tigrinya (Semitic language spoken

⁶⁹ From this onomatopoeia is also derived French *canard* ‘duck’, an etymology that is accepted by FEW: II 166b.

⁷⁰ VON WARTBURG derives *jars* from *jars* ‘spine’, “*weil der gänserich mit seiner rute die gans sticht*” (FEW: XVI 18). As parallel, he provides Auvergne *dagə* ‘gander’ (FEW: III 1), which he derives from **daga* ‘dagger’, and points to Old French *daguer* ‘to mount’ (said of a deer). But since the penis of the gander has a corkscrew shape, a denomination “rod” or “dagger” seems not very likely.

⁷¹ Christopher K. SCHMIDT in WOLD assumes that the Japanese word is borrowed from Chinese *éniāo* in the medieval period, but the *Nikkoku* gives a first attestation in 1884 (s.v. “*gachō*”).

⁷² See *Nikkoku* for references to this etymology, s.v. “*kari*”. The meaning “goose” is attested since the 8th century, “call” from the 9th century. See also *karigane* ‘cry of the wild goose’ or ‘wild goose’ (*Nikkoku*, s.v. “*karigane*”). Another name of the wild goose *gan* 雁, attested since the 15th century (*Nikkoku*, s.v. “*gan*”), is probably borrowed from Middle Chinese **ɲan^h/ɲe:n^h* (reconstruction of PULLEYBLANK 1991: 358).

in Eritrea) *haha* or *'a'a* which is “derived from its call” according to LITTMAN *apud* ROHLFS (1927: 109, fn. 14), and shows a characteristic reduplicated structure as well.⁷³

b) One should set apart the onomatopoeic names that are drawn from a “call” used to attract domesticated animals (*Lockruf*, *huchement*).⁷⁴ This process was studied by ROHLFS (1927; also SUOLAHTI 1909: 415), who tracked down a great array of dialectal names of “goose” or “duck” within Western Europe and compared them to attested *Lockrufe*. For example, *pir* ‘goose’ in many dialects of Western France comes from a call such as *pír píř píř*, which is attested in the region of Angoulême; in Franche-Comté and Switzerland *bora*, *buri* ‘duck’ or ‘goose’ are drawn from a call *buri buri buri*, which is also attested in Alsace (ROHLFS 1927:106-107; also FEW: I 637). As non Romance example, one can add Hungarian *liba* ‘goose’, which derives from *lib*, a *Lockruf* (BENKŐ 1993-1997: 896). ROHLFS identifies as common features of these calls the frequent occurrence of the vowel *i*, and interprets it as expressing smallness, softness.⁷⁵ He concludes that such names were produced by/for the children for the chicks (1927: 114-5). Indeed they are rather different from the pattern we identified because they are not imitation of the bird calls.

We can conclude from these examples that onomatopoeic denominations are rather frequent for the goose, which is expected in view of its descriptions in ancient sources and the general typology identified by anthropologists for bird names. Since this point is now established, one could ascribe an onomatopoeic origin to other words for “goose” whose etymology is not known, either because no *verbum sonandi* is attested or recorded, or because the origin of these names lies in remote past. I will only quote here the words that show similarity to the phonetic pattern we identified (velar stop+low open vowel /a/).⁷⁶

⁷³ C. BERNARD points to my attention dialectal French *koka* ‘gander’ (Allier), which may be onomatopoeic. At any rate, it is based on the masculinative in **-ardu* of “goose” that we find in *uyar*, *uwtsar*, *autsar* ‘gander’ (Haute-Loire), etc. (FEW: XXV 776b). It could be an onomatopoeic remotivation of this word by the addition of an initial *k-*. But one could also explain it by the contamination of *coq* ‘rooster’, since there are derivatives of the latter word with the same suffix, such as Modern French *coquard* ‘métis de volaille (faisan et poule)’ (FEW: II 857b).

⁷⁴ For references and a typology, see DOR (1985: 377-379).

⁷⁵ For up-to-date references and a phonetic explanation of the association of high-front vowels with smallness (and other categories), see CARLING and JOHANSSON (2014: 205-208).

⁷⁶ Of course, I am not claiming that all names of the goose are onomatopoeic. Many words remain obscure; see for example: Proto Finno-Ugrian **lunta*, whose reflexes refer to the goose (Hungarian *lúd*; Khanty *lont*), sometimes to duck (Hill Mari *lódš*) or bird in general (Finnish *lintu*) (BENKŐ 1993-1997: 912); or Proto-Tungusic **nuŋŋakī* ‘goose’ > Evenki *nuŋŋakī* (cf. STAROSTIN et al. 2003:1021).

Such names are attested in Northern American languages: Munsee (Eastern Algonquian language) *ka·kʷ* ‘wild goose (*branta*)’, which SPECK (1946: 257) interprets as the flight call of the bird.⁷⁷ Among “Altaic” languages, a relationship between Proto-Turkic **qāř* (see above §3.2), Proto-Mongolian **galayu(n)* (Middle Mongolian *qalau’u*, etc.) and Proto-Japanese **kàri* (Middle Japanese *kàri*, etc.) is sometimes advocated (STAROSTIN et al. 2003: 547, with older references), but it raises formal problems, and an onomatopoeic denomination is a more likely solution (DOERFER 1963-1975: III 387). Besides, even if these words should have a common etymon, it would fit our pattern. The different names of the goose in South-East Asia were studied by ALVES 2015: 49, who proposes a three-fold classification: 1) a Sino-Tibetan word **ŋan* (Tibetan *ŋan-pa*; Chinese *yàn* 雁 < Old Chinese **C.[ŋ]r̥ar-s* (BAXTER and SAGART 2014) or **ŋr̥ans* (SCHUESSLER 2007: 556)), borrowed in Vietnamese as *ngan* ‘wild goose’. To this root should also belong Vietnamese *ngỗng* and Proto-Hlai **C-ŋa:nh*; 2) **haan* in the Austro-Asiatic family (cf. Thai *hàan*, Lao *haan*, Khmer *khŋa:n*, etc.), which may be derived from Old Chinese via **hŋ-* (SCHUESSLER 2007: 556); 3) **ŋa* which gives the name of the domestic goose in Chinese (*é* 鵞 < Old Chinese **ŋʰar* according to BAXTER and SAGART 2014, s.v.)⁷⁸, and in Proto-Hlai (**C-ŋe*). The reconstructed form **ŋan* was said to be derived from **ŋa* ‘goose’ (> Chinese *é* 鵞 ‘domestic goose’) with a suffix **-n* (BENEDICT 1972: 157, fn. 428), but since this form is also attested in Tibetan, it should go back to Proto-Sino-Tibetan, and we may also be dealing with two different words (SCHUESSLER 2007: 556). Whatever the exact relationship between these words, one should note that they are quite close to the onomatopoeia we reviewed, because of their velar initials and the *a* vowel.

⁷⁷ SPECK adds that the word also means ‘swan’ but that the speakers could hardly identify this bird. Other putative onomatopoeic etymologies in North American languages require closer scrutiny and a detailed comparison with the calls of the species they refer to. HOHN (1973: 167) argued also that Chipewyan *cha* ‘Canada goose (*branta canadensis*)’ was “no doubt [a] rendering of the call”, and that Chipewyan *cho ga* ‘snow goose (*chen hyperbore*)’ should be understood as ‘white *cho* caller’. He postulated also an onomatopoeic origin for Cree *we wheoo* ‘snow goose’. This name was borrowed in English as *wawa* /‘weɪwə/ (now written *wavey*), which (erroneously) transcribed in French as *oua oua*, was used by Apollinaire in the poem quoted in epigraph of this paper because of its similarity with French *oie* /wa/ ‘goose’.

⁷⁸ Bai YU called my attention to a poem of the Tang dynasty written by Luo Binwang now taught to children at school, where the name of the goose (Middle Chinese *ŋa*) is used as an onomatopoeia, underlined by the deletion of two syllables which allows lengthening of the word: 鵞，鵞，鵞，/曲項向天歌。/白毛浮綠水，/紅掌撥清波。“Goose, goose, goose! With curved neck, you sing toward the sky. Your white feathers float over the green water; your red feet push the clear waves.” In such cases, one could also assume an influence of the bird name on the onomatopoeia, as in German *kräh kräh* for the crow (*Kräh*).

4.3.2. **ĝ^han-s-* as an onomatopoeic designation

The PIE word for “goose”, **ĝ^hans-*, conforms to the identified pattern because of the initial velar and the vowel *a*, and is therefore likely to be derived from an onomatopoeia **ĝ^han-*, *-s-* being a suffix. Since it is a reconstructed word, we cannot be certain of its exact phonetic realization, but important here is the vowel **a*, for we have seen that this vowel is generally chosen as a rendition of goose call because of the similarity of its timbre.⁷⁹ Besides, nasalization can here be a rendition of the resonant characteristic of the goose call. Nevertheless, the choice of an aspirated palatal **ĝ^h* may require further clarification, although, as a voiced velar, it fits the general pattern identified of the goose call. Taken at its face value, it is possible that a palatal velar was deemed more appropriate to render the abruptness of the goose call. But it should be noted that according to KÜMMEL (cf. reference in 2012: 305), there are several reasons to assume that “palatals” were actually plain velar. As for the aspiration, or the breathy voice, it could also render the resonance feature of the goose call.⁸⁰

To support the analysis of **ĝ^han-s-* as an animated *s*-stem with zero-grade suffix,⁸¹ GRIEPENTROG (1995: 231-2) quotes as parallel **muh₁s-* ‘mouse’, which he derives from **m(i)eu_hh₁-* ‘to move’ (LIV²: 445). However, this word is also traditionally (IEW: 753) linked to Skt. *muṣṇāti* ‘to steal, rob’ (**meu_hsH-* ‘to pick up, to take away’, cf. LIV²: 445); for the mouse as a destructive animal, see PAULY-WISSOWA XIV: 2401-2404. In that case, the *s* should be part of the root. BRUGMANN (*Grundriss*: II/1, 546-7) noticed that within the *s*-stems, there were several animal names that display non thematicized reflexes in several languages, as for example, Old Norse *lax* < **loĥ-so-* alongside Lithuanian *lašišà* < **loĥ-i(s)-* and Russian *losós* < **loĥ-os-*, or Greek κόσσυφος, κόψ-ιχος ‘blackbird’ alongside Old Church Slavonic *kosŭ* ‘id’ < **kopso-*. Although this should remain speculative, PIE **ĝ^han-s-* could be a remnant of an older system of animated *s*-stem with zero-grade of the suffix.

⁷⁹ The consequence of attributing an imitative origin to **ĝ^han-s-* is that the phonetic structure of an onomatopoeia precludes the restoration of a coloring **h₂*. As is well-known, LUBOTSKY (1989) challenged the reconstruction of **a* for PIE, but see the recent methodological considerations of PINAULT (2018) on this matter.

⁸⁰ In consonant shift theories, the “aspirated” stops actually come from voiced consonants, cf. KÜMMEL (2012: 293; 306).

⁸¹ GRIEPENTROG (1995: 223) partly isolates the *-s*-segment on account of the Germanic related terms **gan-era-* and **gan-at-a(n)-* ‘gander’. This is to be preferred to the explanation of SZEMERÉNYI (1991:1071), who derives both terms from a basis **gans-* + suffix, with *ad hoc* phonetic developments. But it would presuppose a PIE pedigree for these words, whereas they have no cognates in other languages. They are more probably internal Germanic formations based on the reanalysis of the nominative singular **ganz* as *gan* + nominative singular *-z* (BAMMESBERGER 1990:196); see, in the reverse direction, Germanic **lūs-* ‘louse’ with a secondary *s*-suffix coming from the reanalysis of the nominative singular according to GRIEPENTROG (1995:259-63).

Lastly, an onomatopoeic origin would also explain why the Slavic forms have a non-palatal reflex, but share the same refection of the *s*-stem into an *i*-stem as in Baltic, if it is assumed that the expected outcome **zpsĩ* was reshaped as **gpsi* in order to preserve the imitative value of the first part of the word (cf. Polish *gęgać* ‘to honk’).

ABBREVIATIONS

Unless noted in this list, the abbreviations of Greek and Latin texts are that of the LSJ and OLD.

Ad Hom. Il. = VALK, Marchinus van der (1971-1987), *Eustathii commentarii ad Homeri Iliadem pertinentes*. 4 vols. Leiden: Brill.

Ad Hom. Od. = STALLBAUM, Johann Gottfried (2010), *Eustathii Archiepiscopi Thessalonicensis commentarii ad Homeri Odysseam*. 2 vols. Cambridge: Cambridge University Press (reprint of Lipsiae: Weigel, 1825-1826).

CEToM = A Comprehensive Edition of Tocharian Manuscripts. <http://www.univie.ac.at/tocharian/> [retrieved: Feb. 29, 2020].

Choerob. *Ep.in.Ps.* = GAISFORD, Thomas (1842), *Georgii Choerobosci dictata in Theodosii canones, nec non epimerismi in Psalmos*. Vol. 3. Oxonii: E Typographeo academico.

Divy = COWELL, Edward Byles, and Robert Alexander NEIL (1886), *The Divyāvadāna*. Cambridge: University Press.

DWB¹ = GRIMM, Jacob, Wilhelm GRIMM, et al. (1854-1971), *Deutsches Wörterbuch*. Leipzig: S. Hirzel.

EWA = MAYRHOFER, Manfred (1981-2001), *Etymologisches Wörterbuch des Altindoarischen*. 3 vols. Heidelberg: C. Winter.

FEW = VON WARTBURG, Walther (1922-2002), *Französisches etymologisches Wörterbuch*. 25 vols. Leipzig/Bonn/Basel: Schroeder/Klopp/Teubner/ Helbing & Lichtenhahn/Zbinden.

FRISK = FRISK, Hjalmar (1960-1970), *Griechisches etymologisches Wörterbuch*. 3 vols. Heidelberg: C. Winter.

Grundriss = BRUGMANN, Karl, and Berthold DELBRÜCK (1906-1917), *Grundriss der vergleichenden Grammatik der indogermanischen Sprachen*. 2. Bearbeitung. Strassburg: Trübner.

IEW = POKORNY, Julius (1959), *Indogermanisches etymologisches Wörterbuch*. Bern & München: Francke.

KEWA = MAYRHOFER, Manfred (1956-1980), *Kurzgefasstes etymologisches Wörterbuch des Altindischen*. 4 vols. Heidelberg: C. Winter.

LIV² = RIX, Helmut, Martin KÜMMEL, Thomas ZEHNDER, Reiner LIPP, Brigitte SCHIRMER, et al. (2001), *Lexikon der indogermanischen Verben. Die Wurzeln und ihre Primärstammbildungen*. 2nd ed. Wiesbaden: Reichert.

- LIV² add = KÜMMEL, Martin (2011-2015), "Addenda und Corrigenda zu LIV²." Letzte Änderung: 03.02.2015. <http://www.martinkuemmel.de/liv2add.html> [retrieved: Fev. 29, 2020].
- LSJ = LIDDELL, Henry George, Robert SCOTT, Henry Stuart JONES, et al. (1996), *A Greek-English Lexicon*. Revised supplement. Oxford: Clarendon press.
- MW = MONIER-WILLIAMS, Monier (1899), *A Sanskrit-English Dictionary*. London: Clarendon Press.
- Nikkoku = *Nihon Kokugo Daijiten* 日本国語大辞典 [Great Dictionary of the Japanese Language] (2000-2002). [Online version: 2007]. 2nd edition. Tokyo: Shogakkan. <https://japanknowledge.com/contents/nikkoku/index.html> [retrieved: Sept. 28, 2020].
- NIL = WODTKO, Dagmar S., Britta IRSLINGER, and Carolin SCHNEIDER. (2008), *Nomina im indogermanischen Lexikon*. Heidelberg: Winter.
- OED = SIMPSON, John Andrew, and Edmund S. C. WEINER, eds. (1989), [CD-ROM Version: 2009]. *The Oxford English Dictionary*. 2nd edition. Oxford: Clarendon Press.
- OLD = GLARE, P. G. W., ed. (1982), *Oxford Latin Dictionary*. Oxford: Clarendon Press.
- PAULY-WISSOWA = PAULY, August, Georg WISSOWA, et al. (1894-1980), *Paulys Realencyclopädie der classischen Altertumswissenschaft*. Neue Bearbeitung. Stuttgart: J. B. Metzler.
- Ph. Lex = THEODORIDIS, Christos (1982-), *Photii Patriarchae Lexicon*. 3 vols. Berlin: De Gruyter.
- RGA = HOOPS, Johannes, Heinrich BECK, Dieter GEUENICH, and Heiko STEUER, eds. (1973-2007), *Reallexikon der germanischen Altertumskunde*. Zweite, völlig neu bearbeitete und stark erweiterte Auflage. Berlin: W. de Gruyter.
- SAO = *Svenska akademiens ordbok* [Online]. Göteborg: Språkdata, Institutionen för svenska språket (1997-). <https://www.saob.se/> [retrieved: Sept. 28, 2020].
- Saund = JOHNSTON, Edward H. (1928), *The Saundarananda*. London: Oxford University Press.
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