



Universiteit  
Leiden  
The Netherlands

## **Indo-Aryan -(a)ṣartanna in the Kikkuli treatise**

Kloekhorst, A.; Lubotsky, A.; Fellner, H.; Malzahn, M.; Peyrot, M.

### **Citation**

Kloekhorst, A., & Lubotsky, A. (2021). Indo-Aryan -(a)ṣartanna in the Kikkuli treatise. In H. Fellner, M. Malzahn, & M. Peyrot (Eds.), *lyuke wmer ra: Indo-European studies in honor of Georges-Jean Pinault* (pp. 331-336). Ann Arbor, New York: Beech Stave Press. Retrieved from <https://hdl.handle.net/1887/3480048>

Version: Publisher's Version

License: [Licensed under Article 25fa Copyright Act/Law \(Amendment Taverne\)](#)

Downloaded from: <https://hdl.handle.net/1887/3480048>

**Note:** To cite this publication please use the final published version (if applicable).

*lyuke wmer ra*

Indo-European Studies  
in Honor of

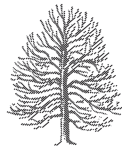
**Georges-Jean Pinault**

*edited by*

*Hannes A. Fellner*

*Melanie Malzahn*

*Michaël Peyrot*



**Beech Stave Press**

*Ann Arbor • New York*

©2021 Beech Stave Press, Inc. All rights reserved.

No part of this publication may be reproduced, translated, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior written permission from the publisher.

Typeset with L<sup>A</sup>T<sub>E</sub>X using the Galliard typeface designed by Matthew Carter and Greek Old Face by Ralph Hancock. The typeface on the cover is Bourgogne by Steve Peter.

Library of Congress Cataloging-in-Publication Data

ISBN 978-0-9895142-9-3 (alk. paper)

Printed in the United States of America

23 22 21      3 2 1

# Table of Contents

L Y U K E W M E R R A




Preface .....	ix
Bibliography of Georges-Jean Pinault .....	xi
List of Contributors .....	xxix
<b>Douglas Q. Adams</b> , The dual endings of the verb in Tocharian B and their Proto-Indo-European background .....	I
<b>Émilie Aussant</b> , The Vyākaraṇic descriptive model and the French grammars of Sanskrit .....	12
<b>Nalini Balbir</b> , À propos d'un lapidaire prakrit .....	26
<b>Alain Blanc</b> , L'histoire compliquée de l'adjectif grec ἀφαιρός .....	57
<b>Václav Blažek</b> , A hypothetical Tocharian contribution to Chinese astronomical terminology .....	70
<b>Joel P. Brereton</b> , How the Gāyatrī became the Gāyatrī .....	75
<b>Gerd Carling</b> , Flat mirror or well-shaped disc? Tocharian A <i>tāpaki</i> (B <i>tapākye</i> ) and A <i>mukär*</i> .....	84
<b>Adam Alvah Catt</b> , A newly identified Tocharian fragment of the <i>Tridaṇḍisūtra</i> ..	90
<b>Ching Chao-jung</b> , He sat down on the grass under a Nyagrodha tree: On the Kuchean word <i>atiyo*</i> ~ <i>atiya*</i> in Kumtura mural painting captions ...	101
<b>Éric Dieu</b> , Accentuation récessive et accentuation columnale en grec ancien, avec quelques considérations sur la loi de limitation .....	114
<b>Hannes A. Fellner</b> , Polar life in the Tarim Basin .....	125
<b>José Luis García Ramón</b> , The development of the labiovelars in Greek: Sound change, areal diffusion, and the myth of the three phases .....	138
<b>Romain Garnier</b> , The PIE word for 'name' .....	152
<b>Laura Grestenberger</b> , The <i>in</i> -group: Indo-Iranian <i>in</i> -stems and their Indo-European relatives .....	164
<b>Olav Hackstein</b> , On Latin <i>arbor</i> and why <i>tree</i> is grammatically feminine in PIE .....	183

*Table of Contents*

<b>Jens-Uwe Hartmann, Dieter Maue, and Fang Wang</b> , Der neugeborene Bodhisattva besucht das Śākya-Heiligtum: Zu den Bildern 5 und 6 der Treppenhöhle von Kizil .....	205
<b>Athanasius Huard</b> , “ <i>pattitrukālle karīškenta wārpanamane</i> ” ou comment honorer un moine tokharien .....	225
<b>Stephanie W. Jamison</b> , False segmentations and resegmentations in the Rigveda: Gemination and degemination .....	236
<b>Jay H. Jasanoff</b> , Pre-Toch. <i>*b<sub>1</sub>lud<sup>h</sup>-néu-ti</i> ‘goes out’ .....	243
<b>Ronald I. Kim</b> , Remarks on linguistic variation and change in Tocharian A . . . .	252
<b>Jared S. Klein</b> , The Old Church Slavic background of Russian <i>a</i> .....	268
<b>Bernhard Koller</b> , Question particles and the left periphery within Tocharian syntax .....	281
<b>Frederik Kortlandt</b> , Tocharian B <i>ste, star</i> ‘is’, <i>skente, skentar</i> ‘are’ .....	305
<b>Jens Peter Laut and Ablet Semet</b> , Neues zum 18. Kapitel des altuigurischen Maitreyasamiti-Sūtra ( <i>Maitrisimit nom bitig</i> ) .....	308
<b>Claire Le Feuvre</b> , Védique <i>vádhrī-</i> , <i>vīśan-</i> , <i>dhārú-</i> , grec *ἔθρις, ἄροσση/ἔροσση et θήλυς: Conversion et dérivation .....	319
<b>Alexander Lubotsky and Alwin Kloekhorst</b> , Indo-Aryan <i>°(a)uartaṇna</i> in the Kikkuli treatise .....	331
<b>Melanie Malzahn</b> , Back to an old, but not decrepit explanation of Homeric Greek ἐγήρα .....	337
<b>Vincent Martzloff</b> , Vestiges du participe parfait en <i>*-nos/-us-</i> en latin et dans les langues sabelliques? .....	348
<b>Audrey Mathys</b> , Participes présents, noms d’agents et langue poétique dans <i>Beowulf</i> .....	361
<b>H. Craig Melchert</b> , Hittite neuter <i>i</i> -stems .....	379
<b>Alan J. Nussbaum</b> , Persephonology and Persemorphology: Περσεφόνη/Φερροφαττα etc. ‘Sheaf Thresher’ reanalyzed .....	391
<b>Norbert Oettinger</b> , Die Bedeutung von vedisch <i>śvañc</i> .....	409
<b>Hirotohi Ogihara</b> , Āgama texts transmitted to Kuche Buddhistism .....	414
<b>Birgit Anette Olsen</b> , Latin <i>-ll-</i> and gemination by laryngeal .....	426
<b>Daniel Petit</b> , On the secondary cases of Baltic and Tocharian .....	438
<b>Michaël Peyrot</b> , On a festive occasion: The inflection of Tocharian B <i>eksalye</i> and morphologically related words .....	450
<b>Elisabeth Rieken</b> , Anatolische Fruchtbarkeit, urindogermanische Männer und die Wurzel <i>*men-</i> ‘hervorragend’ .....	462
<b>Nicholas Sims-Williams</b> , Chotano-Sogdica III: Old Khotanese <i>u, -u, -ū</i> .....	477

<b>Carmen Spiers</b> , La malédiction de l'observateur ( <i>upadrastár-</i> ) dans l'Atharvaveda .....	487
<b>Brent Vine</b> , <i>biass biítam</i> , <i>valetudinem vitam</i> : On alliteration in Italic curse texts .....	501
<b>Michael Weiss</b> , Barley in Anatolian, Tocharian, and elsewhere: A fine-grained analysis .....	513
<b>Jens Wilkens and Hans Nugteren</b> , Notes on Old Uyghur lexicography and etymology .....	527
<b>Kazuhiko Yoshida</b> , The Hittite 3 pl. preterites in <i>-ar</i> revisited .....	538
<b>Peter Zieme</b> , Das letzte Blatt der Sängimer Einleitung zum <i>Maitrisimit nom bitig</i> und ein tocharisches Wort .....	546
<b>Stefan Zimmer</b> , Le suffixe gaulois <i>*-ēto-</i> .....	554
Index Verborum .....	563

# Indo-Aryan °(*a*)*u*artanna in the Kikkuli treatise

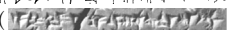
ALEXANDER LUBOTSKY  ALWIN KLOEKHORST



1. As is well known, the Middle Hittite treatise on horse training composed by Kikkuli, “the horse trainer from the land of Mittanni,”<sup>1</sup> contains many technical terms from his native language, Hurrian, several of which are generally explained as in fact being loanwords from Indo-Aryan.<sup>2</sup> Especially the compounds containing Indo-Aryan numerals have attracted a lot of attention, because they clearly demonstrate the Indo-Aryan provenance of these loanwords. The first members of these terms, *aikauartanna*,<sup>3</sup> *tierauartanna* (glossed in Hittite as ‘three turns/rounds’),<sup>4</sup> *panza-uartanna* (glossed in Hittite as ‘five turns/rounds’),<sup>5</sup> *sattauartanna* (glossed in Hittite as ‘seven turns/rounds’),<sup>6</sup> and *naūartanna*,<sup>7</sup> can be directly connected with the Sanskrit numerals *éka*- ‘one’ (< \**aika*-),<sup>8</sup> *tri*- ‘three’, *páñca*- ‘five’, *saptá*- ‘seven’, and

<sup>1</sup>KUB 1.13 i 1–2: *UMMA* <sup>m</sup>*KIKKULI* <sup>LU</sup>*ĀŠ[Š]UŠŠANNI ŠA KUR* <sup>URU</sup>*MITTANNI*.

<sup>2</sup>We use the term Indo-Aryan for the Indo-Iranian language which shows typical non-Iranian traits, even though the term is unfortunate because the Indo-Aryans of the Mittanni most probably were never in India.

<sup>3</sup>*a-i-ka-ya-ar-ta-an-na* (KBo 3.5 i 17, 21). Note that Kammenhuber (1961:80 with n. 20) cites the form of KBo 3.5 i 21 as *a-i-ka ya-ar-ta-an-na*, i.e. with a word space between *aika* and *uarta*. On the hand copy of this texts there indeed seems to be a word space present (⸎⸎⸎⸎⸎⸎ / ⸎⸎⸎⸎⸎⸎⸎⸎⸎⸎⸎⸎⸎⸎), but if we compare this to the photograph of this tablet as available on Hetkonk (); note that the two pieces on each side of the break join directly), it is clear that in fact no space is there: we can thus safely read *a-i-ka-ya-ar-ta-an-na* here as well.

<sup>4</sup>*ti-e-ra-ya-ar-ta-an-na* (KBo 3.2 obv.<sup>1</sup> 65, glossed as “*uuaḥnuḥar 3*”), *ti-e-ru[-ur-t]a-an-na* (KBo 3.2 lower edge 2, glossed as “*uuaḥnu[uyar 3]*”), *ti-e-ra-u-ur-ta-an-na* (KBo 3.5 ii 37), *ti-e-ru-u-ur-ta-an-na* (KBo 3.5 iii 17), *ti-e(-ra)-ya-ar-ta-an-na* (KUB 1.11 + iv 35, glossed as “*3 uuaḥnu[uyar]*”).

<sup>5</sup>*pa-an-za-ya-ar-ta-an-na* (KBo 3.2 obv.<sup>1</sup> 58, glossed as “*uuaḥnuḥar 5*”).

<sup>6</sup>*ša-at-ta-ya-ar-ta-an-na* (KBo 3.2 obv.<sup>1</sup> 18, rev.<sup>1</sup> 8, both glossed as “*uuaḥnuḥar 7*”), *ša-at(-ta)-ya-ar-ta-an-na* (KUB 1.11 + ii 43, glossed as “*7 uuaḥnuḥar*”).

<sup>7</sup>*na-a-ya-ar-ta-an-na* (KBo 3.2 obv.<sup>1</sup> 36), *na-ya-ar-ta-an-ni* (KBo 3.2 rev.<sup>1</sup> 24). According to Kammenhuber 1961:138 n. 63, the latter form “flektiert . . . als heth. Dativ auf -i.”

<sup>8</sup>It can be demonstrated that the monophthongization of \**ai* to *e* must at least be posterior to compilation of the Atharva-Veda and maybe even later (cf. Lubotsky 2012). The single spelling of *k* in Hitt. *aikauartanna* does not, as stated by Starke (1995:63 n. 146), represent a voiced [g]: it rather represents a short voiceless stop [k] (note that Hittite had long stops as well), which can be directly equated with the \**k* of Indo-Aryan \**aika*-.

*náva-* ‘nine’.<sup>9</sup> Although this connection is no doubt correct, a few remarks are in order.

Two minor formal deviations can be resolved relatively easily. The compound *nāuarta* instead of *\*naua-arta* is likely to be due to haplology,<sup>10</sup> whereas *šatta-arta* instead of *\*šapta*<sup>o</sup> can be explained by assimilation of the cluster *\*-pt-* to *-tt-*,<sup>11</sup> either in the Indo-Aryan dialect from which this term derives or in the Hurrian language that borrowed it.

Nevertheless, there are two problems which, in our view, have not been sufficiently accounted for, namely, the origin of the second member of all these compounds, and the relationship between the Hittite spelling *tier(a)-* and Indo-Aryan *tri-* ‘three’. Although these two issues may at first sight look unrelated, they may have the same source, as we shall presently see.

2. The first problem we will treat is the form and meaning of the second member of these compounds. There are essentially two different approaches to the meaning of the *°arta* compounds. One operates with the meaning ‘one, three, five, etc. rounds’ (Kammenhuber 1961), while the other favors the meaning ‘one, three, five, etc. turns’ (Starke 1995). For an overview of different viewpoints on this matter, cf. Raulwing 2006. Since the viewpoints strongly depend on the intricacies of horse training, of which we cannot form an independent judgment, we refrain from taking sides in this issue. For the following discussion it is nevertheless important to keep in mind that *°arta* must mean either ‘round’ or ‘turn’.

As far as the etymological proposals for *°arta* are concerned, the literature up to 1964 has been summarized by Mayrhofer (1965), to which we refer the reader, and since that article no new insights have been proposed, as far as we know.<sup>12</sup> At first, *°arta* was usually taken at face value and compared to Sanskrit *varṭana-*, a derivative in *-ana-* from the root *vṛt-* ‘to turn’. This Sanskrit neuter noun is attested only fairly late, however (the oldest attestation seems to be *Kātyāyana Śrautasūtra* 8.4.2, which is a late Vedic text), and has the meaning of an action noun, ‘the act of rolling on, moving forward’. This does not seem suitable for the compounds in *°arta*.

Another etymological proposal connected Skt. *varṭanī-* f. ‘wheel edge’ (RV), ‘turning of the wheel, track, course, trail of the wind’ (RV+), but this proposal was not generally accepted because of the formal difference between the *i*-stem in Sanskrit vs. the *a*-stem of *°arta*. In his 1965 article, Mayrhofer pointed to a few parallel cases in Indo-Iranian, where an *i*-stem simplex corresponds to an *a*-stem compound:

<sup>9</sup>Note that Hitt. *z* = [ts] and *š* = [s], cf. e.g. Kloekhorst 2019.

<sup>10</sup>Thus already Kronasser 1956:223 (“*nawarta* dissimiliert aus *nava-varṭana-*”).

<sup>11</sup>Thus already, e.g., Kronasser 1956:223. The alternative view that *\*šapta-* would have been changed to *šatta-* in analogy to the Hurrian word for ‘seven’, *šitta* (thus, e.g., Kammenhuber 1961:19–20, cf. also HEG 2.956), seems less likely to us: we would then expect a form *\*\*šittarta*.

<sup>12</sup>Cf. the treatment in HEG 4.173–4.



Skt. *aṅgūri-* (RV), *aṅgūli-* (VS+) f. ‘finger’ vs. *daśāṅgulá-* n. ‘length of ten fingers’ (RV), or Plr. \**Haṅguri-* (> Oss. *engwylʒ*, *engulʒe* ‘finger’) vs. YAv. *zairimiiaṅura-* m. ‘turtle, i.e. whose toes are in a house’. Nevertheless, this phenomenon (*i*-stem simplex vs. *a*-stem compound) is very rare in Indo-Iranian,<sup>13</sup> and the Ṛgvedic compound *dvi-vartani-* ‘having a double track’ (10.61.20) shows that *vartani-* did not necessarily change its stem in compounds with numerals. Furthermore, there are semantic problems: in Sanskrit, *vartani-* clearly refers to the turning of the wheel and to the track it leaves behind, so that we then have to assume that Kikkuli used the word in the sense ‘round’ < ‘track’, which is possible, but is not supported by any evidence.

3. It seems therefore better to return to the first solution, albeit in an improved fashion. As mentioned above, Sanskrit *vartana-* is attested only late and does not have a suitable meaning, but if we assume that the °*uartaṇna* compounds contain the noun *ā-vartana-*, with the preverb *ā*, both problems disappear.

The oldest attestation of *ā-vartana-* is RV 10.19.4–5, in a hymn where cows are asked to come home:

*yán niyānam nyāyanam, samjñānam yát parāyanam |*  
*āvartanam nivartanam, yó gopā āpi tám huve ||*  
*yá udānad vyāyanam, yá udānat parāyanam |*  
*āvartanam nivartanam, āpi gopā ní vartatām ||*

‘Also the one who is the cowherd—I call him to the journeying back, the coming back, the bringing to agreement, and the going away, to the turning here and the turning back.

He who has managed the dispersal, who has managed the going away, the turning here, and the turning back—let the cowherd also turn back.’ (Jamison and Brereton 2014)

The expression *āvartanam nivartanam* ‘turning back, turning home’ is repeated (sometimes with slight variations) in RV-Khila 3.15.8; ŚS 6.77.2 = PS 19.16.2, TS 3.3.10.1, SāmavidhānaBr. 2.5.9, TBr. 3.7.9.8. The action noun *āvartana-* is a productive derivative of a very frequent Vedic combination *ā-√vrt-* ‘to turn, turn back, return’. Because of the productivity of the suffix *-ana-*, we cannot ascertain the age of *āvartana-*, but nothing precludes it from being of Proto-Indo-Iranian date. Also in some of the Iranian languages, \**ā-√vart-* shows the meaning ‘to return’, cf. Buddh. Sogd. ʾwʾrt, Man. Sogd. ʾwrt /āwart/ ‘to (re)turn’ (cf. also Man.Sogd. ʾwrt nwrtyy /āwart-niwartē/ ‘to go to and fro’), Khwar. m|ʾwrd- ‘to turn back, return’, so at least the meaning seems to be well established for Indo-Iranian.

<sup>13</sup>Apart from the word for ‘finger’, most other examples given by Wackernagel (1905:118f.), Debrunner (1954:140), and Debrunner (1957:37) concern post-Vedic forms or those only mentioned by the grammarians (e.g., Pāṇini 5.4.102 *tryaṅjala-* ‘three handfuls’ vs. ŚBr. + *añjali-* m. ‘open hands folded together’). The situation with Skt. *ṣyoná-* /*ṣyona-*/ ‘pleasant, agreeable’ (< \**su-yoná-*), YAv. *hu-iaona-* ‘comfortable’ vs. Skt. *yóni-* m. ‘seat, place, home, residence, womb, lap’, YAv. *yaona-* m. ‘way, course’ is too complicated to serve as a good illustration of the phenomenon.

4. We would expect that in the compounds with *\*aika-*, *\*pañā-*, *\*sapta-*, and *\*naya-*, the final *-a* of the numerals would fuse with the initial *ā-* of *\*āuarta-*, yielding forms with a long *\*ā-*. However, in the attested forms, no vowel length of the *\*ā-* seems to be expressed in writing. We may therefore assume that at some moment in the process of the borrowing of these compounds into Hurrian vowel length was lost.<sup>14</sup> The result is, however, that in these forms there is no formal way to distinguish between the interpretations *\*uarta-* and *\*āarta-*. This is not the case for the compound with *\*tri-*, however. Thus far, it was difficult to explain why an Indo-Aryan compound *\*tri-arta-* or *\*tri-artani-* would end up in Hittite as *tieraarta*, with an *-a-* before the *u*.<sup>15</sup> With our identification of the second part of the compound as reflecting Indo-Aryan *\*āarta-*, this problem vanishes.

5. The remaining problem regarding *tieraarta* is the relationship between the element that in Hittite is spelled *tier-* and the Indo-Aryan numeral *\*tri-*. According to *HEG* 4.373, the remarkable spelling of the Hittite form expresses the “Schwierigkeit, die anlautende Doppelkonsonanz /tr/ adäquat wiederzugeben.” This can hardly be correct, however: an initial sequence [tri-] would in Hittite be spelled *\*\*ta-ri-*, without any problems. Another solution is suggested by Benveniste (1962:86), referred to by Mayrhofer (1965:II n. 2), who argues that the element spelled *ti-e-ra-* can be interpreted as /tera-/, which to his mind is reminiscent of the stem of the numeral ‘3’ as attested in Hittite, *teri-* (gen.pl. *teriāš*, but cf. also derivatives like *teriān* adv. ‘the third time’). He therefore proposes that /tera-/ be explained “par une adaptation à la forme hittite” (1962:87).

Although ingenious at first sight, this explanation cannot withstand scrutiny. First, the compounds in *arta* are technical terms that belong to the vocabulary of Kikkuli, who was a native speaker of Hurrian. Also the scribe(s) who wrote down the physical tablets that contain these terms were very likely native speakers of Hurrian (cf. Kammenhuber 1961:42, who proposes that the tablets are produced as a team effort of “Kikkuli mit einem Stab von hurrischen Mitarbeiter”). This means that *tieraarta* could hardly have undergone influence by the Hittite word for the numeral ‘3’.

Second, and more importantly, the Hurrian term is *tieraarta*, not *teraarta*. Although at the time that Benveniste formulated his explanation of *tieraarta* it was still possible to interpret a spelling *ti-e-ra-* as representing *tera-* (or *tēra-*,

<sup>14</sup>This is confirmed by, e.g., the Indo-Aryan theonym *nāsatya-* that in the Šattiūazza treaty is rendered in cuneiform as <sup>DINGIR.MEŠ</sup>*na-ša-at-ti-ia-an-na* (e.g. Kammenhuber 1968:149), without any sign of the original length of the word’s first vowel.

<sup>15</sup>It is true that not all attestations of this word show an *a* before the *u*, but in these forms there is no *a* after the *u* either: *ti-e-ru[-ur-ē]a-an-na* (KBo 3.2 lower edge 2), *ti-e-ru-u-ur-ta-an-na* (KBo 3.5 iii 17). Since these forms are attested on tablets that also contain the form *tieraarta*, with *-a-*, it is difficult to view them as *sprachwirklich*. Benveniste’s proposal that the *-a-* in *tieraarta* is “normaliséc sur *panza- šatta- nawa-*” (1962:87) does not seem attractive to us.

as is sometimes encountered as well),<sup>16</sup> it has nowadays become clear that the sign TI practically never had the value /te/ (for which the Hittite scribes used the sign TE). Since *tieraṅartaṅna* in all five of its attestations is spelled *ti-e-r°*, and not *\*\*te-e-r°* or *\*te-r°*, it can be ruled out that this word started in [ter-]. The spelling *ti-e-r°* rather points to [tier-] or [tyer-].<sup>17</sup> This contrasts with the Hittite numeral ‘3’, which shows the consistent spelling *te-ri-*, and therefore must have had the shape [teri-].<sup>18</sup> Benveniste’s hypothesis that the initial part of *tieraṅartaṅna* was adapted from Hitt. *teri-* ‘three’ cannot therefore be upheld anymore.

6. To our mind, the form *tieraṅartaṅna* must go back to the Indo-Aryan preform of this word, which, on the basis of the discussion above, can now be assumed to have consisted of a compound of *\*tri-* + *\*°āṅartaṅna*. We propose that the development of the preform *\*tri-āṅartaṅna* to the attested form *tieraṅartaṅna* with an initial sequence /tiera-/ or /tyera-/ must have been due to phonological processes that took place either in the Indo-Aryan dialect to which the *\*°āṅartaṅna* compounds originally belong, or in the prehistory of Mittanni-Hurrian as spoken by Kikkuli, or in the process of the transfer of this word from Indo-Aryan into Hurrian. One possible pathway of phonological development that might be envisaged is that in *\*triāṅartaṅna* the *\*i* had become consonantal because of the following *\*ā*, *\*triā°*, and that this caused palatalization of the entire initial cluster, *\*tʳiā-*. If then an anaptyctic *e* developed in the cluster *\*tʳiā-*, with subsequent loss of the palatalization of the *\*r*, we would arrive at *\*tʳerā-*, spelled in Hittite as *ti-e-ra-*. Perhaps alternative pathways to get from *\*tri-āṅartaṅna* to *tieraṅartaṅna* are possible as well.

7. Although the exact phonological development of *tieraṅartaṅna* < *\*tri-āṅartaṅna* must remain open for now, we do believe that our proposal that the second member of the compound was *\*°āṅartaṅna* brings a final solution to this form much closer. Furthermore, although we are not in the position to judge the respective merits of various proposals concerning the horse training program as described in the Kikkulitext, our analysis of the compounds *aikaṅartaṅna*, *tieraṅartaṅna*, etc., as containing Indo-Aryan *\*°āṅartaṅna* suggests that they had the meaning ‘one/three/five/seven/nine turns’.

## Abbreviations

HEG = Tischler, Johann. 1977–2016. *Hethitisches etymologisches Glossar*. 4 vols. Innsbruck: Institut für Sprachen und Literaturen der Universität Innsbruck.

<sup>16</sup>Note that also in more modern times a reading “*tieraṅartaṅna*” can be found, cf. e.g. Starke 1995, Raulwing 2006, Puhvel 2007:73, HEG 3.318–20, 4.373.

<sup>17</sup>Thus already Kloekhorst 2008:878.

<sup>18</sup>This is supported by CLuw. *tarri-*, which goes back to PAnat. *\*tēri-*.

## References

- Benveniste, Émile. 1962. *Hittite et indo-européen: Études comparatives*. Paris: Maisonneuve.
- Debrunner, Albert. 1954. *Altindische Grammatik*. Vol. 2, part 2, *Nominalsuffixe*. Göttingen: Vandenhoeck & Ruprecht.
- . 1957. *Nachträge zu J. Wackernagel, Altindische Grammatik, Bd. II, 1*. Göttingen: Vandenhoeck & Ruprecht.
- Jamison, Stephanie W., and Joel P. Brereton. 2014. *The Rigveda: The Earliest Religious Poetry of India*. Oxford: Oxford University Press.
- Kammenhuber, Annelies. 1961. *Hippologia Hethitica*. Wiesbaden: Harrassowitz.
- . 1968. *Die Arier im Vorderen Orient*. Heidelberg: Winter.
- Kloekhorst, Alwin. 2008. *Etymological Dictionary of the Hittite Inherited Lexicon*. Leiden: Brill.
- . 2019. “The spelling of clusters of dental stop + sibilant in Hittite.” *Münchener Studien zur Sprachwissenschaft* 73:55–72.
- Kronasser, Heinz. 1956. *Vergleichende Laut- und Formenlehre des Hethitischen*. Heidelberg: Winter.
- Lubotsky, Alexander. 2012. “Dissimilatory loss of *i* in Sanskrit.” In *The Sound of Indo-European 2: Papers on Indo-European Phonetics, phonemics and morphophonemics*, ed. Roman Sukač and Ondřej Šefčík, 177–81. Munich: Lincom.
- Mayrhofer, Manfred. 1965. “Zu den Zahlwortkomposita des Kikkuli-Textes.” *Indogermanische Forschungen* 70:11–3.
- Puhvel, Jaan. 2007. *Hittite Etymological Dictionary*. Vol. 7, *Words Beginning with N*. Berlin: Mouton de Gruyter.
- Raulwing, Paul. 2006. “The Kikkuli text (CTH 284): Some interdisciplinary remarks on Hittite training texts for chariot horses in the second half of the 2nd millennium B.C.” In *Les équidés dans le monde méditerranéen antique: Actes du colloque organisé par l'École française d'Athènes, le Centre Camille Jullian, et l'UMR 5140 du CNRS, Athènes, 26-28 Novembre 2003*, ed. Armelle Gardeisen, 61–75. Lattes: Éd. de l'Association pour le développement de l'archéologie en Languedoc-Rousillon.
- Starke, Frank. 1995. *Ausbildung und Training von Streitwagenpferden: Eine hippologisch orientierte Interpretation des Kikkuli-Textes*. Wiesbaden: Harrassowitz.
- Wackernagel, Jakob. 1905. *Altindische Grammatik*. Vol. 2, part 1, *Einleitung zur Wortlehre, Nominalkomposition*. Göttingen: Vandenhoeck & Ruprecht.