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On Bactrian umlaut

MARIA CARMELA BENVENUTO, HARALD BICHLMEIER

ABSTRACT

The aim of this paper is to explore the phonetically grounded diachronic phonological change known as ‘umlaut’ in Bactrian. In particular, this regards the fronting (palatalizing) in Bactrian of *a* to <i> and of *ā* to <ē> before high front vowels, as well as the backing and rounding of *a* to <o> before *u*. Studies devoted to Bactrian phonology mention the *i*-umlaut, labelled as palatalization, but disregard the *u*-umlaut. In the recent studies on Bactrian grammar (in a wider sense), both phenomena are described: the *i*-umlaut as palatalization and the *u*-umlaut as sporadic vowel assimilation. What has not yet been noted is that while cases where the front vowels arise are context free (i.e., without conditioning environments), the backing and rounding of *a* to <o> before *u* is context-sensitive since it occurs only in a labial environment: we can compare, for example, Bactrian $\mu\omicron\lambda\omicron$ “wine” < Proto-Iranian **madu*-, with Bactrian $\kappa\alpha\sigma\omicron\kappa\omicron$ “little” < **kasu-ka*-, Avestan *kasu*-. The present study thus re-examines Bactrian umlaut and offers a systematic description of this sound change in different positions.

KEYWORDS: Bactrian, umlaut, Iranian historical phonology.

1. *Introduction*

1.1. *On Bactrian*

Bactrian is an Iranian language or, to be more precise, a North-Eastern Middle Iranian language, formerly spoken mainly in territories that are now part of Northern Afghanistan and surrounding areas. It is attested from roughly the 2nd/3rd century CE (Bactrian inscriptions of Karatepe, mid-late 2nd century CE) to the 9th century CE (the Bactrian inscriptions of the Tochi valley), i.e., from the Kushano-Sasanian period to Islamic times. It is first found in stone inscriptions (building

inscriptions etc.) and coin legends, and later on in generally legal documents (contracts, *vel sim.*) on parchment¹. During the Kushan period (1st to 3rd century CE) in particular, Bactrian seems to have been used over a wider area than the actual lands that its speakers inhabited. During the reign of the Kushans, who succeeded to the Greek dominions that emerged from the conquests made by Alexander the Great towards the end of the 4th century BCE, a variant of the Greek script, the so-called Graeco-Bactrian script (henceforth, G), began to be used to write Bactrian. As the (modified) Greek alphabet has fewer letters than the language has phonemes, certain inconsistencies obviously arose. Most documents are written in this script, but there are also a few documents written in Manichaean-Bactrian script (henceforth, M), which is essentially (to put it simply) a variant of Pahlavi script.

In spite of all the legal documents on parchment that came to light after c. 1990, Bactrian is still far from being fully attested. However, it can now be considered a reasonably well documented Middle Iranian language with documentary sources of different kinds, and can no longer strictly be seen as a *‘Trümmersprache’* as was the case in the 1960s. The new Bactrian sources that have come to light over the last few decades, since the 1990s, have definitively transformed our knowledge of the language.

However, in spite of a large number of studies on all aspects of Bactrian, many problems remain and many aspects merit further investigation. Indeed, the historical grammar of this language also has gaps that need to be filled: it is hoped that this article will respond to this need regarding the question of umlaut.

1.2. *History of research*

When Walter Bruno Henning wrote *Mitteliranisch* in 1958, he made only a passing reference to the Bactrian language owing to the scantiness of available sources, which at the time mostly consisted of coin

¹ For a reconsideration of the document dates, the nature of the Bactrian calendar and the timescale of the Bactrian era, the reader is referred to SIMS-WILLIAMS and DE BLOIS (2018). Apart from their conclusion, the conspectus is particularly interesting and useful as it converts all the attested dates to Gregorian/modern dates (SIMS-WILLIAMS and DE BLOIS, 2018: 82).

legends. Since then, our knowledge of Bactrian has steadily increased thanks to the discovery of numerous new documents. The first considerable Bactrian inscription, discovered at Surkh Kotal near Baghlan in 1957, was first published by Maricq in 1958 and a second edition by Humbach came out soon after, in 1960. Humbach then published further inscriptions (Humbach, 1966; 1967), although the bulk of Bactrian documents known at present were not published until the early 2000s².

For the purposes of this paper, we will examine all the material available (the epigraphic sources³, the legal documents⁴ and Manichaean manuscripts⁵) in order to study the phonetically based diachronic phonological changes known as umlaut in Bactrian. In particular, this regards the fronting (palatalizing) in Bactrian of *a* to *i* (or, more precisely, of /a/ to <i>) and of *ā* to *ē* before high front vowels and the backing and rounding of *a* to *o* (or, more precisely, of /a/ to <o>) before *u*.

The main focus in the present study is *u*-umlaut, and we hope to have found an (at least preliminarily) viable solution to explain its scope and development. In contrast, *i*-umlaut is undoubtedly a phenomenon for which a definitive solution is not yet at hand. Indeed, *i*-umlaut seems to have occurred in a less systematic way: the question of where it took place, and where it did not, undoubtedly requires further investigation.

Nevertheless, having analyzed what we deem to be all the words evidencing some kind of umlaut – or *not* evidencing it in spite of there being phonological and/or phonetic preconditions for it – we can conclude that there appears to be a single phenomenon, which is seemingly neither chronologically nor geographically differentiated (although Bactrian is attested for over half a millennium over a fairly vast territory).

² These are collected in the *Bactrian Documents* series edited by SIMS-WILLIAMS (*BD 1*; *BD 1*²; *BD 2*; *BD 3*). SIMS-WILLIAMS and DE BLOIS (2018: 1) write: «These volumes are complemented by Geoffrey Khan's *Arabic Documents from Early Islamic Khurasan* (2007), an exemplary edition of 32 Arabic documents which appear to have come to light together with some of those in Bactrian». Examining this later edition only brought up a few Bactrian names, none of which appeared relevant to our study.

³ See DAVARY (1982); SIMS-WILLIAMS (1996; 1998; 2012c) and references therein.

⁴ See *BD 1*; *BD 1*²; *BD 2*; *BD 3*.

⁵ See SIMS-WILLIAMS (2009).

2. Earlier observations concerning Bactrian umlaut

Umlaut phenomena are common in Iranian languages, especially in Eastern ones. In spite of this, they are still insufficiently investigated as to whether umlaut affected prevalently or exclusively vowels in accented syllables (as one might expect). Some interesting observations can be found in Kümmel (2014a) where Old and Middle Iranian languages (with the exception of Bactrian) are briefly considered.

What we do know is that Middle Iranian languages seem to continue the Old Iranian tendency towards word-related features (Kümmel, 2014a; 2014b)⁶. This means that most of them exhibit stressed syllables acting as a ‘center of gravity’ in the word structure and so vowel reductions in unstressed positions and umlaut phenomena are common (Kümmel, 2014a).

The umlaut phenomenon was only sporadically noted with regard to Bactrian⁷, mainly due to a lack of material which would have shown it. Indeed, studies devoted to Bactrian phonology⁸ mention *i*-umlaut, occasionally labeled as palatalization, but disregard *u*-umlaut. In particular, Steblin-Kamenskij (1981: 337-338) explains the ending of the 3pl. «*indo* [əndə] ... <*(h)anti», giving «*πιδο* [pəd] ... < **pati*» as a further example of umlaut, although he makes no mention of anything like *u*-umlaut. In the same way Sims-Williams (1989a: 348) mentions palatalization of *ā* to *ē* and of *a* to *i* «exemplified by the present stem *-lēr-* “to hold” (in *αβληρ*, meaning unknown, M *lynlyryg* = Middle Pers. *dēndār*) and the preposition G *πιδο*, M *pyd*; cf. Khot. *pader-* and

⁶ Since AUER’s (1993) revised syllable vs. word language typology, languages can be classified typologically depending on whether the central prosodic domain for phonetic and phonological processes is the syllable or the phonological word. In other words, the phonetic and phonological processes operate at the level of the word and are dependent on the stress and position within the word. See also CARO and SZCZEPANIAK (2014) and the references therein.

⁷ HUMBACH (1960: 46) was among the first to note these phenomena with regard to Bactrian, providing the following examples (from inscriptions): for *i*-umlaut, Bact. *πιδο* “in, on, at, by with” compared with Av. *paiti* “to, upon, for, with”, Bact. *πιδοι* “lord, master” compared with Av. *paitiš* “id.,” Bact. *πιδεινο* “lords” compared with Av. *paitinqm* “lords (gen.pl.)” (some forms are explained differently today); and for *u*-umlaut, Bact. *πορο* “much” compared with (Proto-)Av. *paru-* (nom.sg.ntr. YoungAv. *pouru*) “much”.

⁸ Cf. MORGENTIERNE (1970: 126); STEBLIN-KAMENSKIJ (1981: 337); SIMS-WILLIAMS (1985; 1989a; 1989b: 234).

vāte respectively»⁹. On the contrary, *u*-umlaut is briefly mentioned as being in the title *λοιχοβοσαρο* “helper of the country (?)”: «If the title G *loixobosaro* “helper of the country (?)” does indeed contain **dahyu-*, the first syllable shows both *i*- and *u*-umlaut»¹⁰.

More recently, Gholami describes both phenomena: *i*-umlaut as palatalization and *u*-umlaut as sporadic vowel assimilation (Gholami, 2014: 65), but without providing a detailed discussion of the historical development of either umlaut phenomena and/or its/their limitations (Table 1).

| PALATALIZATION | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><i>*a > i / _ya, i</i> <i>αγίρο</i> “ineffective” < <i>*a-karya-</i> <i>κίνο</i> “canal” < <i>*kanyā-</i> <i>κίσατο</i> “youngest” < <i>*kasišta</i>¹¹</p> | <p><i>*ā > ē / _ya</i> <i>ληρ-</i> “to have” < <i>*dāraya-</i> <i>σηζο</i> “ability” < <i>*wājāya-</i> <i>σηλ</i> “to lead” < <i>*wādāya-</i> <i>οισηρ</i> “to argue” < <i>*wi-čāraya-</i></p> |
| <p><i>*a > i / _s, z</i> <i>λίστο</i> “hand” < <i>*dasta-</i> <i>αγισινδο</i> “dissatisfied” < <i>*aka-sandV</i>¹² <i>οιζινδδιγο</i> “current” < <i>*waz-antiya-ka</i>¹³</p> | <p><i>*a > i / _n</i> <i>οανινδο</i> “victorious” < <i>*wananta-</i></p> |
| VOWEL ASSIMILATION | |
| <p><i>*a > o / _u</i> <i>μολο</i> “wine” < <i>*madu-</i> <i>ποσο</i> “sheep” < <i>*pasu-</i></p> | <p><i>κωσοβο</i> “blanket” < <i>*kaučapa</i>¹⁴</p> |

Table 1. *Vocalic changes (according to Gholami, 2014: 65).*

⁹ SIMS-WILLIAMS (1989a: 348) writes: «a remarkable form is G *nokonziki* (i.e. [-ikʷ] < **aki?*), obl. of the personal name *nokonzoko*».

¹⁰ In a subsequent paper SIMS-WILLIAMS (2004: 65) suggests a different etymology recognising as part of the title the word containing *χοβισαρο/χοβοσατο* “self” «perhaps preceded by a prefix *λο-/άλι-* equivalent to Av. *adā* (adv.), Khot. *dī* (prep.) “under” < **adah* (BAILEY, 1979: 158a) plus the article *i*».

¹¹ According to GHOLAMI (2014: 65), the subsequent **-s-* might also be responsible for the raising/umlaut in this case.

¹² This form received a different reading: it appears as *αγισινδ[ο]* in *BD* 1: P21' and *αγισινδ[ηιο]* in *BD* 1²: P21' and was interpreted here as 3pl.opt. of *αγισ-* “to take, hold, get hold of, capture” < **ā-kas-ya-* (Chor. *ksy/kt* “to get stuck”, Khot. *kaśś-/kašta-* “to be taken hold of”).

¹³ For GHOLAMI (2014: 65), the subsequent **-i-* in the following syllable might also be responsible for the umlaut here.

¹⁴ GHOLAMI (2014: 65) also offers this example, that certainly does not fit into the scenario described, although she reasons that a development **au > *ou > -ω-* can be assumed.

In addition to the contextual palatalization $*a > i / _ ya, i$, Gholami (2014: 65) identifies a second kind of palatalization, as can be seen in Table 1, triggered by the features of an adjacent coronal consonant or dental nasal, $*a > i / _ s, z, n$, as in $\lambda\iota\sigma\tau\omicron$ “hand” < $*dasta$, $\omicron\zeta\iota\nu\delta\delta\iota\gamma\omicron$ “current” < $*wazantiya-ka-$, $\omicron\alpha\nu\iota\nu\delta\omicron$ “victorious” < $*wananta$. In contrast, she considers the u -umlaut a simple case of vowel assimilation.

3. Problems connected with Bactrian script

Before considering the umlaut, it is useful to touch briefly on the question of ambiguity in writing.

Notwithstanding the two scripts attested – Graeco-Bactrian and Manichaean ultimately deriving from different ancient traditions in writing –, there remain uncertainties in determining the Bactrian vowel phonemes (see Table 2) since there are inconsistencies in how they are indicated. For example, there is phonemic length distinction, which is only partially represented.

| | FRONT | CENTRAL | BACK |
|------|--------------|--------------|--------------|
| high | \bar{i}, i | $\bar{ɪ}$ | u, \bar{u} |
| mid | \bar{e}, e | $\bar{ə}$ | o, \bar{o} |
| low | | \bar{a}, a | |

Table 2. *Bactrian vowels.*

Indeed, the problem that arises with both umlaut phenomena regards the true nature of the vowels written with *iota* and *omicron* in Bactrian. While it is easy to assume that the continuations of Proto-Iranian (PIr.) $*i$ and $*\bar{i}$ are written with *iota* and *epsilon iota* respectively, one may initially be quite skeptical as to whether the *iota* written for a fronted and/or raised PIr. /a/ also represents /i/. Examples from Central Asian (cf. Uyghur) and European languages (cf. [Old] High German, Old Norse etc.) usually show a fronting and raising of /a/ by /i/ to /ɛ/ or /e/, but rarely a raising and centralization to /ə/

(*schwa*)¹⁵. That is, we regularly find partial assimilations attested, but not necessarily a full assimilation of /a/, /ā/ > /i/, /ī/. In addition, although attested, a centralization to /ə/ is a less evident result of such a process of assimilation, as the distance in the vowel triangle between the /i/ triggering the process and /ə/ as the result of the process is not much smaller than the distance between the triggering /i/ and original /a/ (Figure 1).

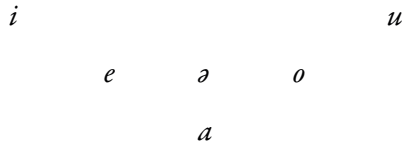


Figure 1. *Standard vowel triangle.*

In other words, at first glance it is difficult to imagine a total *a-i* > *i-i* assimilation here either. The signs *epsilon* and *ēta* are most probably used to represent the short /e/ and long /ē/ respectively. While /ē/ is the result of *i*-umlauted /ā/, /e/ is not the result of *i*-umlauted /a/. Therefore, we might deduce that *schwa* was the result of the raising process of /a/, which was written using *iota* because it was too different from /e/ to be written with *epsilon*. Nonetheless, some kind of *schwa* would still be closer to the triggering /i/ or /ī/ than /a/ was before the process and thus less energy would be needed by the speaker to pronounce the string of sounds. Some researchers, in fact, hold that *iota* is a/the spelling for *schwa*, cf., e.g., Steblin-Kamenskij (1981: 337). An example of this situation might be found in the attested variant $\nu\alpha\beta\iota\chi\tau\omicron : \nu\omicron\beta\iota\chi\tau\omicron : \nu\iota\beta\iota\chi\tau\omicron$ (M $\eta\beta\gamma\chi\tau$ -) “to write” from **nipixšta*, where the alternative use of α, ι, \omicron for the vowel in the prefix **ni-* could be explained as different ways to render an ə .

Therefore, while being cautious about accepting a full assimilation, we might assume that *iota* is the spelling of some *i-schwa* or a somewhat centralized *i* [ɪ], which might still have been phonetically distinct from an inherited short *i* and long *ī*, but close enough to be spelled with *iota*.

¹⁵ Cf. BRAUNE and HEIDERMANNS (2018: 82-85); NOREEN (1923: 56-65).

If this is true, it might also explain the tendency for /a/ to be written <i>, i.e., [i] before *s*, *z*, and *n*, as this might also be simply a kind of assimilation towards some more centralized vowel (or *schwa*), although this process seems somewhat unusual and cannot be regarded as regular.

Nevertheless, it is worth noting that something similar must have happened in Old Indian/Vedic (OI/Ved.), cf. 2sg. impv. of **as-* “to be”: Proto-Indo-Iranian (PIIr., with secondary full grade) **(H)as-dʰi > *az-dʰi > *əzdʰi > Ved. edhi* (vs. Old Av. *zdī < PIr. *Hz-di < PIE *h₂s-dʰi*). Indeed, we can be sure that the intermediate result was different from **i*, as we have the attestation of PIE **ni-sd-ó-* “nest” > PIIr. **nizda-* > OI *nīḍa-* “nest”. In addition, Avestan gives us an example for the raising of **a > ə* before a (tautosyllabic) nasal as in PIIr. **(H)santi > PIr. *(H)hanti > Av. hānti* 3pl. pres. of “to be”.

As far as the phonetic value is concerned, *omicron* appears even more ambiguous, since it can represent both *u* and *ū*, and *w* (not to mention the fact that it can function as a mere delimitative grapheme, most probably not representing any sound at all when found at the end of words ending in a consonant)¹⁶. Therefore, it is also quite difficult to evaluate the actual phonetic value of umlauted vowels written with *omicron*. We can simply suppose that it might be something like /o/, as this is a typical result of *u*-umlaut of /a/ in other languages (cf. again Old Norse)¹⁷. Of course, a full assimilation to /u/ cannot be excluded, but from a typological point of view this seems less probable.

Nevertheless, it is also typologically unusual for the result of the front raising and the back raising to end up at different relative points in the vowel triangle: if an /a/ umlauted by /i/ gives /e/, then we would expect a raising of /a/ by /u/ to end up as /o/ (see Figure 2 below). Thus, if the front raising leads to an *i-schwa*, one would expect a *u-schwa* as the result of back raising (see Figure 3 below).

¹⁶ In fact, in a first phase the final *o* was (most probably) a reduced vowel [ə] and subsequently it started to function as a word-divider. On this, see HENNING (1960: 50); SIMS-WILLIAMS (1989b: 234); HUYSSE (2003: 60-61). The Bactrian loanwords seem to suggest that final *-o* could «have represented a still audible [ə], since it is represented not only by TB *-ø*, but also by *-e* or *-o* and *-(o)*» (TREMBLAY, 2005: 435).

¹⁷ Cf. NOREEN (1923: 69-71).

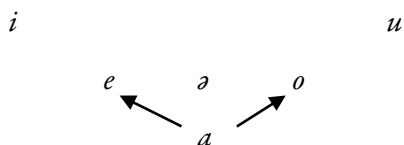


Figure 2. *Parallel raising of /a/ to /e/ or /o/.*

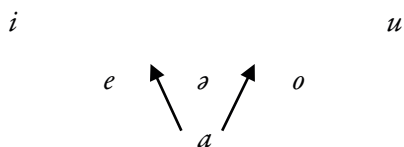


Figure 3. *Parallel raising of /a/ to i-schwa or u-schwa.*

Otherwise, if taken at face value ($/a/ \rightarrow <i> = /i/$; $/a/ \rightarrow <o> = /o/$), the result of the raising processes would have to have been as in Figure 4:

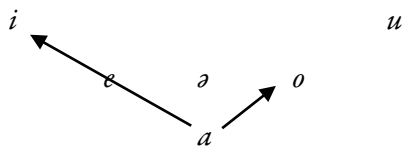


Figure 4. *Non-parallel raising of /a/ to /i/ or /o/.*

It must be admitted, however, that the processes do not seem have worked symmetrically in the case of the reflexes of umlaut processes on long vowels (cf. Figure 5):

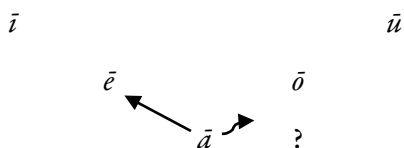


Figure 5. *Non-parallel raising of /ā/ to /ē/ or (?).*

If we took into consideration what Lazard (1984) says (relying on the rather insufficient Bactrian material known at that time) about the vowels and the vowel-system of Bactrian, the situation regarding long vowels is, in fact, most probably as presented in Figure 5 above.

Regarding short vowels, the theoretical considerations in Figures 2-4 would have to be slightly reinterpreted. Lazard's research was based only on the inscriptions that were available at the time, although the vowel alternations are present there in identical word forms. Lazard reached the conclusion that Bactrian had the following short vowels, spelled as illustrated below:

| | | |
|-----------|------------|-------------|
| [i] <i> | [i̇] <i/o> | [u] <o> |
| | [ī] <i/o> | |
| [e] <e/i> | [ə] <e/o> | [ʌ/ɔ] <a/o> |
| | [a] <a> | |

Figure 6. *Bactrian vowels according to Lazard (1984).*

However, according to Lazard, the phoneme system consisted of only the following four elements (the other sounds being allophones of these):

| | |
|-----|------|
| /i/ | /u/ |
| | /i̇/ |
| /a/ | |

Figure 7. *Bactrian vowel system according to Lazard (1984).*

If these considerations were correct, the result of *i*-umlaut must indeed have been rather like /i/, as it is never written <e> (which, according to Lazard, is used for writing an allophone of [ī] and [o] after *k, g*) or <o> (thus excluding [i̇] or [ə] as a result).

The result of *u*-umlauted /a/ remains unclear, however, as written <o> covers [ə] (at word-end at least), [ʌ/ɔ] and [u], which are all sounds at the

back of the vowel triangle. We can only be sure that it was a vowel higher than /a/ and more rounded than not. This state of affairs is supported by Bactrian loanwords in Tocharian where «Bact. internal *i* [is matched] by TAB *ä*, Bact. internal *o* mostly by TAB *u*» (Tremblay, 2005: 435).

Furthermore, on the basis of Lazard's analysis of the Bactrian vowel system, it is obvious that the two umlaut-processes of fronting/raising (*i*-umlaut) and raising/rounding (*u*-umlaut) functioned unsymmetrically in the short vowel system and the long vowel system. In both systems the raising went higher in the front part of the vowel triangle than in the back part and each raising process arrived higher in short vowels than in long vowels:

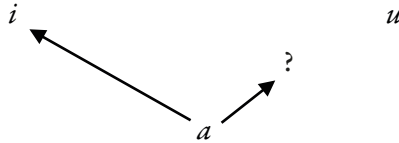


Figure 8. *Raising process in the short vowel system.*

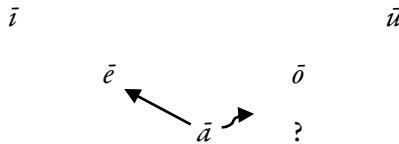


Figure 9. *Raising process in the long vowel system.*

The Bactrian word for “wine”, which is also attested in Manichaean script as *mwwl* in M1224 r2 (Sims-Williams, 2009: 248, 257, 263), does not shed any further light on the subject as to whether its spelling *must* stand for /u/. Other words spelled with <ww> in M1224 are, e.g., the demonstrative pronoun Man.-Bact. *'ww* = Gr.-Bact. *oo* “that” < Pr. **awam*, Man.-Bact. *zwwz-* “to rise, to stand up” (< [Pre-]Proto-Bact. **uz-waza*), Man.-Bact. *cywwng* = Gr.-Bact. *σoγγo* “(as much) as” (< older Bact. **σaγγωγo* < **čiyāt-* + *γγωγo*), where the spelling stands partially for /wə/ or maybe for /o/. However, we also find Man.-Bact. *pwwn* “merit” = Gr.-Bact. *πo(ν)vo*, a loan from Skt. *pun̄ya*, Pāli *puñña*, where it probably stands for /u/. In addition, /u/ is also conveyed by

Gr.-Bact. <o>, Man.-Bact. <'w(w)> in Man.-Bact. 'w(w)d, 'wṭ = Gr.-Bact. οδο "and" < Pr. *uta¹⁸.

We can compare the grapheme-phoneme correspondences given by Sims-Williams (1989b: 233):

| | Typical letter forms | | Likely phonetic values |
|---|----------------------|-----------------------|------------------------|
| | Rectangular | Cursive ²⁴ | |
| α | Ⲁ | ⲁ | a, ā, initial ə- |
| β | Ⲃ | ⲃ | b, β |
| γ | Ⲅ | ⲅ | g, γ (γγ = [ŋg]) |
| δ | Ⲇ | ⲇ | d |
| ε | Ⲉ | ⲉ | e (εi = [ɪ]) |
| ζ | Ⲋ | ⲋ | z, ž, dz |
| η | Ⲍ | ⲍ | ē (final -ηιο = [-ē]) |
| θ | Ⲏ | ⲏ | θ |
| ι | Ⲑ | ⲑ | y, i, ī |
| κ | Ⲓ | ⲓ | k |
| λ | Ⲕ | ⲕ | l |
| μ | Ⲗ | ⲗ | m |
| ν | Ⲙ | ⲙ | n |
| ο | ⲏ | Ⲑ | w, u, ū, o, ə, Ø |
| π | ⲑ | Ⲓ | p |
| ρ | ⲓ | Ⲕ | r |
| β | ⲕ | Ⲍ | š |
| σ | ⲍ | Ⲏ | s, ts, dz |
| τ | ⲏ | ⲏ | t |
| υ | Ⲑ | ⲑ | h (ou = [uh] or [ū]) |
| φ | Ⲓ | ⲓ | f |
| χ | Ⲕ | ⲕ | x |
| ω | Ⲇ | ⲇ | ō |

Figure 10. *Graeco-Bactrian script* (from Sims-Williams, 1989b: 233).

4. *Problematic aspects of Bactrian umlaut*

With respect to Bactrian umlaut as presented in Table 1 (above) from data collected by Gholami (2014), the first kind of palatalization *a > <i> / _ya, i could be considered a generally recognized

¹⁸ On the forms and etymologies mentioned, cf. SIMS-WILLIAMS (2007: 244, 248, 257, 264); SIMS-WILLIAMS (2009: 261, 262, 264, 265).

phenomenon. While there is common agreement regarding the first kind of palatalization, a systematic examination reveals some counterexamples that merit further attention in a future study. One of the biggest problems regarding *i*-umlaut is posed by the preposition $\alpha\beta\omicron$ / $ab(\acute{\alpha})$, $\alpha\beta(\acute{\alpha})$ / etc. “to, towards, at, regarding” etc., which is generally explained as having developed from PIr. **abi* (< PIr. **ab^hi*; cf. Av. *aiβi* etc., OI *abhi*), but never shows any trace of *i*-umlaut. In our opinion, a way of explaining this situation is to suppose an early loss of auslauting **i* (before *i*-umlaut took place) in a word which might have become unstressed within the word chain of the sentence, the stress in a syntagma preposition + noun being retained only on the noun. If this was not the case, we would be left with the unsatisfying idea that *i*-umlaut did not take place following an open syllable with an anlauting vowel (a rule that would appear rather *ad hoc*). On the other hand, we see that compounds with **abi*, **upa*, **apa*, as well as – partially – the prepositions themselves, have become difficult to discern; cf. the following examples (1-3) taken from *BD* 2: 183f.:

- (1) **abi*-:
 $\alpha\beta\iota\tau\alpha\delta\omicron$ “master (craftsman)” < **abi-štāta-*
 $\alpha\beta\iota\tau\alpha\omicron\alpha\nu\omicron$ “estate” < **abi-štāwan-*
 $\alpha\beta\lambda\iota\gamma\omicron$ “way, manner” < **abi-dayana-ka-*
- (2) **apa*-:
 $\alpha\beta\eta\delta\omicron$ “to depart, go away” (past stem) < **apa-ita-*
 $\alpha\beta\iota\sigma\tau\alpha\nu\omicron$ “delay, waste of time” < **apa-stanā-*
 $\alpha\beta\iota\sigma\tau\alpha\omicron\omicron\alpha\gamma\omicron$ “disloyal, renegade, outlaw” < **apa-stāwaka-*
- (3) **upa*-:
 $\alpha\beta\iota\delta\alpha\nu\omicron$ “obligation, liability” < **upa-(a)i-tan-a-*

Indeed, the same holds true if **apayā* > $\alpha\beta\eta(\alpha)$ -, $\alpha\beta\eta(\iota)\omicron$ -, $\alpha\beta\eta\upsilon\omicron$ -, $\alpha\beta\upsilon\eta$ - etc. “off, without, un-” is the correct etymology. It is (even) hard(er) to explain why **ay* should not have led to *i*-umlaut here as it did elsewhere.

Alternatively, we might even imagine that at an early stage of Bactrian there was (in both cases mentioned above) some coalescence of several etymologically different prepositions/adverbs into a single

form, which then conveyed the meanings of the different preforms and generalized the form without umlaut.

Furthermore, a problem of a similar kind is posed by several personal names, which, according to their phonology, should show *i*-umlaut, but never do, cf. $\kappa\alpha\eta\eta\beta\kappa\omicron$ “Kaniška” (< **Kaniš[ta]ka*; Sims-Williams, 2010: 75f.) or $\beta\alpha\zeta\eta\beta\kappa\omicron$ “Vasiška” (probably **Vas-* + $-\eta\beta\kappa\omicron$; Sims-Williams, 2010: 42f.)¹⁹. Might the fact that these are the names of kings be relevant? Have such royal names been restored time and again to their original forms and thus been spared ‘normal’ development? Further research appears necessary here, although in our opinion it would be extremely difficult to find a fully satisfactory explanation.

The second palatalization triggered by the coronal context is a specific issue raised by Gholami that is problematic in many respects. In fact, upon closer examination, these kinds of vowel shifts do not apply in all cases, as can be seen in Table 3 (below). In particular, the second kind of palatalization or raising is a fairly irregular phenomenon given that it is disregarded in many presumably typical contexts (see, for example, $\alpha\zeta\delta\omicron$ “knowledge” < **azdā-*; $\beta\alpha\sigma\tau\omicron$ past stem of “to bind” < **basta-*; $\beta\alpha\nu\delta\omicron$ “bundle” < **banda-*; $\sigma\omega\gamma\alpha\nu\delta\omicron$ “oath” < **saukanta-* [this last word could even be a counterexample for the raising of /a/ > <i> before *n*!]). On the other hand, it is sometimes applied in untypical contexts: see, for example, $\tau\omicron\chi\mu\iota\gamma\omicron$ “family” < **tauxma-ka-* (or perhaps we have to reconstruct **tauxmija-ka-*?); $\zeta\alpha\delta\iota\kappa\omicron$, with its variant $\zeta\alpha\delta\alpha\kappa\omicron$ “child”²⁰, analyzed by Sims-Williams (*BD* 2: 210) as **zātaka-* + “affectionate suffix” with preserved **k* (or are there variants **zātaka-* vs. **zātika-*?).

In contrast, Gholami defines *u*-umlaut as sporadic since it does not appear regularly and there are instances, such as $\kappa\alpha\sigma\omicron\kappa\omicron$ (14x) vs. $\kappa\omicron\sigma\omicron\kappa\omicron$ (1x) “little” < **kasu-ka-*, where it generally does not occur.

¹⁹ The etymologies of rulers’ names are indeed problematic. SIMS-WILLIAMS (2002: 237f.) argues that the suffix $-\eta(\beta)\kappa\omicron$ «has no plausible Bactrian etymology and it is found exclusively in the names of a ruling class who are known to be comparatively recent immigrants to Bactria». He suggests that Bact. $-\eta(\beta)\kappa\omicron$ and Toch. B *-ske* have their origin in an unattested Iranian language in which **-čk-*, i.e., [tšk], was simplified to **-šk-*.

²⁰ On vowel alternation in the same word, see LAZARD (1984). See also SIMS-WILLIAMS (*BD* 2: s.v. $-\iota\gamma\omicron$) where it is considered in some cases as ‘variant spelling’ for $-\alpha\gamma\omicron$, maybe on the basis of $\chi\alpha\beta\iota\gamma\omicron$ “cloth” from **xāša-ka* that in Man. appears as *x’šg* and not **x’šyg*.

Table 3 provides a number of counterexamples from our dataset that run counter to the general rules given in Gholami (2014) seen in Table 1 above:

| COUNTEREXAMPLES (WITHOUT PALATALIZATION) | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| * <i>a</i> > <i>i</i> / _ <i>ya, i</i> γαρο “mountain” < * <i>gari-</i> νοζδο “near” < * <i>nazdiyah-</i> | * <i>ā</i> > <i>ē</i> / _ <i>ya, i</i> ραβτιλαφο “righteousness” < * <i>rāštiyaθwa-</i> |
| * <i>a</i> > <i>i</i> / _ <i>s, z</i> αζδο “knowledge” < * <i>azdā-</i> βαστο past “to bind” < * <i>basta-</i> νοζδο “near” < * <i>nazdiyah-</i> κασοκο “little” < * <i>kasu-ka-</i> | * <i>a</i> > <i>i</i> / _ <i>n</i> βανδο “bundle” < * <i>banda-</i> σωγανδο “oath” < * <i>saukanta-</i> |
| COUNTEREXAMPLE (WITHOUT ‘VOWEL ASSIMILATION’) | |
| * <i>a</i> > <i>o</i> / - <i>u</i> κασοκο “little” < * <i>kasu-ka-</i> | — |

Table 3. Counterexamples to vocalic changes presented by Gholami (2014: 65).

There is another question that has received scant attention to date: can umlauted/raised vowels themselves (be it by *i*-umlaut or by raising before *n* etc.) cause umlaut? One word form given in Table 1 (above) suggests that this might be the case: οζινδδιγο “current” < PIr. **waz-antiya-ka-*. This might indeed evidence a development of PIr. **waz-antiya-ka-* > **waz-īntiya-ka-* > Bact. οζινδδιγο “current”.

All these issues show that Bactrian umlaut and related phenomena pose problems that merit further investigation. Here we focus our attention specifically on the phenomenon of *u*-umlaut. Although we have not yet found solutions to these problems, we can at least present some preliminary results.

5. Backing and rounding of *a* to *o* before *u*

Our data show that there are a few items in the Bactrian corpus which show umlaut arising as a phonetic assimilation conditioned by

a lost high non-palatal rounded vowel in a syllable that follows the affected segment. These are presented in Table 4a. Table 4b lists other words, which, in a similar context, apparently do not show the vowel shift.

| U-UMLAUT *A > <O> / _ U | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| root with *a | root with *-ā- |
| μολο “wine” ²¹ < * <i>madu-</i> ποσο “sheep” < * <i>pasu-</i> (ο)ολο “wife” ²² < * <i>wadū-</i> | |
| ποῦζο “debt” ²³ < * <i>partu-čī-</i> or * <i>partu-čīya-</i> βορο PN <i>Bur</i> ²⁴ < * <i>babru-</i> | — |
| ροῦζο “vineyard” ²⁵ < * <i>razu-ka-</i> κολο- part of PN ²⁶ < * <i>kalu-</i> , * <i>kadu-</i> -γολο component of names (as in οαχβογολο) < * <i>kalu-/kadu-</i> | |

Table 4a. *New data on Bactrian umlaut.*

²¹ Cf. YoungAv. *madu-* nt. “wine” and Sogd. *mδw* (BD 2: 235a). There are ten occurrences: B5, K9, U14, 12’, al14*, 17, ci10, cj8, 10, je7. This word is also attested in Manichaean script in M1224 r2 as *mwul* (SIMS-WILLIAMS, 2009: 248, 257, 263).

²² Cf. Sogd. *wdw* (BD 2: 248a). This word is attested in A12, 16, 18, 20, N16, Q11, zb4. It always appears as part of a compound in A as in ολοβωστογο (A1f) “marriage contract”, in ολογωγγο (A16) “like a wife” and we find its variant οολο- in οολοβαρο “bride price”.

²³ Cf. Sogd. *pwrc* and Arm. *partak* (< **partu*) (BD 2: 257b). This word is attested once in M2f.

²⁴ This personal name (PN) is attested twice: in J5, m16. SIMS-WILLIAMS (2010: 52f., no. 102) proposes a comparison with Sogd. PN *βwr*, Proto-Oss. PN Bόρυς, Oss. *bur/bor* “yellow”, Middle Pers. / New Pers. *bōr* “reddish brown, bay (horse)”. However, he considers the etymology quite problematic and suggests among other possibilities a derivation from OIran. **babru-* (= OI *babbrū-* “reddish brown”, *inter alia* as an epithet of horses).

²⁵ Cf. Middle Pers. and New Pers. *raz* “vine, vineyard” (BD 2: 260b). This word occurs 16 times: C9f, 11’, J13, m1*, Nn15’, U6, 10, 11, 12, 14, 17, 21, 10’, W13, Y19, ck4, 5.

²⁶ The archetype **κολο-/κολαγο-* is reconstructed by SIMS-WILLIAMS (2010: 81, no. 220) as the stem of the patronymic (or even a family name?) *κολαγανο* attested in A5. This form is also assumed to be the first part of the compound in the PN *κολοοαρδαγο* (cj1) with the variant *καλοοιαρδαγο* (cq2), while as the second part of a compound it appears as -γολο in the PN *οαχβογολο* (ch 1, 23; SIMS-WILLIAMS, 2010: 104, no. 322) and could be derived from **kadu-* or **kalu-* (the etymology of which is not yet clear; cf. SIMS-WILLIAMS, 2010: 74, no. 199). On the other hand, TREMBLAY (2003: 124) proposes a link with Ved. *kulā-* “family” that could be recognised in Bact. *Κολαγανο* (lit. “noble”) and other Iranian personal names, as in Scyth. *Κολάξαις* (Hdt. IV,5: 7) < **kula-xšāia-*, Khot. *Ysar-kula-*, *Mihira-kula-*.

| ABSENCE OF <i>U</i> -UMLAUT IN SPITE OF /_ <i>U</i> | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| root with * <i>a</i> | root with * <i>-ā-</i> |
| κασοκο “little” ²⁷ < * <i>kasu-ka-</i> καλοοιαρδαγο, καλοοαρδαγο PN <i>Kalwardag</i> < * <i>kalu(w)-</i> as first member τανο “person, self” ²⁸ < * <i>tanū-</i> υοσινδο “pleased” ²⁹ < * <i>hu-sandu-</i> γανδομο “wheat” ³⁰ < * <i>ganduma-</i> οαρνο “name of a city” ³¹ < * <i>Warnu-</i> ζινδοκο/ζανδοκο PN ³² <i>Zinduk/</i> <i>Zanduk</i> < * <i>zantu-ka-</i> | ταιαγο PN ³³ <i>Tayag</i> < * <i>tāyu-</i> “thief” + * <i>-ka-</i> βανιγανο FamN ³⁴ < * <i>bānu-</i> βαζο PN <i>Baz</i> ³⁵ < * <i>bāzu-</i> “arm” |

Table 4b. *New data on Bactrian umlaut (absence of u-umlaut).*

The notion of the *u* having been lost also applies to words with just two syllables in Proto-Iranian. This is assuming that final written *omicron* either no longer has the characteristic of a real vowel (which is the *communis opinio*), and is only used as a marker of word boundaries or that it is – or at least was in early Bactrian – a *schwa*-like sound. This being the case, it would evidently imply that *u*-umlaut is an assimilation process that took place in Proto-Bactrian before the general loss or weakening of final vowels.

We have here a classic scenario, also seen, for example, in Old High German or Old Norse umlaut processes, in which an allophonic variant of a phoneme becomes phonologized by the loss of the trigger of a

²⁷ Cf. Av. *kasu-* (BD 2: 221b). The form κασοκο is attested in J11, L13, U15, 12', Uu23, V21, 22, W15, X8, 15'. The form κοσοκο is attested once in Ii10f*, 11.

²⁸ Cf. Av. *tanū-* (BD 2: 268a). The word is attested in T18', X8, 13, 17, 16', Y4f, cg7*, 8*.

²⁹ See BD 2: 273ab: A19, 20, A24, A28 (usually in forms with the copula at the end).

³⁰ Cf. Av. *gantuma-*, MMP *gnwm* (BD 2: 206a). The word is attested in A35*, am1a, 1B*, 3C, 25A*, and its variant γανδαμο am2A*.

³¹ Cf. OI Place name *Varñu-* (BD 2: 242a). The word is attested in L2, 12, xd4f*, 7.

³² Attested as ζινδοκο in Ii5, 5* and xl5, but as ζανδοκο in Iv1* and xl11f* (BD 2: 212b); cf. also SIMS-WILLIAMS (2010: 64).

³³ Cf. BD 2: 268a: F5; SIMS-WILLIAMS (2010: 134).

³⁴ Cf. BD 2: 201b: ah10; SIMS-WILLIAMS (2010: 45).

³⁵ Cf. BD 2: 201a: S 7, 9, 15, 18; SIMS-WILLIAMS (2010: 43).

phonetical variation. Moreover, the best examples (4-6) for *u*-umlaut show an initial labial consonant:

- (4) PIr. **madu*- “wine” > Early PBact. **/malu/*³⁶
 > Late PBact. **/malu/* [molu] > [molə] > Bact. $\mu\omicron\lambda\omicron$ /mol/
- (5) PIr. **pasu*- “sheep” > Early PBact. **/pasu/*
 > Late PBact. **/pasu/* [posu] > [posə] > Bact. $\pi\omicron\sigma\omicron$ /pos/
- (6) PIr. **wadū*- “bride” > Early PBact. **/walu/*
 > Late PBact. **/walu/* [wolu] > [wələ] > Bact. $(\omicron)\omicron\lambda\omicron$ / $(\underline{w})\omicron$ /

A parallel situation can be assumed for three-syllable words, which evidence syncope of the middle vowel. This syncope can only have taken place, however, after the syncopated *u* had caused *u*-umlaut (7):

- (7) PIr. **razuka*- “vineyard” > PBact. **/razuga/* [rozugə]
 > Bact. $\rho\omicron\zeta\gamma\omicron$ /rozg(ə)/, /rozγ(ə)/

The syncope of the middle syllable in three-syllable words, as well as the general loss – or at least weakening – of the final vowel, indicate first-syllable stress³⁷.

What we have seen so far also sheds light on the /ā/ > /ē/ fronting process. This process also becomes logical if we accept an early syncope of short middle vowels – because in that case the trigger for fronting comes into immediate contact with the syllable – where the fronting then takes place:

³⁶ If Toch. B *mālo* “a kind of intoxicating drink” is indeed a loanword from Bactrian (and not from some other Iranian language/dialect showing the change PIr. **(-)d- > (-)l-*), the loanword must have come into Tocharian B after the change PIr. **(-)d- > (-)l-*, but before Bactrian *u*-umlaut (cf. TREMBLAY, 2005: 435; ADAMS, 2013: 482f.). While Tremblay is certain of the Bactrian origin of the loan, Adams regards it as only a possibility. In the case of the original Bactrianness of Toch. B *mālo*, the relative chronology puts the lateralization clearly before *u*-umlaut (as would be expected).

³⁷ This would be consistent with what we know about accent in Middle Iranian languages. Indeed, in these languages the accent developed into a generalized stress on the initial syllable and then into a dynamic accent conditioned by quantitative rules similar to those of Classical Latin (CANTERA, 2017: 497). See also BACK (1978: 30); HUYSE (2003: 55f.).

- (8) PIr. **dāraya*- > Early PBact. **lāraya*- [lāraja-]
 > Late PBact. **lārya*- [lārja-] > [lērja-] > Bact. ληρ- /lēr/ “to have”
- (9) PIr. **wāṣaya*- > Early PBact. **wāṣaya*- [uāṣ/zaja-]
 > Late PBact. **wāṣya* [uāṣ/zja] > [uēṣ/zja] > Bact. οηζο /wēṣ/z/ “ability”
- (10) PIr. **wādaya*- > Early PBact. **wālaya*- [uālaja-]
 > Late PBact. **wālyā*- [uālja-] > [uēlja-] > Bact. οηλ- /wēl/ “to lead”
- (11) PIr. **wi-čāraya*- > Early PBact. **wi-čāraya*- [uīč/cāraja-]
 > Late PBact. **wi-čārya*- [uīč/cārja-] > [uīč/cērja-]
 > Bact. οισηρ- /wic/sēr/ “to argue”

This, however, gives us an indication of the relative chronology; the above-mentioned processes imply the following succession of changes:

- loss/syncope of PIr. /a/ (low, unrounded vowel) in middle syllables;
 - *i*-umlaut and *u*-umlaut;
 - loss/syncope of PIr. /u/ (high, rounded vowel) in middle syllables;
 - loss of auslauting vowels (or their becoming schwas)³⁸.

This scenario strongly implies a first syllable accent that probably already existed in Proto-Bactrian. The loss/syncope of low unrounded /a/ before the syncope of the high rounded vowel /u/ has a partial parallel in Latvian, where the stem-vowel /a/ is lost in the nom. sg. of *o*-stems, cf. Latv. *nams* < PBalt. **namas* “house”, while the stem-vowel /u/ is retained, cf. Latv. *vidus* “middle” < PBalt. **vidus*.

³⁸ On loss of the final vowel being the more recent phenomenon, see MORGENSTIERNE (1970: 126): «complete loss of most final vowels in EIr. at this early date would be most surprising; and even if Bact. *-i* could be derived from disyllabic *-abya*, what would be the origin of plur. *-e*? Mj.-Yd. still retains *-ā* as *-a/o*, and also in Sgl.-Ishk., as well as in the Shgh. group, umlaut-phenomena point to a relatively recent loss of all final vowels».

6. *Exceptions to Bactrian u-umlaut?*

Let us return to *u*-umlaut (cf. Table 3) to consider the apparent counterexamples. First of all, it is worth noting that the assimilations involving *u* do not operate at the regressive level in the case of inherited long \bar{a} , even if this occurs in a labial context, as can be seen in the personal names Bact. βανιγο < PIr. **bānu* + **ka*-, Bact. βαζο < PIr. **bāzu*- “arm”, as well as in a non-labial context as in Bact. ταιαγο < PIr. **tāyu*- “thief” + **ka*- (the existence of a preform **tāya-ka*- derived from **tāya*- “theft” can, of course, not be excluded completely). The reason for this is most probably the greater resilience of long vowels against umlaut phenomena, for which Old High German may also offer a certain parallel: *i*-umlaut working on long vowels is noted in written texts much later than *i*-umlaut working on short vowels, though some scholars believe that it was there as early as it was in short vowels³⁹.

Interestingly, Bact. κασοκο “little” < **kasu-ka*- vs. κοσοκο, which has the same syllable structure as PIr. **razu-ka*- “vineyard”, behaves differently. Maybe the reason for this is that Bact. /r/ was pronounced in a similar way to how it is pronounced in Standard English, thus furthering any potential rounding, while /k/ might have been pronounced more as a neutral consonant and not as a back velar or even an uvular one, thus not supporting any backing or rounding of /a/ from the start. Nevertheless, /k/ seems to take a middle position given examples like Bact. κολο- PN < PIr./PBact. **kalu*-, **kadu*- with *u*-umlaut by final/middle **-u*(-)⁴⁰.

This also suggests the above-mentioned relative chronology, which can be refined as follows:

- loss/syncope of PIr. /a/ (low, unrounded vowel) in middle syllables;
 - *i*-umlaut (by inlauting and auslauting *i*, *y*) generally and *u*-umlaut (by inlauting and auslauting *u*) in labial and rhotic

³⁹ Cf. BRAUNE and HEIDERMANNS (2018: 82f.).

⁴⁰ On the other hand, if Bact. κολο- is regarded as foreign element (see TREMBLAY, 2003: 124 and fn. 26 above), the umlaut does not operate.

contexts generally, probably mostly after initial *k-* by final *-u*, but only very partially by middle *-u-*;

- loss/syncope of PIr. /u/ (high, rounded vowel) in middle syllables (after *u*-umlauting first syllables with labials and rhotics, but before *u*-umlauting those with initial *k-* generally);
- loss of auslauting vowels (or their becoming schwas).

It thus appears quite evident that some phonological environments favor the shift, while others do not. Indeed, the backing and rounding of *a* to <o> before *u* seems to be context sensitive.

7. *The syllable constraint*

In Table 3 the four examples in the left-hand column with an initial labial consequently show the *u*-umlaut independent of whether the syllable of the umlauted vowel is open or closed in Proto-Iranian. There is reason to assume, however, that these syllables might have been open in Proto-Bactrian (12-13):

- (12) PIr. **partu-či-* or **partu-čiya-* > PBact. **/pardu-či-/*
 > **/pa.d(d)u-či-/* [pa.d(d)u-č/ci-] > [po.d(d)u-č/ci-]
 > **poddž/zī-* > ποζζο / ποζζ / “debt”

- (13) PIr. **babru-* “beaver, reddish” > PBact. **/ba.(β)ru/* [ba.(β)ru]
 > [bo.(β)ru] > Bact. βορο, PN *Bur*

A counterexample might be seen in Bact. οαρνο “name of a city” < **Warnu-*, but there are two things about this word which are different (apart from it being a toponym, which might cause it to behave in a more archaic way, i.e., it might retain more archaic phonetic features): the initial labial is not a plosive, and the closed syllable is still present in Bactrian.

The closed-syllable constraint might – in addition to the non-labial constraint – also apply to the following words (14-15):

- (14) PIr. **ganduma-* > PBact. **gan.duma-* > Bact. γανδομο /gandəm/ “wheat”
- (15) PIr. **zantu-ka-* > PBact. **zan.tuka-* > Bact. ζανδοκο⁴¹ PN *Zanduk*

Moreover, these examples might also show that after a closed, i.e., long syllable there was no syncope of *u* in Proto-Bactrian. This, of course, cannot be proven unless we find new evidence, that is, words with closed first syllables starting with a labial consonant.

8. *The case of υοσινδο “pleased” < *hu-sandu-*

PIr. **hu-sandu-* > Bact. υο-σινδο “pleased” also deserves special mention⁴² since it shows some irregularity in its phonetic development, i.e., the change of *a* to *i* in a phonetically unexpected environment. In fact, if the closed-syllable-constraint applies, this word would not show *u*-umlaut, even less so given the absence of a labial environment and the closed syllable; the expected Bactrian outcome of **hu-sandu-* would be **υοσανδο*. Clearly, we might now think that raising before *n* occurred, the extent of which is still undefined.

Nevertheless, other explanations might be appropriate for the phonetic inconsistencies in the development of **hu-sandu-* > υο-σινδο. It is potentially important to take into account aspects of morphological change such as reanalysis and analogy. Indeed, it is possible to consider υοσινδο as an analogical formation modeled on an existing form with an etymologically justified -σινδο as the second member in compounds such as χρσινδο/χρσινδο “acting willingly” (with χρσ- < **hwa-* “own, self” as the first member), ωσινδο “having the same wish” (with ω- < **hāwat-* “the same” as the first member) and υονοσινδο/υονασινδο “content, satisfied” (with υονο- < **hu-ni-* as the first member). In all these words the second member can be analyzed as Bact. σινδο “wish”. This word is analyzed in detail by Sims-Williams (*BD* 2: 264) as a «ver-

⁴¹ This name is also attested as ζινδοκο (cf. fn. 32 above); the <i> in this variant might be due to the (however not consequently happening) raising before *n*.

⁴² This is discussed in BENVENUTO (forthcoming).

bal noun to $\sigma\nu\delta$ - “to wish, be pleased”, deriving from **sandaya-*», the causative stem marked by the suffix *-aya-*, like *səṇḍaiia-* “to seem” in Avestan. Being connected to **sandaya-*, the etymological interpretation of $\sigma\nu\delta\omicron$ suggests that it was affected by a metaphonetic process with *i*-umlaut. The frequency and productivity of these formations might have triggered the analogical form $\upsilon\omicron$ - $\sigma\nu\delta\omicron$ rather than the expected ** $\upsilon\omicron$ - $\sigma\alpha\nu\delta\omicron$* .

9. Concluding remarks

In this paper we have discussed the general problem of umlaut in Bactrian and have analyzed in some depth the case of *u*-umlaut in the Bactrian corpus. Regarding the latter, we have discussed all attested cases and their (potential) exceptions. We have observed that some phonological environments favor the shift, while others do not. Our preliminary findings are that the backing and rounding of *a* to <*o*> before *u* seems to be context sensitive. To sum up our results:

- (i) the *i*-umlaut seems to be a relatively well attested feature of Bactrian historical grammar. While not consistent enough to speak of a fixed law, it applies to syllables with PIr. /*a*/ and / \bar{a} / when they are followed:
 - in the case of short /*a*/ by *i* or *ya* in the next syllable;
 - in the case of long / \bar{a} / by *ya* in the next syllable (*i* does not seem to trigger umlaut here, although it should be noted that to our knowledge there seem to be no examples in which /*i*/ in a syllable after one with / \bar{a} / can be reliably reconstructed). Umlaut, particularly in the case of / \bar{a} /, seems to imply a syncope of short /*a*/ before umlaut;
- (ii) the case of *u*-umlaut is slightly different:
 - it only applies to short /*a*/, never to PIr. long / \bar{a} / (perhaps because it had already turned into some kind of [\bar{a}]?);

- it also only applies to short /a/ if this vowel is accompanied by labial or rhotic consonants and stands in an open syllable in Proto-Bactrian;
- *u*-umlaut by a final *-u* seems to be stronger than umlaut by a middle *-u*.

We can thus provide the following preliminary account of the relative chronology of sound changes in connection with umlaut processes:

1. loss/syncope of PIr. /a/ (low, unrounded vowel) in middle syllables;
2. *i*-umlaut (by inlauting and auslauting *i, y*) applying generally to /a/ and /ā/;
- 3a. *u*-umlaut (by inlauting and auslauting *u*) applying to short /a/ in Proto-Bactrian open syllables with labial and rhotic initial consonants;
- 3b. *u*-umlaut applying to short /a/ probably generally in Proto-Bactrian open syllables after initial *k*- by final *-u*, but only partially by middle *-u*;
4. loss/syncope of PIr. /u/ (high, rounded vowel) in middle syllables after an open syllable (after *u*-umlauting initial open syllables with labials and rhotics, but before *u*-umlauting generally syllables with initial *k*-);
5. loss of all auslauting vowels (or their becoming schwas).

While further research in this field is clearly needed, the scenario outlined here seems to provide a sufficiently tidy explanation of the attested facts.

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