



Cognates of Old Chinese *-n, *-r, and *-j in Tibetan and Burmese

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Abstract

Following a suggestion of Starostin (1989), Baxter & Sagart (2011) reconstruct *-n, *-j, and *-r as distinct finals in Old Chinese. These three finals have regular correspondences in Tibetan and Burmese. The Trans-Himalayan proto-language distinguished *-n, *-j, *-r, *-l, and *-rl. Burmese loses *-r and generally loses *-l, except after -u-, where it changes to -y. Tibetan loses *-y and changes *-rl to -l. Chinese changes *-rl to *-r. Because Burmese shows different reflexes for *aj (-ay) and *əj (> -i), the merger of *ə and *a in Tibetan and Burmese are independent innovations; and this merger does not confirm a 'Tibeto-Burman' subgroup (contra Handel 2008). These correspondences require confirmation through further research on evidence of *-r in the Min dialects and Han dynasty Buddhist transcriptions from Indic languages in Chinese characters.

Keywords

Chinese – Tibetan – Burmese – resonant finals – Trans-Himalayan

Because phonetic information is not directly encoded in the Chinese script there is considerable room to question what the final consonants of Old Chinese may originally have been.¹ Karlgren reconstructed *-r and *-n in Old

¹ This essay uses the Library of Congress system for transliterating Tibetan with the exception that the letter ^ṅ is transliterated as 'h' rather than with an apostrophe and I use 'č' and 'j' rather than 'c' and 'j'. The Library of Congress system is used for Burmese also, with the exception that heavy and creaky tones are transliterated as ḥ and ʔ rather than " and '. Old Burmese is cited when available, otherwise an Old Burmese equivalent of Written Burmese words is reconstructed; Hill (2012a: 67–67, 2012b: 3–4) presents the sound changes necessary for doing

Chinese (Karlgren 1933: 19–37, Schuessler 1974: 80–81); most researchers change his *-r to *-j and extend its occurrence (Schuessler 2009: 25). Many scholars operate with systems that have *-n and *-j (e.g. Gong 2002[1995], Schuessler 2007, 2009: 26), but Starostin (1989) further proposes to distinguish *-r, yielding systems with *-n, *-j, and *-r as distinct finals.

Starostin proposes *-r for 諧聲 xiéshēng series with Middle Chinese readings that mix final -n and final -j (1989: 399–407), e.g. 斤 *kjin* (0443a) and 斤 *gjij* (0443n). The explanation for such series is that the dominant dialect of Old Chinese changed *-r into -n, but an eastern dialect instead changed *-r to -j (Baxter & Sagart in press). A mixed series combines readings inherited from the dominant dialect and borrowing from an eastern dialect. At time both types of readings are available for a single character, e.g. 敦 *twoj*, *twon* (0464p). Because no circumstances require that an eastern borrowing with final -j be brought into every series with inherited *-r, any unmixed -n series might have originally been an *-r series; this is especially true of short series, where the probability of the intrusion of -j into an -n series is low, simply because the number of characters in the series is low.²

In addition to the evidence of mixed -n and -j 諧聲 xiéshēng series, Baxter & Sagart rely on Chinese transcriptions of foreign words, and rhyme evidence as support for the reconstruction of *-r (cf. Baxter & Sagart in press). Baxter & Sagart employ brackets to index segments for which the evidence available to them does not permit unambiguous reconstruction (cf. Sagart & Baxter 2009: 227 note 6, Baxter & Sagart in press). Thus, a reconstruction *ban means that they have no reason to posit final *-r and a reconstruction *bar means that they have good reason to reconstruct *-r, but a reconstruction *ba[n] means that both *-n and *-r are possible reconstructions, and a reconstruction *ba[r] also

so. For Chinese I provide the character followed by Baxter's Middle Chinese (1992), an Old Chinese reconstruction taken from or compatible with the current version of Baxter & Sagart's system (2011), and the character number in Karlgren (1964[1957]). Like in Baxter's own recent work, for Middle Chinese I use 'ae' and 'ea' in place of his original 'æ' and 'e'. I do not however following him in changing 'i' to '+'. Old Chinese reconstructions lacking in Baxter & Sagart (2011) I reconstruct myself, often relying on Schuessler (2009); my reconstructions are preceded by # rather than *. I omit features of Baxter and Sagart's system, such as pointed brackets, intended only to exhibit morphological structure. For Tibetan verbs that undergo stem alternation I cite only the verbal root and the present stem; if the verb exhibits voicing alternation I favour the voiceless form (cf. Hill 2010, 2014). I would like to thank the British Academy for support during the writing of this paper and to thank Laurent Sagart whose comments on Hill (2012b) inspired this contribution.

2 It is also possible for an unmixed -j series to originate as an *-r series, e.g. the series built on 眉 *mij* (0567a). However, this circumstance is rare since -n is the dominant reflex of *-r.

means that both *-n and *-r are possible reconstructions. It appears that the system of Baxter & Sagart permits two ways of expressing “could be *-r or *-n”, although I am unaware of them specifically stating so, one must conclude that in their system *[-r] means “is probably *-r but could be *-n”, whereas *[-n] means “is probably *-n but could be *-r”. Thus, in their reconstructions the certainty by which a final is reconstructed as *-r divides into four grades: (1) *-r, (2) *-[-r], (3) *-[-n] / *-[-j], (4) *-n / *-j.

Baxter & Sagart have not presented their reasoning for *-r versus *-n in detail for each word. In the absence of this discussion, for present purposes it is convenient to predict that in those cases where Baxter & Sagart allow both *-r and *-n as possible (whether this is symbolized as *[n] or *[r]) future scholarship will find grounds internal to Chinese to reconstruct *-r in those cases where it facilitates comparison to Tibetan. Consequently, I hereafter write as *{-r} an *-[-n] in the system of Baxter & Sagart that compares well with Tibetan -r and -l. I thus distinguish *[-r] ‘is probably *-r but could be *-n (according to Baxter & Sagart)’, *{-r} ‘is probably *-n but could be *-r (according to Baxter & Sagart) and compares well with Tibetan -r or -l’, and *-[-n] ‘is probably *-n but could be *-r (according to Baxter & Sagart) and does not compare well with Tibetan -r or -l’. In my presentation the certainty with which final *-r is posited in Old Chinese has five grades, varying from most certain to least certain as follows: (1) *-r, (2) *-[-r], (3) *{-r}, (4) *[n] / *-[-j], (5) *-n / *-j. This change of notation in no way undermines or contradicts the reconstructions proposed by Baxter & Sagart, but instead merely makes explicit that in writing *[n] they allow for *-r as a possible reconstruction; the notational change is a convenience for the reader’s eye.

Benedict (1972: 172–173), Schuessler (1974, 2007: 92–93), Unger (1986), and LaPolla (1994) all take up the question of Chinese cognates of Tibetan -r and -l but these contributions use Old Chinese reconstructions that fail to recognize final *-r as distinct from *-n and *-j. Gong (1993) reconstructs *-r and *-l in (Pre-)Old Chinese on the basis of comparisons with Tibetan, effectively taking Tibetan as original for any correspondence of Tibetan -n, -r, and -l to Old Chinese *-n, *-r (not equivalent to Starostin’s *-r), and *-d. Gong proposes an unconditioned split of (Pre-)Old Chinese *-l to (later) Old Chinese *-n, *-d, and *-r. Starostin (1996) compares Trans-Himalayan *-r in his reconstruction with final -r in Caucasian languages, but he does not explicitly state the correspondences among Chinese, Tibetan, and Burmese. No previous research catalogues the correspondences of resonant finals among Old Chinese, Tibetan, and Burmese while incorporating Starostin’s proposal for *-r in Old Chinese.

Using the reconstructions of Baxter & Sagart (2011), which incorporate Starostin’s suggestion for a distinct final *-r, this paper classifies the correspondenc-

es in Tibetan and Burmese of Chinese cognates ending in *-n, *-r, and *-j. I take as a starting point the cognates proposed in Gong (2002[1995]), to which I add a few words from Schuessler (1974), from a collection of potential cognates that Laurent Sagart kindly supplied me with, and from the suggestions of the two anonymous referees of this article.

If Old Chinese has *-n, *-r, and *-j whereas Tibetan has -n, -r, and -l, the most obvious hypothesis to account for the origins of these finals is that both languages inherited *-n and *-r and that Tibetan -l corresponds to Chinese *-j, with Tibetan reflecting the original value (cf. Table 1).³

TABLE 1 *Expected correspondences between Chinese -n, -r, -j and Tibetan -n, -r, and -l*

Correspondence number	Old Chinese	Tibetan	Reconstruction
1	-n	-n	*-n
2	-r	-r	*-r
3	-j	-l	*-l

There is a certain amount of data that confirms this supposition. Examples with the main vowel *-a- are treated first, because this vowel correspondence is straightforward and the examples relatively plentiful.

1. Chi. *an :: Tib. -an

1. Chi. 殘 *dzan* < *[dz]^ha[n] (0155c) ‘injure, remnant’, Tib. གཙམ་ *gzan* < *gdzan ‘wear out, hurt, waste’

Many potential instances of correspondence 1, such as Schuessler’s comparison of 看 *khanH* ‘gaze at’, which he reconstructs *khâns (24-04/0142a)⁴ with Tibetan མཁས་ *mkhan* ‘know’ (2009: 252), are not examples of this correspondence in the reconstruction of Baxter & Sagart, because of their reconstruction with final *-r (i.e. 看 *khanH* < *k^ha[r]s).⁵

3 Simon (1929: 176–177) notes correspondence 1. Schuessler (1974: 83–84) notes correspondence 3. Correspondence 2 has not been proposed previously to my knowledge; it would not have been possible to propose before the publication of Starostin (1989).

4 Schuessler’s *khâns is equivalent to *k^han-s using the conventions of this paper.

5 The reconstruction *[r] permits *-n as a reconstruction. In analogy to writing *{r} for a *[n] with comparative support for *r, one could write *(n) for *[r] with comparative support for *n. However, I am not aware of other examples that would make use of this convention.

2. Chi. *ar :: Tib. -ar
2. Chi. 竿 *kan* < *k^ʰar (0139k) ‘pole, rod’, Tib. མཁར་ *mkhar* / རཁར་ *hkhar* ‘staff, stick’
 3. Chi. 難 *nan* < *n^ʰar (0152d) ‘difficult’, Tib. མནར་ *mnar* ‘suffer, be tormented’
 4. Chi. 瘡 *tanX* < *t^ʰar? (0147l) ‘disease, suffering, distress’, Tib. ལྡར་ *ldar* ‘be weary, tired, faint’
 5. Chi. 燔 *bjon* < *[b]ar (0195i),⁶ Tib. རཁར་ *hbar* ‘burn, blaze’, Bur. *opa* ‘shine’
 6. Chi. 獻 *sa* < *s-ŋ^ʰar (0252e) ‘offer, present, wise man’, Ch. 義 *ngjeH* < *ŋ(r)ajs (0002r) ‘duty, justice’, Tib. སྣར་ *sniar* ‘intelligent, quick of apprehension’
 7. Chi. 纏 *drjen* < *[d]ra{r} (0204c) ‘bind, wind’, Tib. སྣར་ *star* ‘tie fast, fasten to’
 8. Chi. 緩 *hwanX* < *[ɕ]^wa{r}? (0255l) ‘slack; slow’, Tib. རྩོག་ *hgor* < *hɕ^war ‘tarry, linger’
3. Chi. *aj :: Tib. -al
9. Chi. 河 *ha* < *C.[g]ʰaj (0001g) ‘river’, Tib. རྩོག་ *rgal* ‘cross, ford’⁷
 10. Chi. 加 *kae* < *k^ʰraj (0015a) ‘add’, Tib. རྩོག་ *bkral* ‘to appoint’, Tib. རྩོག་ *khral* ‘tax’
 11. Chi. 罷疲 *bje* < *[b]raj (0026a, 0025d) ‘fatigue’, Tib. རྩོག་ *brgyal* < *brjal ‘sink down, faint’
 12. Chi. 荷 *ha* < *[g]ʰaj (00010) ‘carry’, 駕 *kaeH* < *krajs (18–04/0015e) ‘to yoke’, Chi. 可 *khaX* < *[k]^ha[j]? (0001a) ‘be able’, Tib. རྩོག་ *khal* ‘burden, load’, Tib. √kal ‘to load’ (pres. རྩོག་ *hgel*) ‘load’, རྩོག་ *hkhel* ‘be loaded’
 13. Chi. 披 *phje* < *p^h(r)aj (0025j) ‘divide’, Tib. རྩོག་ *hphral* ‘be separate, to part’
 14. Chi. 離 *lje* < *[r]aj (0023f) ‘to leave, distribute’, Tib. རྩོག་ *ral* ‘rent, rift’

The three anticipated correspondences of Table 1 by no means exhaust the relevant comparanda between Chinese and Tibetan. In a further correspondence, a healthy number of examples show *-r in Chinese against -l in Tibetan.

6 Gong instead compares Chi. 焚 *bjun* < *bən (0474a) ‘burn’ (2002[1995]:106).

7 A reviewer instead suggests comparing 澗 *kaenH* < *[k]^ʰra{r}-s (019ii) ‘stream in a ravine’, which would make this an instance of correspondence 4.

5. Chi. *ar :: Tib. -al
15. Chi. 扞捍 *hanH* < *m-kʰa[r]s (0139q, 0139i) 'shield (n.), ward off', Chi. 干 *kan* < *kʰa[r] (0139a) 'protect, guard', Tib. རྒྱལ་ལྔ་ *hgal* 'oppose, contradict'
 16. Chi. 肝 *kan* < *s.kʰa[r] (0139l) 'liver', Tib. མཚམས་ལྔ་ *mkhal* 'kidney, reins'
 17. Chi. 鼾 *xan* < *[qʰ]ʰa[r]? (0139-) 'snore', Tib. ཧྲལ་ *hal* 'pant, snort'
 18. Chi. 餐 *tshan* < *tsʰʰar (0154c) 'eat, food, meal', Tib. མཚམས་མ་ *tshal-ma* 'breakfast'
 19. Chi. 蕃 *bjon* < *[b]ar (0195m) 'ample, flourish', Tib. རྣམས་ལྔ་ *dpal* 'glory', Tib. སྣལ་མེག་ *sbal-mig* 'bud, sprout'
 20. Chi. 扞 *hanH* < *m-kʰa[r]s (0139q) 'fend off', Tib. རྒྱལ་ལྔ་ *hgal* 'oppose'
 21. Chi. 炭 *thanH* < *[tʰ]ʰa{r}s (0151a) 'charcoal, coal', Tib. ཐལ་ *thal* 'dust, ashes'
 22. Chi. 援 *hjwon* < *[g]ʰa{r} (0255e) 'pull up', Tib. རྣོལ་ལྔ་ *hgrol* < *hḡʰral 'become free'
 23. Chi. 鞞 *kjon* < *ka[r] (0249c) 'quiver', Tib. རྣལ་པ་ *rkyal-pa* 'sack, bag'
 24. Chi. 蹠 *bjon* < *bar (0195l) 'paw', Tib. ཕྱག་སྣལ་ *phyag-sbal* 'soft part of an animal's paw'⁸

The segment to be reconstructed for correspondence 5 is not obvious; for the time being *-rl serves as a convenient index for this correspondence (cf. Table 2).

25. 粲 *tshanH* < *[tsʰ]ʰars (0154b) 'bright and white', Tib. མཚོར་ *mtshar* 'fair, beautiful, bright', Tib. √stsal (pres. གསལ་ལྔ་ *gsal*, cf. Hill 2012b: 25) 'clear, bright'

In example 25, the Chinese word 粲 *tshanH* < *[tsʰ]ʰars (0154b) 'bright and white' may either participate in correspondence 2 or in correspondence 5, depending on whether one compares it to Tibetan མཚོར་ *mtshar* 'fair, beautiful, bright' or to Tibetan √stsal (pres. གསལ་ལྔ་ *gsal*) 'clear, bright'.

8 A reviewer instead suggests comparing སྣལ་པ་ *spar-ba* 'handful', making this an example of correspondence 2. Jäschke defines this word 'paw, claw', but offers weak evidence for these definitions (1881: 330). In my experience it always means 'handful' (e.g. ཐལ་བ་སྣལ་གཤམ་ལྔ་ *thal-ba spar gan khyer* 'carrying a handful of ash', de Jong 1959: 36, or རྣོར་བུ་སྣལ་གཤམ་གྱིས་ *nor-bu sbar gan gis* 'with a handful of jewels', *Mdzan's blun*, Derge Kanjur, vol. 74, p. 153b). If སྣལ་པ་ *spar*/*spar* *sbar* 'handful' is etymologically related to ཕྱག་སྣལ་ *phyag-sbal* 'soft part of an animal's paw', the variation between -r and -l should be compared to that seen in མཚམས་ *mgur* / མཚམས་ *mgul* 'neck' (cf. correspondence 85 below).

TABLE 2 Summary of correspondences

Correspondence number	Old Chinese	Tibetan	Reconstruction
1	-n	-n	*-n
2	-r	-r	*-r
3	-j	-l	*-l
5	-r	-l	*-rl

The foregoing Sino-Tibetan comparisons include no Burmese cognates. For correspondence 1, no Burmese cognates are available. Although the data included in this paper do not offer an example of Old Chinese *-an corresponding to Burmese *-an*, it is reasonable to anticipate that such examples will be found. For correspondences 2, 3, and 5 Burmese presents open syllables.

2. Chi. *-ar :: Tib. *-ar* :: Bur. *-a*

7. Chi. 纏 *drjen* < *[d]ra{r} (0204c) 'bind, wind', Tib. སྲོ་ *star* 'tie fast, fasten to', Bur. တာ *tā* 'cling to'

3. Chi. *aj :: Tib. *-al* :: Bur. *-a*

10. Chi. 加 *kae* < *k^ʰraj (0015a) 'add', Tib. ཁམ་ *khral* 'tax', Bur. ကြား *krāh* 'interval'
12. Chi. 荷 *haX* < *[g]^ʰaj? (00010) 'carry', 駕 *kaeH* < *krajs (18-04/0015e) 'to yoke', Chi. 可 *khaX* < *[k]^ʰa[j]? (0001a) 'be able', Tib. ཁམ་ *khal* 'burden, load', Tib. ལཀ་ *kal* 'to load' (pres. ལཀེལ་ *hgel*) 'load', ལཀེལ་ *hkhel* 'be loaded', Bur. တာ *ka* 'saddle'
13. Chi. 披 *phje* < *p^ʰ(r)aj (0025j) 'divide', Tib. ལྔམ་ *hphral* 'be separate, to part', Bur. ပြား *prāh* 'be divided into parts'
26. Chi. 枷 *kaeH* < *krajs 'stand, support', Bur. ကြာ *krā* 'last, take time'
27. Chi. 歌 *ka* < *k^ʰaj (0001q) 'sing, song', Bur. တာ *ka* 'dance'
28. Chi. 施 *syē* < *laj (0004l) 'give, bestow, extend', Bur. လှာ *lyāh* 'oblong, extended in time'
29. Chi. 義 *ngjeH* < *ŋajs (0002r) 'duty, justice', 儀 *ngje* < *ŋaj (18-05/0002u) 'proper demeanour; model', Bur. င်း *nha* 'distribute equally'

5. Chi. *-ar :: Tib. *-al* :: Bur. *-a*

15. Chi. 扞捍 *hanH* < *m-k^ʰa[r]s (0139q, 0139i) 'shield (n.), ward off', Chi. 干 *kan* < *k^ʰa[r] (0139a) 'protect, guard', Tib. ཁག་ *hgal* 'oppose, contradict', Bur. တာ *kā* 'shield n.'
16. Chi. 肝 *kan* < *s.k^ʰa[r] (0139l) 'liver', Tib. མཁམ་ *mkhal* 'kidney, reins', Bur. ခဲ *khāh* 'loins, waist'

These Burmese cognates allow a Burmese column to be added to the table of correspondences (cf. Table 3).

30. Tib. སྐལ་པ་ *sbal-pa* 'frog', Bur. ဖꨂ *phāh*
 31. Tib. གསལ་ *gsal* 'clear', Bur. ཅ། *sā* 'shine'

In the absence of a Chinese cognate, examples 30 and 31, in which Tibetan *-l* corresponds to open syllables in Burmese, are ambiguous as to whether they follow correspondence 3 or correspondence 5.

TABLE 3 Summary of correspondences

Correspondence number	Old Chinese	Tibetan	Burmese	Reconstruction
1	-n	-n	-n?	*-n
2	-r	-r	-Ø	*-r
3	-j	-l	-Ø	*-l
5	-r	-l	-Ø	*-rl

The discussion so far has not included Burmese examples that end with *-y*. As one might anticipate, Burmese final *-ay* corresponds to Chinese final **-aj* (cf. Schuessler 1974: 85–86). When a Tibetan cognate is available it lacks an Auslaut consonant.

6. Chi. **aj* :: Bur. *-ay*

32. Chi. 沙 *srae* < **s^hraj* (0016a) 'sand', Tib. ས་ *sa* 'earth', Bur. သဲ *sai* 'sand'
 33. Chi. 籬 *lje* < **raj* (0023g) 'hedge', Tib. ར་ *ra* 'courtyard'
 34. Chi. 羅 *la* < **r^haj* (0006a) 'a kind of net', Tib. ལ་ *dra* 'net', Tib. རྩ་ *rgya* < **rja* (Li's law) 'net, trap'.
 35. Chi. 波 *pa* < **p^haj* (0025l) 'wave', Tib. འཇམ་ *dbaḥ* 'wave'⁹
 36. Chi. 訛 *pje* < **p(r)aj* (0025h) 'one-sided, insincere words', Tib. སྤྲུ་ *phra-mo* 'slander'
 37. Chi. 俄 *nga* < **ŋ^haj* (0002h) 'slanting', Bur. ဝဲ *nai?* 'be inclined on one side'
 38. Chi. 嘉 *kae* < **k^hraj* (0015g) 'excellent', Bur. ဝဲ *kai* 'overdo, exceed'
 39. Chi. 敲 *kje* < **kraj* (0001d) 'slanting', 揸 *kjeX* < *kraj?* (0001y) 'pull aside' Bur. ကဝ် *kay* 'be distended'

9 This word only fits the correspondence if we presume (contra Hill 2005: 115–118, 2009: 129–131, 2011: 453) that *-h* in this word was used as a *mater lectionis* and was not segmentally pronounced.

40. Chi. 跛 *paX* < *p^haj? (0025m) ‘walk lame’, Bur. ཤེ *phai* ‘avoid, shun’,
འཕོ *phay* ‘push aside’
41. Chi. 破 *phaH* < *p^hajs (0025o) ‘break (v.)’, Bur. ཤེ *phai?* ‘break off a
small piece’
42. Chi. 侈 *tsyheX* < *t-laj? (0003t) ‘wide, extend’, OBur. ལྷོ *klay* ‘wide,
broad’

In some examples Tibetan has the vowel *-e-* instead of *-a-*.¹⁰

43. Chi. 移 *ye* < *laj (0003q) ‘move (v.)’, Tib. ཇི *rje* ‘exchange’, Bur. ལོ *lai*
‘change, exchange’
44. Chi. 多 *ta* < *[t-l]aj (0003a) ‘many’, Tib. ཆེ *che* ‘great’, Tib. མཐོང་བོ
mthe-bo ‘thumb’, Bur. འདྲོ *tay* ‘very’ (intensive)
45. Chi. 靡 *mje* < *maj? (0017h) ‘not’, Tib. མེད *myed* ‘not exist’
46. Chi. 魍 *trhje* < *raaj (0023b) ‘demon’, Tib. རྩེ *hdre* < *hre ‘demon’
47. Chi. 我 *ngaX* < *ŋaj? (0002a) ‘I, we’, Tib. ཇི *ned* ‘we’

Matisoff suggests that Tibetan underwent the change *-aj > *-e* and presents cognate set 43 in favour of this proposal (2003: 202, 205). This suggestion however does not explain the *-a-* vowel in Tibetan in examples 32–36.

The Tibetan cognate ཇི *riod* in example 48 has the vowel *-o-*, arising through Laufer’s law (cf. Hill 2011: 451–452, 2013b); this sound change obscures whether the original vowel was *a or *e.¹¹

48. Chi. 偽 *ngjweH* < *N-G^wajs (0027k) ‘false, cheat’, Tib. ཇི *riod* <
*rɨ^wat / *rɨ^wet ‘deceive’

The inclusion of correspondence 6 in the table of correspondences (cf. Table 4) brings to completion treatment of cognates in Tibetan and Burmese of Old Chinese words with finals *-n, *-j, and *-r and the main vowel *-a-.

10 There is one apparent example where Chinese *-aj corresponds to *-i-* in Burmese (Chi. 燬 *xjweX* < *ŋaj? ‘fire’ [18–19/0356b], OTib. མེ *mye* ‘fire’, Bur. མི *mih* ‘fire’), however because there are more examples of Chinese *aj corresponding to Burmese *-i-* (cf. 88–90 below), it is probably better to take Chi. 焜 *xjwix* < *ŋaj? (0583e) ‘burn’ as the relevant cognate, and to explain the ablaut seen in the two words Chi. 燬 *xjweX* < *ŋaj? ‘fire’ (18–19/0356b) and Chi. 焜 *xjwix* < *ŋaj? (0583e) as a problem internal to Chinese historical phonology. In the Sinological literature an Old Tibetan word *smye ‘fire’ is sometimes drawn into this comparison, but no such word exists (cf. Hill 2013c).

11 In examples 45, 47 and 48 Tibetan exceptionally has a final *-d*.

TABLE 4 Summary of correspondences

Correspondence number	Old Chinese	Tibetan	Burmese	Reconstruction
1	-n	-n	-n?	*-n
2	-r	-r	-∅	*-r
3	-j	-l	-∅	*-l
5	-r	-l	-∅	*-rl
6	-j	-∅	-y	*-j

Vowels other than 'a' exhibit the same six correspondences, and confirm the predicted Burmese outcome *-n* for correspondence 1. However, there are three complications. First, although Tibetan and Burmese generally appear to have changed *-e- to *-a-* before dentals, *-r*, and *-l* (Hill 2012: 11–13, e.g. 46, 53), in several cases Tibetan has *-e-* instead of *-a-* (67, 68). Second, Old Chinese *-ə- corresponds to both *-u-* (e.g. 56, 57, 70–76, 83) and *-a-* (e.g. 64, 78, 79, 84) in Tibetan. Because in Old Chinese it is difficult to distinguish *-ən, *-ər, and *-əj from *-un, *-ur, and *-uj (Baxter 1992: 427–428, 550; Hill 2012b: 18–21), it is likely that this complication is due to an incorrect reconstruction of the vowels in Old Chinese. Nevertheless, whether or not difficulty in establishing the Old Chinese reconstructions is responsible for the irregular correspondences one observes with Tibetan and Burmese is a matter that must be determined on a case by case basis and whether revisions of the Old Chinese reconstructions that would bring them into presumed alignment with Tibetan and Burmese would contradict reliable internal Chinese evidence is also a matter that must be determined on a case by case basis. Third, Burmese has final *-y* after the vowel *-u-*, where we expect zero (60, 61, 62, 76, and 77). These five examples are the only cases of Burmese *-y* corresponding to a Tibetan final *-l*. This distribution suggests that *-l changed to *-y after the vowel *-u-* in Burmese, rather than being lost altogether as it is after other vowels. This explanation presumes an earlier Burmese merger of *-rl with *-l (making 76 and 77 examples of *ul). In sum, it is possible to postulate a series of sequential changes in the history of Burmese: *-rl > *-l, *ul > -uy, and *-l > ∅.¹²

12 Taking into account the vowel correspondences as well as final consonants, the change *-ow > *-u* in Burmese (cf. Hill 2012a: 77, 2012b: 31) must precede *ul > *uy*. Otherwise, WBur. ཅུལྲ་ *thweh* < OBur. *thuyh < *thulh < *thowlh 'spittle' (example 60) and WBur. ཅུལྲ་ *krwe* < OBur. *kruy < *krul < *krowl 'shell' (example 62), would instead yield *thowlh > *thowh > *thūh and *krowl > *krow > *kru respectively.

1. Chi. *-n :: Tib. -n :: Bur. -n¹³
 49. Chi. 繕 *dzyenH* < *[g]e[n]ʔs (0205f) 'repair', Tib. 𑄎𑄣 *glan* 'patch, mend (v.)', 𑄎𑄣 *lhan* 'a patch'
 50. Chi. 尊 *tswon* < *[ts]ʰu[n] (0430a) 'honor (v.)', Tib. བུ་མཚན་ *btsun* 'noble, righteous, honourable'
 51. Chi. 昏 *xwon* < *mʰu[n] (0457k) 'dusk, dark', Tib. མུན་ *mun* 'darkness', Bur. མུན་ *mhun* 'be dim, dusky'
 52. Chi. 婚 *xwon* < *mʰən (0457m) 'marriage', Tib. སྲིད་ཀྱི་ *smyan-ka* 'marriage, married couple'
2. Chi. *r :: Tib. -r :: Bur. -Ø
 53. Chi. 鮮 *sjen* < *[s][e]r (0209a) 'fresh', Tib. གསེར་ *gsar* 'new', Bur. འདྲ་ *sa* 'titivate'
 54. Chi. 霰 *senH* < *[s]ʰe{r}s (0156d) 'sleet', Tib. སེར་ *ser* 'hail'
 55. Chi. 裹 *kwaX* < *s.[k]ʰo[r]ʔ (0351d) 'wrap (v.)', Tib. སྐོར་ *skor* 'go around'
 56. Ch. 飛 *pji* < *Cə.pə[r] (0580a) 'fly (v.)', 翕 翮 *pjun* < *(Cə).pə[r] (0471ef) 'fly (v.), soar', 奮 *pjunH* < *p[ə]{r}s (0473a) 'spread wings and fly', Tib. རྩམ་ *hphur* 'fly (v.)'
 57. Chi. 銑 *senX* < *səʔ (0478h) 'glossy', Tib. གསེར་ *gser* 'gold'¹⁴
 58. Chi. 齧 *nqjin* < *ŋəʔ{r} (0416-) 'gums', Tib. རྩེལ་ *rñil* < *rñil 'gums'¹⁵
3. OChi. *-j :: Tib. -l :: Bur. -Ø (or -y after u-)¹⁶
 59. Chi. 氏 *tejX* < *tʰijʔ (0590a) 'bottom', Tib. མཚན་མཚོ་ *mthil* 'bottom, base'¹⁷
 60. Chi. 唾 *thwaH* < *tʰʰojs (0031m) 'spit', Tib. ཐོ་ལེ་ *tho-le* 'spit', WBur. རྩེལ་ *thweh* < *thuyh 'spittle'
 61. Chi. 虺 *xjwjiX* < *mʰrujʔ (0572a) 'snake', Tib. སྲུལ་ *sbrul* < *smrul (Simon's law, cf. Hill 2011: 448–449) 'snake', OBur. རྩེལ་ *mruy* 'snake'
 62. Chi. 蝸 *kwa* < *kʰroj (0018c) 'snail', WBur. རྩེལ་ *krwe* < *kruy 'shell'
 63. Chi. 壞 *hweajH* < *N-[k]ʰrujs (0600d) 'to destroy, ruin', Tib. རྩེལ་ *hdru* 'to rot', Tib. སྲུལ་ *brul* 'crumbles'
 64. Chi. 違 *hwij* < *[G]wəʔ[j] (0571d) 'go against', Tib. རྩེལ་ *hgol* < *hgw'al 'part, deviate'

13 There are no examples of Chinese *-on corresponding to Tibetan -on.

14 It may be archaeologically inappropriate to suppose the speakers of the Ursprache knew this metal, but Gong suggests that they are cognate (2002[1995]: 106), and they match the final correspondence.

15 The vowel correspondences in 57 and 58 are irregular; it is perhaps for this reason that Jacques rejects 58 (2013: 295 note 7).

16 There is no case of Chinese *-ej corresponding to Tibetan -al. For the possibility that Old Chinese *ej corresponds to -i- in Tibetan and Burmese confer Hill (2012b: 14).

17 A reviewer instead suggests comparing Tib. མཚན་མཚོ་ *mthil* 'bottom, base' with Chi. 殿 *tenH* < *tʰə[n]-s 'rear (building, army unit)', but such a comparison makes the vowels irregular.

65. Chi. 橢 *thwaX* < *^lʰojʔ (0011c) ‘oval’, WBur. လွှာ *lhwāh* < *lhō₁h¹⁸ ‘oblong (shield)’
66. Chi. 墮 *xjwie* < *^loj (0011e) ‘destroy’, WBur. လွှာ *lhwāh* < *lhō₁h ‘throw out or upon’
5. Chi. *-r :: Tib. -l :: Bur. -Ø (or -y after u-)
67. Chi. 徧 *penH* < *p^he{r}s (0246b) ‘(go) all around’, Tib. √pel (pres. རེལ་ *hphel*) ‘increase, augment’
68. Chi. 遣 *khjenX* < *^h[k]ʰe{r}ʔ (0196b) ‘send away’, Tib. √skyal (pres. སྐྱེལ་ *skyel*) ‘send’
69. Chi. 郡 *gjunH* < *gurs (0459g) ‘district’, Tib. ལྷུལ་ *khul* ‘district, province’
70. Chi. 軍 *kjun* < *^h[k]wər (0458a) ‘army’, Tib. ལྷུལ་ *g.yul* ‘army, battle’
71. Chi. 運 *hjunH* < *^h[ɣ]wərs (0458d) ‘move’, Tib. ལྷུལ་ *hgul* ‘move’
72. Chi. 根 *kon* < *^h[k]ʰə{r} (0416b) ‘root, trunk’, Tib. ལྷུལ་ *khul-ma* ‘bottom or side of sth’
73. Chi. 分 *pjun* < *pə{r} (0471a) ‘divide’, Tib. རྩུལ་ *hbul*, རྩུལ་ *hphul* ‘give’
74. Chi. 塵 *drin* < *^h[d]rə{r} (0374a) ‘dust’, Tib. རྩུལ་ *rdul* ‘dust’
75. Chi. 貧 *bin* < *(Cə.)[b]rə{r} (33-30/0471v) ‘poor’, Tib. རྩུལ་ *dbul* ‘poor’
76. Chi. 銀 *ngin* < *^hnrə{r} (0416k) ‘silver’, Tib. རྩུལ་ *dñul* ‘silver’, OBur. ཅུལ་ *nuy* ‘silver’¹⁹
77. Chi. 眉 *mij* < *mrər (0567a) ‘eyebrow’, WBur. မွေး *mweh* < *muyh ‘body hair’
78. Chi. 輝輝 *xjwij* < *q^hwər (0458k, 0458l) ‘brilliant’, Tib. ལྷོལ་ལྷོལ་ *khrol-khrol* < *kh^wral ‘bright, shining, sparkling, glistening’
79. Chi. 西 *sej* < *s-n^hər (0594a) ‘west’ (cf. Sagart 2004: 71–74), Tib. མཛེལ་ *mnal* ‘sleep’, Bur. နား *nāh* ‘rest, stop a while’
6. Chi. *-j :: Tib. -Ø :: Bur. -y²⁰
80. Chi. 禾 *hwa* < *^h[ɣ]ʰoj (0008a) ‘growing grain’, Tib. ལྷོ་ *gro* ‘wheat’
81. Chi. 垂 *dzywe* < *^hdoj (0031a) ‘hang down’, WBur. တွဲ *twai* < *to₁i ‘drooping, hanging’²¹

18 For the need to distinguish o₁ and o₂ in Old Burmese confer Hill (2013b: 65).

19 It may be archaeologically inappropriate to suppose the speakers of the Ursprache knew this metal, but Gong suggests that they are cognate (2002[1995]: 103), and they match the correspondence.

20 There are no examples of Old Chinese *-ej corresponding to Burmese -ay.

21 Hill (2012b: 30 footnote 69) follows Gong (2002[1995]: 168, #45) in comparing Chi. 垂 *dzywe* < *^h[d]oj (19-17/0031a) ‘to hang’ to Tib. ལྷོལ་ *hjol* ‘to hang’ and WBur. တွဲ *twai* ‘suspend from shoulder’, but Bur. *l-* compares poorly with OChi. *d- and Tib. *hʃ-* (cf. Hill 2013a: 197).

82. Chi. 挫 *tswaH* < *ts^hoj(?)s (0012c) ‘push down’, WBur. ငွဲ *cwai* < *co₁i ‘attach, stick to, hold’
83. Chi. 微 *mjij* < *məj (0584d) ‘small, minute’, WBur. မွေ *mwe?* < *muy? ‘minute’
84. Chi. 幾 *kjijX* < *kəj? (0547a) ‘few; how many’, Tib. ལྔག *hgah* ‘some’²²

It is not always possible to confidently assign a cognate set to one of these five correspondences.

85. Chi. 頤 *konX* < *[k]^hə{r}? (0416-) ‘neck’, Tib. མགུ་ *mgul* ‘neck’, Tib. མགུར་ *mgur* ‘neck’

In example 85, the Chinese word 頤 *konX* < *[k]^hə{r}? (0416-) ‘neck’ participates in correspondence 5, if one compares it to Tibetan མགུ་ *mgul* ‘neck’, but it participates in correspondence 2 if it is instead compared with Tibetan མགུར་ *mgur* ‘neck’. The variation between Tibetan -l and -r in this pair or words awaits explanation (cf. footnote 8).

In examples 86 and 87, because of the absence of a Chinese cognate, Tibetan -l corresponding to open syllables in Burmese ambiguously follows correspondence 3 or correspondence 5.

86. Tib. མོ་ *tshil* ‘grease’, Bur. ဆီ *chī* ‘oil’
87. Tib. གསེལ་ *gsil*, Bur. ဆိး *sīh* ‘split’

Just as Chinese *-aj sometimes corresponds to Tibetan -e- (examples 43–47), so too Chinese *-əj sometimes corresponds to Tibetan -e- (examples 88–90). However, in this correspondence Burmese gives -i rather than -ay.

7. Chi. *-əj :: Tib. -e :: Bur. -i
88. Chi. 焜 *xjwix* < *məj? (0583e) ‘burn’, Chi. 燬 *xjweX* < *məj? ‘fire’ (0356b), OTib. མྱེ *mye* ‘fire’, Bur. မီး *mīh* ‘fire’
89. Chi. 邇 *nyeX* < *nəj? (0359c) ‘near, draw near to’, Tib. ཉེ *ñe* ‘near’, Bur. နီး *nīh* ‘near’
90. Chi. 尾 *mjijX* < *[m]əj? (0583a) ‘tail’, Bur. မြီး *mrih* ‘tail’

The Chinese words 燬 *xjweX* < *məj? ‘fire’ (0356b) notwithstanding (cf. footnote 10 above), the divergent treatment of *aj and *əj in Burmese, yielding -ay

22 If we presume (contra Hill 2005: 115–118, 2009: 129–131, 2011: 453) that -h in this word was used as a *mater lectionis* and was not segmentally pronounced.

and *-i* respectively, shows that **-a-* and **-ə-* were separate vowels at one point in the history of this language. Consequently, the generally observed merger of **-a-* and **-ə-* in Burmese and Tibetan is not a shared innovation, but rather reflects independent changes in the two languages (contra Handel 2008: 431).²³

Table 5 summarizes the correspondences among Chinese, Tibetan, and Burmese elaborated so far.

TABLE 5 Summary of correspondences

Correspondence number	Old Chinese	Tibetan	Burmese	Reconstruction
1	-n	-n	-n	*-n
2	-r	-r	-Ø	*-r
3	-j	-l	-Ø (-y after -u-)	*-l
5	-r	-l	-Ø (-y after -u-)	*-rl
6	-j	-Ø	-y	*-j
7	-əj	-e	-i	*-əj

In a further two correspondences, Chinese has **-n*, where the correspondences presented so far predict **-r*. At least four explanations are available to explain such examples: 1. One language is innovative in a way that is not yet understood. 2. Baxter & Sagart are mistaken to reconstruct **-n* rather than for Old Chinese **-r* in these cases. 3. These words are not cognate but merely look-alike. 4. These correspondences require that additional Auslaute (such as **-rn* or **-rl*) be reconstructed for the Trans-Himalayan proto-language. It is not within my power to adjudicate among these four possibilities at this time.

2a. Chi. **-n* :: Tib. *-r* :: Bur. *-Ø*

91. Chi. 半 *panH* < **p^hans* (0181a) 'half', Tib. བར *bar* 'intermediate space'
92. Chi. 板 *paenX* < **C.p^hran?* (0262j) 'plank, board', Tib. རམས *hphar* 'board, flat board'
93. Chi. 顫 *syen* < **s.tan* (0148s) 'shivering, trembling', Tib. རྩོད *hdar* 'tremble, shudder'
94. Chi. 旃 *tsyen* < **tan* (0150c) 'a kind of flag', Tib. རྩོད *dar* 'flag'
95. Chi. 丹 *tan* < **t^han* (0150a) 'cinnabar', Bur. ལོ *tā* 'very red, flaming red'

23 Example 84 is the only hurdle in the way of a regular change **əj > e* in Tibetan.

96. Ch. 粉 *pjunX* < *mə.pən? (0471d) 'flour', Tib. རྩུ་ *dbur* 'smooth (v.)'
- 5a. Chi. *-n :: Tib. -l
97. Chi. 連 *ljen* < *ran (0213a) 'connect, unite in a row', Tib. ལྷ་ *gral* 'row'
98. Chi. 爛 *lanH* < *[r]ʰans (0185l) 'tear (v.)', Tib. ལྷ་ (pres. ལྷ་ལྷ་ *hdral*) 'tear (v.)'
99. Chi. 展 *trjenX* < *tren? (0201a) 'roll over; unfold', Tib. ལྷ་ *rdal* 'spread, extend'
100. Chi. 蠢 *tsyhwinX* < *tʰun? (0463c) 'stupid', Chi. 鈍 *dwonH* < *dʰuns 'dull' (0427i), Chi. 頓 *twonH* < *tʰuns (0427j) 'dull', Tib. ལྷ་ *rtul* 'blunt, dull, stupid'
101. Chi. 純 *dwon* < *dʰun (0427n) 'cover, wrap', Tib. ལྷ་པ་ *thul-ba* 'rolled up; subdued', Tib. ལྷ་པ་ *thul-pa* 'fur coat'
102. Chi. 連 *ljen* < *ren? (0213a) 'cohere', Tib. ལྷ་ལྷ་ *hbre* 'be connected'
103. Chi. 涓 *kwanH* < *kʰons (0157f) 'bubble', Tib. ལྷ་ལྷ་ *hkhhol* 'boil'

In the case where there is a Burmese cognate available to compare with a Chinese *-n corresponding with Tibetan -l, rather than the -Ø or -y that the correspondence 5 of Table 5 suggests, the Burmese cognate has a final -n.

104. Chi. 信 *kwaenH* < *krʰons (0157l) 'servant, groom', Tib. ལྷ་ *khoh* 'servant', OBur. ལྷ་ *kyo,n* 'slave'

The coincidence of *-n in Chinese and -n in Burmese weighs in favour of reconstructing *-n in the proto-language. One may either suggest that Tibetan changed *-n to -l in 104, under a conditioning environment that has yet to be identified, or with the Old Turkic word *qul* 'slave' in mind, it might be a mistake to attribute the Tibetan word the status of a cognate.

Apart from those cases where Chinese shows *-n where one expects *-r, there are also cases where Chinese shows *-r where one expects *-n. The same four explanations are available for such cases, and again I am unable to adjudicate among them at this time.

- 1a. Chi. *-r :: Tib. -n :: Bur. -n
105. Chi. 鑽 *tswan* < *[ts]ʰor (0153h) 'perforate, penetrate', 鑄 *tsjwen* < *tson (0235c) 'chisel, sharp point', Tib. ལྷ་ *mtshon* 'weapon'
106. Chi. 糞 *pjunH* < *p[u]rs (0472a) 'manure, dirt', Tib. ལྷ་ *brun* 'dirt, dung, excrement'

107. Chi. 奔 *pwon* < *p^sur (0438a) ‘run (v.)’, Tib. ཕུན *phun* ‘accomplish, complete’
 108. Chi. 饑 *ginH* < *[g]rə[r]s (0480r) ‘famine’, Tib. བློན་པོ་ *bkren-po* ‘beggar, destitute person’²⁴
 109. Chi. 乾 *kan* < *[k]^sar (0140c) ‘dry’, 旱 *hanX* < *[g]^sa[r]ʔ (0139s) ‘drought, dry’, Bur. མཉམ་ *khanh* ‘dried up’

In two cases Old Chinese **-j* (possibly to be corrected to *-r*) corresponds to Burmese *-n*.

110. Chi. 疲 *bje* < *baj (0025d) ‘exhausted’, Bur. བཅའ་ *panh* ‘tired’
 111. Chi. 圍 *hwij* < *[G]^{wə}[j] (0571g) ‘to surround’, Bur. བཅའ་ *wanh* ‘circular’

In one case Old Chinese **-j* corresponds to Tibetan *-r*.

112. Chi. 歸 *kjwij* < *[k]^{wə}j (0570a) ‘return’, Chi. 回 *hwoj* < *[G]^{wə}j (0542a) ‘revolve’, Tib. རྩོམ་ *hkhor* < *h^kkhwar ‘circle’

In two cases Old Chinese has final **-n* against open syllables in Tibetan and Burmese. It is not possible to reconstruct **-r* because Tibetan would have then had *-r* and it is not possible to reconstruct final **-j* because Burmese would have then had *-y*. The solution here is perhaps a morphological suffix **-n* in Chinese, possibly similar to the Tibetan *-n* suffix seen in pairs such as √*rkun* ‘steal’, རྩོམ་ *rkun-ma* ‘thief’ and √*che* ‘be big’, མཉམ་ *chen-po* ‘big’.²⁵

113. Chi. 段 *twanH* < *t^so[n]s (0172a) ‘hammer’, Tib. ཐོ་བ་ *tho-ba* ‘a large hammer’, Bur. တူ *tū* ‘hammer’
 114. Chi. 騰 *tsjwenX* < *tsonʔ (0235b) ‘fat, rich’, Tib. ཚོ་བ་ *tsho-ba* ‘fat’, Bur. ဆူ *chū* ‘be fat’

Table 6 summarizes the correspondences identified in this study. The findings of this investigation are tentative and require further confirmation. In particular, a full study of final **-r* in Old Chinese, making use of the Min dialects and early Han dynasty Buddhist transcriptions of Indic words, is a prerequisite for further progress. The pilot study of Harrison & Coblin (2012) points the way to how the study of Han dynasty Buddhist transcriptions may proceed.

24 The vowel correspondence is irregular.

25 Matisoff (2003: 443–453) discusses possible instances of a suffix *-n* in a number of Trans-Himalayan languages including Old Chinese.

TABLE 6 *Summary of correspondences*

Correspondence number	Old Chinese	Tibetan	Burmese	Reconstruction
1	-n	-n	-n	*-n
1a	-r	-n	-n	?
2	-r	-r	-Ø	*-r
2a	-n	-r	-Ø	?
3	-j	-l	-Ø (-y after -u-)	*-l
5	-r	-l	-Ø (-y after -u-)	*-rl
5a	-n	-l	?	?
6	-j	-Ø	-y	*-j
7	-əj	-e	-i	*-əj

Proposed sound changes

Burmese

*rl > *l

*əj > i

*ow > u (cf. footnote 12 above)

*ul > uy

*-l, *-r > Ø

Tibetan

*-aj > e (with uncertain conditioning)

*-əj > e (with uncertain conditioning)

*-rl > -l

*-j > Ø

Chinese

*-rl > -r

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