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A Phonological Reconstruction of Proto-Central Naga

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A Phonological Reconstruction of Proto-Central Naga

By

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Committee in charge:

Professor James A. Matisoff, Chair
Professor Andrew Garrett
Professor Johanna Nichols

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Abstract

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Daniel Wayne Bruhn

Doctor of Philosophy in Linguistics

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Professor James A. Matisoff, Chair

This dissertation presents a preliminary reconstruction of the phonology and lexicon (268 items) of Proto-Central Naga (PCN), the putative ancestor of a group of Tibeto-Burman languages spoken primarily in Nagaland, a state in northeast India: Ao, Lotha, Sangtam, and Yimchungrü. Also reconstructed in the process is the phonology and lexicon (386 items) of Proto-Ao (PAo), the intermediate ancestor of the Ao lects. Teleo-reconstructions of Proto-Tibeto-Burman (PTB) are drawn upon to examine the sound changes that took place in the development from PTB to the Central Naga languages.

Chapter I (Introduction) provides background information on the Central Naga languages and discusses the history of scholarship on this group. The conventions and linguistic sources used throughout this work are also presented.

Chapter II (Proto-Ao) reconstructs the phonology and lexicon of Proto-Ao, the intermediate ancestor of the Ao branch of Central Naga. It presents the phonology of standard Chungli Ao, Mangmetong Mongsen Ao, and Proto-Ao, followed by reconstructions of PAo onsets and rimes based on 386 cognate sets. The reconstructibility of the PAo tone system is also explored, and the chapter is concluded with a discussion of the PTB > PAo and PAo > Ao sound changes proposed.

Chapter III (Proto-Central Naga) reconstructs the phonology and lexicon of Proto-Central Naga. It presents the phonology of Lotha, Sangtam, Yimchungrü, and Proto-

Central Naga, followed by reconstructions of PCN rimes and onsets based on 268 cognate sets, with an intervening discussion of the prefixes. The chapter is concluded with a discussion of the PTB > PCN and PCN > CN sound changes proposed.

Chapter IV (Conclusion) examines the place of the Central Naga group within the Tibeto-Burman family based on a study of shared phonological innovations. The dissertation is then concluded with a discussion of future directions in diachronic research on the CN languages.

Seven appendices are provided (A–G): three indices of the sound changes proposed for PTB > PCN (Appendix A), PCN > CN languages (Appendix B), and PAo > Ao lects (Appendix C); two sets of charts summarizing the PTB > PCN > CN (Appendix D) and PTB > PAo > Ao (Appendix E) sound changes; and two indices of PAo (Appendix F) and PCN (Appendix G) reconstructions, alphabetized by proto-gloss.

For Kara, Mariah, and especially Cassie,
who patiently endured with a present-yet-absent father and husband

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Symbols and Abbreviations

A ⋈ B	A and B are co-allofams (members of the same word-family)
Ch.	Chungli Ao
GMA	*A Grammar of Mongsen Ao* (Coupe 2007b)
HPTB	*Handbook of Proto-Tibeto-Burman* (Matisoff 2003)
LSI	*Linguistic Survey of India* (Grierson & Konow 1903–1928)
m	the morpheme in question (in a morpheme-by-morpheme gloss)
Mo.	Mongsen Ao
OC	Old Chinese
PAo	Proto-Ao
PCN	Proto-Central Naga
PKC	Proto-Kuki-Chin
PNN	Proto-Northern Naga
PTB	Proto-Tibeto-Burman
PTk	Proto-Tangkhulic
Sang.	Sangtam
STC	*Sino-Tibetan: A Conspectus* (Benedict 1972)
STEDT	The Sino-Tibetan Etymological Dictionary and Thesaurus Project, University of California, Berkeley (http://stedt.berkeley.edu/)
TBL	*Zàng-Miǎn yǔzú yǔyán cíhuì* [A Tibeto-Burman Lexicon] (Dai & Huang 1992)
TBRS	*The Tibeto-Burman Reproductive System* (Matisoff 2008)
WB	Written Burmese
WT	Written Tibetan
Yim.	Yimchungrü/Yimchunger
ZMYYC	*Zàng-Miǎn-yǔ yǔyīn hé cíhuì* [Tibeto-Burman Phonology and Lexicon] (Sun et al. 1991)
GLOSS	gloss of a proto-form
‘gloss’	all other glosses

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CHAPTER I. INTRODUCTION

I.1. Purpose & Organization

This study reconstructs the phonology and lexicon of Proto-Central Naga (PCN), the putative ancestor of a small group of Tibeto-Burman languages spoken primarily in Nagaland, a state in northeast India (see Figure 1). The languages of northeast India, especially those lumped under the geographic term 'Naga' (see §I.3.1), are of particular interest for Tibeto-Burman studies, given their exceptional diversity, uncertain classification (see §I.3.4), and general lack of reliable documentation.

Four such languages compose the Central Naga (CN) subgroup (Ao, Lotha, Sangtam, and Yimchungrü), whose genetic unity until now has been posited solely on the basis of lexical and typological considerations (see §I.3.3). This work provides additional support for the subgroup by applying the comparative method to these languages and producing a phonological reconstruction of their putative ancestor, identifying shared phonological innovations in the process.

Chapter I (Introduction) provides background information on the Central Naga languages and discusses the history of scholarship on this group. The conventions and linguistic sources used throughout this work are also presented.

Chapter II (Proto-Ao) reconstructs the phonology and lexicon of Proto-Ao, the intermediate ancestor of the Ao branch of Central Naga. It presents the phonology of standard Chungli Ao, Mangmetong Mongsen Ao, and Proto-Ao, followed by reconstructions of PAo onsets and rimes based on 386 cognate sets. The reconstructibility of the PAo tone system is also explored, and the chapter is concluded with a discussion of the PTB > PAo and PAo > Ao sound changes proposed.

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The current chapter is arranged as follows: This section (§I.1) presents the purpose and organization of this dissertation, while §I.2 introduces the Central Naga languages and their linguistic setting, including brief surveys of the academic literature on each language. §I.3 discusses the status of Central Naga as a genetic subgroup, and §I.4 finally presents the sources of language data and conventions employed in this study.

A final organizational note is in order: This work follows the common Tibeto-Burman practice of organizing reconstructions by syllable components (initials, medials, and rimes) instead of segment type. The tight integration of the syllable nucleus with its coda in TB languages renders such an approach much simpler and more productive than examining the development of individual phonemes. By treating the syllable rime as a unit, a portion of the conditioning environment is 'built into' the description of a sound change, thereby simplifying it. Instead of specifying the multitudinous fates of PCN ***a** in a daughter language, for example, one instead examines the independent developments of ***-a**, ***-aj**, ***-am**, ***-an**, ***-aŋ**, etc. (For more on this practice, see Matisoff 1973b: 78–79 and Mortensen 2003: 42.)

I.2. Central Naga Languages and Setting

Central Naga or the 'Ao group' (Burling 2003) consists of four Tibeto-Burman languages spoken primarily in Nagaland, a hill state in northeast India bordered on the west by Assam, the south by Manipur, the northeast by Arunachal Pradesh, and the east by Burma. These languages are Ao, Lotha, Sangtam, and Yimchungrü/Yimchunger.

Figure 1 shows the location of Nagaland in relation to the rest of India and the surrounding countries, while Figure 2 presents the various districts of the state. Figure 3 (adapted from Mills 1926, map facing p.1) illustrates the location of various tribes/languages in Nagaland, with the Central Naga languages highlighted.

Figure 1: Map of India and surrounding countries, showing location of Nagaland[1]

[1] Adapted with permission from a map by PlaneMad/Wikimedia (http://en.wikipedia.org/wiki/File:India Nagaland locator map.svg). The original image and this adaptation are released under the CC BY-SA 3.0 license (http://creativecommons.org/licenses/by-sa/3.0/).

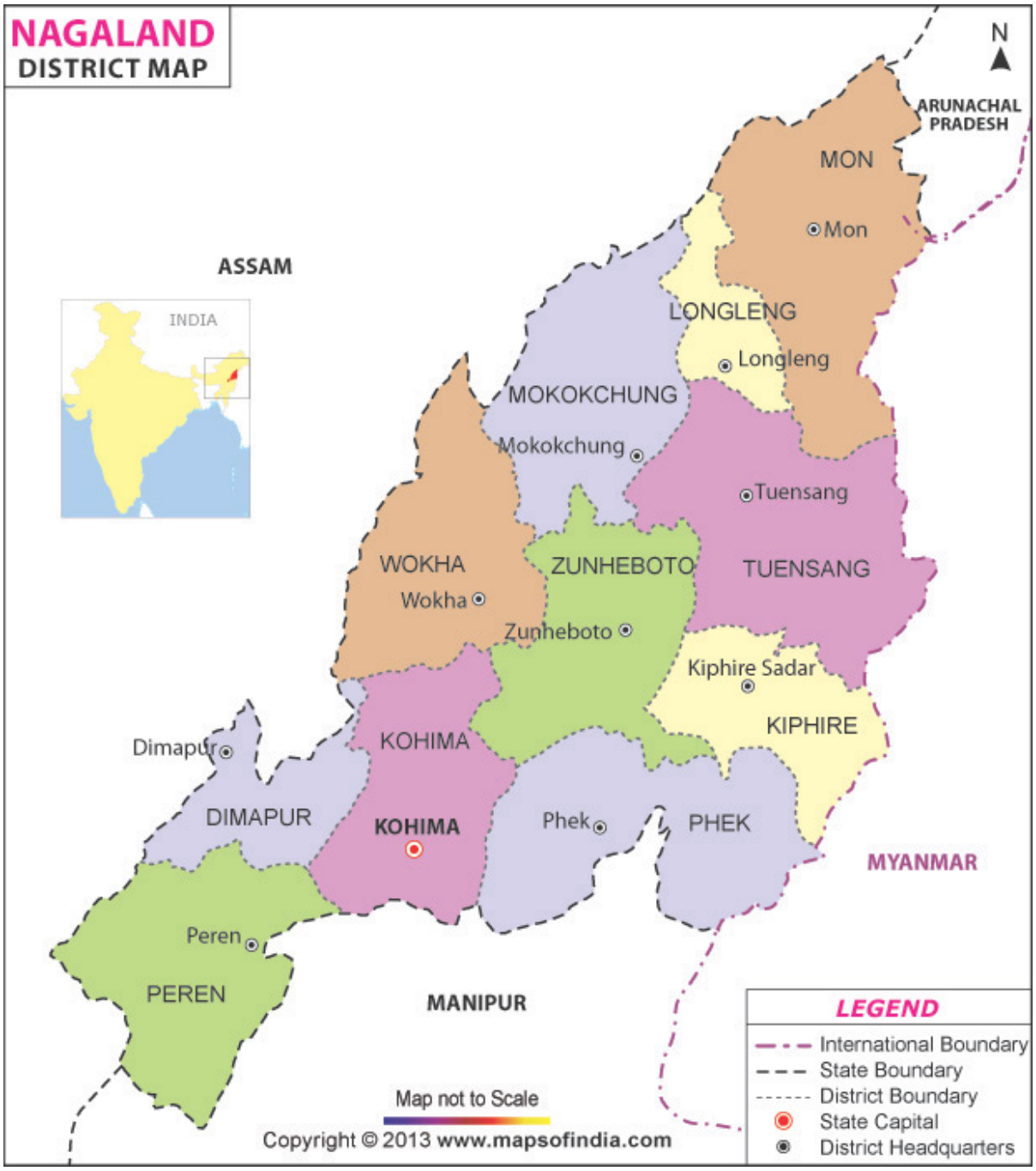


Figure 2: Districts of Nagaland[2]

[2] Map image purchased from MapsofIndia.com (http://www.mapsofindia.com/maps/nagaland/nagaland.htm), licensed for educational, non-commercial use.

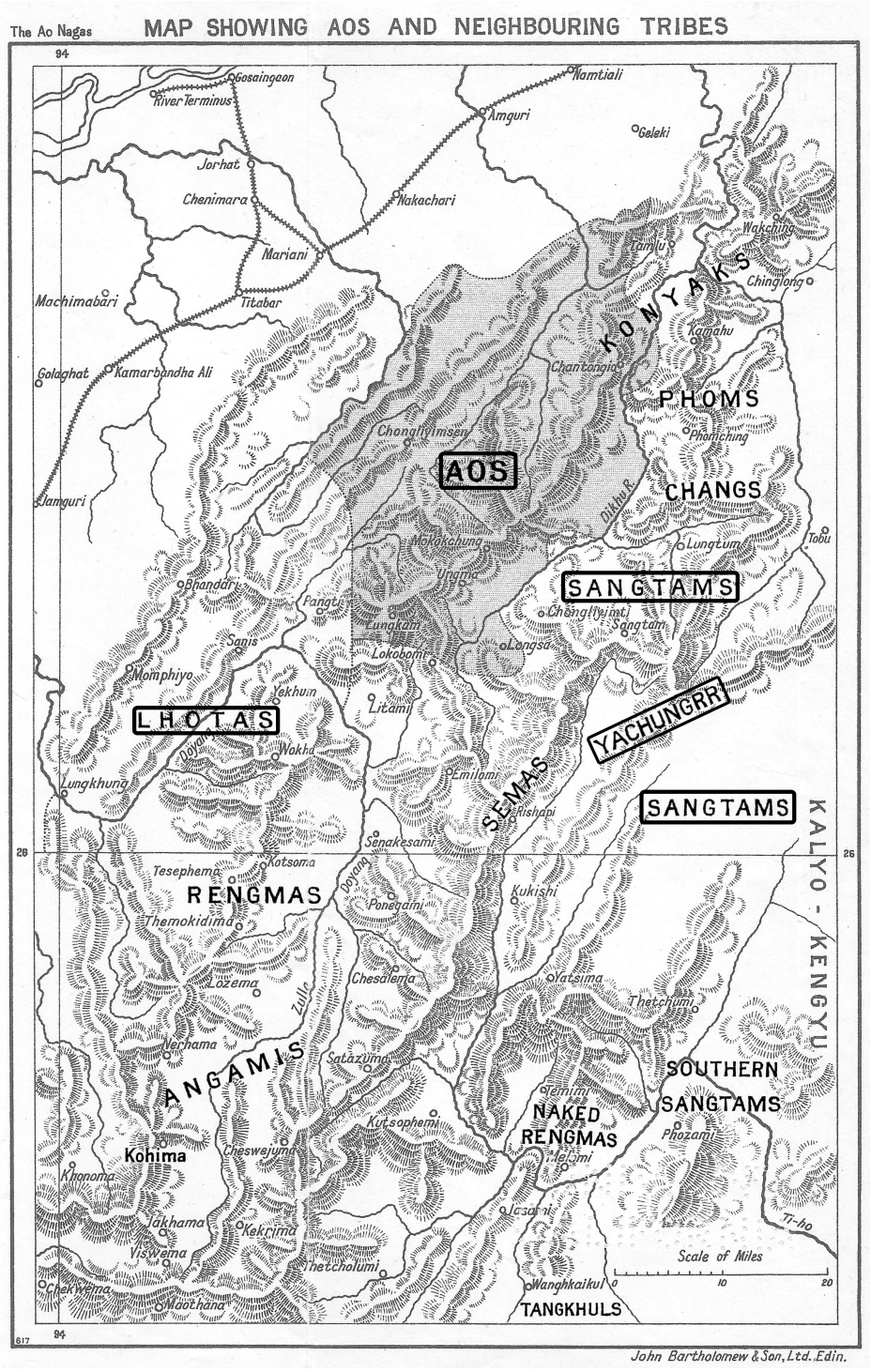


Figure 3: Tribes/languages in Nagaland, with CN languages in boxes[3]

[3] Adapted from Mills 1926, map facing p.1.

I.2.1. Ao

Ao is spoken by approximately 261,000 people in India,[4] principally in the Mokokchung district of Nagaland. Its two main lects are Chungli and Mongsen, which 'border on mutual unintelligibility' (Burling 2003: 184).[5] Changki, spoken in four villages, is sometimes considered a third major variety, but is mutually intelligible with Mongsen (Coupe 2007b: 10, 16). Temsunungsang notes that each village in Mokokchung technically speaks its own variety of the major lect, and variation can even exist within large villages which contain multiple *khels*[6] (2009a: 2).

Through missionary work in the late nineteenth and early twentieth centuries that focused on producing a Bible translation and establishing schools, the Molung variety of Chungli spread throughout the Mokokchung district as the prestige lect.

Much of the primary research on Ao exists in works from the British colonial period, including early word lists (Hodgson 1849, 1850; Brown 1851; Campbell 1874; Clark 1879; Damant 1880; Davis 1892), the *Linguistic Survey of India* (Grierson & Konow 1903–1928, henceforth 'LSI'), two short grammatical descriptions of Chungli (Avery 1886; Clark 1893), a mammoth 977-page dictionary of Chungli (Clark 1911), and an anthropological monograph on the Ao people with a grammar chapter primarily on Longchang Mongsen (Mills 1926). For several decades after the publication of Mills 1926, the original linguistic works on Ao focused on Chungli: Marrison's (1967) dissertation on the classification of the Naga languages (for which he elicited vocabulary from a Chungli consultant in Assam[7]), a phonetic reader (Gowda 1972), a sketch grammar (Gowda 1975), a dictionary published by Nagaland Bhasha Parishad (NBP, 'Nagaland Language Society') (Kumar 1971a), a dictionary from the Central Institute of Indian Languages (CIIL) (Gowda 1985), and Weidert's works (1979, 1987) on Tibeto-Burman tonogenesis containing a small set (~130 words) of elicited Chungli vocabulary. Beginning in the late 1990s, however, extensive fieldwork conducted in Nagaland by Alexander Coupe has yielded a plethora of publications on varieties of Mongsen (Coupe 1998, 2002, 2003b, 2007a, 2008, 2011a, 2011b, 2012a, 2012b, 2013), including a phonetic and phonological description of Waromung Mongsen (2003a) and a 526-page grammar of Mangmetong Mongsen (2007b, henceforth 'GMA'). Recent investigations into Ao morphology and prosodic phonology and morphology

[4] As reported in the 2001 Census of India (Government of India 2010).
[5] The lack of mutual intelligibility between Chungli and Mongsen supports treating them as separate *languages*, but they are similar enough to be often thought of as *dialects* of Ao. To circumvent this issue, the Ao varieties are referred to throughout this dissertation by the neutral term 'lects'.
[6] *Khel* is the Nagamese word for an administrative ward.
[7] See Marrison 1967: II: 331 and Coupe 2007b: 29.

have also been produced by scholars in Hyderabad (Sanyal 2005; Sanyal et al. 2006, 2007; Temsunungsang 2003, 2006, 2008, 2009a, 2009b; Temsunungsang & Sanyal 2005). Consultant work with a Chungli speaker in Berkeley, California, has also contributed to some unpublished papers on various topics (Bratkievich 2010; Bruhn 2010a, 2010b; Escamilla 2010) and one dissertation (Escamilla 2012).

The phonemic inventories of Chungli and Mangmetong Mongsen are presented in §II.2.1 and §II.2.2, respectively.

I.2.2. Lotha

Lotha is spoken by approximately 170,000 people (Government of India 2010), principally in the Wokha district (formed out of the Mokokchung district in 1973). The autonym of this tribe is [kjoŋ^{3}]~[kjon^{3}] (lit. 'person/people'), the term 'Lotha' (formerly spelled *Lhota*, *Hlota*, or *Lota*) being an exonym said to derive originally from the Assamese word for 'creeper' (Acharya 1983: xviii).

Mills (1922: 207) and Marrison (1967: II: 355) mention the existence of two dialects with slight differences spoken on opposite sides of the Doyang river, but little else is known about varieties of Lotha. According to Marrison (1967: II: 355) and Acharya (1975: xii), the variety spoken in Wokha Town is represented in Lotha literary works and is considered the standard.

The earliest literature on Lotha consists of word lists (Campbell 1874, Butler 1875, Damant 1880) and a sketch grammar (Witter 1888). Witter's grammar formed the basis for the Lotha material in the LSI, the grammar chapter of Mills' anthropological monograph on the Lotha people (Mills 1922), and the Lotha wordlist in Marrison's dissertation (Marrison 1967). Since those works, the only significant linguistic publications on Lotha have been an NBP Lotha–Hindi–English dictionary (Kumar 1971b), Acharya's phonetic reader (1975) and short grammar (1983), and dictionaries by the Lotha Literature Committee (Murry et al. 1978) and K.P. Lotha (2004). Weidert's 1987 work on Tibeto-Burman tonogenesis also contains a small set (~120 forms) of precisely transcribed Lotha words.

The phonemic inventory of Lotha is presented in §III.2.1.

I.2.3. Sangtam

Sangtam is spoken by approximately 84,000 people (Government of India 2010), principally in the Tuensang district and Kiphire district (formed out of Tuensang in

2004). The Sangtam-speaking area consists of two noncontiguous sections:[8] a western division (formerly 'Northern Sangtam' or Lophomi[9]) in the Chare and Longkhim subdivisions of Tuensang, and an eastern division (formerly 'Central Sangtam' or Thukumi[10]) west of the Zungki/Tiho river in Kiphire. This bifurcation is apparently due to Sumi and Yimchungrü migration which split the Sangtam territory (Bouchery & Sangtam 2012: 9–10; Hutton 1921: 375).

According to Marrison, the Sangtam orthography developed by missionaries is based on the dialect spoken in what is now the western division of Sangtam (1967: II: 366), and Bouchery & Sangtam pinpoint it more specifically to the villages surrounding the Longkhim administrative headquarters in the Tuensang district (2012: 11). Bouchery & Sangtam also note that the Sangtam themselves recognize six dialects: 'Longkhim', 'Kiphire', 'Sanphure', 'Hurong', 'Phelungre' and 'Alisopur' (2012: 11).

The linguistic literature on Sangtam is even thinner than that of Ao and Lotha: The LSI (1903) contains the first known published wordlist of Sangtam ('Thukumi') (collected by Captain A.E. Woods, Deputy Commissioner of the Naga Hills District, in 1899–1900; LSI III.II: 290). In 1939, Kauffmann published an ethnographic article on the western Sangtam with some texts of songs, a German-Sangtam wordlist, and a short grammar sketch (Kauffmann 1939). Marrison's Sangtam wordlist was elicited in Guwahati (Assam) from a speaker of the western division in 1963 (1967: II: 333, 366). The NBP Hindi-Sangtam-English dictionary (Kumar 1973a) appears to be the only published dictionary of Sangtam, though the particular dialect it represents is unknown. The most precise transcriptions of Sangtam come from Weidert's fieldwork (1987), though he presents only ~60 forms. The most recent published work on Sangtam is a brief examination of kinship terms that uses the standard Sangtam orthography (Bouchery & Sangtam 2012).

The phonemic inventory of Sangtam is presented in §III.2.2.

[8] An alleged third division referenced in older literature, the 'Southern Sangtam' of the Kohima district (e.g. Marrison 1967: II: 366), is a linguistically separate group now known as the Pochury/Pochuri of the Phek district (which was carved out of the Kohima district in 1973). (See Weidert 1981: 29 [n.3], Bouchery & Sangtam 2012: 9 [fn.1], Burling 2003: 186.)

[9] A Sumi (formerly 'Sema') exonym.

[10] A Sumi exonym.

I.2.4. Yimchungrü

Yimchungrü (or 'Yimchunger' [11]) is spoken by approximately 92,000 people (Government of India 2010), principally in the Tuensang and Kiphire districts. Marrison notes that six dialects are reported in the 1961 Census of India: 'Chirr', 'Minir', 'Pherrongre', 'Tikhir', 'Wui', and 'Yimchunger' (1967: II: 372).

Of all the Central Naga languages, Yimchungrü is the least-studied. The first wordlist of 'Yachumi' (apparently a Sumi exonym; Hutton 1921: 377) appeared in the LSI, also collected by Captain A.E. Woods in 1899–1900 (LSI III.II: 290). Marrison's Yimchungrü data was extracted from two Gospel translations based on the dialect spoken around the village of 'Yimstung-Aenr' (1967: II: 334, 372–373). The only dictionary is published by NBP (Kumar 1973b), and does not indicate the provenance of the data. Finally, the most precise transcriptions again come from Weidert (1987), who provides only ~97 forms from some unknown dialect of Yimchungrü.

The phonemic inventory of Yimchungrü is presented in §III.2.3.

I.2.5. Language Contact

With so many diverse languages in a small area (16,579 km^2; Government of India 2010),[12] Nagaland is a hotbed of language contact. Speakers of a given lect, especially those living in border regions, have historically interacted with speakers of 1) other varieties of the same language, 2) surrounding Tibeto-Burman languages, and 3) Indic, Khasic (Mon-Khmer), and Tai languages (through trade in the plain of Assam and the resettlement of outsiders in Nagaland). In addition, an 'imperfectly learned' variety of Assamese known as 'Nagamese' is utilized as a lingua franca throughout Nagaland (Coupe 2007a; GMA: 4–6; also see Boruah 1993), and English is the official state language and medium of instruction in schools (Government of Nagaland 2008, 2013). Such intensive contact has undoubtedly resulted in various lects influencing each other across the spectrum of borrowing, from simple lexical loans to language mixing. Coupe has provided evidence that the agentive marker of standard Chungli, for example, was originally borrowed from the neighboring Chang language (Northern Naga) (2007a: 356–357). The phenomenon of language contact in Nagaland warrants a full treatment

[11] The alternate names presumably reflect some sort of variation involving metathesis of the final syllable.

[12] By way of comparison, the land area of New Jersey is larger, with 19,437 km^2 (State of New Jersey 2013).

that cannot be provided here, though the results of such a study will undoubtedly lead to revisions of the Proto-Central Naga reconstruction presented in this work.

The following list illustrates some apparent lexical loans into CN languages from various TB and non-TB sources, categorized by donor family:

Other CN lects:

Mangmetong/Khensa Mongsen **[a]-ji** 'rice beer' <? Chungli **ji²** 'rice beer'

Chungli **a³-kuʔ¹** 'be bitter' <? Lotha **kho²-** 'be bitter'

Chungli **jaŋ²ku²** 'bag' <? Lotha **jaŋ³khoʔ³** or Mangmetong Mongsen **hjaŋkhu** 'bag'

Other TB languages:

Chungli **mə³tʃaŋ³** 'sleep' < Karbi *-mék jáng-* 'sleep' ('eye' + 'sink/fall') (Grüssner 1978: 206)

Indic:

Chungli **ka¹kət³**, Mangmetong Mongsen **kákát**, Lotha **ka¹koʔ³**, Sangtam *kakün* 'book' < Assamese *kakot* (Xobdo 2013) or Hindi *kāgada* 'paper' (Shabdkosh 2013)

Chungli **kuɹ¹**, Lotha **ku¹rə¹**, Sangtam *kuri* 'horse' < Nagamese *gʰurā/gurā* 'horse' (Boruah 1993: 105)

Chungli **si¹ti²**, Mangmetong Mongsen **sìti**, Sangtam *shüti* 'letter (correspondence)' < Nagamese *sitʰi* 'letter' (Boruah 1993: 107)

Khasic:

Mangmetong Mongsen **màsàʔ** 'domestic ox', Chungli **na¹siʔ¹**, Sangtam **²mi²sɯ**, Yimchungrü **¹mo¹ši** 'cattle' < Khasi *masi* 'cow' (Singh 1906: 129) or Proto-Khasic ***məsi** COW (Sidwell 2012: R: 390)

Mangmetong Mongsen **tsàhŋi** 'sun' <? Khasi *sngi* 'sun; day' (Singh 1906: 188) or Proto-Khasic ***sŋi** SUN (Sidwell 2012: R: 31.A)

Tai:

Chungli **tʃu³pa¹**, Mangmetong Mongsen **tʃuphà**, Sangtam *yangthsaba* 'king' <? Ahom **chau** 'term of respect' + **pha** 'king' (Morey 2010: 252.3, 437.2)

I.3. Subgrouping

I.3.1. 'Naga'

It is essential to note that 'Naga' is a collective geographic/cultural (not linguistic) term for the various people groups in the hills between the valleys of the Brahmaputra and Chindwin rivers, north of the Manipur valley (Hutton 1922: xvi). Despite their names, Northern Naga (NN) and Central Naga (CN) are not subgroups of a 'Naga' branch, though they are both Tibeto-Burman groups. Northern Naga (also called 'Konyak') is posited as a member of the 'Sal' (or 'Bodo-Konyak-Jinghpaw') subgroup of Tibeto-Burman with Bodo-Koch and Jingpho/Jinghpaw (Burling 1983, 2003; French 1983), but appears to have no close relationship with Central Naga (see Chapter IV). With the exception of the Northern Naga group, the higher affiliations of the 'Naga' languages within Tibeto-Burman are unknown (see Figure 4 below), though previous classification attempts have placed them in a dubious 'Kuki-Naga' subgroup of TB (e.g. STC). The STEDT Project simply categorizes all the 'Naga' languages under a purely-geographic 'Northeast India' placeholder (the erstwhile 'Kamarupan'; HPTB: 5–6).

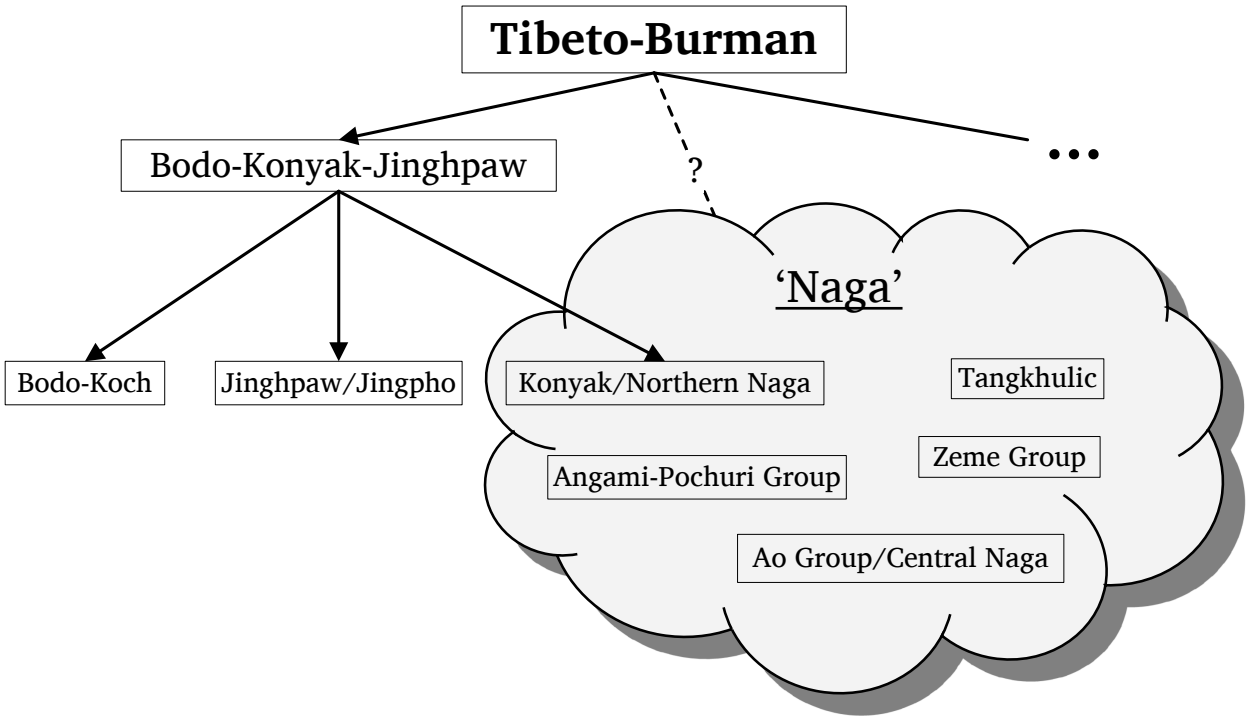


Figure 4: The 'Naga' groups in Tibeto-Burman

The origin of the term 'Naga' has been the subject of much speculation. Hypotheses include (but are not limited to):

1. Assamese **noga** 'naked' (< Sanskrit **nagna**)
   (Dalton 1872: 38; Hutton 1921: 5 [fn.1]; Hutton, writing in Mills 1926: 1 [fn.1]; Marrison 1967: I: 14; cf. Hutton 1965: 17)
2. Assamese **noga** 'mountain' (< Sanskrit **naga**) (Hutton 1921: 5 [fn.1]; Hutton 1922: xvi [fn.2]; Marrison 1967: I: 13)
3. Dimasa **naga** 'young man, warrior (Marrison 1967: I: 13)
4. Sanskrit **nag(a)** 'snake' (Dalton 1872: 38–39)
5. Jingpho **na** 'ear' + **ga** 'split (v.)' (Wayesha 2010: 1–2)

Whatever its ultimate origin, the term 'Naga' has since been adopted by the people themselves and also has a central role in the Naga nationalist movement (Baruah 2003).

I.3.2. Historical Overview

The earliest genetic grouping of the Central Naga languages was proposed by Brandreth, who categorizes Lotha with various Mongsen and Chungli Ao dialects in his 'Class XII' (1878: 21, 31). Damant also groups Ao ('Hatigorria') with Lotha, though also with Sumi, calling this the 'Central Naga Family' (1880: 246). In the later Linguistic Survey of India, Sumi is recognized as having a closer relationship with Angami, and the Central Naga group as containing the Ao lects,[13] Lotha, Sangtam, and Yimchungrü (the latter two languages having been first documented in 1899–1900; LSI III.II: 290). Shafer's much later analysis (1950, 1955) also yields this group, which he terms the 'Northern Naga Branch of 'Kukish.'[14]

Marrison's (1967) typological study of the languages of Nagaland concludes by placing the Ao lects with Sangtam in 'Type B-1' but categorizing Lotha and Yimchungrü with Ntenyi[15] and Meluri[16] in 'Type B-2'. However, he explicitly notes the similarity of the Type B-2 languages to the Ao lects (1967: I: 263).

[13] The LSI's Central Naga group includes a 'Tengsa' language, which is actually a variety of Ao influenced by Phom (Marrison 1967: II: 367).
[14] Shafer also includes Lepcha ('Rong') in his 'Northern Naga Branch', a classification that is now considered erroneous (Burling 2003: 186). Note that what is now referred to as the 'Northern Naga' or 'Konyak' group (containing Tangsa, Nocte, Wancho, Phom, Konyak, and Chang; cf. French 1983) corresponds to Shafer's 'Nagish Section' under 'Baric' (1953).
[15] Also known as 'Northern Rengma,' an Angami-Pochuri language (Burling 2003: 186; Lewis et al. 2013).
[16] Apparently a dialect related to Pochuri/Eastern Rengma (Angami-Pochuri group) (Burling 2003: 186).

Finally, Burling undertakes a new classification based on lexical comparisons and produces the same grouping as the LSI and Shafer (with the exception of Lepcha), which he re-labels as the 'Ao group' (2003: 184).

Recent work by Alexander Coupe provides additional support for a genetic relationship among Ao, Lotha, and Sangtam (and beyond, to the Angami-Pochuri group), based on the sharing of a typologically rare overcounting numeral system (Coupe 2012a; p.c., 14 July 2012).

The most recent classification of Central Naga is reproduced in Figure 5 (taken from Coupe 2012a: 216, based on Burling 2003: 184). (Note that the 'Ao Group' = Central Naga, and Yacham-Tengsa is a Phom-influenced variety of Ao.)

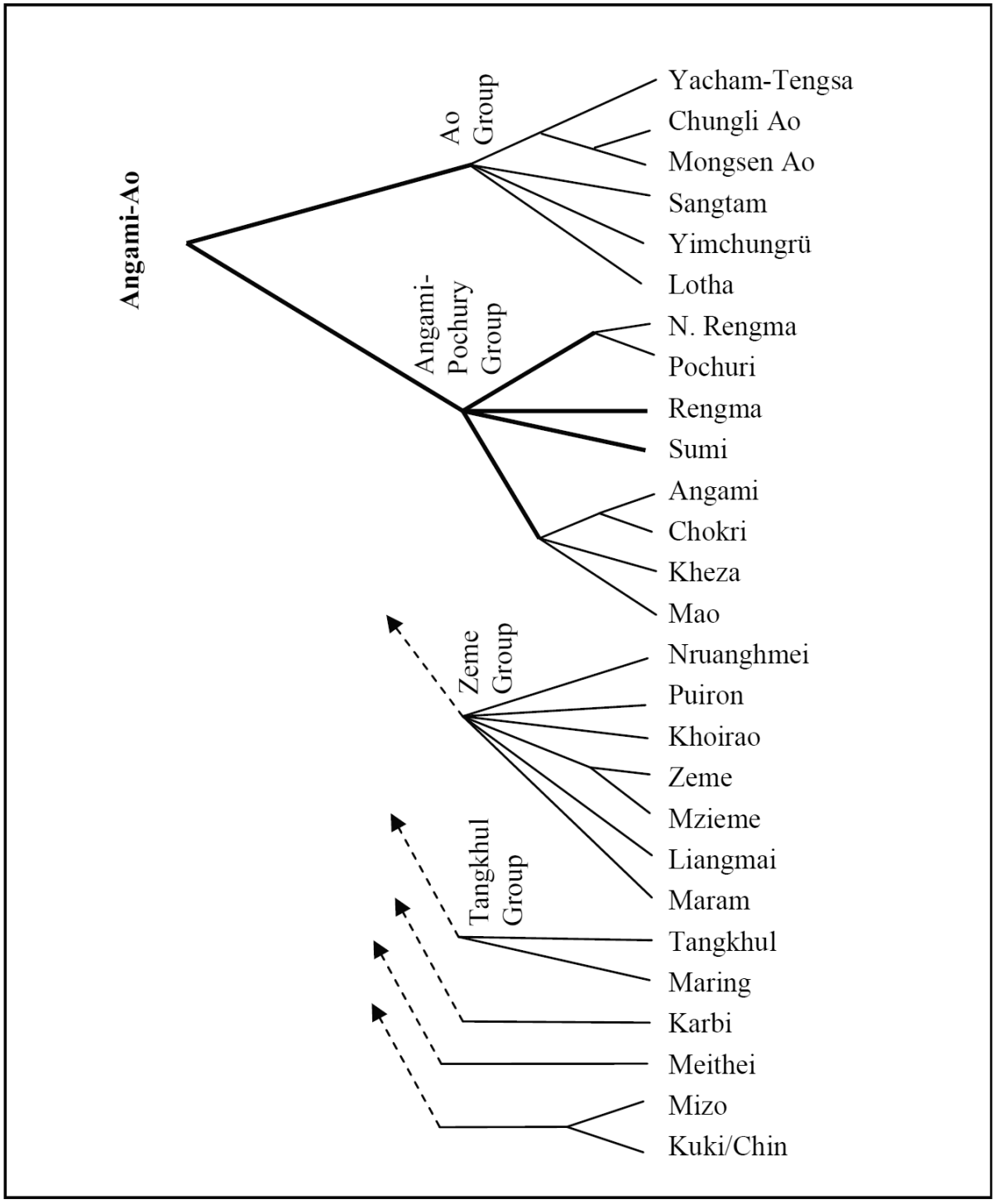


Figure 5: Classification of languages of India's eastern border, including Central Naga[17]

[17] From Coupe 2012a: 216, based on Burling 2003: 184.

I.3.3. Evidence

The challenges of demonstrating a genetic relationship among languages lacking irregular morphology and complex paradigms are well-known (LaPolla 2000, 2012; Nichols 1996: 63), and the agglutinative TB languages of Nagaland are no exception. Moreover, the violent political conflicts taking place in the region since India's independence in 1947 (see Baruah 2003) have resulted in a dearth of reliable data from these languages, a gap which is only now being filled by fieldworkers and native speaker linguists. As a result, the evidence currently utilized to unite this subgroup is admittedly not yet in the category of 'individual-identifying', a criterion for demonstrating statistically probable descent from a common proto-language (Nichols 1996). Nevertheless, that the unity of Central Naga is based on multiple types of evidence is reason enough to consider it a safe presumption for the present. These types of evidence are as follows:

I.3.3.1. Lexical comparison

Though not stated explicitly, the earliest groupings of the Central Naga languages in Brandreth 1878, Damant 1880, and the LSI appear to have been based primarily on surface similarity of cognates and quantity of shared vocabulary, with some consideration of morphosyntactic features.[18] Marrison's analysis of different lexical types in the Naga languages also yields a group containing the Ao lects, Lotha, Sangtam, Yimchungrü, Meluri, and (to a lesser extent) Ntenyi and Puiron.[19] Finally, Burling's classification, which he describes as depending heavily on 'lexical comparison' (without further elaboration; 2003: 182), results in an 'Ao group' that matches the 'Central Naga' of the LSI (and here).

I.3.3.2. Overcounting numeral systems

Coupe has examined the presence of overcounting numeral systems[20] in historical records of Ao lects, Lotha, and Sangtam, as well as various languages of the Angami-

[18] The position of the negative affix/particle with respect to the verb also appears to have been utilized as a classification criterion in the LSI (LSI III.II: 198; Marrison 1967: I: 130).
[19] A Zeme language (Burling 2003: 186), said by Marrison to be a dialect of Rongmei (Marrison 1967: II: 364).
[20] In an *overcounting* system, "a value is expressed in relation to a higher parameter known as the augend" (Coupe 2012a: 205). For example, 16 may be expressed as something like 'the 6 before the 20', with 20 being the augend. In a *subtractive* system, on the other hand, 16 would be expressed as '20 minus 4.'

Pochuri group (Coupe 2012a; p.c., 14 July 2012). He argues that the typological rarity of such systems, which have since been replaced by decimal systems through the efforts of missionary schools, is evidence for shared inheritance from an innovative common ancestor (2012a: 214).

Unique properties of the particular ancestral system cannot be reconstructed, however, since each daughter language starts the overcounting pattern at a different point and the linking verbs between the numeral and augend have not been shown to be cognate across the languages. For these reasons, this discovery remains in the category of 'type-identfying' evidence for now (Nichols 1996), until the details of the proto-system can be reconstructed.

I.3.3.3. Other typological similarities

Marrison also undertook a typological comparison of the Naga languages on phonological, morphological, and syntactic grounds:

> **Phonological:** Marrison's analysis of phonological types splits the Central Naga languages into three separate groups: 1) the Ao lects, 2) Lotha & Sangtam, and 3) Yimchungrü. Even so, he states that the Ao lects have 'phonological affinities' with Lotha, Sangtam, and Yimchungrü, as well as Tangkhul and Maring[21] (1967: I: 57).
>
> **Morphological:** Marrison does not synthesize all his various morphological comparisons into a single set of groupings, but the results of a few categories are summarized follows:
>
> > *Nominal affixation:* Lotha is 'Type A', while the Ao lects, Sangtam, and Yimchungrü are grouped in 'Type B' (1967: I: 114–115).
> >
> > *Position of verbal negative particle:* In all the Central Naga languages, the negative particle precedes the verb.
> >
> > *Type of classificatory verb affixes:* Mongsen Ao resides in category 1 ('nasal only'), while the remaining CN languages occupy category 3 ('a-/e- and nasal').

[21] Maring is classified by Burling and the Ethnologue as Tangkhulic (Burling 2003: 187; Lewis et al. 2013). Mortensen, on the other hand, excludes Maring from core Tangkhulic, but observes: "[I]t seems certain that Maring and the Tangkhul languages do belong to the same top-level branch of the Tibeto-Burman family" (Mortensen 2003: 8).

Syntactic: Marrison also does not synthesize the results of his syntactic comparisons (though he utilizes a subset of the syntactic critera in the final typological classification; 1967: I: 253), noting a 'general similarity of syntactic structures amongst the Naga languages' (1967: I: 250).

I.3.3.4. Shared phonological innovations

Finally, the PCN reconstruction developed in Chapter III supports the genetic unity of Central Naga by identifying several shared phonological innovations from PTB, the four most salient of which are the 1) merger of all back diphthongs to ***-u**, 2) nasalization of ***-r** to ***-n**, 3) occlusivization of ***-s** to ***-t**, and 4) coda-loss and nucleus-reduction in ***l**-final rimes.

Since his idiosyncratic methods and treatment of sources have not been without criticism (cf. Hale 1982: 5–6; HPTB: 2; Burling 2003: 182; Denlinger 1976), it is interesting that Shafer's attempts at working out the 'phonetic equations' (regular correspondences) and 'phonetic shifts' (sound changes) also yielded a Central Naga grouping largely consistent with those already discussed (1950, 1955). Shafer 1950 in particular contains many reconstructions of 'Kukish' (comparable to STC's 'Kuki-Naga') that appear similar to the PTB and/or PCN etyma in this dissertation, despite his necessary reliance on inferior sources.

I.3.4. Central Naga within TB

The proper position of the Central Naga group within Tibeto-Burman is still very much in doubt (see Chapter IV). Various hypotheses have placed it under a dubious 'Naga Group' (LSI), a 'Kukish Section' of the 'Burmic Division' (Shafer 1950, 1955), or a 'Kuki-Naga' group (STC).[22] More recent classifications have adopted a laudable agnosticism with regard to the higher affiliation of Central Naga (e.g. Burling 2003: 184), though Coupe utilizes their shared overcounting numeral systems to link Central Naga (the 'Ao Group') with the Angami-Pochuri group, yielding a new 'Angami-Ao' node (see Figure 5).

[22] Benedict's statement that "no sharp (linguistic) distinction between Kuki and Naga can be maintained" (STC: 10) is challenged by the fact that no 'Naga' language has (yet) been shown to exhibit verb stem alternations, a defining characteristic of the Kuki-Chin languages. The Central Naga group in particular also failed to participate in the occlusivization of PTB ***s(y)-** to ***th-**, another innovation of Proto-Kuki-Chin (VanBik 2009: 9).

I.4. Sources and Conventions

The following subsections present the sources of language data and conventions employed in this dissertation.

I.4.1. Subgroup Name

With regard to name of the subgroup in question, I have chosen to retain the original Damant 1880 and LSI term 'Central Naga' for the following reasons:

1. I am reluctant to add yet another name to the swamp of Tibeto-Burman nomenclature.
2. 'Central Naga' is already recognized in the literature.
3. 'Proto-Central Naga' is less confusing and more euphonious than 'Proto-Ao group' or 'Proto-Aoish'.

The downside of this term is that it conveys the false impression that 'Naga' is a linguistic sub-family, of which 'Central Naga' and the (unrelated) 'Northern Naga' would be subgroups. Future linguists might therefore find it advantageous to completely rename this group with a shared cultural term, as Sun has done for the 'Tani' languages, formerly referred to variously as 'North Assam', 'Abor-Miri-Dafla', 'Mirish', and 'Mishingish' (Sun 1993: 2–4).

I.4.2. PTB

Proto-Tibeto-Burman teleo-reconstructions [23] in this dissertation are taken from Benedict 1972 ('STC'), Matisoff 2003 ('HPTB'), Matisoff 2008 ('TBRS'), and the STEDT database,[24] except where noted in a few cases. Unpublished PTB reconstructions from the STEDT database are followed by a superscript dagger (†).[25]

PTB forms conform to the phonology and transcription system of Proto-Tibeto-Burman developed in HPTB and utilized by STEDT, the main features of which are

[23] 'Teleo-reconstruction' is Benedict's (1973) term for reconstructing the ancestor of a language family based on a selection of daughter languages from different subgroups, thereby bypassing the reconstruction of intermediate proto-languages. (See also HPTB: 8–9.)
[24] Sino-Tibetan Etymological Dictionary and Thesaurus Project (http://stedt.berkeley.edu/search)
[25] These STEDT reconstructions were current as of 3 March 2014.

summarized in the following subsections. (The only deviation from the IPA is the use of **y** for /j/.)

I.4.2.1. Syllable canon

Figure 6 presents the (sesqui-)syllable canon[26] of PTB, as put forward in HPTB (HPTB: 12, 82). Optional components are in parentheses, and tone is enclosed in brackets to indicate its uncertainty:

					[T]			
(P_2)	(P_1)	C_i	(G_1)	(G_2)	V	(:)	(C_f)	(s)

Figure 6: PTB syllable canon (HPTB: 12, 82)

The syllable constituents are as follows:

P_2/P_1	prefixes (***s-**, ***m-**, ***ʔ-**, ***b-**, ***g-**, ***d-**, ***r-**, ***l-**, ***k-**)
C_i	initial consonant (see §I.4.2.2, below)
G_1/G_2	glides/liquids (***-y-**, ***-w-**, ***-r-**, ***-l-**)
V	vowel (see §I.4.2.3, below)
:	vowel length
C_f	final consonant (***-p**, ***-t**, ***-k**, ***-m**, ***-n**, ***-ŋ**, ***-s**, ***-w**, ***-l**, ***-r**, ***-y**)
s	suffix (***-n**, ***-t**, ***-s**, ***-k**, ***-y**)
T	tone

I.4.2.2. Onsets

The following table diagrams the simplex initials of PTB (cf. HPTB: 15):

[26] The term 'sesquisyllable' ('syllable and a half') was introduced in Matisoff 1973 to refer to disyllables in which the first ('minor') syllable is phonologically reduced (1973b: 86). The inclusion of prefixes in the syllable canon of PTB indicates that PTB forms could be sesquisyllabic.

	Labial	*Dental*	*Palatal*	*Velar*	*Glottal*
Nasal stops	m	n		ŋ	
Oral stops	p b	t d		k g	ʔ
Affricates		ts dz			
Fricatives		s z			h
Approximants	w	l r	y		

Table 1: PTB simplex initials (cf. HPTB: 15)

Labial stops sometimes appear with a following superscript / ʷ/ (***p**ʷ-*, ***b**ʷ-*), indicating an etymon with supporting forms that show the effects of 'extrusion' (see HPTB: xxxviii, 61 [fn.86]; Matisoff 2000). A few etyma also contain ***h**ʷ-*, ***k**ʷ-*, ***g**ʷ-*, and ***ŋ**ʷ-* as unit phonemes.

The inclusion of a glide or liquid in the first approximant slot (G_1) yields the onset clusters diagrammed in Table 2 (cf. HPTB: 59):

	Labial	*Dental*	*Palatal*	*Velar*	*Glottal*
-w- clusters:	pw, bw	tw, dw		kw, gw	
	mw	nw		ŋw	
		tsw, dzw			
		sw			hw
		lw rw	yw		
-y- clusters:	py, by	ty, dy		ky, gy	
	my	ny		ŋy	
		tsy, dzy			
		sy, zy			hy
	wy	ly ry			
-r- clusters:	pr, br	tr, dr		kr, gr	
	mr			ŋr	
		sr, zr			hr

	Labial	*Dental*	*Palatal*	*Velar*	*Glottal*
	pl, bl			kl, gl	
-l- clusters:	ml				
		zl			

Table 2: PTB onset clusters (cf. HPTB: 59)

Palatal onsets are conceived of as dental initials followed by the palatal glide ***-y-**. The PTB voiceless palatal affricate, for example, is reconstructed as ***tsy-** instead of ***tʃ-**. (See HPTB: xxxvii, 29–30.)

When an initial is followed by glides/liquids in both approximant slots (G_1, G_2), a double-approximant cluster is created. The following table presents the double-approximant clusters reconstructed for PTB (cf. HPTB: 82):

G_1 / G_2:	*-w-*	*-y-*	*-r-*	*-l-*
-w-				
-y-	pyw, tyw, kyw, gyw tsyw, dzyw syw, hyw		tsyr	
-r-	brw, krw, grw	pry, gry zry		
-l-	glw	ply, kly mly		

Table 3: PTB double-approximant clusters (cf. HPTB: 82)

I.4.2.3. Rimes

The following figure shows the monophthongs and diphthongs of PTB, with marginal rimes enclosed in parentheses (cf. HPTB: 159):

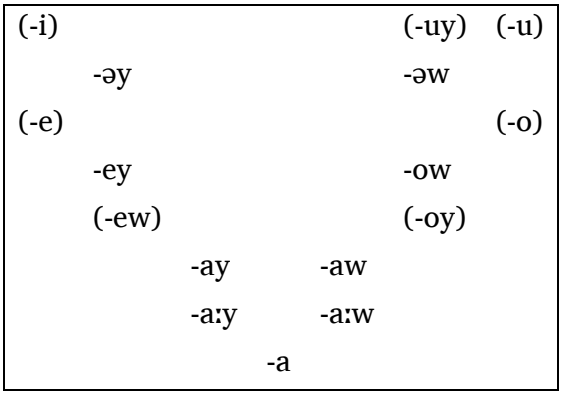


Figure 7: PTB open monophthongs/diphthongs

Benedict's pre-publication version of STC transcribed ***-əy** as ***-iy** and ***-əw** as ***-uw**, in essence reconstructing long monophthongs (HPTB: 159–160). This convention is retained when indicating variation between ***-i** and ***-əy** as ***-i(y)** or between ***-u** and ***-əw** as ***-u(w)**.

The PTB closed rimes are given in the following tables (marginal rimes again enclosed in parentheses):

Nasal-final rimes						*Stop-final rimes*					
-im	—			-um	-uːm	-ip	-iːp			-up	-uːp
(-em)	—			—	—	-ep	—			-op	-oːp
		-am	-aːm					-ap	-aːp		
-in	-iːn			-un	—	-it	-iːt			-ut	-uːt
-en	—			-on	—	(-et)	—			-ot	—
		-an						-at			
-iŋ	-iːŋ			-uŋ	-uːŋ	-ik	-iːk			-uk	-uːk
-eŋ	—			-oŋ	—	-ek	-eːk			-ok	-oːk
		-aŋ	-aːŋ					-ak	-aːk		

Table 4: PTB nasal-final and stop-final rimes (cf. HPTB: 248, 313; STEDT)

*r-final rimes					*l-final rimes				
-ir	-iːr		-ur	-uːr	-il	-iːl		-ul	-uːl
-er	-eːr		-or	-oːr	-el	-eːl		-ol	-oːl
		-ar -aːr					-al -aːl		

Table 5: PTB liquid-final rimes (cf. HPTB: 389, 403; STEDT)

*s-final rimes	
-is	-us
-es	—
-as	

*Table 6: PTB *s-final rimes (cf. HPTB: 431)*

Finally, HPTB notes that in some cases a medial glide acts more like a component of the rime than of the onset (HPTB: 11). The reconstructed co-occurrences of PTB rimes with the ***-w-**/**-y-** medials are listed below for reference:

-w-:	-w[a/i]	-wam -wap	-wan -wat -was -wa(ː)r -w[a(ː)/i/e]l	-w[a(ː)/ə]y	-wa(ː)ŋ -wa(ː)k
-y-:	-y[a/i/e/o/u]	-y[a(ː)/o/ə]w -y[a/i/o/u]m -y[a(ː)/i(ː)/o(ː)/u]p	-y[a/i(ː)/e/o]n -y[a/i(ː)/e/u]t -y[a/i(ː)/e/uː]r -y[a(ː)/i(ː)/e(ː)/u]l	-y[a(ː)/e/ə]y	-y[a/i/e/o/u]ŋ -y[a/i/e/u(ː)]k

Table 7: PTB rimes with glide medials (double-approximant clusters omitted)

I.4.3. Ao

The Chungli Ao data in this dissertation derives primarily from elicitation sessions with two language consultants (2008–2013):[27]

AL: Akum Longchar; female; born 1970 in Impur (Mokokchung District), Nagaland, India; native speaker of Khensa Mongsen and Impur Chungli (≈Mopungchuket Chungli); fluent in Nagamese and English.

The segmental features of the Chungli data herein conform to 'standard Chungli' (the Molung variety) as depicted in Clark 1911 and Temsunungsang 2009a, both of which were consulted to provide additional forms where necessary.

The Mongsen Ao data comes primarily from the variety spoken in Mangmetong village, documented in GMA. This word list is supplemented by several forms from elicitation sessions with AL, a native speaker of Khensa Mongsen—a variety which exhibits the same voiceless sonorant series and general region of use (Ongpangkong range) as Mangmetong Mongsen (GMA: 29). Some data was also drawn from Temsunungsang 2009a, which contains undifferentiated Mongsen forms from Mokokchung (town) and Mangmetong (Temsunungsang 2009a: 5). Forms identified as simply 'Mongsen' in this dissertation are from the Mangmetong variety unless otherwise indicated.

Chungli and Mongsen forms are transcribed using a slightly modified IPA, with voiceless sonorants designated by a preceding *h* (e.g. **hn** /n̥/, **hw** /ʍ/, **hl** /l̥/) and aspiration represented by a non-superscript following *h* (e.g. **ph** /pʰ/, **tsh** /tsʰ/). Tones in Mongsen forms are represented by accents over the vowel nuclei (◌́ = High, ◌ = Mid, ◌̀ = Low), while Chungli tones are indicated by superscript numbers following each syllable (³ = H, ² = M, ¹ = L). Diphthongal offglides are transcribed with the glides **w** and **j** in Mongsen, but **u** and **i** in Chungli, reflecting their disparate syllable structures. (See the discussion in §II.2.2.1.) Coupe encloses Mangmetong Mongsen prefixes in square brackets, e.g. **[a]-tʃa** 'rice (cooked)' (GMA: 495).

Where consultant data was unavailable, some Chungli forms from Clark 1911 appear in the cognate sets. These forms are provided in both the Clark orthography (in FULL CAPS) and my modified-IPA interpretation of Clark's transcription, based on the Chungli phonemic inventory (§II.2.1). (Note that Clark 1911 does not record tones or glottal stops.)

[27] One consultant desired their information to remain undisclosed.

I.4.4. Lotha

The Lotha data comes primarily from elicitation sessions with a consultant (2010–2013):

MK: Mhalo Kikon; female; born 1942 in Tsungiki village (Wokha District), Nagaland, India; native speaker of Lotha; fluent in Nagamese, Assamese, English, and Hindi.

A few forms were also drawn from Murry et al. 1978, Lotha 2004, and Weidert 1987, the last of which is the only source which reports tones.

As with the Ao data, Lotha forms largely conform to the IPA, except in their use of a preceding *h* to designate voiceless sonorants (e.g. **hn** /n̥/) and a following non-superscript *h* to represent aspiration (e.g. **ph** /pʰ/). Superscript numbers following each syllable indicate tones (^{3} = H, ^{2} = M, ^{1} = L).

I.4.5. Sangtam, Yimchungrü

The sources of Sangtam data for this dissertation are Marrison 1967, Kumar 1973a, and Weidert 1987 (the only one to report tones). Only Marrison provides the provenance of his data, noting that he elicited it from a speaker of the Lophomi dialect (i.e., the western division of Sangtam) in 1963 (1967: II: 333, 366).

The sources of Yimchungrü data are Marrison 1967, Kumar 1973b, and Weidert 1987 (the only one to report tones). Again, only Marrison provides the provenance of his data, having extracted the Yimchungrü wordlist from two Gospel translations based on the dialect spoken around the village of Yimstung-Aenr (1967: II: 334, 372–373).

For both languages, forms with tone numbers *preceding* the syllables (e.g. Sangtam **¹a²ñɯ** ‘two’) are from Weidert 1987. Italicized forms (e.g. Yimchungrü *khüh* ‘chest’) are orthographic (non-IPA) lexical items from Marrison 1967 or Kumar 1973a/b. (Where there is a noteworthy discrepancy between Marrison and Kumar, citations are given.) Lexical items from Weidert 1987, Marrison 1967, and Kumar 1973a/b are followed by their IPA transcriptions in brackets where interpretation is required.

The considerable dependence on non-phonemic transcriptions of the Sangtam and especially Yimchungrü data is admittedly a weak point in this dissertation, leaving much room for future work. The NBP dictionaries have come under particular criticism (e.g. Weidert 1981: 2), but much useful data can be extracted from them when paired with more accurate sources, such as Weidert 1987 (cf. discussion in Sun 1993: 19–20).

I.4.6. PAo, PCN

I.4.6.1. Transcription

The phonemic inventories of Proto-Ao and Proto-Central Naga are presented in §II.2.3 and §III.2.4, respectively.

As with Lotha and Chungli, PCN and PAo forms largely conform to the IPA, except in their use of a preceding **h** to designate voiceless sonorants (e.g. **hn** /n̥/) and a following non-superscript **h** to represent aspiration (e.g. **ph** /pʰ/). PAo and PCN transcriptions utilize **j** for /j/ (unlike PTB, which uses **y**).

The syllables of polysyllabic PAo reconstructions are delimited by hyphens when the individual meaning of at least one syllable is understood (e.g. PAo ***t-hna-ɹuŋ*** EAR (PFX-EAR-HOLE) (231)) but by periods when the semantic composition is unclear (e.g. PAo ***mən.ti*** CORN (30)).

I.4.6.2. Variation, ambiguity

Proto-segments inside parentheses or separated by the allofam symbol (⩙) indicate *variation* (e.g. PCN ***a-ma(ŋ)*** BE DARK [197], PCN ***mjak*** ⩙ ***hmik*** EYE [234]). Forms in allofamic variation ('co-allofams' / 'members of the same word-family') are more than simply non-cognate (near-)synonyms (such as PCN ***ki*** [64] and ***a-tʃə*** [97], both meaning WATER). Rather, co-allofams are presumed to be the vestiges of an original relationship, possibly involving morphological processes, borrowing of related forms from different languages, or proto-dialect mixture (cf. Matisoff 1978a: 16–19 for more discussion). In sets where the PAo/PCN form unambiguously reflects a single allofam of a PTB etymon with multiple variants separated by the allofam symbol, the relevant PTB allofam is underlined (e.g. PCN ***siŋ*** WOOD < PTB ***siŋ*** ⩙ ***sik*** TREE / WOOD [211]).

Ambiguity, on the other hand, is indicated by square brackets containing a single element (e.g. PCN ***[h]muk*** THUNDER [262], ambiguous between ***hmuk*** and ***muk***) or a slash separating two or more segments (e.g. PCN ***tsh[a/ə]m*** MORTAR [150], a set which lacks the necessary supporting forms to decide between ***tsham*** or ***tshəm***). The only exception to this practice involves Proto-Ao forms in which the rime is ambiguous between ***-a*** and ***-aj***: These are typically reconstructed as PAo ***-a***, except where extra-Ao evidence (PCN and/or PTB) supports the ***-aj*** diphthong, in which case the PAo rime is represented as ***-a[j]***.

The few completely indeterminate segments are represented with $C_?$ (for a consonant) and $V_?$ (for a vowel). (C and V lacking the subscript question marks are

placeholders meaning ‘any consonant’ and ‘any vowel’.) Reconstructions considered somewhat speculative are followed by question marks.

I.4.6.3. Prefixes

PCN and PAo consonant-initial prefixes are concisely represented in the reconstructions as a consonant separated from the root (or another intervening prefix) by a hyphen: e.g. PCN ***th-njaːm** FIFTY [117], PAo ***m-jəm** LOVE (293), PAo ***t-ph-la[j]** NAVEL (345). Such forms may have been pronounced sesquisyllabically in PCN and/or PAo (i.e., with the prefix produced as a minor, toneless **Cə** syllable). However, it is important to note that no attested daughter language is analyzed as containing sesquisyllables, though in Ao lects the reflexes of the prefixes are vocalized with a weak schwa, which undergoes sporadic harmony with the root vowel (cf. GMA: 53).

A prefix that appears in a particular PCN reconstruction is not necessarily reflected in all reflexes of that etymon. A PCN prefix is generally reconstructed when it appears in at least two reflexes. The conventions for reconstructing Proto-Ao prefixes are described in §II.1.2.2.

I.4.6.4. Set numbers, glosses, supporting forms

Proto-Ao set numbers are given in parentheses, while PCN set numbers appear in square brackets. Each proto-language is numbered independently (e.g. (2) is PAo ***hmapa** WORK, JOB and [2] is PCN ***m-ph(w)a** FOOT (PART)).

When a single reconstruction has multiple proto-glosses, commas separate (near-)synonymous senses (e.g. PCN FEMALE, WOMAN [34] and PCN BE QUICK, QUICKLY [245]), while slashes delimit senses with a greater semantic distance (e.g. PCN HEART / BE ROUND [231]). Distinct reconstructions with identical proto-glosses are differentiated by a subscript number on the proto-gloss (e.g. PCN ***ki** WATER_1 [64] vs. PCN ***a-tʃə** WATER_2 [97]).

PCN reconstructions with stative verb proto-glosses (e.g. BE NEW [160], BE SOUR [167]) are reflected by verbs in Ao and Lotha (‘be new’, ‘be sour’), and likely also in Sangtam and Yimchungrü. (Weidert 1987 glosses all adjectives as ‘to be X’, but Marrison 1967 and Kumar 1973a/b do not indicate how adjectives should be interpreted in the grammatical system of either language.)

The lack of a gloss for a supporting form in a cognate set indicates synonymy with the proto-gloss.

Where a PTB teleo-reconstruction has an attested reflex in only one Ao lect, the intermediate Proto-Ao form has been interpolated based on the PTB form and its attested reflex.

If a supporting form has more than one root syllable, the portion relevant to the particular reconstruction is underlined (e.g. PAo ***t-<u>hna</u>-ɹuŋ** < PCN ***hna*** EAR [7]). Morpheme glosses sometimes follow in parentheses where the root in question (indicated by 'm') is part of a compound with known elements: e.g. Lotha **<u>han¹</u>-poŋ³** 'rooster' (m-male) in PCN CHICKEN [165].

I.4.7. Miscellaneous General Conventions

All apparent instances of the back vowel [ɑ] in this dissertation are simply a typographical feature of italicizing [a] (e.g. *ɑ*; cf. Thomason 2008).

The term 'vowel reduction' throughout this work refers to the diachronic phonemic process of centralization and merger with the schwa phoneme (present in all Central Naga vowel inventories, including PCN), not to a surface phonetic process (though the phonetic process is certainly the original source of the phonemic sound change).

Double asterisks (**) indicate an intermediate form reconstructed between canonical language stages (e.g. between PTB and PCN or between PCN and Lotha). Double asterisks before a segment in a discussion designate that segment as belonging to an intermediate form (even if the particular segment will not itself undergo changes before the next language stage).

A prefix that appears in a particular PTB reconstruction is not necessarily reflected in all reflexes of that etymon. For example, many PTB etyma appear with instances of prefixes that completely dropped out before the Central Naga stage (e.g. PTB ***r-luŋ*** STONE > PCN ***luŋ*** STONE [229]).

CHAPTER II. PROTO-AO

II.1. Introduction

II.1.1. Purpose & Organization

This chapter presents a reconstruction of the phonemic inventory and lexicon of Proto-Ao, the hypothetical ancestor of the Tibeto-Burman lects Mongsen Ao and Chungli Ao, spoken in the Mokokchung district of Nagaland state in northeast India. The analysis here examines their historical development from Proto-Tibeto-Burman through Proto-Ao to Mongsen and Chungli, the two primary daughter lects of PAo.

The next subsection (§II.1.2) discusses some theoretical issues in reconstructing PAo, while §II.2 contains the syllable canons and phoneme inventories of PAo and its daughter lects. The full results of the PAo reconstruction are presented in §II.3–§II.5: onsets in §II.3, rimes in §II.4, and tones in §II.5. The chapter is then concluded in §II.6.

Appendix C lists and categorizes the PAo > Mongsen/Chungli sound changes established, which are summarized in tabular format in Appendix E. Appendix F contains an index of Proto-Ao reconstructions sorted by proto-gloss.

II.1.2. Issues in Reconstruction

II.1.2.1. Phonemic analysis

A significant factor in reconstructing any proto-language is the phonemic analysis one adopts for its daughter languages. In both Mongsen and Chungli, the consonants [s] and [ʃ] appear in complementary distribution, suggesting an analysis in which the phoneme /s/ surfaces as [ʃ] before the high front vowel /i/ but elsewhere as [s]. Comparing Mongsen and Chungli cognates with initial /s/ yields two correspondence sets, however, namely **sa** : **sa** and **sa** : **si** [ʃi]. These correspondences are best explained by positing separate /s/ and /ʃ/ phonemes in Proto-Ao and reconstructing ***sa** for the first set but ***ʃa** for the second (which became Mongsen **sa** but 'brightened' the vowel in Chungli to become **si** [ʃi]). Thus, although PAo ***ʃ** has merged with ***s** to become a single phoneme /s/ in both daughter lects, the retention of [ʃ] in Chungli as an

allophone of /s/ serves as a clue that /s/ and /ʃ/ may have been separate phonemes at one time in the history of the language. (This is discussed in further detail in §II.3.2.1.)

II.1.2.2. Prefixes

Another complex issue in Ao is the treatment of prefixes, particularly the ubiquitous **a-** verbal/nominal prefixes, whose reconstruction is discussed in the sections below. In general, disyllabic Mongsen-Chungli cognates in which the first syllable has an open schwa rime are also reconstructed with a prefix at the Proto-Ao level (e.g. Mo **ɹənəm** : Ch **ɹə²nəm²** < PAo ***ɹ-nəm** BE/GET READY (262)). In many cases, this practice is corroborated by the appearance of a prefix + root (or bare root) cognate in PTB or another Tibeto-Burman language.

*Verbal ***a-***

In Chungli, nearly 40% of all verb roots appear with a semantically empty, underlyingly toneless **a-** prefix in certain morphological contexts but not in others. This phenomenon is illustrated by 'go' in Table 8:

ROOT: *u² 'go'*	***a-** prefix*		*no prefix*	
	a²-u²	'went' (PAST)	u²-aŋ²	'go!' (IMP)
	a²-u²-əɹ³	'goes' (PRES)	u²-taɹ³²	'is going' (IMMED)
	a²-u²-tsə³	'will go' (IRR)	u²-tak²tsəʔ³	'caused to go' (CAUS)
	a²-u²-paʔ³	'going' (NOM)	u²-u³ku²	'has gone' (PRES.PERF)
	a²-u²-taŋ³	'while going' (CONTEMP)	u³-nə¹	'wanted to go' (DESID)
	m-a²-u²	'didn't go' (NEG)	tu¹-u²	'don't go!' (PROHIB)
			u²-ti²	'let's go!' (HORT)
			u²-taŋ²	'tried to go' (CONATIVE)

*Table 8: Chungli **a-** prefix environments*

The Mongsen cognates of these Chungli 'A-stem' verbs overwhelmingly lack an initial **a-**, e.g. Ch **a²-tən²** : Mo **tən** 'sang'; Ch **a²-si²** : Mo **sa** 'said'.[28] T. Temsunungsang analyzes this phenomenon synchronically, hypothesizing that certain Chungli verbs ('bound forms') undergo 'vowel augmentation' to satisfy a verbal disyllabic minimality constraint that Mongsen lacks (Temsunungsang 2009a: §3.5). While this proposal is an attractive approach for analyzing Chungli phonology in isolation, it does not address

[28] The only exception discovered so far is Ch **a³-sək¹** : Mo **atshák** 'feel cold' (181).

the origin of the **a-** prefix, which exhibits occasional correspondences with other Central Naga verb prefixes (Lotha **e^{1}-**, Sangtam **a-**, Yimchungrü **a-**). The sporadicity of the correspondences may point to areal diffusion as the means by which this prefix spread throughout the Central Naga languages (cf. §III.4.1).

In a number of other Chungli verbs, a disyllabic root bears a non-prefixal /a/ in all morphological contexts. These verbs are identified by their failure to drop the initial /a/ in any of the 'no prefix' environments listed in Table 8 above: e.g. **a^{1}ləp^{2}-aŋ^{2}** 'wrap!' (wrap-IMP). The Mongsen cognates of these forms either bear or lack a corresponding initial /a/ (unpredictably), as illustrated by the two sets of correspondences in Table 9:

Ch a : Mo a			***Ch a : Mo Ø***		
Chungli	*Mongsen*	*gloss*	*Chungli*	*Mongsen*	*gloss*
a^{3}nək^{3}	anik	'be soft'	a^{3}ni^{3}	nì	'lead'
a^{3}pak^{3}	apak	'be flat'	a^{2}səm^{2}	səm tsə	'run'
a^{3}rək^{1}	ahɹək	'drown'	a^{2}maŋ^{2}	maŋ	'believe'
a^{3}kət^{1}	akhət	'cough'	a^{2}ŋa^{2}	hŋa	'hear'
a^{3}ta(ʔ)^{3}	ata	'await'	a^{3}li^{1}	hlì	'buy'
a^{3}tʃət^{3}	atʃət	'squeeze'	a^{3}ru^{1}	ɹà	'come'
a^{2}tʃi^{2}	atsə	'look at'	a^{3}tsəʔ^{1}	tshəʔ	'pull'
a^{3}saʔ^{1}	asáʔ	'be deliberate'	a^{2}rə^{2}	hɹə	'sew'

Table 9: Cognate sets with Chungli non-prefixal /a/

The three major patterns of Ao **a**- prefix/initial correspondence are summarized as follows:

Corr. #	*Chungli*	*Mongsen*	*Example*
1	**a**- prefix	no initial /a/	'die': Ch **a^{2}-sə^{2}**, Mo **sə**
2	initial /a/	no initial /a/	'buy': Ch **a^{3}li^{1}**, Mo **hlì**
3	initial /a/	initial /a/	'squeeze': Ch **a^{3}tʃət^{3}**, Mo **atʃət**

*Table 10: Ao **a**- prefix/initial correspondences*

The question of how to reconstruct these correspondences in Proto-Ao is not one with an easy answer, especially given the high possibility of areal diffusion as the means of

transmission. The following diachronic scenario, however, will serve as the working hypothesis of this chapter:

1. Proto-Ao adhered to a minimality constraint requiring disyllabic verbs (the same constraint proposed for Chungli in Temsunungsang 2009a). PAo verbs were therefore a mixture of disyllabic roots (those with /a/-initials are represented by Correspondence #3) and monosyllabic roots augmented with an **a**- prefix (Correspondences #1 and #2).

2. The minimality constraint became inoperative in the Mongsen branch, which subsequently (or concurrently) jettisoned the **a-** prefix (but retained the /a/-initial in disyllabic roots). Hence, the preponderance of monosyllabic verb stems in Mongsen.

3. Chungli continued to adhere to the disyllabic minimality constraint and therefore preserved both the **a-** prefix and the /a/-initial in disyllabic roots. In some cases (Correspondence #2), **a**-prefixed verb roots sporadically underwent morphological reanalysis in which the **a-** prefix was re-interpreted as the initial syllable of a disyllabic root.

The means by which the aforementioned reanalysis took place is not hard to imagine, given that modern speakers of Chungli sometimes have difficulty remembering whether the initial /a/ of a particular verb is a prefix or part of a disyllabic root (and, consequently, whether to drop the /a/ in the 'no prefix' environments of Table 8).[29] The only correspondence of the Chungli **a-** prefix with Mongsen initial /a/ (FEEL COLD (181)) is likely a case of reanalysis in the opposite direction: the PAo /a/-initial disyllabic verb root was reanalyzed in Chungli as bearing the **a**- prefix. The rarity of these cases may be simply due to the scarcity of PAo /a/-initial verb roots in the first place.

Correspondences #1 and #2 are indicated in the Proto-Ao reconstructions by the presence of an **a-** prefix separated from the verb root by a hyphen (e.g. ***a-sə** DIE (101)), while Correspondence #3 is reconstructed as a disyllabic PAo verb root bearing an /a/ initial (e.g. ***a.tʃət** SQUEEZE (158)).

[29] This confusion occurs despite the fact that the /a/-initial (not **a**-prefixed) verb roots are a very small set in Chungli, constituting less than 10% of the verb roots collected so far. However, the psychological prominence of this set likely comes from the presence of such verbs as 'come', 'buy', 'run', 'look at', and 'believe'.

*Nominal *a-*

The verbal **a-** prefix should not be confused with another **a-** prefix that appears on certain nouns, most often in Mongsen. Temsunungsang again analyzes this as a case of vowel augmentation, this time to satisfy a disyllabic minimality constraint on Mongsen nouns (2009a: 72–74). Coupe, on the other hand, simply labels **a-** as a 'non-relational prefix' and notes that the nouns on which it appears are predominantly cultural artifacts and natural objects (GMA: 248). The Chungli cognates of Mongsen **a**-prefixed nouns vary unpredictably in their preservation of the prefix (e.g. Mo **[a]-hŋáʔ** : Ch **a^{3}-ŋuʔ^{1}** 'fish' vs. Mo **[a]-sə́ŋ** : Ch **səŋ^{1}** 'wood'). In a few rare cases, Chungli preserved the prefix while Mongsen lost it (BILE / GALL BLADDER (102), NIT (186), SHADOW / SOUL (228), INTESTINES (304)). For the Proto-Ao reconstructions in this paper, the PAo ***a-** nominal prefix is unambiguously reconstructed only when both lects exhibit reflexes (e.g. ***a-hŋaʔ** FISH (265)). In cases where the Chungli or Mongsen reflex has dropped it, the PAo prefix is enclosed in parenthesis (e.g. ***(a-)səŋ** WOOD (115)).

*Nominal *t-*

Matisoff dubs Ao an 'odontophiliac' language due to its 'special fondness for dental prefixes' (HPTB: 141). A large number of correspondences support the reconstruction of a ***t-** nominal/numeral prefix at the PAo level. This prefix may have descended from the PTB ***d-** prefix in at least one case (SIX (314)), but otherwise appears to have been secondarily distributed throughout the language.

*Verbal/Nominal *m-*

Many PAo verbs and some nouns are reconstructed with ***m-** prefixes (from the PTB ***m-** prefix; cf. HPTB: 117): e.g. ***m-lən** EXCHANGE (369), ***m-lət** LEECH (WATER) (368)). The meaning and function of these prefixes, however, is unknown.

Other prefixes

Other rare Proto-Ao prefixes are ***ɹ-**, ***p-**, ***ph-**, and ***th-**, which appear only in the following reconstructions:

Prefix	*Reconstructions*	
***ɹ-**	***ɹ-nəm** BE/GET READY (262)	
***p-**	***p-ɹi** BE ENOUGH (311) ***p-la** BE HAPPY (342)	***t-(p-)ɹəm** WAIST (321)
***ph-**	***ph-ɹuk** SOW, SCATTER (313) ***ph-ləj** FOUR (328)	***ph-ləm** BE TIRED (366) ***t-ph-la [j]** NAVEL (345)
***th-**	***th-ja** LUCK, FORTUNE (281) ***th-ni** ≷ ***th-nət** SEVEN (248) ***th-ɹa** (TIMES) TEN (307)	***th-ku** NINE (59) ***th-nəm** FIFTY (261)

Table 11: Rare PAo prefixes

The meanings of these prefixes are unclear, though it can be noted that ***th-** appears with several numerals.

II.2. Phonology

This section presents the phonologies of Proto-Ao (§II.2.3) and its daughter lects (Chungli in §II.2.1 and Mongsen in §II.2.2).

II.2.1. Chungli

The phonology of 'standard' Chungli Ao presented here is based on my work with two speakers and is corroborated in large part by Temsunungsang 2009a.

II.2.1.1. Syllable canon

The following diagram and table (modeled on GMA: 23) present the syllable structure of Chungli Ao. A syllable minimally consists of an obligatory vowel produced with a particular tone:

$$\sigma = (C_1)\ V_1\ (V_2)\ (C_2)\ T_1\ (T_2)$$

(C_1)	*V_1*	*(V_2)*	*(C_2)*	*T_1*	*(T_2)*
p t k					
m n ŋ	i u	i u	p t k ʔ	3 (High)	3
tʃ [ts, tʃ]	ə		m n ŋ	2 (Mid)	2
s z (h)	a		ɹ	1 (Low)	1
w l ɹ j					

Table 12: Chungli phonotactics

Note, however, that not all possible combinations of the components in Table 12 are attested syllables in Chungli.

Many Chungli words are combinations of prefix + root syllable(s) (e.g. **a²-tu²** 'went up', **tə²-paŋ²** 'mouth', **tə²-mə³sən¹** 'liver').

Chungli exhibits a number of disyllabic roots in which the first syllable is a schwa-vocalized formative (e.g. /mə/ or /pə/) and whose tone is generally predictable from the following syllable (e.g. **mə³səp¹** 'suck / kiss', **tə²-pə²la²** 'happy (adj.)' (NOM-be.happy)). Despite the schwa vocalization of the initial syllables, these roots are not considered sesquisyllables, since the initial syllables bear distinct (though often

predictable) tones.[30] (In addition, speakers hum such a root as two separate syllables.) These formatives as analyzed as descending from Proto-Ao prefixal syllables (cf. §II.1.2.2).

When a syllable exhibits two tone levels, the second tone is borne on a sonorant coda (C_2), the second vowel in a diphthong (V_2), or a phonetically lengthened nuclear vowel (V_1) (see §II.2.1.5).

Open and sonorant-final syllables are referred to as *smooth*, while stop-final syllables are *checked*.

II.2.1.2. Consonants

The following table contains the inventory of consonants in Chungli:

	Labial	*Dental/Alveolar*	*Palatal/Pal-alv.*	*Velar*	*Glottal*
Nasal stops	m	n		ŋ	
Oral stops	p	t		k	ʔ
Affricates		[ts]	tʃ		
Fricatives		s, z			(h)
Approximants	w	l ɹ	j		

Table 13: Chungli consonants

All consonants may appear in the syllable onset except the glottal stop, which is restricted to coda position and is contrastive (e.g. **a^{3}-zə^{1}** ‘dog’ vs. **a^{3}-zəʔ^{1}** ‘blood’).

The voiceless glottal fricative /h/ is a rarity in the lexicon, appearing only in **hauʔ^{1}** ‘yes’, **haiʔ^{1}** ‘okay’, **ha^{3}tʃi^{1}** ‘sneezed’ (clearly sound-symbolic) and some loanwords.

The voiceless fricative /s/ is produced as [s], except where it undergoes palatalization to [ʃ] before the high front vowel /i/, e.g. /siʔ^{L}/ → [ʃiʔ^{1}] ‘meat’.

For the status of [ts] in Chungli (which appears to be an allophone of /tʃ/), see the discussion in §II.3.3. Chungli words in this chapter are transcribed as if [ts] and [tʃ] are separate phonemes in order to aid reconstruction.

The voiced dental/alveolar fricative /z/ is followed only by the schwa vowel.

[30] Matisoff states that “Jingpho may be taken as a model sesquisyllabizing language” (HPTB: 98), and Kurabe summarizes the properties of the Jingpho **Cə** minor syllable as follows: “1) it does not bear tones; 2) it is always an open syllable (**gən*); 3) it does not have a consonant cluster as its onset (**grə*); 4) it never occurs word-finally (**gə#*)” (2012: 124).

II.2.1.3. Vowels

Table 14 lists the vowel phonemes:[31]

	Front	*Central*	*Back*
High	i		u
Mid		ə	
Low		a	

Table 14: Chungli vowels

The mid central /ə/ shows the most variability of the vowel phonemes, exhibiting a wide range of subphonemic variations from [ɪ] to [ɯ] depending on the surrounding phonetic environment. Three major allophones can be identified: [ə] and [ɯ], whose distribution is discussed in §II.3.3, and [ɪ/i], which is produced when /ə/ assimilates to an adjacent palatal glide /j/. In prefixal or formative syllables, an underlying schwa is often observed to undergo harmony with the high back vowel of a root syllable, e.g. **tu̲²-kuŋ²** 'neck', **mu̲³luk³** 'basket' (contrast Mongsen **[tə]-khuŋ** 'neck', **məluk** 'basket').

Tautosyllabic diphthongs (/ai, au, ui, ua, əi/) appear in few words and in many cases clearly result from morpheme concatenation. For example, [auk[31]] 'swept' is actually the bound verb root **-uk¹** with the verbal **a-** prefix (which is produced as High before a Low tone). It may therefore be the case that all diphthongs in Chungli are merely the phonetic output of heteromorphemic sequences.

Vowel length is not contrastive in Chungli.

Gowda's phonemic analysis of Chungli vowels (1975: 4–10) includes a contrast between /u/ and /o/. In the speech of my consultants, however, [u] and [o] are simply variant realizations of /u/.[32]

II.2.1.4. Rimes

The following table depicts the nucleus-coda pairings that serve as the underlying rime patterns in Chungli:

[31] Gowda (1975: 4-5) asserts a contrast between /e/ and /ɯ/ in Chungli, but does not provide any relevant minimal pairs. Gowda's analysis of Chungli is addressed in Temsunungsang & Sanyal 2005: 1-2.
[32] Whether [u] and [o] are in complementary distribution is indeterminate.

final / *nucleus*	**-Ø/ʔ**	**-p**	**-m**	**-t**	**-n**	**-ɹ**	**-k**	**-ŋ**
-i-	✓	—	—	—	—	—	—	—
-a-	✓	—	—	—	—	—	✓	✓
-ə-	✓	✓	✓	✓	✓	✓	✓	✓
-u-	✓	—	—	—	—	—	✓	✓

Table 15: Chungli rime patterns

All vowels can appear in open/glottal-final syllables.

Only schwa precedes the bilabial codas **-p**, **-m** and dental codas **-t**, **-n**. The few surface instances of **-it**, **-in**, **-un**, and **-ut** can be analyzed as underlying /jət/, /jən/, /wən/, and /wət/, or as possible loans.

The only underlying rime with an **-ɹ** coda is /-əɹ/. All surface instances of **-iɹ**, **-aɹ**, and **-uɹ** are hetermorphemic, consisting of a vowel-final stem concatenated with **əɹ** (the agentive nominalizer, present tense marker, etc.).

The velar codas **-k** and **-ŋ** can be preceded by any vowel except **-i-**.

II.2.1.5. Tones

Chungli's register tone system[33] exhibits three levels: Low (L), Mid (M), and High (H). Smooth syllables may be produced at any of these three tone levels, while checked syllables are restricted to appearing with H or L tone (cf. Temsunungsang 2009a: 13).

Most syllables bear only a single tone, but some tautomorphemic monosyllables do appear with contour patterns of two tone levels, such as HL or LM (e.g. **juk**^{31} 'sent'). However, Temsunungsang 2008 finds that these contour-bearing syllables fall into two categories: 1) obstruent-final, with both tone levels realized on a lengthened vowel nucleus, and 2) sonorant-final, with the second tone realized on the coda:

[33] I.e., consisting of level tones (as in most Bantu languages). This is opposed to a *contour tone system*, in which tone contours are not divisible into combinations of level tones and are therefore considered unit tonemes (as in most Chinese languages). (Note that an unrelated use of the term 'register' refers to the combination of tone and phonation type into a single system, as in Burmese.)

Coda:	obstruent	sonorant
Realization of tone contour:	$\overset{T_1\ T_2}{\backslash\ /}$ (C) V: C	$\overset{T_1\ T_2}{|\ \ |}$ (C) V C

Table 16: Chungli monosyllabic contour tones

Vowels and sonorant codas therefore appear to be the only tone-bearing units (TBU) in Chungli, with vowels lengthening to accommodate a monosyllabic contour tone pattern before a non-tone-bearing obstruent coda. Temsunungsang's analysis, which preserves the status of Chungli tone as a register system, is adopted in this chapter.

Tautosyllabic diphthongs can also bear two tone levels in Chungli and are therefore analyzed as having two vowel components. Most (and perhaps all) of these result from hetero-morphemic concatenation (e.g. **a^{3}-uk^{1}** 'swept').

Various complex tone sandhi patterns occur on syllables (especially verbal affixes) in certain morphological environments. (See Temsunungsang 2009a for a comprehensive analysis of Chungli verb tone alternations.)

II.2.2. Mongsen

This section presents a summary of the syllable canon and phoneme inventory of Mangmetong Mongsen, taken from GMA (chapters 2–3).

II.2.2.1. Syllable canon

The following diagram and table (GMA: 23) present the syllable structure and phonotactic distribution of Mangmetong Mongsen. The only obligatory elements are a vowel and tone:

$$\sigma = (C_1)\ V\ (G)\ (C_2)\ T$$

(C$_1$)	*V*	*(G)*	*(C$_2$)*	*T*
p p^{h} t t^{h} k k^{h}				
ts ts^{h} tʃ tʃ^{h}	i u	w j	p t k	H(igh)
m n ŋ	ə		m n ŋ	M(id)
m̥ n̥ ŋ̊	a (a̱)		ɹ	L(ow)
z s h				
w l ɹ j				
ʍ l̥ ɹ̥ j̊				

Table 17: Mongsen phonotactics (surface)

Mangmetong Mongsen differs from Chungli in the structure of its diphthongs: As reflected in the table above, Mongsen syllables exhibit a single tone level even when the nucleus is a phonetic diphthong (formed by morpheme concatenation). Coupe therefore analyzes these tautosyllabic diphthongs in Mongsen as sequences of vowel plus non-nuclear glide (/w/ or /j/) (GMA: 25–26). Chungli tautosyllabic diphthongs, in contrast, can bear two tone levels (see §II.2.1.5). The offlides of these diphthongs are thus treated as full vowels in Chungli (/u/ or /i/).

Note that the above diagram and table depict the *surface* syllable structure of Mangmetong Mongsen, since a glide only fills the post-vocalic position as a result of morpheme concatenation. Removing the (G) position yields the underlying syllable structure.

II.2.2.2. Consonants

Table 18 presents the inventory of consonant phonemes (based on Table 2.2 from GMA: 28), with Coupe's transcription system shown in parentheses where it deviates from the IPA:

	Bilabial	*Dental*	*Post-alveolar*	*Palatal/Pal-alv.*	*Velar*	*Glottal*
Nasal stops	m m̥ (hm)	n n̥ (hn)			ŋ ŋ̊ (hŋ)	
Oral stops	p pʰ (ph)	t tʰ (th)			k kʰ (kh)	
Affricates		ts tsʰ (tsh)		tʃ tʃʰ (tʃh)		
Fricatives		s z				h
Laterals		l l̥ (hl)				
Approximants	w ʍ (hw)		ɹ ɹ̥ (hɹ)	j j̊ (hj)		

Table 18: Mongsen consonants

All consonants may appear in syllable onset position. Coda position is limited to the phonemes /p, t, k, m, n, ŋ, ɹ/. Coupe also defines a glide position immediately preceding the coda consonant, which can only be filled by the voiced labiovelar /w/ or voiced palatal /j/.

The aspirated bilabial stop /pʰ/ exhibits the free variants [pʰ] and [ɸ] in the speech of some Mangmetong speakers. In addition, both /s/ and /z/ undergo palatalization before /i/ to [ʃ] and [ʒ], respectively. For some speakers, [z] and [ʒ] are in free variation before the high front vowel, while others preserve [z] in all environments (GMA: 30–31).

Coupe also states that /ɹ/ (voiced apical post-alveolar approximant) "is often realized as a sub-laminal retroflex approximant [ɻ], particularly before a non-front vowel" (GMA: 38), and notes at least one instance in which it was produced as a retroflex fricative [ʐ] (GMA: 43).

Coupe treats the voiceless glottal fricative /h/ as a segment unspecified for place of articulation (POA) and comments on its infrequent appearance (GMA: 31–32).

Like Chungli, Mangmetong Mongsen also exhibits a coda-restricted glottal stop, though Coupe chooses to analyze this as a prosodic feature rather than a segment (2003a: 24–27; GMA: 23–25, 50–51, 77–78). For the purpose of reconstruction, however, I treat Mongsen /ʔ/ as a full-fledged segment in cognate sets.

II.2.2.3. Vowels

Table 19 lists the vowel phonemes (Table 2.3 from GMA: 45):

	Front	*Central*	*Back*
High	i		u
Mid		ə	
Low		a a̰	

Table 19: Mongsen vowels

As in Chungli, Mangmetong Mongsen /u/ is realized as [u] or [o]. Coupe remarks that [o] "is mostly realized in the proximity of a velar environment, but this is not consistent enough to be stated as a rule" (GMA: 45).

Also like Chungli, Mongsen /ə/ is susceptible to assimilatory effects and has various allophonic realizations depending on the surrounding phonological environment. In Mongsen, the contrast between /ə/ and /i/ is often neutralized when the vowel is in the initial position of a word (GMA: 46).

Creaky-voice phonation (to be distinguished from the prosodic glottal stop) only appears on the vowel /a̰/, which contrasts with /a/. The creaky /a̰/ phoneme exists in only a few lexical items from Coupe's corpus, always following a labiovelar approximant (/w/ or /ʍ/): **wa̰pət** 'slope', **[a]-hwá̰?** 'bamboo sp.', **hwa̰-tsə** 'bamboo sap', **wà̰-pà?** 'to slice', **tə́nəm wà̰pùŋ** 'Great pied hornbill cock', and **tə́nəm wà̰tsə** 'Great pied hornbill hen' (GMA: 46). The historical source of this marginal phoneme is as yet unknown.

Vowel length is not contrastive in Mongsen.

Mongsen has no phonemic diphthongs, but either of the high vowels /i/ and /u/ may be morphologically concatenated to a syllable and fill the glide (G) slot, forming the offglide of a phonetic diphthong.

II.2.2.4. Rimes

The following table depicts the nucleus-coda pairings that serve as the underlying rime patterns in Mangmetong Mongsen (as deduced from GMA):

nucleus \ *final*	**-Ø/ʔ**	**-p**	**-m**	**-t**	**-n**	**-ɹ**	**-k**	**-ŋ**
-i-	✓	—	—	—	—	—	✓	✓
-a-	✓	—	✓ ?	—	—	—	✓	✓
-ə-	✓	✓	✓	✓	✓	✓	✓	✓
-u-	✓	—	—	—	—	—	✓	✓
-a̰-	✓	—	—	—	—	—	—	—

Table 20: Mangmetong Mongsen rime patterns

All vowels can appear in open/glottal-final syllables, and the rare creaky-voiced phoneme /a̰/ is restricted to this position.

As in Chungli, schwa is the only vowel clearly attested before the bilabial codas **-p** and **-m**. Instances of **-ip** and **-im** can be analyzed as underlying /-jəp/ and /-jəm/. The **-am** rime is rare and likely consists of underlying hetermorphemic /a-əm/ sequences. Coupe records only one case of **-um**: **supùj sùlum** ‘attire (attire + ECHO)’ (GMA: 495), which involves some sort of unexplained echo reduplication.

The dental codas **-t**, **-n** also appear to only allow a schwa nucleus. The few transcriptions of **-in** may be underlying /-jən/, and **-an** appears in only one word recorded by Coupe: **an** ‘mustard (the plant)’ (GMA: 495), which may be /a-ən/.

All surface instances of a vowel before **-ɹ** are underlying hetermorphemic /-V-əɹ/ sequences.

The velar codas **-k** and **-ŋ** can be preceded by any vowel in Mongsen (except for the creaky /a̰/)—unlike in Chungli, which prohibits **-ik** and **-iŋ**.

II.2.2.5. Tones

Mongsen has three level tones (Low, Mid, High) and exhibits one tone per syllable. This restriction holds even for tautosyllabic diphthongs (e.g. **tʃhaj** ‘play’, produced with one M tone), which Coupe analyzes as sequences of vowel + non-nuclear glide (see §II.2.2.1).

The H tone in Mangmetong Mongsen appears ‘relatively infrequently in lexical roots’ (GMA: 58), and is much less common than in Chungli (Coupe, p.c., 20 February 2010).

As in Chungli, Mongsen exhibits complex tone sandhi, discussed in Temsunungsang 2009a and GMA: §3.

II.2.3. Proto-Ao

This section presents the reconstructed syllable canon and phoneme inventory of Proto-Ao.

II.2.3.1. Syllable canon

A Proto-Ao syllable minimally consists of a vowel produced with a particular tone:

$$\sigma = (C_1)\ (G_1)\ V\ (G_2)\ (C_2)\ T$$

(C_1)	*(G_1)*	*V*	*(G_2)*	*(C_2)*	*T* [34]
p pʰ t tʰ k kʰ					
m m̥ n n̥ ŋ ŋ̊	w j	i u	j	p t k ʔ	⋮
ts tsʰ tʃ tʃʰ		ə		m n ŋ	2
s z ʃ ʒ x ɣ		a		ɹ	⋮
w l ɹ j					
ʍ l̥ ɹ̥ j̊					
h					

Table 21: Proto-Ao phonotactics

As with its daughter lects, not all possible combinations of the components in Table 21 are reconstructed syllables in Proto-Ao. In particular, the only reconstructed clusters of initial + glide are ***p(h)w**, ***t(h)j**, and ***lj**. The consonants ***p**, ***m**, ***t**, and ***n** appear as codas only in syllables whose vowel nucleus is ***ə**. Finally, when ***j** occupies the pre-final glide slot (G_2), the only allowable codas are null or ***ʔ**.

Proto-Ao prefixes were likely all vocalized with a weak schwa nucleus and are represented in the reconstructions as a consonant separated from the root by a hyphen (e.g. PAo ***t-ɹət** BONE, ***m-jəm** LOVE).

II.2.3.2. Consonants

The inventory of Proto-Ao consonants is presented below in Table 22, with the transcription system utilized in this chapter shown in parentheses where it differs from the IPA:

[34] Only one proto-tone (*Tone 2) is reconstructible at this time (see §II.5).

	Labial	*Dental/Alveolar*	*Palatal*	*Velar*	*Glottal*
Nasal stops	m m̥ (hm)	n n̥ (hn)		ŋ ŋ̊ (hŋ)	
Oral stops	p pʰ (ph)	t tʰ (th)		k kʰ (kh)	ʔ
Affricates		ts tsʰ (tsh)	tʃ tʃʰ (tʃh)		
Fricatives		s z	ʃ ʒ	x ɣ	h
Approximants	w ʍ (hw)	l ɹ l̥ (hl) ɹ̥ (hɹ)	j j̊ (hj)		

Table 22: Proto-Ao consonants

The Proto-Ao consonant inventory minimally differs from the Mangmetong Mongsen inventory in its inclusion of the 'palatal' fricatives ***ʃ** and ***ʒ**, a segmental glottal stop, and the velar fricatives ***x** and ***ɣ**.

II.2.3.3. Vowels

Table 23 presents the reconstructed vowel inventory of Proto-Ao, which is equivalent to the Chungli inventory:

	Front	*Central*	*Back*
High	i		u
Mid		ə	
Low		a	

Table 23: Proto-Ao vowels

The two diphthongal vowel + glide sequences reconstructed for Proto-Ao are ***-aj** and ***-əj** (both discussed in §II.4.1.5).

II.2.3.4. Rimes

The following table depicts the rime patterns reconstructed for Proto-Ao:

nucleus \ *final*	*-Ø/ʔ	*-j(ʔ)	*-p	*-m	*-t	*-n	*-ɹ	*-k	*-ŋ
-i-	✓	—	—	—	—	—	—	✓	✓
-a-	✓	✓	—	—	—	—	—	✓	✓
-ə-	✓	✓	✓	✓	✓	✓	✓	✓	✓
-u-	✓	—	—	—	—	—	—	✓	✓

Table 24: PAo rime patterns

All vowels can appear in open/glottal-final syllables.

The two diphthongs reconstructed are ***-aj*** and ***-əj***, which appear only in open or glottal-final syllables.

Only schwa precedes the bilabial codas ***-p***, ***-m***, dental codas ***-t***, ***-n***, and alveolar coda ***-ɹ.***

All vowels can appear before the velar codas ***-k*** and ***-ŋ***.

II.2.3.5. Tones

The reconstruction of Proto-Ao tones is not a straightforward endeavor, as the process of establishing regular correspondences yields a system in which nearly every tone in Chungli corresponds to every tone in Mongsen. Only one proto-tone (*Tone 2) is reconstructible at this time, though some additional gains in deciphering the PAo tone system have been made (see §II.5).

II.3. Proto-Ao Onsets

This section presents cognate sets supporting the reconstruction of Proto-Ao onsets (singleton initials and clusters). Oral stops are treated in §II.3.1, fricatives in §II.3.2, affricates in §II.3.3, nasal stops in §II.3.4, glides and liquids in §II.3.5, onset clusters in §II.3.6, and onset-less forms in §II.3.7.

II.3.1. Oral Stops

This section reconstructs the Proto-Ao aspirated and unaspirated oral stops: ***p(h)-**, ***t(h)-**, and ***k(h)-**, whose developments are summarized below:

PAo	*environments*	*Mongsen*	*Chungli*
***p-**	(unconditioned)	**p-**	**p-**
***ph-**	(unconditioned)	**ph-**	**p-**
***t-**	(unconditioned)	**t-**	**t-**
***th-**	(unconditioned)	**th-**	**t-**
***k-**	(unconditioned)	**k-**	**k-**
***kh-**	(unconditioned)	**kh-**	**k-**

Table 25: Proto-Ao oral stop development

*II.3.1.1. *p(h)-*

The Chungli voiceless unaspirated bilabial stop **p-** corresponds to both Mongsen aspirated **ph-** and unaspirated **p-**. The appearance of aspirated **ph-** in Mongsen does not appear to have been conditioned by any environment, justifying the reconstruction of both ***ph-** and ***p-** at the Proto-Ao level, which have merged in Chungli.

*Mo **p-**, Ch **p-** < PAo *__p__- < PTB *__b__-, *__p__-*

Table 26 contains cognate sets supporting the reconstruction of PAo unaspirated ***p-**, which developed from a merger of PTB ***b-** with ***p-**:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(1) HE, SHE (3SG)	pa	pa^{2}	*__p__a	*p^{w}a MAN / FATHER / HUSBAND / PERSON
(2) WORK, JOB	hmapa	ma^{3}pa^{3}	*hma.__p__a	
(3) GENERAL NOMINALIZER (SUF.)	-pàʔ	-paʔ^{3}	*-__p__aʔ	
(4) WHO?	sə́páʔ	si^{3}paʔ^{3}	*ʃə-__p__aʔ	
(5) BE FLAT / MAT	apak ‘be flat’ səŋ-pak ‘plank’	a^{3}pak^{3} ‘be flat’ pak^{3}ti^{3} ‘mat’	*(a.)__p__ak	*r-pak LEAF
(6) SPINDLE	paŋthəmɹu	paŋtuŋ (Clark: PANGTONG)	*__p__aŋ	*p^{w}aŋ SPIN / SPINDLE
(7) MOUTH	[tə]-paŋ	tə^{2}-paŋ^{2}	*t-__p__aŋ	*m-p(r)(w)aŋ MOUTH†
(8) TIME	hmapaŋ	ma^{2}paŋ^{2}	*hma.__p__aŋ	
(9) REQUEST (v.)	məpisi	mə^{3}pi^{3}-si^{2}	*m-__p__i-ʃi	
(10) CARRY (SHOULDER)	pu	a^{2}pu^{2}	*a-__p__u	*bəw CARRY (ON BACK OR SHOULDERS)
(11) BELLY	[tə]-puk làŋ	tə^{3}-puk^{3}	*t-__p__uk	*puːk BELLY / CAVE
(12) BLOOM (v.)	puŋ	a^{2}-puŋ^{2}	*a-__p__uŋ	
(13) JUMP	puŋ	a^{2}-puŋ^{2}	*a-__p__uŋ	
(14) WILD PIG	pùŋì	puŋ^{1}zə^{1}	*__p__uŋ.jəj	
(15) WIND (n.)	məpuŋ	mu^{2}puŋ^{2}	*m-__p__uŋ	*buŋ WIND
(16) BE COMPLETE, SUFFICIENT	pən	a^{2}pən^{3}sa^{1}	*a-__p__ən	

*Table 26: PAo *__p__-*

- (1) Proto-Ao ***pa*** HE, SHE (3SG) descended from a variant of PTB ***p^{w}a*** which failed to extrude (contrast PAo ***t-pwaʔ*** FATHER (371), from the same PTB root).
- (6) PAo ***paŋ*** SPINDLE provides a case in which the PTB bilabial stop (sporadically) extruded in other daughter languages (as indicated by PTB ***p^{w}-***) but completely failed to do so in Ao.
- (9) Both Mongsen and Chungli appear to have lexicalized the REPETITIVE marker ***-ʃi*** (90) in PAo ***m-pi-ʃi*** REQUEST (v.). Although ***mə^{3}pi^{3}*** and ***mə^{3}pi^{3}-si^{2}*** are both still attested in Chungli, the distinction is no longer one of repetition: ***mə^{3}pi^{3}*** is simply less common than ***mə^{3}pi^{3}-si^{2}*** and strikes one Ao consultant (AL) as ‘more formal’.

- (4) The second syllable of PAo ***ʃə-paʔ*** WHO? is likely related to the GENERAL NOMINALIZER suffix ***-paʔ*** (3), though the Mongsen reflexes bear different tones.
- (15) PAo ***m-puŋ*** WIND is reconstructed with an ***m-*** prefix, though it is possible that PAo WIND is a compound in which the first element reflects PTB ***r-məw*** SKY / HEAVENS / CLOUDS.

*Mo **ph-**, Ch **p-** < PAo ***ph-** < PTB ***s-p-**, ***b-***

Table 27 contains the cognate sets which support the reconstruction of PAo ***ph-*** as a root-initial consonant. (PAo ***ph-*** appears elsewhere as a prefix; cf. §II.1.2.2.)

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(17) FIVE	phaŋa	pu^{1}ŋu^{2}	***ph**a-ŋa	*l/b-ŋa FIVE
(18) BELT, STRAP (FOR WEAVING)	a-phì [35]	a^{3}-pi^{1}	*a-**ph**i	*bi STRING / STRAP / BELT†
(19) THIGH	[tə]-phi	tə^{3}-pi^{1}	*t-**ph**i	*pey LEG (HPTB); LEG / THIGH / FOOT (STEDT)
(20) THINK	phìlə̀m	pi^{3}ləm^{1}	***ph**i-ləm	
(21) BLOW	phu	a^{2}-pu^{2}	*a-**ph**u	*pu BLOW†

*Table 27: PAo ***ph-***

- (17) The initial ***pha** syllable in PAo FIVE descended from PTB prefixal ***b-** through some unknown devoicing, aspirating, and vocalizing process.
- (19) PTB ***pey** is glossed in HPTB as LEG, but has since been updated in the STEDT database to LEG / THIGH / FOOT (20 February 2013).
- (20) The second syllable of PAo ***phi-ləm** THINK appears to mean HEAD (363).
- (21) PTB blow is reconstructed as ***pu** because the PTB inventory does not include aspirated stops, but the majority of attested forms supporting the STEDT reconstruction of BLOW contain aspirated [p^{h}], e.g. Bijiang Bai **phu^{55}** (Xu & Zhao 1984), Mawo Qiang **p^{h}ɤ** (Sun 1981), and Prakaa Manang **^{2}p^{h}u ^{3}lə-** (Hoshi 1984). It is also possible that these aspirated forms in various TB languages are imitative in nature (as English 'puff' [p^{h}ʌf] and 'poof' [p^{h}uf]).

Onset clusters consisting of ***p(h)-** and ***-w-** can also be reconstructed for Proto-Ao (see §II.3.6).

[35] This form comes from a Khensa Mongsen consultant (AL).

*II.3.1.2. *t(h)-*

An aspiration contrast for the dental stops is also reconstructed at the Proto-Ao level.

*Mo **t-**, Ch **t-** < PAo *t- < PTB *d-, *t-*

Table 28 illustrates the merger of PTB ***d-** and ***t-** to yield PAo unaspirated ***t-**, which descended unchanged in Mongsen and Chungli:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(22) QUOTATIVE, THUS	tə̀	ta^{2}	***t**a	
(23) HOW?	kútə́	ku^{2}-ta^{2}	*ku-**t**a	
(24) AWAIT	ata	a^{3}ta(ʔ)^{3}	*a.**t**a	
(25) QUICKLY	zaktà [36]	jak^{3}ta^{2}	*ʒak.**t**a	
(26) WEAVE	tàk	a^{3}-tak^{3}	*a-**t**ak	*tak ⪤ *dak WEAVE
(27) STING	mətak	mə^{3}tak^{3}	*m-**t**ak	
(28) TOUCH	taŋtʃhàʔ	taŋ^{3}siʔ^{1}	***t**aŋ.tʃhaʔ	
(29) SIBLING/BROTHER (OLDER)	[tə]-ti ‘older sibling’	tə^{2}-ti^{2} ‘older brother’	*t-**t**i	
(30) CORN	mənti	mən^{2}ti^{2}	*mən.**t**i	
(31) PRIEST	pàʔ-tíɹ [37]	pu^{1}tiɹ^{32}	*pwaʔ-**t**i-əɹ	
(32) DIG	tùʔ	a^{3}-tu^{3}	*a-**t**u(ʔ)	*tu ⪤ *s/m-du DIG
(33) POKE, JAB	tùʔ	a^{3}-tuʔ^{1}	*a-**t**uʔ	
(34) STEM, TRUNK	[tə]-tuŋ	tə^{2}-tuŋ^{2}	*t-**t**uŋ	*duːŋ POST / COLUMN
(35) DANGER, ACCIDENT	ləntuŋ	lən^{1}tuŋ^{1}	*lən.**t**uŋ	
(36) PROHIBITIVE (PFX.)	tə̀-	tə^{1}-	***t**ə-	*da ⪤ *ta NEGATIVE IMPERATIVE
(37) STRIKE, BEAT	tə̀p	a^{3}-təp^{1}	*a-**t**əp	*tip/tup ⪤ *dip/dup BEAT / STRIKE
(38) PAINT (v.)	tə̀p	a^{3}-təp^{3}	*a-**t**əp	
(39) RECIPROCAL / COLLECTIVE (SUF.)	-təp	-təp^{3}	*-**t**əp	
(40) FLOOR	[a]-təm	a^{3}-təm^{3}	*a-**t**əm	
(41) KNOW$_{1}$	mətət	mə^{3}tət^{3}	*m-**t**ət	

[36] Khensa Mongsen (AL)
[37] Khensa Mongsen (AL)

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(42) SING	tən	a^{2}-tən^{2}	*a-**t**ən	
(43) START, BEGIN	tənlak	tən^{3}zək^{1}	***t**ən.ljak	

*Table 28: PAo *t-*

- (23) The first syllable of PAo ***ku-ta*** HOW? is the INTERROGATIVE PRONOUN ***ku*** (57).
- (24) Chungli 'await' shows variation in the presence/absence of a final glottal stop, so a glottal stop coda cannot be reliably reconstructed for the PAo form here.[38]
- (29) The fact that Mongsen 'older sibling' is cognate with Chungli 'older brother' suggests that the Proto-Ao form was originally either 1) OLDER BROTHER and was semantically broadened in Mongsen, or 2) OLDER SIBLING and was narrowed in Chungli.
- (31) PAo ***pwaʔ-ti-əɹ*** PRIEST appears to consist of FATHER (371) and a morpheme of unknown meaning (perhaps something like SACRED or SUPERNATURAL ?),[39] followed by the MASCULINE GENDER suffix (386).

*Mo **th-**, Ch **t-** < PAo *th- < PTB ?*

An aspirated ***th-*** may be reconstructed for Proto-Ao, but its PTB source is obscure:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(44) BLOCK, STOP UP	thàŋ	a^{3}-taŋ^{1}	*a-**th**aŋ	
(45) SEVER	thàŋ	a^{3}-taŋ^{1}	*a-**th**aŋ	
(46) ALWAYS	táthì	tə^{3}ti^{1}	*t-**th**i	
(47) EIGHT	thiɹ 'eighty' (tshət 'eight')	ti^{3}-ɹ^{1} 'eighty' ti^{3} 'eight'	***th**i ≍ *tshət	'PKN' *d-ryat EIGHT [40]
(48) OIL	thutsə	tu^{3}tsə^{3}	*th**u**-tsə	
(49) REACH, ARRIVE	thùŋ	a^{3}-tuŋ^{1}	*a-**th**uŋ	

[38] Temsunungsang 2009a: 210 gives an open rime, while my consultants produce a glottal coda.
[39] cf. Lahu **tìʔ** 'eternity; eternal abundance; something everlasting and supernatural (originally an animist concept)', ultimately a loan (through Shan) from Sanskrit **divya** (Matisoff 1988: 608).
[40] This reconstruction is presented in STC as belonging to the hypothesized 'Kuki-Naga' proto-language (STC: 45 [fn.148]; see also Matisoff 1995: 204), differing from the PTB form (*__b-g-ryat__) only in its prefix.

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(50) END, FINISH	thəm	a^{2}-təm^{2}	*a-**th**əm	
(51) SOW (v.)	thàn	a-tən (Clark A-TEN)	*a-**th**ən	

*Table 29: PAo *th-*

- (47) Mongsen **thiɹ** 'eighty', Chungli **tiɹ^{31}** 'eighty' and Chungli **ti^{3}** 'eight' support the reconstruction of PAo ***thi** EIGHT (which appended PAo ***-ɹ(a)** (TIMES) TEN (307) as a multiplicative suffix to yield EIGHTY). This PAo form has no apparent ancestor, while Mongsen **tshət** 'eight' is most likely a reflex of 'PKN' ***d-ryat** EIGHT, with the dental affricate descending from the 'PKN' ***d-ry-** cluster (see discussion below Table 49, page 76). Although no Chungli cognate for Mongsen **tshət** is available,[41] the ancestor of this form may have been present at the Proto-Ao level along with ***thi**, presumably reflecting some original allofamic variation in EIGHT. Alternatively, Mongsen could have borrowed **tshət** from another Tibeto-Burman language of the area: cf. PTk ***ʃɐt** (Mortensen 2012: #539), Phom **ʃat^{33}** (Burling & Phom 1998), both 'eight'.
- (48) The second syllable of PAo ***thu-tsə** OIL may be related to ***(a-)tsə** WATER (182).

*II.3.1.3. *k(h)-*

The last stop series consists of the Proto-Ao velars ***k-** and ***kh-**:

*Mo **k-**, Ch **k-** < PAo *k- < PTB *k-, *g-*

PAo ***k-** developed from a merger of PTB ***g-** with ***k-**, as shown below in Table 30:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(52) GAPE, OPEN MOUTH	ka	a^{2}-ka^{2}	*a-**k**a	*m-ka OPEN / OPENING / MOUTH / DOOR
(53) SWAGGER, SWAY	kàlì 'swagger'	ka^{3}zə^{3} 'sway (as a leech)'	***k**a.ləj	
(54) HOUSE	[a]-ki	ki^{1}	*(a-)**k**i	
(55) CORNER	kìnìk	ki^{1}nək^{1}	***k**i.nik	

[41] But note Yacham-Tengsa (an Ao lect under heavy contact with Phom) *teset* 'eight' (Marrison 1967: II: 82).

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(56) HEAD$_1$	kùhɹàŋ ‘hat’ maŋku ‘head trophy’ —	ku^{2}ɹaŋ^2 ‘hat’ maŋ^{2}ku^2 ‘head trophy’ tu^2-ku^{2}lak^3 ‘head’	*ku	*m/s-gaw HEAD
(57) INTERROG. PRO.	kújím ‘when?’ kújá? ‘how many?’ kútə́ ‘how?’	ku^3-taŋ^3 ‘when?’ ku^3-i?^{1} ‘how many?’ ku^2-ta^2 ‘how?’	*ku	
(58) UNCLE (MAT.) / FATHER-IN-LAW	[tə]-ku	tə^2-ku^2	*t-ku	*gəw-n ⩙ *kəw-n ELDER BROTHER / SENIOR MALE RELATIVE
(59) NINE	thuku	tu^3-ku^3	*th-ku	*d/s-kəw NINE
(60) BASKET$_1$	aku	ku^2	*(a-)ku	*kaw BASKET
(61) CHEST	[tə]-kù?	tu^3-ku?^{1}	*t-ku?	*k(r)u CHEST / RIB†
(62) KNEE	[tə]-məkuk	tə^2-mu^{3}kuk^1	*t-m-kuk	*gu(ː)k ⩙ *m-ku(ː)k CROOKED / BENT / KNEE / ANGLE
(63) WIN	kùk	a^3-kuk^3	*a-kuk	
(64) BE COLD	məkuŋ	mu^{2}kuŋ^2	*m-kuŋ	
(65) MUSHROOM	kùŋhɹə	kuŋ^{1}əɹ^2	*kuŋ.hɹə	
(66) BE DRY	kuŋ	a^3-kuŋ^3	*a-kuŋ	*ka(ː)ŋ ROAST / TOAST / BURN / BE DRY
(67) DECEIVE	kəlàk	kə^{3}lak^1	*kə.lak	
(68) SKIN, RIND, SHELL	[tə]-kəp	tə^3-kəp^3	*t-kəp	*kop ⩙ *kwap SKIN / LIP / SCALES (FISH) / SHELL†
(69) YEAR	[a]-kəm	kəm^1	*(a-)kəm	cf. PKC *kum AGE / YEAR
(70) BECOME / LIVE	kəm ‘become’ tə-kəm ‘life’	a^2-kəm^2 ‘become’ ta^2-kəm^2 ‘life’	*a-kəm	
(71) CHIN$_1$	—	tə^2-kəm^2	*t-k[h]əm	*gam JAW / MOLAR
(72) POSSESS (INALIENABLY)	kət	a^3-kət^3	*a-kət	

*Table 30: PAo *k-*

- (57) The PAo INTERROGATIVE PRONOUN ***ku** is also reconstructed as the first syllable of ***ku-ta** HOW? (23).
- (58) UNCLE (MATERNAL) / FATHER-IN-LAW is a shorthand proto-gloss that captures what appear to be the most common uses of this kinship term. The full range of the term in both lects is defined by Mills as a 'man of the phratry of the mother of the party spoken of' (1926: 172).
- (59) The aspirated ***th-** prefix in PAo ***th-ku** NINE possibly descended from a variant PTB form[42] in which the prefixes were related syntagmatically, namely: ***s-d-kəw**. The ***s-** prefix could then have induced devoicing and aspiration on the following ***d-** prefix, yielding ***th-**. The nuclear **-u-** vowel of the prefixal syllables in both the Mongsen and Chungli forms appears to be the result of sporadic harmony with the root vowel.
- (69) No PTB etymon of PAo ***(a-)kəm** YEAR has been reconstructed yet, but this form is cognate with PKC ***kum** YEAR (VanBik 2009: 106) and Lotha **o^{1}-kəm^{3}** 'season' (cf. PCN ***a-kam** YEAR / SEASON [129]).
- (71) No Mongsen cognate exists for Chungli **tə^{2}-kəm^{2}** 'chin', which could have descended from PAo aspirated ***kh-** or unaspirated ***k-**. Since PTB ***gam** has a voiced initial and lacks an ***s-** prefix, the PAo initial was likely unaspirated: ***t-kəm** CHIN$_1$.

*Mo **kh-**, Ch **k-** < PAo ***kh-** < PTB ***(s-)k-***

Proto-Ao ***kh-** yielded Mongsen aspirated **kh-** and Chungli unaspirated **k-**:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(73) POSSESS (ALIENABLY) [43]	khà	a^{3}-ka^{1}	*a-**kh**a	
(74) BE BITTER	khá?	a^{3}-ku?^{1}	*a-**kh**a?	*b-ka-n BITTER / LIVER
(75) CHIN$_2$	[tə]-mə́khá?	—	*t-m-**kh**a?	*s-ka ⪤ *m-ka-y JAW / CHIN
(76) WOUND, SORE	khùma	ku^{1}mu^{2}	***kh**u-ma	
(77) BAG	hjaŋkhu	jaŋ^{2}ku^{2}	*hjaŋ.**kh**u	
(78) SMOKE	mukhuli	mu^{2}ku^{2}zə^{2}	*mu-**kh**u-ləj	*kəw-n/t SMOKE
(79) CROW (v.)	khuŋ	a^{2}-kuŋ^{2}	*a-**kh**uŋ	
(80) NECK	[tə]-khuŋ	tu^{2}-kuŋ^{2}	*t-**kh**uŋ	*k-woŋ NECK†

[42] cf. Matisoff's discussion of a 'doubly-prefixed prototype' (1995: 208).
[43] See GMA: §9.4 for a discussion of possessive verbs in Mongsen.

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(81) TOGETHER	khələm	kə^{3}ləm^{3}	*__kh__ə.ləm	
(82) EDGE, BANK	juŋ-khəm ‘river bank’	a^{1}-juŋ^{2}-kəm^{2} ‘river bank’	*__kh__əm	*r-ka(:)m EDGE / BANK / PRECIPICE / LIP / MOUTH
(83) SHADOW, SHADE	a-khə̀m [44]	a^{3}-kəm^{1}	*a-__kh__əm	
(84) SAVE, RESCUE	khəmlak [45]	kəm^{3}zək^{1}	*__kh__əm.ljak	
(85) BOAST	atshəkhəm	a^{3}sə^{1}kəm^{2}	*a.tʃhə.__kh__əm	
(86) COUGH (v.)	akhət	a^{3}kət^{1}	*a.__kh__ət	

*Table 31: PAo *__kh-__*

- (74) Chungli **a^{3}-ku?^{1}** ‘be bitter’ may be a loan from Lotha (see the discussion of this form in the rimes section below Table 80).
- (75) No Chungli cognate exists for Mongsen **[tə]-mə́khá?** ‘chin’, but the Proto-Ao form can be unambiguously interpolated with the aid of the PTB teleo-reconstructions. A variant PTB form with a syntagmatic combination of the ***s-** and ***m-** prefixes (i.e., ***m-s-ka**) is the likely source of PAo ***t-m-kha?**, with the PTB ***s-** prefix inducing aspiration on PTB root-initial ***k-** to yield the aspirated PAo ***kh-**.
- (76) PAo ***khu-ma** WOUND, SORE is a compound reflecting both PCN ***khu?** WOUND, INJURY / SCAR [80] (PTB source uknown) and PCN ***hma** WOUND, SORE [4] (< PTB ***r-ma-t** WOUND / INJURED) (cf. §II.3.4.1, Table 52).
- (80) PTB ***k-woŋ** NECK evidently lost the labiovelar glide initial before the Proto-Ao stage (cf. discussion of PCN ***a/k-hwuŋ** NECK [220] in §III.5.5.1).

II.3.2. Fricatives

This section discusses the reconstruction of the Proto-Ao dental/alveolar, palatal, velar, and glottal fricatives: ***s-**, ***z-**; ***ʃ-**, ***ʒ-**; ***x-**, ***ɣ-**; ***h-**:

PAo	*environments*	*Mongsen*	*Chungli*
***s-**	(uncond.)	**s-**	**s-**
***z-**	(uncond.)	**z-**	**z-**

[44] Khensa Mongsen (AL)
[45] Khensa Mongsen (AL); cf. also Temsunungsang 2009a: 211, which has **khə́mlák** for some variety of Mongsen (either Mangmetong or Mokokchung: Temsunungsang 2009a: 5).

PAo	*environments*	*Mongsen*	*Chungli*
***ʃ-**	(uncond.)	**s-**	**s-**
***ʒ-**	(uncond.)	**z-**	**j-**
***x-**	(uncond.)	**w-**	**w-**
***ɣ-**	(uncond.)	**hw-**	**w-**
***h-**	(uncond.)	**h-**	**Ø**

Table 32: Proto-Ao fricative development

*II.3.2.1. *ʃ-, *s-*

Although neither daughter lect contains /ʃ/ as a distinct phoneme, it appears as an allophone of /s/ and can also be reconstructed as a distinct segment at the Proto-Ao level.

*Mo **s-**, Ch **s-** [ʃ-] < PAo ***ʃ-** < PTB ***sy-***

Proto-Ao ***ʃ-*** coalesced into a single segment from PTB ***sy-*** (a fricative-glide cluster; cf. HPTB: 29) and existed as a phoneme distinct from ***s-*** in Proto-Ao. In Mongsen, ***ʃ-*** merged with ***s-*** before all vowels except /i/ (e.g. PAo ***a-ʃa*** SAY > Mongsen **sa** 'say'). In Chungli, on the other hand, any vowel following ***ʃ-*** was raised to /i/, and the [ʃ] pronunciation was retained (e.g. PAo ***a-ʃa*** SAY > Chungli [a^{2}-ʃi^{2}] 'say'). For both lects, these changes yielded a situation in which [ʃ] surfaces only before /i/. Since [s] never appears before /i/, this is a case of complementary distribution, justifying the synchronic treatment of [s] and [ʃ] as allophones of a single phoneme /s/ in both lects.

Confusion caused by contrast neutralization before /i/ was likely a trigger for this change: Given current data, it is unclear whether any phonemic ***si*** sequences existed in Proto-Ao. If a phonemic ***s-*** did indeed appear before ***-i-***, it was likely palatalized and produced as [ʃi], thus neutralizing the contrast between ***s-*** and ***ʃ-*** in that position. Speakers would therefore have been unable to determine whether a [ʃi] sequence contained underlying /s/ or /ʃ/. In the development of both Mongsen and Chungli, this issue was resolved by treating all instances of [ʃ] as palatalized /s/. (For convenience, this will be referred to as the PAL-S principle.) The lects differed, however, in the importance attached to preserving the phonetic forms of vowels vs. consonants. In Mongsen, all sequences violating the PAL-S principle were repaired by preserving the vowels and changing surface [ʃ] to [s]. Thus, PAo ***ʃa*** and ***ʃə*** became Mongsen [sa]

and [sə]. In Chungli, however, these sequences were repaired by preserving the surface form of the initial consonant and 'brightening' the vowel to /i/, essentially establishing a *de facto* palatalization context. PAo ***ʃa** and ***ʃə** thus both became Chungli [ʃi]. This process is illustrated below in Table 33, with changes in boldface:

Proto-Ao		*Mongsen*		*Chungli*	
surface	*underlying*	*surface*	*underlying*	*surface*	*underlying*
ʃa	/ʃa/	**s**a	/sa/	**ʃi**	/si/
ʃə	/ʃə/	**s**ə	/sə/	**ʃi**	/si/
ʃi	/ʃi/ or /si/	ʃi	/si/	ʃi	/si/
sa	/sa/	sa	/sa/	sa	/sa/
sə	/sə/	sə	/sə/	sə	/sə/

*Table 33: Development of Proto-Ao *ʃ- and *s-*

Although each lect underwent a different path of development, the phonemic consequence in both lects was a merger of ***ʃ-** with ***s-**.[46]

Cognate sets supporting the reconstruction of PAo ***ʃ-**, which descended via coalescence from PTB ***sy-**, are presented below in Table 34:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(87) SAY	sa	a^{2}-si^{2} [a^{2}-ʃi^{2}]	*a-**ʃ**a	
(88) ANIMAL / MEAT	[a]-sáʔ 'meat' sàɹàɹə 'animal' sàŋatʃa 'macaque' sà-ti 'elephant'	si^{1}ʔ [ʃi^{1}ʔ^{1}] 'meat' si^{2}ɹu^{3}ɹu^{1} [ʃi^{2}ɹu^{3}ɹu^{1}] 'animal' si^{1}ŋu^{1} [ʃi^{1}ŋu^{1}] 'monkey' si^{2}ti^{2} [ʃi^{2}ti^{2}ʔ^{2}] 'elephant'	*(a-)**ʃ**aʔ	*sya-n ANIMAL / BODY / FLESH / MEAT
(89) ASK, REQUEST	məsàʔ	m$ə^{3}$$si^{1}$ʔ [m$ə^{3}$ʃ$i^{1}$ʔ^{1}]	*m-**ʃ**aʔ	
(90) REPETITIVE (SUF.)	-si [ʃi]	-si^{2} [-ʃi^{2}]	*-**ʃ**i	
(91) $KNOW_2$	si [ʃi]	a^{3}-si^{1} [a^{3}-ʃi^{1}]	*a-**ʃ**i	*syey-s KNOW

[46] It has been said that reconstruction using the comparative method is impossible when a "merger of the same phonemes has taken place in all the languages compared" (Fox 1995: 73), but this is only the case when the merger proceeded in an *identical manner* in all daughter languages. The merger of ***s-** and ***ʃ-** took different routes in Chungli and Mongsen and affected adjacent phonemes in different ways, leaving behind evidence of their original status as separate phonemes.

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(4) WHO?	sə́pá?	si^{3}pa?^{3} [ʃi^{3}pa?^{3}]	***ʃ**ə-pa?	
(92) POUR	səwk	si^{3}-uk^{1} [ʃi^{3}-uk^{1}]	***ʃ**ə-uk	

*Table 34: PAo ***ʃ-***

- (87), (89) Given their similarity, it is probable that PAo ***m-ʃa?** ASK, REQUEST is morphologically related to ***a-ʃa** SAY, by means of the ***m-** prefix and the final glottal stop (which may be the trace of some proto-suffix).
- (90) The Chungli and Mongsen reflexes of PAo ***-ʃi** both signal repetition of the verbs to which they are suffixed, i.e., 'VERB again' (cf. GMA: 326–327). Clark also observes that the Chungli suffix "may have the force of repetition to satiety or sufficiency" (1911: 692).
- (90), (91) The verbal REPETITIVE marker and KNOW are both reconstructed with ***ʃi**, a Proto-Ao surface form which was ambiguous between underlying /si/ and /ʃi/. In the case of KNOW, however, the PTB reconstruction with ***sy-** supports the choice of PAo ***ʃ-**.
- (92) The second morpheme in PAo ***ʃə-uk** POUR is a suffix meaning INTO (384).

Mo s-, Ch s-** < PAo ***s-** < PTB ***s-; *kr-** / _ ***-i

The following table presents cognate sets for the reconstruction of PAo ***s-**:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(93) HOWL, SCREAM	asà	a^{3}sa^{1}	*a.**s**a	
(94) BE DELIBERATE	asá?	a^{3}sa?^{1}	*a.**s**a?	
(95) BREAK$_{1}$	ɹàksa?	ɹak^{3}sa?^{1}	*ɹak.**s**a?	
(96) ITCH (v.)	məsak	mə^{3}sak^{1}	*m-**s**ak	*m-sak ITCH
(97) LIZARD	sàŋphila	saŋ^{2}kən^{2}	***s**aŋ-	*r-saŋ LIZARD
(98) LIFT / AWAKEN	-mə́sù [47]	mə^{3}su^{1}	*m-**s**u	*m-sow ARISE / AWAKE(N)
(99) BE BORN / GIVE BIRTH	sù?	a^{3}-su^{1}	*a-**s**u(?)	*g-sow REAR (CHILD) / BEAR (CHILD)
(100) CLOTH / SHAWL	[a]-sə	sə^{1}	*(a-)**s**ə	
(101) DIE	sə	a^{2}-sə^{2}	*a-**s**ə	*səy DIE

[47] Khensa Mongsen (AL)

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(102) BILE / GALL BLADDER	[tə]-sə 'bile'	ta^{3}-sə^{1} 'gall bladder'	*t-(a-)**s**ə	*m/s-kri(y)-s GALL / BILE / SOUR
(103) NEST / WEB (OF SPIDER)	tə́-sə̀p [48]	tə^{3}-səp^{1}	*t-**s**əp	*(t)sip ≍ *(t)sup NEST / WOMB / SCROTUM
(104) RUN	səm tsə̀	a^{2}səm^{2}	*a-**s**əm	
(105) THREE	asəm	a^{1}-səm^{2}	*a-**s**əm	*g-sum THREE
(106) KILL	təp-sə̀t ('hit'-'kill')	təp^{3}-sət^{1} ('hit'-'kill')	*s**s**ət	*g/b-sat KILL
(107) STUFF, POSSESSIONS	usə̀t	u^{1}sət^{1}	*u.**s**ət	
(108) BE NEW	sən	a^{2}sən^{2}	*a-**s**ən	*g-sar NEW / FRESH
(109) BE SOUR	sə́n	a^{3}-sən^{1}	*a-**s**ən	*su:r ≍ *swa:r SOUR / BE ACID
(110) INSECT (CRAWLING)	məsən	mə^{3}sən^{1}	*m-**s**ən	
(111) LEAK, DRIP	sən	a^{2}-sən^{2}	*a-**s**ən	
(112) LIVER	[tə]-məsən	tə^{2}-mə^{3}sən^{1}	*t-m-**s**ən	*m-sin LIVER / BITTER
(113) GATHER, ASSEMBLE (vi.)	səntəp	sən^{3}-təp^{3}	*s**s**ən-təp	
(114) BE WHITE	məsəŋ	mə^{2}səŋ^{2}	*m-**s**əŋ	
(115) WOOD	[a]-sə́ŋ	səŋ^{1}	*(a-)**s**əŋ	*siŋ ≍ *sik TREE / WOOD
(116) FILL, BE FULL	səŋ	a^{2}-səŋ^{2}	*a-**s**əŋ	
(117) GINGER	sə́ŋmúk	səŋ^{3}muk^{3}	*s**s**əŋ.muk	

*Table 35: PAo *s-*

- (102) Most instances of Proto-Ao ***s-*** here descended unchanged from PTB ***s-***. The ***s-*** in BILE / GALL BLADDER is the only exception, as it appears to have developed from PTB ***kr-*** before ***-i***. (See PCN ***a-sə*** BILE / GALL BLADDER [92] in §III.3.1.7 for evidence that the appropriate PTB allofam was ***kri***, not ***krəy***.) Note that PTB ***kr-*** yielded PAo ***tʃ(h)-*** in different environments: cf. CRY, WEEP (156) and SHAVE, SCRAPE (175).
- (113) The second syllable in PAo ***sən-təp*** GATHER, ASSEMBLE (vi.) is the RECIPROCAL / COLLECTIVE suffix (39).

[48] Khensa Mongsen (AL)

*II.3.2.2. *ʒ-, *z-*

As is the case with PAo ***ʃ-**, although neither daughter lect contains /ʒ/ as a distinct phoneme, it can be reconstructed as a distinct segment at the Proto-Ao level. (Note that [ʒ] persists as an allophone of /z/ for some Mongsen speakers, as mentioned in the discussion of Table 18.)

*Mo **z-**, Ch **j-** < PAo *ʒ- < PTB ?*

A number of cognate pairs show a correspondence between Mongsen **z-** and Chungli **j-**, which can be regarded as reflexes of the Proto-Ao voiced palatal fricative ***ʒ-**. In the development of Mongsen, PAo ***ʒ-** was simply dentalized to **z-** (merging with PAo ***z-**). In Chungli, open and glottal-final rimes following ***ʒ-** were raised to **-i(ʔ)** (illustrated in (119), (118), and (122) below), after which all instances of ***ʒ-** lenited to **j-** (merging with PAo ***j-**):

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(118) GO IN, ENTER	za	a^{2}-i^{2} (/a-ji/)	*a-ʒa	
(119) GRASS	[a]-za	a^{3}-jiʔ^{3}	*a-ʒa(ʔ)	
(25) QUICKLY	zaktà [49]	jak^{3}ta^{2}	*ʒak.ta	
(120) CREATE, BUILD	zaŋlu	jaŋ^{2}lu^{2}	*ʒaŋ.lu	
(121) SEND	zàk	juk^{31}	*ʒuk	
(122) RICE BEER	Mangmetong: [a]-ji Longchang: azə	ji^{2}	*(a-)ʒə	cf. PLB *m-dzəy^{1} LIQUOR
(123) POISON	məzəm	mi^{3}jəm^{3} (/m-jəm/)	*m-ʒəm	
(124) SHIN	[tə]-məzən	tə^{2}-min^{2} (/t-m-jən/)	*t-m-ʒən	
(125) POWER, WRATH	azən	a^{3}-in^{3} (/a-jən/)	*a-ʒən	
(126) GROW UP	zən [50]	a^{2}-in^{2} (/a-jən/)	*a-ʒən	

*Table 36: PAo *ʒ-*

As seen above in Table 36, a /jə/ sequence often surfaces as [i] in Chungli (cf. §II.2.1.3).

▸ (121) The only problematic form in the table above is Mongsen **zàk** 'send', which did not follow the expected development from PAo ***ʒuk** to Mongsen **zuk**. This cannot be

[49] Khensa Mongsen (AL)
[50] Khensa Mongsen (AL)

due to a phonotactic prohibition against the sequence [zuk] in Mongsen, as it is attested in other words (e.g. **məzuk** 'crumple').

▸ (122) The cognate set for RICE BEER appears to point to a reconstruction like PAo ***(a-)ji**, but the existence of Longchang Mongsen *azü* [azə] (Mills 1926: 360) suggests that Mangmetong Mongsen **[a]-ji** is a (prefixed) borrowing from Chungli, especially given the fact that Longchang and Mangmetong are otherwise identical in words containing **j** or **z**. The correspondence of Mongsen **z-** : Chungli **j-** therefore supports the reconstruction of PAo ***ʒ-**, which is corroborated by the PLB form ***m-dzəy**^{1} LIQUOR (HPTB: 189).

A few cognate pairs show the reverse of this correspondence (Mongsen **j-** : Chungli **z-**), but these have been reconstructed with PAo ***j-** (§II.3.5.2).

*Mo **z-**, Ch **z-** < PAo ***z-** < PTB ?*

The remaining instances of Mongsen **z-** correspond to Chungli **z-**, thus supporting the reconstruction of PAo ***z-**:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(127) BIRD	wàzàʔ	u^{1}zəʔ^{1}	*wa-**z**aʔ	
(128) BAMBOO SHOOT	[a]-zi	zə^{2}	*(a-)**z**i	
(129) WRITE	zəlu	zə^{3}lu^{1}	***z**ə-lu	
(130) LAW	thəmzəŋ	u^{2}-zəŋ^{2}	*-**z**əŋ	
(131) COUNT / READ	zàŋ	a^{3}-zəŋ^{1}	*a-**z**əŋ	*graŋ ⩕ *kraŋ MEASURE / COUNT
(132) NAIL (FINGER/TOE)	[tə]-məzəŋ	tə^{2}-mə^{2}zəŋ^{3}	*t-m-**z**əŋ	*s-liŋ ~ s-leŋ NAIL / CUTICLE†

*Table 37: PAo ***z-***

▸ (127), (128) Chungli **u^{1}zəʔ^{1}** 'bird' and **zə^{2}** 'bamboo shoot' show the reduction of all vowels to schwa in Chungli after PAo ***z-**.

▸ (130) The first syllable of Chungli **u^{2}-zəŋ^{2}** 'law' means 'word' (279).

The PTB source of Proto-Ao ***z-** is difficult to determine from these cognate sets, but it may have involved consonant clusters containing PTB ***r-**. Additionally, if PAo ***t-m-zəŋ** NAIL truly descended from the PTB reconstruction given in (132), another possible source of Proto-Ao ***z-** could be a frication development of PTB ***l-** > **z-** before ***-iŋ**. (A similar development occurred in Chungli with PAo ***(h)l-** before ***-əj(ʔ)**; see §II.3.5.4).

*II.3.2.3. *ɣ-, *x-*

In some cognate sets, Mongsen **(h)wa(ʔ)** corresponds with Chungli **wa(ʔ)** instead of **u(ʔ)** (cf. §II.3.5.1). These sets could conceivably be reconstructed as PAo ***(h)waj(ʔ)**, given that the PAo ***-aj** rime yielded Mo/Ch **-a** but avoided the velarization of ***-a(ʔ)** to Chungli **-u(ʔ)** (cf. §II.4.1.5). In this case, however, extra-Ao evidence must be brought to bear: The Lotha cognates for these sets all have **h-** (**m^{1}-ha^{2}-** 'bless', **ho^{2}-** 'swim', **ho^{3}həm^{3}-** 'yawn'), though it is Lotha **v-** which regularly corresponds to PAo ***w-** (cf. §III.5.5.1). In the case of YAWN, Lotha **h-** does in fact correspond to PAo ***hw-** (§III.5.5.1), but the Lotha **-o** rime militates against the reconstruction of PAo ***-aj**.

These considerations warrant the reconstruction of a separate set of initials. The velar fricatives ***ɣ-/*x-** are the best candidates, providing the velar POA element while lacking the lip-rounding that would have contributed to the development of Chungli **u**. Projecting this reconstruction further back to PCN also provides a set of initials that could easily debuccalize to Lotha **h-** (cf. §III.5.2.3).

*Mo **wa(ʔ)**, Ch **wa(ʔ)** < PAo ***ɣa(ʔ)** < PTB ?*

The following table presents the cognate sets supporting the reconstruction of PAo voiced ***ɣ-**, whose PTB source is unknown. PAo ***ɣ-** yielded **w-** in both Mongsen and Chungli:

	Mongsen	*Chungli*	*Proto-Ao*
(133) BLESS	muwa	mə^{2}wa^{2}-tsəʔ^{3}	*m-ɣa[j]
(134) SLICE, SAW / SWIM	wa̰ʔ	a^{3}-waʔ^{1}	*a-ɣaʔ [51]

*Table 38: PAo *ɣ-*

▸ (133) The rime of PAo BLESS is reconstructed as ***-a[j]** on the evidence of other Central Naga cognates (cf. §II.4.1.5).

*Mo **hwa**, Ch **wa** < PAo ***xa** < PTB ***ha** ?*

Below is the sole cognate set reconstructed with PAo ***x-**, which yielded Mongsen **hw-** but Chungli **w-**:

[51] Possibly related to Written Burmese **hlwɑ^{1}** 'saw (n.)' (TBL).

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(135) YAWN	hwàməsa	wa^{1}mə^{2}sa^{2}	*__x__a-m-sa	*ha-y YAWN†

*Table 39: PAo *__x__-*

▸ (135) PTB ***h-*** normally yielded PAo ***h-*** (cf. §II.3.2.4), but YAWN suggests that some unknown conditioning environment resulted in PTB ***h-*** > PAo ***x-***.
The Ao evidence alone could alternatively support the reconstruction of PAo ***hwaj*** for the first syllable, with the ***-aj*** rime yielding ***-a*** in both daughter lects. The Lotha cognate also contains ***h-*** (__**h**__**o**^{3}**həm**^{3}**-** 'yawn'), which does correspond with PAo ***hw-*** (§III.5.5.1). The Lotha ***-o*** rime, however, only corresponds with PAo ***-a*** (not ***-aj***). The PAo form must therefore have contained ***-a***, requiring the reconstruction of the ***x-*** initial.

*II.3.2.4. *h-*

*Mo **h-**, Ch **Ø-** < PAo *__h__- < PTB *__h__-*

Syllables with Mongsen initial ***h-*** correspond to Chungli onset-less syllables, revealing that PAo ***h-*** was preserved in Mongsen but lost in Chungli:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(136) HANG (vt.)	hitʃak	i^{3}tak^{3}	*__h__i.tjak	
(137) HOLD	—	am^{31} (/a-əm/) 'hold'	*a-__h__əm	
	__hə̀m__ət 'hold'	__am__^{3}-ət^{1} 'cling, latch onto'		
	__hə̀m__si 'use'	__am__^{32}-si^{2} 'use'		
(138) BANANA LEAF / ASPIDISTRA LEAF	am 'aspidistra sp.'	am^{31} (/a-əm/) 'banana leaf'	*a-__h__əm	
(139) BY HAND / CARRY	hən 'carry'	—	*__h__ən	
	__hən__-uk 'put into'	ən^{3}-uk^{1} 'put in'		
	__hən__tʃuk 'throw away'	__ən__^{3}-tuk^{3} 'throw away'		
(140) CHICKEN	[a]-hən 'chicken'	an^{2} (/a-ən/) 'chicken'	*a-__h__ən	*ha:r FOWL / CHICKEN / QUAIL
	__hən__-tsə 'egg'	__ən__^{2}-tsə^{2} 'egg'		

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(141) CURRY	ənt͡ʃhu	an^{3} (/a-ən/), aun^{3} (/a-wən/ ?), ain (Clark: AIN) (/a-jən/)	*(a-)**h**ən	*h(y)an CURRY / VEGETABLE DISH

*Table 40: PAo *h-*

- (137), (139) For HOLD, Proto-Ao ***a-həm** lost initial ***h-** in Chungli to yield **a^{3}-əm^{1}** [am^{31}]. It is interesting that PAo ***həm** HOLD and ***hən** BY HAND / CARRY both involve an action done with the hand and differ only in the final consonant, suggesting an original morphological relationship.
- (138) Mangmetong Mongsen **am** and Chungli **am^{31}** support a Proto-Ao form like ***a-əm** for BANANA LEAF / ASPIDISTRA LEAF, but the etymon is instead reconstructed as ***a-həm** for the following reason: Temsunungsang reports (Mokokchung?) Mongsen **ám̀** and posits an underlying form /áhə̀m/, basing this on 'cross dialectal data where Mangmetong Mongsen clearly attests a fricative as the onset of the second syllable' (2009a: 45). The lack of this intervening **h** in Coupe's Mangmetong form suggests variation in the preservation of ***h-** even within the Mangmetong Mongsen community (perhaps through influence from Chungli, which lost it entirely).

  As to the inconsistent glosses: My consultants define the Chungli form as 'banana leaf', though Clark makes no mention of the banana plant in his definition: 'a large smooth, glossy leaf of a plant that grows in damp or shady places' (1911: 53).[52] Temsunungsang also gives his Mongsen form as 'banana leaf' (2009a: 45), but Coupe glosses the Mangmetong form as 'aspidistra sp.' (and in most of his examples, the word refers to the leaves of the plant) (GMA: 490). Whatever the original meaning of this form, the leaves of the banana plant (genus *Musa*) and the *Aspidistra* are very similar (long, green, and flexible), and thus it is not difficult to imagine how the same term could come to be used for both.
- (140) CHICKEN shows that PAo ***h-** descended from PTB ***h-** (and that PTB ***-a(ː)r** > PAo ***-ən**). The Mongsen and Chungli forms for 'egg' are both compounds of roots meaning CHICKEN and EGG (185). The Proto-Ao nominal ***a-** prefix was apparently not present in compounds (hence, **-ən** instead of **-an** in Chungli **ən^{2}-tsə^{2}** 'egg').
- (141) CURRY is a difficult set, given the range of Chungli variants. The correspondence of Mongsen **ən** and Chungli **an^{3}** supports a PAo form like ***(a-)ən**, but the other Chungli forms suggest the reconstruction of an original initial that was lost to yield

[52] *Aspidistra* are particularly known for their ability to survive in the shade (Stamps 2003).

the **an³** variant. Given that the PTB reconstruction and other Central Naga languages (cf. PCN ***a-haːn** CURRY [164]) all contain **h-**, it seems best to reconstruct Proto-Ao CURRY as ***(a-)hən**, suggesting that the ***h-** was sporadically lost in the Mangmetong Mongsen form (as in BANANA LEAF / ASPIDISTRA LEAF (138)). In Chungli, ***h-** was regularly lost (yielding **an³**), though in some cases it somehow mutated into glides, yielding the variants **aun³** (/a-wən/) and **ain** (/a-jən/).
The second syllable of Mongsen **əntʃhu** 'curry' appears to reflect PAo ***tʃhu** COOK (170).

II.3.3. Affricates

Reconstructing the initial affricates of Proto-Ao requires first addressing the question of their phonemic status in the daughter lects. In both Chungli and Mongsen, [ts(h)] is much more restricted than [tʃ(h)] in its attested phonotactic environments, appearing only before /ə/. Temsunungsang (2009a) capitalizes on this observation to adopt a phonemic analysis of Chungli in which [ts] and [tʃ] are allophones of the same phoneme /tʃ/. The conditioning environment for the surface allophone of /tʃ/ is the allophone of /ə/ ([ɯ] or [ə]), which itself is conditioned by the coda consonant according to the principle of 'Rime Harmony': the coda consonant and vowel nucleus of a syllable must correspond in the feature [±back]. If the coda is a member of the class of 'back consonants' (/k, ŋ, ʔ/), then a schwa nucleus surfaces as the back vowel [ɯ]. This [ɯ] allophone in turn licenses only [−distributed] onsets, barring [tʃ] and forcing an underlying /tʃ/ onset to surface as [ts]. In all other environments, /tʃ/ surfaces as [tʃ] by default.

While Temsunungsang's approach is attractive in its simplification of the Chungli phonemic inventory, his analysis creates a number of difficulties. Because the Rime Harmony principle does not apply to coda-less (open) syllables, he must posit a ban on [ə] in certain open-syllable contexts in order to explain why /tʃə/ surfaces as [tsɯ] and not [tʃə] (2009a: 14, 35). This is problematic for my elicited Chungli data, in which an open-syllable [ə] clearly occurs where Temsunungsang states that only [ɯ] should occur (e.g. [nə²] 'spear'). In addition, Rime Harmony fails to explain why the back consonant /ʔ/ co-occurs as a coda with the front vowel nucleus /i/ (2009a: 21). Temsunungsang also explicitly excludes the coda consonant /ɹ/ from his discussion, since it occurs with all vowel nuclei (front or back) and is not captured by Rime Harmony (2009a: 21).

Although their conditioning environments are difficult to adequately describe, the complementary distribution of [ts] and [tʃ] in Chungli certainly suggests a synchronic

allophony relationship: [ts] is always followed by the [ɯ] allophone of schwa, while [tʃ] appears with /i/, /a/, /u/, and the [ə] allophone of schwa. Evidence from the domain of morpho-phonological alternations is also significant: When a verb bearing the causative suffix /-tak²tsəʔ³/ is further combined with the imperative suffix /-aŋ²/, the final schwa and glottal stop are deleted, and [ts] becomes [tʃ]:

a²-u² 'went'
u² + **-tak²tsəʔ³** (CAUS) → **u²tak²tsəʔ³** 'caused (someone) to go'
u²tak²tsəʔ³ + **-aŋ²** (IMP) → **u²tak²tʃaŋ²** 'cause (someone) to go!'

In contrast, when the verb root itself ends in the syllable /tsəʔ/, addition of the imperative suffix does not trigger loss of the final schwa or palatalization of [ts]:

a³tsəʔ¹ 'pulled'
a³tsəʔ¹ + **-aŋ²** (IMP) → **a¹tsə¹aŋ²** 'pull!'

məˀ³tsəʔ¹ 'kicked'
məˀ³tsəʔ¹ + **-aŋ²** (IMP) → **məˀ³tsə¹aŋ²** 'kick!'

In an Optimality Theoretic analysis (Prince & Smolensky 1993), this disparate behavior could be captured by positing a high-ranking root-faithfulness constraint. Whatever the explanation, however, Temsunungsang's insight is to be credited for revealing that [ts] and [tʃ] have some sort of synchronic relationship in Chungli.

Bypassing the issue of the particular allophone of schwa in the syllable nucleus, the relationship between [tʃ] and [ts] in Chungli can be captured by the following scheme:

Chungli:
/tʃ/ → [ts] / syllable coda is **Ø**, **-ʔ**, **-k**, or **-ŋ**
[tʃ] elsewhere

Note, however, that given the hypothesis that allophonic [ts] in Chungli reflects original instances of PAo ***ts(h)-**, the Chungli words in this chapter are transcribed as if [ts] and [tʃ] are separate phonemes in order to aid reconstruction.

Turning to the status of these affricates in Mongsen, Coupe observes that while Temsunungsang's phonemic analysis appears to account for a large portion of his corpus of Mangmetong Mongsen, /ts(h)/ and /tʃ(h)/ are 'in contrastive distribution before schwa in identical rhymes' (p.c., 28 September 2010), and thus should be considered separate phonemes (e.g. /-tʃhət/ 'ABIL suffix' vs. /tshət/ 'eight' / 'stood on'). In addition, a few Mangmetong Mongsen words contain phonotactic sequences that would be violations of Temsunungsang's system developed for Chungli:

Violation of:	*Rime Harmony*	*Open-σ /ə/ requires [ts] onset*
	tshət ‘eight’ / ‘stood on’	**tʃhə**.luʔ ‘borrowed’
	tsàn.ɹə ‘Lotha tribesman (pejorative)’	**tʃà**.lì ‘walked’

Table 41: Mongsen violations of Temsungsang’s (2009a) constraints

The near-complementary distribution of /ts(h)/ and /tʃ(h)/, however, does lead Coupe to propose the possibility of a merger in progress:

> “An interesting feature of the dental affricate is that it is constrained to occurring in the environment before the schwa. The drastic loss of other vocalic environments in which it may occur could be the harbinger of a phonemic merger with the palato-alveolar affricate, whose environments of realization are unrestricted synchronically” (GMA: 31).

Coupe’s work on the Waromung variety of Mongsen uncovered some additional evidence for this merger: the existence of two words produced with initial [ts(h)] by older speakers but [tʃ(h)] by younger speakers, which indicates a possible ***ts(h)-** > **tʃ(h)-** sound change (Coupe 2003a: 46–47).

The current level of research suggests, therefore, that ***ts(h)-** and ***tʃ(h)-** were separate phonemes in Proto-Ao which have fully merged in Chungli but are still marginally distinct in Mongsen. This state of affairs is consistent with the observation that Mongsen tends to be more conservative than Chungli (based on comparison with PTB teleo-reconstructions). The marginal preservation of these phonemes in Mongsen, combined with the possibility that the mergers took different routes in each lect, allows for the reconstruction of particular instances of Proto-Ao ***ts(h)-** and ***tʃ(h)-** on the basis of comparative evidence.

Table 42 summarizes the diachronic analysis proposed here for Proto-Ao affricates (to be explicated in the following subsections):

PAo	*environments*	*Mongsen*	*Chungli*
***tʃ-**	(uncond.)	**tʃ-**	**tʃ-**
***tʃh-**	before ***-ə(k)**	**tsh-**	**s-**
	elsewhere	**tʃh-**	**s-**

PAo	*environments*	*Mongsen*	*Chungli*
***ts-**	before ***-ak/ŋ**	**tʃ-**	**tʃ-** [ts] allophone
	before ***-i**	**ts-**	**tʃ-** [tʃ] allophone
	elsewhere	**ts-**	**tʃ-** [ts] allophone
***tsh-**	(uncond.)	**tsh-**	**tʃ-** [ts] allophone

Table 42: Proto-Ao affricate development

*II.3.3.1. *tʃ(h)-*

*Mo **tʃ-**, Ch **tʃ-** < PAo ***tʃ-** < PTB ***dzy-**, ***ts(y)-**, ***kr-***

Table 43 presents the cognate sets that unambiguously support a reconstruction of Proto-Ao unaspirated ***tʃ-**. All Chungli forms in this table contain the [tʃ-] allophone of /tʃ-/:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(142) RICE (COOKED)	[a]-tʃa	tʃi^{1}	*(a-)**tʃ**a	*dzya RICE
(143) EAT	tʃàʔ ‘consume’	a^{3}-tʃiʔ^{3}	*a-**tʃ**aʔ	*dzya-n/k EAT / FOOD / FEED
(144) SON	tʃà-(ə)ɹ (‘offspring’ + ANOM)	tə^{3}-tʃiɹ^{31}	*(t-)**tʃ**a-əɹ	*tsa-n ⩙ *za-n CHILD / SON / RELATIVES
(145) CALL	tʃa	a^{2}-tʃa^{2}	*a-**tʃ**aj	
(146) DIRT, RUBBISH	tʃànàʔ	tʃa^{3}naʔ^{1}	***tʃ**aj.naʔ	
(147) BE CLEAR	tʃàŋtʃà	tʃaŋ^{2}tʃa^{2}	***tʃ**aŋ-**tʃ**aj	*(t)syaŋ CLEAR, PURE, CLEAN
(148) BREAK$_2$	-tʃak	tʃak^{3}-	***tʃ**ak	
(149) CHEW	mətʃak	mə^{3}tʃak^{3}	*m-**tʃ**ak	*m-dzyak CHEW†
(150) BOW / SLINGSHOT	litʃak	li^{3}tʃak^{3}	*li-**tʃ**ak	
(151) SEED, NUT	tʃaŋ	tə^{3}-tʃaŋ^{3}	*(t-)**tʃ**aŋ	*tsyaŋ TESTICLE
(152) RICE (HUSKED, UNCOOKED)	[a]-tʃaŋ	tʃaŋ^{1}	*(a-)**tʃ**aŋ	
(153) THAT (ONE), DEMONSTRATIVE	a-tʃu	a^{3}-tʃi^{3}	*a-**tʃ**u	
(154) PINEAPPLE	tʃuɹu	tʃi^{1}ɹu^{1}	***tʃ**u.ɹu	
(155) SHIELD	[a]-tʃuŋ	tʃuŋ^{1}	*(a-)**tʃ**uŋ	

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(156) CRY, WEEP	tʃə̀p	a^{3}-tʃəp^{3}	*a-**tʃ**əp	*krap WEEP
(157) DRINK$_{1}$	tʃəm	a^{2}-tʃəm^{2}	*a-**tʃ**əm	
(158) SQUEEZE	atʃət	a^{3}tʃət^{3}	*a.**tʃ**ət	
(159) BE OLD	tʃə́n	a^{3}-tʃən^{3}	*a-**tʃ**ən	

*Table 43: PAo *tʃ-*

- (142)–(144), (153), (154) Raising of PAo ***-a** to **-i** occurred in Chungli following ***tʃ-** for COOKED RICE, EAT, and SON. The cognate sets for THAT (ONE) (153) and PINEAPPLE (154) also suggest that PAo ***-u** was fronted to Chungli **-i** in the same environment. PAo initial ***tʃ-** may thus have had a 'palatalizing' effect on the vowel nuclei of open and glottal-final syllables.
- (145)–(147) The failure of the rimes in CALL, DIRT, and BE CLEAR to raise to Chungli **-i** following ***tʃ-** is due to the ***-aj** diphthongal rime, which yielded Chungli **-a** only after the ***-a** > **-i** brightening change was complete.

Proto-Ao ***tʃ-** descended from the PTB clusters ***dzy-**, ***tsy-**, ***kr-**, and possibly also the dental affricate ***ts-**.[53]

*Mo **tʃh-**, Ch **s-** < PAo *tʃh- < PTB *dz(y)-, *ts(y)-, *kr-*

A robust correspondence between Mongsen **tʃh-** and Chungli **s-** supports the reconstruction of PAo aspirated ***tʃh-**, which was preserved in Mongsen but merged with the reflexes of PAo ***s-** and ***ʃ-** in Chungli:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(160) YAM	[a]-tʃha [54]	si^{2}	*(a-)**tʃh**a	
(161) WING	[tə]-tʃha	ta^{3}-si^{1}kaŋ^{2}	*t-(a-)**tʃh**a	
(162) TRAP, CATCH	tʃhà?	a^{3}-si?^{1}	*a-**tʃh**a?	
(28) TOUCH	taŋtʃhà?	taŋ^{3}si?^{1}	*taŋ.**tʃh**a?	
(163) DISAPPEAR / LOSE	tʃhàmà?	sa^{3}ma?^{1}	***tʃh**aj-ma?	

[53] Matisoff: "[S]ince the PTB dental affricates */ **ts dz** / must definitely be considered unit phonemes, it would be nicely parallel to consider the palatal affricates to be clusters of */ **ts dz** / + **-y-**" (HPTB: 29–30).

[54] Alexander Coupe, p.c., 19 December 2013.

		Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(164)	BE DIFFICULT / BE HARD	tʃhàk ‘be hard’ [55]	a^{3}-sak^{1} ‘be hard / difficult’	*a-**tʃh**ak	*tsak-t HARD / SOLID[†]
(165)	AWAKE, ARISE	tʃhàktʃhà	sak^{31}	***tʃh**ak	
(166)	MASCULINE NOMINALIZER (SUF.)	-tʃhaŋ	-saŋ^{2}	*-**tʃh**aŋ	cf. PLB *tsaŋ^{1} PERSON / HUMAN BEING
(167)	CLOSE (v.)	tʃhìʔ	a^{3}-siʔ^{1}	*a-**tʃh**iʔ	*dzyi:p SHUT / CLOSE (v.) / CLOSE TOGETHER
(168)	GNASH, GRIND TEETH	tʃhitəp	si^{3}təp^{3}	***tʃh**i-təp	
(169)	PUNJI SPIKE	[a]-tʃhu	a^{2}-su^{2}	*a-**tʃh**u	*tsow-t THORN / PIERCE
(170)	COOK	— tʃhuɹu ‘cook’ əntʃhu ‘curry’	a^{2}-su^{2} ‘cook’ su^{2}ɹu^{2} ‘cook rice’	*a-**tʃh**u	*tsyow BOIL (v.) / COOK / BAKE
(171)	RUST	[a]-tshəŋ	suŋ^{2}	*(a-)**tʃh**uŋ (?)	*g/b-syaŋ EXCREMENT / RUST / BLIGHT
(172)	SUCK / KISS	mátʃhóp ‘suck’ mətʃhəp ‘kiss’	mə^{3}səp^{1}	*m-**tʃh**əp	*m-dzup ⩙ *m-dzip SUCK / SUCKLE / MILK / KISS
(173)	MORTAR	tʃhəmku	səm^{1}	***tʃh**əm	*t(s)um ⩙ *(t)sum MORTAR
(174)	WEAR, PUT ON	tʃhàm	a^{3}-səm^{1}	*a-**tʃh**əm	
(175)	SHAVE, SCRAPE	tʃhàt ‘scrub’ tʃhàtùk ‘scrape’	a^{3}-sət^{1} ‘shave, plane (v.)’	*a-**tʃh**ət	*m-kret SCRATCH / SCRAPE
(176)	MONEY	[a]-tʃhən	sən^{1}	*(a-)**tʃh**ən	
(177)	WRING, SQUEEZE	mətʃhən	mə^{2}sən^{2}	*m-**tʃh**ən	*tsyir ⩙ *tsyu:r WRING / SQUEEZE

*Table 44: PAo ***tʃh-***

▸ (163) The Chungli reflex of DISAPPEAR / LOSE does not show the expected raising of PAo open-syllable ***-a** to **-i** after ***tʃ(h)-** and is therefore reconstructed with PAo ***-aj**. (See the discussion below Table 43, above.)

[55] This Mongsen form comes from Temsunungsang 2009a: 212.

- (168) The second syllable of PAo ***tʃhi-təp*** GNASH, GRIND TEETH appears to be a lexicalization of the ***-təp*** RECIPROCAL / COLLECTIVE suffix (39).
- (169) Clark notes variation between [tʃ] and [s] in Chungli **a²-su²** 'punji spike' (1911: 196), which may be indicative of Mongsen influence. (See Coupe 2003a: 47–50 for an example in which influence from Chungli results in free variation in certain Waromung Mongsen words.)
- (170) According to Clark, Chungli **su²ɹu²** 'cook rice' is a compound of **a²-su²** 'cook' and **a³-ɹu¹** 'roast' (312), noting that the "Ao way of cooking rice for the table is to first boil it (*aso*, *so*), and subsequently place it in a covered vessel near the fire to be kept hot (*aro*, *ro*)" (1911: 718). Mongsen **tʃhuɹu** 'cook' appears to be the same compound, using the cognate morphemes **tʃhu** and **ɹu** (cf. PAo ***a-ɹu*** ROAST (312)).
  The first syllable of Mongsen **əntʃhu** 'curry' reflects PAo ***(a-)hən*** CURRY (141).
- (171) RUST is problematic: If the PAo form is reconstructed as ***(a-)tʃhəŋ*** on the basis of Mongsen **[a]-tshəŋ**, then the expected Chungli reflex is **səŋ**, not **suŋ**. On the other hand, Chungli **suŋ²** could have descended from Proto-Ao ***(a-)tʃhuŋ***, but the expected Mongsen reflex would then be **a-tʃhuŋ**. Perhaps some sporadic process of vowel reduction (and subsequent affricate dentalization) then acted on the Mongsen form, producing **[a]-tshəŋ**.
  Also unclear is the relationship of the Proto-Ao form to PTB ***g/b-syaŋ***, which may not be the appropriate etymon for this set.

The PTB sources of PAo ***tʃh-*** are a variety of dental affricates and affricate + palatal glide clusters, in addition to the ***kr-*** cluster. Presumably some prefixal interaction is the cause of the aspiration on the initial in Proto-Ao.

*Mo **tshə(k)**, Ch **sə(k)** < PAo ***tʃhə(k)** < PTB ?*

Chungli **s-** also corresponds in many forms with the Mongsen dental affricate **tsh-**. This cannot be Proto-Ao ***tsh-**, which became the Chungli [ts-] allophone of /tʃ-/ (see §II.3.3.2). The forms below therefore show that the PAo aspirated palatal affricate ***tʃh-** yielded Ch **s-**/Mo **tsh-** preceding ***-ə(k)**:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(178) MITHUN	[a]-tshə	sə²	*(a-)**tʃhə**	
(179) TIE (v.)	mətshə	mə²sə²	*m-**tʃhə**	
(180) DEER	mətshə	mə²sə²	*m-**tʃhə**	

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(85) BOAST	atshəkhəm	$a^{3}sə^{1}kəm^{2}$	*a.**tʃh**ə.khəm	
(181) FEEL COLD	atshák	a^{3}-sək^{1}	*a.**tʃh**ək	

*Table 45: PAo ***tʃhə(k)***

- (181) PAo ***a.tʃhək*** FEEL COLD provides the only example of a PAo /a/-initial reanalyzed as an **a-** prefix in Chungli. Mongsen **atshák** preserves the full disyllabic nature of the verb root.

The development of Proto-Ao ***tʃh-*** in Ao is fully described as follows:

***tʃh-**	>	Chungli:	**s-**
	>	Mongsen:	**tsh-** before ***-ə**, ***-ək** (and possibly ***-əŋ**, ***-əʔ**)
			tʃh- elsewhere

The diachronic relationship depicted above between PAo ***tʃh-*** and its Mongsen reflexes has the unique advantage of exactly mirroring the allophonic relationship between [tʃ] and [ts] in Chungli: /tʃ/ is generally realized as [tʃ], surfacing as [ts] only when it is followed by schwa and the syllable coda is null, /ʔ/, or a velar consonant. The reflexes of PAo ***tʃh-*** may therefore be moving toward a similar synchronic relationship in Mongsen.

A single form from Coupe's glossary (GMA: 499), not in the above table, appears to contradict this proposal: Mangmetong Mongsen **tʃhəluʔ** 'borrowed', in which **tʃh-** appears before an open-syllable schwa where **tsh-** is expected. Given that this merger of ***tʃ(h)-*** and ***ts(h)-*** is currently in progress, however, and that sound changes are not instantaneously propagated among all speakers of a language, it is very possible that this lexical item came from a speaker who had not yet adopted the merger. Alternatively, this form may be a loan from a more conservative dialect.

*II.3.3.2. *ts(h)-*

*Mo **ts-**, Ch [ts-] < PAo ***ts-** < PTB ***dz(y)-**, ***ts(y)-**, ***kl-***

The correspondence between Mongsen **ts-** and the Chungli [ts-] allophone of /tʃ-/ points to Proto-Ao ***ts-***:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(182) WATER	[a]-tsə	tsə^{1}	*(a-)**ts**ə	*tsyu WATER / BODY FLUID
(183) SALT	mətsə	mə^{3}tsə^{3}	*m-**ts**ə	*m-t(s)i SALT / YEAST
(184) SALIVA, SPITTLE	mətsə	mə^{2}tsə^{2}	*m-**ts**ə	*m-ts(y)il SPIT / SPITTLE / SALIVA
(185) EGG	həntsə	ən^{2}-tsə^{2}	*hən-**ts**ə	*dz(y)u EGG
(186) NIT	hlutsə	a^{1}-ɹu^{2}tsə^{2}	*(a-)hɹu-**ts**ə	
(187) FALL, PLUMMET	atsə	tsək^{31}	*(a-)**ts**ə(k)	*kla-k/y/t ⪤ *gla-k/y/t FALL
(188) ROAST$_1$	tsə̀k	a^{3}-tsək^{3}	*a-**ts**ək	
(189) WASH (HANDS)	mə̀tsək	mə^{3}tsək^{3}	*m-**ts**ək	
(190) CELESTIAL	tsəŋmuk ‘thunder’ tsəŋi ‘rain’ tsəŋla? ‘lightning’ tsə̀ŋhɹəm ‘god, deity’	tsəŋ^{3}-muk^{1} ‘thndr.’ tsəŋ^{1}-lu^{1} ‘rain’ tsəŋ^{1}-pə^{3}ɹət^{1} ‘ltng.’ tsəŋ^{1}-ɹəm^{2} ‘deity’	*tsəŋ-	
(191) PUNCH, SPEAR (V.)	tsəŋ	a^{2}-tsəŋ^{2}	*a-tsəŋ	

*Table 46: PAo *ts-*

The possible PTB sources for PAo ***ts-*** overlap with those for PAo ***tʃ(h)-***, suggesting that the palatal and dental affricates underwent various unknown changes between the PTB and PAo stages.[56]

- (185) In both Ao forms for ‘egg’, the first syllable means ‘chicken’ (140).
- (187) FALL, PLUMMET shows PTB ***kl-*** > PAo ***ts-***, a sound change that serves as an excellent parallel to PTB ***kr-*** > PAo ***tʃ(h)-*** (see CRY, WEEP (156) and SHAVE, SCRAPE (175)). The Mongsen and Chungli forms of FALL also reflect the original variation in the presence/absence of suffixal ***-k***.
- (190) The reflexes of the CELESTIAL morpheme ***tsəŋ*** appear on words for supernatural beings and sky-related weather phenomena in both lects. Clark notes that “TSUNG in

[56] Matisoff notes that “[t]he contrast between dental and palatal sibilants and affricates is shaky or non-existent in many TB languages” (HPTB: 30), a fact that makes their PTB reconstruction particularly difficult.

Zungi [Chungli] and Mungsen [Mongsen], seems to have an idea of divine, heavenly, or supernatural" (1911: 898).

*Mo **tʃak/ŋ**, Ch **[ts]ək/ŋ** < PAo *__tsak/ŋ__ < PTB ?/*__kyaŋ__*

Three sets show a correspondence between Mongsen **tʃaC$_{velar}$** and Chungli [tsəC$_{velar}$] (underlying /tʃ/):

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(192) PADDY, GRAIN	[a]-tʃak	tsək^{1}	*(a-)**ts**ak	
(193) BAMBOO SHOOT (FERMENTED)	itʃak	i^{3}tsək^{3}	*i.**ts**ak	
(194) FOOT / LEG	[tə]-tʃaŋ	tə^{3}-tsəŋ^{3}	*t-**ts**aŋ	*r-k(y)aŋ FOOT / LEG† [57]

*Table 47: PAo *__tsak/ŋ__*

▸ (194) FOOT / LEG suggests that the PTB ***ky-*** cluster coalesced to yield PAo ***ts-***.

All three sets can be reconstructed as PAo ***tsaC$_{velar}$***. In the process of merging the PAo affricates ***ts-*** and ***tʃ-***, Mongsen preserved the ***-ak/ŋ*** rimes and palatalized ***ts-*** to ***tʃ-*** in this environment. Chungli, on the other hand, preserved PAo ***ts-*** here as the [ts] allophone of /tʃ/ and instead reduced the vowel nucleus to schwa.

*Mo **tsə**, Ch **tʃi** < PAo *__tsi__ < PTB ?*

Three cognate pairs contain a correspondence between Mongsen **tsə** and Chungli **tʃi** /tʃi/, which may reflect Proto-Ao ***tsi***:

	Mongsen	*Chungli*	*Proto-Ao*
(195) LOOK, STARE	atsə	a^{2}tʃi^{2}	*a.**tsi**
(196) PECK, BITE	tsə̀	mə^{3}tʃi^{3}	*(m-)**tsi**
(197) BRAID, KNIT, PLAIT	mətsə	mə^{3}tʃi^{3}	*m-**tsi**
(198) SUGAR CANE	mùtsə	mu^{1}tʃi^{2}	*mu.**tsi**

*Table 48: PAo *__tsi__*

When PAo ***ts-*** preceded ***-i***, the initial was palatalized to [tʃ-] /tʃ-/ in Chungli, while the vowel was simply reduced to schwa in Mongsen.

[57] This PTB form is reconstructed as ***r-kaŋ*** ⧓ ***keŋ*** LEG / FOOT / STEM / STALK in HPTB, but has since been updated in the STEDT database (5 November 2013).

*Mo **tsh-**, Ch [ts-] < PAo ***tsh-** < PTB ***(s-)ry-** ?*

Table 49 illustrates the correspondence of the Chungli [ts-] allophone of /tʃ-/ and Mongsen **tsh-**, supporting the reconstruction of the PAo aspirated dental affricate ***tsh-**:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(199) BE SHORT	tshə	a^{3}-tsə^{1}	*a-**tsh**ə	
(200) PULL	tshə̀ʔ	a^{3}tsəʔ^{1}	*a-**tsh**əʔ	
(47) EIGHT	tshət 'eight'	(ti^{3} 'eight')	***tsh**ət ⪤ *thi	'PKN' *d-ryat EIGHT
(201) PINCH	mətshək	mə^{3}tsək^{1}	*m-**tsh**ək	*sik PINCH / TWIST
(202) LOUSE	[a]-tshək	a^{3}-tsək^{1}	*a-**tsh**ək	*s-r(y)ik LOUSE
(203) COLLIDE, BUMP	tshə̀k	a^{3}-tsək^{1}	*a-**tsh**ək	

*Table 49: PAo ***tsh-***

- (47) See Table 29 (page 53) for the discussion of EIGHT.
- (47), (201), (202) The PTB/'PKN' forms of EIGHT, PINCH, and LOUSE suggest that PAo ***tsh-** descended from some sort of PTB cluster involving ***r-**, ***-y-**, and possibly ***s-**.[58]
- (201) PTB TWIST is reconstructed simply as ***sik** PINCH / TWIST in HPTB (HPTB: 344), but this would be expected to yield PAo ***m-sək**, not the proposed form ***m-tshək**. It should also be noted that that Temsunungsang reports Chungli 'pinch' as **mɯ^{3}sɯk^{1}** (=**mə^{3}sək^{1}**) (2009a: 209): This Mo **tsh** : Ch **s** correspondence would then support a reconstruction of PAo PINCH as ***m-tʃhək** with ***tʃh-** (see Table 45, page 73).

II.3.4. Nasal Stops

As with the oral stops, three places of articulation can be reconstructed for the nasal stops, with voiced and voiceless variants: ***hm-** and ***m-**, ***hn-** and ***n-**, and ***hŋ-** and ***ŋ-**. Their development is summarized below in Table 50:

PAo	*environments*	*Mongsen*	*Chungli*
***m-**	before ***-əj**	**m-**	**n-**
	elsewhere	**m-**	**m-**

[58] cf. Jingpho **mətsat** 'eight' (< PTB ***b-g-ryat**) (STC: 45).

PAo	*environments*	*Mongsen*	*Chungli*
***hm-**	before ***-əj**	**hm-**	**n-**
	elsewhere	**hm-**	**m-**
***n-**	(uncond.)	**n-**	**n-**
***hn-**	(uncond.)	**hn-**	**n-**
***ŋ-**	(uncond.)	**ŋ-**	**ŋ-**
***hŋ-**	(uncond.)	**hŋ-**	**ŋ-**

Table 50: Proto-Ao nasal stop development

*II.3.4.1. *(h)m-*

In the large majority of cognate sets, Chungli **m-** corresponds to both Mongsen **m-** and **hm-**, with no apparent environment conditioning the voiceless nasal in Mongsen. Both ***hm-** and ***m-** are thus reconstructed for Proto-Ao in the following tables:

*Mo **hm-**, Ch **m-** < PAo ***hm-** < PTB ?*

Table 51 presents the reconstruction of PAo ***hm-**, whose PTB source is unknown:

	Mongsen	*Chungli*	*Proto-Ao*
(2) WORK, JOB	hmapa	ma^{3}pa^{3}	***hm**a.pa
(8) TIME	hmapaŋ	ma^{2}paŋ^{2}	***hm**a.paŋ
(204) WIDOW	hmì-làɹ [59]	a^{3}-mi^{1}-tsəɹ^{1}	*(a-)**hm**i-
(205) VAPOR	hmiluŋ ‘cloud, fog’	mi^{1}luŋ^{1} ‘rising ashes’	***hm**i.luŋ

*Table 51: PAo **hm-***

*Mo **m-**, Ch **m-** < PAo ***m-** < PTB ***m-***

In most cases, PAo ***m-** descended unchanged from PTB ***m-**, as shown in the following table:

[59] Khensa Mongsen (AL)

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(206) BREAST	mama	ma²ma²	*ma.ma	
(76) WOUND, SORE	khùma	ku¹mu²	*khu-ma	*r-ma-t WOUND / INJURED
(207) CUP	màɹùk	ma¹ɹuk¹	*ma.ɹuk	
(208) BANANA	maŋu	mu³ŋu³	*ma.ŋu	
(209) NO (REFUSAL)	màʔ	maʔ¹	*maʔ	*ma-y NEGATIVE
(210) SLAP	màʔ	a³-maʔ¹	*a-maʔ	
(163) DISAPPEAR / LOSE	tʃhàmàʔ	sa³maʔ¹	*tʃhaj-maʔ	*ma-t LOSE / DISAPPEAR
(211) FACE / SURFACE	[tə]-ma	tə³-ma³	*t-ma[j]	*s-maːy FACE
(212) BE DARK	màŋ	a³-maŋ¹	*a-maŋ	*s-maŋ ≋ *s-mak BLACK / INK / DEEP
(213) BELIEVE	maŋ	a²maŋ²	*a-maŋ	
(214) BODY / CORPSE	[tə]-maŋ ‘body’ [a]-maŋ ‘corpse’	tə²-maŋ² ‘body’	*(t/a-)maŋ	*s-maŋ CORPSE
(215) DREAM (n./v.)	aja-maŋ ‘dream’ (n.)	puŋ³maŋ³ ‘dream’ (n./v.)	*maŋ	*r/s-maŋ ≋ *mak DREAM
(216) FIRE	mi	miʔ¹	*mi(ʔ)	*mey FIRE
(78) SMOKE	mukhuli	mu²ku²zə²	*mu-khu-ləj	*mey FIRE
(198) SUGAR CANE	mùtsə	mu¹tʃi²	*mu.tsi	
(217) MEDICINE, DRUG	muli	mu²zə²	*mu.ləj	
(218) BROOD, HATCH	muk	a³-muk¹	*a-muk	
(219) THUNDER	tsəŋmuk	tsəŋ³-muk¹	*tsəŋ-muk	*m-bruŋ ≋ *m-bruk THUNDER / DRAGON
(117) GINGER	sáŋmúk	səŋ³muk³	*səŋ.muk	
(220) REST, OBSERVE	mùŋ	a³-muŋ¹	*a-muŋ	
(221) NEGATIVE (VERBAL PFX.)	mə-	mə²-	*mə-	*ma-y NEGATIVE
(222) SIT	mən	a³-mən¹	*a-mən	
(30) CORN	mənti	mən²ti²	*mən.ti	

*Table 52: PAo **m-***

- (78) The first syllable of PAo ***mu-khu-ləj*** SMOKE may reflect PTB ***r-məw*** SKY / HEAVENS / CLOUDS, as in Lahu **mû-qhɔ̂** 'smoke' (Matisoff 1988: 993). However, given that all the other Central Naga cognates of this word are compounds of 'fire' + 'smoke' (see PCN ***khu?*** SMOKE [81]), the first syllable of PAo ***mu-khu-ləj*** is likely a variant of PAo ***mi(?)*** FIRE (216) (< PTB ***mey***) that underwent sporadic vowel harmony with the root to yield PAo ***mu-***.
- (219) The only instance of PAo ***m-*** which descended from a segment other than PTB ***m-*** appears in ***tsəŋ-muk*** THUNDER, which yielded PAo ***m-*** from some interaction of the PTB ***m-*** prefix with the 'resonantal' cluster ***br-*** (HPTB: 59): Perhaps the nasality of the ***m-*** prefix spread to the root-initial ***b-*** and the weak medial ***-r-*** glide was lost.
  The first syllable of THUNDER is the CELESTIAL morpheme ***tsəŋ-*** (190).

*Mo **(h)mi(?)**, Ch **nə(?)** < PAo *(h)məj(?)** < *PTB *məy***

For a number of cognate pairs, Mongsen **(h)m-** is found to correspond with Chungli **n-**, shown below in Table 53. The prevalence of the Mongsen **-i** : Chungli **-ə** vowel correspondence in these pairs points to an original PAo ***-əj(?)*** rime (< PTB ***-əy***). Since this same Proto-Ao diphthong affected other initial consonants in Chungli (including movement toward the dental/alveolar area; see §II.4.6), it is not surprising that an original bilabial nasal would dentalize to Chungli **n-** when followed by ***-əj(?)*** (PAo ***məj(?)*** > pre-Chungli ****nəj(?)*** > Chungli ***nə(?)***, but PAo ***məj(?)*** > Mongsen ***mi(?)***):

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(223) TARO	[a]-mi [60]	(ma^{3})nə^{1}	*(a-)məj	*m-n(w)ay YAM (?)
(224) SPEAR	[a]-mi	nə^{2}	*(a-)məj	
(225) DESIDERATIVE (SUF.)	-mì	-nə^{1}	*-məj	
(226) PERSON	[a]-mi?	nə(?) (Clark: NV̰)	*(a-)məj?	*r-mi(y)-n MAN / PERSON [61]

[60] Glossed as 'yam' in GMA but later revised to 'taro' after further investigation (Alexander Coupe, p.c., 19 December 2013). Mills also defines Longchang Mongsen *ami* as 'taro' (1926: 125, 359).
[61] The sequence **i(y)** in a PTB reconstruction indicates allofamic variation between ***i*** and ***əy*** (HPTB: 509).

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(227) BE SWEET	mijaŋ	a²-naŋ²	*a-m-jaŋ	
(228) SHADOW / SOUL	[tə]-hmila	ta²-nə²la²	*t-(a-)**hməj**-la	*m-hla GOD / SOUL / BEAUTIFUL

*Table 53: PAo *(h)məj-*

- (223) The relationship of PAo ***(a-)məj** TARO to PTB ***m-n(w)ay** YAM is unclear.
- (226) Proto-Ao ***(a-)məj?** PERSON clearly descended from the PTB allofamic variant ***r-məy-n**, though the source of the PAo glottal stop is unknown. Clark states that Chungli NṲ [nə(ʔ)] 'person' is 'now nearly obsolete except in composition' (1911: 519). The common Chungli word for 'person' is now **ni²suŋ²**, whose first syllable may reflect PAo ***(a-)məj?**, although the rime development is unexpected.
- (227) The Mongsen and Chungli forms in BE SWEET are both developments from a Proto-Ao etymon in which the ***m-** prefix was affected by the following root-initial palatal glide ***j-**. In Mongsen, the schwa vocalization of the prefix was simply raised to **-i**. In Chungli, the prefix + root combination appears to have been sporadically reanalyzed as a disyllabic stem like ****məj.aŋ**, which then underwent dentalization of the ****m-** initial and loss of the ****-j** offglide (§II.4.1.5):

  PAo ***a-m-jaŋ** > (reanalysis) ****a-məj.aŋ** > (dentalization) ****a-nəj.aŋ** > (offglide loss) ****a-nəaŋ** > (vowel merger) Chungli **a-naŋ**

  The Chungli reflexes of other ***j-**initial Proto-Ao roots with ***m-** prefixes do not share this (apparently sporadic) development (cf. Table 63, §II.3.5.2).
- (228) Proto-Ao SHADOW / SOUL is a complicated case, with at least a couple of possible reconstructions. The most straightforward analysis recognizes Mongsen **hmi** and Chungli **nə** here as reflexes of PAo ***hməj**, yielding ***t-(a-)hməjla** for the full Proto-Ao etymon. If the PAo form truly descended from PTB ***m-hla**, however, then the syllable ***hməj-** is much too complex to be the reflex of the PTB prefix ***m-**. Matisoff (p.c., 2 November 2010) suggests the intriguing possibility that PTB ***m-hla** SOUL could be reanalyzed as compound of ***mi(y)** PERSON and ***hla** (which would now mean SHADOW)—an idea that works well with the Proto-Ao reconstruction ***t-(a-)hməj-la**.

*II.3.4.2. *(h)n-*

Both voiceless and voiced variants of dental nasals are reconstructed for Proto-Ao.

*Mo **hn-**, Ch **n-** < PAo *__hn-__ < PTB *__s-n-__ ?*

Table 54 presents the cognate pairs supporting the reconstruction of PAo ***hn-**:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(229) BE NEAR	áhná ‘be near’	a^{3}na^{1} ‘near’	*a.**hn**a[j]	*s-na:y ⪤ *s-ney NEAR
(230) FLOWER	hnaɹu	na^{2}ɹu^{2}	***hn**a.ɹu	
(231) EAR	[tə]-hnaɹuŋ	tə^{2}-na^{2}-ɹuŋ^{3}	*t-**hn**a-ɹuŋ	*r/g-na EAR / HEAR / LISTEN
(232) SCRATCH (v.)	hnàk	a^{3}nak^{1}	*a-**hn**ak	*hyak SCRATCH (?)
(233) GUARD (v.)	hnàk	a^{3}-nək^{1}	*a-**hn**ak	
(234) SON-IN-LAW / BROTHER-IN-LAW	[t(ə)]-əmhnak ‘son-in-law’	a^{3}-nək^{1} ‘son/bro.-in-law’	*(a-)**hn**ak	*s-ma:k SON-IN-LAW
(235) FOLLOW	hni	a^{2}ni^{2}-tak^{3}	*a-**hn**i	
(236) SMELL (vi./vt.)	məhnəm	mə^{2}nəm^{2}	*m-**hn**əm	*m/s-nam SMELL
(237) FATHOM	ahnəm	a^{1}-nəm^{2}	*a-**hn**əm	*la(:)m FATHOM

*Table 54: PAo *__hn-__*

The proposed PTB etyma for these forms do not unambiguously identify the source of PAo ***hn-**:

- (229), (236) For BE NEAR and SMELL, the PTB ***s-** prefix may have devoiced the root-initial ***n-**.
- (231) Proto-Ao EAR consists of a compound deriving from two PTB roots meaning EAR and HOLE / ORIFICE / EAR, respectively (cf. Table 66, §II.3.5.3). The devoicing of the initial nasal in PTB ***r/g-na** to yield PAo ***hna-** has an unknown cause.
- (232) The voiceless nasal in Proto-Ao ***a-hnak** SCRATCH may be tentatively attributed to rhinoglottophilia (Matisoff 1975).
- (232), (233) If SCRATCH and GUARD were indeed segmentally homophonous verbs in Proto-Ao, they appear to have diverged irregularly in Chungli: In SCRATCH the **a-** prefix was reanalyzed as part of the root, while in GUARD the root vowel was sporadically reduced to schwa (see also CHOKE / DROWN (301) and SON-IN-LAW / BROTHER-IN-LAW (234)).
- (234) The PTB ***m-** initial ***s-ma:k** SON-IN-LAW underwent some sort of dentalizing and devoicing process to yield PAo ***hn-** (cf. PCN ***a-mjak** IN-LAW [235]). As in GUARD (233), the PAo root vowel has sporadically reduced to schwa in Chungli.

Note that SON-IN-LAW / BROTHER-IN-LAW is a shorthand proto-gloss that captures what appear to be the most common uses of this complex kinship term. The full range of the term in either lect is not well-understood yet, but Mills defines it as the 'son of a woman of the phratry of the party spoken of' (1926: 172).

- (235) PAo ***a-hni*** FOLLOW appears to be paradigmatically related to PAo ***a-ni*** LEAD (v.) (243), with the voicelessness of the root-initial nasal serving some sort of morphological function. However, if PAo ***hn-*** is the remnant of an original causative PTB ***s-*** prefix (cf. HPTB: 100), then Proto-Ao LEAD and FOLLOW are paradigmatically related in an unexpected way, with FOLLOW literally meaning 'cause to lead' (or perhaps the permissive sense of 'let (someone) lead').
- (237) FATHOM exhibits a unique (and likely sporadic) PTB ***l-*** > PAo ***hn-*** development not corroborated by any other correspondence sets (but see the development of PAo ***lj-*** > Chungli ***n-*** in §II.3.6.3).

*Mo **n-**, Ch **n-** < PAo *__n-__ < PTB *__n-__*

Proto-Ao ***n-*** largely descended from PTB ***n-***:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(238) YOU (2SG)	nàŋ	na^{1}	*__n__a(ŋ)	*na-ŋ 2ND PERSON PRONOUN
(239) AFFIX, STICK (v.)	mənaʔ	mə^{3}naʔ^{3}	*m-__n__aʔ	
(146) DIRT, RUBBISH	tʃànàʔ	tʃa^{3}naʔ^{1}	*tʃaj.__n__aʔ	
(240) BE BLACK	nák	a^{3}-nak^{1}	*a-__n__ak	*s-nak BLACK / INK / DEEP
(241) PROMISE, BE CONFIDENT	náŋlák [62]	naŋ^{3}zək^{1}	*__n__aŋ.ljak	
(242) I, ME (1SG)	nì	ni^{1}	*__n__i	*ŋa-y 1ST PERSON PRONOUN / SELF
(243) LEAD (v.)	nì	a^{3}ni^{3}	*a-__n__i	
(244) EYE	[tə]-nik	tə^{3}-nək^{3}	*t-__n__ik	*s-mik ⩬ *s-myak EYE
(55) CORNER	kìnìk	ki^{1}nək^{1}	*ki.__n__ik	
(245) BE TENDER, SOFT	anik	a^{3}nək^{3}	*a.__n__ik	

[62] Khensa Mongsen (AL), also Temsunungsang 2009a: 211.

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(246) NAME	[tə]-niŋ	tə^{2}-nəŋ^{2}	*t-**n**iŋ	*r/s-miŋ NAME
(247) SKY	[a]-niŋ	a^{3}-nəŋ^{1}	*a-**n**iŋ	
(248) SEVEN	thəni ‘seven’ nətəɹ∼niɹə ‘seventy’	tə^{3}-nət^{3} ‘seven’ nət^{3}əɹ^{1} ‘seventy’	*th-**n**i ⩙ *th-**n**ət	*s-ni-s SEVEN
(249) SIBLING (YOUNGER)	[tə]-nu	tə^{2}-nu^{2}	*t-**n**u	*naːw YOUNGER SIBLING
(250) BE LATE	mənu	mə^{2}nu^{2}	*m-**n**u	
(251) MACHETE, DAO	[a]-nuk	nuk^{1}	*(a-)**n**uk	
(252) HUNDRED	nuklàŋ	nuk^{1}laŋ^{1}	***n**uk.laŋ	
(253) SUN / DAY	thani ‘today’	ta^{2}-nə^{2} ‘today’ a^{1}-nə^{2} ‘sun’	***n**əj	*nəy SUN / DAY
(254) CAT	mùni	ta^{1}-nə^{2}	*-**n**əj	
(255) LAUGH / SMILE	məni	mə^{2}nə^{2}	*m-**n**əj	*m-nwi(y)-k LAUGH
(256) BE SOFT	nəp	a^{3}nəp^{3}	*a-**n**əp	
(257) BE WELL, SATISFIED	nəm	a^{2}nəm^{2}	*a-**n**əm	*s-nam GOOD
(258) PUSH, PRESS	nəm	a^{2}-nəm^{2}	*a-**n**əm	
(259) BE LOW	nə̀m [63]	a^{3}-nəm^{1}	*a-**n**əm	*s-nem ⩙ *s-nyam LOW / SOFT
(260) MOUNTAIN	tə́nə̀m	tə^{2}-nəm^{2}	*t-**n**əm	
(261) FIFTY	thənəm	tə^{1}-nəm^{2}	*th-**n**əm	
(262) BE/GET READY	ɹənəm	ɹə^{2}nəm^{2}	*ɹ-**n**əm	
(263) TWO	anət	(a^{1}-na^{1})	*a-**n**ət	*g/s-ni-s TWO
(264) BE/MAKE DIRTY	mənən	mə^{3}nən^{3}	*m-**n**ən	

*Table 55: PAo *n-*

- (240), (257) The reconstructed Proto-Ao reflexes of PTB ***s-nak** BLACK and ***s-nam** GOOD show no voiceless or palatalized nasals, appearing not to have been affected by the ***s-** prefix. This suggests that they may have descended from prefix-less PTB variants.

[63] Khensa Mongsen (AL)

- (242) PTB ***ŋa-y*** 1ST PERSON PRONOUN is included for completeness, but its development into PAo ***ni*** is irregular (which is not unexpected with such high-frequency function words).
- (244), (246) The dentalization of PTB ***m-*** to PAo ***n-*** in both EYE and NAME appears to have been triggered by the adjacent PTB ***-ik/ŋ*** rimes.
- (248) Allofamic variants must be reconstructed at the Proto-Ao stage for SEVEN, reflecting the original PTB suffixed vs. unsuffixed variants. The regular development of the PTB ***-s*** suffix is PAo final ***-t***, with all vowels before final ***-t*** then reducing to schwa in Proto-Ao (e.g. PTB ***g/b-sat*** > PAo ***sət*** KILL (106); cf. §II.4.3.1). Unsuffixed PTB ***s-ni*** yielded the PAo variant ***th-ni***, reflected in Mongsen **thəni** 'seven', **niɹa** 'seventy'. (The source of the PAo ***th-*** prefix is unknown.) The suffixed variant PTB ***s-ni-s*** became the PAo variant ***th-nət*** according to the regular development of PTB ***-i-s*** > ****-it*** > PAo ***-ət***, finally reflected in Chungli **tə^{3}nət^{3}** 'seven' and Mongsen **nətəɹ** 'seventy'.
- (263) Similar variation between ***a-na*** ≷ ***a-nət*** could be posited for Proto-Ao TWO, but this would require a PTB form like ***na-s***, instead of the reconstructed ***g/s-ni-s***. The source of Chungli **a^{1}-na^{1}** 'two', therefore, remains something of a mystery.[64]

*II.3.4.3. *(h)ŋ-*

Finally, voiceless and voiced variants of the velar nasal are reconstructed for Proto-Ao.

*Mo **hŋ-**, Ch **ŋ-** < PAo *hŋ- < PTB *g-n-, *s-ŋ- ?*

The correspondence of Mongsen **hŋ-** with Chungli **ŋ-** supports the reconstruction of Proto-Ao ***hŋ-**, shown in Table 56:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(265) FISH	[a]-hŋáʔ	a^{3}-ŋuʔ^{1}	*a-**hŋ**aʔ	*s-ŋya FISH
(266) HEAR, LISTEN	hŋa	a^{2}ŋa^{2}	*a-**hŋ**aj	*r/g-na EAR / HEAR / LISTEN

*Table 56: PAo *hŋ-*

- (265) The voiceless nasal in PAo ***a-hŋaʔ*** FISH may be a result of the ***s-*** prefix in PTB ***s-ŋya***. The medial palatal glide in PTB ***s-ŋya*** appears not to have been preserved in the Proto-Ao form.

[64] See Table 29 for a comparable irregularity in EIGHT (47).

▸ (266) PAo ***a-hŋa*** HEAR, LISTEN may have developed from a variant[65] of PTB ***r/g-na*** in which the velar prefix interacted with the root-initial nasal to yield ****ŋ-** (perhaps through metathesis: ***g-n-** > ****ng-** > ****ŋ-**). The trigger for devoicing to ***hŋ-**, however, is unknown.

*Mo **ŋ-**, Ch **ŋ-** < PAo ***ŋ-** < PTB ***ŋ-***

PAo ***ŋ-*** descended unchanged from PTB ***ŋ-***:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(17) FIVE	phaŋa	pu^{1}ŋu^{2}	*pha-**ŋ**a	*l/b-ŋa FIVE
(267) MONKEY	sàŋatʃa ‘macaque’	si^{1}-ŋu^{1} ‘monkey’	*ʃa-**ŋ**a	
(208) BANANA	maŋu	mu^{3}ŋu^{3}	*ma.**ŋ**u	

*Table 57: PAo **ŋ-***

II.3.5. Glides and Liquids

The Proto-Ao inventory of approximants includes voiced and voiceless variants of the labiovelar and palatal glides, as well as the liquids (rhotic and lateral):

PAo	*environments*	*Mongsen*	*Chungli*
***w-**	***wa(ʔ)**	**wa(ʔ)**	**u(ʔ)**
	elsewhere	**w-**	**w-**
***hw-**	***hwa(ʔ)**	**hwa(ʔ)**	**u(ʔ)**
	elsewhere	**hw-**	**w-**
***j-**	before ***-əj**, ***-ak**	**j-**	**z-**
	elsewhere	**j-**	**j-**
***hj-**	(uncond.)	**hj-**	**Ø**
***ɹ-**	(uncond.)	**ɹ-**	**ɹ-**

[65] See EAR (231) for a different PAo reflex of PTB ***r/g-na***.

PAo	*environments*	*Mongsen*	*Chungli*
***hɹ-**	(uncond.)	**hɹ-**	**ɹ-**
***l-**	before ***-əj**, ***-ik/ŋ**	**l-**	**z-**
	elsewhere	**l-**	**l-**
***hl-**	before ***-əj**, ***-ik/ŋ**	**hl-**	**z-**
	elsewhere	**hl-**	**l-**

Table 58: Proto-Ao approximant development

*II.3.5.1. *(h)w-*

Proto-Ao exhibited the voiced and voiceless labiovelar glides ***w-** and ***hw-** in initial position, which descended from an unknown split in PTB ***w-**. (See §II.3.6.1 for reconstruction of the glides in medial position.) Mongsen preserved the glides, while ***hw-** merged with ***w-** in Chungli to yield **w-**. In addition, when PAo ***(h)w-** was followed by open/glottal-final **-a(ʔ)**, Chungli coalesced the ***(h)wa(ʔ)** sequence to **u(ʔ)**.[66]

*Mo **hw-**, Ch **w-** < PAo ***hw-** < PTB ?*

Table 59 presents the cognate set for PAo voiceless ***hw-**:

	Mongsen	*Chungli*	*Proto-Ao*
(268) ROAST, WARM (v.)	hwaŋ	a^{2}-waŋ^{2}	*a-**hw**aŋ

*Table 59: PAo *hw-*

▸ (268) As noted above, Chungli neutralized the voicing contrast.

*Mo **w-**, Ch **w-** < PAo ***w-** < PTB ***w-***

Other cognate sets support the reconstruction of PAo voiced ***w-**, which descended from PTB ***w-**:

[66] cf. the parallel developments of PTB ***-wa** > WT **-o**, Lahu **-u** (HPTB: 167).

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(269) CHAFF, HUSK	wana	wa^{2}nu^{2}	*__w__aj	*pwaːy HUSK / CHAFF
(270) CROW (n.)	wahɹu	wa^{2}ɹu^{2}	*__w__aj-hɹu	*wa BIRD / FEATHER
(271) SWELL, BE SWOLLEN	wàk	a^{3}-wak^{1}	*a-__w__ak	

*Table 60: PAo *__w__-*

- (269) The initial bilabial stop in PTB ***pwaːy** HUSK / CHAFF was presumably interpreted as a prefix and subsequently lost, leaving ***waːy** to descend into PAo as ***waj**. The Mo **na** : Ch **nu** correspondence is unusual and therefore left unreconstructed for now.
- (270) PTB ***wa** BIRD somehow adopted a palatal suffix to yield ***waj** in PAo CROW. The resultant ***-aj** diphthongal rime yielded Mongsen and Chungli **-a**, but did not participate in the coalescence of ***wa** > **u** in Chungli (see the following subsection).

*Mo **(h)wa(ʔ)**, Ch **u(ʔ)** < PAo **(h)wa(ʔ)** < PTB ***wa***

When the PAo coda was open/glottal-final ***-a(ʔ)**, Chungli coalesced the ***(h)wa(ʔ)** sequence to ***u(ʔ)**:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(272) GO	wa	a^{2}-u^{2}	*a-__w__a	*s-wa GO
(273) LEAF	sə̀ŋàwà, tə́-wá [67]	tu^{3} (/tə-u/)	*t-__w__a	
(127) BIRD	wàzàʔ	u^{1}zəʔ^{1}	*__w__a-zaʔ	*wa BIRD / FEATHER
(274) BAMBOO	[a]-hwə́ʔ	a^{3}-uʔ^{1}	*a-__hw__aʔ	*r-wa BAMBOO

*Table 61: PAo *__(h)wa(ʔ)__*

*II.3.5.2. *(h)j-*

The palatal glide exhibited both voiced and voiceless variants in Proto-Ao.

*Mo **hj-**, Ch **Ø-** < PAo ***hj-** < PTB ***y-***

The Proto-Ao voiceless palatal glide was preserved in Mongsen but completely lost in Chungli:

[67] The latter Mongsen form was provided by T. Temsunungsang (p.c., 19 October 2010).

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(275) EARN / PAY WAGES	hjàʔ ‘earn’ [68] tihjàʔ ‘wages’ [69]	a^{3}-aʔ^{1} ‘earn / pay wages’ taʔ^{31} (/tə-aʔ/) ‘wages’	*a-**hj**aʔ	
(276) BE SHY	ahjak	ak^{31}	*a.**hj**ak	*g-yak ⪤ *s-r(y)ak ASHAMED
(277) THREAD, YARN	a-hjaŋ [70]	aŋ^{2} (/a-aŋ/)	*a-**hj**aŋ	
(77) BAG	hjaŋkhu	jaŋ^{2}ku^{2}	***hj**aŋ.khu	
(278) WEIGH	hju	u^{2}taŋ^{2}	***hj**u	
(279) WORD	[a]-hju	u^{2}	*(a-)**hj**u	
(280) BISCUIT	[a]-hjim	am^{2} (/a-əm/)	*a-**hj**əm	

*Table 62: PAo *hj-*

- (275) In both Mongsen and Chungli, ‘wages’ is a deverbal noun consisting of the nominalizer **tə-** prefixed to the verb stem ‘earn / pay wages’, yielding ‘that which is earned/paid’ (i.e., wages).
- (276) PAo ***hj-** likely descended from some interaction of prefixes with PTB ***y-**, as suggested by the PTB forms for ASHAMED.
- (77) The preservation of the palatal glide in Chungli **jaŋ^{2}ku^{2}** ‘bag’ is the only exception to the development posited here, suggesting that it may be a loan from Mongsen **hjaŋkhu** or Lotha **jaŋ^{3}kho?^{3}**.

*Mo **j-**, Ch **j-** < PAo *j- < PTB *ly- / _*-əw; *y-*

In most cases, the Proto-Ao voiced palatal glide was preserved in both Ao lects:[71]

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(281) LUCK, FORTUNE	thija	ti^{2}-ja^{2}	*th-**j**a	
(227) BE SWEET	mijaŋ	a^{2}-naŋ^{2}	*a-m-**j**aŋ	
(282) SELL	jùk	a^{3}-juk^{1}	*a-**j**uk	

[68] This Mongsen form comes from Temsunungsang 2009a: 212 (transcribed therein as **ʰjàʔ**).
[69] Coupe originally reported Mangmetong Mongsen ‘wages’ as **thijàʔ** (GMA: 496), but has since confirmed that this form should be transcribed as **tihjàʔ** (NOM-‘earn’) (p.c., 14 July 2012).
[70] Khensa Mongsen (AL)
[71] The **-i-** vowel transcribed in many of these Mongsen forms is likely underlying /ə/ which has been raised to [i] in the presence of initial /j/.

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(283) SWALLOW	májúk [72]	mə^{3}juk^{3}	*m-**j**uk	*mlyəw-k SWALLOW (v.)
(284) RIVER	[a]-juŋ	a^{1}-juŋ^{2}	*a-**j**uŋ	
(285) DRINK$_{2}$	juŋ [73]	a^{2}-juŋ^{2}	*a-**j**uŋ	
(286) CENTER, MIDDLE	tijuŋ [74]	tə^{2}-juŋ^{2}	*t-**j**uŋ	
(287) FINGER / TOE	[tə]-mijuŋ	tə^{2}-mə^{2}juŋ^{3}	*t-m-**j**uŋ	*m-yuŋ FINGER
(288) SLEEP	jip	a^{3}-jəp^{1}	*a-**j**əp	*s-yip ⩙ *s-yup SLEEP / PUT TO SLEEP / CONCEAL / HIDE (v.)
(289) RETURN, TURN BACK	mijip	mə^{3}jəp^{1}	*m-**j**əp	
(290) FLY / FLOW	jim	a^{2}-jəm^{2}	*a-**j**əm	*byam FLY (v.)
(291) SEARCH FOR, SEEK$_{1}$	jə̀m- [75]	a^{3}-jəm^{1}	*a-**j**əm	
(292) VILLAGE	[a]-jim	jəm^{2}	*(a-)**j**əm	*k-yim ⩙ *k-yum HOUSE
(293) LOVE (v.)	mijim	mə^{3}jəm^{3}	*m-**j**əm	
(294) CONCEAL	mijim	mə^{2}jəm^{2}	*m-**j**əm	
(295) SPIN (THREAD)	jən [76]	a^{2}-jən^{2}	*a-**j**ən	
(296) IRON	[a]-jin	jən^{2}	*(a-)**j**ən	*syaːl ⩙ *syiːr IRON

*Table 63: PAo *j-*

- (227) The development of PAo BE SWEET is discussed in §II.3.4.1 (Table 53).
- (283) PAo ***m-juk*** SWALLOW shows the loss of the liquid in PTB ***ly-*** to yield PAo ***j-*** when followed by PTB ***-əw***. (Contrast the preservation of PTB ***ly-*** as PAo ***lj-*** preceding PTB ***-ak*** in LICK (382).)
- (290) In FLY, the PTB ***b-*** initial may have been reinterpreted as a prefix and subsequently lost.
- (292) PTB ***k-yim/yum*** HOUSE was apparently extended to mean VILLAGE in Proto-Ao (cf. PCN ***a-jam*** HOUSE / VILLAGE [135]).
- (296) The initial ***s-*** of the ***sy-*** cluster in PTB ***syiːr*** IRON was likely reanalyzed as a prefix and lost, leaving ***y-*** (PAo ***j-***).

[72] Khensa Mongsen (AL)
[73] Khensa Mongsen (AL)
[74] Alexander Coupe, p.c., 19 December 2013. (GMA records an idiolectal pronunciation with an aspirated prefix: **thijuŋ**.)
[75] Khensa Mongsen (AL)
[76] Khensa Mongsen (AL)

*Mo **ji(ʔ)**, Ch **zə(ʔ)** < PAo ***jəj(ʔ)** < PTB ***yəy** ?*

The following cognate pairs exhibit the reverse of the correspondence relationship used as the basis for reconstructing PAo ***ʒ-** in §II.3.2.2:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(297) HORN OF ANIMAL	[tə]-ji	tə^{3}-zə^{3}	*t-**j**əj	
(298) DOG	[a]-ji	a^{3}-zə^{1}	*a-**j**əj	*d-k^{w}əy-n DOG
(14) WILD PIG	pùŋì	puŋ^{1}zə^{1}	*puŋ.**j**əj	
(299) BLOOD	[a]-jíʔ	a^{3}-zəʔ^{1}	*a-**j**əjʔ	*s-hywəy BLOOD

*Table 64: PAo ***jəj-***

With the aid of the PTB etyma, these forms can best be reconstructed at the Proto-Ao level as containing initial ***j-** followed by the diphthongal rime ***-əj(ʔ)**. PAo ***j-** in this environment was dentalized and spirantized to **z-** in Chungli, but preserved as **j-** in Mongsen. The ***-əj(ʔ)** rime then developed regularly as **-ə(ʔ)** in Chungli and **-i(ʔ)** in Mongsen.

- (298) The means by which PTB ***k^{w}-** became PAo ***j-** in DOG is unclear (but see the discussion of PCN ***khjəj** DOG [104] in §III.5.1.3).
- (299) PTB ***s-hywəy** BLOOD contains the 'double glide' ***-yw-** following a voiceless glottal fricative initial (HPTB: 84–85). The initial ***h-** and medial labiovelar glide ***-w-** were lost and yielded ****yəy**, [77] which descended into PAo as ***jəjʔ** (somehow gaining a final glottal stop).

*II.3.5.3. *(h)ɹ-*

The Proto-Ao inventory can be reconstructed with both voiced and voiceless rhotic liquids.

*Mo **hɹ-**, Ch **ɹ-** < PAo ***hɹ-** < PTB ***(s-)r-***

The correspondence of Mongsen **hɹ-** with Chungli **ɹ-** supports PAo ***hɹ-**, which appears to be a development from PTB ***(s-)r-**:

[77] cf. the loss of PTB ***-w-** in BE EASY (344).

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(300) DISEASE	jimhɹà ‘influenza’ hɹamən ‘malaria’	jəm^{3}ɹa^{1} ‘influenza’ ɹa^{1}mən^{1} ‘malaria’	*__hɹ__a[j]	
(301) CHOKE / DROWN (vi.)	ahɹək	a^{3}ɹak^{1} / a^{3}ɹək^{1}	*a.__hɹ__ak	
(270) CROW (n.)	wahɹu	wa^{2}ɹu^{2}	*waj-__hɹ__u	
(186) NIT	hlutsə	a^{1}-ɹu^{2}tsə^{2}	*(a-)__hɹ__u-tsə (?)	*s-row NIT
(302) PERFORATE / SEW	hɹà	aɹ^{2} (/a-əɹ/)	*a-__hɹ__ə	
(303) CANE, RATTAN	[a]-hɹə	a^{3}-ɹə^{1}	*a-__hɹ__ə	*s-rwi(y) CANE / RATTAN / ROPE
(304) INTESTINES	[tə]-hɹə	taɹ^{2} (/t-a-əɹ/)	*t-(a-)__hɹ__ə	*ri:l BELLY / STOMACH / INTESTINES
(65) MUSHROOM	kùŋhɹə	kuŋ^{1}əɹ^{2}	*kuŋ.__hɹ__ə	
(305) GOD, DEITY	tsəŋhɹəm	tsəŋ^{1}-ɹəm^{2}	*tsəŋ-__hɹ__əm	

*Table 65: PAo *__hɹ__-*

- (301) The Mangmetong Mongsen form for ‘drown’ is **ahɹək**, whose final rime matches that of Chungli **a^{3}ɹək^{1}** (from Temsunungsang 2009a: 209). My Chungli consultants produce this as **a^{3}ɹak^{1}**, however, which is supported by Clark’s transcription of ARAK (Clark 1911: 110). The PAo form is therefore hypothesized to be ***ahɹak**, with sporadic reduction of the final vowel in certain varieties. Mongsen otherwise has no particular phonotactic prohibition on [ɹak] sequences: cf. **ɹàk** ‘bind w/ bamboo’ (309) and **ɹàksaʔ** ‘break’ (95), below.
- (186) NIT shows an unexpected PTB ***s-r-*** > Mongsen ***hl-*** development, though sporadic **l** ~ **ɹ** interchange is not particularly surprising and the voicelessness of the initial may be a result of PTB prefixal ***s-**. Only one other pair contains this **(h)l** : **ɹ** correspondence: Mongsen **laŋpən** : Chungli **ɹaŋ^{2}pən^{2}** ‘whole’.
- (302), (304), (65) PERFORATE / SEW, INTESTINES, and MUSHROOM all illustrate the metathesis of Chungli word-final schwa following ***(h)ɹ-*** (see Table 90, §II.4.1.4). In PERFORATE / SEW, PAo ***hɹ-*** was merged with ***ɹ-*** in Chungli and yielded **a-ɹə**, a form which some Chungli dialects still preserve (cf. Clark 1911: 116 ARER, RER and Temsunungsang 2009a: 86 *ārū*). In the Chungli variant presented here, the word-final schwa was metathesized to yield **aɹ** (underlying /a-əɹ/). Looking outside Proto-

Ao to other Central Naga languages, the reconstruction of the PAo form with an open-syllable rime is corroborated by other Central Naga forms for 'sew' (cf. PCN ***hrəj** SEW, STITCH [111]).

- (303) The medial labiovelar glide in PTB ***s-rwi(y)** CANE / RATTAN / ROPE was evidently lost before the PAo stage. The failure of PAo ***a-hrə** to metathesize in Chungli shows the somewhat sporadic nature of this sound change (cf. §II.4.1.4).
- (304) In INTESTINES, PTB ***r-** yielded PAo voiceless ***hɹ-** (possibly through some interaction with a prefix). The PAo form ***hɹə** is again corroborated by other CN forms with open syllables (cf. PCN ***a-(h)rə** INTESTINES [101]). Chungli **taɹ** (/t-a-əɹ/) shows the result of word-final schwa-metathesis (but note that Clark 1911: 770 has both TAR (/ta-əɹ/) and TARER /ta-ɹə/). In addition, the Chungli reflex preserves the nominal **a-** prefix (cf. §II.1.2.2), which the Mongsen form lacks.
- (65) Chungli 'mushroom' likely developed as follows: PAo ***kuŋ.hɹə** > ****kuŋ.ɹə** (merger with ***ɹ-**) > **kuŋəɹ** (metathesis of word-final schwa).
- (305) The first syllable of PAo ***tsəŋ-hɹəm** GOD, DEITY is the CELESTIAL morpheme (190).

*Mo ɹ-, Ch ɹ- < PAo *ɹ- < PTB *r-, *l-*

PAo ***ɹ-**, which was preserved in Mongsen and Chungli, descended from instances of PTB ***r-** and ***l-**:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(306) SOME, A LITTLE	təɹà	tə^{3}-ɹa^{1}	*t-ɹa	
(307) (TIMES) TEN	thə-ɹa 'ten' səm-ɹa 'thirty' li-ɹə 'forty' ɹuk-ɹa 'sixty' nət-əɹ~ni-ɹə 'seventy' thi-ɹ 'eighty' thuku-ɹ 'ninety'	t-əɹ^{1} 'ten' səm^{2}-əɹ^{2} 'thirty' li^{1}-ɹ^{2} 'forty' ɹuk^{1}-əɹ^{2} 'sixty' nət^{3}-əɹ^{1} 'seventy' ti^{3}-ɹ^{1} 'eighty' tu^{3}ku^{3}-ɹ^{1} 'ninety'	*th-ɹa	cf. PKC *hraa TEN
(308) COME	ɹà	a^{3}ɹu^{1}	*a-ɹa (?)	*la-y COME / ARRIVE *la-y ⪤ *ra COME†
(309) BIND (W/ BAMBOO)	ɹàk	a^{3}-ɹak^{1}	*a-ɹak	*grak CORD / TIE / BIND

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(95) BREAK$_1$	ɹàksaʔ	ɹak^{3}saʔ^1	*ɹak.saʔ	
(310) BE HARD	məɹaŋ	mə^{2}ɹaŋ^2	*m-ɹaŋ	*g-raŋ ⪤ *m/b-raŋ STRONG / FIRM / TENSE†
(311) BE ENOUGH	pəɹi	pə^{3}ɹi^3	*p-ɹi	
(154) PINEAPPLE	tʃuɹu	tʃi^{1}ɹu^1	*tʃu.ɹu	
(312) ROAST$_2$	tʃhuɹu ‘cook’	a^3-ɹu^1 ‘roast’ su^{2}ɹu^2 ‘cook rice’	*a-ɹu	cf. PTk *row ROAST
(230) FLOWER	hnaɹu	na^{2}ɹu^2	*hna.ɹu	
(313) SOW, SCATTER	phəɹuk	pə^{3}ɹuk^3	*ph-ɹuk	
(314) SIX	təɹuk	tə^3-ɹuk^3	*t-ɹuk	*d-ruk SIX
(207) CUP	màɹùk	ma^{1}ɹuk^1	*ma.ɹuk	
(315) BURN (vi./vt.)	ɹuŋ	a^2-ɹuŋ^2	*a-ɹuŋ	*ploŋ BURN
(316) BOAT	[a]-ɹuŋ	ɹuŋ^2	*(a-)ɹuŋ	*m-loŋ BOAT
(317) BACK (BODYPART)	tə-ɹuŋ-thuŋ [78]	tə^2-ɹuŋ^2-tuŋ^2	*t-ɹuŋ-thuŋ	*m-ruŋ BACK (BODY)†
(231) EAR	[tə]-hnaɹuŋ	tə^2-na^{2}ɹuŋ^3	*t-hna-ɹuŋ	*ruŋ HOLE / ORIFICE / EAR†
(318) HATCH (vi.)	ɹə́lák [79]	ɹə^{3}zək^1	*ɹə.ljak	
(319) BOUNDARY, BORDER	aɹʔ (/a-ɹəʔ/ ?)	aɹ^3-tsə^1 (/a-əɹ-tsə/)	*a-ɹəʔ	*b-rəy DRAW, MARK; BOUNDARY†
(320) BE RED	məɹəm	mə^{2}ɹəm^2	*m-ɹəm	
(321) WAIST	[tə]-ɹəm	tə^2-pə^{2}ɹəm^3	*t-(p-)ɹəm	*s/b-ram RIB†
(322) BURY	ɹəm	a^2-ɹəm^2	*a-ɹəm	
(323) BEAR, ENDURE	aɹəm	a^{2}ɹəm^2	*a.ɹəm	
(324) BE HEAVY	rə́t [80]	a^3-ɹət^1	*a-ɹət	*s-ləy-t ⪤ *s-rəy-t HEAVY
(325) BONE	[tə]-ɹət	tə^3-ɹət^3	*t-ɹət	*s/m/g-rus BONE

[78] Khensa Mongsen (AL)
[79] Khensa Mongsen (AL), also Temsunungsang 2009a: 211.
[80] Khensa Mongsen (AL)

		Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(326)	SCOLD, THREATEN	məɹən ‘threaten’	mə^{3}ɹən^{3} ‘scold’	*m-ɹən	
(327)	CLEAN (vt./vi.)	məɹək	mə^{3}ɹək^{3}	*m-ɹək	

*Table 66: PAo *ɹ-*

- (307) The Proto-Ao root for (TIMES) TEN was reduced and resyllabified to **əɹ** (or simply **-ɹ** in cases of vowel hiatus) across the board in Chungli, while sporadic reduction occurred in Mongsen to yield the variants **ɹa**, **ɹə**, and **-ɹ**.
- (308) The case of COME is a peculiar one: Both Ao lects contain **ɹ-**, though HPTB reconstructs PTB ***la-y** (HPTB: 165). The STEDT database, however, acknowledges allofamic variation between ***la-y** and ***ra**. In addition, the Mongsen and Chungli cognate pair exhibit a **ɹa** : **ɹu** correspondence (cf. Mongsen **sàɹàɹə** : Chungli **si^{2}ɹu^{3}ɹu^{1}** ‘animal’ (88)), suggesting a possible reconstruction as ***ɹwa**, though this would be the only example of a PAo ***ɹw-** cluster.

  Alternatively, Proto-Ao COME could have been ***a-ɹ-wa**, morphologically related by an ***ɹ-** prefix to PAo ***a-wa** GO (272) (> Mongsen **wa**, Chungli **a^{2}-u^{2}**). PAo ***a-ɹ-wa** would have yielded Chungli **a^{3}ɹu^{1}** ‘come’ by the ***wa** > **u** development, while in Mongsen the ***a-** prefix would have been lost and the weak root initial preempted by the ***ɹ-** prefix to yield **ɹa**, namely: PAo ***a-ɹ-wa** > Chungli **a^{3}ɹu^{1}**, Mongsen **ɹà** ‘come’. This possible paradigm is depicted in Table 67:

	PAo	*Mongsen*	*Chungli*
GO	*a-wa	wa	a^{2}-u^{2}
COME (PFX-GO)	*a-ɹ-wa	ɹà	a^{3}ɹu^{1}

Table 67: Ao ‘come’ and ‘go’

  Until more support can be gathered, however, the reconstruction of Proto-Ao COME is left as the questionable form ***a-ɹa**.
- (309), (315) The initial clusters in PTB ***grak** CORD / TIE / BIND and ***ploŋ** BURN may have been reanalyzed as combinations of prefix + root-initial glide, yielding ****g-rak** and ****p-loŋ**. The ***g-** and ***p-** ‘prefixes’ were then lost, leaving ***r-** and ***l-** as the PTB initials reflected in the PAo forms by ***ɹ-**. (See HPTB: 96 for a discussion of this reanalysis/metanalysis process.)

- (310) PAo ***m-ɹaŋ*** BE HARD is presumably related to Proto-Northern-Naga ***raŋ*** HARD (French 1983: 501).
- (312) The first syllables of Mongsen **tʃhuɹu** 'cook' and Chungli **su²ɹu²** 'cook rice' descended from PAo ***a-tʃhu*** COOK (170).
- (317) The final syllable in PAo ***t-ɹuŋ-thuŋ*** BACK (BODYPART) may be related to ***t-tuŋ*** STEM, TRUNK (34), but the aspiration discrepancy has no explanation yet.
- (319) Chungli **aɹ³-tsə¹** (/a-əɹ-tsə/) 'boundary, border' shows the metathesis of PAo schwa following ***ɹ-*** in word-final syllables. (Presumably the **tsə** syllable was added later to form the compound.) Clark reports the Chungli form as ARV̥R /a-rə/ (1911: 126), a variant retaining the un-metathesized syllable. Unless Mongsen **aɹʔ** 'boundary, border' also reflects a metathesis process, it may be a fast-speech reduction of /a-ɹəʔ/.
- (321) Chungli **tə²-pə²ɹəm²** 'waist' (perhaps originally from the ***s-b-*** prefix sequence in PTB RIB) suggests the reconstruction of a ***p-*** prefix in the Proto-Ao form, which was lost in Mongsen.
- (322), (323) Proto-Ao ***a-ɹəm*** BURY and ***a.ɹəm*** BEAR, ENDURE are strikingly similar, differing only in the morphological status of the initial /a/. Unsurprisingly, they descended from a single PCN etymon: ***ram*** BURY / ENDURE, BEAR [137] (cf. §III.3.2.2).

*II.3.5.4. *(h)l-*

Four different correspondence sets provide evidence for the reconstruction of the Proto-Ao lateral liquid series ***(h)l-***.

*Mo **(h)li**, Ch **zə** < PAo *(h)ləj < PTB *ləy*

As observed earlier (§II.3.4.1, §II.3.5.2), the Proto-Ao diphthongal rime ***-əj(ʔ)*** often affected the initial consonant. In Chungli, the development of PAo ***(h)l-*** paralleled that of ***j-*** (§II.3.5.2) by spirantizing to **z-** before ***-əj***. Table 68 lists the cognate pairs showing a correspondence between Mongsen **(h)li** and Chungli **zə**, reflecting PAo ***(h)ləj*** (< PTB ***ləy***):

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(217) MEDICINE, DRUG	muli	mu²zə²	*mu.**ləj**	*r-tsəy MEDICINE / JUICE / PAINT (?)
(328) FOUR [81]	phəli	pə¹zə²	*ph-**ləj**	*b-ləy FOUR

[81] cf. Written Tibetan **bźi** (HPTB: 69).

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(329) RESPOND, REPLY$_1$	laŋli	laŋ^{3}zə^3	*laŋ.**ləj**	
(78) SMOKE	mukhuli	mu^{2}ku^{2}zə^2	*mu-khu-**ləj**	
(53) SWAGGER, SWAY	kàlì ‘swagger’	ka^{3}zə^3 ‘sway (as a leech)’	*ka.**ləj**	
(330) VINE / VEIN	[tə]-hli ‘vein’ hli ‘vine’	tə^2-zə^2 ‘vein / vine’	*(t-)**hləj**	
(331) FLEA [82]	[a]-hli	a^1-zə^2-puŋ^3	*a-**hləj**	*s-ləy FLEA

*Table 68: PAo *(h)ləj*

- (217) With regard to the potential relationship between PTB ***r-tsəy** MEDICINE and PAo ***muləj** MEDICINE, DRUG, it is possible that a metathesized variant of the PTB etymon developed as follows: ****tsrəy** > ****srəy** > ****s-rəy** > ***ləy** (=**ləj**).[83]
- (328) The PTB source of aspiration on the ***ph-** prefix in PAo FOUR is unknown.
- (331) The voiceless initial in PAo ***a-hləj** FLEA may be due to devoicing by ***s-** in PTB ***s-ləy**.

*Mo **(h)lik/ŋ**, Ch **zək/ŋ** < PAo *(h)lik/ŋ < PTB ?/*liŋ*

A correspondence between Mongsen **(h)li-** and Chungli **zə-** is also found before velar codas, indicating that PAo ***(h)l-** was additionally spirantized to Chungli **z-** before ***-iC$_{\text{velar}}$** rimes:

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(332) PLANT$_1$ (v.)	liŋ	a^2-zəŋ^2	*a-liŋ	
(333) BASE / LOWER RANGE	aliŋ	a^3-zəŋ^3	*a-liŋ	*m-liŋ NECK
(334) NECKLACE	áhlìk [84]	a^3-zək^1	*a-hlik	

*Table 69: PAo *(h)lik/ŋ*

- (333) PAo BASE / LOWER RANGE may have developed from PTB NECK through the conception of the neck as the base of the head.

[82] cf. Written Tibetan **ldźi** (HPTB: 69).
[83] Based on suggestions from James Matisoff (p.c., 18 May 2010).
[84] This Mangmetong Mongsen form comes from T. Temsunungsang (p.c., 19 October 2010).

*Mo **hl-**, Ch **l-** < PAo ***hl-** < PTB ***l-**, ***r-***

In other sets, Mongsen **hl-** corresponds to Chungli **l-**, reflecting PAo ***hl-** (< PTB ***r-**, ***l-**):

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(335) GO DOWN	hlà	a^{2}-lu^{2}	*a-**hl**a (?)	
(336) BE LONG	hláŋ	a^{3}-laŋ^{1}	*a-**hl**aŋ	*m-raŋ HIGH / LONG
(337) BUY	hlì	a^{3}li^{1}	*a-**hl**i	*g/m/s-lay ⩕ *r-ley CHANGE / EXCHANGE / BUY / BARTER
(338) FIELD	[a]-hlú	a^{3}-lu^{1}	*a-**hl**u	*low FIELD
(339) BEAN	hluli	lu^{3}li^{1}	***hl**u.li	
(340) WRAP, FOLD	hlèp	a^{3}ləp^{1}	*a-**hl**əp	*klup COVER / WRAP

*Table 70: PAo ***hl-***

- (335) The Mongsen **-a** : Chungli **-u** vowel correspondence in GO DOWN matches that in COME (308), suggesting that PAo GO DOWN could be reconstructed instead as ***a-hlwa**, though this would be the only example of a PAo ***hlw-** cluster. Another possibility is PAo ***a-hl-wa**, with the ***hl-** prefix (somehow meaning 'down') preempting the root initial in Mongsen: PAo ***a-hl-wa** > Chungli **a-lu**, Mongsen **hla** 'go down'.
- (340) PTB ***klup** COVER / WRAP apparently lost its initial velar stop, though it is not known how the remaining ***l-** devoiced to yield PAo ***hl-**.

*Mo **l-**, Ch **l-** < PAo ***l-** < PTB ***(h)l-**, ***r-***

The third set of cognate pairs reflects PAo voiced ***l-** (< PTB ***l-**, ***r-**):

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(341) FEM. SEMANTIC GENDER (SUF.)	-la	-la^{2}	*-**l**a	*g-la FEMININE AFFIX [85]
(342) BE HAPPY	pəla	pə^{2}la^{2}	*p-**l**a	
(343) ALLOW, PERMIT	məla	mə^{2}la^{2}	*m-**l**a	
(228) SHADOW / SOUL	[tə]-hmila	ta^{2}-nə^{2}la^{2}	*t-(a-)hməj-**l**a	*m-hla GOD / SOUL / BEAUTIFUL
(344) BE EASY	məla [86]	mə^{2}la^{2}	*m-**l**a[j]	*lwa(ː)y EASY

[85] This PTB form comes from French (1983: 487, 519), citing personal communication from Benedict (see the discussion of PCN ***la** FEMALE, WOMAN [34] in §III.3.1.1).

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(345) NAVEL	[tə]-phəla	tə^{2}-pə^{2}la^{2}	*t-ph-**l**a[j]	*m/s-la(ː)y NAVEL / CENTER / SELF
(67) DECEIVE	kəlàk	kə^{3}lak^{1}	*kə.**l**ak	
(346) CUT, HACK	laŋ	a^{2}-laŋ^{2}	*a-**l**aŋ	
(252) HUNDRED	nuklàŋ	nuk^{1}laŋ^{1}	*nuk.**l**aŋ	
(329) RESPOND, REPLY$_1$	laŋli	laŋ^{3}zə^{3}	***l**aŋ.ləj	
(347) RESPOND, REPLY$_2$	laŋ́lák [87]	laŋ^{3}zək^{1}	***l**aŋ.ljak	
(348) LIVE, BE, EXIST	li	a^{2}-li^{2}	*a-**l**i	*s-ri(y)-t COPULA / BE / EXISTENCE
(349) GROUND, EARTH	[a]-lí	a^{3}-li^{3}	*a-**l**i	*m-ley ≷ *m-ləy EARTH / GROUND / SOIL / MUD / COUNTRY
(350) BE EXCESSIVE	ali	a^{2}li^{2}	*a.**l**i	
(339) BEAN	hluli	lu^{3}li^{1}	*hlu.**l**i	
(351) TONGUE	[tə]-məli	tə^{2}-mə^{2}li^{2}	*t-m-**l**i	*m/s-lay ≷ *s-ley TONGUE
(150) BOW / SLINGSHOT	litʃak	li^{3}tʃak^{3}	***l**i-tʃak	*d/s-ləy BOW / SLINGSHOT (?)
(352) MARROW	[tə]-liŋla	tə^{3}-nəŋ^{3}la^{1}	*t-**l**iŋ-**l**a	*r-kliŋ ≷ *r-kl(y)aŋ MARROW / BRAIN
(120) CREATE, BUILD	zaŋlu	jaŋ^{2}lu^{2}	*ʒaŋ.**l**u	
(129) WRITE	zəlu	zə^{3}lu^{1}	*zə-**l**u	
(353) BOIL (vt.)	məlu	mu^{3}lu^{3}	*m-**l**u	
(354) BASKET$_2$	məluk	mu^{3}luk^{3}	*m-**l**uk	
(355) JOIN	luk	a^{3}-luk^{3}	*a-**l**uk	
(356) BRAIN	[tə]-kuluk	tu^{2}-ku^{3}luk^{1}	*t-ku-**l**uk	*s/k-lwak BRAIN[†]
(357) ROLL, SPIN	luŋ	a^{2}-luŋ^{2}	*a-**l**uŋ	
(358) STONE, ROCK	[a]-luŋ	luŋ^{1}	*(a-)**l**uŋ	*r-luŋ STONE
(359) BE WILLING	məluŋ	mu^{2}luŋ^{2}	*m-**l**uŋ	

[86] This Mongsen form comes from Marrison 1967: II: 81, where it is transcribed as *mela*.
[87] Khensa Mongsen (AL)

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(360) BE ROUND	luŋluŋ	luŋ²luŋ²	*luŋluŋ	*luŋ ⪤ *lum HEART / ROUND
(361) HEART	[tə]-məluŋ-tʃaŋ	tə²-mu²luŋ² tʃaŋ²	*t-m-luŋ	*m-luŋ MIND / HEART / LIVER
(205) VAPOR	hmiluŋ ‘cloud, fog’	mi¹luŋ¹ ‘rising ashes’	*hmi.luŋ	
(362) CUT (v.)	làp	a³-ləp¹	*a-ləp	*s-lep SLICE / PARE OFF
(363) HEAD$_2$	phìlàm ‘think’ [tə]-ləm ‘head’	pi³ləm¹ ‘think’ —	*ləm	*luŋ ⪤ *lum HEART / ROUND
(364) DIVIDE, APPORTION	ləm-sa ‘distribute’	a²-ləm² ‘divide, apportion’	*a-ləm	*b-rim DISTRIBUTE
(365) BE WARM	ləm	a²-ləm²	*a-ləm	*s-lum ⪤ *lim WARM / MAKE WARM
(366) BE TIRED	phələm	pə²ləm²	*ph-ləm	
(367) BE THICK	màləm	mə²ləm³	*m-ləm	
(81) TOGETHER	khələm	kə³ləm³	*khə.ləm	
(368) LEECH (WATER)	mənət	mə³lət³	*m-lət	*m-liːt HORSE-LEECH
(369) EXCHANGE	mələn	mə³lən³	*m-lən	
(35) DANGER, ACCIDENT	ləntuŋ	lən¹tuŋ¹	*lən.tuŋ	

*Table 71: PAo *l-*

- (228) The PTB cluster ***hl-** in ***m-hla** SOUL was evidently simplified to ****l-**, yielding PAo ***t-(a-)hməj-la**. (See also the discussion below Table 53, §II.3.4.1).
- (344) The medial labiovelar glide in PTB ***lwa(ː)y** EASY evidently dropped out before the Proto-Ao stage (cf. BLOOD (299)).
- (150) PTB ***d/s-ləy** BOW / SLINGSHOT should have yielded PAo ***ləj-**, further reflected as Mongsen **li-** and Chungli **zə-**. The correspondence of Mongsen **li-** with Chungli **li-** in this set, however, supports PAo ***li-** (which could have descended from PTB ***li-** or ***ley-**). On the other hand, it is possible that the PAo form was indeed ***ləj-tʃak** and that Chungli **li³tʃak³** was borrowed from Mongsen.
- (352) The initial ***k-** in PTB ***kliŋ** MARROW / BRAIN was presumably reanalyzed as a prefix and subsequently lost, leaving PAo ***liŋ**. This root shows a sporadic PAo ***l-** > Ch **n-** change, by which the initial ***l-** escaped spirantization to **z-** in Chungli

preceding ***-iŋ*** (Table 69, above). Clark reports an alternate Chungli form in which the second ***l-*** (in the PAo ***-la*** morpheme of unknown meaning/origin) has also undergone the same sporadic development to **n-**: TENUNGNA [tə-nəŋ-na] (1911: 851).

- (356) The ***ku*** syllable in PAo ***t-ku-luk*** BRAIN may be an instance of the morpheme meaning HEAD (56) or the vowel-harmonized reflex of an original ***k-*** prefix (as suggested by the PTB reconstruction ***s/k-lwak***).
- (360) PAo ***luŋluŋ*** BE ROUND appears to be a reduplication of the same root morpheme as in ***t-m-luŋ*** HEART (361).
- (361) The morpheme **tʃaŋ** in both Mongsen and Chungli 'heart' means 'seed, nut' (151).
- (368) LEECH (WATER) shows a sporadic development of PAo ***l-*** to Mongsen **n-** (cf. PTB ***l-*** > PAo ***hn-*** in FATHOM (237) and PAo ***lj-*** > Chungli ***n-*** in §II.3.6.3).

II.3.6. Clusters

The Proto-Ao lexicon appears to have contained some words with onset clusters involving the medial glides ***-w-*** and ***-j-***.

PAo	*environments*	*Mongsen*	*Chungli*
***pwa**	(uncond.)	**pa**	**pu**
***phwa**	(uncond.)	**pha**	**pu**
***tj-**	(uncond.)	**tʃ-**	**t-**
***thj-**	(uncond.)	**tʃh-**	**t-**
***lj-**	sporadic	**l-**	**n-**
	sporadic	**j-**	**z-**
	elsewhere	**l-**	**z-**

Table 72: Proto-Ao cluster development

*II.3.6.1. *p(h)w-*

Some Proto-Ao words contained clusters of the (un)aspirated bilabial stop ***p(h)-*** and medial labiovelar glide ***-w-***.

*Mo **p(h)a(ʔ)**, Ch **pu(ʔ)** < PAo *p(h)wa(ʔ) < PTB *p^{w}a, *p-wa*

Table 73 contains cognate pairs illustrating a correspondence between Chungli **pu(ʔ)** and Mongsen **p(h)a(ʔ)**, supporting the reconstruction of PAo ***pwa(ʔ)** and ***phwa(ʔ)**. The medial ***-w-** glide was lost in Mongsen but coalesced with ***-a(ʔ)** to yield **-u(ʔ)** in Chungli (as did the glide in initial position; cf. §II.3.5.1):

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(370) SEARCH FOR, SEEK$_2$	pasi	pu^{2}si^{2}	***pwa**-ʃi	*pa SEARCH FOR / SEEK
(371) FATHER	[tə]-paʔ	tə^{3}-puʔ^{3}	*t-**pwa**ʔ	*p^{w}a MAN / FATHER / HUSBAND / PERSON
(372) WELL, POND	tsə-pàʔ	tsə^{3}-puʔ^{1}	*tsə-**pwa**ʔ	
(373) FOOT (PART)	[tə]-məpha ‘foot, dorsal aspect’	tə^{2}-mu^{3}pu^{1} ‘part of foot’	*t-m-**phwa**	*p^{w}a-n PALM / SOLE
(374) TOOTH	[tə]-pha	tə^{2}-pu^{2}	*t-**phwa**	*s-wa ⩙ *p-wa TOOTH†
(375) CATCH	phàʔ	a^{3}-puʔ^{1}	*a-**phwa**ʔ	

*Table 73: PAo *p(h)wa-*

- (370) The second syllable in PAo ***pwa-ʃi** SEARCH FOR, SEEK may be a lexicalization of the REPETITIVE suffix (90).
- (370), (371), (373) One source of PAo ***p(h)w-** is ‘extrusion’ of ***p-**, represented as PTB ***p^{w}-** (cf. Matisoff 2000). PTB ***pa** SEARCH FOR / SEEK is supported by only a small number of forms in HPTB, some of which bear an **-o/-u** rime (HPTB: 24), suggesting a better reconstruction as PTB ***p^{w}a**.
- (372) The first morpheme in PAo ***tsə-pwaʔ** WELL, POND is WATER (182).
- (374) The allofamic variation between the prefixes in PTB TOOTH lends itself to the hypothesis that PAo ***t-phwa** descended from a variant PTB form ***s-p-wa**, with the ***s-** prefix yielding aspirated PAo ***ph-**. The Central Naga evidence, however, points to a PTB variant ***p-s-wa** yielding PCN ***p-hwa**, which was then reanalyzed in PAo as ***phwa** (cf. PCN ***p-hwa** TOOTH [27]).

*II.3.6.2. *t(h)j-*

The first PAo cluster containing a palatal glide may be tentatively reconstructed on the basis of the following interesting correspondences. In three forms, Mongsen

unaspirated **tʃ-** corresponds to Chungli **t-**. In two forms, Mongsen aspirated **tʃh-** also corresponds to Chungli **t-**:

*Mo **tʃ(h)-**, Ch **t-** < PAo ***t(h)j-** < PTB ?*

	Mongsen	*Chungli*	*Proto-Ao*
(136) HANG (vt.)	hitʃak	i^{3}tak^{3}	*hi.**tj**ak
(376) ABANDON, LEAVE / AWAY (SUF.)	tʃuk ‘abandon, leave’ hən<u>tʃuk</u> ‘throw away’ mətsə-<u>tʃuk</u> ‘spit out’ [88]	<u>tuk^{3}</u>-tsəʔ^{3} ‘abandon, leave’ ən^{3}-<u>tuk^{3}</u> ‘throw away’ mə^{2}tsə^{2}-<u>tuk^{3}</u> ‘spit (v.)’	*-**tj**uk
(377) LOCATIVE NOMINALIZER (SUF.)	-tʃən	-tən^{1}	*-**tj**ən
(378) PLANT$_2$ (v.)	tʃhəm	a^{2}-təm^{2}	*a-**thj**əm
(379) ABILITIVE (SUF.)	-tʃhət	-tət^{1}	*-**thj**ət

*Table 74: Mongsen **tʃ(h)-** : Chungli **t-***

These cognate pairs provide preliminary evidence for aspirated and unaspirated PAo clusters of a dental stop and palatal glide (***tj** and ***thj** [t^{h}ʲ̊]).

*II.3.6.3. *lj-*

The last cluster reconstructed for Proto-Ao consists of ***l-** followed by the medial palatal glide ***-j-**.

*Mo **l-**, Ch **z/n-** < PAo ***lj-** < PTB ***ly-** / _ ***-ak***

Table 75 presents cognate sets exhibiting the correspondences Mo **l** : Ch **z** and Mo **l** : Ch **n**, both reconstructed as PAo ***lj-**, which was preserved from PTB ***ly-** when followed by PTB ***-ak**. (Contrast the development of PTB ***ly-** > PAo ***j-** preceding PTB ***-əw** in SWALLOW (283).)

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(347) RESPOND, REPLY$_2$	laŋlak [89]	laŋ^{3}zək^{1}	*laŋ.**lj**ak	
(43) START, BEGIN	tənlak	tən^{3}zək^{1}	*tən.**lj**ak	

[88] Khensa Mongsen (AL)
[89] Khensa Mongsen (AL)

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(380) DOWNWARD MOTION (SUF.)	-lak	-zək^{1}	*-**lj**ak	
(84) SAVE, RESCUE	khəmlak [90]	kəm^{3}zək^{1}	*khəm.**lj**ak	
(241) PROMISE, BE CONFIDENT	náŋlák [91]	naŋ^{3}zək^{1}	*naŋ.**lj**ak	
(318) HATCH (vi.)	ɹálák [92]	ɹə^{3}zək^{1}	*ɹə.**lj**ak	
(381) HIT, BEAT	jàk	a^{3}-zək^{1}	*a-**lj**ak	
(382) LICK	məlak	mə^{3}nak^{3}∼məzək (Clark MEZV̊K)	*m-**lj**ak	*m/s-lyak LICK / TONGUE

*Table 75: PAo *lj-*

The reconstruction of PAo ***ljak*** for all these sets is corroborated by the development of PAo ***l-*** to Chungli **z-** in other palatal contexts (e.g. PTB ***b-ləy*** > PAo ***ph-ləj*** > Mo **phəli**, Ch **pə^{1}zə^{2}** 'four' (328); cf. §II.3.5.4). The medial palatal glide of PAo ***ljak*** disappeared in Mongsen but yielded in the spirantization of ***l-*** to **z-** in Chungli. The ***-ak** rime was then reduced to **-ək** following **z-**. (All vowels following **z-** were reduced to **-ə-** in Chungli.)

- (380) PAo ***-ljak** is reflected in both lects by suffixes that convey the sense of downward motion, e.g:

  'undress': Mo **tʃhəm-<u>lak</u>**, Ch **səm^{3}-<u>zək^{1}</u>** 'wear' (174) + DOWNWARD
  'pour out': Mo **i-<u>lak</u>**, Ch **i^{3}-<u>zək^{1}</u>** 'pour' ? + DOWNWARD

- (381) PAo ***lj-** regularly yielded Chungli **z-** in HIT, BEAT but sporadically simplified the cluster to **j-** instead of **l-** in the Mongsen form.
- (382) The **n**∼**z** variation in Chungli 'lick' suggests that ***lj-** regularly became **z-** in some varieties of Chungli but underwent sporadic change to **n-** in others. Although my Chungli consultants are only familiar with **mə^{3}nak^{3}**, Clark notes the existence of regional variation between **mənak** and **məzək** for 'lick' (1911: 448). Temsunungsang also records an instance of Mongsen 'lick' with **n** (Temsunungsang 2009a: 211), indicating that the tendency of PAo ***lj-** to yield **n-** was not confined to Chungli.

[90] Khensa Mongsen (AL); cf. also Temsunungsang 2009a: 211, which has **khə́mlák** for some variety of Mongsen (either Mangmetong or Mokokchung).
[91] Khensa Mongsen (AL), also Temsunungsang 2009a: 211.
[92] Khensa Mongsen (AL), also Temsunungsang 2009a: 211.

Other TB languages in Nagaland preserve the medial glide in 'lick', e.g. Yimchungrü **²mɯ²leak** (Weidert 1987: #647), Zeme **niak** (Marrison 1967: II: 149), Rongmei **a-lĭak**, and Liangmei **malĭ̲ak** (both Weidert 1987: #1043).

It is interesting to note that at least one cognate pair exists in which the Mo **l** : Ch **n** correspondence is reversed, with Mongsen **n** and Chungli **l**: Mo **mənət** vs. Ch **mə³lət³** 'water leech' (368), originally from PTB ***m-liːt** HORSE LEECH. However, these Ao forms do not appear to have descended from PAo ***lj-**, but rather show a sporadic development of PAo ***l-** (cf. Table 71, §II.3.5.4).

II.3.7. Zero

*Mo **Ø-**, Ch **Ø-** < PAo ***Ø-** < PTB **?***

The following table lists the zero-initial syllables reconstructed for Proto-Ao (excluding /a/ initials and **a-** prefixes on verb roots):

	Mongsen	*Chungli*	*Proto-Ao*	*PTB*
(193) BAMBOO SHOOT (FERMENTED)	itʃak	i³tsək³	*i.tsak	
(383) POUR OUT	ilak	i³zək¹	*i-ljak	
(107) STUFF, POSSESSIONS	usə̀t	u¹sət¹	*u.sət	
(384) INTO (SUF.)	-uk	-uk¹	*-uk	
(385) SWEEP	ùk	a³-uk¹	*a-uk	*k/p-y(w)ak SCOOP / SWEEP†
(386) AGENTIVE NOM. / MASC. GENDER (SUF.)	-əɹ	-əɹ¹	*-əɹ	

Table 76: PAo zero initials

- (385) The PTB initial ***y-** in SWEEP has disappeared, and the PAo form shows the regular rime development of PTB ***-wak** > PAo ***-uk** (as in BRAIN (356)).
- (383) The second morpheme of PAo ***i-ljak** POUR OUT appears to be a suffix indicating downward motion (380).
- (386) Both Mongsen and Chungli employ **-əɹ** as an agentive nominalizer that doubles as a marker of masculine semantic gender (cf. GMA: 264).[93] This suffix is present in SON (144) and PRIEST (31).

[93] The similarity of this morpheme to Mandarin Chinese 兒 *ér* 'child, son' is coincidental, as the modern Chinese form reflects OC ***ŋe** (Baxter & Sagart 2011).

II.4. Proto-Ao Rimes

This section presents the reconstructed rimes of Proto-Ao, grouped by the place of articulation of the coda: zero and glottal stop codas in §II.4.1, bilabial codas in §II.4.2, dental codas in §II.4.3, the rhotic alveolar coda in §II.4.4, and velar codas in §II.4.5. §II.4.6 discusses the unique influence of the PAo ***-əj(ʔ)** and ***-ik/ŋ** rimes as a conditioning environment.

Much discussion of the rimes can be found throughout the previous section on onsets (§II.3), and the reader is referred to the relevant pages where appropriate.

II.4.1. Zero/Glottal Codas

With respect to segmental sound changes, the open syllables pattern with the glottal-final syllables in Ao. In addition, the source of the glottal stop coda in Proto-Ao cannot be determined from the PTB reconstructions.[94] These two types of rimes are therefore combined in the following subsections. A PAo syllable is reconstructed with a final glottal stop when it appears in both reflexes (Mongsen and Chungli), and with a variant glottal stop (in parentheses) when it appears in only one reflex.

Table 77 summarizes the development of these rimes from Proto-Ao into Mongsen and Chungli (discussed below):

PAo	*environments*	*Mongsen*	*Chungli*
***-a(ʔ)**	after ***ʃ-**, ***ʒ-**, ***tʃ-**, ***tʃh-**	**-a(ʔ)**	**-i(ʔ)**
	after ***(h)ŋ-**	**-a(ʔ)**	**-u(ʔ)**
	***(h)wa(ʔ)**	**(h)wa(ʔ)**	**u(ʔ)**
	***-wa(ʔ)**	**-a(ʔ)**	**-u(ʔ)**
	after ***z-**	**-a(ʔ)**	**-ə(ʔ)**
	sporadic	**-ə(ʔ)**	**-ə(ʔ)**
	elsewhere	**-a(ʔ)**	**-a(ʔ)**

[94] For example, the glottal stop in PAo ***a-hŋaʔ** FISH (265) is corroborated by Lotha **o^{1}-ŋoʔ^{2}** and Yimchungrü **^{2}tɯ$^{(2)}$ŋɯʔ** (Weidert 1987: #275), but the PTB reconstruction ***s-ŋya** and its supporting forms (STC: #189; HPTB: 162) provide no hints as to the source of this coda.

PAo	*environments*	*Mongsen*	*Chungli*
***-i(ʔ)**	after ***ts-**	**-ə(ʔ)**	**-i(ʔ)**
	after ***z-**	**-i(ʔ)**	**-ə(ʔ)**
	elsewhere	**-i(ʔ)**	**-i(ʔ)**
***-u(ʔ)**	after ***tʃ-**	**-u(ʔ)**	**-i(ʔ)**
	elsewhere	**-u(ʔ)**	**-u(ʔ)**
***-ə(ʔ)**	after ***ʃ-**	**-ə(ʔ)**	**-i(ʔ)**
	word-final, after ***(h)ɹ-**	**-ə(ʔ)**	metathesis
	elsewhere	**-ə(ʔ)**	**-ə(ʔ)**
***-aj**	(uncond.)	**-a**	**-a**
***-əj(ʔ)**	(uncond.)	**-i(ʔ)**	**-ə(ʔ)**

Table 77: Proto-Ao open/glottal-final rime development

*II.4.1.1. *-a(ʔ) < PTB *-a*

PTB ***-a*** descended into Proto-Ao as ***-a(ʔ)***, which remained **-a(ʔ)** in Mongsen but yielded **-a(ʔ)**, **-u(ʔ)**, **-i(ʔ)**, or **-ə(ʔ)** in Chungli depending on the surrounding phonological environment. These divergences are discussed below.

*Mo, Ch -a(ʔ) < PAo *-a(ʔ)*

The following table lists the PAo forms containing ***-a(ʔ)***, which in most environments yielded **-a(ʔ)** for both Mongsen and Chungli:

Set	*PAo*	*PTB*
(1) HE, SHE (3SG)	*p**a**	*p^{w}a MAN / FATHER / HUSBAND / PERSON
(2) WORK, JOB	*hm**a**.p**a**	
(3) GENERAL NOMINALIZER (SUF.)	*-p**aʔ**	
(4) WHO?	*ʃə-p**aʔ**	
(206) BREAST	*m**a**.m**a**	
(207) CUP	*m**a**.ɹuk	

Set	*PAo*	*PTB*
(210) SLAP	*a-m**aʔ**	
(209) NO (REFUSAL)	*m**aʔ**	*ma-y NEGATIVE
(163) DISAPPEAR / LOSE	*tʃhaj-m**aʔ**	*ma-t LOSE / DISAPPEAR
(8) TIME	*hm**a**.paŋ	
(24) AWAIT	*a.t**a**	
(25) QUICKLY	*ʒak.t**a**	
(238) YOU (2SG)	*n**a**(ŋ)	*na-ŋ 2ND PERSON PRONOUN
(239) AFFIX, STICK (v.)	*m-n**aʔ**	
(146) DIRT, RUBBISH	*tʃaj.n**aʔ**	
(230) FLOWER	*hn**a**.ɹu	
(231) EAR	*t-hn**a**-ɹuŋ	*r/g-na EAR / HEAR / LISTEN
(52) GAPE, OPEN MOUTH	*a-k**a**	*m-ka OPEN / OPENING / MOUTH / DOOR
(53) SWAGGER, SWAY	*k**a**.ləj	
(73) POSSESS (ALIENABLY)	*a-kh**a**	
(75) $CHIN_2$	*t-m-kh**aʔ**	*s-ka ≍ *m-ka-y JAW / CHIN
(93) HOWL, SCREAM	*a.s**a**	
(94) BE DELIBERATE	*a.s**aʔ**	
(95) $BREAK_1$	*ɹak.s**aʔ**	
(134) SLICE, SAW / SWIM	*a-ɣ**aʔ**	
(135) YAWN	*x**a**-m-s**a**	*ha-y YAWN†
(281) LUCK, FORTUNE	*th-j**a**	
(275) EARN / PAY WAGES	*a-hj**aʔ**	
(306) SOME, A LITTLE	*t-ɹ**a**	
(341) FEM. SEMANTIC GENDER (SUF.)	*-l**a**	*g-la FEMININE AFFIX
(342) BE HAPPY	*p-l**a**	
(343) ALLOW, PERMIT	*m-l**a**	
(228) SHADOW / SOUL	*t-(a-)hməj-l**a**	*m-hla GOD / SOUL / BEAUTIFUL
(352) MARROW	*t-liŋ-l**a**	

*Table 78: PAo *-**a(ʔ)** > Mo, Ch -**a(ʔ)***

*Mo **-a(ʔ)**, Ch **-i(ʔ)** < PAo *-a(ʔ) / *ʃ_, ʒ_, tʃ(h)_*

The following table contains the instances of PAo ***-a(ʔ)*** which remained **-a(ʔ)** in Mongsen but were raised to **-i(ʔ)** in Chungli following PAo palatal sibilants (***ʃ-**, ***ʒ-**, ***tʃ-**, ***tʃh-**):

Set	*PAo*	*PTB*
(87) SAY	*a-ʃ**a**	
(88) ANIMAL / MEAT	*(a-)ʃ**aʔ**	*sya-n ANIMAL / BODY / FLESH / MEAT
(89) ASK, REQUEST	*m-ʃ**aʔ**	
(267) MONKEY	*ʃ**a**-ŋa	
(118) GO IN, ENTER	*a-ʒ**a**	
(119) GRASS	*a-ʒ**a(ʔ)**	
(142) RICE (COOKED)	*(a-)tʃ**a**	*dzya RICE
(143) EAT	*a-tʃ**aʔ**	*dzya-n/k EAT / FOOD / FEED
(144) SON	*(t-)tʃ**a**-əɹ	*tsa-n ⪤ *za-n CHILD / SON / RELATIVES
(160) YAM	*(a-)tʃh**a**	
(161) WING	*t-(a-)tʃh**a**	
(162) TRAP, CATCH	*a-tʃh**aʔ**	
(28) TOUCH	*taŋ.tʃh**aʔ**	

*Table 79: PAo *-a(ʔ) > Ch **-i(ʔ)***

▸ (119) The status of the coda in PAo GRASS is unclear, as the Chungli reflex (**a^{3}-ji^{3}ʔ**) contains a glottal stop that does not appear in the Mongsen form (**[a] -za**).

*Mo **-a(ʔ)**, Ch **-u(ʔ)** < PAo *-a(ʔ) / *(h)ŋ_, *(h)w_, sporadic **-u-** harmony*

Proto-Ao ***-a(ʔ)*** remained Mongsen **-a(ʔ)** but was velarized to Chungli **-u(ʔ)** when preceded by the velar nasal initial ***(h)ŋ-*** or by coalescence with the initial/medial labiovelar glide (***(h)w-**, ***-w-**). Some instances of ***-a*** also underwent sporadic vowel harmony in Chungli when **-u-** was present in an adjacent syllable (FIVE (17); WOUND, SORE (76); BANANA (208)):

Set	*PAo*	*PTB*
(17) FIVE	*ph**a**-ŋ**a**	*l/b-ŋa FIVE
(76) WOUND, SORE	*khu-m**a**	*r-ma-t WOUND / INJURED
(208) BANANA	*m**a**.ŋu	

Set	*PAo*	*PTB*
(267) MONKEY	*ʃa-ŋ**a**	
(265) FISH	*a-hŋ**aʔ**	*s-ŋya FISH
(272) GO	*a-w**a**	*s-wa GO
(273) LEAF	*t-w**a**	
(127) BIRD	*w**a**-zaʔ	*wa BIRD / FEATHER
(274) BAMBOO	*a-hw**aʔ**	*r-wa BAMBOO
(371) FATHER	*t-pw**a**ʔ	*p^{w}a MAN / FATHER
(370) SEARCH FOR, SEEK$_2$	*pw**a**-ʃi	*pa SEARCH FOR / SEEK
(372) WELL, POND	*tsə-pw**a**ʔ	
(373) FOOT (PART)	*t-m-phw**a**	*p^{w}a-n PALM / SOLE
(374) TOOTH	*t-phw**a**	*s-wa ⋌ *p-wa TOOTH[†]
(375) CATCH	*a-phw**aʔ**	
(74) BE BITTER	*a-kh**aʔ**	*b-ka-n BITTER / LIVER
(308) COME	*a-ɹ**a** (?)	*la-y COME / ARRIVE *la-y ⋌ *ra COME[†]
(335) GO DOWN	*a-hl**a** (?)	

*Table 80: PAo *-**a(ʔ)** > Ch -**u(ʔ)***

- (17), (76), (208) The second ***-a** in PAo ***pha-ŋa** FIVE was velarized by regular sound change to Chungli **-u** (following PAo ***ŋ-**), which then acted as the trigger for sporadic vowel harmony of the first ***-a** to **-u**, yielding Chungli **pu^{1}ŋu^{2}**. The same vowel harmony to **-u** occurred in WOUND, SORE (PAo ***khu-ma** > Chungli **ku^{1}mu^{2}**) and BANANA (PAo ***maŋu** > **mu^{3}ŋu^{3}**). Vowel harmony of the prefixal/formative schwa with **-u-** is also common in both lects (cf. GMA: 53; also Chungli **mu^{2}puŋ^{2}** 'wind' (15), **mu^{3}lu^{3}** 'boil (vt.)' (353), **mu^{3}luk^{3}** 'basket' (354), **mu^{2}luŋ^{2}** 'be willing' (359), **tu^{2}-ku^{3}luk^{1}** 'brain' (356), **tu^{2}-ku^{2}lak^{3}** 'head' (56), **tu^{2}-kuŋ^{2}** 'neck' (80), **tu^{3}-kuʔ^{1}** 'chest' (61), **tu^{3}-ku^{3}** 'nine' (59)).
- (74) As demonstrated previously in Table 78 (sets (52), (53), (73)), PAo ***-a(ʔ)** usually remained Chungli **-a(ʔ)** following the velar stops ***k(h)-**, but here the Chungli reflex of PAo BE BITTER shows velarization to **-u(ʔ)** in the same environment (PAo ***a-khaʔ** > Chungli **a^{3}-kuʔ^{1}** 'be bitter'). This may be a sporadic change, or Chungli may have borrowed Lotha **kho^{2}-** 'be bitter' (see PCN ***a-khaʔ** BE BITTER [10]).
- (308), (335) See Table 66 (page 94) and Table 70 (page 97) for discussion of the rime development in COME and GO DOWN, respectively.

*Mo **-aʔ**, Ch **-əʔ** < PAo *-aʔ / *z_*

When preceded by ***z-***, Proto-Ao ***-aʔ*** became Chungli ***-əʔ***:

Set	*PAo*	*PTB*
(127) BIRD	*wa-z**aʔ**	

*Table 81: PAo *-aʔ > Ch -əʔ*

In fact, this reduction to schwa occurred in Chungli for all vowels following ***z-*** (see Table 37, page 62), the synchronic consequence of which is a phonotactic restriction of Chungli **z** + vowel sequences to **zə**. (Mongsen appears to have no such restriction on which vowels may follow **z-**.)

Sporadic Reduction

Two cognate sets show sporadic reduction of PAo ***-a*** to ***-ə*** in Chungli and/or Mongsen:

Set	*PAo*	*PTB*
(22) QUOTATIVE, THUS	*t**a**	
(23) HOW?	*ku-t**a**	
(307) (TIMES) TEN	*th-ɹ**a**	cf. PKC *hraa TEN

*Table 82: PAo *-a reduced/resyllabified*

- (22) The Proto-Ao QUOTATIVE particle ***ta*** and the second syllable of ***ku-ta*** HOW? saw their rimes reduced to schwa in Mongsen.
- (307) The Proto-Ao reflexes of (TIMES) TEN show sporadic reduction and resyllabification of the root to **ɹə** or **əɹ** in both daughter lects, which is not unexpected with such a high-frequency numeral morpheme. (See Table 66 (page 94) for the full cognate set.)

*II.4.1.2. *-i(ʔ) < PTB *-i, *-ey*

Proto-Ao ***-i(ʔ)*** descended from a merger of PTB ***-i*** and ***-ey***. PAo ***-i(ʔ)*** remained ***-i(ʔ)*** in both Ao lects for most cases, but was reduced to a schwa in two environments, discussed below.

*Mo, Ch **-i(ʔ)** < PAo *-i(ʔ)*

The following table presents instances of PAo ***-i(ʔ)*** which remained **-i(ʔ)** in both Mongsen and Chungli:

Set	*PAo*	*PTB*
(9) REQUEST (v.)	*m-p**i**-ʃi	
(18) BELT, STRAP (FOR WEAVING)	*a-ph**i**	*bi STRING / STRAP / BELT†
(19) THIGH	*t-ph**i**	*pey LEG (HPTB); LEG / THIGH / FOOT (STEDT)
(20) THINK	*ph**i**-ləm	
(216) FIRE	*m**i(ʔ)**	*mey FIRE
(204) WIDOW	*(a-)hm**i**-	
(205) VAPOR	*hm**i**.luŋ	
(30) CORN	*mən.t**i**	
(29) SIBLING/BROTHER (OLDER)	*t-t**i**	
(46) ALWAYS	*t-th**i**	
(47) EIGHT	*th**i** ⩙ *tshət	
(248) SEVEN	*th-n**i** ⩙ *th-nət	*s-ni-s SEVEN
(242) I, ME (1SG)	*n**i**	*ŋa-y 1ST PERSON PRONOUN / SELF
(243) LEAD (v.)	*a-n**i**	
(235) FOLLOW	*a-hn**i**	
(54) HOUSE	*(a-)k**i**	
(55) CORNER	*k**i**.nik	
(91) KNOW$_2$	*a-ʃ**i**	*syey-s KNOW
(90) REPETITIVE (SUF.)	*-ʃ**i**	
(136) HANG (vt.)	*h**i**.tjak	
(167) CLOSE (v.)	*a-tʃh**i**ʔ	*dzyi:p SHUT / CLOSE (v.) / CLOSE TOGETHER
(168) GNASH, GRIND TEETH	*tʃh**i**-təp	
(311) BE ENOUGH	*p-ɹ**i**	
(351) TONGUE	*t-m-l**i**	*m/s-lay ⩙ *s-ley TONGUE
(348) LIVE, BE, EXIST	*a-l**i**	*s-ri(y)-t COPULA / BE / EXISTENCE
(349) GROUND, EARTH	*a-l**i**	*m-ley ⩙ *m-ləy EARTH / GROUND / SOIL / MUD / COUNTRY

Set	*PAo*	*PTB*
(350) BE EXCESSIVE	*a.l**i**	
(150) BOW / SLINGSHOT	*l**i**-tʃak	*d/s-ləy BOW / SLINGSHOT (?)
(339) BEAN	*hlu.l**i**	
(337) BUY	*a-hl**i**	*g/m/s-lay ⩙ *r-ley CHANGE / EXCHANGE / BUY / BARTER
(193) BAMBOO SHOOT (FERMENTED)	***i**.tsak	
(383) POUR OUT	***i**-ljak	

*Table 83: PAo *-i(ʔ) > Mo, Ch -i(ʔ)*

- (248) PAo ***th-ni** reflects the unsuffixed allofam of PTB SEVEN (see discussion below Table 55, page 83).
- (242) Perhaps due to its status as a high-frequency function word, PTB ***ŋa-y** 1ST PERSON PRONOUN shows irregular development into PAo ***ni**.
- (167) CLOSE (V.) suggests that PAo final ***-ʔ** descended from PTB final ***-p**, but this is the only instance of such a development. In all other cases, PTB ***-p** was preserved in Proto-Ao (§II.4.2.1).
- (351) PTB TONGUE shows allofamic variation between ***m/s-lay** and ***s-ley**. Since the PTB rime ***-ay** yielded PAo ***-aj**, however, PAo ***t-m-li** TONGUE must have descended from some combination of these forms, namely PTB ***m-ley**.
- (150) See Table 71 (page 99) for discussion of the rime development in BOW, SLINGSHOT.

*Mo -ə, Ch -i < PAo *-i / *ts_*

When preceded by PAo ***ts-**, ***-i** remained **-i** in Chungli but was reduced to **-ə** in Mongsen (cf. Table 48, page 75):

Set	*PAo*	*PTB*
(198) SUGAR CANE	*mu.ts**i**	
(195) LOOK, STARE	*a.ts**i**	
(197) BRAID, KNIT, PLAIT	*m-ts**i**	
(196) PECK, BITE	*(m-)ts**i**	

*Table 84: PAo *-i > Mo -ə*

*Mo **-i**, Ch **-ə** < PAo *-**i** / *-**z**_*

As mentioned previously (Table 81), all vowels were reduced to schwa in Chungli following PAo *-**z**-:

Set	*PAo*	*PTB*
(128) BAMBOO SHOOT	*(a-)z**i**	

*Table 85: PAo *-**i** > Ch **-ə***

*II.4.1.3. *-u(ʔ) < PTB *-u, *-əw, *-ow, *-a(ː)w*

Proto-Ao ***-u(ʔ)*** descended from a merger of PTB ***-u***, ***-əw***, ***-ow***, and ***-a(ː)w***. PAo ***-u(ʔ)*** remained ***-u(ʔ)*** in Mongsen but yielded Chungli ***-u(ʔ)*** or ***-i*** (discussed below).

*Mo, Ch **-u(ʔ)** < PAo *-**u(ʔ)***

Table 86 shows instances of PAo ***-u(ʔ)*** which remained ***-u(ʔ)*** in both daughter lects:

Set	*PAo*	*PTB*
(198) SUGAR CANE	*m**u**.tsi	
(10) CARRY (SHOULDER)	*a-p**u**	*bəw CARRY (ON BACK OR SHOULDERS)
(21) BLOW	*a-ph**u**	*pu BLOW[†]
(33) POKE, JAB	*a-t**uʔ**	
(32) DIG	*a-t**u(ʔ)**	*tu ⪤ *s/m-du DIG
(48) OIL	*th**u**-tsə	
(249) SIBLING (YOUNGER)	*t-n**u**	*naːw YOUNGER SIBLING
(250) BE LATE	*m-n**u**	
(56) HEAD$_1$	*k**u**	*m/s-gaw HEAD
(57) INTERROG. PRO.	*k**u**	
(58) UNCLE (MAT.) / FATHER-IN-LAW	*t-k**u**	*gəw-n ⪤ *kəw-n ELDER BROTHER / SENIOR MALE RELATIVE
(59) NINE	*th-k**u**	*d/s-kəw NINE
(60) BASKET$_1$	*(a-)k**u**	*kaw BASKET
(61) CHEST	*t-k**uʔ**	*k(r)u CHEST / RIB[†]
(77) BAG	*hjaŋ.kh**u**	
(76) WOUND, SORE	*kh**u**-ma	

Set	*PAo*	*PTB*
(78) SMOKE	*m**u**-kh**u**-ləj	*mey FIRE; *kəw-n/t SMOKE
(208) BANANA	*ma.ŋ**u**	
(98) LIFT / AWAKEN	*m-s**u**	*m-sow ARISE / AWAKE(N)
(99) BE BORN / GIVE BIRTH	*a-s**u(ʔ)**	*g-sow REAR (CHILD) / BEAR (CHILD)
(169) PUNJI SPIKE	*a-tʃh**u**	*tsow-t THORN / PIERCE
(170) COOK	*a-tʃh**u**	*tsyow BOIL (v.) / COOK / BAKE
(279) WORD	*(a-)hj**u**	
(278) WEIGH	*hj**u**	
(312) ROAST$_2$	*a-ɹ**u**	cf. PTk *row ROAST
(154) PINEAPPLE	*tʃu.ɹ**u**	
(230) FLOWER	*hna.ɹ**u**	
(270) CROW (n.)	*waj-hɹ**u**	
(186) NIT	*(a-)hɹ**u**-tsə	*s-row NIT
(120) CREATE, BUILD	*ʒaŋ.l**u**	
(129) WRITE	*zə-l**u**	
(353) BOIL (vt.)	*m-l**u**	
(338) FIELD	*a-hl**u**	*low FIELD
(339) BEAN	*hl**u**.li	
(107) STUFF, POSSESSIONS	***u**.sət	

*Table 86: PAo *-u(ʔ) > Mo, Ch -u(ʔ)*

- (78) As discussed under Table 52 (page 78), the first syllable of PAo ***mu-khu-ləj*** SMOKE appears to be a vowel-harmonized reflex of PTB ***mey*** FIRE.
- (32), (99) For both PAo ***a-tu(ʔ)*** DIG and ***a-su(ʔ)*** BE BORN / GIVE BIRTH, the Mongsen reflex contains a glottal stop coda that its Chungli cognate lacks, making the reconstruction of PAo ***-ʔ*** uncertain.

*Mo **-u**, Ch **-i** < PAo *-u / *tʃ_*

In two cognate sets, PAo ***-u*** was fronted to Chungli ***-i*** after the unaspirated affricate ***tʃ-***:

Set	*PAo*	*PTB*
(153) THAT (ONE), DEMONSTRATIVE	*a-tʃ**u**	
(154) PINEAPPLE	*tʃ**u**.ɹu	

*Table 87: PAo *-**u** > Ch -**i***

*II.4.1.4. *-ə(ʔ)*

Various PTB rimes were reduced to ***-ə(ʔ)*** in Proto-Ao, though the conditioning environments are somewhat scattered and uncertain (discussed below). PAo ***-ə(ʔ)*** remained **-ə(ʔ)** in Mongsen, but yielded **-ə(ʔ)**, **-i**, or a resyllabified rime in Chungli.

*Mo, Ch **-ə(ʔ)** < PAo *-ə(ʔ)*

In most cases, PAo ***-ə(ʔ)*** remained **-ə(ʔ)** in both Mongsen and Chungli. The following table lists these instances:

Set	*PAo*	*PTB*
(221) NEGATIVE (VERBAL PFX.)	*m**ə**-	*ma-y NEGATIVE
(36) PROHIBITIVE (PFX.)	*t**ə**-	*da ≷ *ta NEGATIVE IMPERATIVE
(67) DECEIVE	*k**ə**.lak	
(81) TOGETHER	*kh**ə**.ləm	
(100) CLOTH / SHAWL	*(a-)s**ə**	
(101) DIE	*a-s**ə**	*səy DIE
(102) BILE / GALL BLADDER	*t-(a-)s**ə**	*m/s-kri(y)-s GALL / BILE / SOUR
(122) RICE BEER	*(a-)ʒ**ə**	cf. PLB *m-dzəy[1] LIQUOR
(129) WRITE	*z**ə**-lu	
(182) WATER	*(a-)ts**ə**	*tsyu WATER / BODY FLUID
(183) SALT	*m-ts**ə**	*m-t(s)i SALT / YEAST
(184) SALIVA, SPITTLE	*m-ts**ə**	*m-ts(y)il SPIT / SPITTLE / SALIVA
(185) EGG	*hən-ts**ə**	*dz(y)u EGG
(186) NIT	*(a-)hɹu-ts**ə**	
(187) FALL, PLUMMET	*(a-)ts**ə**(k)	*kla-k/y/t ≷ *gla-k/y/t FALL
(199) BE SHORT	*a-tsh**ə**	
(200) PULL	*a-tsh**əʔ**	
(178) MITHUN	*(a-)tʃh**ə**	

Set	*PAo*	*PTB*
(179) TIE (v.)	*m-tʃhə	
(180) DEER	*m-tʃhə	
(85) BOAST	*a.tʃhə.khəm	
(318) HATCH (vi.)	*ɹə.ljak	

*Table 88: PAo *-ə(ʔ) > Mo, Ch -ə(ʔ)*

- (221), (36) The reduction of PTB ***-a*** to PAo schwa in NEGATIVE and PROHIBITIVE is not surprising, considering their status as high-frequency verbal prefixes.
- (101) PTB ***-əy*** appears to have monophthongized to PAo ***-ə*** following PTB ***s-***, as in DIE.
- (102) PTB ***-i*** may have yielded PAo schwa following PTB ***kr-***, as in BILE / GALL BLADDER. (The development of this PTB etymon is discussed more fully in the PCN chapter: see especially §III.6.4.1.)
- (182), (183), (185) The PTB open rimes ***-i*** and ***-u*** were reduced to PAo schwa following various PTB affricates.
- (184) SALIVA and INTESTINES (304) (Table 90, below) show that PTB ***-i(:)l*** was also reduced to PAo ***-ə(ʔ)***, perhaps unconditionally.
- (187) PTB ***-a*** yielded PAo schwa following PTB ***kl-***. (See Table 46, page 74 for discussion of the variation in PAo FALL, PLUMMET.)

*Mo -ə, Ch -i < PAo *-ə / *ʃ_*

When preceded by PAo ***ʃ-***, ***-ə*** remained ***-ə*** in Mongsen but was raised to ***-i*** in Chungli:

Set	*PAo*	*PTB*
(4) WHO?	*ʃə-paʔ	
(92) POUR	*ʃə-uk	

*Table 89: PAo *-ə > Ch -i*

Raising to Chungli ***-i*** occurred for all vowels following PAo ***ʃ-*** (cf. Table 33, page 58).

*Mo **-ə**, Ch metathesis < PAo *-ə / *(h)ɹ_#*

In a word-final syllable with a PAo ***(h)ɹ-*** onset, ***-ə*** remained **-ə** in Mongsen but was often metathesized in Chungli, yielding a resyllabified **-əɹ** rime:[95]

Set	*PAo*	*PTB*
(319) BOUNDARY, BORDER	*a-ɹəʔ	*b-rəy DRAW, MARK; BOUNDARY†
(304) INTESTINES	*t-(a-)hɹə	*riːl BELLY / STOMACH / INTESTINES
(302) PERFORATE / SEW	*a-hɹə	
(65) MUSHROOM	*kuŋ.hɹə	

*Table 90: PAo *-ə > Ch metathesis*

(See Table 66 (page 94) for the full cognate sets and discussion.)

- (319) PTB ***-əy*** appears to have monophthongized to PAo ***-ə*** following PTB ***r(w)-***, as in BOUNDARY, BORDER and CANE, RATTAN (303) (Table 91, below).

Some Chungli variants retain the open rime, as indicated by Clark's transcriptions of 'boundary, border' as ARV̥R (1911: 126), 'sew' as ARER (1911: 116) (both /a-ɹə/), and 'intestines' as TAR/TARER (1911: 770) (/ta-əɹ/ and /ta-ɹə/). One of my Chungli consultants (AL) also preserves the rime in the following set:

Set	*PAo*	*PTB*
(303) CANE, RATTAN	*a-hɹə	*s-rwi(y) CANE / RATTAN / ROPE

*Table 91: PAo word-final *-ə preserved in Chungli*

Such variation reveals the sporadic nature of this metathesis.

*II.4.1.5. *-aj, *-əj(ʔ)*

Only two open/glottal-final Proto-Ao rimes have been reconstructed with ***-j-*** in the pre-coda glide position (cf. Table 21): ***-aj*** and ***-əj(ʔ)***.

*Mo **-a**, Ch **-a** < PAo *-aj < PTB *-a(ː)y*

PAo ***-aj*** lost its offglide independently in both daughter lects to yield Chungli/Mongsen **-a**, merging with most reflexes of PAo ***-a***. The Chungli reflexes of PAo ***-aj*** remain distinct from those of ***-a*** in their failure to show velarization to **-u** after ***(h)ŋ-***,

[95] See also the discussion regarding the formation of the PAo *-əɹ rime (§II.4.4, below).

(h)w- or brightening to ***-i*** after ****tʃ(h)-***. The velarization/brightening of ****-a(ʔ)*** in the Chungli branch had therefore already occurred when the palatal offglide of PAo ****-aj*** was lost in Chungli (yielding ***-a***).

Since both PAo ****-a*** and ****-aj*** yielded Chungli/Mongsen ***-a***, the only Ao correspondences of ***a : a*** that can be unambiguously reconstructed as PAo ****-aj*** are those in which the Chungli reflex would have velarized/brightened had it descended from PAo ****-a***. For example, if Chungli ***-tʃa²*** 'call' (145) had descended from PAo ****tʃa***, it would have brightened to ***-tʃi***. The appearance of Chungli un-brightened ***-a*** in a brightening context therefore reveals that the PAo form was not ****tʃa***, but ****tʃaj***. Looking further up the tree, this PAo form is confirmed by the PCN reconstruction ****tsaj*** CALL [49].

For sets in which the correspondence is ***a*** : ***a*** but the Chungli form does not contain a velarizing/brightening context, the PAo rime is ambiguous between ****-a*** and ****-aj***. These are left as PAo ****-a*** for now, except where extra-Ao evidence (PCN and/or PTB) indicates a diphthong, in which case the rime is represented as ****-a [j]*** :

Set	*PAo*	*PTB*
(211) FACE / SURFACE	*t-m**a [j]**	*s-maːy FACE
(229) BE NEAR	*a.hn**a [j]**	*s-naːy ⩙ *s-ney NEAR
(266) HEAR, LISTEN	*a-hŋ**aj**	*r/g-na EAR / HEAR / LISTEN
(133) BLESS	*m-ɣ**a [j]**	
(145) CALL	*a-tʃ**aj**	
(146) DIRT, RUBBISH	*tʃ**aj**.naʔ	
(147) BE CLEAR	*tʃaŋ-tʃ**aj**	
(163) DISAPPEAR / LOSE	*tʃh**aj**-maʔ	
(269) CHAFF, HUSK	*w**aj**	*pwaːy HUSK / CHAFF
(270) CROW (n.)	*w**aj**-hɹu	*wa BIRD / FEATHER
(300) DISEASE	*hɹ**a [j]**	
(344) BE EASY	*m-l**a [j]**	*lwa(ː)y EASY
(345) NAVEL	*t-ph-l**a [j]**	*m/s-la(ː)y NAVEL / CENTER / SELF

*Table 92: PAo *-aj > Mo, Ch -a*

▸ (266) The Chungli reflex of HEAR / LISTEN (**a²ŋa²**) contains ***-a*** but failed to participate in the development of PAo ****-a*** > Ch ***-u*** / ****(h)ŋ*** _ (see Table 80, page 109), revealing that the PAo rime was ****-aj***, not ****-a***.

- (266), (270) HEAR, LISTEN and CROW (n.) somehow both picked up a palatal suffix in the development from PTB to yield PAo ***-aj**.
- (145), (146), (147), (163) The ***-aj** rimes in these PAo forms (CALL, DIRT, BE CLEAR, and DISAPPEAR) yielded Chungli **-a** despite the palatal affricate initials (contrast PAo ***-a(ʔ)** > Ch **-i(ʔ)** / ***tʃ(h)** _ ; Table 79, page 108).

*Mo **-i(ʔ)**, Ch **-ə(ʔ)** < PAo ***-əj(ʔ)** < PTB ***-əy***

PTB ***-əy*** was retained in PAo as ***-əj(ʔ)**, except where it was reduced to schwa (cf. Table 88, page 116). PAo ***-əj(ʔ)*** yielded Mongsen **-i(ʔ)** (a loss of the schwa nucleus and retention of the palatal offglide) and Chungli **-ə(ʔ)** (a loss of the palatal offglide):

Set	*PAo*	*PTB*
(223) TARO	*(a-)m**əj**	*m-n(w)ay YAM (?)
(224) SPEAR	*(a-)m**əj**	
(225) DESIDERATIVE (SUF.)	*-m**əj**	
(226) PERSON	*(a-)m**əjʔ**	*r-mi(y)-n MAN / PERSON
(228) SHADOW / SOUL	*t-(a-)hm**əj**-la	*m-hla GOD / SOUL / BEAUTIFUL
(253) SUN / DAY	*n**əj**	*nəy SUN / DAY
(254) CAT	*-n**əj**	
(255) LAUGH / SMILE	*m-n**əj**	*m-nwi(y)-k LAUGH
(297) HORN OF ANIMAL	*t-j**əj**	
(298) DOG	*a-j**əj**	*d-k^{w}əy-n DOG
(299) BLOOD	*a-j**əjʔ**	*s-hywəy BLOOD
(14) WILD PIG	*puŋ.j**əj**	
(217) MEDICINE, DRUG	*mu.l**əj**	*r-tsəy MEDICINE / JUICE / PAINT (?)
(328) FOUR	*ph-l**əj**	*b-ləy FOUR
(329) RESPOND, REPLY$_1$	*laŋ.l**əj**	
(78) SMOKE	*mu-khu-l**əj**	
(53) SWAGGER, SWAY	*ka.l**əj**	
(330) VINE / VEIN	*(t-)hl**əj**	
(331) FLEA	*a-hl**əj**	*s-ləy FLEA

*Table 93: PAo ***-əj(ʔ)** > Mo **-i(ʔ)**, Ch **-ə(ʔ)***

- (223), (228) For discussion of TARO and SHADOW / SOUL, see Table 53 (page 80).

- (255) PTB ***m-nwi(y)-k*** LAUGH appears to have lost the medial ***-w-*** glide before the Proto-Ao stage.
- (217) For MEDICINE, see the discussion below Table 68 (page 96).

II.4.2. Bilabial Codas

The bilabial codas reconstructed for Proto-Ao are ***-p*** and ***-m***, which descended unchanged from PTB final ***-p*** and ***-m***, respectively.

PAo	*environments*	*Mongsen*	*Chungli*
-əp	(uncond.)	**-əp**	**-əp**
-əm	(uncond.)	**-əm**	**-əm**

Table 94: Proto-Ao bilabial-final rime development

*II.4.2.1. *-əp/m < PTB *-Vp/m*

All PTB vowels before ***-p*** or ***-m*** were reduced to schwa in Proto-Ao, and PAo ***-əp/m*** remained **-əp/m** in both Mongsen and Chungli:

*Mo, Ch **-əp/m** < PAo ***-əp/m***

Set	*PAo*	*PTB*
(37) STRIKE, BEAT	*a-t**əp**	*tip/tup ⪤ *dip/dup BEAT / STRIKE
(38) PAINT (v.)	*a-t**əp**	
(39) RECIPROCAL / COLLECTIVE (SUF.)	*-t**əp**	
(256) BE SOFT	*a-n**əp**	
(68) SKIN, RIND, SHELL	*t-k**əp**	*kop ⪤ *kwap SKIN / LIP / SCALES (FISH) / SHELL[†]
(103) NEST / WEB (OF SPIDER)	*t-s**əp**	*(t)sip ⪤ *(t)sup NEST / WOMB / SCROTUM
(156) CRY, WEEP	*a-tʃ**əp**	*krap WEEP
(172) SUCK / KISS	*m-tʃh**əp**	*m-dzup ⪤ *m-dzip SUCK / SUCKLE / MILK / KISS
(289) RETURN, TURN BACK	*m-j**əp**	
(288) SLEEP	*a-j**əp**	*s-yip ⪤ *s-yup SLEEP / PUT TO SLEEP / CONCEAL / HIDE (v.)

Set	*PAo*	*PTB*
(362) CUT (v.)	*a-l**əp**	*s-lep SLICE / PARE OFF
(340) WRAP, FOLD	*a-hl**əp**	*klup COVER / WRAP

*Table 95: PAo *-**əp** > Mo, Ch -**əp***

Set	*PAo*	*PTB*
(40) FLOOR	*a-t**əm**	
(50) END, FINISH	*a-th**əm**	
(257) BE WELL, SATISFIED	*a-n**əm**	*s-nam GOOD
(258) PUSH, PRESS	*a-n**əm**	
(259) BE LOW	*a-n**əm**	*s-nem ⩙ *s-nyam LOW / SOFT
(262) BE/GET READY	*ɹ-n**əm**	
(260) MOUNTAIN	*t-n**əm**	
(261) FIFTY	*th-n**əm**	
(236) SMELL (vi./vt.)	*m-hn**əm**	*m/s-nam SMELL
(237) FATHOM	*a-hn**əm**	*la(:)m FATHOM
(69) YEAR	*(a-)k**əm**	cf. PKC *kum AGE / YEAR
(70) BECOME / LIVE	*a-k**əm**	
(71) CHIN$_1$	*t-k[h]**əm**	*gam JAW / MOLAR
(82) EDGE, BANK	*kh**əm**	*r-ka(:)m EDGE / BANK / PRECIPICE / LIP / MOUTH
(83) SHADOW, SHADE	*a-kh**əm**	
(84) SAVE, RESCUE	*kh**əm**.ljak	
(85) BOAST	*a.tʃhə.kh**əm**	
(104) RUN	*a-s**əm**	
(105) THREE	*a-s**əm**	*g-sum THREE
(123) POISON	*m-ʒ**əm**	
(137) HOLD	*a-h**əm**	
(138) BANANA LEAF / ASPIDISTRA LEAF	*a-h**əm**	
(157) DRINK$_1$	*a-tʃ**əm**	
(173) MORTAR	*tʃh**əm**	*t(s)um ⩙ *(t)sum MORTAR
(174) WEAR, PUT ON	*a-tʃh**əm**	

Set	*PAo*	*PTB*
(290) FLY / FLOW	*a-j**əm**	*byam FLY (v.)
(291) SEARCH FOR, $SEEK_1$	*a-j**əm**	
(292) VILLAGE	*(a-)j**əm**	*k-yim ⩙ *k-yum HOUSE
(293) LOVE (v.)	*m-j**əm**	
(294) CONCEAL	*m-j**əm**	
(280) BISCUIT	*a-hj**əm**	
(320) BE RED	*m-ɹ**əm**	
(321) WAIST	*t-(p-)ɹ**əm**	*s/b-ram RIB†
(322) BURY	*a-ɹ**əm**	
(323) BEAR, ENDURE	*a.ɹ**əm**	
(305) GOD, DEITY	*tsəŋ-hɹ**əm**	
(363) $HEAD_2$	*l**əm**	*luŋ ⩙ *lum HEART / ROUND
(364) DIVIDE, APPORTION	*a-l**əm**	*b-rim DISTRIBUTE
(365) BE WARM	*a-l**əm**	*s-lum ⩙ *lim WARM / MAKE WARM
(366) BE TIRED	*ph-l**əm**	
(367) BE THICK	*m-l**əm**	
(81) TOGETHER	*khə.l**əm**	
(378) $PLANT_2$ (v.)	*a-thj**əm**	

*Table 96: PAo *-**əm** > Mo, Ch -**əm***

II.4.3. Dental Codas

The dental codas reconstructed for Proto-Ao are ***-t** and ***-n**, which descended from PTB final (or suffixal) ***-s/t** and ***-n/r**, respectively.

PAo	*environments*	*Mongsen*	*Chungli*
***-ət**	(uncond.)	**-ət**	**-ət**
***-ən**	(uncond.)	**-ən**	**-ən**

Table 97: Proto-Ao dental-final rime development

*II.4.3.1. *-t < PTB *-t, *-s*

Proto-Ao final ***-t** developed from a merger of PTB final ***-t**, final ***-s**, and suffixal ***-s**.

*Mo, Ch **-ət** < PAo *-ət < PTB *-Vt, *-Vs*

All PTB vowels before ***-t** or ***-s** were reduced to schwa in Proto-Ao, and PAo ***-ət** remained **-ət** in both Mongsen and Chungli:

Set	*PAo*	*PTB*
(41) KNOW$_1$	*m-t**ət**	
(263) TWO	*a-n**ət**	*g/s-ni-s TWO
(248) SEVEN	*th-n**ət** ⩙ *th-ni	*s-ni-s SEVEN
(72) POSSESS (INALIENABLY)	*a-k**ət**	
(86) COUGH (v.)	*a.kh**ət**	
(106) KILL	*s**ət**	*g/b-sat KILL
(107) STUFF, POSSESSIONS	*u.s**ət**	
(47) EIGHT	*tsh**ət** ⩙ *thi	'PKN' *d-ryat EIGHT
(158) SQUEEZE	*a.tʃ**ət**	
(175) SHAVE, SCRAPE	*a-tʃh**ət**	*m-kret SCRATCH / SCRAPE
(324) BE HEAVY	*a-ɹ**ət**	*s-ləy-t ⩙ *s-rəy-t HEAVY
(325) BONE	*t-ɹ**ət**	*s/m/g-rus BONE
(379) ABILITIVE (SUF.)	*-thj**ət**	

*Table 98: PAo *-ət > Mo, Ch -ət*

- (248) PAo ***th-nət** reflects the suffixed allofam of PTB SEVEN (see discussion below Table 55, page 83).
- (47) For discussion of the allofamic variation in PAo EIGHT, see Table 29 (page 53).

*II.4.3.2. *-n < PTB *-n, *-r*

Proto-Ao final ***-n** developed from a merger of PTB final ***-n** and final ***-r**.

*Mo, Ch **-ən** < PAo *-ən < PTB *-Vn, *-Vr*

All PTB vowels before ***-n** or ***-r** were reduced to schwa in Proto-Ao, and PAo ***-ən** remained **-ən** in both Mongsen and Chungli:

Set	*PAo*	*PTB*
(16) BE COMPLETE, SUFFICIENT	*a-p**ən**	
(222) SIT	*a-m**ən**	
(30) CORN	*m**ən**.ti	
(42) SING	*a-t**ən**	
(43) START, BEGIN	*t**ən**.ljak	
(51) SOW (v.)	*a-th**ən**	
(264) BE/MAKE DIRTY	*m-n**ən**	
(108) BE NEW	*a-s**ən**	*g-sar NEW / FRESH
(109) BE SOUR	*a-s**ən**	*suːr ≋ *swaːr SOUR / BE ACID
(111) LEAK, DRIP	*a-s**ən**	
(110) INSECT (CRAWLING)	*m-s**ən**	
(112) LIVER	*t-m-s**ən**	*m-sin LIVER / BITTER
(113) GATHER, ASSEMBLE (vi.)	*s**ən**-təp	
(125) POWER, WRATH	*a-ʒ**ən**	
(126) GROW UP	*a-ʒ**ən**	
(124) SHIN	*t-m-ʒ**ən**	
(139) BY HAND / CARRY	*h**ən**	
(140) CHICKEN	*a-h**ən**	*haːr FOWL / CHICKEN / QUAIL
(141) CURRY	*(a-)h**ən**	*h(y)an CURRY / VEGETABLE DISH
(159) BE OLD	*a-tʃ**ən**	
(177) WRING, SQUEEZE	*m-tʃh**ən**	*tsyir ≋ *tsyuːr WRING / SQUEEZE
(176) MONEY	*(a-)tʃh**ən**	
(295) SPIN (THREAD)	*a-j**ən**	
(296) IRON	*(a-)j**ən**	*syaːl ≋ *syiːr IRON
(326) SCOLD, THREATEN	*m-ɹ**ən**	
(369) EXCHANGE	*m-l**ən**	
(35) DANGER, ACCIDENT	*l**ən**.tuŋ	
(377) LOCATIVE NOMINALIZER (SUF.)	*-tj**ən**	

*Table 99: PAo ***-ən** > Mo, Ch **-ən***

II.4.4. Alveolar Coda

The Proto-Ao alveolar approximant ***-ɹ*** has an unknown PTB source:

PAo	*environments*	*Mongsen*	*Chungli*
-əɹ	(uncond.)	**-əɹ**	**-əɹ**

Table 100: Proto-Ao alveolar-final rime development

As noted in §II.4.1.4, some instances of Chungli **-əɹ** correspond to Mongsen **(h)ɹə(ʔ)** and are therefore reconstructed as PAo ***(h)ɹə(ʔ)**, with the Chungli rime arising from metathesis. The existence of **-əɹ** in the syllable canon of both Mongsen and Chungli, however, also supports the reconstruction of PAo ***-əɹ**.

Coupe notes that Mangmetong is unique among the Mongsen varieties in the tendency of its speakers to produce the **-ɹ** coda as the onset of an additional syllable with a schwa nucleus (GMA: 55), i.e., [ɹə] or [ɻə]. Marrison, however, observes "that the Ao Chungli final -r, in most cases is not equivalent to a final consonant, but to an additional syllable in other nearby languages" (Marrison 1967: I: 63). This correspondence is evident in the reflexes of PCN SON (PAo ***(t-)tʃa-əɹ**, Sangtam **tsu-rə**, Yimchungrü **tsəʔ-rə** [20]). The aforementioned Mangmetong synchronic resyllabification behavior, therefore, which appears to generate surface [ɹə] from underlying /-əɹ/, may instead reflect an incomplete sound change of ***ɹə** > ****əɹ**. That is, the comparative evidence suggests an original PCN ***ɹə**, which yielded ***ɹə** ⧓ ***əɹ** variants in Proto-Ao. This variation is apparently still present as a synchronic phenomenon in the Ao daughter lects.

*Mo, Ch **-əɹ** < PAo ***-əɹ** < PTB ?*

One set contains reflexes of PAo ***-əɹ**:

Set	*PAo*	*PTB*
(386) AGENTIVE NOM. / MASC. GENDER (SUF.)	***-əɹ**	

*Table 101: PAo ***-əɹ** > Mo, Ch **-əɹ***

In both Mongsen and Chungli, the **-əɹ** suffix (as in SON (144) and PRIEST (31)) is an agentive nominalizer that doubles as a marker of masculine semantic gender (cf. GMA: 264). Both lects also contain two verbal **-əɹ** morphemes, a sequential converb and a

present tense marker, which Coupe hypothesizes to have been originally derived from the agentive nominalizer (GMA: 263–264).

II.4.5. Velar Codas

The velar codas reconstructed for Proto-Ao are ***-k** and **ŋ**, which descended unchanged from PTB final ***-k** and ***-ŋ**, respectively.

PAo	*environments*	*Mongsen*	*Chungli*
***-ak**	sporadic	**-ək**	**-ak/ək**
	after ***ts-**, ***lj-**	**-ak**	**-ək**
	elsewhere	**-ak**	**-ak**
***-aŋ**	after ***ts-**	**-aŋ**	**-əŋ**
	elsewhere	**-aŋ**	**-aŋ**
***-ik**	(uncond.)	**-ik**	**-ək**
***-iŋ**	(uncond.)	**-iŋ**	**-əŋ**
***-uk**	sporadic	**-ək**	**-uk**
	elsewhere	**-uk**	**-uk**
***-uŋ**	sporadic	**-əŋ**	**-uŋ**
	elsewhere	**-uŋ**	**-uŋ**
***-ək**	(uncond.)	**-ək**	**-ək**
***-əŋ**	(uncond.)	**-əŋ**	**-əŋ**

Table 102: Proto-Ao velar-final rime development

*II.4.5.1. *-ak/ŋ < PTB *-a(ː)k/ŋ*

PTB ***-a(ː)k** and ***-aŋ** descended unchanged into Proto-Ao, except where they reduced to ***-ək/ŋ** in a few cases (§II.4.5.4).

*Mo, Ch **-ak/ŋ** < PAo *-ak/ŋ*

In the majority of cases, PAo ***-ak/ŋ*** remained **-ak/ŋ** in both daughter lects:

Set	*PAo*	*PTB*
(5) BE FLAT / MAT	*(a.)p**ak**	*r-pak LEAF
(26) WEAVE	*a-t**ak**	*tak ⪤ *dak WEAVE
(27) STING	*m-t**ak**	
(240) BE BLACK	*a-n**ak**	*s-nak BLACK / INK / DEEP
(232) SCRATCH (v.)	*a-hn**ak**	*hyak SCRATCH (?)
(96) ITCH (v.)	*m-s**ak**	*m-sak ITCH
(25) QUICKLY	*ʒ**ak**.ta	
(148) BREAK$_2$	*tʃ**ak**	
(149) CHEW	*m-tʃ**ak**	*m-dzyak CHEW[†]
(150) BOW / SLINGSHOT	*li-tʃ**ak**	
(164) BE DIFFICULT / BE HARD	*a-tʃh**ak**	*tsak-t HARD / SOLID[†]
(165) AWAKE, ARISE	*tʃh**ak**	
(271) SWELL, BE SWOLLEN	*a-w**ak**	
(276) BE SHY	*a.hj**ak**	*g-yak ⪤ *s-r(y)ak ASHAMED
(309) BIND (W/ BAMBOO)	*a-ɹ**ak**	*grak CORD / TIE / BIND
(95) BREAK$_1$	*ɹ**ak**.sa?	
(67) DECEIVE	*kə.l**ak**	
(136) HANG (vt.)	*hi.tj**ak**	

*Table 103: PAo **-ak** > Mo, Ch **-ak***

Set	*PAo*	*PTB*
(6) SPINDLE	*p**aŋ**	*p^{w}aŋ SPIN / SPINDLE
(7) MOUTH	*t-p**aŋ**	*m-p(r)(w)aŋ MOUTH[†]
(8) TIME	*hma.p**aŋ**	
(212) BE DARK	*a-m**aŋ**	*s-maŋ ⪤ *s-mak BLACK / INK / DEEP
(213) BELIEVE	*a-m**aŋ**	
(214) BODY / CORPSE	*(t/a-)m**aŋ**	*s-maŋ CORPSE
(215) DREAM (n./v.)	*m**aŋ**	*r/s-maŋ ⪤ *mak DREAM
(28) TOUCH	*t**aŋ**.tʃha?	

Set	*PAo*	*PTB*
(44) BLOCK, STOP UP	*a-th**aŋ**	
(45) SEVER	*a-th**aŋ**	
(238) YOU (2SG)	*n**a(ŋ)**	*na-ŋ 2ND PERSON PRONOUN
(241) PROMISE, BE CONFIDENT	*n**aŋ**.ljak	
(97) LIZARD	*s**aŋ**-	*r-saŋ LIZARD
(120) CREATE, BUILD	*ʒ**aŋ**.lu	
(147) BE CLEAR	*tʃ**aŋ**-tʃaj	*(t)syaŋ CLEAR, PURE, CLEAN
(151) SEED, NUT	*(t-)tʃ**aŋ**	*tsyaŋ TESTICLE
(152) RICE (HUSKED, UNCOOKED)	*(a-)tʃ**aŋ**	
(166) MASCULINE NOMINALIZER (SUF.)	*-tʃh**aŋ**	cf. PLB *tsaŋ[1] PERSON / HUMAN BEING
(268) ROAST, WARM (v.)	*a-hw**aŋ**	
(227) BE SWEET	*a-m-j**aŋ**	
(277) THREAD, YARN	*a-hj**aŋ**	
(77) BAG	*hj**aŋ**.khu	
(310) BE HARD	*m-ɹ**aŋ**	*g-raŋ ⪤ *m/b-raŋ STRONG / FIRM / TENSE†
(346) CUT, HACK	*a-l**aŋ**	
(252) HUNDRED	*nuk.l**aŋ**	
(329) RESPOND, REPLY$_1$	*l**aŋ**.ləj	
(347) RESPOND, REPLY$_2$	*l**aŋ**.ljak	
(336) BE LONG	*a-hl**aŋ**	*m-raŋ HIGH / LONG

*Table 104: PAo *-**aŋ** > Mo, Ch -**aŋ***

*Mo -**ak/ŋ**, Ch -**ək/ŋ** < PAo *-**ak/ŋ** / *ts_, *lj_*

When preceded by ***ts-*** or ***lj-***, PAo ***-ak/ŋ*** remained ***-ak/ŋ*** in Mongsen but was reduced to ***-ək/ŋ*** in Chungli (cf. §II.3.3.2 and §II.3.6.3 for the development of the initials):

Set	*PAo*	*PTB*
(192) PADDY, GRAIN	*(a-)ts**ak**	
(193) BAMBOO SHOOT (FERMENTED)	*i.ts**ak**	
(380) DOWNWARD MOTION (SUF.)	*-lj**ak**	
(381) HIT, BEAT	*a-lj**ak**	

Set	*PAo*	*PTB*
(382) LICK	*m-lj**ak**	*m/s-lyak LICK / TONGUE
(347) RESPOND, REPLY$_2$	*laŋ.lj**ak**	
(43) START, BEGIN	*tən.lj**ak**	
(84) SAVE, RESCUE	*khəm.lj**ak**	
(241) PROMISE, BE CONFIDENT	*naŋ.lj**ak**	
(318) HATCH (vi.)	*ɹə.lj**ak**	

*Table 105: PAo *-**ak** > Ch -**ək***

Set	*PAo*	*PTB*
(194) FOOT / LEG	*t-ts**aŋ**	*r-k(y)aŋ FOOT / LEG[†]

*Table 106: PAo *-**aŋ** > Ch -**əŋ***

Sporadic Reduction

Some PAo roots with ***-ak** show sporadic reduction to **-ək** in Mongsen and/or Chungli:

Set	*PAo*	*PTB*
(233) GUARD (v.)	*a-hn**ak**	
(234) SON-IN-LAW / BROTHER-IN-LAW	*(a-)hn**ak**	*s-ma:k SON-IN-LAW
(301) CHOKE / DROWN (vi.)	*a.hɹ**ak**	

*Table 107: PAo *-**ak** > Mo -**ək**, Ch -**ak**/-**ək***

- (233), (234) The schwa nuclei in both Chungli **a^3-nək^1** 'guard' and **a^{3}nək^1** 'son-in-law / brother-in-law' appear to be sporadic reductions of PAo ***hnak** (see discussion below Table 54, page 81).
- (301) CHOKE / DROWN shows reduction to **-ək** in Mongsen and variation between reduced and un-reduced forms in Chungli. (See the discussion below Table 65, page 91.)

*II.4.5.2. *-ik/ŋ < PTB *-ik/ŋ*

PTB ***-ik** and ***-iŋ** descended unchanged into Proto-Ao, except where reduced to ***-ək/ŋ** in a few cases (§II.4.5.4).

*Mo **-ik/ŋ**, Ch **-ək/ŋ** < PAo ***-ik/ŋ***

Proto-Ao ***-ik/ŋ*** remained unchanged in Mongsen but was reduced to **-ək/ŋ** in Chungli. This set of rimes also triggered the spirantization of ***(h)l-** initials to **z-** in Chungli (§II.3.5.4, §II.4.6).

Set	*PAo*	*PTB*
(244) EYE	*t-n**ik**	*s-mik ≋ *s-myak EYE
(55) CORNER	*ki.n**ik**	
(245) BE TENDER, SOFT	*a.n**ik**	
(334) NECKLACE	*a-hl**ik**	

*Table 108: PAo ***-ik** > Mo **-ik**, Ch **-ək***

Set	*PAo*	*PTB*
(246) NAME	*t-n**iŋ**	*r/s-miŋ NAME
(247) SKY	*a-n**iŋ**	
(332) PLANT$_1$ (v.)	*a-l**iŋ**	
(333) BASE / LOWER RANGE	*a-l**iŋ**	*m-liŋ NECK
(352) MARROW	*t-l**iŋ**-la	*r-kliŋ ≋ *r-kl(y)aŋ MARROW / BRAIN

*Table 109: PAo ***-iŋ** > Mo **-iŋ**, Ch **-əŋ***

- (244) See Table 55 (page 83) for discussion of EYE.
- (352) PAo ***t-liŋla*** MARROW shows a sporadic PAo ***l-** > Ch **n-** change, thereby avoiding the spirantization of ***l-** to **z-** before ***-iŋ** in Chungli.

*II.4.5.3. *-uk < PTB *-u(ː)k, *-wak, *-əw-k; *-uŋ < PTB *-u(ː)ŋ, *-oŋ, *-a(ː)ŋ / *k_*

An unconditional merger of PTB ***-u(ː)k,** ***-wak**, and the suffixed-rime ***-əw-k** yielded Proto-Ao ***-uk**, while the only known instance of PTB ***-a(ː)ŋ** following ***k-** (BE DRY (66)) merged with PTB ***-u(ː)ŋ** and ***-oŋ** to yield PAo ***-uŋ**:

*Mo, Ch **-uk/ŋ** < PAo ***-uk/ŋ***

In nearly all cases, PAo ***-uk/ŋ*** descended unchanged into Mongsen and Chungli:

Set	*PAo*	*PTB*
(11) BELLY	*t-p**uk**	*puːk BELLY / CAVE
(218) BROOD, HATCH	*a-m**uk**	
(219) THUNDER	*tsəŋ-m**uk**	*m-bruŋ ⩙ *m-bruk THUNDER / DRAGON
(117) GINGER	*səŋ.m**uk**	
(251) MACHETE, DAO	*(a-)n**uk**	
(252) HUNDRED	*n**uk**.laŋ	
(63) WIN	*a-k**uk**	
(62) KNEE	*t-m-k**uk**	*gu(ː)k ⩙ *m-ku(ː)k CROOKED / BENT / KNEE / ANGLE
(283) SWALLOW	*m-j**uk**	*mlyəw-k SWALLOW (v.)
(282) SELL	*a-j**uk**	
(314) SIX	*t-ɹ**uk**	*d-ruk SIX
(313) SOW, SCATTER	*ph-ɹ**uk**	
(207) CUP	*ma.ɹ**uk**	
(355) JOIN	*a-l**uk**	
(354) BASKET_2	*m-l**uk**	
(356) BRAIN	*t-ku-l**uk**	*s/k-lwak BRAIN†
(376) ABANDON, LEAVE	*tj**uk**	
(384) INTO (SUF.)	*-**uk**	
(385) SWEEP	*a-**uk**	*k/p-y(w)ak SCOOP / SWEEP†

*Table 110: PAo *-**uk** > Mo, Ch -**uk***

▸ (283) At some point in the development of SWALLOW, its PTB open rime ***-əw*** fused with the ***-k*** suffix to yield Proto-Ao ***-uk*** (cf. PTB ***-əw*** > PAo ***-u***; §II.4.1.3).

Set	*PAo*	*PTB*
(12) BLOOM (v.)	*a-p**uŋ**	
(13) JUMP	*a-p**uŋ**	
(14) WILD PIG	*p**uŋ**.jəj	
(15) WIND (n.)	*m-p**uŋ**	*buŋ WIND
(220) REST, OBSERVE	*a-m**uŋ**	
(34) STEM, TRUNK	*t-t**uŋ**	*duːŋ POST / COLUMN
(35) DANGER, ACCIDENT	*lən.t**uŋ**	
(49) REACH, ARRIVE	*a-th**uŋ**	

Set	*PAo*	*PTB*
(66) BE DRY	*a-k**uŋ**	*ka(:)ŋ ROAST / TOAST / BURN / BE DRY
(64) BE COLD	*m-k**uŋ**	
(65) MUSHROOM	*k**uŋ**.hɹə	
(79) CROW (v.)	*a-kh**uŋ**	
(80) NECK	*t-kh**uŋ**	*k-woŋ NECK[†]
(155) SHIELD	*(a-)tʃ**uŋ**	
(284) RIVER	*a-j**uŋ**	
(285) DRINK_2	*a-j**uŋ**	
(286) CENTER, MIDDLE	*t-j**uŋ**	
(287) FINGER / TOE	*t-m-j**uŋ**	*m-yuŋ FINGER
(316) BOAT	*(a-)ɹ**uŋ**	*m-loŋ BOAT
(315) BURN (vi./vt.)	*a-ɹ**uŋ**	*ploŋ BURN
(231) EAR	*t-hna-ɹ**uŋ**	*ruŋ HOLE / ORIFICE / EAR[†]
(317) BACK (BODYPART)	*t-ɹ**uŋ**-thuŋ	*m-ruŋ BACK (BODY)[†]
(357) ROLL, SPIN	*a-l**uŋ**	
(358) STONE, ROCK	*(a-)l**uŋ**	*r-luŋ STONE
(359) BE WILLING	*m-l**uŋ**	
(360) BE ROUND	*l**uŋluŋ**	*luŋ ⪤ *lum HEART / ROUND
(361) HEART	*t-m-l**uŋ**	*m-luŋ MIND / HEART / LIVER
(205) VAPOR	*hmi.l**uŋ**	

*Table 111: PAo *-**uŋ** > Mo, Ch -**uŋ***

▸ (66) BE DRY demonstrates the development of PTB ***-a(:)ŋ** to PAo ***-uŋ** after PTB **k-**. In most other environments, PTB ***-a(:)ŋ** descended unchanged into PAo (see §II.4.5.1).

*Mo -**ək/ŋ**, Ch -**uk/ŋ** < PAo *-**uk/ŋ** ?*

Two cognate sets exhibit an irregular development of PAo ***-uk/ŋ** > Ch **-uk/ŋ**, Mo **-ək/ŋ**:

Set	*PAo*	*PTB*
(121) SEND	*ʒ**uk** (?)	
(171) RUST	*(a-)tʃh**uŋ** (?)	*g/b-syaŋ EXCREMENT / RUST / BLIGHT (?)

*Table 112: PAo *-**uk/ŋ** > Mo -**ək/ŋ***

Both cases appear to involve sporadic reduction of the vowel nucleus in Mongsen.

▸ (121) For SEND, see the discussion below Table 36 (page 61).

▸ (171) For RUST, see the discussion below Table 44 (page 71).

*II.4.5.4. *-ək < PTB *-ak, *-ik (reduced); *-əŋ < PTB *-aŋ, *-iŋ (reduced)*

Proto-Ao ***-ək/ŋ*** derived from a reduction of the vowel nuclei in PTB ***-ak/ŋ*** and ***-ik/ŋ*** to schwa in various environments (discussed below Table 114).

*Mo, Ch **-ək/ŋ** < PAo *-ək/ŋ*

PAo ***-ək/ŋ*** descended unchanged into Mongsen and Chungli:

Set	*PAo*	*PTB*
(181) FEEL COLD	*a.tʃhə**k**	
(187) FALL, PLUMMET	*(a-)tsə**(k)**	*kla-k/y/t ≍ *gla-k/y/t FALL
(188) ROAST$_1$	*a-tsə**k**	
(189) WASH (HANDS)	*m-tsə**k**	
(201) PINCH	*m-tshə**k**	*sik PINCH / TWIST
(202) LOUSE	*a-tshə**k**	*s-r(y)ik LOUSE
(203) COLLIDE, BUMP	*a-tshə**k**	
(327) CLEAN (vt./vi.)	*m-ɹə**k**	

*Table 113: PAo *-ək > Mo, Ch -ək*

Set	*PAo*	*PTB*
(114) BE WHITE	*m-sə**ŋ**	
(115) WOOD	*(a-)sə**ŋ**	*siŋ ≍ *sik TREE / WOOD
(116) FILL, BE FULL	*a-sə**ŋ**	
(117) GINGER	*sə**ŋ**.muk	
(130) LAW	*-zə**ŋ**	
(131) COUNT / READ	*a-zə**ŋ**	*graŋ ≍ *kraŋ MEASURE / COUNT
(132) NAIL (FINGER/TOE)	*t-m-zə**ŋ**	*s-liŋ ~ s-leŋ NAIL / CUTICLE[†]

Set	*PAo*	*PTB*
(190) CELESTIAL	*ts**əŋ**-	
(191) PUNCH, SPEAR (v.)	*a-ts**əŋ**	

*Table 114: PAo *-**əŋ** > Mo, Ch -**əŋ***

The determination of which PTB environments yielded PAo ***-ək/ŋ** is complicated by the unclear development of the initials, but a few observations may be made:

- (187), (201), (202) PTB ***-ak** and ***-ik** were reduced to PAo ***-ək** following whichever PTB sources yielded PAo ***ts(h)-** (see Table 46, page 74 for FALL; see Table 49, page 76 for PINCH and LOUSE).
- (115) PTB ***-iŋ** was reduced to ***-əŋ** following ***s-**.
- (131), (132) PTB ***-iŋ** was reduced to ***-əŋ** following whichever PTB sources yielded PAo ***z-** (see Table 37, page 62).

II.4.6. Palatal Conditioning Environments

Of all the Proto-Ao syllables, those containing the high-front diphthongal rime ***-əj(ʔ)**, a high-front nucleus followed by velar coda (***-ik/ŋ**), or a medial palatal glide (***-j-**) yielded the most drastic changes in the initial consonants of Chungli. These changes are summarized below:

PAo > Ch	*Env.*	*Example*	*Section*
*(h)m- > n-	*-əj(ʔ)	*(a-)**m**əj > **n**ə^{2} ‘spear’ (224)	§II.3.4.1 (Table 53)
*j- > z-	*-əj(ʔ)	*t-**j**əj > tə^{3}-**z**ə^{3} ‘horn’ (297)	§II.3.5.2 (Table 64)
*(h)l - > z-	*-əj, *-ik/ŋ	*ph-**l**əj > pə^{1}**z**ə^{2} ‘four’ (328) *a-**hl**ik > a^{3}-**z**ək^{1} ‘necklace’ (334)	§II.3.5.4 (Table 68) §II.3.5.4 (Table 69)
*l- > z/n-	*-j-	*m-**lj**ak > mə^{3}**n**ak^{3}∼mə**z**ək ‘lick’ (382)	§II.3.6.3 (Table 75)

Table 115: Effects of PAo palatal environments

What unifies these developments is the movement of their places of articulation to the dental/alveolar area and the spirantization of the approximants to **z-**.

II.5. Proto-Ao Tones

Although not without some difficulties, the diachronic analysis of onsets and rimes in Proto-Ao is relatively straightforward. The reconstruction of PAo tones, on the other hand, is fraught with complications. One difficulty lies in the fact that Chungli and Mongsen have different tone-bearing units (TBU's): Mongsen exhibits one tone per syllable (cf. §II.2.2.5), while Chungli syllables can bear contours (cf. §II.2.1.5). More significantly, however, Mangmetong Mongsen and standard Chungli do not appear to share regular tonal correspondences: Nearly every single tone level in one lect shows a correspondence to each tone level in the other lect. This remains the general case across syllable types (checked vs. smooth)[96] and major grammatical categories (nouns vs. verbs).

Such behavior clearly presents a significant obstacle to the reconstruction of Proto-Ao tones, but a few trends can be discerned in the data that may eventually open the door to a fuller reconstruction of tones. These are presented in the following subsections.

II.5.1. Tone Correspondences

The most robust pattern in the data is the near-complete correspondence of Chungli M syllables with Mongsen M syllables.[97] The reverse is not true, however: Other Mongsen M syllables correspond to Chungli H and L syllables.

The tone correspondences between Mongsen and Chungli syllables are summarized in the table below, where *c* refers to checked syllables (those with stop codas) and *s* to smooth syllables (open or sonorant codas):

[96] Note that all Mongsen-Chungli cognate syllable pairs have identical codas (and thus identical checked/smooth syllable types), with the exception of the few pairs in which Mongsen and Chungli seem to differ regarding the presence of a final glottal stop.

[97] I am setting aside the issue of the conflicting TBU's in Mongsen and Chungli and focusing on syllables bearing a single tone.

Mongsen \ *Chungli*	*L*	*M*	*H*
L	c, s	s (very weak corr.)	c, s
M	c, s	s (<Tone *2)	c, s
H	c, s	Ø	c, s

Table 116: Mo-Ch tone correspondences
(c = checked syllables, s = smooth syls.)

Table 116 reflects Temsunungsang's observation that Chungli checked syllables are restricted to bearing H or L (cf. §II.2.1.5). Thus, M tones in Chungli appear only on smooth syllables.

The correspondence of all Chungli smooth M syllables with some Mongsen smooth M syllables strongly indicates that they shared the same tone at the Proto-Ao stage (called Tone *2 for convenience, since its reflexes are mid (level 2) tones). What is unclear is whether Chungli or Mongsen (or perhaps neither) reflects the original PAo situation with regards to syllable type and tone. At least three scenarios are possible:

1. If Tone *2 was restricted to smooth syllables in Proto-Ao (as M is in Chungli), then some checked syllables (originally produced with a PAo tone other than Tone *2) came to be produced in Mongsen with M (the reflex of Tone *2).

2. On the other hand, if PAo Tone *2 was produced on a mix of checked and smooth syllables (as M is in Mongsen), then the checked Tone *2 syllables were changed in Chungli to some other tone (L or H).

3. Alternatively, the set of Tone *2 syllables could have contained all and only PAo smooth syllables, in which case both Mongsen and Chungli altered the members of this set: Some reflexes of Tone *2 smooth syllables were produced with L or H in Chungli, while some checked reflexes of other PAo tones were changed to Tone *2 (>M) in Mongsen.

Reliable reconstruction of additional Proto-Ao tones does not appear to be feasible from the current data set.

II.5.2. Further Observations

Although only one tone level can be unambiguously reconstructed for Proto-Ao at this stage of research, some additional observations may be made. In Mangmetong

Mongsen, the H tone appears ‘relatively infrequently in lexical roots’ (GMA: 58), whereas none of the three tone levels in Chungli seems to have an infrequent distribution in lexical roots. Chungli therefore makes more uniform use of its tonal space than Mongsen and exhibits tonal distinctions where Mongsen has complete homophones. The following table lists several such instances in which two segmentally identical roots are homophonous in Mongsen, but whose cognates are differentiated by their tone patterns in Chungli:

gloss	*Mongsen*	*Chungli*
‘spear’	[a]-mi	nə^{2}
‘taro’	[a]-mi	nə^{1}
‘together’	khələm	kə^{3}ləm^{3}
‘worship (v.)’	khələm	kə^{2}ləm^{2}
‘salt’	mətsə	mə^{3}tsə^{3}
‘spittle’	mətsə	mə^{2}tsə^{2}
‘love (v.)’	mijim	mə^{3}jəm^{3}
‘conceal’	mijim	mə^{2}jəm^{2}
‘paint (v.)’	tə̀p	-təp^{3}
‘strike, beat’	tə̀p	-təp^{1}
‘stone, rock’	[a]-luŋ	luŋ^{1}
‘spin, turn, roll’	luŋ	-luŋ^{2}
‘shawl, cloth’	[a]-sə	sə^{1}
‘die’	sə	-sə^{2}

Table 117: Mongsen homophones with tonally distinct Chungli cognates

Although it has been observed that Mongsen is more segmentally conservative than Chungli, the pattern in Table 117 suggests that Chungli is more conservative with respect to tone, preserving original Proto-Ao tone distinctions where Mongsen has collapsed them.

II.6. Discussion & Conclusion

This section summarizes and discusses the general sound changes that took place in the onsets and rimes from Proto-Tibeto-Burman to Proto-Ao (§II.6.1), and from Proto-Ao to Mongsen and Chungli (§II.6.2).[98] A relative chronology of particular sound changes also appears in §II.6.3 and some final remarks in §II.6.4.

II.6.1. PTB > PAo

II.6.1.1. Onsets

The PTB series of voiced and voiceless initial stops (bilabial, dental, and velar) merged and descended into Proto-Ao as unaspirated stops, with the aspirated PAo stops perhaps arising from some interaction with PTB prefixes.

The PTB voiceless dental fricative ***s-** descended unchanged in Proto-Ao, while the fricative-glide cluster ***sy-** coalesced into a single phoneme as PAo ***ʃ-**. Some mixture of the PTB dental and palatal affricates/affricate-glide clusters ***ts(y)-** and ***dz(y)-** served as the primary source of the four PAo affricates ***ts(h)-** and ***tʃ(h)-**.

An unknown conditioning environment yielded a split of the voiceless glottal fricative ***h-** into PAo ***x-** and ***h-**.

The PTB nasal stops (bilabial, dental, and velar) descended unchanged into Proto-Ao, again with prefixal-interaction possibly yielding the voiceless series. One example of PAo ***hŋ-** appears to have come from the velar-prefixed dental nasal ***g-n-**.

PTB ***r-** and ***l-** served as the sources of the Proto-Ao liquids, having been exchanged with one another in some instances. The voiceless variants possibly arose by influence of the PTB ***s-** prefix. The rare ***hl-** cluster was also simplified to ***l-** in Proto-Ao. The PTB initial glides ***w-** and ***y-** became the Proto-Ao initial glides, with no interchange like that observed for the liquids.

With regard to PTB clusters, some PTB consonant clusters involving ***r** appear to be the source of PAo ***z-**. Two consistent patterns of cluster development are that of PTB ***kl-** > PAo ***ts-** and PTB ***kr-** > PAo ***tʃ(h)-**, with ***-l-** vs. ***-r-** providing the original dental/alveolar vs. palato-alveolar contrast in the clusters. (Note, however, that PTB ***kr-** also yielded PAo ***s-** before ***-i** and that PAo ***ts-** may also have descended from

[98] Note that, due to the greater time gap, the changes described for PTB > PAo are less reliable than those for PAo > Mo/Ch.

PTB ***ky-***.) PTB extrusional ***p^{w}-*** became the PAo cluster ***pwa-*** and PTB ***p-w-*** became PAo ***phw-***, with the aspiration possibly arising by influence from a prefixed PTB ***s-***. The PTB cluster ***ly-*** lost the initial liquid in Proto-Ao when followed by the PTB rime ***-əw-k*** (but preserved it preceding ***-ak***).

Where a PTB medial glide (***-w-*** or ***-y-***) did not coalesce with the initial (or rime), it was either lost or reanalyzed as the initial (after loss of the original initial).

The PTB ***s-*** prefix appears to have induced Proto-Ao aspiration or voicelesness, though not every root prefixed with PTB ***s-*** follows this pattern (indicating variation in the presence of the prefix).

II.6.1.2. Rimes

Most of the PTB open diphthong rimes[99] unglided and merged with monophthongs in Proto-Ao, yielding open or glottal-final rimes (the source of PAo ***-ʔ*** is unknown):

> PTB ***-ey*** lost its nucleus but retained the offglide and merged with ***-i*** to yield PAo ***-i(ʔ)***. PTB ***-i*** was reduced to schwa following PTB ***kr-*** and ***ts-***.
>
> The PTB back diphthongs (***-a(ː)w***, ***-ow***, and ***-əw***) lost their nuclei but retained the offglides and merged with ***-u*** to yield PAo ***-u(ʔ)***. PTB ***-u*** was reduced to schwa following the PTB affricates ***tsy-*** and ***dz(y)-***.
>
> The PTB high front diphthong ***-əy*** was retained in Proto-Ao, except where it was monphthongized to ***-ə*** following ***s-*** and ***r(w)-***.

In some cases, the PTB monophthong ***-a*** was reduced to a schwa in PAo (either due to frequency effects or following PTB ***kl-***).

Contrastive vowel length in PTB was completely lost in PAo.

PTB codas were altered in only a few instances: PTB ***-s*** and ***-r*** underwent fortition to ***-t*** and ***-n***, respectively. These changes yielded a merger with PTB rimes already ending in ***-t*** and ***-n***. The PTB rimes ***-il*** and ***-iːl*** lost their ***-l*** coda and were reduced to PAo schwa.

One of the most striking PTB > Proto-Ao developments is the merger of all vowels to schwa before the bilabial and dental codas (***-m***, ***-p***, ***-n***, ***-t***). Before velar codas, however, PTB vowel nuclei were largely preserved. This dichotomy may find its most natural explanation as a difference in the location of oral closure in the coda, which affected the quality of the vocalic nucleus in divergent ways. The bilabial and dental

[99] See §I.4.2.3 for the reconstructed PTB vowel inventory.

articulations of the coda consonants ***-m**, ***-p**, ***-n**, and ***-t** yielded a drastically shortened vocal tract in front of the closure, obscuring the perception of the preceding vowels and providing the impetus for their eventual merger. Open syllables and those closed by the dorsal articulations of ***-k** and ***-ŋ**, on the other hand, yielded a greater length of vocal tract and therefore produced less of an effect on the perception of the vowel nuclei, contributing to their preservation in Proto-Ao.

The few instances in which PTB pre-velar vowel nuclei were altered in PAo fall into these categories:

PTB ***-oŋ** merged with ***-u(ː)ŋ** to yield PAo ***-uŋ**. (No PAo reflexes of the rare PTB ***-ok** rime were found, but it most likely merged with ***-u(ː)k**.)

Pre-velar ***-a-** and ***-i-** paralleled the development of PTB open syllables by reducing to schwa following certain fricates[100] and clusters: PTB ***-ak** and ***-ik** were reduced to PAo ***-ək** following ***kl-** and some combination of ***s-** and ***-ry-** (which yielded PAo ***ts-**). PTB ***-iŋ** yielded ***-əŋ** following ***s-** and whichever PTB source(s) developed into PAo ***z-** (cf. §II.4.5.4).

The ***-a(ː)-** nucleus was raised and backed to PAo ***-u-** when surrounded by velar consonants: PTB ***-wak** coalesced the medial labiovelar glide and nucleus, merging with ***-u(ː)k** to yield PAo ***-uk**. Likewise, the one known instance of PTB ***-a(ː)ŋ** following the velar stop ***k-** merged with PTB ***-u(ː)ŋ** to yield PAo ***-uŋ**.

II.6.2. PAo > Mongsen, Chungli

II.6.2.1. Onsets

All aspiration distinctions on Proto-Ao oral stops (bilabial, dental, and velar) were preserved in Mongsen but lost in Chungli. Chungli also merged the PAo voiceless nasals with the voiced nasals, a contrast that Mongsen preserved.

In both lects, the Proto-Ao voiceless sibilants ***ʃ-** and ***s-** merged to **s-**, though by different routes. The PAo voiced sibilant ***ʒ-** lenited to merge with the palatal glide ***j-** in Chungli but dentalized and merged with the voiced dental fricative ***z-** in Mongsen. PAo ***z-** descended unchanged in both lects. The PAo velar fricatives ***ɣ-** and ***x-** lenited and labialized to labiovelar glides, maintaining the voicing contrast as **w-** and **hw-** in Mongsen while merging to ***w-** in Chungli.

[100] 'Fricate' is a cover term for fricatives and affricates (HPTB: 27).

The (un)aspirated dental and palato-alveolar affricates contrasted phonemically in Proto-Ao, but have undergone a complicated merger to /tʃ/ in Chungli and appear to be in the process of merging to /tʃ(h)/ in Mongsen. The various changes involved in the mergers appear to be essentially moving both lects toward a phonological system in which underlying /tʃ/ is realized as [ts] before **-ə**, **-əʔ**, **-ək**, and **-əŋ**, but as [tʃ] everywhere else:

> PAo unaspirated ***tʃ-*** descended unchanged in Mongsen and Chungli to yield /tʃ/. PAo aspirated ***tsh-*** descended unchanged in Mongsen as /tsh/, but lost the aspiration contrast in Chungli to merge with ***ts-***, yielding [ts-], all instances of which came to be treated as allophones of Chungli /tʃ/.
>
> Where PAo ***ts-*** was followed by ***-i***, it was palatalized to /tʃ/ in Chungli but remained /ts/ in Mongsen (with a vowel reduction from ***-i*** > **-ə**). Where PAo ***ts-*** was followed by ***-ak***, it became Mongsen /tʃak/ but Chungli [tsək] (phonemically /tʃək/). PAo ***ts-*** has elsewhere remained **ts-** in both lects (phonemically /tʃ/ in Chungli, though still produced as [ts]).
>
> The Proto-Ao aspirated affricate ***tʃh-*** has merged with ***s-*** in Chungli. In Mongsen, ***tʃh-*** became /tsh/ before ***-ə*** and ***-ək***, but has elsewhere remained /tʃh/.

With regard to the Proto-Ao approximants in initial position (bilabial glide, palatal glide, rhotic liquid, and lateral liquid), Mongsen has preserved them with their original voicing contrasts. Chungli lost the voiceless palatal glide ***hj-***, but otherwise merged the voiceless approximants with their voiced variants. All sequences of PAo ***(h)wa(ʔ)*** coalesced into Chungli **u(ʔ)**.

The Proto-Ao voiceless glottal fricative ***h-*** was preserved in Mongsen but lost in Chungli.

When a PAo initial consonant was followed by the ***-əj(ʔ)*** diphthongal rime, various changes took place in Chungli. Original bilabial nasals dentalized to **n-**, and lateral liquids and palatal glides spirantized to **z-**. The spirantization of ***(h)l-*** to **z-** in Chungli also occurred before the high front vowel with a velar coda (***-ik/ŋ***). Mongsen, on the other hand, preserved the original initials in all these cases.

Finally, Mongsen lost the medial labiovelar glide in PAo clusters of ***p(h)-*** and ***-w-***, while in Chungli the glide coalesced with ***-a*** to yield a **-u** rime. A few PAo clusters are reconstructed with a medial palatal glide: PAo ***tj-*** and ***thj-*** yielded Mongsen **tʃ-** and **tʃh-**, respectively, but lost the medial glide and aspiration distinction in Chungli,

merging to **t-**. The PAo cluster ***lj-** (< PTB ***ly-**) regularly became Mongsen **l-** and Chungli **z-**, but sporadically yielded Mongsen **j-** or Chungli **n-**.

II.6.2.2. Rimes

The PAo open/glottal-final rimes with monophthongal nuclei were generally preserved in Mongsen, with the exception of ***-i**, which was reduced to Mongsen **-ə** following PAo ***ts-**. (The PAo syllable ***ɹa** also underwent sporadic reduction/resyllabification to **əɹ/ɹə** in one morpheme in both daughter lects.) In Chungli, however, the rimes in this category underwent a number of changes:

All vowels following ***z-** were reduced to Chungli schwa.

Various PAo vowels were raised/fronted ('brightened') to Chungli **-i(ʔ)** in certain palatal environments: PAo ***-ə** yielded **-i** after ***ʃ-**, while ***-u** was fronted to **-i** following ***tʃ-**. PAo ***-a(ʔ)** was raised to **-i(ʔ)** in the largest number of instances, following the palatal sibilants ***ʃ-**, ***ʒ-**, ***tʃ-**, and ***tʃh-**.

PAo ***-a(ʔ)** was also raised and backed ('velarized') to Chungli **-u(ʔ)** when preceded by the velar nasal initial ***(h)ŋ-** and by coalescence with the initial/medial labiovelar glide (***(h)w-**, ***-w-**).

When preceded by PAo ***(h)ɹ-** in a word-final syllable, ***-ə** was often metathesized in Chungli, yielding a resyllabified **-əɹ** rime.

With respect to diphthongs, the PAo ***-əj(ʔ)** rime followed a consistent pattern of development in open/glottal-final rimes, yielding Mongsen ***-i(ʔ)** and Chungli ***-ə(ʔ)** in every instance. This rime also triggered spirantization/dentalization of various initials in Chungli (§II.4.6).

PAo ***-aj** yielded **-a** in both Mongsen and Chungli, even in Chungli brightening/velarization contexts. This indicates that ***-aj** > **-a** occurred independently in both lects after the brightening/velarization of ***-a(ʔ)** in the Chungli branch.

The PAo bilabial and dental stop-final rimes (***-əp**, ***-əm**, ***-ət**, ***-ən**, ***-in**) descended unchanged in both Mongsen and Chungli. The alveolar rime ***-əɹ** was also preserved.

The monophthongal nuclei of PAo velar-final rimes were largely preserved in Mongsen and Chungli, except for some reductions to schwa: In Chungli, PAo ***-ik** and ***-iŋ** were unconditionally reduced to ***-ək** and ***-əŋ**, PAo ***-ak** regularly yielded **-ək** after ***ts-** and ***lj-**, and PAo ***-aŋ** yielded **-əŋ** following ***ts-**. PAo was ***-uk/ŋ** was

sporadically reduced to **-ək/ŋ** in Mongsen, while ***-ak** was sporadically reduced to **-ək** in both lects.

II.6.3. Relative Chronology

Some PAo > Mongsen, Chungli sound changes described in this chapter are crucially ordered with respect to each other. The relative chronology of the PAo > Mongsen changes is discussed in §II.6.3.1 and that of the PAo > Chungli changes in §II.6.3.2.

II.6.3.1. PAo > Mongsen

There are two PAo>Mongsen changes that should be ordered with respect to each other, but there is no data to determine their relative order:

The coalescence of the ***t(h)j-** clusters to **tʃ(h)-** fed or counterfed the dentalization of ***tʃh-** to **tsh-** before ***-ə(k)**:

1.	***t(h)j-** > **tʃ(h)-**	
2.	***tʃh-** > **tsh-** _ ***-ə(k)**	(feeding)
	? OR ?	
1.	***tʃh-** > **tsh-** _ ***-ə(k)**	
2.	***t(h)j-** > **tʃ(h)-**	(counterfeeding)

Likewise, the monophthongization of ***-əj(ʔ)** to **-i(ʔ)** fed or counterfed the reduction of ***-i(ʔ)** following ***ts-**:

1.	***-əj(ʔ)** > **-i(ʔ)**	
2.	***-i(ʔ)** > **-ə(ʔ)** / ***ts** _	(feeding)
	? OR ?	
1.	***-i(ʔ)** > **-ə(ʔ)** / ***ts** _	
2.	***-əj(ʔ)** > **-i(ʔ)**	(counterfeeding)

II.6.3.2. PAo > Chungli

Chain shifts

Several chain shifts took place in the development from Proto-Ao to Chungli. The velarization of ***-a(ʔ)** to **-u(ʔ)** and its brightening to **-i(ʔ)** in various environments occurred before ***-aj** unconditionally monophthongized to **-a**. (This is evidenced by the various reflexes of ***-aj** which do not show velarization or brightening; cf. §II.4.1.5.)

1. ***-a(ʔ)** > **-i(ʔ)** / *palatal sibilant _
   ***-a(ʔ)** > **-u(ʔ)** / ***(h)ŋ** _
   ***(h)wa(ʔ)**, ***-wa(ʔ)** > **u(ʔ)**
2. ***-aj** > **-a**

The labialization and merger of ***ɣ-** and ***x-** to **w-** also took place only after the coalescence of the initial/medial ***w** with ***-a(ʔ)** to yield **-u(ʔ)** (thereby producing apparent instances of un-coalesced **wa** in Chungli):

1. ***(h)wa(ʔ)**, ***-wa(ʔ)** > **u(ʔ)**
2. ***ɣ-**, ***x-** > **w-**

Brightening and counterbleeding

The ***-a(ʔ)** rime was brightened to **-i(ʔ)** prior to two unconditional onset changes that eliminated some conditioning factors: the lenitions of ***ʒ-** to **j-** and ***tʃh-** to **s-** (a counterbleeding order):

1. ***-a(ʔ)** > **-i(ʔ)** / *palatal sibilant _
2. ***tʃh-** > **s-**
   ***ʒ-** > **j-**

Sonorant voicing and stop/affricate de-aspiration

The PAo voiced/voiceless sonorants (nasals and approximants) underwent various changes in Chungli, and in all cases (including those in which the segment place and manner were preserved) the voicing contrast was lost. It is therefore simplest to treat an across-the-board voicing merger as having occurred prior to the changes in which some originally voiceless nasals and approximants were dentalized, spirantized, or coalesced.

The sole voiceless approximant that did not merge with its voiced counterpart is ***hj-**, which must have been lost before the voicing merger:

1. ***hj-** > Ø
2. ***h(N)-**, ***N-** > **N-**; ***h(A)-**, ***A-** > **A-** (N = nasal; A = approximant)
3. ****m-** > **n-** / _ ***-əj(ʔ)**
   ****wa(ʔ)** > **u(ʔ)**
   ****l-** > **z-** / _ ***-əj(ʔ)**, ***-ik/ŋ**

The PAo aspirated stops and affricates also underwent de-aspiration to merge with their unaspirated counterparts in Chungli. Assuming this de-aspiration process took

place for all stops and affricates at the same time (a debatable conjecture), it occurred only after ***tʃh-** yielded **s-**:

1. ***tʃh-** > **s-**
2. ***T(h)-**, ***T-** > T-; ***Af(h)-**, ***Af-** > **Af-** (T = oral stop, Af = affricate)

Reduction of dentalizing/spirantizing environments

As summarized in §II.4.6, the ***-əj(ʔ)**, ***-ik**, and ***-iŋ** rimes had the effect of dentalizing and usually spirantizing the preceding initial. All three rimes, however, also show unconditional reduction to Chungli **-ə(ʔ)**, **-ək**, and **-əŋ**, respectively. In the case of ***(h)m-** (which first merged to ****m-** as described in the previous section), its dentalization to **n-** preceding ***-əj(ʔ)** can be explicitly ordered before the reduction of ***-əj(ʔ)** to **-ə(ʔ)**:

1. ****m-** > **n-** / _ ***-əj(ʔ)**
2. ***-əj(ʔ)** > **-ə(ʔ)**

That the dentalization of ****m-** to **n-** was conditioned by **-əj(ʔ)** and not **-ə(ʔ)** is shown by the preservation of the bilabial initial in ***mə-** > **mə²-** NEGATIVE (VERBAL PFX.) (221) and in all the Chungli forms with **mə-** reflecting the original ***m-** prefix (vocalized with a weak schwa).

Although the data is not conclusive, it is reasonable to assume that other dentalizations and spirantizations before ***-əj(ʔ)** and ***-ik/iŋ** also occurred prior to reduction of the rimes, since their high tongue position was presumably the key contributing factor to dentalization/spirantization. The relevant changes can therefore be ordered as follows:

1. ****l-** > **z-** / _ ***-əj(ʔ)**
   ***j-** > **z-** / _ ***-əj(ʔ)**
2. ***-əj(ʔ)** > **-ə(ʔ)**

1. ****l-** > **z-** / _ ***-ik/ŋ**
2. ***-ik/ŋ** > **-ək/ŋ**

*Rime reduction following **z-***

As noted in §II.2.1.2, Chungli **z-** is followed only by rimes with a schwa nucleus. This phonotactic observation suggests that all vowels following PAo ***z-** (and intermediate ****z-** from other PAo sources) were reduced to schwa in the Chungli branch. This

reduction followed the coalescence/spirantization of the PAo ***lj-** cluster to Chungli **z-**, which produced environments for the subsequent reduction:

1. ***lj-** > **z-**
2. ***-V-** > **-ə-** / ***z** _

The monophthongization of ***-aj** to **-a** fed or counterfed the reduction of all vowels following ***z-**, but there are no examples yet of PAo ***zaj** to determine which change came first. Given the lack of any [za] sequences in Chungli, however, it is safe to assume that ***zaj** would have yielded **zə**. The monophthongization change can therefore be ordered before the reduction:

1. ***-aj** > **-a**
2. ***-V-** > **-ə-** / ***z** _

Phonemic realignments

Two apparent 'sound changes' actually involved no shift of the onsets themselves. Rather, the rime changes they produced had the effect of reconfiguring their phonemic status.

The apparent 'dentalization' of PAo ***ʃ-** to Chungli **s-** happened as follows: Proto-Ao /ʃ/ and /s/ were originally separate phonemes in contrastive distribution, with /s/ showing surface palatalization to [ʃ] before /i/ (thereby neutralizing the phonemic contrast in that environment). In the Chungli branch, all vowels following ***ʃ-** were 'brightened' to **-i-**. This sound change had the effect of arranging the surface segments [s] and [ʃ] in complementary distribution, with [ʃ] appearing only before /i/ and [s] before all other vowels. Chungli [ʃ], which reflects original PAo ***ʃ-**, therefore came to be regarded as the allophone of /s/ before /i/, without any diachronic change in the POA of the segment.

The second realignment of a phoneme produced largely by other changes is the apparent 'palatalization' of PAo ***ts(h)-** to Chungli **tʃ-**: /tʃ/, /tʃh/, /ts/, and /tsh/ were separate phonemes in contrastive distribution in Proto-Ao. (Their distribution was not completely overlapping, however, as /tʃ/ did not occur before ***-ə(ʔ/k/ŋ)** rimes, for example.) In the Chungli branch, PAo ***tʃh-** became **s-**, after which the affricate aspiration contrast was lost. Instances of ****ts-** before ***-i** were palatalized to **tʃ-**, leaving the ***-ak/ŋ** rimes as the only environments in which the /tʃ/ and /ts/ phonemes contrasted. Neither initial shifted in place of articulation from this point, but the ***-ak/ŋ** rimes were reduced to **-ək/ŋ** following ****ts-**. Since ***tʃ-** is not reconstructed as having occurred with the ***-ək/ŋ** rimes in Proto-Ao, this rime reduction had the effect of separating [ts] and [tʃ] into complementary distribution. Chungli [ts], which reflects

original PAo ***ts(h)-***, therefore came to be regarded as an allophone of /tʃ/ by virtue of the ***-ak/ŋ*** rime reduction (though the synchronic rules to generate the surface forms are somewhat obscure; cf. §II.3.3).

As such, these two developments are not independent sound changes that need to be ordered with respect to other changes. They instead involve 'secondary mergers' (expanding on the terminology and analysis of Hoenigswald 1960: 93–94), in which separate phonemes are merged as a result of sound changes that alter their surrounding environments.

Crucial but undetermined ordering

A few pairs of sound changes should be crucially ordered with respect to each other, but there are no examples to determine which orderings are correct.

The coalescence of the medial glide + rime sequence ***-wa(ʔ)*** to ***-u(ʔ)*** fed or counterfed the 'brightening' of ***-u(ʔ)*** following ***tʃ-***, but there are no PAo ***tʃwa(ʔ)*** forms that would reveal whether coalescence occurred before (***tʃwa(ʔ)*** > (coalesc.) ****tʃu(ʔ)*** > (bright.) ***tʃi(ʔ)***) or after brightening (***tʃwa(ʔ)*** > (no bright. env.) ***tʃwa(ʔ)*** > (coalesc.) ***tʃu(ʔ)).***

The monophthongization of ***-əj(ʔ)*** > ***-ə(ʔ)*** fed or counterfed both the brightening of ***-ə(ʔ)*** > ***-i(ʔ)*** / ***ʃ** _* and the metathesis of ***-ə(ʔ)*** / ***(h)ɹ**_#*. Without examples of PAo ***ʃəj*** or ***(h)ɹəj***, the orderings cannot be determined.

Summary

The relative orderings which can be determined for the PAo > Chungli sound changes are diagrammed in the following figure:

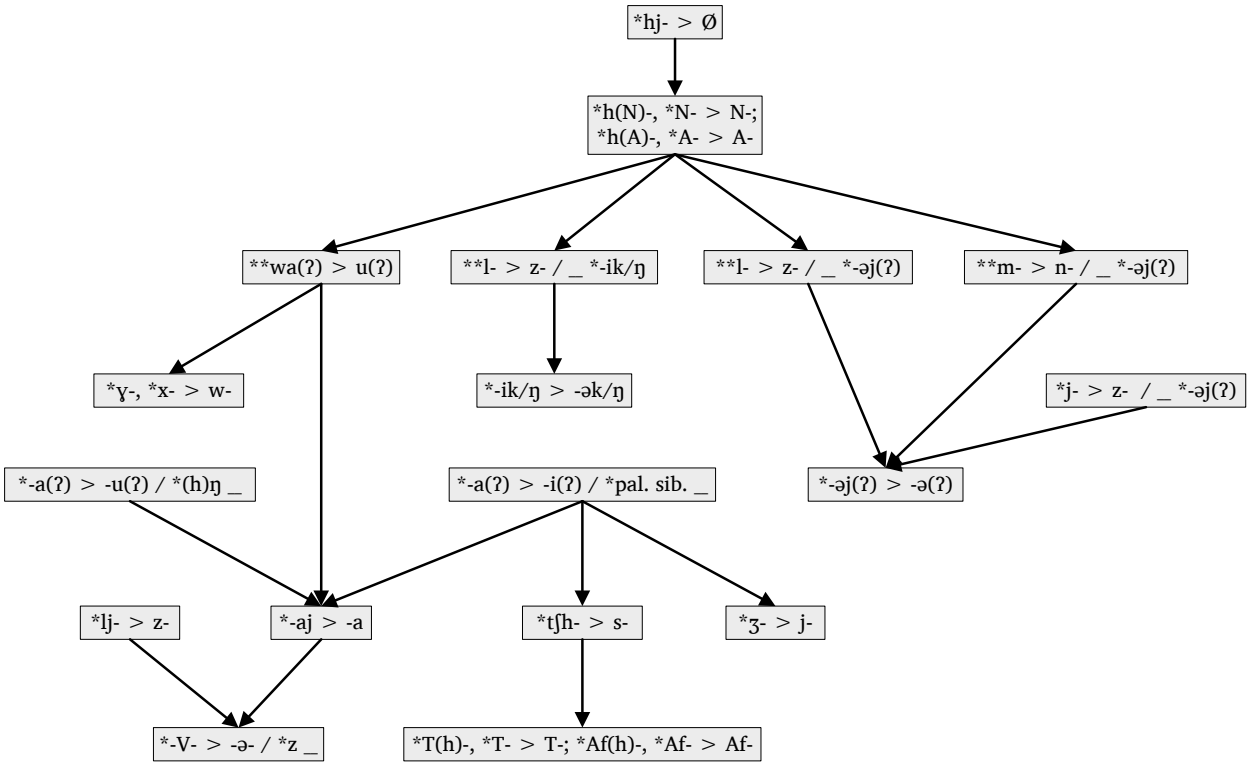


Figure 8: PAo > Chungli relative chronology

II.6.4. Final Remarks

While a number of the PTB > Proto-Ao sound changes are unclear, the development of the onsets and rimes from Proto-Ao to Mongsen and Chungli reveals a very clear generalization: Mongsen tended to preserve original segmental contrasts, while Chungli merged or lost them. In the area of prosody, this generalization is reversed: Chungli appears to preserve original tone contrasts that Mongsen has merged.

Also intriguing is the observation that both lects participated in some of the same mergers (***ʃ-** with ***s-**, ***ts-** with ***tʃ-**, and ***tsh-** with ***tʃh-**), but did so by different routes of development in their interaction with the rimes.

CHAPTER III. PROTO-CENTRAL NAGA

III.1. Introduction

III.1.1. Purpose & Organization

This chapter presents a preliminary phonological reconstruction of the Central Naga group by building on the findings of Chapter II (Proto-Ao) and incorporating data from Lotha, Sangtam, and Yimchungrü. The next subsection discusses various issues regarding CN reconstruction (§III.1.2). §III.2 presents the phoneme inventories of Lotha (§III.2.1), Sangtam (§III.2.2), Yimchungrü (§III.2.3), and the reconstructed Proto-Central Naga (§III.2.4). §III.3–§III.5 present the cognate sets supporting the reconstruction of Proto-Central Naga, with rimes in §III.3, prefixes in §III.4, and onsets (initials and medials) in §III.5.[101] The chapter is then concluded in §II.6 with a discussion of the reconstructed sound changes.

Indices of PTB > PCN and PCN > CN sound changes are provided in Appendix A and Appendix B, respectively, with tabular summaries of the changes in Appendix D. Appendix G contains an index of the PCN reconstructions by proto-gloss.

III.1.2. Reconstruction Notes

The phonological reconstruction of Proto-Central Naga faces some significant challenges: First, the number of solid cognate sets drops off dramatically as one looks further afield. While the previous chapter presents nearly 400 Mongsen-Chungli cognate sets for the reconstruction of Proto-Ao, less than 200 of these sets have Lotha cognates, and even fewer (<130) have Lotha, Sangtam, and Yimchungrü cognates (based on existing data). Second, the quality of data for Sangtam and Yimchungrü is uneven: Weidert 1987 provides detailed phonetic transcriptions but fewer than one hundred forms for each language, while Marrison 1967 contains hundreds of forms, but which all lack tone designations and, in the case of Yimchungrü, are based on non-phonemic sources. Nevertheless, flawed data is more useful than no data, and much

[101] The rimes are presented before the initials in this chapter because they require more discussion.

progress can be made toward the reconstruction of PCN using these sources, provided they are employed with caution.

III.2. Phonology

This section presents the phonologies of the Central Naga languages (Lotha in §III.2.1, Sangtam in §III.2.2, and Yimchungrü in §III.2.3), including Proto-Central Naga itself (§III.2.4).

III.2.1. Lotha

The phonology of Lotha presented here is based on my work with a native speaker consultant (MK). Future research will likely reveal instances in which I have missed particular phonemic processes and consequently under-phonemicized the inventory, presenting allophonic segments as separate phonemes. In the interest of ensuring that this work remains useful to future linguists, however, I have not attempted to reduce multiple segments to allophones of a single phoneme where there was not sufficient evidence.

III.2.1.1. Syllable canon

The following diagram and table (modeled on GMA: 23) depict the syllable structure of Lotha. A syllable minimally consists of an obligatory vowel produced with a particular tone:

$$\sigma = (C_1)\ (G)\ V\ (C_2)\ T$$

(C_1)	*(G)*	*V*	*(C_2)*	*T*
p pʰ t tʰ k kʰ	j	i u	p (t) k ʔ	3 (High)
m m̥ n n̥ ŋ ŋ̊		e ə o	m n ŋ	2 (Mid)
f v h		a	(v)	1 (Low)
ts tsʰ tʃ tʃʰ				
s z ʃ ʒ				
l l̥ r r̥ j j̊				

Table 118: Lotha phonotactics

Not all possible combinations of the components in Table 118 are attested syllables in Lotha. (See the chart of rimes in §III.2.1.4.) Also not indicated in the table and syllable

diagram is the existence of the syllabic nasal prefix,[102] which consists solely of a nasal consonant and L tone.

Some surface syllables do contain tautosyllabic diphthongs, but these are the result of morpheme juxtaposition (see §II.2.1.3). The underlying system of Lotha phonology contains no phonemic diphthongs.

The dental stop /t/ is disallowed in coda position on the surface but may exist in some underlying codas, emerging in certain intervocalic environments created by suffixation. (See the discussion in §III.2.1.4.)

When the future TAM suffix **-uʔ²** is attached to a vowel-final (or /t/-final) verb stem, it surfaces as a voiced labiodental fricative coda:

/tso²-uʔ²/ → [tsov²] 'will eat'

III.2.1.2. Consonants

The following table contains the inventory of Lotha consonants in IPA, with the transcription system of this chapter in parentheses:

	Labial	*Dental/Alveolar*	*Palatal*	*Velar*	*Glottal*
Nasal stops	m m̥ (hm)	n n̥ (hn)		ŋ ŋ̊ (hŋ)	
Oral stops	p pʰ (ph)	t tʰ (th)		k kʰ (kh)	ʔ
Affricates		ts tsʰ (tsh)	tʃ tʃʰ (tʃh)		
Fricatives	f v	s z	ʃ ʒ		h
Approximants		l l̥ (hl) r r̥ (hr)	j j̊ (hj)		

Table 119: Lotha consonants

The table above uses phonologically significant (not narrowly phonetic) categories. For example, /ʃ/ may be post-alveolar, /tʃ/ palato-alveolar, and /j/ properly palatal, but these phonetic distinctions are not significant in the phonology of Lotha. Instead, these segments all fall under the broad POA category of 'palatal', contrasting with other

[102] Or 'prefixal formative', as it has no apparent morphological function.

broad categories like ‘labial’ (including both bilabials and labiodentals) and ‘dental/alveolar’.

All consonants may appear in the syllable onset position except the glottal stop, which only surfaces in pre-pausal, word-final coda position. The glottal stop appears to be lexically specified in some forms, but no minimal pair has been identified that demonstrates a phonological contrast between the glottal stop and a zero coda. It may also be a prosodic feature of high-toned open syllables (see §III.2.1.5).

The voiced nasal /n/ synchronically assimilates in place to a following consonant, e.g.:

/tʃʰen¹-/ ‘strike’ + /-pʰi¹/ PLURACT.? → [tʃʰem¹pʰi¹-] ‘knock, pound (v.)’

In addition, the syllabic nasal prefix shows place assimilation to the root-initial consonant, except when that consonant is /j/ or /h/ (surfacing instead as [m̩¹-]):

m̩¹-poŋ¹ ‘wind (n.)’ **n̩¹-thək²-** ‘be itchy’ **ŋ̍¹-khok²** ‘knee’
m̩¹-jak²- ‘lick’
m̩¹-ha¹- ‘bless’

Whether this pattern is the result of a diachronic or synchronic process has not been conclusively established. The Lotha nasal prefix is therefore transcribed with its surface POA throughout this chapter.

The labiodental phoneme /f/ is infrequent in the lexicon, and is always followed by an open-syllable (or glottal-final) schwa phoneme (except in **fə³<u>fo?³</u>** ‘cowrie’, which may be a loanword). The voiced counterpart /v/, on the other hand, seems somewhat more frequent and can be followed by more vowels than just /ə/. When followed by /o/, /v/ varies (freely) in pronunciation between [w] and [v].

As with /f/, the voiced palatal fricative /ʒ/ only precedes open-syllable/glottal-final /ə/. This phonotactic restriction does not hold with the voiceless counterpart /ʃ/.

The rhotic phoneme /r/ appears to vary among [r], [ɹ] and [ʐ], though the conditioning is unclear.

The palatal approximant /j/ is the only phoneme which can appear in the medial glide position, allowing minimal pairs like **ka²-tʃʰo?²** ‘got infected’ vs. **kja²-tʃʰo?²** ‘cried’.

III.2.1.3. Vowels

Table 120 presents the vowel phonemes of Lotha:

	Front	*Central*	*Back*
High	i		u
Mid	e	ə	o
Low		a	

Table 120: Lotha vowels

The /u/ vowel appears only in open or glottal-final syllables. When /u/ follows /k/ or /p/, the consonant is affricated and the vowel is unrounded to [ɯ]:

/ku/ → [kvɯ] /kʰu/ → [kfɯ]
/pu/ → [pvɯ] /pʰu/ → [pfɯ]

There is also some evidence that the same process takes place following /m/ and /m̥/, though not quite as consistently:

/mu/ → [mvɯ] /m̥u/ → [m̥fɯ]

The insertion of the labial segment [f]/[v] and concomitant unrounding of /u/ may be interpreted as a transfer of the rounding from the vowel to the onset.[103]

The vowels /ə/, /e/, and /u/ are analyzed as separate phonemes by virtue of their contrastive distribution in open/glottal-final syllables (e.g. /o¹-se̲ʔ²/ 'steel', /o¹-sə̲¹/ 'track, (foot)print', /su̲¹lu²-/ 'make a mistake').

The central schwa vowel /ə/ ranges in pronunciation from [ə] to [ɯ]. For this reason, the contrast between /u/ and /ə/ is often difficult to distinguish following certain consonants: e.g. /e¹-rəʔ³/ [e¹-rɯʔ³] 'boundary, border' vs. /e¹-ruʔ³/ [e¹-rɤʔ³] 'rain'.

Schwa is also susceptible to elision before vowels with which it has been morphologically juxtaposed, leaving behind its tone to yield a contour, e.g.:

/rə³-/ 'sear (meat)' + /-a²/ IMP → [ra³²] 'sear (meat)!'

The high front vowel /i/ shows a tendency to centralize and lower in open syllables following sibilants (neutralizing the contrast with schwa): e.g. /ʃi³-/ [ʃi~ʃə] 'buy' and /tʃiʔ³/ [tʃiʔ~tʃəʔ] 'that'.

Some apparently tautosyllabic diphthongs (such as [ae], and [oe]) are formed through heteromorphemic juxtapositions, but these are not underlying vowel phonemes.

[103] The same synchronic process also occurs in Black Lahu (Matisoff 1973a: 3).

III.2.1.4. Rimes

The following table depicts the nucleus-coda pairings that serve as the underlying rime patterns in Lotha:

nucleus \ *final*	**-Ø/ʔ**	**-p**	**-m**	**-t**	**-n**	**-k**	**-ŋ**
-i-	✓	—	—	—	—	—	—
-e-	✓	—	—	(✓)	✓	—	✓ ?
-a-	✓	—	—	(✓)	✓	✓	✓
-ə-	✓	✓	✓	—	—	✓	✓
-o-	✓	—	—	—	✓	✓	✓
-u-	✓	—	—	—	—	—	—

Table 121: Lotha rime patterns

Note that other (surface) rime patterns can be formed through morpho-phonological processes. For example, **-am** surfaces via assimilation of **-an** to an adjacent bilabial consonant, as in /han^{1}-poŋ^{3}/ [ham^{1}poŋ^{3}] ‘rooster’ (chicken-male).

All vowels are attested in open/glottal-final syllables, and the high vowels **-i-** and **-u-** are restricted to that environment.

Only schwa appears before the bilabial codas **-p** and **-m**. Schwa is oddly absent before the dental nasal coda **-n**, as only **-en**, **-an**, and **-on** are attested.[104] Rimes with the **-n** coda are often produced on the surface as glottal-final nasalized vowels, e.g. /o^{1}-k^{h}en^{3}/ [o-k^{h}en∼o-k^{h}ẽʔ] ‘song’.

The central and back vowel nuclei **-a-**, **-ə-**, and **-o-** can appear before the velar codas **-k** and **-ŋ**. The **-eŋ** rime is marginally attested and may be the surface form of an underlying /e-əŋ/ sequence.

*Final **-t***

The lack of a surface **-t** coda in Lotha is a peculiar feature, and one which stands in contrast to the clear preservation of PCN final ***-t** in Ao. There are clues, however, that an underlying **-t** exists in the coda of some Lotha syllables, surfacing only in particular phonological environments. The evidence for a final **-t** comes from the appearance of [t] between certain verb roots and vowel-initial TAM suffixes, such as the imperative

[104] It is possible that [-en] is underlying /-ən/, but this has not yet been proven.

-aʔ² or present **-a²laʔ²**. When suffixed to a verb root with a consonantal coda, the morphemes are concatenated as expected:

/han¹-aʔ²/ → [ha¹naʔ²] ‘carry!’

When suffixed to a verb root with an open-syllable **-i**, **-u**, or **-o**, vowel hiatus is formed:

/pi²-aʔ²/ → [pi²aʔ²] ‘give!’
/ju¹-aʔ²/ → [ju¹aʔ²] ‘drink!’
/tso²-aʔ²/ → [tso²aʔ²] ‘eat!’

In the case of verb-final **-ə**, the root vowel is elided:

/m̩¹-rə¹-aʔ²/ → [n̩¹raʔ²] ‘climb!’

Following any verb root with open-syllable **-e**, however, a [t] appears between the root and the suffix:

/kʰe²-aʔ²/ → [kʰe²t̲aʔ²] ‘sweep!’
/ze²-aʔ²/ → [ze²t̲aʔ²] ‘look!’

The fact that this not simply a case of phonological epenthesis limited to resolving /e-a/ vowel hiatus is revealed by the suffixation of verb roots bearing open-syllable **-a**. Some forms appear with an intervening [t], while in others the adjacent vowels have simply coalesced:

intervening [t]
/e¹-ma²-a²laʔ²/ → [e¹ma²t̲a²laʔ²] ‘is laughing’
/va²-aʔ²/ → [va²t̲aʔ²] ‘keep!’

vowel coalescence
/tsa²-aʔ²/ → [tsaʔ²] ‘walk!’
/kʰa³-aʔ²/ → [kʰaʔ³²] ‘read!’
/kʰa³-a²laʔ²/ → [kʰa³laʔ²] ‘is reading’

This irregularity reveals that the appearance of [t] is not phonological epenthesis but rather the emergence of an underlying segment in an intervocalic environment created by suffixation. Since [t] appears after all verb roots that end in **-e**, these roots are underlying /-et/. Those verb roots which appear to end in **-a** are divided among underlying /-at/ and /-a/.

This intervening [t] also appears when a vowel-initial TAM suffix is attached to the derivational suffixes **-ka²** (unclear meaning) and **-tʃhe²** (abilitive modality), indicating that these suffixes are underlyingly /-kat/ and /-tʃʰet/, respectively:

/tsu²-aʔ²/ → [tsu²aʔ²] 'point!'
/tsu²-kat²-aʔ²/ → [tsu²ka²t̲aʔ²] 'poke!'

/tsa²-/ 'walk' + /-tʃʰet²/ ABIL + /-aʔ²/ (?) → [tsa²tʃʰe²t̲aʔ²] 'is able to walk'

There is some unexpected behavior with the **-uʔ²** future suffix, however, which fails to allow the underlying /t/ to surface. Instead, the suffix is realized as a /-v/ coda, just as it is with vowel-final verb stems:

/tsʰu²-kat²-uʔ²/ → [tsʰu²kav²] 'will poke'
/tsa²-tʃʰet²-uʔ²/ → [tsa²tʃʰev²] 'will be able to walk'

This pattern suggests that not every intervocalic environment provides the necessary factors for coda /t/ to surface. It is possible that it only surfaces before /a/, but this speculation requires further investigation.

Until a vowel-initial nominal suffix can be identified to test Lotha nouns ending in **-a(ʔ)** or **-e(ʔ)**, it remains to be seen whether any noun roots contain the underlying coda /t/.

The disappearance of /t/ from surface codas has a striking a parallel in the synchronic behavior of /n/, which in codas is often reduced to a glottal stop with nasalization on the preceding vowel (discussed in this section, above).

III.2.1.5. Tones

Lotha has a register tone system with three levels (Low, Mid, and High), all of which are manifested on both verbal and nominal roots. It is my impression that minimal pairs/triplets distinguished only by tonal contrasts are rarer in Lotha than in Chungli. (Chungli tone seems to have a high functional load, likely due to the much-reduced segment inventory.) Still, segmental homophones may be found in Lotha, such as those in the following tables:

segments	*tone pattern*	*gloss*
/o-k^{h}u?/	L.L	‘trap (n.)’
/o-k^{h}u?/	L.M	‘wound, fresh injury; scar’
/o-k^{h}u?/	L.H	‘lung’

Table 122: Lotha tonal minimal triplet (nouns)

segments	*tone*	*gloss*
/ji-a?/	H.M	‘come here!’
/ji-a?/	L.M	‘go away!’

Table 123: Lotha tonal minimal pair (verbs)

As in Mongsen, the underlying Lotha TBU is the syllable. On the surface, however, the coalescence of identical vowel segments (or elision of schwa before another vowel) in adjacent morphemes can result in the presence of a tone contour on a single syllable, e.g.:

/o^{1}-li?^{3}/ ‘field’ + /-i^{2}/ ‘in’ → [o^{1}li^{32}] ‘in the field’
/jək^{3}ra^{3}-/ ‘be shy’ + /-a^{2}/ PRED → [jək^{3}ra^{32}] ‘tired (predicate form)’
/rə^{3}-/ ‘sear (meat)’ + /-a^{2}/ IMP → [ra^{32}] ‘sear (meat)!’

While the resultant vowel may be phonetically long in order to accommodate its tone contour, vowel length is not a contrastive feature in the phonology of Lotha.

Word-final open syllables with a high tone are produced with a final glottal stop in isolation or at the end of a phrase. This pattern suggests that the glottal stop, in addition to being lexically specified on some morphemes, may be a feature of the high tone.

III.2.2. Sangtam

The phoneme inventory of Sangtam presented here is based on my interpretation of the data in Marrison 1967, Kumar 1973a, and Weidert 1987. It will no doubt be superseded by the fruits of modern fieldwork in years to come.

Marrison's Sangtam wordlist was elicited in Guwahati (Assam) from a speaker of the Lophomi (i.e., western division of Sangtam) dialect in 1963 (1967: II: 333, 366).[105] Kumar (1973a), unfortunately, does not provide the source of his data. Weidert elicited his Sangtam data during various research projects sponsored by the Deutsche Forschungsgemeinschaft (German Research Council) from 1975–1984 (1987: v). While Weidert's transcriptions are the most phonetically precise, they also form the smallest set (approx. 60 forms, compared to Marrison's ~850 and Kumar's ~2,000).

III.2.2.1. Syllable canon

The following diagram and table (modeled on GMA: 23) depict the syllable structure of Sangtam. A syllable minimally consists of an obligatory vowel produced with a particular tone. (A is an approximant slot.)

$$\sigma = (C_1)\ (A)\ V\ (C_2)\ T$$

(C_1)	*(A)*	*V*	*(C_2)*	*T*
p p^h t t^h k k^h	j	i u	p (k) ʔ	2 (High)
m n ŋ	r	e ə	m n ŋ	1 (Low)
f v h		a		
ts ts^h tʃ $tʃ^h$				
s z ʃ ʒ x/ɣ				
l r ɾ̥ j				

Table 124: Sangtam phonotactics

Sangtam shows (dialectal?) variation in the appearance of /k/ in syllable coda position.

III.2.2.2. Consonants

The following table contains the inventory of Sangtam consonants in IPA, with the transcription system of Marrison 1967/Kumar 1973a italicized in parentheses (where it differs from the IPA):

[105] Marrison's own understanding of the Sangtam inventory is found in Volume II, page 366 of his dissertation (Marrison 1967).

	Labial	*Dental/Alveolar*	*Palatal*	*Velar*	*Glottal*
Nasal stops	m	n	nʲ (*ny*) (?)	ŋ (*ng*)	
Oral stops	p (*b/p*) pʰ (*ph*)	t (*d/t*) tʰ (*th*)		k (*g/k*) kʰ (*kh*)	ʔ
Affricates		ts tsʰ (*ths*)	tʃ (*j*) tʃʰ (*ch*)		
Fricatives	f v (*w/v*)	s z	ʃ (*sh*) ʒ (*zy*)	x/ɣ (*gh*)	h
Approximants		l r ɾ̥ (*rh*)	j (*y*)		

Table 125: Sangtam consonants

All three sources report a palatal nasal consonant, which Marrison and Kumar transcribe as *ny* and Weidert as **ñ**, as in 'sun': *nyü* (Marrison 1967, Kumar 1973a), **¹ñɯ** (Weidert 1987: #216). This may represent an underlying palatal nasal phoneme /ɲ/ or (perhaps more likely) a /nj/ cluster. Some instances of *ny*/**ñ** may also be underlying /n/ showing surface palatalization due to the following rime. Since a detailed investigation of Sangtam phonology has not yet been conducted to resolve this ambiguity, the segment/cluster in question is transcribed in this chapter as the non-committal **nʲ**.

Marrison 1967 and Kumar 1973a both transcribe a three-way VOT contrast in the Sangtam oral stops (voiced, voiceless unaspirated, and voiceless aspirated). Weidert, on the other hand, presents a 'tense = voiceless-aspirated' vs. 'lax = half-voiced' contrast transcribed as **p**, **t**, **k** vs. **b**, **d**, **g** (1987: xviii).[106] The actual contrast is likely two-way, as indicated in Weidert 1987, for the following reasons:

1. My work on Lotha and Chungli Ao has convinced me that Weidert's (1987) phonetic transcriptions and phonological analyses of the Central Naga languages are the most reliable of all material published up to that date.

2. The voiced stops (*b*, *d*, *g*) are sparingly attested in Marrison's data.[107]

[106] Weidert abandons his system on occasion and explicitly transcribes stop aspiration in two Sangtam forms, **¹i¹phɯ¹li** 'daughter in law' (1987: #112) and **¹mɯ¹the** 'know' (1987: #988), the latter of which he transcribes elsewhere as **¹mɯ¹te** (1987: #325).

[107] Unlike Marrison 1967 (which is searchable online via the STEDT database), Kumar 1973a has not been completely digitized and therefore cannot be easily subjected to the same analysis.

3. Mongsen and Lotha exhibit a two-way VOT contrast, and Chungli has no contrast at all on the oral stops. A three-way contrast in Sangtam seems out of place.

Contra Weidert, however, the Sangtam two-way stop contrast is likely one of simple aspiration (voiceless unaspirated vs. voiceless aspirated), as in Mongsen and Lotha. Weidert's class of 'half-voiced' stops are probably voiceless unaspirated, with some coarticulatory voicing from the following vowel.

These factors support the treatment of Sangtam oral stops as exhibiting only a two-way aspiration contrast. The sets of (half-)voiced stops (*b*, *d*, *g*) in all three sources are therefore understood to be representing voiceless unaspirated stops (/p t k/). As Weidert indicates (1987: xviii), his transcriptions of **p**, **t**, **k** should be interpreted as voiceless aspirated (/p^h t^h k^h/). This system is summarized in the following table:

	/p/	/p^h/	/t/	/t^h/	/k/	/k^h/
Marrison 1967, Kumar 1973a	b, p	ph	d, t	th	g, k	kh
Weidert 1987	b	p	d	t	g	k

Table 126: Interpretation of Sangtam oral stops

As in the other CN languages, the glottal stop is restricted to coda position. The Sangtam glottal stop can exist word-medially (all examples from Marrison 1967):

ya?yane 'fast (quick)'
no?shing 'sword'
aküpra?i 'hard'

Note that Kumar 1973a does not transcribe the glottal stop, and Marrison 1967 does so only sporadically. The scarcity of forms in the data with a glottal stop renders its segmental status unclear.

With regard to the VOT of the affricates, Weidert 1987 transcribes a two-way voiced vs. voiceless unaspirated contrast, which undoubtedly corresponds to the 'tense vs. lax' system he uses for the oral stops. The data in Marrison 1967 and Kumar 1973a suggests an aspiration contrast in the dental affricates (*ts* vs. *ths*) but a simple voicing contrast in the palatal affricates (*j* vs. *ch*). It seems most sensible, however, to follow the treatment

of the oral stops by analyzing the Sangtam affricates as simply contrasting in aspiration (voiceless unaspirated vs. voiceless aspirated).[108]

The places of articulation for the affricates also deserve attention: Marrison considers the distinction between dental and palatal affricates to be a sub-phonemic contrast, since his chart of initials combines them under '/j c ch/' (1967: II: 366) (though his actual data transcribes the contrast as *ts/ths* vs. *j/ch*). On the other hand, Kumar 1973a and Weidert 1987 maintain the POA distinction, and in many cognate sets the Sangtam affricates match those of Lotha, in which the POA contrast is phonemic. I have therefore decided to treat the dental and palatal affricates as separate phonemes in Sangtam.[109]

The system of interpretation for the Sangtam affricates is summarized below. (Weidert's Sangtam data contains no instances of /ts/, though it would likely be transcribed therein as **dz**.)

	/ts/	/tsʰ/	/tʃ/	/tʃʰ/
Marrison 1967, Kumar 1973a	ts	ths	j	ch
Weidert 1987	(dz)	ts	dž	tš

Table 127: Interpretation of Sangtam affricates

The voiced labiodental fricative /v/ is most often transcribed as *v*, though it appears to vary (freely/dialectally?) with [w]:

'bless': *müvajü*, *amüwa* (Marrison 1967)
'tea': *singwaki* (Kumar 1973a) vs. *singva* (Marrison 1967)

A few forms also show some sort of variation between [ʒ] (*zy*) and [j] (*y*):

'tail': *müying* (Marrison 1967) vs. *amüzying* (Kumar 1973a)
'rope/twine': *müya* (Marrison 1967) vs. *muzye* (Kumar 1973a)
'yellow': **¹a¹mɯ¹yiŋ** (Weidert 1987: #542) vs. *amüzying* (Kumar 1973a)

[108] It is puzzling, however, that the sequence *chh* appears nowhere in the Sangtam data of either Marrison 1967 or Kumar 1973a, given that *chh* is used to represent the aspirated palatal affricate /tʃʰ/ elsewhere in Marrison 1967 and in Kumar's other dictionaries (1971 (Lotha), 1973b (Yimchungrü)).
[109] One additional consideration is this: It is much easier to later combine two segments as allophones than it is to roll back an analysis in which they have been erroneously collapsed under a single phoneme.

Kumar 1973a and Marrison 1967 transcribe a number of forms with *gh*, which Marrison reports as the voiced velar fricative /ɣ/ (1967: II: 366). Weidert 1987, however, reports this as the voiceless /x/:

'bamboo': *ghu* (Marrison 1967), *gho* (Kumar 1973a) vs. **²xu** (Weidert 1987: #257)

The voicing of this phoneme is therefore left undetermined for now.

The palatal glide /j/ and rhotic liquid /r/ are the the only phonemes which can appear in the medial approximant position. Medial /r/ appears to be preceded only by initial /t/ or /tʰ/, while medial /j/ is preceded only by initial /k/, /kʰ/, or /n/.

III.2.2.3. Vowels

The vowel phonemes of Sangtam are presented in the following table:

	Front	*Central*	*Back*
High	i		u (*o*/*u*)
Mid	e	ə (*ü*)	
Low		a	

Table 128: Sangtam vowels

All three sources report separate *u* and *o* vowels, but transcription inconsistencies among (and within) the sources suggest that these are the same vowel:

'dao': **⁽²⁾nuʔ** (Weidert 1987: #638), *no* (Marrison 1967)
'bamboo': **²xu** (Weidert 1987: #257), *ghu* (Marrison 1967), *gho* (Kumar 1973a)
'sweep (v.)': **²gu²vuʔ** (Weidert 1987: #1222), *vo* (Marrison 1967)
'nine': *tü<u>ku</u>* (Marrison 1967), *tü<u>ko</u>* (Kumar 1973a)
'ninety': *<u>ku</u>re* (Marrison 1967, Kumar 1973a)

This vowel is likely /u/, since it corresponds to /u/ in the other Central Naga languages (cf. §III.3.1.6).

The vowel *e* in all three sources appears to be a distinct phoneme, though some instances of *e* before bilabial codas in Marrison 1967 and Kumar 1973a apparently represent the schwa phoneme:

'think': *<u>lem</u>thing* (Kumar 1973a)
²<u>lɯm</u>¹tiŋ (Weidert 1987: #473)
< PCN ***ləm** [147]

‘bread/flour’: *hüm* ‘flour’
hemthse ‘bread’ (both Kumar 1973a)
< PCN ***a-hjəm ⩕ *a-həm*** [146]

‘skin’: *kep* (Marrison 1967)
aküp (Kumar 1973a)
< PCN ***kəp*** [155]

The schwa phoneme /ə/ is transcribed as **ɯ** in Weidert 1987 and generally as *ü* in Marrison 1967 and Kumar 1973a, though some rimes transcribed as *ap*, *am*, and *ip* (and *ep* and *em*, as noted above) appear to actually contain a schwa nucleus:

‘bread’: *hemthse* (Kumar 1973a)
hamthse (Marrison 1967)
< PCN ***a-hjəm ⩕ *a-həm*** [146]

‘cover (v.)’: *ahepti* (Kumar 1973a)
hapti (Marrison 1967)
< PCN ***a-hl [a/ə] p*** [158]

‘sleep (v.)’: *yip* (Marrison 1967)
yep (Kumar 1973a)
< PCN ***jap*** [153]

Marrison 1967 and Kumar 1973a transcribe some apparent diphthongs: /ia, eu, ai, au, ui, əi, əu, ua, ue/. Their phonemic status is unclear, however, and in some cases they are likely the result of morpheme concatenation or mistranscription of the /j/ glide.

III.2.2.4. Rimes

The following table depicts the nucleus-coda pairings that serve as the underlying rime patterns in Sangtam. Dubious rimes are followed by question marks, while those showing possible dialect variation are surrounded by parentheses:

nucleus \ *final*	**-Ø**	**-p**	**-m**	**-n**	**-k**	**-ŋ**	**-ʔ**
-i-	✓	✓ ?	✓ ?	✓ ?	—	✓	✓
-e-	✓	—	✓ ?	—	—	✓ ?	
-a-	✓	—	✓ ?	—	(✓)	✓	✓
-ə-	✓	✓	✓	✓	—	✓	
-u-	✓	—	—	—	(✓)	✓	✓

Table 129: Sangtam rime patterns

Like Lotha, Sangtam lacks a final **-t** on the surface. It is unknown whether a coda **-t** exists underlyingly.

Any vowel can appear as the nucleus of an open syllable.

Only schwa is firmly attested before the bilabial codas **-p**/**-m** and the dental/aveolar coda **-n**.

The presence of the velar coda **-k** appears to be subject to dialectal or free variation:

‘black’: *anya* (Marrison 1967), *anyak* (Kumar 1973a)
‘six’: *thüro* (Marrison 1967), *thürok* (Kumar 1973a)

All vowels appear before the velar nasal coda **-ŋ**, though **-eŋ** is rare and may be a mistranscription.

The vowel nuclei **-i-**, **-e-**, and **-u-** are attested in syllables with glottal stop codas, but there are too few glottal stops recorded in the data to know if **-eʔ** and **-əʔ** also exist in Sangtam.

III.2.2.5. Tones

Of the sources consulted for this chapter, only Weidert 1987 records the tones of Sangtam, indicating two levels (¹= Low, ²=High).[110] Sangtam appears to have a register tone system, with one tone per syllable.

Weidert places some tone numbers in parentheses, e.g. **¹a⁽²⁾saʔ** ‘heart / breath’ (1987: #953). In explaining this practice, he simply notes that “[t]onal realization is redundantly marked for stopped syllables (occurs in Lotha, Sangtam, Yimchunger)” (xvii). Since the only Sangtam tone number that appears inside parentheses is ‘2’, it may be concluded that all stopped syllables in Sangtam bear High tone.

[110] Kauffman, however, reports a three-tone system for Sangtam (Kauffmann 1939: 229; cf. Marrison 1967: I: 94).

III.2.3. Yimchungrü

The phoneme inventory of Yimchungrü presented here is based on my interpretation of the data in Marrison 1967, Kumar 1973b, and Weidert 1987. As with Sangtam, it is tentative and subject to revision in light of modern fieldwork.

Marrison's Yimchungrü wordlist was extracted from two Gospel translations based on the dialect spoken around the village of Yimstung-Aenr (1967: II: 334, 372–373).[111] Kumar (1973b) does not provide the source of his data. As with Sangtam, Weidert elicited his Yimchungrü data during various research projects sponsored by the Deutsche Forschungsgemeinschaft (German Research Council) from 1975–1984 (1987: v). Again, although his transcriptions are the most phonetically precise, they form the smallest set (approx. 97 forms, compared to Marrison's ~540 and Kumar's ~2,000).

III.2.3.1. Syllable canon

The following diagram and table (modeled on GMA: 23) depict the syllable structure of Yimchungrü. A syllable minimally consists of an obligatory vowel produced with a particular tone:

$$\sigma = (C_1)\ (A)\ V\ (C_2)\ T$$

(C_1)	*(G)*	*V*	*(C_2)*	*T*
p p^h t t^h k k^h	j	i u	p t k ʔ	2 (High)
m n ŋ	r	e ə o	m n ŋ	1 (Low)
f h		a		
ts ts^h tʃ $tʃ^h$				
s z ʃ ʒ				
w l r r̥ j				

Table 130: Yimchungrü phonotactics

Unlike Lotha and Sangtam, Yimchungrü allows final **-t** on the surface.

[111] Marrison's own understanding of the Yimchungrü inventory is found in Volume II, page 373 of his dissertation (Marrison 1967).

III.2.3.2. Consonants

The following table contains the inventory of Yimchungrü consonants in IPA, with the transcription system of Marrison 1967/Kumar 1973a italicized in parentheses (where it differs from the IPA):

	Labial	*Dental/Alveolar*	*Palatal*	*Velar*	*Glottal*
Nasal stops	m	n	nʲ (*ny/ni/ne*) (?)	ŋ (*ng*)	
Oral stops	p (*b/p*) pʰ (*ph*)	t (*d/t*) tʰ (*th*)		k (*g/k*) kʰ (*kh*)	ʔ (*-h*)
Affricates		ts tsʰ (*ths*)	tʃ (*j/ch*) tʃʰ (*chh*)		
Fricatives	f	s z	ʃ (*sh*) ʒ (*zh*)		h
Approximants	w (*w/v*)	l r ɾ̥ (*rh*)	j (*y-/-e-/-i-*)		

Table 131: Yimchungrü consonants

Weidert reports a palatal nasal **ñ**, which is transcribed variously as *ni*, *ne*, or *ny* in Marrison 1967 and Kumar 1973b, e.g.:

⁽¹⁾ñuʔ¹ge 'milk / breast' (Weidert 1987: # 327)
niuhke 'milk' (Kumar 1973b: 61)
niu 'breast' (Marrison 1967)

²a²mɯ²ñan [¹] 'to be dirty' (Weidert 1987: #402)
amünian 'sin' (Marrison 1967)
münean 'dirt' (Kumar 1973b: 83)

This could represent an underlying palatal nasal phoneme /ɲ/ or (perhaps more likely) a /nj/ cluster. Some instances may also represent /n/ showing surface palatalization due to the following rime. Without a detailed investigation of Yimchungrü phonology, it seems best to transcribe this segment/cluster as the non-committal **nʲ**.

As in Sangtam, Marrison 1967 and Kumar 1973b both transcribe a three-way VOT contrast in the Yimchungrü oral stops, while Weidert maintains his 'tense = voiceless-

aspirated' vs. 'lax = half-voiced' contrast transcribed as **p**, **t**, **k** vs. **b**, **d**, **g** (1987: xviii).[112] In Sangtam, this is interpreted as a simple aspiration distinction for various reasons (cf. §III.2.2.2), and all the same considerations apply to the Yimchungrü data. The system of interpretation is summarized as follows:

	/p/	/p^{h}/	/t/	/t^{h}/	/k/	/k^{h}/
Marrison 1967, Kumar 1973a	b, p	ph	d, t	th	g, k	kh
Weidert 1987	b	p	d	t	g	k

Table 132: Interpretation of Yimchungrü oral stops

As in the other CN languages, the glottal stop is restricted to coda position (transcribed in Kumar 1973b as a final *h*). The Yimchungrü glottal stop can exist word-medially:

'dog': **$^{(2)}$ki?^{1}nu** (Weidert 1987: #269)
khih̲nupung (Kumar 1973b: 35)

'three': **$^{(1)}$ma?^{2}sam [^{2}]** (Weidert 1987: #253)
mah̲sam (Kumar 1973b: 99)

Note that Marrison 1967 does not transcribe the Yimchungrü glottal stop.

With regard to the VOT of the affricates, Weidert 1987 transcribes a two-way voiced vs. voiceless unaspirated contrast, which undoubtedly corresponds to the 'tense vs. lax' system he uses for the oral stops. The data in Marrison 1967 and Kumar 1973b suggests a two-way aspiration contrast in the dental affricates (*ts* vs. *ths*) but a three-way voicing/aspiration contrast in the palatal affricates (*j* vs. *ch* vs. *chh*). As in Sangtam, the most sensible course of action is to analyze the contrast as simply one of aspiration, following the treament of the oral stops.

Marrison again treats the dental vs. palatal affricate contrast as sub-phonemic (1967: II: 373), though the POA distinction is maintained in his transcriptions (and those of Weidert 1987 and Kumar 1973b). As in Sangtam, the Yimchungrü dental and palatal affricates are best analyzed as separate phonemes for now.

The system of interpretation for the Yimchungrü affricates is summarized below. (Weidert's Yimchungrü data contains no instances of /ts^{h}/, though it would likely be transcribed therein as **ts**.)

[112] Weidert abandons his system one time in explicitly transcribing the Yimchungrü aspiration of **^{2}phɯ^{1}le** 'daughter in law' (1987: #112).

	/ts/	/tsʰ/	/tʃ/	/tʃʰ/
Marrison 1967, Kumar 1973a	ts	ths	j, ch	chh
Weidert 1987	dz	(ts)	dž	tš

Table 133: Interpretation of Yimchungrü affricates

Marrison 1967 and Kumar 1973b contain surprisingly few forms with *chh* /tʃʰ/, leading one to suspect that some instances of /tʃʰ/ are mistranscribed in these sources as *ch*.

Kumar 1973b contains transcriptions of both *w* and *v*, while Marrison reports only a few forms with *w* (and none with *v*). Weidert 1987 contains no instances of either **w** or **v**. Nothing can be said with certainty, but it is possible that [v] is an allophonic realization of /w/ before schwa.

Weidert 1987 alternates between transcribing /r̥/ as **hr** or **rh**, while Marrison 1967 and Kumar 1973b consistently employ *rh*.

All three sources transcribe the palatal glide /j/ in initial position as *y*. In medial position, Weidert 1987 employs **-e-**, while Marrison 1967 and Kumar 1973b alternate between **-i-** and **-e-**, e.g. 'on': *khiak* (Marrison 1967), *kheak* (Kumar 1973b: 66).

As in Sangtam, the palatal glide /j/ and rhotic liquid /r/ are the the only phonemes which can appear in the medial approximant position. Medial /r/ appears to be preceded only by initial /t/ or /tʰ/, while medial /j/ is attested with several initials, including /p/, /k/, /kʰ/, /h/, /n/, /l/, and /r/.

III.2.3.3. Vowels

The vowel phonemes of Yimchungrü are presented in the following table:

	Front	*Central*	*Back*
High	i		u (*ou/u*)
Mid	e	ə (*ii*)	o
Low		a	

Table 134: Yimchungrü vowels

The high back vowel /u/ is generally transcribed as *u* in all three sources, except where it appears as *ou* after *y* in Marrison 1967, e.g. 'swallow': *muyou* (Marrison 1967), *muyu* (Kumar 1973b: 64).

The mid back vowel /o/ (< PCN ***-ej**) appears to be a phoneme distinct from /u/, as transcriptions of open *o* are consistent among all three sources (contrast Sangtam). Rimes transcribed as *ong* and *ung* may both represent /uŋ/, however, for the following reasons: 1) Weidert 1987 has no instances of **-oŋ**, 2) there are very few transcriptions of *ong* in Marrison 1967 or Kumar 1973b, and 3) Marrison conflicts with Kumar in nearly every transcription of *ong*:

‘heart’: *mulong* (Marrison 1967)
mulung (Kumar 1973b: 60)

‘nose’: *nubong* (Marrison 1967)
nüpung (Kumar 1973b)
¹nɯ²buŋ (Weidert 1987: #186)

‘wind’: *apong* (Marrison 1967)
apung (Kumar 1973b)

‘boat’: *sangkong* (Marrison 1967)
sangkung (Kumar 1973b: 64)
¹saŋ²guŋ [²] (Weidert 1987: #160)

All instances of *ong* are therefore best interpreted as /uŋ/. The few examples of *ok* may also represent /uk/, given the following entry from Kumar: *nukji; nokji* ‘knife’ (1973b: 45)

Weidert provides a near-minimal pair supporting the status of /e/ as a distinct phoneme: **¹ke** ‘count / read’ (1987: #577) vs. **⁽¹⁾kɯʔ** [kəʔ] ‘chest’ (1987: #788). Note also *rimre* ‘wolf’ (Marrison 1967, Kumar 1973b: 78) vs. *rimri* ‘spirit’ (Marrison 1967), *arimri* (Kumar 1973b: 90) (but tone is omitted).

As in Sangtam, the schwa phoneme /ə/ is transcribed as **ɯ** in Weidert 1987 and generally as *ü* in Marrison 1967 and Kumar 1973a. Some instances of *u* in Marrison 1967 are mistranscriptions of schwa, e.g. ‘nose’: *nubong* (Marrison 1967), **¹nɯ²buŋ** (Weidert 1987: #186).

As previously mentioned (§III.2.3.2), Marrison 1967 and Kumar 1973b use *-i-* and *-e-* to represent medial /j/ (e.g. *ia* or *ea* for /ja/). Beyond this, their data contains rare instances of apparent diphthongs: /au, oi, aə/. As in Sangtam, however, their phonemic status is unclear and they may be the result of morpheme concatenation.

Kumar reports some cases of apparent long vowels, e.g. *tsaa* ‘walk’ (1973b: 43), but Marrison’s use of a hyphen (e.g. *tsa-a* ‘pass by’, *limtsa-a* ‘walk’) suggests that a

morpheme boundary (or possibly a glottal stop) exists between the two identical vowels.

III.2.3.4. Rimes

The following table depicts the nucleus-coda pairings that serve as the underlying rime patterns in Yimchungrü:

nucleus \ *final*	**-Ø**	**-p**	**-m**	**-t**	**-n**	**-k**	**-ŋ**	**-ʔ**
-i-	✓	✓	✓	✓	✓	✓	✓	✓
-e-	✓	—	—	—	✓	—	✓ ?	—
-a-	✓	✓	✓	—	✓	✓	✓	✓
-ə-	✓	✓	✓	✓	✓	✓	✓	✓
-o-	✓	—	—	—	—	—	—	✓
-u-	✓	—	✓	—	—	✓	✓	✓

Table 135: Yimchungrü rime patterns

Yimchungrü appears to permit the most rime patterns of all of the Central Naga languages, though some of these are undoubtedly mistranscriptions.

Any vowel can appear as the nucleus of an open syllable, and the only glottal-final rime missing from the data is **-eʔ**.

The only vowel nuclei allowed before bilabial codas are **-i-**, **-a-**, **-ə-**, and **-u-**, though the **-up** rime is not attested in the data.

Unlike Lotha and Sangtam, Yimchungrü permits two surface rimes with a **-t** coda: **-it** and **-ət**. The dental nasal coda **-n** appears with **-i-**, **-e-**, **-a-**, and **-ə-** nuclei.

The velar codas **-k** and **-ŋ** appear with **-i-**, **-a-**, **-ə-**, and **-u-** nuclei. The fact that **-ek** is not attested renders the **-eŋ** rime dubious, especially since only one example appears in the data: *mükhün-pengrü* ‘deaf’ (Marrison 1967), which Kumar transcribes with *peang* [pjaŋ] (1973b: 74).

III.2.3.5. Tones

As with Sangtam, only Weidert 1987 records the tones of Yimchungrü, indicating two levels (^{1}= Low, ^{2}=High). Yimchungrü appears to have a register tone system, with one tone per syllable.

Weidert places some tone numbers in parentheses, noting that "[t]onal realization is redundantly marked for stopped syllables (occurs in Lotha, Sangtam, Yimchunger)" (xvii). However, if by this statement he means that all stopped syllables in Yimchungrü bear the same tone, his data actually contradicts this (underlines added):

[1]**mo$\underline{^{(1)}}$kɯʔ** 'smoke' (1987: #302)
[2]**a$\underline{^{(2)}}$hɯʔ** 'to steal' (1987: #305)

Weidert also indicates underlying tones for Yimchungrü: "Underlying tones of last = main syllables are entered in brackets following the surface tone representation of the word in question" (1987: xviii).

III.2.4. Proto-Central Naga

This section presents the reconstructed inventory of Proto-Central Naga.

III.2.4.1. Syllable canon

The following diagram and table (modeled on GMA: 23) depict the syllable structure of PCN. A syllable minimally consists of an obligatory vowel produced with a particular tone:

$$\sigma = (C_1)\ (A_1)\ V\ (A_2)\ (C_2)\ T$$

(C_1)	*(A_1)*	*V*	*(A_2)*	*(C_2)*	*T*
p pʰ t tʰ k kʰ m m̥ n n̥ ŋ ŋ̊ ts tsʰ tʃ tʃʰ s z ʃ ʒ x ɣ w ʍ l l̥ r r̥ j j̊ h	j w l	i u e ə a aː	j	p t k ʔ m n ŋ	?

Table 136: PCN phonotactics

Not all combinations of the above components are reconstructed syllables in PCN. (See the summary of rimes in §III.2.4.4). When the palatal glide ***j*** fills the second approximant slot (A_2), for example, the only attested vowel nuclei are ***-a-***, ***-e-***, and

-ə-, and the only codas are zero or ***-ʔ***.[113] In addition, the only reconstructed clusters of initial + approximant are diagrammed in the following table:

	****p(h)-***	****m(h)-***	****t(h)-***	****(h)n-***	****(h)r-***	****(h)l-***	****k(h)-***
****-w-***	*pw-			*nw-	*rw-		*kw-
****-j-***	*pj-	*mj-	*thj-	*(h)nj-	*hrj-	*lj-	*k(h)j-
****-l-***							*khl-

Table 137: PCN initial + medial clusters

The tone slot contains a question mark because the tone system of PCN cannot be reconstructed yet.

III.2.4.2. Consonants

The following table contains the inventory of PCN consonants in IPA, with the transcription system of this chapter in parentheses where it differs from the IPA:

	Labial	*Dental/Alveolar*	*Palatal*	*Velar*	*Glottal*
Nasal stops	m m̥ (hm)	n n̥ (hn)		ŋ ŋ̊ (hŋ)	
Oral stops	p pʰ (ph)	t tʰ (th)		k kʰ (kh)	ʔ
Affricates		ts tsʰ (tsh)	tʃ tʃʰ (tʃh)		
Fricatives		z s	ʒ ʃ	ɣ x	h
Approximants	w ʍ (hw)	l r l̥ (hl) r̥ (hr)	j j̊ (hj)		

Table 138: PCN consonants

All consonants may appear in the syllable onset except the glottal stop, which is restricted to syllable codas.

[113] Future reconstructions of PCN phonology might therefore find it advantageous to analyze this pre-final ****j*** as a coda and the glottal stop as a contrastive prosodic element.

III.2.4.3. Vowels

The following table presents the vowel phonemes of PCN:

	Front	*Central*	*Back*
High	i		u
Mid	(e)	ə	
Low		a aː	

Table 139: PCN vowels

The ***e** vowel is a marginal phoneme, appearing only with the pre-final ***-j-** glide (cf. §III.3.1.4).

A vowel length contrast is reconstructed only for the low central vowel (see the discussion in §II.4.1.5 and §II.4.3). The long vowel ***aː** appears only with a ***-m** or ***-n** coda.

III.2.4.4. Rimes

The following table summarizes the PCN rime patterns reconstructed in §III.3:

nucleus \ *final*	***-Ø/ʔ**	***-j(ʔ)**	***-p**	***-m**	***-t**	***-n**	***-k**	***-ŋ**
***-i-**	✓	—	—	—	✓ ?	—	✓	✓
***-e-**	—	✓	—	—	—	—	—	—
***-a-**	✓	✓	✓	✓	✓ ?	✓	✓	✓
***-aː-**	—	—	—	✓	—	✓	—	—
***-ə-**	✓	✓	✓	✓	✓ ?	✓	—	—
***-u-**	✓	—	—	—	✓ ?	—	✓	✓

Table 140: PCN rime patterns

Open/glottal-final syllables permit the vowel nuclei ***-i-**, ***-a-**, ***-ə-**, and ***-u-**, while only ***-e-**, ***-a-**, and ***-ə-** can be followed by the pre-final ***-j-** glide to form diphthongs.

Only ***-a(ː)-** and ***-ə-** appear with the bilabial codas ***-p** and ***-m**, though ***-aːp** is not reconstructed.

The rimes with *-**t** are all very provisional, but they appear to allow the same set of vowel nuclei as the open/glottal-final syllables. Rimes with final *-**n** are restricted to the nuclei *-**a(ː)**- and *-**ə**-.

The velar codas *-**k** and *-**ŋ** can be preceded by *-**i**-, *-**a**-, and *-**u**-.

III.2.4.5. Tones

Proto-Central Naga was undoubtedly a language with a register tone system. At this time, however, there is too little reliable data on the tones of Sangtam, Yimchungrü, and Proto-Ao to reconstruct the system.

III.3. PCN Rimes

This section contains the reconstructed rimes of Proto-Central Naga, grouped by place of articulation of the coda: zero and glottal stop codas in §III.3.1, bilabial codas in §III.3.2, dental codas in §III.3.3, and velar codas in §III.3.4.

III.3.1. Zero/Glottal Codas

As in Ao, the open syllables appear to pattern with the glottal-final syllables in the rest of Central Naga. These two types of rimes are therefore combined in the following subsections. A PCN syllable is generally reconstructed with a final glottal stop when a glottal stop appears in at least one reliably transcribed supporting form (other than a Lotha high-toned syllable with a prosodic glottal stop). Where there may have been variation, the PCN glottal stop appears in parentheses. It should be noted, however, that the presence/absence of a glottal stop appears not to be captured in the majority of the Sangtam and Yimchungrü data.

The table below summarizes the development of these rimes from Proto-Central Naga into PAo, Lotha, Sangtam, and Yimchungrü (discussed in the following sections):

<table>
<tr><th>PTB</th><th>PCN</th><th>PAo</th><th>Lotha</th><th>Sangtam</th><th>Yimchungrü</th></tr>
<tr><td>*-a</td><td>***-a(ʔ)**</td><td>*-a(ʔ)</td><td>-o(ʔ)</td><td>-u(ʔ) / *j, *s, *ʃ, *ts _
-a(ʔ) else.</td><td>-i(ʔ) / *pal. _
-ə(ʔ) else.</td></tr>
<tr><td>*-a-y, *-a(ː)y</td><td>***-aj(ʔ)**</td><td>*-aj(ʔ)</td><td>-a(ʔ)</td><td>-a, -i</td><td>-a, -i</td></tr>
<tr><td>*-ey</td><td>***-ej(ʔ)**</td><td rowspan="2">*-i(ʔ)</td><td rowspan="2">-i(ʔ)</td><td rowspan="2">-i(ʔ)</td><td>-o</td></tr>
<tr><td>*-i</td><td>***-i(ʔ)**</td><td>-e</td></tr>
<tr><td>*p^{w}a, *wa (reanalyzed: **-wa)</td><td>***-wa(ʔ)**</td><td>*-wa(ʔ)</td><td rowspan="2">-u(ʔ)</td><td>-u</td><td>-u</td></tr>
<tr><td>*-a(ː)w, *-əw, *-ow, *-u *p^{w}a, (*wa ?)</td><td>***-u(ʔ)**</td><td>*-u(ʔ)</td><td>-u, -ə</td><td>-u(ʔ), -ə(ʔ)</td></tr>
</table>

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-i(:)l, *-al, *-u:l *-i / *kr_ *-u / *tsy_, *dz(y)_	***-ə(ʔ)**	*-ə(ʔ)	-ə(ʔ)	-ə	-ə, -u
*-əy	***-əj(ʔ)**	*-ə(ʔ) / *(h)r, *s _ *-əj(ʔ) else.			-e / *(h)r, **ʃ _ -i(ʔ) else.

Table 141: PCN open/glottal-final rimes

*III.3.1.1. *-a(ʔ)*

PCN ***-a*** and ***-aʔ*** descended from PTB ***-a*** and are among the best-attested Central Naga rimes. PCN ***-a(ʔ)*** remained ***-a(ʔ)*** in Proto-Ao, but became ***-o(ʔ)*** in Lotha.

In Sangtam, the default case seems to be preservation of ***-a(ʔ)***, with raising/rounding to ***-u*** following the disparate PCN initials ***j-***, ***s-***, ***ʃ-***, and ***ts-***. Although most of the initials in this set are sibilants, the PCN sibilants ***ʒ-*** and ***tsh-*** did not trigger the same change (though there is one apparently sporadic instance of PCN ***-a(ʔ)*** > Sangtam ***-u*** following ***tsh-*** in SPEAR (n.) [23]).

In Yimchungrü, ***-a(ʔ)*** was raised to ***-i(ʔ)*** following the PCN palatal initials ***ʃ-*** and ***j-*** (also included in the set responsible for ***-a(ʔ)*** > ***-u*** in Sangtam), but reduced to schwa everywhere else.

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-a	***-a(ʔ)**	*-a(ʔ)	-o(ʔ)	-u(ʔ) / *j, *s, *ʃ, *ts _ -a(ʔ) elsewhere	-i(ʔ) / *palatal _ -ə(ʔ) elsewhere

*Table 142: PCN *-a(ʔ)*

Below are the cognate sets supporting the reconstruction of this rime:

[1] HE, SHE (3SG) PCN *pa

PAo ***pa*** (1); Lotha **(o)m³-po<u>ʔ³</u>** [114]
< PTB ***p^{w}a*** MAN / FATHER / HUSBAND / PERSON

[114] The anomalous Lotha **-om** rime in this form may be underlying /on/ which has assimilated on the surface to the following [p]. The initial [o] is elided in fast speech.

▸ This set shares a PTB etymon with FATHER [37], but represents a variant which failed to extrude to ***pwa** in PCN. Lotha **o^{1}-po?^{2}** ‘father’ may also have descended from this variant.

[2] FOOT (PART) PCN *m-ph(w)a

PAo ***t-m-phwa** FOOT (PART) (373)
Lotha **m̩^{1}-pho?^{3}** ‘skin of foot (?)’
Sang. -^{1}mɯ^{2}pa [**-mə-p^{h}a**] ‘sole (foot)’
Yim. *müfü* [**mə-fə**] ‘foot’
< PTB ***p^{w}a-n** PALM / SOLE

▸ This PCN form shows rime variation between ***-a** and ***-wa**, with only the PAo form reflecting the PCN variant with the medial labiovelar glide (cf. §III.3.1.2).

[3] NO (REFUSAL) PCN *maʔ

PAo ***maʔ** NO (REFUSAL) (209)
Lotha **mo?^{2}** ‘no (refusal)’
Sang. *ma* ‘no’
Yim. *mü**la*** [**mə-la**] ‘no’
< PTB ***ma-y** NEGATIVE

[197] BE DARK PCN *a-ma(ŋ)

Sang. *ama* ‘dark’; Yim. *amü**tü*** [**a-mə-tə**] ‘dark’
(See BE DARK [197] in §III.3.4.1 for the other reflexes and further discussion.)

▸ This PCN form shows rime variation between ***-a** and ***-aŋ**.

[4] WOUND, SORE PCN *hma

PAo ***khu-ma** WOUND, SORE (76)
Lotha **e^{1}-hmo^{1}** ‘sore / old wound’
Sang. ^{1}ma^{1}tsa [**ma-ts^{h}a**] ‘wound (n.)’
Yim. *mü* [**mə**] ‘wound (n.)’
< PTB ***r-ma-t** WOUND / INJURED

▸ Proto-Ao has merged PCN ***khuʔ** WOUND, INJURY / SCAR [80] and ***hma** WOUND, SORE into a single compound: PAo ***khu-ma** WOUND, SORE.

[5] QUOTATIVE PCN *ta(ʔ)

PAo ***ta** (22); Lotha **toʔ^{1}**

[6] NOSE PCN *na(ʔ)

Mongsen **[tə] -naʔ**
Lotha **khe^{3}noʔ^{3}**
Sang. ^{2}na^{1}buŋ [**na-puŋ**]
Yim. ^{1}nɯ^{2}buŋ [**nə-puŋ**]
< PTB ***s-na** ⧓ ***s-naːr** NOSE

▸ Chungli **tə^{3}-ni^{3}** ‘nose’ is most likely related to this set, but its rime development is unexplainable.

[7] EAR PCN *hnaʔ

PAo ***t-hna-ɹuŋ** (231)
Lotha **e^{1}-noʔ^{1}**
Yim. ^{2}nɯ^{2}kɯn [**nə-k^{h}ən**] (m-hole)
< PTB ***r/g-na** EAR / HEAR / LISTEN

▸ The Sangtam form for ‘ear’ is **naŋ-k^{h}i** (ear-hole), the first syllable of which descended from a different root: PTB ***nam** EAR† (cf. HOLE [79]).

[8] GAPE, OPEN MOUTH PCN *ka

PAo ***a-ka** (52); Lotha **ko^{1}-**
< PTB ***m-ka** OPEN / OPENING / MOUTH / DOOR

[9] LOINS / GROIN PCN *m-k(w)a

Lotha **ŋ̇^{1}-kuʔ^{3}** ‘groin’
nkvüühüm [**ŋ-ku-həm**] ‘pubic hair’ (m-hair) (Lotha 2004: #594)
Sang. ^{1}a^{1}mɯ^{2}ga [**a-mə-ka**] ‘loins’
Yim. ^{2}mɯ^{2}gɯ [^{1}] [**mə-kə**] ‘loins’

▸ The PCN form is reconstructed with variation in the medial labiovelar glide, as Lotha **ŋ̇^{1}-kuʔ^{3}** is the only cognate which reflects PCN ***-wa**. Sangtam **-a** and Yimchungrü **-ə** reflect PCN ***-a**.

[10] BE BITTER PCN *a-kha?

PAo ***a-kha?*** (74)
Lotha **kho²-**
Sang. *akha* [**a-kʰa**]
Yim. ²a-⁽²⁾kɯʔ [**a-kʰəʔ**]
< PTB ***b-ka-n** BITTER / LIVER

[11] MONKEY PCN *ŋa

PAo ***ʃa-ŋa*** MONKEY (267); Yim. *shihngü* [**ʃiʔ-ŋə**] 'langur'

▸ The first morpheme in both forms reflects PCN ***ʃaʔ*** ANIMAL / MEAT, FLESH [15].

[12] FIVE PCN *pha-ŋa

PAo ***pha-ŋa*** (17); Lotha **mo¹-ŋo¹**; Sang. *müŋga* [**mə-ŋa**]; Yim. *phüngü* [**pʰə-ŋə**]
< PTB ***l/b-ŋa** FIVE

[13] FISH PCN *a-hŋaʔ

PAo ***a-hŋaʔ*** (265)
Lotha **o¹-ŋoʔ²**
Sang. *ngu* [**ŋu**]
Yim. ²tɯ⁽²⁾ŋɯʔ [**tʰə-ŋəʔ**]
< PTB ***s-ŋya** FISH

▸ The Sangtam **-u** rime is unexpected, as it conflicts with the preservation of ***-a** in Sangtam 'five' [12].

[14] NERVE, VEIN / POWER, STRENGTH PCN *a-saʔ

Lotha **e¹-thoʔ²** 'nerves / power, strength'
Sang. *asu* 'power / strength', *suyo* [**su-ju**] 'vein'
Yim. *süihmüih* [**səʔ-məʔ**] 'power'
< PTB ***r-sa** VEIN / SINEW

▸ Sangtam shows the peculiar raising/rounding of ***-aʔ*** to **-u** following ***s-**.

[15] ANIMAL / MEAT, FLESH PCN *a-ʃaʔ

PAo ***(a-)ʃaʔ** ANIMAL / MEAT (88)
Lotha **o^{1}-soʔ^{2}** ‘meat’, **so^{2}-tsəʔ^{1}** ‘elephant’
Sang. *shu* [**ʃu**] ‘meat’, *shuza* [**ʃu-za**] ‘monkey / langur’
Yim. $^{(1)}$šiʔ [**ʃiʔ**] ‘meat / flesh’, *rimshih* [**rim-ʃiʔ**] ‘animal’ (jungle-m)
< PTB ***sya-n** ANIMAL / BODY / FLESH / MEAT

▸ The **-iʔ** rime in Yimchungrü appears to be the result of raising under influence from the palatal ***ʃ-** initial, as in Chungli (see §II.3.2.1).

[16] GRASS PCN *a-ʒa(ʔ)

PAo ***a-ʒa(ʔ)** (119); Lotha **e^{1}-roʔ^{3}**; Sang. *zanu*

[17] YAWN (v.) PCN *xa

PAo ***xa-m-sa** (135); Lotha **ho^{3}həm^{3}-**
< PTB ***ha-y** YAWN†

▸ The second syllable of Lotha **ho^{3}həm^{3}-** is most likely related to PKC ***haam** YAWN (VanBik 2009: #747) and PTk ***ham** YAWN (Mortensen 2012: #619) (both < PTB ***m-ha(ː)m** ⧓ ***kam** YAWN†).

[18] SWIM PCN *ɣaʔ

PAo ***a-ɣaʔ** SLICE, SAW / SWIM (134)
Lotha **ho^{2}-** ‘swim’
Sang. *ve* (Marrison 1967), *vecho* [**ve-tʃ^{h}u**] (Kumar 1973a) ‘swim’

▸ The Sangtam **-e** rime is unexpected.

[19] EAT PCN *tsaʔ

PAo ***a-tʃaʔ** (143)
Lotha **tso^{2}-**
Sang. *tsu* [**tsu**], *chu* [**tʃ^{h}u**] (Marrison 1967)
tsucho [**tsu-tʃ^{h}u**] (Kumar 1973a)
Yim. $^{(1)}$dzɯʔ [**tsəʔ**]
< PTB ***dzya-n/k** EAT / FOOD / FEED

▸ The ***-aʔ** rime appears to have yielded Sangtam **-u** following ***ts-**.

[20] SON PCN *tsaʔ

PAo ***(t-)tʃa-əɹ** (144)
Lotha ^{1}o^{2}dzo(ʔ) [**o^{1}-tso(ʔ)^{2}**] (Weidert 1987: #303)
tso^{2}-khjoŋ^{1}-oʔ^{2} (MK)
Sang. *tsurü* [**tsu-rə**]
Yim. $^{(1)}$dzɯʔ^{1}rɯ [**tsəʔ-rə**]
< PTB ***tsa-n** ≋ ***za-n** CHILD / SON / RELATIVES

▸ As in EAT [19], above, the ***-aʔ** rime yielded Sangtam **-u** following ***ts-**.

[21] BUILD, MAKE / DO PCN *tsha

Mongsen **tʃhà** ‘do, make’
Lotha **tsho^{3}-** ‘build / do’
Sang. *thsa* [**ts^{h}a**] ‘build’
Yim. *thsü* [**ts^{h}ə**] ‘build’

▸ Sangtam **ts^{h}a** ‘build’ and **ats^{h}a** ‘hot’ [22] suggest that PCN ***-a** was preserved in Sangtam following ***tsh-** (though see SPEAR (n.) [23], below).

[22] BE HOT / HURT PCN *tsha

Mongsen **tʃha** ‘be hot’
Lotha **tsho^{1}-** ‘be hot / spicy’
Sang. *athsa* [**a-ts^{h}a**] ‘hot’
thsacho [**ts^{h}a-tʃ^{h}u**] ‘pain’
Yim. *thsü* [**ts^{h}ə**] ‘pain’
< PTB ***tsa-t** HOT / HURT / PAIN / ILL

[23] SPEAR (n.) PCN *tshaʔ

Lotha **o^{1}-tshoʔ^{2}**; Sang. *thsu* [**ts^{h}u**]; Yim. *thsüh* [**ts^{h}əʔ**]

▸ PCN ***-aʔ** appears to have (sporadically?) velarized and rounded to Sangtam **-u** here following ***tsh-**, in contradiction to its preservation in both BUILD, MAKE / DO [21] and BE HOT / HURT [22].

[24] WING PCN *a-tʃha

PAo ***t-(a-)tʃha** (161); Lotha **e^{1}-tʃhoʔ^{3}**

▸ Sangtam *khyo* [**k^{h}jo**] ‘wing’ (Marrison 1967) is not cognate to these forms, and may instead be related to PKC ***khlaa** WING (VanBik 2009: #1309).

[25] GO PCN *wa

PAo *__a-wa__ (272)
Lotha __vo[1]-__
Sang. *vii* [__və__]
Yim. *ii* [__ə__] (Marrison 1967), *yii* [__jə__] (Kumar 1973b)
< PTB *__s-wa__ GO

▸ The rime appears to have exceptionally reduced to schwa in Sangtam (likely a high-frequency effect).

[26] LEAF PCN *a-wa

PAo *__t-wa__ (273); Lotha __o[1]-vo?[3]__; Sang. __[1]a[2]va__; Yim. [2]a[2]ɯ [[1]] [__a-ə__]

[27] TOOTH PCN *p-hwa

PAo *__t-phwa__ (374); Lotha __o[1]-ho[1]__; Sang. *ha*; Yim. *hii* [__hə__]
< PTB *__s-wa__ ~ *__p-wa__ TOOTH[†] (HPTB: *__swa__, *__s-wa__ TOOTH)

▸ It is important to note that PCN *__hw-__ is a voiceless labiovelar glide initial [ʍ], not a cluster of *__h-__ with *__-w-__. The CN rimes therefore reflect PCN *__-a__, not *__-wa__ (which is discussed separately in §III.3.1.2).

[28] BAMBOO$_1$ PCN *r-hwaʔ

PAo *__a-hwaʔ__ (274)
Sang. __[2]xu__ (Weidert 1987: #257), *ghu* [__ɣu__] (Marrison 1967)
Yim. [(1)]hɯʔ [__həʔ__]
< PTB *__r-wa__ BAMBOO

▸ The Sangtam __-u__ rime appears to reflect PCN *__-waʔ__, with *__-w-__ as a medial glide instead of an onset (cf. §III.3.1.2). This correspondence, along with the Sangtam __x/ɣ-__ initial (cf. §III.5.5.3), suggests that the PCN prefix + initial cluster *__r-hw-__ was reanalyzed as a voiceless *__hr-__ initial with the *__-w-__ medial glide in Sangtam: PCN *__r-hwaʔ__ [r-ʍaʔ] > **__hrwaʔ__ [r̥waʔ] > Sang. __ɣu/xu__

[29] MOTHER PCN *ja

Mongsen __[tə]-ja__; Lotha __o[1]-jo[1]__
< PTB *__yay__ ~ *__ʔay__ MOTHER / GRANDMOTHER / MATERNAL AUNT

▸ PTB *__-ay__ unexpectedly lost its offglide here to yield PCN *__-a__.

[30] PALM OF HAND PCN *m-ja

Mongsen **[tə]-mija**
Lotha **m̩^{1}-jo^{1}-ku?^{3}**
Sang. *müyo* [**mə-ju**]
Yim. *müyilung* [**mə-ji-luŋ**]

▸ The Yimchungrü **-i** rime may be the result of raising in a palatal context (cf. MEAT, FLESH [15]). Whether this development is diachronic, synchronic, or perceptual (in the mind of the original transcriber) is unknown.

[31] HEAR PCN *ja

Mongsen **jà?**; Lotha **zo^{2}-**; Sang. *yuchi* [**ju-tʃ^{h}i**]

▸ PCN ***-a** yielded Sangtam **-u** following ***j-**.

[32] EARN / PAY WAGES PCN *hja?

PAo ***a-hja?** (275); Lotha **m̩^{1}-jo^{2}-**

[33] (TIMES) TEN PCN *th-ra

PAo ***th-ɹa** (307)
Lotha **ta^{1}-ro^{1}** 'ten', **thəm^{1}-ro^{1}** 'thirty' (three-x10)
Sang. *thüre* [**t^{h}ə-re**] 'ten', *sangre* [**saŋ-re**] 'thirty' (three-x10)
Yim. *thürü* [**t^{h}ə-rə**] 'ten', *samrü* [**sam-rə**] 'thirty' (three-x10)
cf. PKC ***hraa** TEN (VanBik 2009: #1100), PTk ***ra** TEN (Mortensen 2012: #339)

▸ The **-a** rime has inexplicably raised to **-e** in Sangtam, though it is not surprising to find an irregular development in a high-frequency numeral form.

[34] FEMALE, WOMAN PCN *la

PAo ***-la** FEMININE SEMANTIC GENDER (SUF.) (341)
Lotha **-lo^{1}** (female suffix)
e^{1}-lo^{1}-e?^{3} 'female, woman / wife' [115]
Sang. *laʑarü* [**la-zarə**] 'young woman', *ashi larü* [**aʃi la-rə**] 'old woman'
Yim. *aliberü* [**a-li-berə**] 'woman' ?
< PTB ***g-la** FEMININE AFFIX (French 1983: 487, 519, citing p.c. from Benedict)

[115] This Lotha form is inavariably produced on the surface as [e^{1}-lwe?^{13}], but consists of three underlying morphemes: /e^{1}-lo^{1}-e?^{3}/ (PFX-female-SUF). (The **-e?^{3}** suffix also appears in **e^{1}-po^{1}-e?^{3}** 'man, male / husband' and **o^{1}-tso^{2}-e?^{3}** 'children', but its meaning is unclear.)

▸ The Yimchungrü **-i** rime is unexpected, given the lack of palatal context.

French cites personal communication from Paul K. Benedict as the source of the otherwise unpublished PTB reconstruction ***g-la**, which is glossed as 'feminine affix, used especially of young females' (1983: 487). This etymon is apparently the ancestor of PKC ***laa** FEMALE (adolescent stage) (VanBik 2009: #1018), PTk ***la** DAUGHTER (Mortensen 2012: #602), PNN ***C-gla**^{B} FEMALE (French 1983: 486), and the PCN form here.

A strikingly similar PTB etymon ***la** meaning MALE appears in TBRS (TBRS: 208) and descended into PNN as ***la**^{A} MALE (OF ANIMALS) and ***la**^{B} MALE (French 1983: 519, 520).

[35] BOW (n.) PCN *laʔ

Mongsen	**LASANG** [**lasaŋ**] (Clark 1911: 334)
Lotha	**lo^{2}tshəʔ^{1}**
Sang.	*thsalu* [**ts^{h}a-lu**]
Yim.	^{1}saŋ^{1}lɯʔ [**saŋ-ləʔ**] (wood-m)

< PTB ***g/b/m-la-y** ARROW

▸ The development of PCN ***-a** > Sangtam **-u** following ***l-** here conflicts with the preservation of ***-a** in FEMALE, WOMAN [34].

PCN ***laʔ** reflects the the PTB variant which lacks the palatal suffix ***-y**.

PTB ***d/s-ləy** BOW / SLINGSHOT is not the source of this PCN etymon, though it is possibly reflected in PAo ***li-tʃak** BOW / SLINGSHOT (150) (see §II.3.5.4).

*III.3.1.2. *-wa(ʔ)*

The PCN ***-a(ʔ)** rime with the medial labiovelar glide ***-w-** is distinguished from ***wa** (with a ***w-** initial) by its development into Lotha as **-u(ʔ)**. (Contrast PCN ***wa** > Lotha **vo**; see §III.5.5.1.) PCN ***-wa(ʔ)** developed from a merger of two PTB sources:

1. Extrusion from the PTB bilabial initial ***p-** in ***pa** syllables (written as PTB ***p^{w}-**)[116] (SEARCH, SEEK$_1$ [36]; FATHER [37], BAMBOO$_2$ [38]; FOOT (PART) [2]), and

[116] Matisoff utilizes ***p^{w}-** to represent instances of PTB ***p-** whose reflexes include some forms that show the effects of extrusion (see HPTB: 61 [fn.86], 147).

2. PTB initial ***w-*** reanalyzed as a medial glide (RAIN [39]).

(PTB ***-wa*** must also have yielded PCN ***-wa(ʔ)***, but no examples have been identified yet.)

It should be noted that not all instances of the reconstructed initial PTB ***pʷ-*** have Central Naga reflexes that derive from ***pw-***. In some cases the initial has failed to extrude, e.g. PTB ***pʷa*** > PCN ***pa*** HE, SHE (3SG) [1] and PTB ***pʷaŋ*** > PAo ***paŋ*** SPINDLE (6). In addition, there is at least one case in which PTB ***pʷa*** extruded to ****pwa*** and apparently underwent a pre-PCN ****-wa*** > ****-u*** process before descending into PCN as ***pu*** (AXE [66] in §III.3.1.6). Finally, some PCN roots with initials reflecting original PTB ***pʷ-*** must be reconstructed with variation as ***p(w)-***. (Extrusion is a messy business.)

PCN ***-wa(ʔ)*** was preserved as such in Proto-Ao (though later coalesced to ***-u(ʔ)*** in Chungli), but yielded ***-u(ʔ)*** in Lotha, Sangtam, and Yimchungrü:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*pʷa, *wa (reanalyzed as **-wa)	***-wa(ʔ)***	*-wa(ʔ) > Mo -a(ʔ), Ch -u(ʔ)	-u(ʔ)	-u	-u

*Table 143: PCN ****-wa(ʔ)***

The PAo ***-wa(ʔ)*** : Lotha ***-u(ʔ)*** correspondence crucially distinguishes reflexes of PCN ***-wa(ʔ)*** from those of PCN ***-u(ʔ)***, which show a PAo ***-u(ʔ)*** : Lotha ***-u(ʔ)*** correspondence (§III.3.1.6).

[36] SEARCH, SEEK$_1$ PCN *pwa

PAo ***pwa-ʃi*** (370); Sang. *puchi* [***pu-tʃʰi***]
< PTB ***pa*** SEARCH FOR / SEEK

▸ The PTB etymon ***pa*** (HPTB: 24) is better reconstructed as ***pʷa***, as noted in §II.3.6.1.

[37] FATHER PCN *a-pwaʔ

PAo ***t-pwaʔ*** FATHER (371), ***pwaʔ-ti-əɹ*** PRIEST (31)
Lotha **pu^{1}-ti^{3}ʔ** 'priest, village headman'
Sang. **^{1}u^{1}va** 'father'
Yim. ^{1}a^{2}buʔ [**a-puʔ**] 'father' (Weidert 1987: #121)
apuh [**a-puʔ**] 'father' (Kumar 1973b)
< PTB ***p^{w}a*** MAN / FATHER / HUSBAND / PERSON

▸ Lotha **o^{1}-poʔ^{2}** 'father' is excluded from this set, as it could not have descended from PCN ***pwa*** (which > Lotha **pu**), and may have instead developed from a non-extruded variant of PTB ***p^{w}a*** (cf. HE, SHE (3SG) [1]).

The Proto-Ao reflex of PCN FATHER appears to be the first morpheme in PAo ***pwaʔ-ti-əɹ*** PRIEST, whose Lotha cognate is **pu^{1}-ti^{3}ʔ** 'priest, village headman'. (The **-ti-** morphemes are no doubt also cognate, and may mean something like 'sacred' or 'supernatural': see footnote 39 on page 52.) It is tempting to analyze the **pu^{1}** in Lotha 'priest' as the 'mothermorph' **puʔ^{3}**, but its incongruous L tone militates against such an analysis.[117]

Sangtam **va** appears to have resulted from the loss of the PCN ***p-** initial following its reanalysis as a prefix:
PCN ***pwaʔ** > ****p-waʔ** > ****waʔ** > Sang. **va**

[38] BAMBOO$_2$ PCN *pwa/pu

Lotha **ve^{2}-puʔ^{3}**
Sang. ^{2}po [**pu**] (Weidert 1987: #130)
< PTB ***g-p^{w}a** ≷ ***r-p^{w}a*** BAMBOO

▸ Without a Proto-Ao cognate, the PCN form is ambiguous between ***-wa** and ***-u**. If the PCN form was ***pu**, then PTB ***p^{w}a** not only extruded to ****pwa**, but also underwent some early ****-wa** > ****-u** change (one that also affected AXE [66]).

[117] The Lotha 'mothermorph' (cf. Matisoff 1992) is **puʔ^{3}** (with H tone), bearing the sense of 'mother' and also 'principal, main': e.g. **o^{1}-puʔ^{3}** 'mother', **han^{1}-puʔ^{3}** 'mother hen', **joŋ^{3}-puʔ^{3}** 'thumb' (finger-main).

[2] FOOT (PART) PCN *m-ph(w)a

PAo ***t-m-phwa*** FOOT (PART) (373) …
(See FOOT (PART) [2] in §III.3.1.1 for the other reflexes.)
< PTB ***p^{w}a-n*** PALM / SOLE

▸ PTB ***p^{w}a-n*** yielded a PCN etymon with extruded and non-extruded variants: ***m-pha*** (reflected in Lotha, Sangtam, and Yimchungrü) and ***m-phwa*** (reflected only in PAo).

[9] LOINS / GROIN PCN *m-k(w)a

Lotha **ŋ̇^{1}-kuʔ^{3}** ‘groin’
nkvüühüm [**ŋ̇-ku-həm**] ‘pubic hair’ (m-hair) (Lotha 2004: #594)
(See LOINS / GROIN [9] in §III.3.1.2 for the other reflexes and further discussion.)

▸ This PCN form shows rime variation between ***-a*** and ***-wa***, with only Lotha **ŋ̇^{1}-kuʔ^{3}** reflecting the ***m-kwa*** variant.

[39] RAIN PCN *rwa/ru

Chungli **tsəŋ^{1}-lu^{1}**; Lotha **e^{1}-ruʔ^{3}**
< PTB ***r-wa*** ⧓ ***s-wa*** ⧓ ***g-wa*** RAIN

▸ The first syllable of Chungli **tsəŋ^{1}-lu^{1}** ‘rain’ is a reflex of CELESTIAL / SKY / WEATHER [214].
The lack of a PAo reconstruction puts this set in the same position of ambiguity as BAMBOO$_{2}$ [38]. The PCN reconstruction could be ***ru*** or ***rwa*** (with a medial ***-w-***). In both scenarios, PTB ***r-wa*** would have been reanalyzed as ****rwa*** with an ****r-*** initial and ****-w-*** medial. PCN ***ru*** would then be the result of an earlier ****-wa*** > ****-u*** change. (Alternatively, the ****-wa*** > ****-u*** change could have occurred before the reanalysis of the ***r-*** prefix as the root initial.)

*III.3.1.3. *-aj(ʔ)*

PCN ***-aj(ʔ)*** descended from a merger of PTB ***-a-y*** and ***-a(ː)y*** and was preserved in PAo. A chain shift occurred in the development of Lotha that can be analyzed as a drag shift, with PCN ***-aj(ʔ)*** moving to ***-a(ʔ)*** after ***-a(ʔ)*** became ***-o(ʔ)*** (cf. §III.3.1.1):

1. ***-a(ʔ)*** > ***-o(ʔ)***
2. ***-aj(ʔ)*** > ***-a(ʔ)***

Sangtam and Yimchungrü reflexes of PCN ***-aj(ʔ)** largely consist of **-a** and **-i**, but the conditioning environments are unclear due to the limited data.

The modern Mongsen and Chungli reflexes of PAo ***-aj(ʔ)** (see §II.4.1.5) are included under Proto-Ao in the following table to illustrate the widespread independent loss of the palatal offglide in Central Naga:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-a-y, *-a(ː)y	***-aj(ʔ)**	*-aj(ʔ) > Mo -a, Ch -a	-a(ʔ)	-a, -i	-a, -i

*Table 144: PCN **-aj***

Below are the cognate sets for this rime. Some PAo forms denote the rime as ***-a [j]***, indicating that the presence of a PAo ***-aj*** rime is based on extra-Ao evidence (cf. §II.4.1.5).

[40] I, ME (1SG) PCN *aj

Lotha **a**^{3}; Sang. ^{2}**i**; Yim. ^{2}**i** [^{2}]
< PTB ***ŋa-y** 1ST PERSON PRONOUN / SELF

▸ Proto-Ao ***ni** I, ME (1SG) (242) apparently descended from a different PCN form.

[41] SALT PCN *maj

Lotha **o**^{1}**-maʔ**^{3}; Sang. *mi*; Yim. *thimi* [t^{h}**i-mi**]

[42] FACE / SURFACE PCN *hmaj

PAo ***t-ma [j]** FACE / SURFACE (211)
Lotha **o**^{1}**-hmaʔ**^{3} ‘face’
Sang. *aromi* ‘face’
Yim. *mi* ‘face’
< PTB ***s-maːy** FACE

[43] PUS PCN *a-hnaj

Mongsen **ahna-tsə** (m-water); Lotha **e**^{1}**-na**^{2}**-tʃəʔ**^{3} (m-water)
< PTB ***s-naːy** PUS

[44] READ / COUNT PCN *khaj

Lotha **kha³-**
Sang. ²ki [**kʰi**] (Weidert 1987: #577), *khi* (Kumar 1973a)
Yim. ¹ke [**kʰe**] (Weidert 1987: 577), *khe* (Kumar 1973b: 41, 66)

▸ The Yimchungrü **-e** rime is unexpected.

[185] ONE PCN *khaj

(This form appears to be related to PCN ***khat*** HAND, ARM [186] and is discussed with that etymon in §III.3.3.5.)

[45] BABY, CHILD PCN *[h]ŋaj

Lotha **ŋa³-ro?³**
Sang. ¹a²ku²ŋa [**a-kʰu-ŋa**]
Yim. ¹ku¹ŋa¹rɯ [**kʰu-ŋa-rə**]
< PTB ***m/s-ŋa-y*** CHILD / BIRTH / SMALL

[46] HEAR, LISTEN PCN *a-hŋaj

PAo ***a-hŋaj*** (266); Lotha **e¹-ŋa¹-**
< PTB ***r/g-na*** EAR / HEAR / LISTEN

▸ PCN ***a-hŋaj*** appears to have developed from a variant of PTB ***r/g-na*** EAR (cf. PCN EAR [7]) bearing the PTB palatal suffix ***-y***, whose morphological function in this case is unknown.

[47] BLESS PCN *m-ɣaj

PAo ***m-ɣa [j]*** (133)
Lotha **m̩¹-ha¹-**
Sang. *amüwa* [**a-mə-va**], *müvajü* [**mə-va-tʃə**] (Marrison 1967)
Yim. *mühi* [**mə-hi**]

[48] WALK PCN *tsaj

Chungli **tʃa²tʃa²**
Lotha **tsa²-**
Sang. *tse* [**tse**]
Yim. *limtsa-a* [**lim-tsa-a**] (Marrison 1967) (road-m-?)
tsaa [**tsaː**], *tsah* [**tsa?**] (Kumar 1973b)

▸ The PCN ***-aj** rime unexpectedly became **-e** in the Sangtam form. Chungli **tʃa²tʃa²** appears to be a reduplicated form of this root.

[49] CALL PCN *tsaj

PAo ***a-tʃaj** (145); Lotha **tsa¹-**; Sang. *tsicho* [**tsi-tʃʰu**]; Yim. *ji* [**tʃi**]

▸ The Sangtam and Yimchungrü **-i** rimes inexplicably conflict with those in WALK [48].

[50] BE EASY PCN *m-laj

PAo ***m-la [j]** (344)
Lotha **e¹-la³-**
Sang. ¹a¹mɯ¹la [**a-mə-la**]
Yim. ²mɯ²lɯ [¹] [**mə-lə**]
< PTB ***lwa(ː)y** EASY

▸ The reduction in the Yimchungrü rime is unexpected.

[51] NAVEL, BELLY BUTTON PCN *ph-laj

PAo ***t-ph-la [j]** (345); Lotha **n̥¹-la¹**
< PTB ***m/s-la(ː)y** NAVEL / CENTER / SELF

[52] DISEASE, ILLNESS, AILMENT PCN *(h)raj

PAo ***hɹa [j]** (300); Lotha **e¹-ra¹**; Sang. *athsara* [**a-tsʰa-ra**] 'disease' (PFX-hot-m)

*III.3.1.4. *-ej(ʔ)*

PCN ***-ej(ʔ)** descended from PTB ***-ey**. Ao, Lotha, and Sangtam preserved only the high-front offglide as the monophthong **-i(ʔ)**, while Yimchungrü lost the offglide and backed the nucleus from ***-e** to **-o** (or backed the nucleus first to yield ***-oj(ʔ)** before losing the offglide):

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-ey	***-ej(ʔ)**	*-i(ʔ)	-i(ʔ)	-i	-o

*Table 145: PCN *-ej(ʔ)*

[53] THIGH PCN *phej

PAo ***t-phi*** (19); Lotha **o^{1}-phi?^{3}**; Yim. *pho*
< PTB ***pey*** LEG (HPTB); LEG / THIGH / FOOT (STEDT)

▸ PTB ***pey*** is glossed in HPTB as LEG, but has since been updated in the STEDT database to LEG / THIGH / FOOT (20 February 2013).

[54] FIRE PCN *mej(?)

PAo ***mi(?)*** (216); Lotha **o^{1}-mi?^{3}**; Sang. *michang* [**mi-tʃ^{h}aŋ**]; Yim. *mo*
< PTB ***mey*** FIRE

[55] TAIL PCN *a-hmej

Mongsen **[tə]-mi**; Lotha **e^{1}-hmi?^{3}**; Yim. *amo*
< PTB ***r-mey*** TAIL

[56] FRUIT / SEED PCN *a-sej

Lotha	**e^{1}-thi?^{3}** 'fruit / seed'
Sang.	*singsi* [**siŋ-si**] 'fruit' (wood-m)
Yim.	*aso* 'fruit'

< PTB ***sey*** FRUIT / ROSE / ROUND OBJECT

[57] GROUND, EARTH / FIELD PCN *a-lej

PAo	***a-li*** GROUND, EARTH (349)
Lotha	**o^{1}-li?^{3}** 'field (swidden)'
Sang.	*ali* 'earth'
Yim.	*alo* 'earth / land'

< PTB ***m-ley*** ⪤ ***m-ləy*** EARTH / GROUND / SOIL / MUD / COUNTRY

▸ The basic meaning of this root has narrowed somewhat in Lotha to refer to a cultivated plot of land. As in Sangtam and Ao, however, the Lotha reflex can be compounded with FACE / SURFACE [42] to yield 'world / country' (Lotha **li^{3}-hma?^{3}**, PAo ***a-li-ma [j]***, Sang. *alimi*).
See also FIELD / GROUND [88].

[58] TONGUE PCN *m-lej(?)

PAo ***t-m-li*** (351); Lotha **ṇ^{1}-li?^{1}**; Sang. *müli* [**mə-li**]; Yim. *mulo*
< PTB ***m/s-lay*** ⪤ ***s-ley*** TONGUE

▸ This PCN form appears to have descended from a PTB allofam like ***m-ley**, combining aspects of the two allofams presented in HPTB, ***m/s-lay** and ***s-ley**.

[59] BUY PCN *a-hlej

PAo ***a-hli** (337); Lotha **ʃi^{3}-**; Sang. *ali*; Yim. *thulo* [**t^{h}u-lo**]
< PTB ***g/m/s-lay ⩙ *r-ley** CHANGE / EXCHANGE / BUY / BARTER

*III.3.1.5. *-i(ʔ)*

PCN ***-i(ʔ)** is a rare rime, having descended from the weakly attested PTB ***-i** (HPTB: 186). This rime was preserved in Proto-Ao, Lotha, and Sangtam but lowered to **-e** in Yimchungrü (after introducing a palatal component in particular onsets; cf. §III.5.4.2):

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-i	***-i(ʔ)**	*-i(ʔ)	-i(ʔ)	-i(ʔ)	-e

*Table 146: PCN ***-i(ʔ)***

[60] BELT, STRAP, ROPE (WEAVER'S) PCN *a-phi

PAo ***a-phi** (18); Lotha **e^{1}-phiʔ^{3}**
< PTB ***bi** STRING / STRAP / BELT†

[61] SEVEN PCN *th-ni(t)

PAo ***th-ni ⩙ *th-nət** (248)
Sang. ^{1}tɯ$^{(2)}$ñiʔ [**t^{h}ə-n^{j}iʔ**] (Weidert 1987: #593)
thünye [**t^{h}ə-n^{j}e**] (Marrison 1967, Kumar 1973a)
Yim. *thünie* [**t^{h}ə-n^{j}e**] (Marrison 1967)
thüne [**t^{h}ə-ne**] (Kumar 1973b)
< PTB ***s-ni-s** SEVEN

▸ See §II.3.4.2 for the reconstruction of the PAo allofam ***th-nət**, which reflects the PCN variant ***th-nit** with final **-t** (from the PTB allofam ***s-nis**).
Marrison and Kumar both report the Sangtam form with a rime lowered to **-e**, though Weidert records **-iʔ**.
Lotha **tə^{1}-jəŋ^{3}** 'seven' appears not to be cognate to these forms.

[62] TWO PCN *a-ni(t)

PAo ***a-nət*** (263)
Lotha **e^{1}-ni?^{3}**
Sang. ^{1}a^{2}ñɯ [**a-n^{j}ə**]
Yim. *manie* [**ma-n^{j}e**] (Marrison 1967), *mahne* [**maʔ-ne**] (Kumar 1973b)
< PTB ***g/s-ni-s*** TWO

▸ As in SEVEN [61], only the Proto-Ao form reflects the original PTB variant with root-final ***-s*** (cf. §III.3.3.5). The Sangtam rime has reduced to schwa, not unexpected for a high-frequency numeral.

[63] LAUGH / SMILE PCN *m-nəj ⩙ *m-nwi

PAo ***m-nəj*** (255)
Sang. *münyü* [**mə-n^{j}ə**]
Yim. *müne* [**mə-ne**] ‘laugh (v.)’ (Marrison 1967, Kumar 1973b: 96)
*müne**müchih*** [**mə-ne-mə-tʃiʔ**] ‘smile (v.)’ (Kumar 1973b: 82)
< PTB ***m-nwi(y)-k*** LAUGH

▸ The **-e** rime in Yimchungrü ‘laugh’ and ‘smile’ supports the reconstruction of a PCN variant with ***-i***, preserving the allofamic rime variation seen in the PTB etymon. PCN ***-w-*** was lost in Yimchungrü after blocking the palatalization of ***n-*** before ***-i***.

[64] WATER$_{1}$ PCN *ki

Sang. *ki*; Yim. *ke*

▸ The Proto-Ao and Lotha forms for ‘water’ descended from a different etymon (PCN ***a-tʃə*** [97]).

[65] BE, EXIST, LIVE (COPULA) / HAVE PCN *li

PAo ***a-li*** LIVE, BE, EXIST (348)
Lotha **li^{1}-** ‘have / exist, be’
Sang. *li* ‘live (to be alive)’
Yim. *lah* [**laʔ**] ‘be / reside’ ?
< PTB ***s-ri(y)-t*** COPULA / BE / EXISTENCE

▸ The Yimchungrü form is unexpected and likely descended from another etymon.

*III.3.1.6. *-u(ʔ)*

PCN ***-u(ʔ)*** developed from a merger of PTB ***-a(:)w***, ***-əw***, ***-ow***, and ***-u***. One instance of extrusion from PTB ***pʷa*** also yielded PCN **-u** (AXE [66]), while another is ambiguous between PCN ***-wa*** and ***-u*** (BAMBOO$_2$ [38]). (See §III.3.1.2 for examination of other extruded glides that were preserved in PCN.) Finally, one additional set with ambiguity between PCN ***-wa*** and ***-u*** has PTB ***wa*** as its source (RAIN [39]).

This rime was largely preserved as **-u(ʔ)** in the Central Naga languages. In Sangtam and Yimchungrü, however, it was reduced to schwa in some cases for which the conditioning is unclear:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-a(:)w, *-əw, *-ow, *-u *pʷa (*wa ?)	***-u(ʔ)**	*-u(ʔ)	-u(ʔ)	-u, -ə	-u(ʔ), -ə(ʔ)

*Table 147: PCN *-u(ʔ)*

[66] AXE PCN *pu

Chungli **pu^{1}**
Lotha **o^{1}-puʔ^{3}**
Sang. *pü* [**pə**]
Yim. *kü<u>pü</u>* [**kə-<u>pə</u>**]
< PTB ***r-pʷa** AXE

▸ The unusual Mongsen cognate[118] for this set obscures the Proto-Ao form, which is ambiguous between PAo ***pwa*** and ***pu***. While the PTB reconstruction ***r-pʷa*** suggests PCN ***pwa*** (cf. §III.3.1.2), the Sangtam and Yimchungrü **-ə** rimes fit better with PCN ***-u*** than ***-wa***. Given the great time depth of PTB relative to PCN, it is not surprising that at least one instance of extrusion would fail to preserve the extruded ****pwa*** state in PCN. Perhaps some now-lost conditioning factor allowed this particular root to extrude at a much earlier stage than others, making it more susceptible to an earlier ****-wa*** > ****-u*** pressure.

[118] Mongsen has **[a] -u** (GMA: 49) for 'axe', whose cognacy with Chungli **pu^{1}** is uncertain. If the Mongsen form were **pu**, the PAo reconstruction would be ***pu**, while Mongsen **pa** would point to PAo ***pwa*** (see §II.3.6.1).

[67] CARRY (SHOULDER/BACK) PCN *pu(ʔ)

PAo ***a-pu*** CARRY (SHOULDER) (10)
Lotha **pu²-** 'carry (another human on the back)'
Yim. (1)buʔ [**puʔ**] 'carry (on back)'
< PTB ***bəw*** CARRY (ON BACK OR SHOULDERS)

[68] SHOULDER PCN *puʔ

Chungli **ta³-pu³-paŋ²**
Lotha **e¹-puʔ²**
Sang. *pükyang* [**pə-kjaŋ**]
Yim. *tüpuh* [**tə-puʔ**]
< PTB ***baw*** SHOULDER†

▸ The above syllabification of the Sangtam form is an educated guess; if the true syllabification is /pək-jaŋ/, then it is not part of this cognate set.

[38] BAMBOO_2 PCN *pwa/pu

(The rime of this PCN form is ambiguous between ***-wa*** and ***-u***. See BAMBOO_2 [38] in §III.3.1.2 for reflexes and discussion.)
< PTB ***g-pʷa*** ⧓ ***r-pʷa*** BAMBOO

[69] BLOW PCN *phu

PAo ***a-phu*** (21); Lotha **hmu³-**; Sang. *fü* [**fə**]
< PTB ***pu*** BLOW†

[70] POT PCN *phuʔ

Chungli **-puʔ¹** 'pot'
Lotha **o¹-phuʔ²** 'pot'
Sang. *fü* [**fə**] 'pot'
Yim. *pangji-phüih* [**paŋtʃi-pʰəʔ**] 'earthen water-pot'

[71] OIL, GREASE, FAT PCN *thu

PAo ***thu-tsə*** OIL (48)
Lotha **e¹-thu¹** 'fat, grease'
Sang. *tuji* (Marrison 1967), *toji ki* (Kumar 1973a) 'oil': both [**tu-tʃi**]
cf. PKC ***thaaw*** FAT / GREASE (VanBik 2009: #385), PTk ***tʰaw*** FAT (Mortensen 2012: #389), both < PTB ***saːw*** FAT / GREASE / OIL

▸ The possible source of PCN ***thu*** is discussed in §III.5.1.2.

[72] SIBLING (YOUNGER) PCN *nu

PAo ***t-nu*** (249); Lotha **o^{1}-nu^{1}-i?^{3}**
< PTB ***na:w*** YOUNGER SIBLING

[73] HEAD PCN *ku

PAo	***ku*** (56)
Lotha	**ku^{1}-rə?^{3}**
Sang.	*aku*
Yim.	*kuro* (Marrison 1967), *ku* (Kumar 1973b)

< PTB ***m/s-gaw*** HEAD

[74] INTERROGATIVE PRO. PCN *ku
[75] HOW? PCN *ku-ta

PAo	***ku*** INTERROGATIVE PRONOUN (57)	***ku-ta*** HOW? (23)
Lotha	**ku^{1}-thəŋ^{3}** ‘when?’	
	ku^{3}- ‘where?’	**ku^{1}-to?^{3}** ‘how?’
Sang.	*khote* [**k^{h}u-te**] ‘when’ (Kumar 1973b)	
	kotheo [**ku-t^{h}eu**] ‘when?’ (Marrison 1967)	
	khüte [**k^{h}ə-te**] ‘where?’	*khüta* [**k^{h}ə-ta**] ‘how?’
Yim.	*küyimki* [**kə-jimki**] ‘when?’	
	kükheak [**kə-k^{h}jak**] ‘where?’	*kütü* [**kə-tə**] ‘how?’

▸ According to Marrison and Kumar, the rime varies between /u/ and /ə/ in the Sangtam reflexes. Assuming these transcriptions are accurate, the variation may be a high-frequency effect.
The Lotha reflex **ku-** shows (as yet unexplained) tonal alternation between L (‘when?’, ‘how?’) and H (‘where?’).

[76] UNCLE / FATHER-IN-LAW PCN *ku

PAo ***t-ku*** UNCLE (MATERNAL) / FATHER-IN-LAW (58); Sang. *akü* [**a-kə**] ‘uncle’
< PTB ***gəw-n ≋ *kəw-n*** ELDER BROTHER / SENIOR MALE RELATIVE

▸ See §II.3.1.3 for discussion of the Proto-Ao kinship term ***t-ku***.

[77] NINE PCN *t-ku

PAo ***th-ku** (59)
Lotha **to^{1}ku?^{3}**
Sang. *tüku* (Marrison 1967), *tüko* (Kumar 1973b): both [**tə-ku**]
Yim. *tuku* [**tu-ku/tə-ku**]
< PTB ***d/s-kəw** NINE

[78] CHEST PCN *t-ku?

PAo ***t-ku?** (61)
Lotha **te^{1}ki^{1}**
Yim. $^{(1)}$kɯʔ [**k^{h}əʔ**] (Weidert 1987: #788)
khüh [**k^{h}əʔ**] (Kumar 1973b: 48)
< PTB ***k(r)u** CHEST / RIB†

▸ The Lotha rime appears to be the result of some irregular development.

[79] HOLE PCN *a-ku ≋ *a-khən

Mongsen **kupa?** 'hole'

Chungli **ta^{3}-ki?^{3}** 'hole'

Lotha **o^{1}-ku?^{3}** 'hole'

Sang. *akhi* [**a-k^{h}i**] 'hole' (Marrison 1967, Kumar 1973a)
^{1}naŋ^{1}ki [**naŋ-k^{h}i**] 'ear' (ear-m$_{2}$) (Weidert 1987: #162)
nangkhi [**naŋ-k^{h}i**] 'ear' (ear-m$_{2}$) (Marrison 1967)

nangku [**naŋ-ku**] 'ear' (ear-m$_{1}$) (Kumar 1973a)

Yim. *akhün* [**a-k^{h}ən**] 'hole' (Kumar 1973b)
nükhün [**nə-k^{h}ən**] 'ear' (ear-m$_{2}$) (Marrison 1967, Kumar 1973b)
^{2}nɯ^{2}kɯn [**nə-k^{h}ən**] 'ear, earhole' (ear-m$_{2}$) (Weidert 1987: #162)

^{2}nu^{2}gu [**nu-ku**] 'ear' (ear?-m$_{1}$) (Weidert 1987: #162)

< PTB ***kor ≋ *kwar** HOLE / PIT / VALLEY / CAVE

▸ PCN HOLE consists of two allofams: ***a-ku*** and ***a-khən***. PCN ***a-ku*** may have descended from PTB ***kor***, assuming a sporadic loss of the coda yielded ****ko** > PCN ***ku***, while PCN ***a-khən*** could reflect either PTB ***kor*** or ***kwar***.

Mongsen and Lotha reflect PCN ***a-ku***, while Chungli **ta^{3}-ki?^{3}** may have been borrowed from Sangtam **a-k^{h}i** 'hole'. Sangtam and Yimchungrü have forms that descended from both allofams:

Sangtam **a-k^{h}i** and the second syllable of **naŋ-k^{h}i** 'ear' (Marrison 1967, Weidert 1987) both mean 'hole' and descended from PCN ***a-khən***. Kumar 1973a, however, gives a variant form of 'ear': **naŋ-ku**, the second syllable of which apparently reflects the PCN allofam ***a-ku***.

Yimchungrü **a-k^{h}ən** and the second syllable of **nə-k^{h}ən** 'ear' (Marrison 1967, Kumar 1973a) both mean 'hole' and descended from PCN ***a-khən***. This time, Weidert provides the variant form of 'ear': **^{2}nu^{2}gu** [nu-ku] (1987: #162), the second syllable of which descended from PCN ***a-ku***. The first syllable of **nu-ku** 'ear' may reflect some exceptional vowel-harmonizing development of PCN ***hna?*** EAR [7] (which normally yielded Yimchungrü **nə**, not **nu**).

[80] WOUND, INJURY / SCAR PCN *khu?

PAo ***khu-ma** WOUND, SORE (76)
Lotha **o^{1}-khu?^{2}** 'wound, fresh injury / scar'

▸ Proto-Ao has concatenated PCN ***khu?*** WOUND, INJURY / SCAR with ***hma*** WOUND, SORE [4] into a single compound: PAo ***khu-ma*** WOUND, SORE.

[81] SMOKE PCN *khuʔ

PAo ***mu-khu-ləj** SMOKE (78)

Lotha **mi³-khuʔ²** ‘cigarette’ (fire-m), **mo³-khuʔ²** ‘tobacco’ (?-m)

Sang. *mikhu* [**mi-kʰu**] ‘smoke’ (fire-m) (Marrison 1967, Kumar 1973a)
mükhütsu [**mə-kʰə-tsu**] ‘tobacco’ Marrison 1967)
mükhutsong [**mə-kʰu-tsuŋ**] ‘tobacco’ (Kumar 1973a)

Yim. ¹mo(ˀ)kɯʔ [**mo-kʰəʔ**] ‘smoke’ (fire-m) (Weidert 1987: #302)
mokhü [**mo-kʰə**] ‘smoke’ (fire-m) (Marrison 1967)
mokhüh [**mo-kʰəʔ**] ‘smoke’ (fire-m) (Kumar 1973b: 62)

< PTB ***kəw-n/t** SMOKE

- The first syllables of Lotha ‘cigarette’,[119] Sangtam ‘smoke’, and Yimchungrü ‘smoke’ appear to reflect PCN FIRE (***mej(ʔ)** [54]). The first syllable of PAo ***mu-khu-ləj** SMOKE may also be a reflex of ***mej** that has undergone sporadic vowel harmony with the root syllable. The word-initial **mo-/mə-** morphemes in Lotha and Sangtam ‘tobacco’, however, exhibit an unusual rime correspondence (Lotha **-o** : Sang. **-ə**) and therefore have an unknown origin.

[82] COUGH (v.) PCN *a-khu(t)

PAo ***akhət** (86); Lotha **e¹-khu³-**; Sang. *khu*; Yim. *akhü* [**a-kʰə**]
cf. PKC ***khuʔ** COUGH (VanBik 2009: #433), PTk ***kʰa** COUGH (Mortensen 2012: #324)

- The final ***-t** in Proto-Ao may have come from a PCN suffix or syllable coda which was lost in the other daughter languages, but the onomatopoetic nature of this word makes its reconstruction unreliable.

[119] Lotha ‘smoke’ is **mi³phoŋ³** (fire-?), whose second syllable has an unknown origin.

[83] TWENTY PCN *mu-kju

Mongsen **məki**
Chungli **mə^{2}tsə^{2}**
Lotha **mju^{1}kju?^{1}**
Sang. *mükyü* [**məkjə**]
Yim. ^{2}mu^{2}gu [^{2}] [**muku**]
< PTB ***m-kul** TWENTY / ALL

▸ The unusual correspondences of this set, combined with the potential for numerals to exhibit irregular developments, make TWENTY a challenging reconstruction. Lotha and Sangtam point to a medial palatal glide ***-j-**, which appears to have fallen out in the Yimchungrü form. PCN ***kju** may have yielded Mongsen **ki** through loss of the vowel nucleus, while the Chungli form possibly resulted from PCN ***kj-** > Chungli **ts-**, though no other cognate sets have been found yet to corroborate these hypotheses (but cf. PAo FOOT / LEG (194) for an example of PTB ***ky-** > PAo ***ts-**).

The reconstruction of this PCN form as a disyllable with ***mu-** is supported by the Lotha reflex, which has a fully vocalized initial syllable with no place assimilation of the nasal to the root-initial ***k-** (which would point to the PCN nasal prefix ***m-**). The medial glide **-j-** in Lotha **mju-** may have arisen through some sort of harmony with the **kju** syllable.

With regard to the PTB etymon, it is possible that ***kul** underwent sporadic metathesis and glide palatalization to yield ***kul** > ***klu** > ***kju**, but this is highly speculative.

[84] BE BORN / GIVE BIRTH PCN *su(?)

PAo ***a-su(?)** BE BORN / GIVE BIRTH (99)
Sang. *suro* [**su-ru**] ‘give birth’
< PTB ***g-sow** REAR (CHILD) / BEAR (CHILD)

▸ Note that Marrison’s Sangtam *suro* ‘give birth’ is identical to ‘awake (v.)’ in LIFT / AWAKEN [85].
The voiced initial **z-** in Yimchungrü *züpe* [**zə-pe**] ‘give birth’ renders its relationship to this set uncertain.

[85] LIFT / AWAKEN PCN *m-su

PAo ***m-su** LIFT / AWAKEN (98)
Lotha **n̥[1]-thi[2]-tʃhi[1]-** 'awaken (someone)' ?
Sang. *thimüsu* [**t[h]i-mə-su**] 'lift', *thimüsü* [**t[h]i-mə-sə**] 'raise' [120]
jesu [tʃe-su], *suro* [**su-ru**] 'awake (v.) / awaken'
(all Marrison 1967)
Yim. *yimusu* [**ji-mu-su**] 'awake (v.) / awaken'
< PTB ***m-sow** ARISE / AWAKE(N)

▸ While the prefix and initial of the Lotha form are completely regular, the rime development of PCN ***-u** > Lotha **-i** is irregular and has no explanation as of yet.
The transcriptions of the Sangtam reflexes show apparent variation between /u/ and /ə/, though it is possible that Sangtam **t[h]i-mə-sə** 'raise' is cognate to Chungli **mə[2]sə[2]** 'raise, rear (children)' instead of PAo ***m-su** LIFT / AWAKEN (98).

[86] SWALLOW (v.) PCN *m-lju(k)

PAo ***m-juk** (283)
Lotha **n̥[1]-ʒə[1]-**
Sang. [1]mɯ[1]ñɯ [**mə-n[j]ə**]
Yim. *muyou* (Marrison 1967), *muyu* (Kumar 1973b): both [**mu-ju**]
< PTB ***mlyəw-k** SWALLOW (v.)

▸ The PTB alternation between the open- and closed-syllable forms of SWALLOW was apparently preserved even as late as PCN, with only the Ao branch inheriting the closed-syllable variant.
The PCN ***-u** rime has merged with the central **-ə** phoneme in the Lotha form following ****ʒ-**. (Schwa is the only vowel that follows the **ʒ-** initial in Lotha.)

[87] BOIL (v.) PCN *m-lu

PAo ***m-lu** BOIL (vt.) (353); Sang. *mülocho* [**mə-lu-tʃ[h]u**] 'boil (v.)'

[120] James Matisoff has noted an amusing and entirely coincidental similarity to the Italian dessert *tiramisu*, lit. 'pick me up' (p.c., 3 December 2013).

[88] FIELD / GROUND PCN *hlu

PAo ***a-hlu*** FIELD (338)
Sang. *lu* 'field'
Yim. ^{2}a^{2}guŋ^{1}lu [**a-kuŋ-lu**] 'field, ground' (dry?-m)
< PTB ***low*** FIELD

[89] WORD / LANGUAGE PCN *a-(h)ju

PAo ***(a-)hju*** WORD (279)
Lotha **o^{1}-ji?^{1}** (/**o-jə?**/ ?) 'language / word' ?
Sang. *yu* [**ju**] 'word / speech'
Yim. *thiyu* [**t^{h}i-ju**] 'language' (Kumar 1973b)
thiyou [**t^{h}i-ju**] 'voice / news / talk (v.) / word' (Marrison 1967)
cf. PKC ***ʔoo*** SOUND / VOICE

▸ The Lotha form is synchronically and diachronically problematic: While it is possible that all instances of Lotha [ji] are underlying /jə/, the reduction of PCN ***-u*** to Lotha schwa following ***j-*** is doubtful, given the numerous Lotha forms with unreduced [ju].

[39] RAIN PCN *rwa/ru

(The rime of this PCN form is ambiguous between ***-wa*** and ***-u***. See RAIN [39] in §III.3.1.2 for reflexes and discussion.)
< PTB ***r-wa*** RAIN

[90] WEIGH PCN *hju ⩤ *hu ?

PAo ***hju*** (278); Lotha **fə^{3}-**; Sang. *hothing* [**hu-t^{h}iŋ**] 'weight'

▸ With one exception (in **fə^{3}fo?^{3}** 'cowrie, shell', most likely a loan), Lotha initial **f-** is always followed by schwa. In this case, the development of the initial ***h-*** to **f-** was triggered by PCN ***-u***, then resulted in ***-u*** reducing to Lotha **-ə**.

[91] STEAL PCN *a-hu

Chungli **a^{2}u^{3}-ja?^{1}**; Lotha **e^{1}-fə^{2}-**; Sang. *fü* [**fə**]; Yim. ^{2}a$^{(2)}$hɯ? [**a-hə?**]
< PTB ***hu*** STEAL

▸ As in WEIGH [90], PCN ***-u*** has been reduced to **-ə** in Lotha following **f-**.

*III.3.1.7. *-ə(ʔ)*

PCN ***-ə(ʔ)*** resulted from the (conditioned) reduction of various PTB rimes and was preserved in the Central Naga languages, though two Yimchungrü reflexes contain an unexpected **-u** rime:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
conditioned: *-i, *-u uncond.: *-i(ː)l, *-al, *-uːl	***-ə(ʔ)***	*-ə(ʔ)	-ə(ʔ)	-ə	-ə, -u

*Table 148: PCN *-ə(ʔ)*

Based on the few cognate sets below, the conditions for PTB rime reduction to PCN schwa are as follows:

PTB rime		*Reduction environment*
*-i	/	*kr _
*-u	/	*tsy _ , *dz(y) _
*-i(ː)l, *-al, *-uːl	/	(unconditioned)

Table 149: PTB rimes > PCN schwa

[92] BILE / GALL BLADDER PCN *a-sə

PAo ***t-(a-)sə*** (102)
Lotha **o[1]-tshə?[3]**
Sang. [1]a[2]sɯ [**a-sə**]
Yim. [2]a[2]sɯ [[1]] [**a-sə**]
< PTB ***krəy ≈ *m-kri(y)-t-s*** GALL / BILE / SOUR

- The PTB reconstructions indicate allofamic variation between **-əy** and **-i**, but the Yimchungrü schwa rime points to a PCN form with ***-ə*** (instead of ***-əj**), which in turn indicates PTB ***kri*** as the appropriate PTB root.

[93] CLOTH / SHAWL PCN *a-ʃə

PAo ***(a-)sə*** CLOTH / SHAWL (100)
Lotha **o[1]-sə?[3]** 'cloth / clothes'
Sang. *shü* [**ʃə**] 'cloth'

[94] MITHUN, GAYAL (BOS FRONTALIS) PCN *tshə

PAo *(a-)tʃhə (178)
Lotha tshə^{1}-ro?^{3}
Sang. *thsüza* [ts^{h}ə-za]

[95] TIE (v.) PCN *m-tshə

PAo ***m-tʃhə** (179); Lotha **ṇ^{1}-tshə^{3}-**

[96] EGG PCN *tʃə

PAo ***hən-tsə** EGG (chicken-m) (185); Lotha **e^{1}-tʃə^{1}**
< PTB ***dz(y)u** EGG

▸ The PTB ***-u** rime reduced to PCN schwa following PTB ***dz(y)-**.
Sangtam *ake* (Marrison 1967), *hanakyü* [**hana-kjə**] (Kumar 1973a), and Yimchungrü *thunuke* [**t^{h}unu-ke**] (Kumar 1973b) (all 'egg') reflect a different etymon (not reconstructed herein).

[97] WATER$_{2}$ PCN *a-tʃə

PAo ***(a-)tsə** (182); Lotha **o^{1}-tʃə?^{3}**
< PTB ***tsyu** WATER / BODY FLUID

▸ In a parallel to EGG [96], the PTB ***-u** rime reduced to PCN schwa following PTB ***tsy-**. Again, the Sangtam (*ki*) and Yimchungrü (*ke*) forms for 'water' reflect a different etymon (PCN ***ki** [64]).

[98] SALIVA, SPITTLE / SPIT (v.) PCN *m-tʃə

PAo ***m-tsə** SALIVA, SPITTLE (184)
Lotha **ṇ^{1}-tʃə^{1}** 'saliva, spittle'
Sang. *müjü* [**mə-tʃə**] 'spit (v.)'
< PTB ***m-ts(y)il** ≷ ***m-tśril** SPIT / SPITTLE / SALIVA

▸ PTB ***-il** reduced to PCN ***-ə**, perhaps unconditionally.
Yimchungrü *mükhiuki* [**mək^{h}juki**] 'spit (v.)' (Marrison 1967) reflects a different etymon.

[99] ICE, SNOW, HAIL PCN *rə(ʔ)

Chungli **rə³-tʃəp³** ‘snow / ice / hail’
Lotha **ʃe¹rəʔ¹** ‘hail’
Sang ²šu¹rɯ [**ʃu-rə**] ‘hail’
Yim. *aru* ‘snow / hail’
< PTB ***ryal** HAIL / ***ser** HAIL / SLEET

▸ More than one option exists for the PTB etymon. While areal data supports the choice of PTB ***ryal** (cf. PNN **ryəːr** HAIL [French 1983: 499], PKC ***rial** HAIL [VanBik 2009: #946]), the Lotha and Sangtam forms could just as easily reflect PTB ***ser** with an echo vowel.[121]

The unexpected Yimchungrü **-u** rime could be a mistranscription of schwa, though *u* is given in both Kumar 1973b and Marrison 1967. (It is highly possible, however, that some of the Yimchungrü data in both of these works derives from the same primary sources.)

[100] SNAKE PCN *ph-rə

Chungli **pəɹ¹²**
Lotha **n̥¹-rə¹**
Sang. ¹mɯ¹rɯ [**mə-rə**]
Yim. *phuru* (Marrison 1967), *phuruto* (Kumar 1973b)
< PTB ***s-b/m-ruːl** SNAKE

▸ The Chungli reflex underwent resyllabification to shift **r-** into the coda position.
As in ICE / SNOW / HAIL [99], Yimchungrü *u* is unexpected and supported by two sources, though it could be a mistranscription of **ə**.

[101] INTESTINES PCN *a-(h)rə

PAo ***t-(a-)hɹə** (304); Lotha **e¹-rə¹**; Sang. *ghü* [**ɣə**]
< PTB ***riːl** BELLY / STOMACH / INTESTINES

*III.3.1.8. *-əj(ʔ)*

PCN ***-əj(ʔ)** descended unchanged from PTB ***-əy**. The diphthong was largely preserved in Proto-Ao, except where the offglide was lost following PCN ***(h)r-** and ***s-**. Lotha and

[121] See CHICKEN [165] for another example of a PCN echo vowel.

Sangtam also lost the offglide across the board. In Yimchungrü, PCN ***-əj(ʔ)** was monophthongized to **-i** in most cases, but yielded **-e** following PCN ***(h)r-** and ****ʃ-** (< PCN ***s-** / _ ***-əj**):

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-əy	***-əj(ʔ)**	*-ə(ʔ) / *(h)r, *s _ *-əj(ʔ) elsewhere	-ə(ʔ)	-ə	-e / *(h)r, **ʃ _ -i(ʔ) elsewhere

*Table 150: PCN ***-əj(ʔ)***

As with the palatal conditioning environments in Proto-Ao (§II.4.6), this PCN rime yielded spirantization/palatalization of various initial consonants in Lotha, Sangtam, and Yimchungrü: ***s-** (§III.5.2.1), ***(h)n-** (§III.5.4.2), ***hr-** (§III.5.5.3), and ***(h)l-** (§III.5.5.4).

[102] PERSON, HUMAN PCN *a-[h]məjʔ

PAo ***(a-)məjʔ** (226)
Sang. *amüi tsurü* [**a-mə-i tsurə**]
Yim. *mihtsürü* [**miʔ-tsərə**]
< PTB ***r-mi(y)-n** MAN / PERSON

▸ The [əi] sequence in Sangtam *amüi tsurü* 'human' (Kumar 1973a) is more likely a heteromorphemic diphthong involving some suffix than an exceptional preservation of PCN ***-əj**.

[103] SUN / DAY PCN *nəj

PAo ***nəj** SUN / DAY (253)
Sang. [1]ñɯ [**nʲə**] 'sun'
Yim. [2]a[2]ñi [[2]] [**a-nʲi**] 'sun' (Weidert 1987: #216)
ani 'sun', *nimung* [**ni-muŋ**] 'day' (Marrison 1967, Kumar 1973b)
< PTB ***nəy** SUN / DAY

▸ It is unclear whether Lotha **e[1]-ŋ[1]** 'sun' belongs in this set.

[63] LAUGH / SMILE PCN *m-nəj ⩙ *m-nwi

PAo ***m-nəj** (255); Sang. *münyü* [**mə-nʲə**]
(See LAUGH / SMILE [63] in §III.3.1.5 for the other reflexes and discussion.)
< PTB ***m-nwi(y)-k** LAUGH

▸ This PCN form shows variation between ***-əj** and ***-wi**, with the the ***-əj** variant reflected only in the PAo and Sangtam forms.

[104] DOG PCN *khjəj ?

PAo ***a-jəj** (298)
Lotha **fə^{3}-ro?^{3}**
Sang. *füza* [**fə-za**]
Yim. $^{(2)}$ki?^{1}nu [**k^{h}i?-nu**] (Weidert 1987: #269)
khinu [**k^{h}i-nu**] (Marrison 1967)
khihnupung [**k^{h}i?-nu-puŋ**] (Kumar 1973b)

< PTB ***d-k^{w}əy-n** DOG

[105] FECES, EXCREMENT PCN *a-khləj? ?

Mongsen **[a] -tsə́?**
Chungli **sə?^{1}**
Lotha **o^{1}-tʃhə?^{2}**
Sang. ^{2}tšɯ [**tʃ^{h}ə**] 'excrement' (Weidert 1987: #272)
chü [**tʃ^{h}ə**] 'dung' (Marrison 1967)
Yim. $^{(1)}$ki? [**k^{h}i?**] 'excrement' (Weidert 1987: #272)
moshi-khih [**moʃi-k^{h}i?**] 'dung' (cow-m) (Kumar 1973b: 42)

< PTB ***kləy** EXCREMENT

▸ While the rime correspondences are regular, the initials pose some challenges (see §III.5.8.3).

[106] DIE PCN *səj

PAo ***a-sə** (101); Lotha **tʃhə^{1}-**; Sang. *sü* [**sə**]; Yim. *she* [**ʃe**]

< PTB ***səy** DIE

▸ Following PCN ***s-**, ***-əj** yielded **-ə** in Proto-Ao and **-e** in Yimchungrü (which first palatalized ***s-** to **ʃ-**; see the initial discussion in §III.5.2.1).

[107] SEED PCN *ma-tʃəjʔ ?

Chungli **mə³-tsəʔ³** ‘seed for planting’
Lotha **mo¹-tʃəʔ²** ‘seed’
Sang. *majü* [**ma-tʃə**] ‘seed’
Yim. *muji-i* [**mu-tʃi-i**] ‘seed’ (Marrison 1967)
müjih hiukhi [**mə-tʃiʔ hjukʰi**] ‘sow’ (Kumar 1973b: 76)

< PTB ***dzəy*** SEED

▸ Kumar 1973b provides the final glottal stop lacking in Marrison’s transcription of Yimchungrü ‘seed’. Note that Marrison and Kumar conflict in whether the first syllable of Yimchungrü ‘seed’ is **mə** or **mu**, though **mə** would be expected from PCN ***ma**.
The lack of nasal place assimilation in the Lotha form supports the reconstruction of a PCN disyllable with a fully vocalized initial syllable. The PCN ***ma-** syllable regularly yielded Lotha **mo-**, Sangtam, **ma-**, and Yimchungrü **mə-** (cf. §III.3.1.1), and the Chungli **mə-** reflex appears to be a reduction due to the unstressed initial position.

[108] BLOOD PCN *a-(h)jəjʔ

PAo ***a-jəjʔ*** (299); Sang. *ashü* [**a-ʃə**]; Yim. *thiyih* [**tʰi-jiʔ**]

< PTB ***s-hywəy*** BLOOD

▸ Lotha **e¹-tʃen³** ‘blood’ evidently has a different source, possibly PTB ***t(y)a-n*** RED (HPTB: 262) (cf. PKC **shan ⧓ shen** RED [VanBik 2009: #692]).

[109] BOUNDARY, BORDER PCN *a-rəjʔ

PAo ***a-ɹəʔ*** (319)
Lotha **e¹-rəʔ³**
Sang. *lurü* [**lu-rə**] (field-m)
Yim. *aretung* [**a-re-tuŋ**]

< PTB ***b-rəy*** DRAW / WRITE / COUNT (HPTB); DRAW, MARK; BOUNDARY (STEDT)

▸ Following PCN ***r-**, ***-əjʔ*** yielded **-e** in Yimchungrü and **-əʔ** in Proto-Ao.
The PTB etymon ***b-rəy*** appears in HPTB without the BOUNDARY protogloss but has since been updated in the STEDT database (20 June 2012).

[110] CANE, RATTAN PCN *a-(h)rəj

PAo ***a-hɹə*** (303)
Lotha **o^{1}-rə?^{3}**
Yim. ^{2}ti^{2}re [^{1}] [**t^{h}i-re**]
< PTB ***s-rwi(y)*** CANE / RATTAN / ROPE

▸ Following PCN ***(h)r-***, ***-əj*** yielded **-e** in Yimchungrü and **-ə** in Proto-Ao.

[111] SEW, STITCH PCN *hrəj

PAo ***a-hɹə*** (302); Lotha **və^{3}-**; Sang. *ghü* [**ɣə**]; Yim. *thire* [**t^{h}i-re**]

▸ As in CANE, RATTAN [110], PCN ***-əj*** following ***hr-*** yielded Yimchungrü **-e** and PAo **-ə**.

[112] FOUR PCN *phV$_{?}$-ləj

PAo ***ph-ləj*** (328); Lotha **me^{1}-ʒə^{1}**; Sang. *müzyü* [**mə-ʒə**]; Yim. *phiyi* [**p^{h}i-ji**]
< PTB ***b-ləy*** FOUR

▸ The vowel quality of the initial ***phV$_{?}$-*** syllable in PCN FOUR is unknown. (See the discussion of this set in §III.5.5.4.)

[113] MEDICINE, CREAM PCN *mV$_{?}$-ləj ?

PAo ***muləj*** MEDICINE, DRUG (217)
Lotha **mo^{1}-ʒə^{1}** 'medicine, cream'
Sang. *moi* [**mu-jə** ?] 'medicine'
Yim. *molijih* [**mo-li-tʃi?**] 'pill' (m-seed?)
moliyam [**mo-li-jam**] 'hospital' (m-house)

▸ See the discussion in §II.3.5.4 for a possible PTB source.

[114] VINE / VEIN / SINEW PCN *th-ləj?

PAo ***(t-)hləj*** VINE / VEIN (330)
Lotha **tho^{2}-ʒə?^{2}** 'sinew' (nerves/power-m)
Yim. *thiyihru* [**t^{h}i-ji?-ru**] 'vein'
cf. PKC ***tha-ruy*** ⨳ ***-hruy*** VEIN / ARTERY / SINEW (VanBik 2009: #418)

▸ The first syllable of Lotha 'sinew' (from **e^{1}-tho?^{2}** 'nerves / power, strength') reflects PCN ***a-sa?*** NERVE, VEIN / POWER, STRENGTH [14].

[115] FLEA PCN *a-hləj(ʔ)

PAo ***a-hləj*** (331); Lotha **te[1]ʒəʔ[1]**; Sang. *ashüti* [**a-ʃə-ti**]
< PTB ***s-ləy** FLEA

III.3.2. Bilabial Codas

Proto-Central Naga contained the bilabial codas ***-m*** and ***-p***, which descended unchanged from PTB.

The correspondences exhibited by the Central Naga **m**-final rimes generally fall into the following three (unconditioned) sets:

Corr. #	*PTB*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
1	*-am	*-əm	-an	-aŋ	-im
2	*-um, *-im	*-əm	-əm	-aŋ	-am
3	*-um, *-im, *-wam, *-em	*-əm	-əm	-əm	-əm

*Table 151: PCN ***-m** correspondences*

This reconstruction is particularly challenging, due to patterns of overlap among these rime correspondences:

#1 and #2 overlap in CN reflexes (both have PAo ***-əm*** and Sangtam **-aŋ**)
#2 and #3 overlap in CN reflexes (PAo ***-əm***, Lotha **-əm**) and PTB sources (***-um**, ***-im**)

Moreover, although the CN reflexes that descended from PTB etyma with an ***-a-*** nucleus nearly all exhibit correspondence #1, Sangtam reflexes with an **-a-** nucleus fall into both #1 and #2, while Yimchungrü only has **-a-** in #2. Adding to the complexity, it should be noted that these correspondences sets are only generalizations: not every cognate set falls neatly into one of the three categories.

Selecting PCN reconstructions for these rimes therefore involves compromise, prioritizing certain pieces of evidence over others. In this case, I have decided to prioritize the CN forms over their hypothesized PTB etyma:

> The existence of Sangtam **-aŋ** and Yimchungrü **-am** in #2 are taken as evidence for the reconstruction of PCN ***-am***, which Lotha reduced to **-əm** (just as PCN ***-ap*** was reduced to Lotha **-əp**; see §III.3.2.5).

The PCN relationship between #1 and #2 is reconstructed as one of vowel length: #1 points to PCN ***-aːm**, which was merged with ***-am** in Sangtam to yield **-aŋ** but kept separate in Lotha to yield **-an**. (How Yimchungrü developed **-im** from ***-aːm** is unclear.)

Finally, the uniform correspondence of **-əm** in #3 is straightforwardly reconstructed as PCN ***-əm**.

(In all these cases, Proto-Ao reduced the vowel nucleus to yield ***-əm**.)

For the **p**-final rimes, the reconstructed contrast between PCN ***-ap** and ***-əp** depends solely on Yimchungrü **-ap** vs. **-əp**, while the other languages reduced all ***p**-final rimes to **-əp**.

The development of the PCN bilabial-final rimes is summarized in the following table:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-am	***-aːm**	*-əm	-an	-aŋ	-im
*-um, *-im	***-am**		-əm		-am
*-um, *-im, *-wam, *-em	***-əm**			-əm	-əm
*-up/ip	***-ap**	*-əp	-əp	-əp	-ap
*-up/ip, *-op/wap, *-ep	***-əp**				-əp

Table 152: PCN bilabial-final rimes

*III.3.2.1. *-aːm*

PCN ***-aːm** descended from PTB ***-am** and was altered in all Central Naga languages, yielding Proto-Ao ***-əm**, Lotha **-an**, Sangtam **-aŋ**, and Yimchungrü **-im**:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-am	***-aːm**	*-əm	-an	-aŋ	-im

*Table 153: PCN ***-aːm***

[116] SMELL / STINK PCN *m-hnaːm

PAo ***m-hnəm** SMELL (vi./vt.) (236)
Lotha **n̥[1]-nan[1]-** 'stink, emit a bad smell'
Sang. *nyüm* [**nʲəm**] 'stink (v.)' ?
Yim. *münim* [**mə-nim**] 'smell (v./n.)'
< PTB ***m/s-nam** SMELL

▸ As mentioned above, some cognate sets do not fall neatly into one of the three correspondence categories. While the Proto-Ao, Lotha, and Yimchungrü forms unambiguously support PCN ***-aːm**, the Sangtam form seems rather to reflect ***-əm**.

[117] FIFTY PCN *th-njaːm

PAo ***th-nəm** (261)
Lotha **ti[1]-njan[1]**
Sang. *thünyang* [**tʰə-nʲaŋ**]
Yim. *thünim* [**tʰə-nim**]

[118] HEADSTRAP, TUMPLINE PCN *a-hnjaːm

Chungli **a[3]-nəm[1]**; Lotha **o[1]-hnjan[3]**
cf. PTk ***nam** BASKET STRAP (Mortensen 2012: #433)

[119] DOOR PCN *khaːm

Lotha **khan[3]khan[3]** 'door (bamboo)'
khan[3]- 'shut, close' ?
Sang. *kukhang* [**ku-kʰaŋ**] 'door' (house-m)
khangti [**kʰaŋ-ti**] 'shut' (m-?)
khangthru [**kʰaŋ-tʰru**] 'open' (m-?)
Yim. *thiyamkhim* [**tʰi-jam-kʰim**] 'door' (PFX-house-m)
khimshuh [**kʰim-ʃəʔ**] 'open' (m-?)
< PTB ***kam** DOOR†

▸ The relationship of Lotha **khan[3]-** 'shut, close' to **khan[3]khan[3]** 'door (bamboo)' is unclear, but they may reflect the same etymon.

[120] RUN / WALK PCN *a-ʃaːm

PAo ***a-səm** RUN (104)
Lotha **e^{1}-san^{1}-** 'run'
Sang. *shang* [**ʃaŋ**] 'walk', *shangvü* [**ʃaŋ-və**] 'run'
Yim. *shan* [**ʃan**] 'run' ?
cf. PTk ***sam** RUN / FLEE (Mortensen 2012: #440)

▸ The Yimchungrü **-an** rime is unexpected, and does not appear in any other cognate set involving PCN ***-m**.

[121] HAIR (FACE / HEAD) PCN *a-tshaːm

Chungli **paŋ^{3}səm^{1}** 'beard' (mouth-m)
Lotha **o^{1}-tshan^{3}** 'hair (head)'
Sang. *anbü atsa* [**anpə a-tsa**] 'fine hair' ?
< PTB ***tsam** ⪤ ***sam** HAIR (HEAD)

▸ The loss of ***-m** in Sangtam 'fine hair' is anomalous (but cf. POISON (n.) [144]).

[122] SEARCH, SEEK$_2$ PCN *jaːm

PAo ***a-jəm** (291)
Lotha **jan^{3}-**
Sang. *yangchi* [**jaŋ-tʃʰi**]
Yim. *yim* [**jim**]

[123] JUNGLE, FOREST PCN *raːm

Chungli **a^{1}-ɹəm^{2}**
Lotha **o^{1}-ra?^{2}** 'jungle', **ran^{1}-fə?^{3}** 'wolf' (m?-dog)
Sang. *rangmü* [**raŋ-mə**]
Yim. *rim*
< PTB ***ram** FOREST / JUNGLE / FIELD / COUNTRY

▸ The invariant **-a?** rime in Lotha **o^{1}-ra?^{2}** 'jungle' is unexpected. As discussed in §III.2.1.4, final **-n** can be realized as a glottal stop with nasalization on the preceding vowel. However, **o^{1}-ra?^{2}** shows no nasalization and does not vary with **o^{1}-ran^{2}**. The **ran^{1}** syllable in Lotha **ran^{1}-fə?^{3}** 'wolf' may be a better candidate for reflecting this etymon, but my consultant does not recognize this syllable as meaning 'jungle'. The tone discrepancy also reveals that **ran^{1}** (L tone) cannot be a fuller form of **-ra?^{2}** (M tone).

[124] OTTER PCN *raːm

Mongsen **siɹəm**; Lotha **te¹-ran³**
< PTB ***s-ram** OTTER

[125] SPIRIT / DEMON PCN *hraːm

PAo	***tsəŋ-hɹəm** GOD, DEITY (305)
Lotha	**tsəŋ³-hran¹** ‘demon’
Sang.	*tsingrangba* [**tsiŋ-raŋ-pa**] ‘God’
Yim.	*rimri* ‘spirit’ (Marrison 1967), *arimri* ‘demon’ (Kumar 1973b: 85)

▸ The first syllables of the PAo, Lotha, and Sangtam forms all reflect the PCN CELESTIAL / SKY / WEATHER morpheme ***tsiŋ*** [214].

[126] PATH, ROAD, WAY PCN *laːm

Chungli	**lən¹** ‘path, road, way’ ?
Lotha	**o¹-lan³** ‘road’
Sang.	*lang* [**laŋ**] ‘road’
	milang [**mi-laŋ**] ‘dream (n.)’ (sleep?-m) (Marrison 1967)
	melang [**me-laŋ**] ‘dream (n.)’ (sleep?-m) (Kumar 1973a)
Yim.	**¹lim¹ro** ‘way / road’
	milim ‘dream (n.)’ (sleep?-m)

< PTB ***lam** ROAD

▸ Chungli **lən¹** is irregular (**ləm** is expected), but perhaps its form has been influenced by contact with Lotha.
Sangtam and Yimchungrü ‘dream (n.)’ appear to be cognate compounds in which the second morpheme means ‘road / way’. The initial **mi-/me-** morphemes most likely mean ‘sleep’ and possibly reflect PTB ***r/s-mwəy** SLEEP (HPTB: 195, 200), but the Sangtam sound change would be irregular, as PTB ***-əy** is expected to yield Sangtam **-ə** (§III.3.1.8).

*III.3.2.2. *-am*

The reconstruction of PCN ***-am*** is based on the correspondences of PAo ***-əm**, Lotha **-əm**, Sangtam **-aŋ**, and Yimchungrü **-am**. Its possible PTB sources are ***-um** and ***-im**:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-um, *-im	***-am**	*-əm	-əm	-aŋ	-am

*Table 154: PCN ***-am***

Note, however, that the PTB ancestors of this rime overlap with those of PCN ***-əm** (§III.3.2.3).

[127] HIT, SLAP / PLAY (BEAT) PCN *tam

Chungli **a^{3}-təm^{3}** 'hit lightly / play (instrument)'
Lotha **təm^{3}-** 'hit w/ hand, slap, beat drum'
Sang. ^{2}daŋ [**taŋ**] 'slap'
Yim. ^{1}dam [**tam**] 'slap'
cf. PKC ***tum** DRUM (v.) / PLAY (instruments) (VanBik 2009: #189)

[128] FLOOR PCN *a-tam

PAo ***a-təm** (40); Yim. *atampü* [**a-tam-pə**]

[129] YEAR / SEASON PCN *a-kam

PAo ***(a-)kəm** YEAR (69)
Lotha **o^{1}-kəm^{3}** 'season'
Sang. ^{2}gaŋ [**kaŋ**] 'year'
Yim. ^{1}gam [**kam**] 'year'
cf. PKC ***kum** AGE / YEAR (VanBik 2009: #249), PTk ***kum** YEAR (Mortensen 2012: #457)

[130] BECOME PCN *kam
[131] LIFE PCN *a-kam

PAo ***a-kəm** BECOME / LIVE (70)
Lotha **kəm^{1}-** 'become', **e^{1}-kəm^{1}** 'life'
Sang. *kang* [**kaŋ**] 'become', *akang* [**a-kaŋ**] 'life'

[132] BENCH, BLOCK / PILLOW PCN *m-kham

Chungli **mə^{3}kəm^{1}** 'bench / pillow'
Lotha **ŋ̀^{1}-khəm^{3}** 'pillow'
Yim. ^{2}gu-^{2}mu^{2}kam^{1}be [**ku-mu-k^{h}am-pe**] 'pillow' (head-m-?)
< PTB ***m-kum** ≋ ***m-kim** BLOCK / PILLOW

[133] THREE PCN *a-sam

PAo *__a-səm__ (105)
Lotha __e[1]-thəm[1]__
Sang. *asang* [__a-saŋ__]
Yim. [(1)]__ma?[2]sam__ [__[2]__]
< PTB *__g-sum__ THREE

▸ The PTB *__-um__ > PCN __-am__ change here is paralleled in Sinitic: OC *__srum__ > MC __sam__ > Mandarin *sān* 'three' (Baxter & Sagart 2011).

[134] FRIEND PCN *ʃam

Lotha __o[1]-ʃəm[3]__; Sang. *shangrü* [__ʃaŋ-rə__]

[135] HOUSE / VILLAGE PCN *a-jam

PAo *__(a-)jəm__ VILLAGE (292)
Lotha __o[1]-jan[1]__ 'village'
Sang. *yang* [__jaŋ__] 'village'
Yim. [2]ti[2]yam [1] [__t[h]i-jam__] 'house' (Weidert 1987: #196)
thiyam [__t[h]i-jam__] 'home' (Kumar 1973b: 43)
< PTB *__k-yim__ ≷ *__k-yum__ HOUSE

▸ This cognate set exhibits feaures of both PCN *__-a:m__ and *__-am__: The Lotha __-an__ rime indicates PCN *__-a:m__, while PTB *__-um/im__ and Yimchungrü __-am__ indicate PCN *__-am__. Minimizing the number of problems therefore requires the choice of PCN *__-am__ for this set.
Interestingly, the primary meaning of this root as 'house' has been retained in Yimchungrü, while it has shifted in all the other Central Naga languages to 'village'.[122]

[136] LOVE / FRIENDSHIP PCN *m-jam

PAo *__m-jəm__ LOVE (v.) (293)
Sang. [1]mɯ[2]yaŋ[2]rɯ [__mə-jaŋ-rə__] 'friend/with'
Yim. [2]mɯ[2]yam[1]rɯ [__mə-jam-rə__] 'friend/with'

[122] The opposite shift occurred in Siamese: Proto-Tai *__ɓa:n[C]__ 'village' > Siamese __ba:n[C1]__ 'house' (Pittayaporn 2009: 106).

[137] BURY / ENDURE, BEAR PCN *ram

PAo *__a-ɹəm__ BURY (322), *__aɹəm__ BEAR, ENDURE (323)
Lotha __rəm[1]-__ 'endure, bear, be patient'
Sang. *thrü<u>rang</u>* [__t[h]rə-<u>raŋ</u>__] 'bury'

▸ PCN *__ram__ likely began with the meaning of BURY and saw its semantic range extended to include ENDURE, BEAR through the conception of endurance as 'burying' something in one's mind (cf. Clark 1911: 114).

In the Proto-Ao branch, the reflex of this etymon gained an *__a-__ prefix, which apparently facilitated its split along both morphological and semantic lines:

1. The form bearing the original *__a-__ prefix descended into Proto-Ao with the sense of BURY (*__a-ɹəm__), and
2. A reanalyzed form in which the *__a-__ prefix was interpreted as part of a disyllabic root descended into Proto-Ao with the sense of BEAR, ENDURE (*__aɹəm__).

Such a semantic/morphological split is unusual, however, and is therefore speculative.

[138] HIDE, CONCEAL PCN *ram

PAo *__m-jəm__ CONCEAL (294)
Sang. *rang* [__raŋ__] 'hide'
Yim. *ram* 'hide'

▸ The transitivity of the Sangtam and Yimchungrü forms is unknown (i.e., whether they mean 'conceal (something)' or 'hide (oneself)').

[139] CATCH, SEIZE, HOLD PCN *hram

PAo *__a-həm__ HOLD (137)
Lotha __<u>hrəm</u>[3]-at[2]-__ 'catch / hold'
Sang. *rang* [__raŋ__] 'catch'
Yim. *<u>ram</u>lo* 'catch' (Kumar 1973b), *<u>ram</u>a-alu* 'seize' (Marrison 1967)
< PTB *__s-grim__ CATCH / HOLD FAST

*III.3.2.3. *-əm*

The PTB sources of PCN ***-əm** include PTB ***-um** and ***-im** (overlapping with PCN ***-am**). The only unique sources of this PCN rime are PTB ***-wam** and ***-em**. PCN ***-əm** was preserved in all the Central Naga languages.

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-um, *-im, *-wam, *-em	***-əm**	*-əm	-əm	-əm	-əm

*Table 155: PCN *-əm*

[140] SWELL, BE SWOLLEN PCN *pəm

Lotha **pəm^{1}-** 'swell, be swollen'
Sang. *püm*cho* [**pəm-tʃ^{h}u**] 'swell'
Yim. *apüm*khi* [**a-pəm-k^{h}i**] 'swell', *püm* [**pəm**] 'puff'
< PTB ***bwap ≋ *s-bwam** SWELL UP / BE SWOLLEN / STOUT / CALF OF LEG

▸ This set provides the only example of PTB ***-wam** yielding PCN ***-əm**.

[141] PRESS, PUSH PCN *njəm

PAo ***a-nəm** (258)
Lotha **njəm^{3}-**
Sang. *nyem*kenü* [**n^{j}əm-kenə**]
Yim. *nim* (Kumar 1973b)
cf. PKC ***nam ≋ *nom** PUSH / PRESS / PRINT (VanBik 2009: #828)

▸ The Yimchungrü **-im** rime is unexpected, though Kumar's (1973b) surface transcription of *nim* possibly represents an underlying form with a schwa nucleus and medial palatal glide (/njəm/).

[142] BE LOW PCN *a-hnjəm

PAo ***a-nəm** (259)
Lotha **e^{1}-hnjəm^{3}-**
Sang. *amüng*nyem* [**amənŋ-n^{j}əm**]
< PTB ***s-nem ≋ *s-nyam** LOW / SOFT

▸ Since PTB ***-am** would have yielded PCN ***-aːm** instead of ***-əm**, the PTB ancestor of this set is likely the ***s-nem** allofam, though the PCN ***hnj-** cluster suggests a PTB medial palatal glide, as in PTB ***s-nyam**.

[143] SHADOW, SHADE PCN *khəm ≍ *khəp

PAo ***a-khəm** SHADOW, SHADE (83)
Lotha **khəm^{3}-tʃho?^{3}** ‘shadow’
Sang. *nbükhüm* [**n̥-pə-k^{h}əm**] ‘shadow’
Yim. *khüpto* [**k^{h}əp-to**] ‘shade’

▸ The Yimchungrü cognate with final **-p** supports the reconstruction of ***-əm ≍ *-əp** allofamy at the PCN level.

[144] POISON (n.) PCN *m-ʒəm

PAo ***m-ʒəm** (123)
Sang. *müzyü* [**mə-ʒə**] (Marrison 1967)
müzyüm [**mə-ʒəm**] (Kumar 1973a)
Yim. *amüzümbe* [**a-mə-zəm-pe**]

▸ Marrison (1967) reports the Sangtam form with an unexpected open syllable, which is contradicted by the form with **-əm** in Kumar 1973a.

[145] SMELL (n.), ODOR PCN *a-hrəm

Lotha **o^{1}-hrəm^{1}** ‘odor, smell’
Sang. *ghüm* [**ɣəm**] ‘smell’
Yim. ^{2}a^{2}hrɯm [^{1}] [**a-r̥əm**] ‘smell (n.)’ (Weidert 1987: #465)
arhüm [**a-r̥əm**] ‘pungent’ (Kumar 1973b: 33)

< PTB ***s-rim** SMELL†

▸ The PTB etymon from the STEDT database is based on Weidert’s ‘Kuki-Naga-Chin’ reconstruction: ***(s-)rim** (1987: #465).

[146] BREAD, BISCUIT / FLOUR PCN *a-hjəm ≍ *a-həm ?

PAo ***a-hjəm** BISCUIT (280)
Lotha **həm^{1}-rə?^{3}** ‘bread’, **o^{1}-həm^{1}** ‘flour’
Sang. *hüm* [**həm**] ‘flour’
hamthse (Marrison 1967), *hemthse* (Kumar 1973a) ‘bread’:
both [**həm-ts^{h}ə**]

▸ Sangtam ‘bread’ provides an example of a misleadingly transcribed *am* sequence from Marrison 1967 that clearly represents [əm].

[147] HEAD / HEART / MIND PCN *ləm

PAo *__ləm__ HEAD (363), *__phi-ləm__ THINK (20)
Lotha __ləm__**[1]-pəm[3]** ‘heart’ (m-?)
Sang. [2]__lɯm__[1]tiŋ [__ləm__**-tʰiŋ**] ‘think’
Yim. [1]lɯm [**ləm**] ‘think’
< PTB *__luŋ__ ⩙ *__lum__ HEART / ROUND

[148] HAIR / LEAF / FEATHER PCN *a-həm

PAo *__a-həm__ BANANA LEAF / ASPIDISTRA LEAF (138)
Lotha **o[1]-həm[3]** ‘body hair / feather’
Sang. *__amtpo__* [__a-əm__**-tə-pu** ?] ‘hair (of body)’
Yim. *anam* ‘feather’, *mün-__nam__* [**mən-__nam__**] ‘beard’ (mouth-m)

▸ The Yimchungrü **-am** rime is unexpected but may be a mistranscription of **-əm**.
The inclusion of Proto-Ao BANANA LEAF / ASPIDISTRA LEAF is somewhat doubtful, as the large leaves of the banana and *Aspidistra* plants are not very similar to body hair (though perhaps they resemble giant green feathers).

*III.3.2.4. *-ɑm/əm*

The following sets can reflect PCN ***-am*** or ***-əm***, but they lack the Sangtam or Yimchungrü cognates necessary to make the determination:

[149] PLANT (v.) / TRANSPLANT PCN *thj[a/ə]m

PAo ***a-thjəm*** PLANT (v.) (378); Lotha **tʃhəm[1]-** ‘transplant’

[150] MORTAR PCN *tsh[a/ə]m

PAo ***tʃhəm*** (173); Lotha __tshəm__**[3]-po?[3]**
< PTB ***t(s)um*** ⩙ ***(t)sum*** MORTAR

[151] BE WARM PCN *l[a/ə]m

PAo ***a-ləm*** (365); Lotha **ləm[1]-**
< PTB ***s-lum*** ⩙ ***lim*** WARM / MAKE WARM

*III.3.2.5. *-ɑp*

PCN ***-ap** descended from PTB ***-up/ip** and was preserved in Yimchungrü but reduced to **-əp** in the other CN languages:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-up/ip	***-ap**	*-əp	-əp	-əp	-ap

*Table 156: PCN *-ɑp*

The PTB ancestors of this rime overlap with those of PCN ***-əp** (§III.3.2.6), providing an exact parallel to the situation with PCN ***-am** (§III.3.2.2) and ***-əm** (§III.3.2.3).

[152] NEST / WEB PCN *a-sap

PAo ***t-səp** NEST / WEB (OF SPIDER) (103)
Lotha **o^{1}-ʃəp^{2}** 'nest'
Sang. ^{1}a$^{(2)}$sɯp [**a-səp**] 'nest'
Yim. ^{2}a$^{(2)}$sap [**a-sap**] 'nest'
< PTB ***(t)sip ≷ *(t)sup** NEST / WOMB / SCROTUM

[153] SLEEP PCN *jap

PAo ***a-jəp** (288)
Lotha **jəp^{2}-**
Sang. *yip* (Marrison 1967), *yep* (Kumar 1973a): both likely [**jəp**]
Yim. $^{(1)}$yap [**jap**]
< PTB ***s-yip ≷ *s-yup** SLEEP / PUT TO SLEEP / CONCEAL / HIDE (v.)

*III.3.2.6. *-əp*

PCN ***-əp** was preserved in all the CN languages. Its possible PTB ancestors are PTB ***-up/ip** (overlapping with PCN ***-ap**), ***-op/wap**, and ***-ep**:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-up/ip, *-op/wap, *-ep	***-əp**	*-əp	-əp	-əp	-əp

*Table 157: PCN *-əp*

[154] BE SOFT PCN *a-njəp

PAo ***a-nəp*** (256); Lotha **e^{1}-njəp^{2}-**
cf. PKC ***hnip ≋ *hŋip*** SOFT (VanBik 2009: #907)

▸ This PCN etymon could also contain an ***-ip*** rime (cf. PKC ***hnip***), but no other sets supporting ***-ip*** have been found.

[155] SKIN / COVER (n.) PCN *kəp

PAo	***t-kəp*** SKIN, RIND, SHELL (68)
Lotha	**-kəp^{2}** 'cover (n.)' (e.g. **tʃo^{3}-<u>kəp^{2}</u>** 'shoe' [foot-cover])
Sang.	*aküp* [**a-kəp**] 'skin' (Kumar 1973a)
	kep [**kəp**] 'skin' (Marrison 1967)
Yim.	*küp* [**kəp**] 'skin'

< PTB ***kop ≋ *kwap*** SKIN / LIP / SCALES (FISH) / SHELL[†]

▸ HPTB provides another possible PTB ancestor: ***ʔup ≋ *gup*** HATCH / COVER (HPTB: 57).

[143] SHADOW, SHADE PCN *khəm ≋ *khəp

Yim. *<u>khüp</u>to* [**<u>k^{h}əp</u>-to**] 'shade'
(See SHADOW, SHADE [143] in §III.3.2.3 for the other reflexes.)

▸ This PCN etymon shows possible coda variation between ***-m*** and ***-p***, with Yimchungrü reflecting PCN ***khəp***.

[156] SUCK / KISS PCN *m-tshəp

PAo ***m-tʃhəp*** (172); Lotha **ṇ^{1}-tsəp^{2}-**; Sang. and Yim. *müthsüp* [**mə-ts^{h}əp**]
< PTB ***m-dzup ≋ *m-dzip*** SUCK / SUCKLE / MILK / KISS

[157] CUT (v.) PCN *ləp

PAo ***a-ləp*** (362); Yim. *<u>lip</u>khi* (Kumar 1973b: 33)
< PTB ***s-lep*** SLICE / PARE OFF

▸ The Yimchungrü **-ip** rime is unexpected but could be a mistranscription of **-əp**.

*III.3.2.7. *-ɑp/əp*

The following set can reflect PCN ***-ap*** or ***-əp***, but it lacks the Yimchungrü cognate necessary to make the determination:

[158] WRAP / COVER (v.) PCN *a-hl[a/ə]p

PAo	***a-hləp** WRAP, FOLD (340)
Lotha	**hləp²-** ‘cover (v.)’
Sang.	*hapti* [**<u>həp</u>-ti**] ‘cover (v.)’ (Marrison 1967)
	ahepti [**<u>a-həp</u>-ti**] ‘cover (v.)’ (Kumar 1973a)

< PTB ***klup** COVER / WRAP

III.3.3. Dental Codas

Proto-Central Naga contained the dental codas ***-t** and ***-n**, which descended from PTB ***-t**, ***-s** and ***-n**, ***-r**, respectively.

As with PCN ***-m**, the correspondences exhibited by the Central Naga **n**-final rimes generally fall into the following three (unconditioned) sets:

Corr. #	*PTB*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
1	*-an, *-a(ː)r	*-ən	-an	-i	-an, -o
2	*-waːr	*-ən	-en	-i	-an, -o
3	*-a(ː)r, *-war, *-uːr, *-iːr, *-in	*-ən	-en	-i	-ən

*Table 158: PCN ***-n** correspondences*

These correspondences also show the same problematic PTB overlap as PCN ***-m**. In addition, the scarcity of data has obscured the conditioning environments that yielded Yimchungrü **-an** vs. **-o**.

These difficulties notwithstanding, the distribution of the Lotha reflexes provides an exact parallel to PCN ***-m**, suggesting that correspondences #1 and #2 may also be reconstructed with a vowel length contrast (***-aːn** vs. ***-an**). In addition, the reduced Yimchungrü vowel nucleus in #3 suggests PCN ***-ən**. Combined with the uncertain ***-Vt** rimes (discussed below in §III.3.3.5), the system of dental-final rime reconstructions is shown in the following table:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-an, *-a(ː)r	***-aːn**	*-ən	-an	-i	-an, -o
*-waːr	***-an**		-en		
*-a(ː)r, *-war, *-or, *-uːr, *-iːr, *-in	***-ən**				-ən

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-at	***-at**	*-ət	-e[t]	-e	-ə ?
*-i:t/ut ?, *-əy-t	***-ət**		-et		-ət
*-is	***-it**			-i	
*-us	***-ut**		-u? ?	-ə ?	-o ?
*-i:t ?	***-V̩t**		-a? ?	—	—

Table 159: PCN dental-final rimes

The ***-n** developments are summarized below:

> Proto-Ao and Sangtam treated all ***-n** rimes equally, with Proto-Ao reducing the vowel nucleus to schwa and Sangtam reducing the entire rime to **-i**.
>
> Lotha preserved the vowel quality of PCN ***-aːn** as **-an**, but merged the short-vowel ***-an** with ***-ən** to yield **-en**.
>
> Yimchungrü preserved ***-ən** as **-ən**, but merged the ***-a(ː)-** vowel length contrast to yield **-an/-o**. Although these two rime variants cannot be further distinguished with the current level of data, one cognate set shows Yimchungrü reflexes with both rimes (BE SOUR [167]), suggesting that the **-an** vs. **-o** development may be a dialect distinction.

*III.3.3.1. *-aːn*

PCN ***-aːn** descended from PTB ***-an** and ***-a(ː)r** (also a possible ancestor of PCN ***-ən**) and yielded PAo ***-ən**, Lotha **-an** (merging with the reflexes of PCN ***-aːm**), Sangtam **-i**, and Yimchungrü **-an/o**:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-an, *-a(ː)r	***-aːn**	*-ən	-an	-i	-an, -o

*Table 160: PCN *-an*

[159] PRICE, COST, VALUE PCN *a-maːn

Lotha **o^{1}-man^{3}** ‘price’; Sang. *ami* ‘value’; Yim. *amo* ‘price’
< PTB ***man** COST / PRICE†

- The PTB reconstruction is an unpublished etymon from the STEDT database but is supported by the following subgroup-level reconstructions from other sources: PKC ***man*** COST / PRICE (VanBik 2009: #759) and PTk ***man*** PRICE (Mortensen 2012: #771).

[160] BE NEW PCN *a-saːn

PAo ***a-sən*** (108); Lotha ***e*^{1}*-than*^{1}**; Sang. *asi*; Yim. *aso*
< PTB ***g-sar*** NEW / FRESH

[161] GATHER, ASSEMBLE (OF PEOPLE) PCN *ʃaːn

PAo ***sən-təp*** (113); Lotha ***san*^{1}*hru*^{1}*-**; Yim. *shoru* [***ʃo-ru***] 'meet'

- The second syllables of the Lotha and Yimchungrü reflexes also appear to be cognate.

[162] LOVE (v.) PCN *a-m-ʒaːn

Lotha	***n̥*^{1}*-zan*^{3}*-**
Sang.	*amüi* [**a-mə-(j)i**]
Yim.	*amuzho* [**a-mu-ʒo**]

[163] CARRY / PREGNANT / WEAR PCN *haːn

PAo	***hən*** CARRY / BY HAND (139)
Lotha	***han*^{1}**- 'carry (on back) / be pregnant / wear'
Sang.	*hi* 'carry (generic)'
Yim.	*hantarü* [**han-tarə**] 'bring'
	hankhit [**han-k^{h}it**] 'bear' (v.?)

[164] CURRY PCN *a-haːn

PAo ***(a-)hən*** (141); Lotha ***o*^{1}*-han*^{3}**; Sang. *hi*
< PTB ***h(y)an*** CURRY / VEGETABLE DISH

[165] CHICKEN PCN *haːn-a

PAo ***a-hən** (140)

Lotha **ho^{1}noʔ^{3}** ‘chicken’
han^{1}-poŋ^{3} ‘rooster’ (m-male), **han^{1}-kjuʔ^{3}** ‘hen’ (m-female)
han^{1}-puʔ^{3} ‘mother hen’ (m-mother)

Sang. *hanaza* (Kumar 1973a)
^{1}huɯ^{2}na [**həna**] (Weidert 1987: #832)
hünaza [**həna-za**] (Marrison 1967)

Yim. *thunu* [**t^{h}unu/t^{h}ənə** ?]

< PTB ***haːr** FOWL / CHICKEN / QUAIL

▸ The development of PCN CHICKEN is hypothesized as follows:

PTB ***haːr** > ***haːn** by regular sound change.[123] This form then gained what appears to be an echo vowel to yield the PCN allofamic variants ***haːn** and ***haːna**.[124]

The Ao form developed by regular sound change from the non-echo variant: PCN ***haːn** > PAo ***hən**. Lotha also reflects this variant in terms like **han^{1}poŋ^{3}** ‘rooster’, **han^{1}kjuʔ^{3}** ‘hen’, and **han^{1}puʔ^{3}** ‘mother hen’ (PCN ***-aːn** > Lotha **-an**).

The other reflexes developed from PCN ***haːna**, with the echo vowel resulting in resyllabification of the word as ***ha(ː).na**. This yielded Lotha **ho^{1}.noʔ^{3}** ‘chicken’ (PCN ***-a** > Lotha **-o**; cf. §III.3.1.1). Yimchungrü *thunu* may represent [**t^{h}ənə**], which also conforms to regular sound change in the rimes (PCN ***-a** > Yim. **-ə**; cf. §III.3.1.1). (See CHICKEN [165] in §III.5.2.4 for discussion of the Yimchungrü initial.)

[123] The appearance of the long ***-aː-** in both PCN CHICKEN and its PTB etymon appears not to be a preservation of the original PTB of system vowel length *per se*, but simply an incidental overlap in the two systems. That is, the PCN system of contrastive vowel length on ***-a(ː)-** derived not from PTB long ***-aː-** vs. short ***-a-**, but from PTB rimes with contrasting vowel nuclei—some of which happened to be long.
[124] See ICE, SNOW, HAIL [99] for another possible example of a PCN echo vowel.

PCN ***-a** was normally preserved in Sangtam (§III.3.1.1), thereby yielding Sangtam **hana-**, as transcribed in Kumar 1973a. Marrison and Weidert apparently recorded a variant in which the prosodically weak initial syllable was reduced to a schwa rime.

*III.3.3.2. *-an*

PCN ***-an** is reconstructed on the basis of nearly the same correspondences as PCN ***-aːn**, with Lotha showing **-en** here instead of **-an**. (This is similar to contrast between PCN ***-aːm** and ***-am**, which yielded Lotha **-an** and **-əm**, respectively.) The only example of PCN ***-an** with a PTB etymon (BE SOUR [167]) appears to have descended from PTB ***-waːr**. (The PTB co-allofam with ***-uːr** would have yielded PCN ***-ən**.)

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-waːr	***-an**	*-ən	-en	-i	-an, -o

*Table 161: PCN *-an*

[166] BE DIRTY PCN *m-njan

PAo ***m-nən** (264)
Lotha ^{1}n^{3}myen [**n̥-mjen**] (Weidert 1987: #402)
m̥^{1}-men^{3}- (MK)
Sang. *athrünyi* [**a-t^{h}rə-n^{j}i**]
Yim. ^{2}a^{2}mɯ^{2}ñan [^{1}] [**a-mə-n^{j}an**]
cf. PNC ***niin-I, nit-II**; **neen-I, net-II** DIRTY (VanBik 2009: #810)

[167] BE SOUR PCN *a-san

PAo ***a-sən** (109)
Lotha **then^{3}-**
Sang. **^{1}a^{2}si**
Yim. **^{2}a^{2}san [^{1}]** (Weidert 1987: #913)
asho [**a-ʃo**] (Marrison 1967)
< PTB ***suːr ⧓ *swaːr** SOUR / BE ACID

▸ Since PTB ***suːr** would have yielded PCN ***sən** (cf. §III.3.3.3), the ancestor of PCN ***a-san** is the PTB allofamic variant ***swaːr**.

Weidert records Yimchungrü 'be sour' with the **-an** rime, while Marrison reports an **-o** rime (and a palatal initial). This suggests that the Yimchungrü **-an/-o** reflexes of PCN ***-aːn** are divided along dialect lines.

[168] MONEY / PRICE PCN *a-tshan

PAo	***(a-)tʃhən** MONEY (176)
Lotha	**o^{1}-tshen^{3}** 'price'
Sang.	*thsi* [**ts^{h}i**] 'money'
Yim.	*sho* [**ʃo**] 'money'

*III.3.3.3. *-ən*

PCN ***-ən** is distinguished from PCN ***-an** in yielding Yimchungrü **-ən** (instead of **-an/-o**). Its possible PTB ancestors are ***-a(ː)r** (overlapping with PCN ***-aːn**), ***-war**, ***-or**, ***-uːr**, ***-iːr**, and ***-in**:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-a(ː)r, *-war, *-or, *-uːr, *-iːr, *-in	***-ən**	*-ən	-en	-i	-ən

*Table 162: PCN *-ən*

[169] MOUTH$_{1}$ PCN *mən

Lotha **e^{1}-men^{3}**; Yim. *mün* [**mən**]

< PTB ***muːr** MOUTH / FACE / GILLS / BEAK

▸ See PCN ***paŋ** [194] for another etymon meaning MOUTH.

[170] RIPEN, BE RIPE / BE COOKED PCN *hmən

Chungli	**a^{2}-mən^{2}** 'ripen, be ripe, be cooked'
Lotha	**hmen^{1}-** 'be ripe, fully cooked'
Sang.	*nyicho* [**n^{j}i-tʃ^{h}u**] 'ripe'
Yim.	*amümünkhi* [**a-mə-mən-k^{h}i**] 'unripe' (PFX-NEG-m-? ?)

< PTB ***s-min** RIPE / SWEET / DELICIOUS

▸ The Yimchungrü word pair *(a)tsü* [**(a)tsə**] 'good' vs. *amütsü* [**amətsə**] 'bad' suggests that some instances of *mü-* [**mə-**] are negative prefixes, as in *amümünkhi* 'unripe' here. Note, however, that not all instances of **mə-** fall into

this category: The **mə-** formative in Yimchungrü **mə-ʃak** ‘scratch (v.)’ [244], for example, reflects the PCN ***m-** prefix and has an unknown morphological function (if any).

[79] HOLE PCN *a-ku ⩙ *a-khən

Sang. *akhi* [**a-k^{h}i**] ‘hole’ (Marrison 1967, Kumar 1973a)
^{1}naŋ^{1}ki [**naŋ-k^{h}i**] ‘ear’ (Weidert 1987: #162)
nangkhi [**naŋ-k^{h}i**] ‘ear’ (ear-m$_{2}$) (Marrison 1967)

Yim. *akhün* [**a-k^{h}ən**] ‘hole’ (Kumar 1973b)
nükhün [**nə-k^{h}ən**] ‘ear’ (ear-m$_{2}$) (Marrison 1967, Kumar 1973b)
^{2}nɯ^{2}kɯn [**nə-k^{h}ən**] ‘ear, earhole’ (ear-m$_{2}$) (Weidert 1987: #162)

(See HOLE [79] in §III.3.1.6 for the other reflexes and further discussion.)
< PTB ***kor ⩙ *kwar** HOLE / PIT / VALLEY / CAVE

▸ PCN HOLE consists of two allofams: ***a-ku** and ***a-khən**, with the latter reflected only in the Sangtam and Yimchungrü forms given above. PCN ***a-khən** could reflect either PTB allofam (***kor** or ***kwar**).

[171] SONG PCN *khən

Chungli **kən^{1}**
Lotha **o^{1}-khen^{3}**
Sang. *khi*
Yim. *khün* [**k^{h}ən**]
< PTB ***gaːr** DANCE / SING / LEAP / STRIDE ?

▸ PTB ***gaːr** may be the original source of PCN SONG, but it is also possible that ***khən** was a loan from Indic (cf. Sanskrit *gāna* ‘singing’ [Turner 1962–1966: 221: #4130], Assamese *gan* ‘song’ [Xobdo 2013], Nagamese/Assamese *gān* ‘poem, anthem’ [Boruah 1993: 104]).

[172] LIVER PCN *m-sən

PAo ***t-m-sən** (112); Lotha **n̤^{1}-then^{3}**; Sang. *müsi* [**mə-si**]
< PTB ***m-sin** LIVER / BITTER

▸ This set lacks a Yimchungrü cognate, making it technically ambiguous between PCN ***-an** and ***-ən**. However, since a PTB reconstruction is available and the

only other instance of PTB ***-in** yielded PCN ***-ən** (***hmən** RIPEN, BE RIPE / BE COOKED [170]), it is best to reconstruct this set with PCN ***-ən**.

[173] SELL PCN *jən

Lotha **jen^{1}-**; Sang. *i*; Yim. *yin* [**jin**]
< PTB ***ywar** SELL / BUY

▸ Yimchungrü *yin* may represent underlying /jən/, with the vowel nucleus showing coarticulation with the palatal initial.

[174] IRON PCN *jən

PAo	***(a-)jən** (296)
Lotha	**jon^{1}tʃak^{2}**
Sang.	*ithse* [**i-ts^{h}e**], *riche* [**ri-tʃ^{h}e**]
Yim.	^{2}yin^{2}tši [^{2}] [**jin-tʃ^{h}i**]

< PTB ***sya:l** ⧓ ***syi:r** IRON

▸ The PTB allofam ***syi:r** is likely the source of PCN ***jən**, as PTB ***-a:l** would be expected to follow ***-al** and yield PCN ***-ə(ʔ)** (§III.3.1.7).
As in SELL [173], Yimchungrü *yin* may represent underlying /**jən**/.
The Lotha **-on** rime is unexpected.
The second syllable of Lotha **jon^{1}tʃak^{2}** likely descended from PTB ***l-tsyak** IRON / IRON INSTRUMENT.

[175] BE OLD (OF THINGS) PCN *a-C̥ən ?

PAo	***a-tʃən** (159)
Lotha	**e^{1}-hen^{3}-**
Sang.	*azicho* [**a-zi-tʃ^{h}u**]
Yim.	*awün* [**a-wən**]

▸ The rimes of this cognate set point clearly to PCN ***-ən**, but the initial is obscure (see §III.5.7).

*III.3.3.4. *-a(:)n/ən*

The **n**-final sets in this section lack cognates from one or more languages, rendering their reconstructions ambiguous between two or more PCN rimes.

*Ambiguous between *-**an** and *-**aːn**:*

[176] NAIL (BODYPART) PCN *m-[z/ʒ]a[ː]n

Sang. *muzi*; Yim. ²mɯ²zan [¹] [**mə-zan**]
< PTB ***m-(t)syen** NAIL / CLAW ?

▸ Without a Lotha cognate, this reconstruction remains ambiguous with respect to vowel length.

*Ambiguous among *-**a(ː)n** and *-**ən**:*

Lacking a Lotha or Yimchungrü cognate, these sets could reflect PCN ***-aːn**, ***-an**, or ***-ən**:

[177] GROW PCN *ʒ[aː/a/ə]n

PAo ***a-ʒən** GROW UP (126); Sang. *zi* 'grow'

[178] CHANGE / EXCHANGE PCN *m-l[aː/a/ə]n

PAo ***m-lən** EXCHANGE (369); Sang. *müli**chicho* [**mə-li-tʃʰitʃʰu**] 'change'

*Ambiguous between *-**an** and *-**ən**:*

The following sets all contain Lotha **-en** but lack a Yimchungrü cognate to indicate whether the PCN rime was ***-an** or ***-ən**:

[179] BE COMPLETE, SUFFICIENT, FULL PCN *p[a/ə]n

PAo	***a-pən** BE COMPLETE, SUFFICIENT (16)
Lotha	**pen³-** 'be complete, full'
Sang.	*amüpisa* [**a-mə-pi-sa**] 'incomplete' (PFX-NEG-m-SUF ?)
	khütupinü [**kʰətu-pi-nə**] 'completely' (one-m-SUF ?)

▸ In a parallel to Yimchungrü (see RIPEN, BE RIPE / BE COOKED [170] in §III.3.3.3), the Sangtam word pair *atsa* 'good' vs. *amütsa* [**amətsa**] 'bad' suggests that some instances of *mü-* [**mə-**] are negative prefixes, as in *amüpisa* 'incomplete' here. Note, however, that (as in Yimchungrü) other instances of Sangtam **mə-** have an unknown morphological function: e.g. Sangtam **aməla** 'easy' (< PCN ***m-laj** [50]).

[180] CARRY (BY HAND) PCN *p[a/ə]n

Chungli **a²-pən²**; Lotha **pen¹-**

[181] WEAR (CLOTHES) PCN *m-p[a/ə]n

Chungli **a³pən³**
Lotha **m̩¹-pen³-**
Sang. *nüpi* [**nə-pi**] (Marrison 1967)
müpicho [**mə-pi-tʃʰu**] (Kumar 1973a)

< PTB ***pun** WRAP / COVER / WEAR

▸ Yimchungrü *phi* 'wear' (Marrison 1967) does not appear to be a cognate, though perhaps it was borrowed from Sangtam.

[182] POWER / WRATH PCN *a-ʒ[a/ə]n

PAo ***a-ʒən** POWER / WRATH (125)
Lotha **o¹-zen³** 'supernatural power, magic'
Sang. *zi* 'power', *zichüro* [**zi-tʃʰəru**] 'angry'

[183] BREATHE PCN *tʃh[a/ə]n

Mongsen **sənsi** 'breathe'
Lotha **e¹-tʃhen¹-** 'breathe'
Sang. *chichi* [**tʃʰi-tʃʰi**] 'breathe' (Marrison 1967)
asachichü [**asa-tʃʰi-tʃʰə**] 'breath' (breath-m-SUF) (Kumar 1973a)
asa chicho [**asa tʃʰi-tʃʰu**] 'breath' (breath m-SUF) (Kumar 1973a)

[184] SPIN (THREAD) PCN *j[a/ə]n

PAo ***a-jən** (295); Lotha **jen¹-**

*III.3.3.5. *-Vt*

A number of sets support the reconstruction of rimes with a PCN ***-t** coda, which descended from a merger of PTB final/suffixal ***-t** and ***-s**.[125] The vowel nuclei of these rimes, however, are reconstructed with less confidence. In some cases it is also unclear whether the PCN coda was invariably ***-t** or varied with an open syllable.

[125] Matisoff cautions that the "root-final ***-s** is to be carefully distinguished in principle from suffixal ***-s**…though there are cases where this is difficult, *i.e.* roots which show variation between ***-s** and zero final" (HPTB: 431).

PCN generally preserved the vowel nuclei of the PTB *-**t**-final rimes: PTB ***-at** > PCN ***-at**, PTB ***-is** > PCN ***-it**, and PTB ***-us** > PCN ***-ut**. One cognate set shows a reduction of PTB ***-əy-t** > PCN ***-ət** (BE HEAVY [192]), while another source of PCN ***-ət** is ambiguous between PTB ***-iːt** and ***-ut** (EXTINGUISH / BLOW [189]). Finally, one PCN reconstruction reflecting PTB ***-iːt** has an unknown vowel nucleus (LEECH (WATER) [193]).

The clearest development involving the PCN *-**t**-final rimes in the Central Naga daughter languages is the complete reduction of all vowel nuclei to schwa in Proto-Ao (PCN ***-Vt** > PAo ***-ət**). Lotha has developed **-e[t]** from ***-at** and **-et** from ***-it**, ***-ət**. Sangtam shows **-e** as the reflex of ***-at** and ***-ət**, and **-i** as the reflex of ***-it**. Yimchungrü merged ***-it** and ***-ət** to **-ət**. The remaining rime developments are (more) dubious and are therefore flagged with a question mark in the following table:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-at	***-at**	*-ət	-e[t]	-e	-ə ?
*-is	***-it**	*-ət	-et	-i	-ət
*-us	***-ut**	*-ət	-uʔ ?	-ə ?	-o ?
*-iːt/ut ?, *-əy-t	***-ət**	*-ət	-et	-e	-ət
*-iːt ?	***-V̩t**	*-ət	-aʔ ?	—	—

*Table 163: PCN *-**t** rimes*

***-at** set:*

[185] ONE PCN *khaj

[186] HAND, ARM PCN *khat

Ao Ch: **ka**[1] 'one' Mo: **akhət ~ akhəta** 'one'
tə[3]**-ka**[1] 'hand, arm' **[tə]-khát** 'hand, arm'

Lotha **e**[1]**-kha**[1] 'one' **o**[1]**-khe?**[2] 'hand / arm'

Sang. *khe* 'hand / arm'
thüre-khe [**t**^{h}**əre-k**^{h}**e**] 'eleven' (ten-m)
khutü/khütu/khütü [**k**^{h}**ə-tə**] 'one'

Yim. *kha* [**k**^{h}**a**] 'hand' (Marrison 1967)
khah [**k**^{h}**a?**] 'hand' (Kumar 1973b)
khülang [**k**^{h}**ə-laŋ**] 'one'

< PTB ***kat** ONE (STC: 94, note also 'Kuki-Naga' ***khat**); PTB ***ka-t** WING / HAND[†]
cf. PNN **Ç-kla**^{A} ONE (French 1983: 529)

▸ The words for ONE and HAND are intricately interwined in the history of Central Naga, perhaps through the conception of the hand as a unit.[126] As this is the only example of PCN ***-at**, the proposed sound changes are still very hypothetical.

Through some unclear semantic interactions and phonological changes, PTB ***kat** ONE and ***ka-t** WING / HAND yielded the two (morphologically related?) PCN roots ***khaj** ONE and ***khat** HAND, ARM.

Ao appears to have preserved both roots but merged their meanings to yield synonyms, which then dispersed into Chungli and Mongsen: PCN ***khaj** ONE is reflected in both Chungli **ka**[1] 'one' and **tə**[3]**-ka**[1] 'hand, arm'. The Mongsen forms, on the other hand, draw from PCN ***khat** HAND, ARM: **akhət(a)** 'one', **[tə]-khát** 'hand, arm'.

[126] Similarly, the Written Burmese morpheme **khu'** 'unit, individual thing' combines with **hnac** 'two' to form the numeral 'seven' (**khu'-hnac**), in which it is interpreted as referring to the five fingers of the unitary hand (HTPB: 366 [fn.48]).

Lotha kept the roots distinct, developing ***khaj*** > **e[1]-kha[1]** 'one' and ***khat*** > **o[1]-khe?[2]** 'hand / arm'. As mentioned in §III.2.1.4, some Lotha nouns with final **-e?** may have underlying /-et/, but this has not yet been conclusively established.

The Sangtam morpheme **khe** appears to mean both 'hand / arm' and 'one' (appearing in 'eleven'), having descended from PCN ***khat*** (since the expected reflex of ***khaj*** would be Sangtam **kha** or **khi**). Sangtam **khətə** 'one' may contain a reduced form of **khe**.

The PCN sources of the Yimchungrü cognates are somewhat unclear, but **kha(?)** 'hand' could descend from PCN ***khaj*** ONE and the **khə** in *khülang* 'one' from PCN ***khat*** HAND, ARM. This would have involved a swap of their original meanings.

***-it** sets:*

[187] RUB PCN *hmit

Lotha **hmet[2]-** 'rub, wipe, erase / extinguish, put out (flame)'
Sang. *nyi* [**n[j]i**] 'rub' (Marrison 1967)
nichicho [**ni-tʃ[h]i-tʃ[h]u**] 'rub', *nipe* 'rub out' (Kumar 1973a)
Yim. [(1)]nɯt [**nət**] 'rub'

cf. PTk ***mit** RUB (Mortensen 2012: #688); also PTani ***not[2]** RUB (SKIN) (Sun 1993: 211), PKC ***noot** ≋ ***hnoot** MOP / RUB / WIPE (VanBik 2009: #819)

▸ This is the only example of PCN ***-it*** with Lotha, Sangtam, and Yimchungrü reflexes. Lotha lowered ***-it*** to yield **-et**. Yimchungrü preserved the coda and developed ***-ət**, while Sangtam lost the coda but preserved the vowel nucleus as **-i**.

A fortuitous convergence of phonetic forms and meanings apparently gave rise to the merger of ***hmit** RUB with ***hmət** EXTINGUISH / BLOW [189] in Lotha, yielding **hmet[2]-** 'rub, wipe, erase / extinguish, put out (flame)'. In the other CN languages, the reflexes of these two roots were kept separate.

[62] TWO PCN *a-ni(t)

PAo ***a-nət*** (263) …
(See TWO [62] in §III.3.1.5 for the other reflexes and further discussion.)
< PTB ***g/s-ni-s*** TWO

▸ In this set, only PAo ***a-nət*** unambiguously reflects the PCN variant with final ***-t**, which descended from the PTB allofam ***g/s-nis*** with root-final ***-s*** (cf. HPTB: 434).

[61] SEVEN PCN *th-ni(t)

PAo ***th-ni*** ⩙ ***th-nət*** (248) …
(See SEVEN [61] in §III.3.1.5 for the other reflexes and further discussion.)
< PTB ***s-ni-s*** SEVEN

▸ Again, only the PAo allofam ***th-nət*** reflects PCN ***-it**.

***-ut** sets:*

[82] COUGH (v.) PCN *a-khu(t)

PAo ***akhət*** (86) …
(See COUGH [82] in §III.3.1.6 for the other reflexes and further discussion.)
cf. PKC ***khu?*** COUGH (VanBik 2009: #433), PTk ***k^{h}a*** COUGH (Mortensen 2012: #324)

▸ Only PAo ***akhət*** appears to reflect a PCN final ***-t*** (PCN ***-ut*** > PAo ***-ət***), though the PAo ***-t*** in this case could be excrescent, especially given the onomatopoetic nature of this form.

[188] BONE PCN *a-rut

PAo	***t-ɹət*** (325)
Lotha	***o^{1}-ru?^{3}***
Sang.	^{1}a^{2}rɯ [**a-rə**]
Yim.	*ro* (Kumar 1973b), *roreang* [**ro-rjaŋ**] (Marrison 1967)

< PTB ***s/m/g-rus*** BONE

▸ While PAo ***t-ɹət*** clearly reflects a PCN etymon with final ***-t**, the Lotha and Sangtam forms could easily reflect the PCN open/glottal-final rime ***-u(?)*** (§III.3.1.6), suggesting PCN variation: ***a-ru(t)***. Yimchungrü *ro* could be a mistranscription of [ru], which would also reflect PCN ***ru(?)***. If it is accurate, however, then perhaps ***-ut*** merged with ***-ej*** (§III.3.1.4) to yield Yimchungrü

-o. In any case, the paucity of cognate sets for ***-ut** renders this reconstruction uncertain.

***-ət** sets:*

[189] EXTINGUISH / BLOW PCN *hmət ?

Lotha **hmet²-** 'rub, wipe, erase / extinguish, put out (flame)'
Sang. **me** 'extinguish', *mechi* [**me-tʃʰi**] 'blow' (Marrison 1967)
Yim. *müt* [**mət**] 'extinguish' (Marrison 1967), 'blow' (Kumar 1973b)
< PTB ***s-miːn** ⧓ ***s-miːt** EXTINGUISH / SHUT / BLINK, ***s-mut** BLOW ?

▸ PTB ***s-miːt** EXTINGUISH and ***s-mut** BLOW are both possible candidates for the ancestor of PCN ***hmət**, whose coda was preserved in Yimchungrü **mət**. Sangtam lost the coda to yield **me**, while the Lotha preserved it (underlyingly) as **hmet-**. (This Lotha verb appears to reflect a merger of PCN ***hmət** EXTINGUISH / BLOW and ***hmit** RUB [187]).

[190] KNOW PCN *m-thət ?

PAo ***m-tət** (41)
Lotha **n̥¹-tsi³-** ?
Sang. ¹mɯ¹te/¹mɯ¹the [**mə-tʰe**] (Weidert 1987: #325, #988)
müthe [**mə-tʰe**] (Marrison 1967, Kumar 1973a)

▸ PCN ***-ət** yielded PAo **-ət** and Sangtam **-e**, as expected.
The Lotha form is of questionable cognacy, as one would expect Lotha **n̥-thet-** instead.
Yimchungrü *mükhia* [**mə-kʰja**] 'know' (Marrison 1967, Kumar 1973b) appears to have descended from PTB ***m-kyen** KNOW (HPTB: 291), which has an unclear relationship with these forms.

[191] ABILITIVE (SUF.) PCN *-thjət

PAo ***-thjət** (379); Lotha **-tʃhet²**

▸ In both Ao and Lotha, this form is a verb suffix marking abilitive (or 'abilitative') modality, i.e., 'can, able to VERB'.

[192] BE HEAVY PCN *rət ?

PAo ***a-ɹət** (324); Sang. *rati* [**rə-ti** ?] (Marrison 1967)
< PTB ***s-ləy-t** ⧓ ***s-rəy-t** HEAVY

▸ PTB ***s-rəy-t*** contains a dental suffix ***-t*** (HPTB: 454–455), and the PTB ***-əy-t*** sequence was reduced in PCN to ***-ət***. The lack of ***-at*** rimes in the Sangtam data suggests that *rati* should be syllabified as /ra-ti/, and *ra* may be a mistranscription of **rə**.

Unknown nucleus:

The following set has an unknown vowel nucleus:

[193] LEECH (WATER) PCN *m-lV̥t

PAo ***m-lət*** (368); Lotha ***n̥*[1]*-la?*[2]
< PTB ***m-liːt*** HORSE-LEECH

▸ The STEDT database shows that the ***-iːt*** rime of the PTB etymon is well-supported across the family, making the Lotha ***-a?*** reflex unexpected. The PCN rime is therefore indeterminate until more cognate sets are identified.

As for the description of this creature as a 'horse leech', Clark notes: "It is usually found near water or in very damp localities. When an animal goes to the water to drink, it is said to rush up one of the nostrils and there make its abode" (1911: 407). This behavior was also described by my Lotha consultant (MK).

III.3.4. Velar Codas

Proto-Central Naga contained the velar codas ***-k*** and ***-ŋ***, which descended unchanged from PTB.

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-aŋ	***-aŋ***	*-aŋ	-əŋ	-aŋ, -iŋ, -e ?	-aŋ, -əŋ
*-i(ː)ŋ	***-iŋ***	*-əŋ / *sib. _ *-iŋ else.	-əŋ / *sib. _ -jəŋ else.	-iŋ	-iŋ, -əŋ
*-u(ː)ŋ, *-oŋ, *-a(ː)ŋ / *k _	***-uŋ***	*-uŋ	-oŋ	-uŋ	-uŋ
*-a(ː)k	***-ak***	*-ək / *ts(h), *hrj _ *-ak else.	-ak / *pal. _ -ək else.	-a(ʔ/k)	-ək / *(h)r _ -ak else.

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-ik	***-ik**	*-ik	-jək	?	-ək
*-u(ː)k, *-wak, *-əw-k	***-uk**	*-uk	-ok	-u(ʔ/k)	-uk

Table 164: PCN velar-final rimes

*III.3.4.1. *-aŋ*

PCN ***-aŋ*** descended unchanged from PTB ***-aŋ*** and was preserved in Proto-Ao, while Lotha reduced it to **-əŋ**. The Sangtam reflex appears to vary among **-aŋ**, **-iŋ**, and **-e**, based on conditioning as yet unknown. Yimchungrü generally shows **-aŋ**, with some cases of reduction to **-əŋ**:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-aŋ	*-aŋ	***-aŋ**	-əŋ	-aŋ, -iŋ, -e ?	-aŋ, -əŋ

*Table 165: PCN *-aŋ*

[194] MOUTH$_2$ PCN *paŋ

PAo ***t-paŋ*** (7); Lotha **o^{1}-pəŋ^{1}**; Sang. *pe*
< PTB ***m-p(r)(w)aŋ*** MOUTH†

[195] BE DEAF PCN *p(j)aŋ

Lotha **pəŋ^{3}-**
Sang. ^{1}a^{1}naŋ^{1}dbiŋ [**a-naŋ-tə-piŋ**] (PFX-ear-PFX-m) (Weidert 1987: #1072)
nangtping [**naŋ-tə-piŋ**] (ear-PFX-m) (Marrison 1967)
Yim. *nükhünpeang* [**nək^{h}ən-pjaŋ**] (ear-m) (Kumar 1973b)
mükhün-pengrü [**mək^{h}ən-peŋ-rə**] (ear-m-NOM) (Marrison 1967)
< PTB ***l-baŋ ≷ *m-baŋ*** DEAF

- The Sangtam and Yimchungrü forms exhibit some peculiarities: Sangtam 'be deaf' is transcribed with an unexpected **-iŋ** rime, while Yimchungrü has variants with **-jaŋ** (suggesting the reconstruction of medial ***-j-*** in PCN) and **-eŋ** (which is the only instance of this rime in the Yimchungrü data available). The strange *db/tp* cluster in both Sangtam transcriptions likely represents a fast-speech compression of a prefix + root collocation:
  /tə-piŋ/ → [tpiŋ].

[196] DREAM PCN *maŋ

PAo ***maŋ*** DREAM (n./v.) (215); Lotha **o^{1}-məŋ^{3}** ‘dream (n.)’
< PTB ***r/s-maŋ*** ≋ ***mak*** DREAM

[197] BE DARK PCN *a-ma(ŋ)

PAo	***a-maŋ*** BE DARK (212)
Lotha	**məŋ^{3}-** ‘be dark’
Sang.	*romang* [**ro-maŋ**] ‘night’
	ama ‘dark’
Yim.	*amütü* [**a-mə-tə**] ‘dark’

< PTB ***s-maŋ*** ≋ ***s-mak*** BLACK / INK / DEEP

▸ The cognates in this set support the reconstruction of ***ma*** ≋ ***maŋ*** allofamy at the PCN level: PAo ***a-maŋ***, Lotha **məŋ^{3}-**, and Sangtam **-maŋ** reflect PCN ***a-maŋ***, while Sangtam **a-ma** and Yimchungrü **a-mə-** reflect PCN ***a-ma*** according to the regular sound changes in §III.3.1.1 (though the PTB source of PCN ***a-ma*** is unclear).

[198] BODY / CORPSE PCN *a-maŋ

PAo	***(t/a-)maŋ*** BODY / CORPSE (214)
Lotha	**o^{1}-məŋ^{1}** ‘corpse’
Sang.	*asüchome* [**a-sətʃ^{h}u-me**] ‘corpse’ (PFX-die-m ?)
Yim.	*pang* [**paŋ**] ‘body’ ?

< PTB ***s-maŋ*** CORPSE

[199] WHILE (CONTEMPORATIVE) PCN *-thaŋ

Chungli **-taŋ^{1}**; Lotha **-thəŋ^{2}**

▸ In both Chungli and Lotha, this converb suffix provides a contemporative (or ‘simultative’) meaning, i.e., ‘while VERB-ing’. (See the discussion of converbs in GMA: 409–449.)

[200] LIZARD PCN *ʃaŋ-

PAo ***saŋ-*** (97); Lotha **səŋ^{1}rəm^{1}**
< PTB ***r-saŋ*** LIZARD

[201] BE CLEAN / BE CLEAR PCN *tsaŋ

PAo ***tʃaŋ-tʃaj*** BE CLEAR (147); Lotha **ṇ¹-tshəŋ¹-** 'be clean'
< PTB ***(t)syaŋ*** CLEAR, PURE, CLEAN (STC: 52–53)

[202] SEED, NUT PCN *tsaŋ

PAo ***(t-)tʃaŋ*** (151); Lotha **o¹-tsəŋ³**
< PTB ***tsyaŋ*** TESTICLE

[203] RICE (HUSKED, UNCOOKED) PCN *a-tsaŋ

PAo ***(a-)tʃaŋ*** RICE (HUSKED, UNCOOKED) (152)
Lotha **o¹-tsəŋ³** 'rice (husked, uncooked)'
Sang. *tsang* [**tsaŋ**] 'rice (cooked)' / *tse* 'rice (uncooked)'

▸ It is unclear which Sangtam form belongs in this cognate set: Either PCN ***-aŋ*** yielded Sangtam **-e** here, or (perhaps more likely) the rime was preserved as **-aŋ** while the meaning shifted from 'uncooked rice' to 'cooked rice'.

[204] THREAD, YARN PCN *a-hjaŋ

PAo ***a-hjaŋ*** (277)
Lotha **o¹-jəŋ¹**
Yim. *sangpünhing* [**saŋpən-hiŋ**] (cotton-m)

▸ The Yimchungrü **-iŋ** rime is unexpected, though perhaps **hiŋ** represents something like underlying /hjəŋ/.

[205] STARE, LOOK AT, WATCH PCN *m-raŋ ?

Chungli **ɹəp²ɹaŋ²** 'look at, watch'
Lotha **ṇ¹-rəŋ¹-** 'stare (with confusion or disapproval)'
Yim. *mürüngkhih* [**mə-rəŋ-kʰi?**] 'stare'
< PTB ***mraŋ*** SEE / LOOK TOWARD

▸ Lotha **ṇ¹-rəŋ¹** is combined with the **-i?³** suffix[127] and followed by the verb **zet²-** 'look' to produce the meaning 'stare':

[127] The **-i?³** suffix appears to be some sort of verb serializer.

m̥³po³	**na²**	**o¹hmjək²**	**n̥¹rəŋ¹-iʔ³**	**a³**	**zet²-tʃʰoʔ²**
3SG	AGT	eye	stare-SUF	1SG	look-PAST

"He stared at me (with confusion or disapproval)."

Yimchungrü exhibits a reduced rime **-əŋ** here, though it has preserved ***-aŋ** in the identical phonological environment in *amürang* 'strong' [206].

[206] BE HARD / BE STRONG PCN *m-raŋ ?

PAo ***m-ɹaŋ** BE HARD (310)
Yim. *amürang* [**a-mə-raŋ**] 'strong' (Kumar 1973b)
< PTB ***g-raŋ ⩕ *m/b-raŋ** STRONG / FIRM / TENSE†

▸ This set is undoubtedly related to PNN ***raŋ** HARD (French 1983: 501).
In contrast to *mürüngkhih* 'stare' [205], Yimchungrü 'strong' has preserved the ***-aŋ** rime here following ***r-**, though it is possible that the *ang* sequence recorded in Kumar 1973b for this form represents [əŋ].

[207] CUT, CHOP PCN *laŋ

PAo ***a-laŋ** (346); Lotha **ləŋ¹-**

[208] BE LONG PCN *a-hlaŋ

PAo ***a-hlaŋ** (336)
Sang. *ashing* [**a-ʃiŋ**]
Yim. *ashang* [**a-ʃaŋ**]
< PTB ***m-raŋ** HIGH / LONG

*III.3.4.2. *-iŋ*

PCN ***-iŋ** descended from PTB ***-i(ː)ŋ** and was preserved in Sangtam. Proto-Ao also generally retained ***-iŋ** but reduced it to ***-əŋ** following the PCN sibilant initials ***s-**, ***z-**, ***ʃ-**, and ***ts-**. The Lotha data suggests that ***-iŋ** was normally re-phonologized as ***-jəŋ** but reduced to **-əŋ** following the same set of PCN sibilants. The Yimchungrü reflex varies between **-iŋ** and **-əŋ**, with the conditioning uncertain:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-i(:)ŋ	***-iŋ**	*-əŋ / *sibilant _ *-iŋ elsewhere	-əŋ / *sibilant _ -jəŋ elsewhere	-iŋ	-iŋ, -əŋ

*Table 166: PCN ***-iŋ***

[209] NAME PCN *a-miŋ

PAo ***t-niŋ** (246); Lotha **o^{1}-mjəŋ^{1}**; Sang. *aning* [**a-niŋ**]; Yim. *amüng* [**a-məŋ**]
< PTB ***r/s-miŋ** NAME / ORDER / COMMAND

▸ The development of PCN ***miŋ** here parallels that of PCN ***hmik** EYE [234].

[210] SKY / YEAR PCN *niŋ

PAo	***a-niŋ** SKY (247)
Sang.	**^{2}niŋ** 'year' (Weidert 1987: #317)
	ning [**niŋ**] 'sky' (Marrison 1967)
Yim.	^{2}tɯ^{2}niŋ [^{1}] [**t^{h}ə-niŋ**] 'year' (Weidert 1987: #317)
	thüning [**t^{h}ə-niŋ**] 'sky' (Marrison 1967)

< PTB ***s-ni(:)ŋ** ⧓ ***s-nik** YEAR

▸ The semantic relationship between 'sky' and 'year' may have to do with charting the course of time by celestial bodies or by weather patterns. This connection also appears in Karbi (formerly 'Mikir'):

'year': **sinīŋ(ʔ)** (Weidert 1987: #317)
ningkan (Marrison 1967)
niŋ (STC: #368)

'sky': *sining* (Marrison 1967)

Note that Weidert glosses Chungli Ao **^{3}a^{1}nɯŋ** as 'year' (1987: #317), but all the other sources I have consulted (including Ao consultants and dictionaries) give only the 'sky' meaning.

[211] WOOD PCN *siŋ

PAo ***(a-)səŋ** WOOD (115)
Lotha **o^{1}-tshəŋ^{3}** ‘wood’
Sang. ^{2}siŋ^{1}duŋ [**siŋ-tuŋ**] ‘tree’ (m-post)
Yim. **^{1}saŋ** ‘wood’
< PTB ***siŋ ⧓ *sik** TREE / WOOD

▸ Yimchungrü ‘wood’ contains an unexpected **-aŋ** rime for which no explanation is available yet.

[212] ORDER, COMMAND, LAW PCN *ziŋ

PAo ***-zəŋ** LAW (130)
Lotha **ji^{1}-zəŋ^{1}** ‘law’ (word-m)
Sang. *yuzing* [**ju-ziŋ**] ‘order / command / law’ (word-m)
Yim. *theyozüng* [**t^{h}ə-ju-zəŋ**] ‘law’ (PFX-word-m)

▸ This set shows the reduction of PCN ***-iŋ** to ***-əŋ** following ***z-** in Proto-Ao and Lotha (and also in Yimchungrü).

[213] GINGER PCN *ʃiŋ

PAo ***səŋmuk** (117); Lotha **o^{1}-səŋ^{1}**; Sang. *shing* [**ʃiŋ**]; Yim. *shing* [**ʃiŋ**]
cf. PKC ***thiiŋ** GINGER (VanBik 2009: #388)

▸ This etymon may have originally been a loan from Mon-Khmer: cf. Khasi *s’ing/sying* ‘ginger’ (Singh 1906: 203).

[214] CELESTIAL / SKY / WEATHER PCN *tsiŋ

PAo ***tsəŋ-** CELESTIAL (190), ***tsəŋ-muk** THUNDER (219)
***tsəŋ-hɹəm** GOD, DEITY (305)
Lotha **tsəŋ^{3}-hru^{2}** ‘storm’ (m-?), **tsəŋ^{3}-on^{3}** ‘day’
tsəŋ^{3}-kjəŋ^{3} ‘winter’ (m-dry), **tsəŋ^{3}-hran^{1}** ‘demon’
tsəŋ^{3}-tʃo^{3}- ‘hit by lightning’
Sang. *tsing* [**tsiŋ**] ‘rain’, *tsingchi* [**tsiŋ-tʃ^{h}i**] ‘lightning’
tsingrangba [**tsiŋ-raŋ-pa**] ‘God’
tsingghinyüpong [**tsiŋ-ɣi-n^{j}ə-poŋ**] ‘storm’ (m-?-sun-wind)
tsingkang [**tsiŋ-kaŋ**] ‘winter’ (m-season?)
Yim. *tsüng* [**tsəŋ**] ‘rain’, *tsüngpo* [**tsəŋ-po**] ‘wind’
tsüngkam [**tsəŋ-kam**] ‘winter’, *tsüngmuk* [**tsəŋ-muk**] ‘thunder’
cf. PTk ***tsiŋ** SKY / HEAVEN / RAIN (Mortensen 2012: #489)

▸ Weidert refers to this morpheme as the 'meteorological classifier' (1987: 464) and Sun observes that such 'weather' formatives are common in TB languages (1993: 261). Clark also notes that "TSUNG in Zungi and Mungsen, seems to have an idea of divine, heavenly, or supernatural" (1911: 898).

[215] PLANT (v.) PCN *liŋ

PAo ***a-liŋ*** (332); Lotha **jəŋ^{1}-**

*III.3.4.3. *-uŋ*

PCN ***-uŋ*** descended from a merger of PTB ***-u(ː)ŋ*** and ***-oŋ***. One set also suggests that PTB ***-a(ː)ŋ*** following ***k-*** was another source of this rime. PCN ***-uŋ*** was preserved in all daughter languages, with Lotha merely lowering it to **-oŋ**:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-u(ː)ŋ, *-oŋ, *-a(ː)ŋ / *k _	***-uŋ**	*-uŋ	-oŋ	-uŋ	-uŋ

*Table 167: PCN *-uŋ*

[216] MALE (OF ANIMALS) PCN *puŋ

Chungli **tə^{3}-puŋ^{3}** 'male (of animal)'
TEBONG [**tə-puŋ**] 'scrotum or cod of male animals' (Clark 1911: 796)
Lotha **maŋ^{3}sə^{3}-poŋ^{3}** 'bull' (cow-m)
Sang. *misübong* [**misə-puŋ**] 'bull' (cow-m)
Yim. *pung* [**puŋ**] 'male'
< PTB ***s-bloŋ*** SCROTUM / POUCH

▸ This etymon is no doubt related to PNN ***ʔ-buŋ*** 'male (of animals)' (French 1983: 520).

[217] WIND (n.) PCN *m-puŋ

PAo ***m-puŋ*** (15)
Lotha **m̩^{1}-poŋ^{1}**
Sang. *nyüpong* [**n^{j}ə-puŋ**] (sun-m)
Yim. *apong* [**a-puŋ**]
< PTB ***buŋ*** WIND (n.)

[218] STEM, TRUNK / POST / TREE PCN *tuŋ

PAo ***t-tuŋ*** STEM, TRUNK (34)
Lotha **o^{1}-toŋ^{1}** ‘tree’
Sang. ^{2}siŋ^{1}duŋ [**siŋ-tuŋ**] ‘tree’ (wood-m), *tong* [**tuŋ**] ‘post (of house)’
Yim. ^{1}saŋ^{2}duŋ [^{2}] [**saŋ-tuŋ**] ‘tree’ (wood-m)
< PTB ***duːŋ*** POST / COLUMN

[219] BE DRY / BE THIN, LEAN PCN *a-kuŋ

PAo ***a-kuŋ*** BE DRY (66)
Chungli **kuŋ^{2}ɹa^{3}** ‘be thin (of people)’ (m-disease)
Lotha **ŋ̇^{1}-koŋ^{3}-** ‘dry (vt.) / shrivel up / be skinny’
Sang. *akong* [**a-kuŋ**] ‘dry (adj.)’
akongra [**a-kuŋ-ra**] ‘thin’ (m-disease)
Yim. *akung* [**a-kuŋ**] ‘dry (adj.)’
< PTB ***ka(ː)ŋ*** ROAST / TOAST / BURN / BE DRY

▸ This set suggests that PTB ***-a(ː)ŋ*** yielded PCN ***-uŋ*** following the PTB velar initial ***k-***.

[220] NECK PCN *a/k-hwuŋ ?

PAo ***t-khuŋ*** (80)
Lotha **e^{1}-vəŋ^{1}** ?
Sang. *hong* [**huŋ**], *ahong* [**a-huŋ**]
Yim. *ahung* [**a-huŋ**]
< PTB ***k-woŋ*** NECK†

▸ The reduction of the rime in Lotha **e^{1}-vəŋ^{1}** ‘neck’ is unexpected.

[221] SHIELD PCN *a-tsuŋ

PAo ***(a-)tʃuŋ*** (155)
Lotha **o^{1}-tsoŋ^{3}**
Sang. *tsung* [**tsuŋ**] (Marrison 1967), *tsong* [**tsuŋ**] (Kumar 1973a)
Yim. *tsung* [**tsuŋ**]

▸ This term refers to a defensive shield used in war or hunting:

“Shields are used in conflicts with wild animals as well as with human enemies…” (Clark 1911: 961, speaking of the Ao)

"In the old days shields (*otsung*) were always carried in war and are still used at tiger and leopard hunts." (Mills 1922: 18, speaking of the Lotha)

"Die Bewaffnung der Nord-Sangtam besteht aus Speer, Dao, Schild und Armbrust." ["The arms of the North-Sangtam consist of the spear, dao, shield, and crossbow."] (Kauffmann 1939: 216, speaking of the Sangtam)

[222] DRINK (v.) PCN *juŋ

PAo ***a-juŋ*** (285); Lotha **ju^{1}-** ?; Sang. *yong* [**juŋ**]; Yim. *yung* [**juŋ**]

▸ Lotha **ju^{1}-** unexpectedly lost the PCN coda and thus failed to lower the nucleus to /o/.

[223] RIVER PCN *a-juŋ

PAo	***a-juŋ*** RIVER (284)
Sang.	^{1}yuŋ^{1}ki [**juŋ-k^{h}i**] 'stream' (m-water?) (Weidert 1987: #742)
	yongkhi [**juŋ-k^{h}i**] 'river' (m-water?) (Marrison 1967)
Yim.	^{2}a^{2}yuŋ [^{2}] [**a-juŋ**] 'stream'

[224] FINGER / TOE PCN *m-juŋ

PAo	***t-m-juŋ*** FINGER / TOE (287)
Lotha	**joŋ^{3}ro?^{3}**
Sang.	^{1}mɯ^{2}yuŋ^{2}za [**mə-juŋ-za**] 'finger'
Yim.	*yingkhing* [**jiŋ-k^{h}iŋ**] 'finger'

< PTB ***m-yuŋ*** FINGER

▸ Yimchungrü 'finger' contains an unexpected **-iŋ** rime. Some other Lotha sources also report forms that could reflect PCN ***-iŋ*** (**^{3}yɯŋ^{3}ro(?)** [Weidert 1987: #273], *yingro* [**jəŋro**] [Murry et al. 1978: 45; Lotha 2004: #554]), though my consultant produces Lotha 'finger' with the **-oŋ** rime. These observations suggest the possibility of ***-uŋ*** ≍ ***-iŋ*** allofamy in PCN.

The final syllables of the Lotha and Sangtam forms (**ro?** and **za**, respectively) are likely cognate, reflecting PCN ***-a*** (cf. the Lotha and Sangtam forms for DOG [104]; MITHUN, GAYAL (BOS FRONTALIS) [94]; GRASS [16]).

[225] URINATE / URINE PCN *ph-juŋ

Mongsen **hjuŋ-tsə** ‘urine’ (m?-water), **hjuŋtsə hjùŋ** ‘urinate’
Lotha **mjoŋ^{1}-** ‘urinate’
Sang. *müyong* [**mə-juŋ**] ‘urine’
Yim. *phuyung* [**p^{h}u-juŋ**] ‘urine’
cf. PKC **yuŋ-I**, **yun-II** URINATE (VanBik 2009: #1244)

▸ The Yimchungrü prefixal syllable **p^{h}u-** exhibits possible vowel harmony with the root (cf. SNAKE [100], FOUR [112], and CENTER, MIDDLE [230]).

[226] BACK (BODYPART) PCN *ruŋ

PAo ***t-ɹuŋ-thuŋ** (317); Sang. *arong* [**a-ruŋ**]; Yim. *rung* [**ruŋ**]
< PTB ***m-ruŋ** BACK (BODY)†

[227] BURN PCN *ruŋ

PAo ***a-ɹuŋ** (315); Lotha **roŋ^{1}-** ‘burn (vi./vt.)’
< PTB ***ploŋ** BURN

[228] BOAT PCN *a-ruŋ

PAo ***(a-)ɹuŋ** (316); Lotha **o^{1}-hroŋ^{1}**
< PTB ***m-loŋ** BOAT

[229] STONE, ROCK PCN *luŋ

PAo ***(a-)luŋ** (358); Lotha **o^{1}-loŋ^{3}**; Sang. **^{2}luŋ**; Yim. **^{1}luŋ**
< PTB ***r-luŋ** STONE

[230] CENTER, MIDDLE PCN *a-luŋ

PAo ***t-juŋ** (286)
Lotha **o^{1}-loŋ^{1}-o^{1}**
Sang. *alongla* [**a-luŋ-la**]
Yim. *phulung* [**p^{h}u-luŋ**]

[231] HEART / BE ROUND PCN *m-luŋ

PAo ***luŋluŋ** BE ROUND (360), ***t-m-luŋ** HEART (361)
Lotha **loŋ^{1}ʃi^{1}** ‘joy’ (m-?)
Sang. ^{1}a^{1}mɯ^{2}luŋ [**a-mə-luŋ**] ‘be round’
Yim. *mulung* [**mu-luŋ**] ‘heart’
thulung-khiungto [**t^{h}u-luŋ-k^{h}juŋto**] ‘round’

< PTB ***luŋ ≷ *lum** HEART / ROUND (STC), ***m-luŋ** MIND / HEART / LIVER (HPTB)

▸ Proto-Ao ***luŋluŋ** BE ROUND appears to be a reduplication of ***luŋ**.

*III.3.4.4. *-ak*

PTB ***-a(ː)k** is the source of PCN ***-ak**, which was generally preserved in Proto-Ao, except where it was reduced to ***-ək** following PCN ***ts(h)-** and ***hrj-** (which later coalesced to PAo ***tsh-**). Yimchungrü also generally preserved ***-ak** but reduced it to **-ək** following ***(h)r-** (though not following ***hrj-**; cf. LOUSE, LICE [256]). Sangtam developed **-a(ʔ)**, though a few forms (perhaps dialectal variants) have preserved the final ***-k**.

PCN ***-ak** usually yielded **-ək** in Lotha, but several reflexes show preservation of the rime as **-ak**. While it is possible that Lotha ***-ak** vs. ***-ək** reflects an original PCN ***-aːk** vs. ***-ak** vowel length contrast (as in the bilabial and dental nasal rimes), there is evidence to suggest that the PCN rimes were uniformly ***-ak** and that ***-ak** > **-ək** was a Lotha-specific development conditioned by the onset:

> First, while some overlap in PTB ancestors does exist in the bilabial and dental nasal rimes, the reconstruction of PCN vowel length distinctions is at least supported by the following exceptionless sound changes:
>
> PTB ***-am** > PCN ***-aːm**
> PTB ***-an** > PCN ***-aːn**
>
> For the oral velar coda, however, there is one set with PTB ***-aːk** (IN-LAW [235]), and all the other PTB ancestors of both Lotha **-ak** and **-ək** contain ***-ak** (with one exception: PTB ***s-r(y)ik** LOUSE [256]). This PTB overlap is problematic for the reconstruction of a PCN vowel length contrast based on Lotha **-ak/ək**, as there is nothing to explain how PTB ***-ak** split into PCN ***-aːk** and ***-ak**.
>
> Second, with some exceptions, the Lotha **-ak** rimes are generally preceded by a palatal (i.e., palatal, palato-alveolar, or post-alveolar) consonant. This pattern suggests that PCN ***-ak** normally yielded Lotha **-ək** but was preserved as **-ak** following a palatal initial consonant or medial glide.

At this stage in the research, therefore, there is no compelling reason to reconstruct a PCN ***-aːk** rime in addition to ***-ak**, although this is certainly open to change as the Central Naga languages continue to be analyzed.

The development of PCN ***-ak** is summarized in the table below:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-a(ː)k	***-ak**	*-ək / *ts(h), *hrj _ *-ak elsewhere	-ak / *palatal _ -ək elsewhere	-a(ʔ/k)	-ək / *(h)r _ -ak elsewhere

*Table 168: PCN **-ak***

[232] BE FLAT PCN *a-pjak
[233] MAT PCN *a-phak

PAo ***(a)pak** BE FLAT / MAT (5)

Lotha	**e[1]-pjak[2]-** 'be flat'	**o[1]-phək[2]** 'bamboo mat'
Sang.	*pa* 'flat' (Marrison 1967)	*pha* [**p[h]a**] 'mat' (Kumar 1973a)
Yim.	*amü<u>peak</u>* [**a-mə-<u>pjak</u>**] 'flat'	*pheak* [**p[h]jak**] 'mat'
	apeak [**a-pjak**] 'sheet'	

< PTB ***r-pak** LEAF

▸ These cognate sets support the reconstruction of two semantically related PCN forms, both possibly descendants of a split in PTB ***r-pak**.

The MAT cognates (right column) point to a PCN form with initial aspiration: PCN ***a-phak**. The medial palatal glide in Yimchungrü *pheak* 'mat' may have arisen through analogy with Yimchungrü 'flat' and 'sheet'.

The FLAT cognates (left column) support the reconstruction of a medial palatal glide: PCN ***a-pjak**. (Sangtam appears not to have preserved medial palatal glides following ***p-**.) As discussed above, the Lotha form here shows preservation of ***-ak** following a palatal consonant.

The lack of aspiration in PAo ***(a)pak** BE FLAT / MAT shows that the Proto-Ao form descended from PCN ***a-pjak** BE FLAT instead of ***a-phak** MAT, though it has taken over the semantic range of the latter.

[234] EYE PCN *mjak ⩕ *hmik

PAo ***t-nik*** (244); Lotha **o[1]-hmjək[2]**; Sang. *na?*; Yim. *mük* [**mək**]
< PTB ***s-myak ⩕ *s-mik*** EYE

▸ Limiting this reconstruction to a single PCN allofam would be problematic: Sangtam *na?* suggests PCN ***mjak*** (< PTB ***s-myak***), with ***mj-*** > **n-** and ***-ak** > **-a?**. For PCN ***mjak*** to yield PAo ***nik***, however, the medial palatal glide would have had to perform 'double duty' by palatalizing PCN ***m-*** > PAo ***n-*** and raising ***-ak** > ***-ik**. The Lotha and Yimchungrü rime developments would also be unusual: PCN ***-ak*** should yield Yimchungrü **-ak**, and ***-jak*** is expected to yield Lotha **-jak** (not **-jək**), with the palatal consonant preserving the ***-a-*** nucleus.

Reconstructing an allofamic variant PCN ***hmik*** (< PTB ***s-mik***), however, provides an explanation for these forms. In an excellent parallel to PCN ***miŋ*** (see NAME [209]), PCN ***hmik*** was palatalized to PAo ***nik***, reduced to Yimchungrü **mək**, and re-phonologized with a palatal glide and schwa nucleus as Lotha **hmjək**. (The voicing of the initials is discussed in §III.5.4.1). Sangtam *na?* is therefore the only existing CN reflex of PCN ***mjak***.

[235] IN-LAW PCN *a-mjak

PAo ***(a-)hnak*** SON-IN-LAW / BROTHER-IN-LAW (234)
Lotha **o[1]-mjak[2]-o[2]** 'male in-law', **o[1]-mjak[2]-u?[3]** 'female in-law'
Yim. [2]dzɯ?[(2)]meak [[1]] [**tsə?-mjak**] 'son-in-law' (son-m)
(Weidert 1987: #633)

< PTB ***s-ma:k*** SON-IN-LAW

▸ There is not enough evidence to determine the regular PCN reflex of the PTB ***s-*** prefix for certain, but the medial ***-j-*** in PCN ***mjak*** suggests the possibility that PTB ***s-*** yielded a secondary palatal infix in PCN, just as Benedict has demonstrated for Lepcha (Benedict 1943).

The PCN ***-ak*** rime was preserved in Lotha by the presence of the medial palatal glide.

[236] STING PCN *tak

PAo ***m-tak*** (27); Lotha **tək[2]-**

[237] WEAVE PCN *tak

PAo ***a-tak*** (26); Lotha **tək²-**
< PTB ***tak** ≋ ***dak** WEAVE

[238] BE BLACK PCN *a-njak

PAo ***a-nak*** (240)
Lotha **njək²-**
Sang. *anya* [**a-nʲa**] (Marrison 1967), *anyak* [**a-nʲak**] (Kumar 1973a)
Yim. *mürak* [**mə-rak**]
< PTB ***s-nak** BLACK / INK / DEEP

▸ Marrison's record of Sangtam 'black' shows the usual ***-ak** > **-a** development, though Kumar's transcription suggests that final ***-k** was preserved as a free- or dialectal variant.
The failure of the medial palatal glide to prevent reduction of the rime in the Lotha form is anomalous.

[239] SCRATCH$_1$ (v.) PCN *a-hnak

PAo ***a-hnak*** SCRATCH (v.) (232); Lotha **e¹-nək²-** 'scratch (to satisfy an itch)'
< PTB ***hyak** SCRATCH

[240] GUARD (v.) PCN *hnjak

PAo ***a-hnak*** (233); Lotha **hnjak²-**

▸ The medial palatal glide is responsible for the preservation of the ***-ak** rime in Lotha (contrast PCN ***a-hnak** SCRATCH$_1$ [239]).

[241] BITE PCN *m-kak

Lotha **ŋ̊¹-kək²-**; Sang. *müka* [**mə-ka**]
< PTB ***k(w)ak** ≋ ***k(y)ak** BITE / CHEW†

[242] BREATH PCN *sak

Mongsen **[tə]-saka**; Lotha **e¹-thək²**; Sang. **¹a⁽²⁾sa?**; Yim. ⁽¹⁾šak [**ʃak**]
< PTB ***r-sak** BREATH(E) / LIFE

▸ Mongsen 'breath' appears to have gained an echo vowel.

[243] ITCH (v.) PCN *m-sak
[244] SCRATCH$_2$ (v.) PCN *m-ʃak

PAo	***m-sak** ITCH (v.) (96)	
Lotha	**n̥^{1}-thək^2-** 'itch, be itchy'	**n̥^{1}-ʃak^2-** 'scratch (leaving a mark or wound)'
Yim.		*müshak* [**mə-ʃak**] 'scratch (v.)'

< PTB ***m-sak** ITCH

▸ As with BE FLAT [232] and MAT [233], the cognates here support the reconstruction of two related PCN forms, both possibly descendants of PTB ***m-sak**: PCN ***m-sak** ITCH is supported by PAo ***m-sak** and Lotha **n̥^{1}-thək^2-** (left column), while ***m-ʃak** SCRATCH$_2$ is reflected in Yimchungrü *müshak* and Lotha **n̥^{1}-ʃak^2-** (right column), which preserved the ***-ak** rime following the palatal initial ***ʃ-**.

It is interesting that both pairs of semantically related reconstructions (MAT/BE FLAT and ITCH/SCRATCH$_2$) differ from each other by the presence/absence of a palatal component in the PCN form: ***ph-/pj-** for MAT/BE FLAT, ***s-/ʃ-** for ITCH/SCRATCH$_2$.

[245] BE QUICK, QUICKLY PCN *ʒak-

PAo	***ʒakta** QUICKLY (25)
Lotha	**zak^{1}to?^{3}** 'quickly'
Sang.	*ya?yane* [**ja?ja-ne**] 'fast (quick)' (Marrison 1967)
	zaza 'fast' (Kumar 1973a)

cf. PKC ***yok** QUICKLY (VanBik 2009: #1229)

▸ The root has undergone reduplication in Sangtam, most likely of an emphatic nature.
The preservation of the PCN ***-ak** rime in Lotha was conditioned by the palatal fricative ***ʒ-**, which later dentalized to **z-** (cf. §III.6.4.3).
The final syllables of the PAo (**ta-**) and Lotha forms (**to?-**) appear to be cognate (cf. §III.3.1.1).

[246] WASH, BATHE PCN *m-tsak

PAo	***m-tsək** WASH (HANDS) (189)
Lotha	**tsək^2-kat^2-** 'bathe (oneself)'
Sang.	*mütsa* [**mə-tsa**] 'wash (self)'
Yim.	*tsak* [**tsak**] 'wash (self)'

▸ In Proto-Ao, the PCN ***-ak** rime following ***ts-** was reduced to ***-ək**, which later prevented the initial from palatalizing to ***tʃ-** (cf. §III.5.3.1).

[247] BE COLD PCN *a-tshak

PAo ***atʃhək** FEEL COLD (181)
Lotha **tshək²-** 'feel cold'
Sang. *cha* [**tʃʰa**] 'cold'
Yim. *athsak muro* [**a-tsʰak muro**] 'winter' (cold season)
< PTB ***m/ʔ-glak** COLD / FREEZE

▸ The ***-ak** rime was reduced in Proto-Ao following PCN ***tsh-**, which was later unconditionally palatalized to ***tʃh-** in Proto-Ao (unlike its unaspirated counterpart PCN ***ts-** in WASH, BATHE [246].) (See the discussion in the initials section: §III.5.3.1)

[248] BREAK PCN *tʃak

PAo ***tʃak** (148); Lotha **tʃak²-**; Yim. *yihshak* [**jiʔ-ʃak**]

▸ The PCN ***tʃ-** palatal affricate conditioned the preservation of ***-ak** in Lotha.

[249] FACE PCN *tʃak

Chungli **tə³-tʃak³**; Sang. *atsaʔ* [**a-tsaʔ**]; Yim. *chak, jak* [**tʃak**]
< PTB ***tsyak** FACE†

[250] CHEW PCN *m-tʃak

PAo ***m-tʃak** CHEW (149)
Lotha **n̥¹-tʃak²-** 'chew'
Sang. *mütsanacho* [**mə-tsa-natʃʰu**] 'masticate'
Yim. *müjakthünak* [**mə-tʃak-tʰənak**] 'masticate'
< PTB ***m-dzyak** CHEW†

▸ Once again, the PCN ***tʃ-** palatal affricate conditioned the preservation of ***-ak** in Lotha.

[251] BEE PCN *tʃhak

Lotha **o¹-tshak²**; Sang. *thsa* [**tsʰa**]

▸ The preservation of ***-ak** in Lotha points to an original PCN palatal affricate ***tʃh-**, which was later dentalized to **tsh-** before ***-ak**.

[252] BE DIFFICULT / BE HARD / BE DEAR, COSTLY PCN *a-tʃhak

PAo ***a-tʃhak*** BE DIFFICULT / BE HARD (164)
Lotha **tshək²-** 'be costly'
Sang. *athsa* [**a-ts^{h}a**] 'difficult' (Marrison 1967)
ami athsak [**ami a-ts^{h}ak**] 'costly' (price-m) (Kumar 1973a)
Yim. *amoachak* [**amo-a-tʃak**] 'dear (expensive)' (price-m)
< PTB ***tsak-t*** HARD / SOLID†

▸ The Sangtam forms presented by Marrison and Kumar show variation in the preservation of PCN ***-k*** in Sangtam.
The Lotha **-ək** rime is unexpected, as the PCN palatal affricate ***tʃh-*** should have prevented the reduction of ***-ak*** in Lotha.

[253] BE SHY / BE ASHAMED PCN *a-hjak

PAo ***ahjak*** BE SHY (276)
Lotha **jək³ra³-** 'feel shy, ashamed'
Sang. *asha* [**a-ʃa**] 'shy / shame'
< PTB ***g-yak ⧓ *s-r(y)ak*** ASHAMED

▸ The failure of PCN ***-ak*** to be preserved in Lotha following the palatal initial ***hj-*** is anomalous. Perhaps the PTB allofam ***s-r(y)ak*** also descended into PCN and subsequently yielded ****rak** > ****rək** > **jək** in Lotha, but this is highly speculative.

[254] DECEIVE PCN *rak

PAo ***kəlak*** (67)
Sang. *khüracho* [**k^{h}ə-ra-tʃ^{h}u**]
Yim. *rük-aki* [**rək-aki**]

▸ The PCN ***-ak*** rime was reduced to **-ək** in Yimchungrü following ***(h)r-**.
The initial syllables PAo ***kə-*** and Sangtam **k^{h}ə-** may be cognate, though their meaning is unknown.

[255] CHOKE (vi.) PCN *a-hrak

PAo ***ahɹak*** CHOKE / DROWN (vi.) (301); Lotha **e¹-hrək²-** 'choke (vi.)'

[256] LOUSE, LICE PCN *a-hr(j)ak

PAo ***a-tshək*** (202)
Lotha **o^{1}-hrək^{2}**
Sang. *agha* [**a-ɣa**]
Yim. *kurheak* [**ku-r̥jak**] (head-m)
< PTB ***s-r(y)ik** LOUSE

▸ Although the putative PTB ancestor of this set contains an ***-ik** rime, the Sangtam **-a** and Yimchungrü **-ak** rimes compel the reconstruction of PCN ***-ak**.[128] The variable nature of the PTB medial palatal glide seems to have been maintained in PCN, however, as Yimchungrü *kurheak* and PAo ***a-tshək*** are the only CN cognates which reflect the glide.
The PCN ***-ak** rime here was reduced in Proto-Ao.

[257] BIND, TIE PCN *(h)rak

PAo ***a-ɹak** BIND (W/ BAMBOO) (309)
Lotha **rək^{3}-kat^{2}-** 'force, coerce' (MK)
rikata [**rək-kat-a**] 'force' (Murry et al. 1978: 47)
rükata [**rək-kat-a**] 'weld' (Murry et al. 1978: 136) ?
Sang. *ra?* 'bind, tie' (Marrison 1967)
rakcho [**rak-tʃ^{h}u**] 'tie' (Kumar 1973a)
Yim. rhɯk [**r̥ək**] 'tie' (Weidert 1987: #998)
rhük [**r̥ək**] 'tighten / tie' (Kumar 1973b)
rhük [**r̥ək**] 'bind / tie' (Marrison 1967)
< PTB ***grak** CORD / TIE / BIND

▸ This root appears to have gained a metaphorical sense in Lotha, namely to 'force' or 'coerce'.
The Sangtam forms again show variation in the preservation of ***-k**.
As in DECEIVE [254], PCN ***-ak** was reduced to Yimchungrü **-ək** following ***(h)r-**. (Note that the tone of **rhɯk** is omitted in Weidert 1987: #998.)

[128] James Matisoff suggests the possibility that PTB LOUSE exhibited the same ***-ik** ≍ ***-ak** allofamy as PTB ***s-myak** ≍ ***s-mik** EYE [234] (p.c., 3 December 2013).

[258] LICK PCN *m-ljak

PAo ***m-ljak** (382)
Lotha **m̩¹-jak²-**
Sang. *müya* [**mə-ja**]
Yim. ²mɯ²leak([¹]) [**mə-ljak**]
< PTB ***m/s-lyak** LICK / TONGUE

▸ The PCN ***-ak** rime was preserved in Lotha, owing to the palatal glide in the PCN ***lj-** cluster.

*III.3.4.5. *-ik*

PCN ***-ik** descended from PTB ***-ik** and was preserved in Proto-Ao but reduced to **-ək** in Yimchungrü. In Lotha, the rime was re-phonologized with a schwa nucleus and medial palatal glide as **-jək**. The Sangtam reflex is unknown:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-ik	***-ik**	*-ik	-jək	?	-ək

*Table 169: PCN ****-ik***

[259] TICKLE PCN *k-lik

Mongsen **kàlìk**; Lotha **e¹-zək²-**
< PTB ***g-li-k** ARMPIT / TICKLE† (based on ***g-li** ARMPIT / TICKLE; HPTB: 186)

▸ The presence of **-ik** in the Mongsen form points to Proto-Ao ***-ik** (§II.4.5.2). In Lotha, the rime was reduced to **-ək** and the ***l-** initial spirantized to yield **z-**. These developments presumably took place through one of two paths:

PCN ***lik** > ****ljək** (rime reanalysis) > Lotha **zək** (spirantization)
PCN ***lik** > ****zik** (spirant.) > Lotha **zək** (rime reduction following ****z-**)

[234] EYE PCN *mjak ⩙ *hmik

PAo ***t-nik** (244); Lotha **o¹-hmjək²**; Yim. *mük* [**mək**]
(See EYE [234] in §III.3.4.4 for the other reflexes and further discussion.)
< PTB ***s-myak ⩙ *s-mik** EYE

- The PCN ***hmik*** variant descended from PTB ***s-mik*** and is reflected in the PAo, Lotha, and Yimchungrü forms. (The Sangtam form reflects PCN ***mjak*** < PTB ***s-myak***; cf. §III.3.4.4.)

*III.3.4.6. *-uk*

PCN ***-uk*** descended from a merger of PTB ***-u(ː)k***, ***-wak***, and ***-əw-k***, and was preserved in Proto-Ao and Yimchungrü. Sangtam generally developed ***-u(ʔ)***, but as with PCN ***-ak***, there is variation in the preservation of the final ***-k***. Lotha lowered the rime to ***-ok***:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-u(ː)k, *-wak, *-əw-k	***-uk**	*-uk	-ok	-u(ʔ/k)	-uk

*Table 170: PCN *-uk*

[260] SPRING FORTH / ORIGINATE / BE BORN PCN *puk

Chungli **a³-puk³** 'spring forth; originate'; Lotha **pok²-** 'be born'
< PTB ***p/buk** ⪤ ***p/bik** BORN / GIVE BIRTH†

[261] STOMACH, BELLY PCN *puk

PAo ***t-puk*** (11); Lotha **o¹-pok²**; Yim. *buk*, *puk* [**puk**]
< PTB ***puːk*** BELLY / CAVE

[262] THUNDER PCN *[h]muk

PAo ***tsəŋ-muk*** (219); Yim. *tsüngmuk* [**tsəŋ-muk**]
< PTB ***m-bruŋ** ⪤ ***m-bruk*** THUNDER / DRAGON

- See PCN ***tsiŋ*** CELESTIAL / SKY / WEATHER [214] for the ancestor of the first syllable in these forms.

[263] MACHETE, DAO PCN *nuk

PAo ***(a-)nuk*** (251); Sang. **⁽²⁾nuʔ**; Yim. **⁽¹⁾nuk**

[264] KNEE PCN *m-khuk

PAo ***t-m-kuk** (62)
Lotha **ŋ̍¹-khok²**
Sang. *mükho* [**mə-kʰu**]
Yim. *mukhuk* [**mu-kʰuk**]
< PTB ***gu(ː)k ≋ *m-ku(ː)k** CROOKED / BENT / KNEE / ANGLE

[265] SWEEP PCN *(w)uk

PAo ***a-uk** SWEEP (385)
Sang. ²gu²vuʔ [**ku-vuʔ**] 'sweep' (house-m) (Weidert 1987: #1222)
vo [**vu**] 'sweep' (Marrison 1967)
ku wokrü ngitsarü [**ku vuk-rə ŋitsarə**] 'sweeper'
(house m-NOM person) (Kumar 1973a)
< PTB ***k/p-y(w)ak** SCOOP / SWEEP†

▸ The Sangtam forms reveal variation in the preservation of PCN ***-k**.
PTB ***k/p-y(w)ak** SCOOP / SWEEP is a STEDT revision of HPTB's ***py(w)ak** SWEEP / BROOM (HPTB: 609).

[266] BUY / SELL PCN *juk

PAo ***a-juk** SELL (282)
Yim. *yukyinpung* [**juk-jən-puŋ**] 'market, bazaar' (m-sell-LOC)

▸ Yimchungrü 'market' appears to be a compound of this root (most likely meaning 'buy') with **jən** 'sell' [173], followed by a locative suffix.

[267] SOW, SCATTER, THROW (SEEDS) PCN *ph-ruk

PAo ***ph-ɹuk** SOW, SCATTER (313)
Lotha **n̥¹-rok²-** 'sow, scatter, throw (seeds)'
Sang. *shu* [**ʃu**] 'sow' ?
Yim. *youk* [**juk**] 'throw' ? (Marrison 1967)

▸ Marrison 1967 also glosses Yimchungrü *youk* as 'put' and Kumar 1973b has Yimchungrü *yuk* meaning 'fill'. This may indicate that the Yimchungrü form has broadened from the specific meaning of sowing seeds or is not actually cognate.

[268] SIX PCN *t-ruk

PAo ***t-ɹuk** (314)
Lotha **ti[1]-rok[2]**
Sang. *thüro* [**t[h]ə-ru**] ‘six’, *rore* [**ru-re**] ‘sixty’ (m-ten) (Marrison 1967)
thürok [**t[h]ə-ruk**] ‘six’, *rore* [**ru-re**] ‘sixty’ (m-ten) (Kumar 1973a)
Yim. *thuruk* [**t[h]u-ruk**] ‘six’, *rukrü* [**ruk-rə**] ‘sixty’ (m-ten)
< PTB ***d-ruk** SIX (STC: #411)

▸ Sangtam ‘six and ‘sixty’ show the variation in final **-k**.

[86] SWALLOW (v.) PCN *m-lju(k)

PAo ***m-juk** (283) …
(See SWALLOW [86] in §III.3.1.6 for the other reflexes and further discussion.)
< PTB ***mlyəw-k** SWALLOW (v.)

▸ In this set, only PAo ***m-juk** reflects the PCN variant with final ***-k**, which descended from the PTB allofam ***mlyəwk** bearing the velar suffix (cf. HPTB: 481).

III.4. Prefixes

Prefixes are an important yet highly variable factor in Tibeto-Burman reconstruction (cf. the discussion in HPTB: 87ff.). In this chapter, PCN etyma appear with nominal or verbal prefixes when two or more reflexes support their reconstruction, though their meanings are seldom clear. The development of prefixes is discussed in the following sections and summarized in the table below:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
?	***a-**	*a-	e^{1}-, o^{1}-	a-	a-
*m-	***m-**	*m-	m̩^{1}-	mə-	mə-
*p-	***p-**	*p-	?	?	?
*s-b/m- ?	***ph-**	*ph-	m̩^{1}-	mə-	phV-
*d-	***t-**	*t-	tV-	t(h)ə-	tə-
?	***th-**	*th-	t(h)V-	thə-	thə-
*g/k-	***k-**	*k-	?	?	?
*r-	***r-**	?	?	(reanalyzed)	?
*s-Ç-	***Ç-**	(see initials)			

Table 171: PTB > PCN > CN prefix development

*III.4.1. PCN Verbal/Nominal *a-*

As discussed in §II.1.2.2, many Proto-Ao verbs and nouns can be reconstructed with ***a-** prefixes (whose meanings are unclear). These prefixes show sporadic correspondences with nominal/verbal **a-** prefixes in Sangtam and Yimchungrü. In Lotha, many noun cognates bear an **o^{1}-** prefix, as expected if the original PCN nominal prefix was ***a-** (PCN ***-a** > Lotha **-o**; §III.3.1.1). GROUND, EARTH / FIELD [57] provides a suitable example:

PAo ***a-li** : Lotha **o^{1}-li?^{3}** : Sang. **a-li** : Yim. **a-lo**

Lotha also exhibits an **e^{1}-** prefix, however, which corresponds (irregularly) with the CN nominal/verbal **a-** prefixes and appears on both nouns and verbs.[129] This is exemplified by the following sets:

PAo ***a-sən** : Lotha **e^{1}-than^{1}** : Sang. **a-si** : Yim. **a-so** NEW [160] (verbal)
PAo ***a-ɹəʔ** : Lotha **e^{1}-rəʔ^{3}** : Yim. **a-re-** BOUNDARY [109] (nominal)

These prefix correspondence patterns are summarized in the following table:

	PAo	*Lotha*	*Sangtam*	*Yimchungrü*
nouns	*a-	e^{1}-, o^{1}-	a-	a-
verbs	*a-	e^{1}-	a-	a-

Table 172: Vocalic prefix correspondences

Several factors complicate the reconstruction of these prefixes in PCN:

1. Aside from its presence as a prefix, open **-e** is a rare rime in Lotha. There are too few cognate sets to reconstruct its PCN source with certainty.

2. There is no clear division along morphological lines: The Lotha verbal prefixes are all **e^{1}-**, but the nominal prefixes are a mixture of **e^{1}-** and **o^{1}-**.

3. Given the sporadic nature of the correspondences, there remains the possibility that these prefixes were transmitted to the Central Naga languages by areal contact, not through genetic descent.

Until more is known about the source of Lotha **-e** and CN areal transmission, the reconstruction of these PCN verbal/nominal prefixes remains provisional. For the sake of simplicity, both prefix correspondences are represented as PCN ***a-**.

Note that in some cases the PCN verbal ***a-** prefix was interpreted as part of the root in Proto-Ao, yielding disyllabic PAo roots (e.g. PCN ***a-hjak** BE SHY / BE ASHAMED > PAo ***ahjak** BE SHY [253]).

[129] It is interesting to note that Lotha verbal **e^{1}-** is similar to Chungli verbal **a-**, in that it appears to serve the synchronic purpose of simply adding phonological 'bulk', disappearing to be replaced by person agreement prefixes (**a^{3}-** '1sg', **e^{3}-** '1pl') when the verb is in 1st person.

*III.4.2. PCN Verbal/Nominal *m-*

Many PCN etyma are reconstructed with verbal/nominal ***m-*** prefixes, whose meanings and functions are unknown. The PTB ancestor of the verbal ***m-*** prefix is said to have indicated 'inner-directed states or actions' (HPTB: 117), but this narrow sense was no longer retained by the PCN stage.

The Lotha reflex of this PCN ***m-*** prefix is a L-toned syllabic nasal which assimilates in place to the root initial, (e.g. PCN ***m-kak*** > Lotha **ŋ̍^{1}-kək^{2}-** BITE [241]), except when the initial is **j-** (e.g. PCN ***m-ja*** > Lotha **m̩^{1}-jo^{1}-** PALM OF HAND [30]) or **h-** (e.g. PCN ***m-ɣaj*** > Lotha **m̩^{1}-ha^{1}-** BLESS [47]). In the other CN languages it has yielded a **mə-** syllable.

III.4.3. Other PCN Prefixes

Other, less frequent prefixes include ***p-***, ***ph-***, ***t-***, ***th-***, ***r-***, and ***k-***, whose meanings/ functions are also unknown. The PCN reconstructions exhibiting these prefixes are listed in the following table:

PTB	*PCN*	*Reconstructions*	
***p-**	***p-**	***p-hwa** TOOTH [27]	
***s-b/m-** ?	***ph-**	***ph-juŋ** URINATE / URINE [225] ***ph-ruk** SOW, SCATTER, THROW (SEEDS) [267]	***ph-laj** NAVEL, BELLY BUTTON [51] ***ph-rə** SNAKE [100]
***d-**	***t-**	***t-ku** NINE [77] ***t-kuʔ** CHEST [78]	***t-ruk** SIX [268]
?	***th-**	***th-ləjʔ** VINE / VEIN / SINEW [114] ***th-njaːm** FIFTY [117]	***th-ra** (TIMES) TEN [33] ***th-ni(t)** SEVEN [61]
***r-**	***r-**	***r-hwaʔ** BAMBOO$_1$ [28]	
***g/k-**	***k-**	***k-lik** TICKLE [259] ***a/k-hwuŋ** NECK [220]	

Table 173: Rare PCN prefixes

All instances of PCN prefixal ***ph-*** were preserved as such (or lost) in Proto-Ao and Yimchungrü but nasalized to **m-** in Lotha and Sangtam. Interestingly, this same pattern

of development also holds for initial ***ph-*** in prefixes reconstructed as fully vocalized syllables (***phV̥-ləj*** FOUR [112], ***pha-ŋa*** FIVE [12]).

*III.4.4. PTB *s- Prefix*

A number of PCN forms suggest that the PTB ***s-*** prefix yielded devoicing of the root initial (cf. HPTB: 99), especially in the case of sonorant initials (Table 174). PTB ***s-*** was not the only source of PCN devoicing, however, as there are many PCN roots with voiceless initials whose PTB etyma are not reconstructed with prefixal ***s-***. An additional complication is that not all PCN roots with ***s***-prefixed PTB ancestors have devoiced initials (cf. Table 177), but these these forms likely descended from PTB variants lacking the prefix.

Two sets also appear to indicate that PTB ***s-*** interacted with other prefixes (***m-***, ***b-***) to yield the PCN aspirated prefix ***ph-*** (Table 175). Another two sets suggest that PTB prefixal ***s-*** was responsible for the introduction of a secondary palatal glide (Table 176), as in Lepcha (Benedict 1943), but this would conflict with the hypothesis of ***s-*** as introducing devoicing/aspiration.

The PCN cognate sets involving PTB etyma with the ***s-*** prefix are listed and categorized phonologically in the following tables:

PTB	*PCN*	*gloss [set#]*
*s-bloŋ	*puŋ	MALE (OF ANIMALS) [216]
*s-bwam	*pəm	SWELL, BE SWOLLEN [140]
*m/s-gaw	*ku	HEAD [73]
*s-mik	*hmik	EYE [234]
*s-maːy	*hmaj	FACE / SURFACE [42]
*s-min	*hmən	RIPEN, BE RIPE / BE COOKED [170]
*s-miːt / *s-mut ?	*hmət	EXTINGUISH / BLOW [189]
*s-naːy	*a-hnaj	PUS [43]
*m/s-nam	*m-hnaːm	SMELL / STINK [116]
*s-nem ≍ *s-nyam	*a-hnjəm	BE LOW [142]
*s-ŋya	*a-hŋaʔ	FISH [13]
*m/s-ŋa-y	*[h]ŋaj	BABY, CHILD [45]
*s-wa ≍ *p-wa	*p-hwa	TOOTH [27]
*s-hywəy	*a-(h)jəjʔ	BLOOD [108]

PTB	*PCN*	*gloss [set#]*
*s-grim	*hram	CATCH, SEIZE, HOLD [139]
*s-r(y)ik	*a-hr(j)ak	LOUSE, LICE [256]
*s-rim	*a-hrəm	SMELL (n.), ODOR [145]
*s-rwi(y)	*a-(h)rəj	CANE, RATTAN [110]
*g/m/s-lay ≍ *r-ley	*a-hlej	BUY [59]
*s-ləy	*a-hləj(ʔ)	FLEA [115]

*Table 174: PTB *s- >PCN devoiced root initial*

PTB	*PCN*	*gloss [set#]*
*s-b/m-ruːl	*ph-rə	SNAKE [100]
*m/s-la(ː)y	*ph-laj	NAVEL, BELLY BUTTON [51]

*Table 175: PTB *s- > PCN aspirated prefix*

PTB	*PCN*	*gloss [set#]*
*s-maːk	*mjak	IN-LAW [235]
*s-nak	*a-njak	BE BLACK [238]

*Table 176: PTB *s- > PCN palatal glide infix ?*

PTB	*PCN*	*gloss [set#]*
*s-maŋ	*a-maŋ	BODY / CORPSE [198]
*s-maŋ ≍ *s-mak	*a-ma(ŋ)	BE DARK [197]
*s-myak	*mjak	EYE [234]
*s-na ≍ *s-naːr	*na(ʔ)	NOSE [6]
*s-ni-s	*th-ni(t)	SEVEN [61]
*s-ni(ː)ŋ ≍ *s-nik	*niŋ	SKY / YEAR [210]
*s-wa	*wa	GO [25]
*s-yip ≍ *s-yup	*jap	SLEEP [153]
*s-ram	*raːm	OTTER [124]
*s-rəy-t	*rət	BE HEAVY [192]

*s-ri(y)-t	*li	BE, EXIST, LIVE (COPULA) / HAVE [65]
*s-lep	*ləp	CUT (v.) [157]

*Table 177: PCN voiced roots w/ *s-prefixed PTB ancestors*

III.5. PCN Onsets

This section presents cognate sets supporting the reconstruction of PCN consonants in initial (§III.5.1–§III.5.7) and medial positions (§III.5.8).

III.5.1. Oral Stops

PCN contained the aspirated and unaspirated oral stops ***p(h)-**, ***t(h)-**, and ***k(h)-**, whose development is summarized below:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*p-, *b-	***p-**	*p-	p-	p-	p-
	***ph-**	*ph-	ph-	ph-, f-	ph-, f-
*t-, *d-	***t-**	*t-	t-	t-	t-
?	***th-**	*th-	tsh- / _ *-iŋ, *-ə tʃh- / _ *-əj *thj- > tʃh- th- else.	th-	?
*k-, *g-	***k-**	*k-	k-	k-	k-
	***kh-**	*kh-	*khj- > f- *khl- > tʃh- kh- else.	*khj- > f- *khl- > tʃh- kh- else.	kh-

Table 178: PCN oral stops

*III.5.1.1. *p(h)-*

PCN forms with ***p-** and ***ph-** initials descended from PTB etyma with ***p-** or ***b-** initials, but there is no evidence to ascertain how the PCN aspiration distinction arose. PCN ***p-** was preserved in all the Central Naga daughter languages. PCN ***ph-** was also generally preserved, though it yielded **f-** in some Sangtam and Yimchungrü reflexes (perhaps allophonic variants):

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*p-, *b-	***p-**	*p-	p-	p-	p-
	***ph-**	*ph-	ph-	ph-, f-	ph-, f-

*Table 179: PCN *p(h)-*

***p-** sets:*

[1] HE, SHE (3SG) A *pa S – PCN *pa
L (o)m^{3}-po?^{3} Y – < PTB *p^{w}a

- Although represented as ***p^{w}-**, the PTB initial failed to extrude and was preserved in this etymon as PCN ***p-**.

[36] SEARCH, SEEK$_{1}$ A *pwa- S pu- PCN *pwa
L – Y – < PTB *pa

- The medial labiovelar glide in PCN ***pwa** is a result of extrusion from the original PTB ***p-** (indicated with ***p^{w}-**). See §III.3.1.2 for discussion of the PCN ***-wa(ʔ)** sequence.

[38] BAMBOO$_{2}$ A – S pu PCN *pwa/pu
L ve^{2}-puʔ^{3} Y – < PTB *g-p^{w}a ⪤ *r-p^{w}a

[37] FATHER A *t-pwaʔ S u-va PCN *a-pwaʔ
L pu^{1}- Y a-puʔ < PTB *p^{w}a

- Sangtam **v-** reflects the PCN ***-w-** medial glide reanalyzed as the root initial (cf. the rime discussion in §III.3.1.2).

[179] BE COMPLETE, SUFFICIENT, FULL A *a-pən S -pi- PCN *p[a/ə]n
L pen^{3}- Y –

[180] CARRY (BY HAND) C a^{2}-pən^{2} S – PCN *p[a/ə]n
L pen^{1}- Y –

[181] WEAR (CLOTHES)

C a^3pən^3	S nə-pi/mə-pi	PCN *m-p[a/ə]n
L m̥^{1}-pen^3-	Y –	< PTB *pun

▸ The Sangtam forms show variation between **m-** and **n-** as the reflex of the PCN ***m-** prefix.

[232] BE FLAT

A *(a)pak	S pa	PCN *a-pjak
L e^1-pjak^2-	Y -pjak	< PTB *r-pak

▸ The PTB source of the PCN medial palatal glide in this set is unknown. Proto-Ao and Sangtam lost ***-j-** following ***p-**, though it was preserved in Lotha and Yimchungrü.
See PCN ***a-phak** MAT [233] for a related reconstruction.

[194] MOUTH_2

A *t-paŋ	S pe	PCN *paŋ
L o^1-pəŋ^1	Y –	< PTB *m-p(r)(w)aŋ

[195] BE DEAF

A –	S -piŋ	PCN *p(j)aŋ
L pəŋ^3-	Y -pjaŋ/-peŋ-	< PTB *l-baŋ ⪤ *m-baŋ

▸ Yimchungrü **-pjaŋ** (< PCN ***pjaŋ**) and Lotha **pəŋ^3-** (< PCN ***paŋ**) suggest variation in the presence of a medial palatal glide in PCN BE DEAF.

[67] CARRY (SHOULDER/BACK)

A *a-pu	S –	PCN *pu(ʔ)
L pu^2-	Y puʔ	< PTB *bəw

[66] AXE

C pu^1	S pə	PCN *pu
L o^1-puʔ^3	Y -pə	< PTB *r-p^{w}a

[68] SHOULDER

C ta^3-pu^3-	S pə-	PCN *puʔ
L e^1-puʔ^2	Y tə-puʔ	< PTB *baw

[260] SPRING FORTH / ORIGINATE / BE BORN

C a^3-puk^3	S –	PCN *puk
L pok^2-	Y –	< PTB *p/buk ⪤ *p/bik

[261] STOMACH, BELLY

A *t-puk	S –	PCN *puk
L o^1-pok^2	Y puk	< PTB *puːk

[216] MALE (OF ANIMALS)
C tə³-puŋ³ S -puŋ PCN *puŋ
L -poŋ³ Y puŋ < PTB *s-bloŋ

▸ The PTB medial liquid ***-l-*** in this form was lost before the PCN stage.

[217] WIND (n.)
A *m-puŋ S -puŋ PCN *m-puŋ
L m̥¹-poŋ¹ Y a-puŋ < PTB *buŋ

[140] SWELL, BE SWOLLEN
A – S pəm- PCN *pəm
L pəm¹- Y pəm < PTB *s-bwam

▸ The PTB medial ***-w-*** apparently contributed to the development of PTB ***-am*** to PCN ***-əm*** in this etymon and was consumed in the process.

****ph-** sets:*

[2] FOOT (PART)
A *t-m-phwa S -mə-pʰa PCN *m-ph(w)a
L m̥¹-phoʔ³ Y mə-fə < PTB *pʷa-n

▸ Only the PAo form reflects the PCN variant with the medial labiovelar glide, which extruded from PTB ***pʷ-***.

[233] MAT
A – S pʰa PCN *a-phak
L o¹-phək² Y pʰjak < PTB *r-pak

▸ See PCN ***a-pjak*** BE FLAT [232] for a related form. The medial glide ***-j-*** in Yimchungrü ***pʰjak*** 'mat' may have arisen through analogy to ***amə-pjak*** 'flat' and ***apjak*** 'sheet' [232].

[53] THIGH
A *t-phi S – PCN *phej
L o¹-phiʔ³ Y pʰo < PTB *pey

[60] BELT, STRAP, ROPE (WEAVER'S)
A *a-phi S – PCN *a-phi
L e¹-phiʔ³ Y – < PTB *bi

[69] BLOW
A *a-phu S fə PCN *phu
L hmu³- Y – < PTB *pu

▸ Lotha 'blow' shows an unexpected ***ph-*** > ***hm-*** development. Sound symbolism has likely had some effect on the form of the word.

[70] POT C -puʔ[1] S fə PCN *phuʔ
L o[1]-phuʔ[2] Y pʰəʔ

▸ Aspiration contrasts were lost in Chungli (hence, the unaspirated **p-** in Chungli ‘pot’).

*III.5.1.2. *t(h)-*

PCN ***t-*** descended from a merger of PTB ***t-*** and ***d-***, while the PTB ancestor of PCN ***th-*** is unknown. PCN ***t-*** and ***th-*** appear to have been preserved in all the CN daughter languages, though Yimchungrü reflexes of ***th-*** have yet to be found in root initials (only in prefixes: see §III.4.3).

Two sets suggest that PCN ***th-*** coalesced with the ***-j-*** medial to yield the Lotha palatal affricate initial **tʃh-** (PLANT (v.) / TRANSPLANT [149], ABILITIVE (SUF.) [191]). Lotha **tʃh-** was also produced when ****th-*** (previously occlusivized from PCN ***s-***) preceded ***-əj*** (DIE [106] in §III.5.2.1 under PCN ***s-***). In two other cases, PCN ***s-*** was first unconditionally occlusivized to ****th-*** in the Lotha branch then further affricated to ***tsh-*** preceding ***-iŋ*** and ***-ə*** (WOOD [211] and BILE / GALL BLADDER [92], respectively, in §III.5.2.1).

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*t-, *d-	***t-***	*t-	t-	t-	t-
?	***th-***	*th-	tsh- / _ *-iŋ, *-ə tʃh- / _ *-əj *thj- > tʃh- th- else.	th-	?

*Table 180: PCN ***t(h)-***

***t-** sets:*

[5] QUOTATIVE A *ta S – PCN *ta(ʔ)
L toʔ[1] Y –

[127] HIT, SLAP / PLAY (BEAT) C a[3]-təm[3] S taŋ PCN *tam
L təm[3]- Y tam

[128] FLOOR	A *a-təm	S –	PCN *a-tam
	L –	Y a-tam-	
[236] STING	A *m-tak	S –	PCN *tak
	L tək^{2}-	Y –	
[237] WEAVE	A *a-tak	S –	PCN *tak
	L tək^{2}-	Y –	< PTB *tak ⩙ *dak
[218] STEM, TRUNK / POST / TREE	A *t-tuŋ	S tuŋ	PCN *tuŋ
	L o^{1}-toŋ^{1}	Y -tuŋ	< PTB *duːŋ

***th-** sets:*

[149] PLANT (v.) / TRANSPLANT	A *a-thjəm	S –	PCN *thj[a/ə]m
	L tʃhəm^{1}-	Y –	
[191] ABILITIVE (SUF.)	A *-thjət	S –	PCN *-thjət
	L -tʃhet^{2}	Y –	

▸ The previous two sets show that PCN medial ***-j-*** was preserved following ***th-*** in Proto-Ao but yielded the affricate initial **tʃh-** in Lotha.

[199] WHILE (CONTEMPORATIVE)	C -taŋ^{1}	S –	PCN *-thaŋ
	L -thəŋ^{2}	Y –	

▸ Chungli unaspirated **t-** developed from a merger of PAo ***t-*** and ***th-***.

[71] OIL, GREASE, FAT	A *thu-tsə	S tu-tʃi	PCN *thu
	L e^{1}-thu^{1}	Y –	

▸ The Sangtam form has unexpectedly lost its initial aspiration.

Since PTB ***s-*** yielded PCN ***s-*** or ***ʃ-*** (§III.5.2.1), PTB ***saːw*** FAT / GREASE / OIL is likely not the source of PCN ***thu***, except perhaps via borrowing from a Kuki-Chin or Tangkhulic reflex: cf. PKC ***thaaw*** FAT / GREASE (VanBik 2009: #385), PTk ***t^{h}aw*** FAT (Mortensen 2012: #389). Marrison records two CN

forms, however, of which PTB ***sa:w*** may be the ancestor by direct descent: Mongsen *tüso* [**tə-su**] and Sangtam *asu* (also in Kumar 1973a), both 'fat (n.)'.

[190] KNOW A *m-tət S mə-t^{h}e PCN *m-thət ?
L n̥^{1}-tsi^{3}- ? Y –

- If the aspiration reported in the Sangtam form is original to PCN, its loss in Proto-Ao is unexpected.
  As noted in the rime discussion, the cognacy of Lotha **n̥^{1}-tsi^{3}-** 'know' is dubious.

*III.5.1.3. *k(h)-*

As with ***p(h)-**, PCN forms with ***k-** and ***kh-** initials descended from PTB etyma with ***k-** or ***g-** initials, but there is no evidence to ascertain how the PCN aspiration distinction arose. PCN ***k-** and ***kh-** were generally preserved in all the CN languages. Two sets, however, suggest that instances of ***kh-** coalesced with following medial approximants in both Lotha and Sangtam: PCN ***khj-** > Lotha, Sang. **f-** (DOG [104]) and ***khl-** > Lotha, Sang. **tʃh-** (FECES, EXCREMENT [105]).

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*k-, *g-	***k-**	*k-	k-	k-	k-
	***kh-**	*kh-	*khj- > f- *khl- > tʃh- kh- else.	*khj- > f- *khl- > tʃh- kh- else.	kh-

*Table 181: PCN *k(h)-*

***k-** sets:*

[8] GAPE, OPEN MOUTH A *a-ka S – PCN *ka
L ko^{1}- Y – < PTB *m-ka

[9] LOINS / GROIN A – S a-mə-ka PCN *m-k(w)a
L ŋ̊^{1}-ku?^{3} Y mə-kə

[129] YEAR / SEASON
A *(a-)kəm
L o[1]-kəm[3]
S kaŋ
Y kam
PCN *a-kam

▸ cf. PKC ***kum*** AGE / YEAR (VanBik 2009: #249), PTk ***kum*** YEAR (Mortensen 2012: #457)

[130] BECOME
A *a-kəm
L kəm[1]-
S kaŋ
Y –
PCN *kam

[131] LIFE
A *a-kəm
L e[1]-kəm[1]
S a-kaŋ
Y –
PCN *a-kam

[241] BITE
A –
L ŋ̇[1]-kək[2]-
S mə-ka
Y –
PCN *m-kak
< PTB *k(w)ak ⩙ *k(y)ak

[64] WATER$_1$
A –
L –
S ki
Y ke
PCN *ki

[73] HEAD
A *ku
L ku[1]-rəʔ[3]
S a-ku
Y ku-ro, ku
PCN *ku
< PTB *m/s-gaw

[74] INTERROGATIVE PRO.
A *ku
L ku[1/3]-
S kʰu/ku/kʰə
Y kə
PCN *ku

[75] HOW?
A *ku-ta
L ku[1]-toʔ[3]
S kʰə-ta
Y kə-tə
PCN *ku-ta

▸ The Sangtam interrogative pronoun (which also appears in the first syllable of 'how?') unexpectedly varies between aspirated and unaspirated forms.

[76] UNCLE / FATHER-IN-LAW
A *t-ku
L –
S a-kə
Y –
PCN *ku
< PTB *gəw-n ⩙ *kəw-n

[77] NINE
A *th-ku
L to[1]kuʔ[3]
S tə-ku
Y tu-ku/tə-ku
PCN *t-ku
< PTB *d/s-kəw

▸ The source of aspiration on the Proto-Ao ***th-*** prefix is unexpected, unless there existed a PCN ***th-ku*** allofam which descended from PTB ***s-d-kəw*** (see the discussion in §II.3.1.3).

[78] CHEST	A *t-ku?	S –	PCN *t-ku?
	L te^{1}ki^{1}	Y k^{h}ə?	< PTB*k(r)u

▸ The aspiration of the Yimchungrü initial is unexpected.

[79] HOLE	M kupa?	S (-k^{h}i)/-ku	PCN *a-ku (≍ *a-khən)
	C ta^{3}-ki?^{3}	Y (-k^{h}ən)/-ku	< PTB *kor ≍ *kwar
	L o^{1}-ku?^{3}		

▸ Mongsen and Lotha reflect the PCN allofam with unaspirated ***k-**, as do the Sangtam and Yimchungrü **-ku** variants. Chungli **ta^{3}-ki?^{3}** may have been borrowed from Sangtam **a-k^{h}i** 'hole'. (See [79] in §III.3.1.6 for further discussion of the reflexes.)

[83] TWENTY	M məki	S məkjə	PCN *mu-kju
	C mə^{2}tsə^{2}	Y muku	< PTB *m-kul
	L mju^{1}kju?^{1}		

▸ See the rime discussion (§III.3.1.6). The Proto-Ao onset is unclear, while the PCN medial ***-j-** glide dropped out in Yimchungrü following PCN ***k-** but was preserved in Lotha and Sangtam.

The medial palatal glide in the first syllable of Lotha **mju^{1}kju?^{1}** may have arisen through harmony with the second syllable.

PCN ***kju** may have developed by sporadic metathesis and palatalization of PTB ***kul**.

[219] BE DRY / BE THIN, LEAN	A *a-kuŋ	S a-kuŋ	PCN *a-kuŋ
	L ŋ^{1}-koŋ^{3}-	Y a-kuŋ	< PTB *ka(ː)ŋ

[155] SKIN / COVER (n.)	A *t-kəp	S (a-)kəp	PCN *kəp
	L -kəp^{2}	Y kəp	< PTB *kop ≍ *kwap
			or *?up ≍ *gup

***kh-** sets:*

[10]	BE BITTER	A *a-kha?	S a-kʰa	PCN *a-kha?
		L kho²-	Y a-kʰə?	< PTB *b-ka-n
[185]	ONE	C ka¹	S –	PCN *khaj
		L e¹-kha¹	Y kʰə-	< PTB *kat, *ka-t
[186]	HAND, ARM	M -khət/khə́t	S kʰe/kʰə-	PCN *khat
		L o¹-khe?²	Y kʰa?	< PTB *kat, *ka-t
[44]	READ / COUNT	A –	S kʰi	PCN *khaj
		L kha³-	Y kʰe	
[119]	DOOR	A –	S kʰaŋ	PCN *kha:m
		L khan³-	Y kʰim	< PTB *kam
[132]	BENCH, BLOCK / PILLOW	C mə³kəm¹	S –	PCN *m-kham
		L ŋ̍¹-khəm³	Y -mu-kʰam-	< PTB *m-kum ⨳ *m-kim

▸ Aspiration contrasts were lost in Chungli (hence, the Chungli unaspirated **k-**).

[81]	SMOKE	A *-khu-	S -kʰu	PCN *khu?
		L -khu?²	Y -kʰə?	< PTB *kəw-n/t
[80]	WOUND, INJURY / SCAR	A *khu-ma	S –	PCN *khu?
		L o¹-khu?²	Y –	
[82]	COUGH (v.)	A *akhət	S kʰu	PCN *a-khu(t)
		L e¹-khu³-	Y a-kʰə	

▸ cf. PKC ***khu?*** COUGH (VanBik 2009: #433), PTk ***kʰa** COUGH (Mortensen 2012: #324)

[264]	KNEE	A *t-m-kuk	S mə-kʰu	PCN *m-khuk
		L ŋ̍¹-khok²	Y mu-kʰuk	< PTB *gu(:)k ⨳ *m-ku(:)k

▸ The PCN aspiration was unexpectedly lost in the Proto-Ao form.

[104]	DOG	A *a-jəj	S fə-za	PCN *khjəj ?
		L fə^{3}-roʔ^{3}	Y k^{h}iʔ-	< PTB *d-k^{w}əy-n

▸ The tentatively reconstructed PCN initial cluster ***khj-*** yielded **f-** in both Lotha and Sangtam, while the ***-j-*** was lost in Yimchungrü following ***k(h)-*** (cf. TWENTY [83]). In Proto-Ao, the PCN ***kh-*** was possibly interpreted as a prefix and subsequently lost.

HPTB alternates between representing the PTB initial as ***k^{w}-*** (a unit phoneme) or ***kw-*** (stop + glide cluster), but states that "[t]here is no doubt that the PTB root began with a velar stop followed by a labial element" (HPTB: 62). Also noted in HPTB is that "PTB ***kw-*** > W[ritten] T[ibetan] **khy-** is a regular development" (HPTB: 62 [fn.88]). The same development appears to have taken place in this PCN etymon.

[105]	FECES, EXCREMENT	M [a]-tsə́ʔ	S tʃ^{h}ə	PCN *a-khləjʔ ?
		C səʔ^{1}	Y k^{h}iʔ	< PTB *kləy
		L o^{1}-tʃhəʔ^{2}		

▸ PCN ***khl-*** developed from PTB ***kl-*** (gaining aspiration somehow), and the medial liquid ***-l-*** was lost in Yimchungrü. The PCN ***khl-*** cluster apparently yielded Lotha and Sangtam **tʃh-**, but this is the only example discovered.

The irregular correspondence between Mongsen **ts-** and Chungli **s-** is not easily reconstructible in Proto-Ao. If the Mongsen initial were **tsh-** instead of **ts-**, however, the PAo form would be ***tʃhəʔ*** (cf. §II.3.3.1).

[143]	SHADOW, SHADE	A *a-khəm	S -k^{h}əm	PCN *khəm ⩙ *khəp
		L khəm^{3}-	Y k^{h}əp-	

[171]	SONG	C kən^{1}	S k^{h}i	PCN *khən
		L o^{1}-khen^{3}	Y k^{h}ən	< PTB *gaːr ?

▸ Aspiration contrasts were regularly lost in Chungli.

[79] HOLE	M (kupaʔ)	S -kʰi/(-ku)	PCN *a-khən (⪤ *a-ku)
	C taˀ³-kiʔ³	Y -kʰən/(-ku)	< PTB *kor ⪤ *kwar
	L (oˀ¹-kuʔ³)		

- The PCN allofam with ***kh-*** is reflected in the Sangtam and Yimchungrü variants **-kʰi** and **-kʰən**, respectively. (See [79] in §III.3.1.6 for discussion of the reflexes.)

III.5.2. Fricatives

PCN contained the sibilant fricatives ***s-***, ***ʃ-***, ***z-***, and ***ʒ-***, the voiceless glottal fricative ***h-***, and possibly also the non-sibilant velar fricative pair ***x-*** and ***ɣ-***. Their developments are summarized below:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*s-, *kr-	***s-***	*s-	th-	s-	ʃ- / _ *-əj s- else.
*s-, *sy-	***ʃ-***	*ʃ- / _ -aʔ *s- else.	ʃ- / ? s- else.	ʃ-	ʃ-
*(t)sy- ?	***z-***	*z-	z-	z-	z-
	ʒ-	*ʒ-	r- (sporadic) z-	j-, ʒ- (sporadic?) z-	z-, ʒ-
?	***ɣ-***	*ɣ-		v-	h-
*h- ?	***x-***	*x-	h-	?	?
*h-	***h-***	*h-	f- / _ *-u h- else.	f-, Ø- (sporadic) h-	n- (sporadic) h-

Table 182: PCN fricatives

*III.5.2.1. *s-, *ʃ-*

PCN ***s-***, which developed from a merger of PTB ***s-*** and ***kr-***, was preserved in Proto-Ao and Sangtam. PCN ***s-*** was unconditionally occlusivized to Lotha **th-** (but sometimes

underwent further changes: cf. §III.5.1.2).[130] In Yimchungrü, ***s-*** yielded ***ʃ-*** before ****-əj*** but was preserved as ***s-*** everywhere else.

PCN ****ʃ-*** developed from a merger of the PTB cluster ****sy-*** with some instances of ****s-***, and was preserved in Sangtam and Yimchungrü. In Proto-Ao, PCN ****ʃ-*** yielded ****s-*** except for one form, in which it was preserved before the ****-aʔ*** rime.[131] The development of PCN ****ʃ-*** is unclear in Lotha, which generally exhibited ****ʃ-*** > ***s-*** but preserved the initial as ***ʃ-*** in two reflexes (FRIEND [134] and SCRATCH_2 [244]):

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*s-, *kr-	****s-***	*s-	th-	s-	ʃ- / _ *-əj s- elsewhere
*s-, *sy-	****ʃ-***	*ʃ- / _ -aʔ *s- elsewhere	ʃ- / ? s- elsewhere	ʃ-	ʃ-

*Table 183: PCN *s-, *ʃ-*

****s-** sets:*

[14] NERVE, VEIN / POWER, STRENGTH
A –
L e^{1}-thoʔ^{2}
S a-su, su-
Y səʔ-
PCN *a-saʔ
< PTB *r-sa

[152] NEST / WEB
A *t-səp
L o^{1}-ʃəp^{2}
S a-səp
Y a-sap
PCN *a-sap
< PTB *(t)sip ⩕ *(t)sup

- The Lotha **ʃ-** initial is irregular, but the PAo, Sangtam, and Yimchungrü cognates unambiguously support the reconstruction of PCN ***s-***.

[133] THREE
A *a-səm
L e^{1}-thəm^{1}
S a-saŋ
Y maʔ-sam
PCN *a-sam
< PTB *g-sum

[160] BE NEW
A *a-sən
L e^{1}-than^{1}
S a-si
Y a-so
PCN *a-saːn
< PTB *g-sar

[130] The development of **th-** from ***s-*** appears to be an areal sound change that also affected some Bodo-Garo languages and nearly all of Kuki-Chin (VanBik 2009: 16–18).
[131] The conditioning is undoubtedly more complex, but there is only one example from which to derive the rule.

[167] BE SOUR

A *a-sən	S a-si	PCN *a-san
L then³-	Y a-san, a-ʃo	< PTB *suːr ⩕ *swaːr

▸ As mentioned in the rime discussion (§III.3.3.2), Yimchungrü **aʃo** may be a dialect variant, given its **-o** rime and anomalous palatal initial.

[242] BREATH

M [tə]-saka	S a-saʔ	PCN *sak
L e¹-thək²	Y ʃak	< PTB *r-sak

▸ As in BE SOUR [167], Yimchungrü 'breath' shows an unexpected palatal initial.

[243] ITCH (v.)

A *m-sak	S –	PCN *m-sak
L n̥¹-thək²-	Y –	< PTB *m-sak

▸ See PCN ***m-ʃak*** SCRATCH$_2$ [244] for a related set.

[56] FRUIT / SEED

A –	S -si	PCN *a-sej
L e¹-thiʔ³	Y a-so	< PTB *sey

[211] WOOD

A *(a-)səŋ	S siŋ-	PCN *siŋ
L o¹-tshəŋ³	Y saŋ	< PTB *siŋ ⩕ *sik

▸ In the Lotha branch, PCN ***siŋ*** was likely first occlusivized to ****thiŋ**, after which the ****th-** initial affricated to ****tsh-** preceding ****-iŋ**. The sibilant ****tsh-** initial then provided the environment for the ****-iŋ** rime to reduce (§III.3.4.2), yielding Lotha **tshəŋ**. (See the discussion of relative chronology in §III.6.4.3.)

[84] BE BORN / GIVE BIRTH

A *a-su(ʔ)	S su-	PCN *su(ʔ)
L –	Y –	< PTB *g-sow

[85] LIFT / AWAKEN

A *m-su	S -(mə-)su/ə	PCN *m-su
L n̥¹-thi²-tʃhi¹- ?	Y -mu-su	< PTB *m-sow

[92] BILE / GALL BLADDER

A *t-(a-)sə	S a-sə	PCN *a-sə
L o¹-tshəʔ³	Y a-sə	< PTB *krəy ⩕ *m-kri(y)-t-s

▸ As discussed in the rime section (§III.3.1.7), the appropriate PTB allofam is ***kri**.

PCN ***sə*** should have yielded Lotha **thə** by the regular initial development of

s- > **th-**, but it is interesting that there are no instances of /thə/ in the synchronic phonology of Lotha. Perhaps PCN ***sə*** did yield an intermediate ****thə**, all instances of which were affricated to Lotha **tshə**. (See the discussion of relative chronology in §III.6.4.3.)

[106]	DIE	A *a-sə	S sə	PCN *səj
		L tʃhə^{1}-	Y ʃe	< PTB *səy

▸ PCN ***s-*** was likely occlusivized to ****th-** in the Lotha branch, then was palatalized and affricated to **tʃh-** in the palatal rime environment: PCN ***səj*** > ****thəj** > Lotha **tʃhə**. (See the discussion of relative chronology in §III.6.4.3.)

Yimchungrü appears to have palatalized PCN ***s-*** to **ʃ-** before ***-əj** (which then became Yimchungrü **-e** in this environment).

[172]	LIVER	A *t-m-sən	S mə-si	PCN *m-sən
		L n̥^{1}-then^{3}	Y –	< PTB *m-sin

***ʃ-** *sets:*

[15]	ANIMAL / MEAT, FLESH	A *(a-)ʃaʔ	S ʃu	PCN *a-ʃaʔ
		L o^{1}-soʔ^{2}	Y ʃiʔ	< PTB *sya-n

▸ This set presents the only instance discovered so far in which PCN ***ʃ-** was preserved in PAo.

[120]	RUN / WALK	A *a-səm	S ʃaŋ	PCN *a-ʃaːm
		L e^{1}-san^{1}-	Y ʃan	

[134]	FRIEND	A –	S ʃaŋ-	PCN *ʃam
		L o^{1}-ʃəm^{3}	Y –	

▸ Lotha has unexpectedly preserved the ***ʃ-** initial.

[161]	GATHER, ASSEMBLE (OF PEOPLE)	A *sən-	S –	PCN *ʃaːn
		L san^{1}-	Y ʃo-	

[244] SCRATCH$_2$ (v.) A – S – PCN *m-ʃak
L n̥^{1}-ʃak^2- Y mə-ʃak < PTB *m-sak

▸ See PCN ***m-sak*** ITCH [243] for a related set. Lotha has unexpectedly preserved the ***ʃ-*** initial.

[200] LIZARD A *saŋ- S – PCN *ʃaŋ-
L səŋ^1- Y – < PTB *r-saŋ

[213] GINGER A *sə̲ŋmuk S ʃiŋ PCN *ʃiŋ
L o^1-səŋ^1 Y ʃiŋ

[93] CLOTH / SHAWL A *(a-)sə S ʃə PCN *a-ʃə
L o^1-sə?^{3} Y –

*III.5.2.2. *z-, *ʒ-*

The Central Naga cognate sets containing **z-** and **ʒ-** (where not from a spirantized PCN ***l-**) lack clear patterns of correspondence and therefore do not easily lend themselves to reconstruction: Only one set supports the reconstruction of PCN ***z-** (PTB source unknown), which was preserved as **z-** in the CN daughter languages. The remaining sets with a Proto-Ao cognate all have PAo ***ʒ-** and mostly Lotha **z-**, with one apparently sporadic instance of Lotha **r-**. The Sangtam initials, however, vary among **z-** (most frequent), **j-**, and **ʒ-**, while Yimchungrü varies between **z-** and **ʒ-**. In neither language does the data reveal clear conditioning environments for this variation. It therefore seems most prudent to follow Proto-Ao here and reconstruct PCN ***ʒ-** where PAo has ***ʒ-**.

The only set with a PTB etymon is ambiguous between PCN ***z-** and ***ʒ-** (NAIL (BODYPART) [176]) and shows a possible PTB ***(t)sy-** source for one of these initials:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*(t)sy- ?	***z-**	*z-	z-	z-	z-
	***ʒ-**	*ʒ-	r- (sporadic) z-	j-, ʒ- (sporadic?) z-	z-, ʒ-

*Table 184: PCN *s-, *ʒ-*

**z- set:*

[212] ORDER, COMMAND, LAW	A *-zəŋ	S -ziŋ	PCN *ziŋ
	L -zəŋ[1]	Y -zəŋ	

**ʒ- sets:*

[16] GRASS	A *a-ʒa(ʔ)	S zanu	PCN *a-ʒa(ʔ)
	L e[1]-roʔ[3]	Y –	

▸ This set contains the only instance of a PCN ***ʒ-** > Lotha **r-** development.

[162] LOVE (v.)	A –	S a-mə-(j)i	PCN *a-m-ʒaːn
	L n̩[1]-zan[3]-	Y a-mu-ʒo	

▸ Despite the lack of a Proto-Ao cognate, this PCN etymon is reconstructed with *ʒ- because the palatal initial seems a more likely source of Sangtam **j-** and Yimchungrü **ʒ-** in this set than ***z-**.

The Sangtam form is transcribed in both Marrison 1967 and Kumar 1973a as *amüi*, whose root initial is likely either **j-** or was lost: i.e., /a-mə-(j)i/. (See MEDICINE, CREAM [113] for a similar issue with the Sangtam transcription.)

[182] POWER / WRATH	A *a-ʒən	S zi	PCN *a-ʒ[a/ə]n
	L o[1]-zen[3]	Y –	

[177] GROW	A *a-ʒən	S zi	PCN *ʒ[aː/a/ə]n
	L –	Y –	

[245] BE QUICK, QUICKLY	A *ʒakta	S jaʔja-/zaza	PCN *ʒak-
	L zak[1]toʔ[3]	Y –	

▸ Marrison (1967) reports the Sangtam form with a **j-** initial while Kumar (1973a) reports **z-**, revealing some sort of free- or dialect variation.

[144] POISON (n.)	A *m-ʒəm	S mə-ʒə(m)	PCN *m-ʒəm
	L –	Y -mə-zəm-	

▸ Both Marrison (1967) and Kumar (1973a) report Sangtam as having **ʒ-**, an unexpected preservation of the PCN initial.

*Ambiguous between *z- and *ʒ-:*

The following set lacks a PAo cognate and is therefore ambiguous between PCN ***z-*** and ***ʒ-***:

[176] NAIL (BODYPART)	A –	S mu-zi	PCN *m-[z/ʒ]a[ː]n
	L –	Y mə-zan	< PTB *m-(t)syen ?

▸ It is possible that some instances of PTB ***sy-*** underwent voicing to yield PCN ***ʒ-***, but this is speculative.

*III.5.2.3. *ɣ-, *x-*

The PCN velar fricatives ***x-*** and ***ɣ-*** are tentatively reconstructed on the evidence of three cognate sets. One set (YAWN (v.) [17]) demonstrates that at least one instance of PTB ***h-*** yielded PCN ***x-***, which was preserved in Proto-Ao but debuccalized to **h-** in Lotha. The Sangtam and Yimchungrü reflexes of ***x-*** are unknown. PCN ***ɣ-***, which has an unknown PTB source, also debuccalized (and devoiced) to **h-** in Lotha and Yimchungrü, but merged with ***w-*** in Sangtam to yield **v-**:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
?	***ɣ-***	*ɣ-	h-	v-	h-
*h- ?	***x-***	*x-		?	?

*Table 185: PCN *ɣ-, *x-*

The rationale for the Proto-Ao reconstructions is explained in §II.3.2.2.3.

***ɣ-** sets:*

[18] SWIM	A *a-ɣa?	S ve	PCN *ɣa?
	L ho^{2}-	Y –	

[47] BLESS	A *m-ɣa	S -mə-va-	PCN *m-ɣaj
	L m̩^{1}-ha^{1}-	Y mə-hi	

***x-** set:*

[17] YAWN (v.)	A *xa-	S –	PCN *xa
	L ho^{3}həm^{3}-	Y –	< PTB *ha-y

*III.5.2.4. *h-*

PCN ***h-*** descended from PTB ***h-*** and was preserved as such in Proto-Ao. Lotha also generally preserved ***h-*** as **h-**, except where it yielded the labial fricative **f-** when followed by the rounded vowel ***-u**, which itself then reduced to **-ə**. In Sangtam, ***h-*** usually yielded **h-** but sporadically shifted to **f-** or was lost in some cases. The regular reflex in Yimchungrü appears to be **h-**, with one possible case of a rhinoglottophilic development to **n-**:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*h-	***h-**	*h-	f- / _ *-u h- else.	f-, Ø- (sporadic) h-	n- (sporadic) h-

*Table 186: PCN *h-*

[163] CARRY / PREGNANT / WEAR	A *hən	S hi	PCN *haːn
	L han^{1}-	Y han-	
[164] CURRY	A *(a-)hən	S hi	PCN *a-haːn
	L o^{1}-han^{3}	Y –	< PTB *h(y)an
[165] CHICKEN	A *a-hən	S hana/həna	PCN *haːn-a
	L ho^{1}no?^{3}/han^{1}-	Y t^{h}unu/t^{h}ənə	< PTB *haːr

- The unexpected Yimchungrü **th-** initial may derive from a **t-** or **th-** prefix that was later affixed to the form and preempted the root-initial ***h-**:
  PCN ***haːn-a** > ****ha-na** > ****hə-nə** > ****t(h)-hənə** > Yim. **thənə**

[91] STEAL	C a^2u^3-	S fə	PCN *a-hu
	L e^1-$fə^2$-	Y a-hə?	< PTB *hu

▸ Chungli **a^2u^3-** likely reflects PAo ***a-hu**, given that PAo ***h-** was regularly lost in Chungli (§II.3.2.4).

Lotha developed ****f-** from ***h-** before ***-u**, then reduced the rime to schwa:
PCN ***hu** > ****fu** > Lotha **fə**

The preservation of PCN ***hu** as Sangtam **hu** in WEIGH [90] suggests that the development of Sangtam **f-** in STEAL was a sporadic change.

[90] WEIGH	A (*hju)	S hu-	PCN *hu (≵ *hju) ?
	L $fə^3$-	Y –	

▸ Proto-Ao reflects the PCN allofam with ***hj-**, while Sangtam and Lotha reflect ***h-**. Lotha again developed **fə** from PCN ***hu**.

[146] BREAD, BISCUIT / FLOUR	A (*a-hjəm)	S həm	PCN *a-həm (≵ *a-hjəm) ?
	L (o^1-)$həm^1$	Y –	

▸ Proto-Ao again reflects the PCN allofam with ***hj-**, while Sangtam and Lotha reflect ***h-**.

[148] HAIR / LEAF / FEATHER	A *a-həm	S a-əm-	PCN *a-həm
	L o^1-$həm^3$	Y -nam	

▸ Sangtam appears to have sporadically lost the ***h-** initial.
The PCN ***h-** > Yim. **n-** change was likely a sporadic rhinoglottophilic development.

III.5.3. Affricates

Two places of articulation are reconstructed for the PCN affricates: ***ts(h)-** and ***tʃ(h)-**. The sources of these PCN affricates includes the entire range of PTB voiced and voiceless affricates, both with and without the medial palatal glide ***-y-**. This set apparently underwent some unknown mergers and splits to yield the PCN voiced/voiceless and dental/palatal affricates. One set (BE COLD [247]) also shows the PTB cluster ***gl-** yielding PCN ***tsh-**. The following table summarizes these developments:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*dz(y)-, *ts(y)-, *gl-	***ts-**	*ts- / _ **-ək, **-əŋ *tʃ- elsewhere	ts-	ts-	ts-
	***tsh-**	*tʃh-	tsh-	tsh-	tsh-
*dz(y)-, *ts(y)-	***tʃ-**	*ts- / _ *-ə(j)(ʔ) *tʃ- else.	tʃ-	ts- / _ *-ak tʃ- else.	tʃ-
	***tʃh-**	*tʃh-	tsh- / _ *-ak tʃh- else.	tsh- / _ *-ak tʃh- else.	

Table 187: PCN affricates

The single example of Proto-Ao ***tsh-*** descended from PCN ***hrj-*** (LOUSE, LICE [256]).

*III.5.3.1. *ts(h)-*

PCN ***ts-*** and ***tsh-*** find their origins in PTB ***gl-*** and an unclear merger/split of PTB ***dz(y)-*** and ***ts(y)-***. These affricates were generally preserved in all the CN languages except Proto-Ao, which shifted them toward the palate to yield ***tʃ-*** and ***tʃh-*** in most environments. Only the PCN unaspirated affricate ***ts-*** failed to participate fully in this shift, retaining its dental place of articulation when followed by the intermediate rimes ****-ək*** and ****-əŋ*** (formed by the reduction of ***-ak*** and ***-iŋ*** following PCN ***ts(h)-***: cf. §III.3.4.4 and §III.3.4.2, respectively). That is:

PCN ***tsiŋ*** > ****tsəŋ*** > (POA retained) PAo ***tsəŋ*** (CELESTIAL, SKY, WEATHER [214])
PCN ***tsak*** > ****tsək*** > (POA retained) PAo ***tsək*** (WASH, BATHE [246])

vs.

PCN ***tshak*** > ****tshək*** > (palatalized) PAo ***tʃhək*** (BE COLD [247])

It is instructive that PCN ***ts-*** and ***tsh-*** underwent different changes in identical environments (before ****-ək***), despite the fact that their only articulatory difference is the amount of delay before the vocal folds begin vibrating for the vowel nucleus (i.e., the Voice Onset Time, measured in mere tens of milliseconds!). Yet this articulatory delay results in a significant disparity between these two phonemes in the *auditory* realm—the incubator of phonemic sound change.

The changes in these PCN affricates are summarized below:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*dz(y)-, *ts(y)-, *gl-	***ts-**	*ts- / _ **-ək, **-əŋ *tʃ- elsewhere	ts-	ts-	ts-
	***tsh-**	*tʃh-	tsh-	tsh-	tsh-

*Table 188: PCN *ts(h)-*

Shifts toward the palate, whose conditioning environments are unknown, also occasionally occurred in Sangtam and Yimchungrü (discussed below).

***ts-** sets:*

[19] EAT
A *a-tʃaʔ S tsu, tʃʰu PCN *tsaʔ
L tso²- Y tsəʔ < PTB *dzya-n/k

▸ Marrison records both *tsu* and *chu* [tʃʰu] for Sangtam 'eat' (1967: II: 81), revealing (dialectal?) variation in the place of articulation and aspiration of the affricate initial.

[20] SON
A *(t-)tʃa-əɹ S tsu-rə PCN *tsaʔ
L o¹-tso(ʔ)² Y tsəʔ-rə < PTB *tsa-n ⩙ *za-n

[48] WALK
C tʃa²tʃa² S tse PCN *tsaj
L tsa²- Y tsa(ː/ʔ)

[49] CALL
A *a-tʃaj S tsi- PCN *tsaj
L tsa¹- Y tʃi

▸ The Yimchungrü initial was (sporadically?) palatalized to **tʃ-**.

[246] WASH, BATHE
A *m-tsək S mə-tsa PCN *m-tsak
L tsək²- Y tsak

▸ The ***ts-** initial was preserved in Proto-Ao. It is possible that the initial and rime each conditioned changes/retentions in each other at different points in the development along the Ao branch: PCN ***tsak** was reduced to ****tsək** in the Ao branch by virtue of the ***ts-** initial. When the dental affricates were all palatalized in this branch, the ****-ək** rime in ****tsək** then prevented the initial from participating, preserving the root as PAo ***tsək**.

[201] BE CLEAN / BE CLEAR
A *tʃaŋ-tʃaj
L n̥^{1}-tshəŋ^{1}-
S –
Y –
PCN *tsaŋ
< PTB *(t)syaŋ

▸ The aspiration on the Lotha initial is unexpected.

[202] SEED, NUT
A *(t-)tʃaŋ
L o^{1}-tsəŋ^{3}
S –
Y –
PCN *tsaŋ
< PTB *tsyaŋ

[203] RICE (HUSKED, UNCOOKED)
A *(a-)tʃaŋ
L o^{1}-tsəŋ^{3}
S tsaŋ/tse
Y –
PCN *a-tsaŋ

[214] CELESTIAL / SKY / WEATHER
A *tsəŋ-
L tsəŋ^{3}-
S tsiŋ-
Y tsəŋ-
PCN *tsiŋ

▸ The ***ts-*** was preserved in Proto-Ao. As in WASH, BATHE [246], the PCN ***ts-*** initial conditioned the ***-iŋ*** > ***-əŋ*** reduction in the PAo rime, which in turn prevented the initial from palatalizing to ***tʃ-*** in Proto-Ao.

[221] SHIELD
A *(a-)tʃuŋ
L o^{1}-tsoŋ^{3}
S tsuŋ
Y tsuŋ
PCN *a-tsuŋ

****tsh-** sets:*

[21] BUILD, MAKE / DO
M tʃhà
L tsho^{3}-
S ts^{h}a
Y ts^{h}ə
PCN *tsha

[22] BE HOT / HURT
M tʃha
L tsho^{1}-
S -ts^{h}a-
Y ts^{h}ə
PCN *tsha
< PTB *tsa-t

[23] SPEAR (n.)
A –
L o^{1}-tsho?^{2}
S ts^{h}u
Y ts^{h}ə?
PCN *tsha?

[121]	HAIR (FACE / HEAD)	C -səm[1]	S a-tsa ?	PCN *a-tsha:m
		L o[1]-tshan[3]	Y –	< PTB *tsam ⪥ *sam

▸ The **s-** in Chungli **-səm[1]** can reflect PAo ***s-**, ***ʃ-**, or (most likely in this case) ***tʃh-**.
In addition to an unexpected elision of the coda, the Sangtam form appears to have lost aspiration on the ***tsh-** initial.

[150]	MORTAR	A *tʃhəm	S –	PCN *tsh[a/ə]m
		L tshəm[3]-	Y –	< PTB *t(s)um ⪥ *(t)sum

[168]	MONEY / PRICE	A *(a-)tʃhən	S ts[h]i	PCN *a-tshan
		L o[1]-tshen[3]	Y ʃo	

▸ The Yimchungrü **ʃ-** initial is anomalous. (Note that Yimchungrü forms with **-o** reflecting ***-an** may be from a dialect that underwent different sound changes: cf. BE SOUR [167]).

[247]	BE COLD	A *atʃhək	S tʃ[h]a	PCN *a-tshak
		L tshək[2]-	Y a-ts[h]ak	< PTB *m/ʔ-glak

▸ The development of PCN ***tsh-** > Sangtam **tʃh-** here is unexpected. Perhaps PCN ***tsh-** was palatalized to Sangtam **tʃh-** before ***-ak**, but since PCN ***tʃ(h)-** was clearly dentalized to Sangtam **ts(h)-** in the same environment (cf. §III.5.3.2), it is unclear how both changes could have occurred while keeping the reflexes of original PCN ***tshak** and ***tʃhak** distinct in Sangtam.

[94]	MITHUN, GAYAL (BOS FRONTALIS)	A *(a-)tʃhə	S ts[h]ə-	PCN *tshə
		L tshə[1]-	Y –	

[95]	TIE (V.)	A *m-tʃhə	S –	PCN *m-tshə
		L n̩[1]-tshə[3]-	Y –	

[156]	SUCK / KISS	A *m-tʃhəp	S mə-ts[h]əp	PCN *m-tshəp
		L n̩[1]-tsəp[2]-	Y mə-ts[h]əp	< PTB *m-dzup ⪥ *m-dzip

▸ Proto-Ao, Sangtam, and Yimchungrü support the reconstruction of a PCN initial with aspiration, which apparently was lost in the Lotha form (as produced by my consultant). Note, however, that K.P. Lotha reports the form with aspiration (indicated by *tss*): *ntssüpa* ‘kiss / suck’ (Lotha 2004: 185). The

Lotha Literature Committee, on the other hand, appears to indicate some sort of variation: *nt͟sü̲pa* 'kiss' (Murry et al. 1978: 65), *nt͟ssü̲pba* 'suck' (Murry et al. 1978: 119).

*III.5.3.2. *tʃ(h)-*

PCN ***tʃ(h)-*** descended from some mergers and splits of PTB ***dz(y)-*** and ***ts(y)-***. The unaspirated ***tʃ-*** was dentalized to PAo ***ts-*** before PCN open/glottal-final rimes with a schwa nucleus (i.e., ***-ə(ʔ)*** and ***-əj(ʔ)***) and to Sangtam **ts-** before PCN ***-ak***. The initial was preserved in other Sangtam and PAo environments, and unconditionally in Lotha and Yimchungrü.

Sets reflecting PCN aspirated ***tʃh-*** are few, but they seem to indicate that ***tʃh-*** was preserved unconditionally in Proto-Ao. PCN ***tʃh-*** was dentalized to **tsh-** in Lotha and Sangtam before ***-ak***, but preserved in other environments. One set suggests that Yimchungrü lost the aspiration to merge ***tʃh-*** with **tʃ-**:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*dz(y)-, *ts(y)-	***tʃ-***	*ts- / _ *-ə(j)(ʔ) *tʃ- else.	tʃ-	ts- / _ *-ak tʃ- else.	tʃ-
	tʃh-	*tʃh-	tsh- / _ *-ak tʃh- else.	tsh- / _ *-ak tʃh- else.	

*Table 189: PCN *tʃ(h)-*

****tʃ-** sets:*

[248] BREAK — A *tʃak — S – — PCN *tʃak
L tʃak²- — Y -ʃak

- The preservation of ***-ak*** in Lotha supports the reconstruction of PCN ***tʃ-*** (cf. §III.3.4.4), though the Yimchungrü **ʃ-** initial is unusual.

[249] FACE — C tə³-tʃak³ — S a-tsaʔ — PCN *tʃak
L – — Y tʃak — < PTB *tsyak

- The lack of a Lotha cognate and the neutralization of the **ts-**/**tʃ-** contrast in Sangtam before ***-ak*** renders this reconstruction somewhat difficult, but not impossible: If the PCN form had been ***tsak***, the expected Proto-Ao form would be ***tsək*** (as in WASH, BATHE [246]), but Chungli **tʃak** instead reflects

PAo ***tʃak*** (cf. §II.3.3.1). In addition, Yimchungrü **tʃak** supports the reconstruction of PCN ***tʃak**.

[250] CHEW

A *m-tʃak	S mə-tsa-	PCN *m-tʃak
L n̥^{1}-tʃak^{2}-	Y mə-tʃak-	< PTB *m-dzyak

▸ The Sangtam form shows the dentalization of PCN ***tʃ-*** to Sangtam **ts-** before ***-ak*** (as in FACE [249], above).

[98] SALIVA, SPITTLE / SPIT (v.)

A *m-tsə	S mə-tʃə	PCN *m-tʃə
L n̥^{1}-tʃə^{1}	Y –	< PTB *m-ts(y)il ⪤ *m-tśril

▸ This set (and those below) shows the dentalization of PCN ***tʃ-*** to PAo ***ts-*** before PCN open/glottal-final rimes with a schwa nucleus.

[96] EGG

A *-tsə	S –	PCN *tʃə
L e^{1}-tʃə^{1}	Y –	< PTB *dz(y)u

[97] WATER$_2$

A *(a-)tsə	S –	PCN *a-tʃə
L o^{1}-tʃəʔ^{3}	Y –	< PTB *tsyu

[107] SEED

C mə^{3}-tsəʔ^{3}	S ma-tʃə	PCN *ma-tʃəjʔ ?
L mo^{1}-tʃəʔ^{2}	Y mə-tʃiʔ	< PTB *dzəy

▸ The Chungli root syllable **tsəʔ** (underlying /tʃəʔ/; cf. §II.3.3) reflects PAo ***ts [h] ə [j] ʔ***.[132] The PAo initial was likely ***ts-***, reflecting the unaspirated nature of PCN ***tʃ-***.

****tʃh-** sets:*

[24] WING

A *t-(a-)tʃha	S –	PCN *a-tʃha
L e^{1}-tʃhoʔ^{3}	Y –	

[183] BREATHE

M sən-	S tʃ^{h}i-	PCN *tʃh[a/ə]n
L e^{1}-tʃhen^{1}-	Y –	

▸ The Mongsen **s-** initial, which reflects either PAo ***s-*** or ***ʃ-***, is unexpected.

[132] That is, PAo ***tsəʔ***, ***tshəʔ***, ***tsəjʔ***, or ***tshəjʔ***.

[251] BEE A – S ts^ha PCN *tʃhak
L o^1-$tshak^2$ Y –

▸ The preservation of the ***-ak*** rime in Lotha supports the reconstruction of PCN palatal ***tʃh-***, which presumably dentalized to **tsh-** in both Sangtam and Lotha before ***-ak***. (A parallel change in the unaspirated series is PCN ***tʃ-*** > **ts-** before ***-ak*** in Sangtam, though this appears not to have taken place in Lotha: cf. CHEW [250].)

[252] BE DIFFICULT / BE HARD / BE DEAR, COSTLY A *a-tʃhak S $a\text{-}ts^ha(k)$ PCN *a-tʃhak
L tshək²- Y a-tʃak < PTB *tsak-t

▸ As expected, PCN ***tʃh-*** yielded Lotha ***tsh-***. Unexpectedly, however, the ***-ak*** rime shows reduction to **-ək**, a process which should have been prevented by the original ***tʃh-*** initial. (Perhaps this was a later sporadic change.)
Yimchungrü **a-tʃak** shows the loss of aspiration from PCN ***tʃh-***, though it is possible that Marrison's transcription of *ch* in this form actually represents **tʃh-** (cf. §III.2.3.2).

III.5.4. Nasal Stops

PCN contained the voiced and voiceless nasal stops ***(h)m-***, ***(h)n-***, and ***(h)ŋ-***, whose development is summarized below:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*m-	***m-**	*n- / _ *-ik/ŋ *mj- > *hn- ? *m- else.	m-	n- / _ *-iŋ *mj- > n-	n- / _ *-it
	***hm-**		hm-	n^j- / _ *-ən, *-it m- else.	m- else.
*n-	***n-**	*n-	n-	n^j- / _ *-i, *-əj	n^j- / _ *-i, *-əj
*n-, *hy- (spor.)	***hn-**	*hn-	hn- / _ *-j- n- else.	*(h)nj- > n^j- n- else.	*(h)nj- > n^j- n- else.
*ŋ-	***ŋ-**	*ŋ-	ŋ-	ŋ-	ŋ-
	***hŋ-**	*hŋ-			

Table 190: PCN nasal stops

*III.5.4.1. *(h)m-*

None of the Proto-Ao, Sangtam, or Yimchungrü cognates in this section exhibit a voiceless **hm-**. Proto-Ao does have ***hm-** in its inventory (cf. §II.3.4.1), but the PAo forms containing ***hm-** do not appear in any of the cognate sets below, rendering the PCN source of PAo ***hm-** unknown. The reconstruction of PCN ***m-** and ***hm-** in this section is therefore based solely on the **m-** vs. **hm-** contrast seen in Lotha. While it is possible that this contrast is actually a Lotha-specific split of PCN ***m-**, the conditioning for that development would be unknown. The Lotha contrast is therefore best reconstructed back to PCN until further research clarifies the situation.

PCN ***m-** and ***hm-** descended from a split in PTB ***m-** (conditioning unknown). This voicing contrast was preserved in Lotha but merged to **m-** in the other daughter languages, with Sangtam yielding **n-** before ***-iŋ** (or by coalescence with ***-j-**) and the ambiguous palatal(ized) **n^{j}-** before ***-ən** and ***-it**. (As noted in §III.2.2.2, Sangtam **n^{j}i** is ambiguous among /ɲi/, /nji/, and /ni/.)

Although PAo contains a voiceless bilabial nasal ***hm-**, its PCN source is still unknown. The one voiceless PAo reflex of PCN ***m-** is ***hn-**, which developed from PCN ***mj-** and devoiced for unknown reasons (IN-LAW [235]). Both PCN ***m-** and ***hm-** dentalized to PAo ***n-** before the velar-final rimes ***-ik/ŋ** (NAME [209], EYE [234]).

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*m-	***m-**	*n- / _ *-ik/ŋ *mj- > *hn- ? *m- elsewhere	m-	n- / _ *-iŋ *mj- > n- n^{j}- / _ *-ən, *-it m- elsewhere	n- / _ *-it m- elsewhere
	***hm-**		hm-		

*Table 191: PCN *(h)m-*

****m-** sets:*

[3] NO (REFUSAL)	A *maʔ L moʔ^{2}	S ma Y mə-	PCN *maʔ < PTB *ma-y
[197] BE DARK	A *a-maŋ L məŋ^{3}-	S -maŋ, a-ma Y a-mə-	PCN *a-ma(ŋ) < PTB *s-maŋ ⩫ *s-mak

[41] SALT	A –	S mi	PCN *maj
	L o^{1}-maʔ^{3}	Y t^{h}i-<u>mi</u>	
[159] PRICE, COST, VALUE	A –	S a-mi	PCN *a-maːn
	L o^{1}-man^{3}	Y a-mo	< PTB *man
[234] EYE	A (*t-nik)	S naʔ	PCN *mjak (≍ *hmik)
	L (o^{1}-hmjək^{2})	Y (mək)	< PTB *s-myak ≍ *s-mik

▸ The PCN allofam ***mjak*** (< PTB ***myak***) is reflected only in Sangtam, which dentalized the ***m-*** initial to **n-** under the influence of the ***-j-*** medial glide.

[235] IN-LAW	A *(a-)hnak ?	S –	PCN *mjak
	L o^{1}-mjak^{2}-	Y -mjak	< PTB *s-maːk

▸ The PCN medial ***-j-*** glide following ***m-*** was preserved in Lotha and Yimchungrü but resulted in the ***m-*** initial dentalizing to ***hn-*** in Proto-Ao. The source of devoicing in the PAo initial is unknown.

[196] DREAM	A *maŋ	S –	PCN *maŋ
	L o^{1}-məŋ^{3}	Y –	< PTB <u>*r/s-maŋ</u> ≍ *mak
[198] BODY / CORPSE	A *(t/a-)maŋ	S -me	PCN *a-maŋ
	L o^{1}-məŋ^{1}	Y paŋ ?	< PTB *s-maŋ

▸ Yimchungrü **paŋ** ‘body’ has at least three possible explanations: 1) PCN ***maŋ*** underwent some obscure devoicing and denasalizing process to yield **paŋ**, 2) ***maŋ*** ≍ ***paŋ*** allofamy existed at the PCN level, or 3) Yimchungrü borrowed Karbi *bang* ‘body’ (Marrison 1967: 33, labeled as ‘Mikir’).

[54] FIRE	A *mi(ʔ)	S mi-	PCN *mej(ʔ)
	L o^{1}-miʔ^{3}	Y mo	< PTB *mey
[209] NAME	A *t-niŋ	S a-niŋ	PCN *a-miŋ
	L o^{1}-mjəŋ^{1}	Y a-məŋ	< PTB *r/s-miŋ

▸ The initial consonant of PCN ***a-miŋ*** has developed in an exact parallel to ***hmik*** EYE [234] (see below): When followed by ***-iŋ/k***, PCN ***m-*** was dentalized to ***n-*** in Proto-Ao but yielded a **mj-** cluster in Lotha. Although this

is the only example available, it appears that PCN ***m-*** was also dentalized to **n-** before ***-iŋ*** in Sangtam.

[169] MOUTH$_1$	A –	S –	PCN *mən
	L e^1-men^3	Y mən	< PTB *muːr

****hm-** sets:*

[4] WOUND, SORE	A *khu-ma	S ma-	PCN *hma
	L e^1-hmo^1	Y mə	< PTB *r-ma-t
[42] FACE / SURFACE	A *t-ma[j]	S -mi	PCN *hmaj
	L o^1-hmaʔ^3	Y mi	< PTB *s-maːy
[55] TAIL	M [tə]-mi	S –	*a-hmej
	L e^1-hmiʔ^3	Y a-mo	< PTB *r-mey
[187] RUB	A –	S n$^{(j)}$i-	PCN *hmit
	L hmet^2-	Y nət	

▸ The Sangtam cognate is transcribed as *ni* in Kumar 1973a but *nyi* in Marrison 1967.

The PCN ***-it*** rime triggered dentalization of the bilabial initial in both Sangtam and Yimchungrü (and further palatalization in Sangtam), possibly through an intermediate [m^j] onset. (See the discussion of RIPEN, BE RIPE / BE COOKED [170], below.)

This root is undoubtedly related to PTk ***mit*** RUB (Mortensen 2012: #688).

[234] EYE	A *t-nik	S (naʔ)	PCN *hmik (≍ *mjak)
	L o^1-hmjək^2	Y mək	< PTB *s-myak ≍ *s-mik

▸ (See the discussion of this set in the rimes section: §III.3.4.4.) The development of PCN ***hm-*** before ***-ik*** parallels that of ***m-*** before ***-iŋ*** (see PCN ***a-miŋ*** NAME [209]).

The Sangtam form **naʔ** reflects the PCN allofam ***mjak*** (see the previous discussion of EYE [234] in this section, above).

[170]	RIPEN, BE RIPE / BE COOKED	C a^2-mən^2 L hmen^1-	S n^ji- Y -mən-	PCN *hmən < PTB *s-min

▸ As with the ***-it** rime in RUB [187] (above), PCN ***-ən** triggered dentalization/palatalization of the ***hm-** initial to **n^j-** in Sangtam. It is interesting to observe that there are several cases in which a PCN etymon yielded the Sangtam open syllable [mi] without palatalization of the bilabial initial.[133] In those cases, however, the PCN sources of Sangtam **-i** (***-aj(ʔ)**, ***-ej(ʔ)**, ***-aːn**) differ from the PCN sources of **-i** in this set and RUB [187] (***-ən** and ***-it**, respectively). PCN ***-ən** and ***-it** presumably triggered an intermediate ****m^j-** onset (which eventually yielded Sangtam **n^j-** before ****-i**), while ***-aj(ʔ)**, ***-ej(ʔ)**, and ***-aːn** did not.

Note that Sangtam **n^j-** also developed from PCN ***(h)n-** preceding ***-i** and ***-əj** (§III.5.4.2).

[189]	EXTINGUISH / BLOW	A – L hmet^2-	S me- Y mət	PCN *hmət < PTB *s-miːt / *s-mut ?

Ambiguous sets:

These two sets lack Lotha cognates to determine the voicing of the PCN initial and are therefore ambiguous between PCN ***hm-** and **m-** (represented as ***[h]m-**):

[262]	THUNDER	A *-muk L –	S – Y -muk	PCN *[h]muk < PTB *m-bruŋ ⩕ *m-bruk

▸ PTB ***m-bruk** > PCN ***[h]muk** apparently involved loss of the medial liquid ***-r-** and nasalization of the initial ***b-** (or loss of ***b-** and subsequent reinterpretation of the ***m-** prefix as the root initial).

[102]	PERSON, HUMAN	A *(a-)məjʔ L –	S a-mə- Y miʔ-	PCN *a-[h]məjʔ < PTB *r-mi(y)

*III.5.4.2. *(h)n-*

In the previous section (§III.5.4.1), the reconstruction of the PCN ***hm-** vs ***m-** contrast depended solely on Lotha. In this case, the PCN ***(h)n-** voicing contrast depends almost

[133] SALT [41]; FACE / SURFACE [42]; FIRE [54]; PRICE, COST, VALUE [159]

completely on Proto-Ao: Sangtam and Yimchungrü lack **hn-** in their phonemic inventories (based on current data), while virtually every instance of **hn-** in Lotha appears in a form with a medial **-j-** glide (HEADSTRAP, TUMPLINE [118]; GUARD (v.) [240]; BE LOW [142]).[134]

The development can be summarized as follows: PCN ***n-** and ***hn-** descended from a split in PTB ***n-** (conditioning unknown) and were preserved as separate phonemes in Proto-Ao. Lotha generally merged all instances to **n-** but preserved ***hn-** when it was followed by the medial glide ***-j-**. Both Sangtam and Yimchungrü merged the voicing contrast and palatalized the initial to **n^{j}-** when followed by the rimes ***-i** or ***-əj**, or by coalescence with the medial palatal glide ***-j-**:[135]

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam, Yimchungrü*
*n-	***n-**	*n-	n-	
				n^{j}- / _ *-i, *-əj
				*(h)nj- > n^{j}-
*n-, *hy- (sporadic)	***hn-**	*hn-	hn- / _ *-j-	n- elsewhere
			n- elsewhere	

*Table 192: PCN **(h)n-***

***n-** sets:*

[6] NOSE	M [tə]-naʔ	S na-puŋ	PCN *na(ʔ)
	L khe^{3}no?^{3}	Y nə-puŋ	< PTB *s-na ⪤ *s-na:r
[117] FIFTY	A *th-nəm	S t^{h}ə-n^{j}aŋ	PCN *th-nja:m
	L ti^{1}-njan^{1}	Y t^{h}ə-nim	

- Proto-Ao failed to preserve the medial ***-j-** glide following ***n-**. The PCN ***nj-** cluster was preserved as the ambiguous **n^{j}-** initial in Sangtam and likely also in Yimchungrü, though the transcriptions of Marrison 1967 and Kumar 1973b sometimes fail to distinguish between Yimchungrü **n-** and **n^{j}-** before the **-i-** nucleus: Contrast the Weidert 1987 transcription of Yimchungrü 'sun' (**^{2}a^{2}ñi [^{2}]**) [103] with that of Marrison 1967 and Kumar 1973b (*ani*).

[134] Only one exception to this generalization has been found: Lotha **e^{1}-hnəŋ^{3}a^{2}** 'now' (no CN cognates available), which contains **hn-** not followed by **-j-**.
[135] One set (LAUGH / SMILE [63]) suggests that PCN medial ***-w-** blocked the palatalization of PCN ***n-** to Yimchungrü **n^{j}-** preceding ***-i** (and subsequently disappeared).

[166] BE DIRTY

A *m-nən	S -nʲi	PCN *m-njan
L n̥^{1}-mjen^{3}/ m̥^{1}-men^{3}-	Y a-mə-nʲan	

▸ Proto-Ao once again lost ***-j-*** following ***n-***, while Sangtam and Yimchungrü preserved PCN ***nj-*** as **nʲ-**.

The Lotha form is problematic: Weidert reports 'to be dirty' as **^{1}n^{3}myen** (1987: #402), whose palatal glide also appears in Marrison's *myena* (1967: II: 72; from Witter 1888: 104). My consultant, however, produces [m̥^{1}-men^{3}], which is corroborated by K.P. Lotha's *mmena* (Lotha 2004: 338) and the Lotha Literature Committee's *nmen* (Murry et al. 1978: 32). Perhaps these differences are a result of dialect variation and/or a gradual change of **mjen** > **men** in Lotha.

Whatever the case, neither **m-** nor **mj-** is the expected reflex of PCN ***nj-***, which was regularly preserved as **nj-** in Lotha. It is possible, therefore, that there occurred a sporadic assimilation of this root-initial cluster to the nasal prefix (instead of the other way around, as usual), after which the medial glide dropped out in some dialects:

PCN ***m-njan*** > ****m-mjen*** > Lotha **m̥-m(j)en**

[238] BE BLACK

A *a-nak	S a-nʲa(k)	PCN *a-njak
L njək^{2}-	Y mə-rak	< PTB *s-nak

▸ The Yimchungrü **r-** initial is unexpected, though perhaps it developed from a reinterpretation of the ***n-*** initial as a prefix and sporadic alteration of the palatal glide into a rhotic liquid:

PCN ***njak*** > ****n-jak*** > Yim. **m-rak**

[61] SEVEN

A *th-ni ≍ *th-nət	S tʰə-nʲiʔ/nʲe	PCN *th-ni(t)
L –	Y tʰə-n$^{(j)}$e	< PTB *s-ni-s

▸ Sangtam shows the expected palatalization of PCN ***n-*** to **nʲ-** when followed by ***-i***.

Marrison's (1967) transcription of Yimchungrü 'seven' (*thünie)* shows a palatal **nʲ-** (ambiguous among /ɲi/, /nji/, and /ni/), while that of Kumar (*thüne*) apparently does not (1973b: 99). However, Kumar's transcriptions often indicate the presence of a palatal component with *e*: *müne̲an* 'dirt' (1973b:

83)[136], *phe̲ak* ‘mat’ (1973b: 44), *kurhe̲ak* ‘lice’ (1973b: 51). It is therefore not difficult to see how **n^{j}e** in Yimchungrü ‘seven’ could be represented in Kumar 1973b as *ne*, whether due to misperception of the palatal component or the limitations of the transcription system.

[62] TWO	A *a-nət	S a-n^{j}ə	PCN *a-ni(t)
	L e^{1}-ni?^{3}	Y ma(?)-n$^{(j)}$e	< PTB *g/s-ni-s

▸ As in SEVEN [61], a clear representation of the palatal component in Yimchungrü ‘two’ appears only in Marrison’s transcription (*manie*).

[210] SKY / YEAR	A *a-niŋ	S niŋ	PCN *niŋ
	L –	Y t^{h}ə-niŋ	< PTB *s-ni(ː)ŋ ⪤ *s-nik
[72] SIBLING (YOUNGER)	A *t-nu	S –	PCN *nu
	L o^{1}-nu^{1}-i?^{3}	Y –	< PTB *naːw
[263] MACHETE, DAO	A *(a-)nuk	S nu?	PCN *nuk
	L –	Y nuk	
[103] SUN / DAY	A *nəj	S n^{j}ə	PCN *nəj
	L –	Y a-n$^{(j)}$i	< PTB *nəy

▸ The palatal component in Yimchungrü ‘sun’ appears only in Weidert’s transcription. The transcriptions of Yimchungrü in Kumar 1973b and Marrison 1967 most likely fail to distinguish [nji] (or [ɲi]) from [ni].

[63] LAUGH / SMILE	A *m-nəj	S mə-n^{j}ə	PCN *m-nəj ⪤ *m-nwi
	L –	Y mə-ne	< PTB *m-nwi(y)-k

▸ PTB ***m-nwi(y)*** yielded two PCN allofams, one preserving the final palatal glide (***m-nəj**) and the other preserving the medial labiovelar glide (***m-nwi**).

The PAo and Sangtam forms descended from PCN ***m-nəj**, with Sangtam showing the expected palatalization of PCN ***n-** to **n^{j}-** preceding ***-əj**.

[136] Contrast *müinean* ‘dirt’ (Kumar 1973b: 83) with *amünian* ‘sin’ (Marrison 1967) and **^{2}a^{2}mɯ^{2}ñan [^{1}]** ‘to be dirty’ (Weidert 1987: #402). These forms are presumably all transcriptions of the same Yimchungrü word with different strategies for representing the palatal component.

The PCN allofam ***m-nwi*** yielded Yimchungrü **mə-nə** (*müne* in Marrison 1967 and Kumar 1973b). The PCN medial glide ***-w-*** in this allofam served to block the palatalization of PCN ***n-*** before ***-i*** in Yimchungrü (which Marrison would have transcribed as *nie*) before disappearing.

[141]	PRESS, PUSH	A *a-nəm	S nʲəm-	PCN *njəm
		L njəm^{3}-	Y nim	

▸ As mentioned in the rime discussion, Kumar's (1973b) surface transcription of Yimchungrü *nim* possibly represents an underlying form with a schwa nucleus and medial palatal glide (/njəm/). See FIFTY [117] and SUN [103] (this section, above) for similar transcription issues.
This form is likely related to PKC ***nam*** ⧓ ***nom*** PUSH / PRESS / PRINT (VanBik 2009: #828).

[154]	BE SOFT	A *a-nəp	S –	PCN *a-njəp
		L e^{1}-njəp^{2}-	Y –	

***hn-** sets:*

[7]	EAR	A *t-hna-	S –	PCN *hnaʔ
		L e^{1}-noʔ^{1}	Y nə-	< PTB *r/g-na
[43]	PUS	M ahna-tsə	S –	PCN *a-hnaj
		L e^{1}-na^{2}-tʃəʔ^{3}	Y –	< PTB *s-na:y
[116]	SMELL / STINK	A *m-hnəm	S nʲəm ?	PCN *m-hna:m
		L n̥^{1}-nan^{1}-	Y mə-nim	< PTB *m/s-nam

▸ The development of the Sangtam form is unclear, as both the rime (cf. §III.3.2.1) and the palatal component are unexpected. Perhaps it descended from a PCN allofam like ***njəm***.

[118]	HEADSTRAP, TUMPLINE	C a^{3}-nəm^{1}	S –	PCN *a-hnja:m
		L o^{1}-hnjan^{3}	Y –	

▸ As usual, the medial ***-j-*** was lost in Ao following ***hn-***. The Proto-Ao initial was likely ***hn-***, which was regularly merged with **n-** in Chungli.

This etymon appears to be related to PTk ***nam*** BASKET STRAP (Mortensen 2012: #433).

[239] SCRATCH$_1$ (v.) A *a-hnak S – PCN *a-hnak
L e^1-nək^2- Y – < PTB *hyak

▸ The development of PCN ***hn-*** from PTB ***hy-*** in this set appears to be a sporadic rhinoglottophilic change (Matisoff 1975).

[240] GUARD (v.) A *a-hnak S – PCN *hnjak
L hnjak^2- Y –

[142] BE LOW A *a-nəm S -nʲəm PCN *a-hnjəm
L e^1-hnjəm^3- Y – < PTB *s-nem ⪤ *s-nyam

▸ The voicing of the PAo initial is unexpected.
See the rime section for discussion of the PTB etyma (§III.3.2.3).

*III.5.4.3. *(h)ŋ-*

PCN ***hŋ-*** and ***ŋ-*** developed from a split in PTB ***ŋ-*** (conditioning unknown) and were preserved as separate phonemes in Proto-Ao but merged to **ŋ-** in Lotha, Sangtam, and Yimchungrü. The PCN source of Lotha **hŋ-** (as in **ŋ̀^{1}-hŋet^2-** 'nag / find fault with') is unfortunately unknown:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*ŋ-	***ŋ-**	*ŋ-	ŋ-	ŋ-	ŋ-
	***hŋ-**	*hŋ-			

*Table 193: PCN *(h)ŋ-*

****ŋ-** sets:*

[11] MONKEY A *-ŋa S – PCN *ŋa
L – Y -ŋə

[12] FIVE	A *pha-ŋa	S mə-ŋa	PCN *pha-ŋa
	L mo^{1}-ŋo^{1}	Y p^{h}ə-ŋə	< PTB *l/b-ŋa

▸ The PCN prefixal syllable ***pha-*** descended from the PTB ***b-*** prefix, though its source of aspiration is unknown. All instances of the PCN prefixal ***ph-*** were preserved in Proto-Ao and Yimchungrü but nasalized to **m-** in Lotha and Sangtam.[137] In this case, the presence of a full vowel (***-a***) in the PCN prefixal syllable prevented the development of a place-assimilated syllabic nasal in Lotha. The ***pha-*** syllable instead developed according to the regular sound changes for the PCN ***-a*** rime (> PAo ***-a***, Lotha **-o**, Yimchungrü **-ə**; cf. §III.3.1.1) except for its reduction to schwa in Sangtam.

***hŋ-** sets:*

[13] FISH	A *a-hŋaʔ	S ŋu	PCN *a-hŋaʔ
	L o^{1}-ŋoʔ^{2}	Y t^{h}ə-ŋəʔ	< PTB *s-ŋya

▸ The voicelessness of the PCN initial may be due to the PTB ***s-*** prefix (see §III.4.4).

[46] HEAR, LISTEN	A *a-hŋaj	S –	PCN *a-hŋaj
	L e^{1}-ŋa^{1}-	Y –	< PTB *r/g-na

▸ PCN ***hŋ-*** here may have developed from a PTB variant in which the ***g-*** prefix metathesized with the root-initial ***n-*** to form a velar nasal (which somehow devoiced): PTB ***g-n-*** > ****ng-*** > ****ŋ-*** ?>? PCN ***hŋ-***.

Ambiguous set:

[45] BABY, CHILD	A –	S a-k^{h}u-ŋa	PCN *[h]ŋaj
	L ŋa^{3}-roʔ^{3}	Y k^{h}u-ŋa-rə	< PTB *m/s-ŋa-y

▸ Lacking a Proto-Ao cognate, this set is ambiguous between PCN ***hŋ-*** and ***ŋ-***.

[137] cf. FOUR [112]; URINATE / URINE [225]; SOW, SCATTER, THROW (SEEDS) [267]; SNAKE [100]; NAVEL, BELLY BUTTON [51].

III.5.5. Glides and Liquids

The inventory of PCN initial approximants consists of voiced and voiceless glides (labiovelar and palatal) and liquids (rhotic and lateral), whose development is summarized below:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*w-	***w-**	*w-	v-	v-	Ø
	***hw-**	*hw-	h-	h-	h-
*y-	***j-**	*j-	j-	j-	j-
*y-, *hy-	***hj**	*hj-	ʃ- ?	ʃ- ?	h- ?
*l- (sporadic), *r-	***r-**	*ɹ-	r-	r-	r-
	***hr-**	*hrj- > *tsh- *hɹ- else.	v- / _ *-əj hr- else.	x/ɣ- / _ *-ə-, *-waʔ *hrj- > x/ɣ- r- else.	r-, r̥- ?
*r- (sporadic), *l-	***l-**	Ø / _*-juk *j- (sporadic) *l- else.	ʒ- / _ *-əj(ʔ) *lj- > ʒ- / _ *-u z- / _ *-ik j- / _ *-iŋ Ø / _ *-jak l- else.	ʒ- / _ *-əj n- / _ *-ju Ø / _ *-jak l- else.	j- / _ *-əj(ʔ) Ø / _ *-ju l- else.
	***hl-**	*hl-	ʒ- / _ *-əj(ʔ) ʃ-, hl- else.	ʃ- / _ *-əj(ʔ) h-, ʃ- / ? l- else.	ʃ- / ? l- else.

Table 194: PCN approximants

It is important to note that PCN ***hw-**, ***hj-**, ***hr-**, and ***hl-** are voiceless unit phonemes (/ʍ, j̊, r̥, l̥/), not clusters of ***h-** and a medial approximant. This PCN distinction is significant from a phonological standpoint, though it may have been phonetically indistinguishable. In the Matisoff/Benedict PTB reconstructions, however, ***hw-** and ***hy-** represent clusters of ***h-** and a medial glide.

*III.5.5.1. *(h)w-*

PCN ***w-** and ***hw-** both descended from PTB ***w-**, which underwent a split with an unknown conditioning environment. The voiced PCN ***w-** was preserved as a distinct phoneme in Proto-Ao, Lotha, and Sangtam, though its phonetic form shifted to **v-** in Lotha and Sangtam. Even though Yimchungrü does contain forms with **w-** (e.g. *awung* 'hill / mountain' (Marrison 1967)) two cognate sets below suggest that PCN ***w-** was lost in Yimchungrü (possibly through ***wa** > ****u** > **ə**), leaving the source of Yimchungrü **w-** a mystery for now.

The PCN initial ***hw-** was debuccalized to ***h-** in Lotha, Sangtam, and Yimchungrü. PCN ***hw-** appears to have been preserved as PAo ***hw-**, though it was subjected to phonological reanalysis in two reflexes (TOOTH [27], NECK [220]):

PTB	*PCN*	*PAo*	*Lotha, Sangtam*	*Yimchungrü*
*w-	***w-**	*w-	v-	Ø
	***hw-**	*hw-	h-	h-

*Table 195: PCN *(h)w-*

****w-** sets:*

[25] GO
A *a-wa
L vo[1]-
S və
Y ə/jə
PCN *wa
< PTB *s-wa

▸ The palatal glide onset in Kumar's transcription of Yimchungrü 'go' (*yü* [**jə**]) may represent some verbal prefix, given that Marrison reports the form as simply *ü* [**ə**].

[26] LEAF
A *t-wa
L o[1]-vo?[3]
S a-va
Y a-ə
PCN *a-wa

[265] SWEEP
A *a-uk
L –
S vu(?/k)
Y –
PCN *(w)uk
< PTB *k/p-y(w)ak

▸ The PTB variant ***ywak** apparently lost the initial palatal glide either before or after the coalescence of PTB ***-wak** to ****-uk** (cf. §III.3.4.6). The resulting PCN ****uk** form was then ripe for phonological reanalysis as /wuk/, a development reflected in the Sangtam form with initial **v-**. Proto-Ao, on the other hand, preserved the onset-less ***uk** variant.

***hw-** sets:*

[28]	BAMBOO$_1$	A *a-hwaʔ	S xu/ɣu	PCN *r-hwaʔ
		L –	Y həʔ	< PTB *r-wa

▸ This set shows the preservation of PCN ***hw-** in Proto-Ao.
As described in the rime section (§III.3.1.1), the Sangtam initial reflects PCN ***hr-**. In essence, the voicelessness of the ***hw-** initial transferred to the ***r-** prefix and yielded ***hr-**, which then developed into Sangtam **ɣ-** before **-u**.

[27]	TOOTH	A *t-phwa	S ha	PCN *p-hwa
		L o^1-ho^1	Y hə	< PTB *s-wa ⪤ *p-wa

▸ Without the evidence of PAo ***t-phwa**, the PCN reconstruction would clearly be ***ha**. However, the Proto-Ao cluster of medial ***-w-** following the ***ph-** initial reveals that the PCN initial was voiceless ***hw-**, not simply ***h-**. Although the labiovelar glide is medial in the PAo form, it cannot have been so in PCN, otherwise the Lotha rime would be **-u** instead of **-o** (cf. §III.3.1.2). TOOTH therefore developed as follows: PTB possibly contained a variant ***p-s-wa**, with the ***s-** prefix devoicing the ***w-** initial to yield PCN ***p-hwa** (i.e., [p-o̥wa]). The ***p-** prefix was lost in Lotha, Sangtam, and Yimchungrü, which all reflect ***hwa**. In Proto-Ao, PCN ***p-hwa** was reanalyzed as a cluster of aspirated ***ph-** initial with medial ***-w-** glide, yielding PAo ***phwa** (i.e., [p^{h}wa]).

[220]	NECK	A *t-khuŋ	S (a-)huŋ	PCN *a/k-hwuŋ ?
		L e^1-vəŋ^1 ?	Y a-huŋ	< PTB *k-woŋ

▸ In addition to the unexpected reduction of the rime in Lotha ‘neck’, its initial appears to reflect a voiced ***w-** instead of the reconstructed voiceless ***hw-**, making its cognacy questionable.
The Sangtam and Yimchungrü forms lost the ***k-** prefix and developed regularly from ***hwuŋ**. In Proto-Ao, PCN ***k-hwuŋ** was once again reanalyzed as a cluster of aspirated ***kh-** initial with medial ***-w-** glide (which was lost due to its phonetic indistinctness before the ***-u-** nucleus), thus yielding the PAo root ***khuŋ**.

*III.5.5.2. *(h)j-*

PCN voiced ***j-** descended unchanged from PTB ***y-**. The two instances of PCN voiceless ***hj-** with PTB etyma (BE SHY / BE ASHAMED [253] and BLOOD [108]) have different PTB sources: ***y-** (via some conditioned split) and ***hy-**.

PCN ***j-** was preserved in all the daughter languages. PCN ***hj-** was preserved as ***hj-** in Proto-Ao but merged with **j-** in Lotha. The development of ***hj-** is more uncertain in the remaining CN languages: Sangtam may have merged it with ***ʃ-** to yield **ʃ-**, while Yimchungrü may have developed **h-** (merging with the reflexes of ***h-**):

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*y-	***j-**	*j-	j-	j-	j-
*y-, *hy-	***hj**	*hj-		ʃ- ?	h- ?

*Table 196: PCN *(h)j-*

The uncertainty in the Sangtam and Yimchungrü reflexes of ***hj-** is due to the scarcity of cognate sets and the general lack of phonetic precision in the sources for these languages.

****j-** sets:*

[29] MOTHER — M [tə]-ja; L o^{1}-jo^{1}; S –; Y –; PCN *ja < PTB *yay ≋ *ʔay

[30] PALM OF HAND — M [tə]-mija; L $m̩^{1}$-jo^{1}-; S mə-jo; Y mə-ji-; PCN *m-ja

▸ PCN ***j-** did not trigger nasal place assimilation in the Lotha prefix.

[31] HEAR — M jàʔ; L zo^{2}-; S ju-; Y –; PCN *ja

▸ This is the only example in which PCN ***j-** has irregularly yielded Lotha **z-**.

[122] SEARCH, $SEEK_2$ — A *a-jəm; L jan^{3}-; S jaŋ-; Y jim; PCN *jaːm

[135]	HOUSE / VILLAGE	A *a-jəm L o[1]-jan[1]	S jaŋ Y t[h]ə-jam	PCN *a-jam < PTB *k-yim ≋ *k-yum
[136]	LOVE / FRIENDSHIP	A *m-jəm L –	S mə-jaŋ- Y mə-jam-	PCN *m-jam
[153]	SLEEP	A *a-jəp L jəp[2]-	S jəp Y jap	PCN *jap < PTB *s-yip ≋ *s-yup
[184]	SPIN (THREAD)	A *a-jən L jen[1]-	S – Y –	PCN *j[a/ə]n
[266]	BUY / SELL	A *a-juk L –	S – Y juk-	PCN *juk
[222]	DRINK (v.)	A *a-juŋ L ju[1]-	S juŋ Y juŋ	PCN *juŋ
[223]	RIVER	A *a-juŋ L –	S juŋ- Y a-juŋ	PCN *a-juŋ
[224]	FINGER / TOE	A *t-m-juŋ L joŋ[3]-	S mə-juŋ- Y jiŋ-	PCN *m-juŋ < PTB *m-yuŋ
[225]	URINATE / URINE	M hjuŋ/hjùŋ L mjoŋ[1]-	S mə-juŋ Y p[h]u-juŋ	PCN *ph-juŋ

▸ In its development from PCN through Proto-Ao to Mongsen, ***ph-juŋ** may have been sporadically reanalyzed as ****p-hjuŋ** (with a voiceless glide initial) and descended into Mongsen as **hjuŋ** with the prefix lost. (No Chungli cognate is available.)

As usual, the PCN ***ph-** prefix was nasalized to **m-** in Lotha and Sangtam. In a rare development for Lotha, however, the prefix was interpreted as the root initial, yielding **mjoŋ[1]-** 'urinate' as a single syllable.

[173]	SELL	A –	S i	PCN *jən
		L jen[1]-	Y jin	< PTB *ywar

▸ Sangtam *i* likely represents an underlying /ji/.

[174]	IRON	A *(a-)jən	S i-tsʰe, ri-tʃʰe	PCN *jən
		L jon[1]-	Y jin-tʃʰi	< PTB *syaːl ⩙ *syiːr

▸ Given that PTB ***sy-*** represents a cluster of ***s-*** and ***-y-***, it is possible that the initial cluster was reanalyzed as the prefix + initial combination ***s-y-*** (cf. HPTB: 96), and the ***s-*** was subsequently lost in PCN.
Sangtam shows possible [j]~[r] and [tsʰ]~[tʃʰ] variation in its reflex of IRON.

***hj-** sets:*

[32]	EARN / PAY WAGES	A *a-hjaʔ	S –	PCN *hjaʔ
		L m̩[1]-jo[2]-	Y –	
[253]	BE SHY / BE ASHAMED	A *ahjak	S a-ʃa	PCN *a-hjak
		L jək[3]-	Y –	< PTB *g-yak ⩙ *s-r(y)ak
[204]	THREAD, YARN	A *a-hjaŋ	S –	PCN *a-hjaŋ
		L o[1]-jəŋ[1]	Y -hiŋ	

***(h)j-** sets:*

The following sets show variation in the voicing of the PCN initial palatal glide:

[108]	BLOOD	A *a-jəjʔ	S a-ʃə	PCN *a-(h)jəjʔ
		L –	Y tʰi-jiʔ	< PTB *s-hywəy

▸ The PCN voiced initial ***j-*** is reflected in the Proto-Ao and Yimchungrü forms with **j-**, while Sangtam **ʃ-** reflects the voiceless ***hj-**.

The PTB reconstruction ***s-hywəy*** features the double glide ***-yw-*** (HPTB: 84–85). The PTB initial cluster ***hyw-*** lost the labiovelar glide in PCN, and the remaining ***hy-*** cluster of glottal fricative and palatal glide somehow yielded PCN variation between the two unit phonemes ***hj-*** and ***j-***.

[89] WORD / LANGUAGE A *(a-)hju S ju PCN *a-(h)ju
L o^{1}-jə$ʔ^{1}$? Y t^{h}i-ju

▸ In this set, the PCN voiceless initial ***hj-*** is reflected in the Proto-Ao form, while the Sangtam and Yimchungrü initials reflect the voiced initial ***j-***. The cognacy of the Lotha form is questionable, but its initial could reflect PCN ***hj-*** or ***j-***. This PCN form appears to be related to PKC ***ʔoo*** SOUND / VOICE (VanBik 2009: #503).

hj-* ≵ *h- *sets:*

The following sets show possible variation between the PCN voiceless palatal glide ***hj-*** and glottal fricative ***h-***:

[146] BREAD, BISCUIT / FLOUR A *a-hjəm S (həm) PCN *a-hjəm (≵ *a-həm) ?
L ((o^{1}-)həm^{1}) Y –

▸ Proto-Ao reflects PCN ***hj-***, while Sangtam and Lotha reflect ***h-***.

[90] WEIGH A *hju S (hu-) PCN *hju (≵ *hu) ?
L (fə^{3}-) Y –

▸ Proto-Ao again reflects PCN ***hj-***, while Sangtam and Lotha reflect ***h-***.

*III.5.5.3. *(h)r-*

PCN ***r-*** and ***hr-*** descended from a split in PTB ***r-*** (conditioning unknown). Some instances of PTB ***l-*** have also sporadically yielded PCN ***(h)r-***.

All the Central Naga languages preserved PCN voiced ***r-***. (The exact articulation of PCN ***r-*** is unknown, though its Proto-Ao reflex is reconstructible as the voiced (post-)alveolar approximant ***ɹ-***).

Both Proto-Ao and Lotha generally preserved PCN ***hr-*** as such, though ***hr-*** coalesced in PAo with the medial glide ***-j-*** to yield ***tsh-*** (LOUSE, LICE [256]) and became ***v-*** in Lotha before ***-əj*** (SEW, STITCH [111]). In Sangtam, PCN ***hr-*** yielded ***x/ɣ-*** before ***-waʔ***,[138] before rimes with the ***-ə-*** nucleus, and by coalescence with the medial palatal glide ***-j-***. PCN ***hr-*** was elsewhere merged with ***r-*** to yield Sangtam ***r-***.

[138] The single example of ***hr-*** yielding Sangtam ***x/ɣ-*** before ***-waʔ*** comes from a PCN etymon in which the ***r-*** prefix was reanalyzed as the root initial (PCN ***r-hwaʔ*** $BAMBOO_{1}$ [28]). See the discussion in §III.3.1.1.

Yimchungrü appears to vary in its preservation of the voicelessness of ***hr-*** (depending on the accuracy of the transcriptions), but the conditioning environment is unknown:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
	***r-**	*ɹ-	r-	r-	r-
*l- (sporadic), *r-	***hr-**	*hrj- > *tsh- *hɹ- else.	v- / _ *-əj hr- else.	x/ɣ- / _ *-ə-, *-waʔ *hrj- > x/ɣ- r- else.	r-, r̥- ?

*Table 197: PCN ***(h)r-***

****r-** sets:*

[33] (TIMES) TEN — A *th-ɹa; S tʰə-re; PCN *th-ra
L ta¹-ro¹; Y tʰə-rə

▸ As in FIFTY [117], Lotha lost the aspiration on the PCN ***th-*** prefix.

[39] RAIN — C -lu¹; S –; PCN *rwa/ru
L e¹-ruʔ³; Y –; < PTB *r-wa

▸ Chungli shows an unsurprising sporadic development of **l-** from PCN ***r-**.

[123] JUNGLE, FOREST — C a¹-ɹəm²; S raŋ-; PCN *raːm
L o¹-raʔ²/ran¹-; Y rim; < PTB *ram

[124] OTTER — M siɹəm; S –; PCN *raːm
L te¹-ran³; Y –; < PTB *s-ram

[137] BURY / ENDURE, BEAR — A *ɹəm; S -raŋ; PCN *ram
L rəm¹-; Y –

[138] HIDE, CONCEAL — A *m-jəm; S raŋ; PCN *ram
L –; Y ram

▸ The PCN rhotic liquid ***r-*** appears to have sporadically shifted to the PAo palatal glide ***j-*** in this set.

[254] DECEIVE A *kəlak S -ra- PCN *rak
L – Y rək

▸ PCN ***r-*** underwent a sporadic change to PAo ***l-*** here.

[205] STARE, LOOK AT, WATCH C ɹəp²ɹaŋ² S – PCN *m-raŋ ?
L n̥¹-rəŋ¹- Y mə-rəŋ- < PTB *mraŋ

▸ The PTB ***m-*** initial was reanalyzed as a prefix, though not lost: PTB ***mraŋ*** > PCN ***m-raŋ***.

[206] BE HARD / BE STRONG A *m-ɹaŋ S – PCN *m-raŋ ?
L – Y a-mə-raŋ < PTB *g-raŋ ⪤ *m/b-raŋ

[188] BONE A *t-ɹət S a-rə PCN *a-rut
L o¹-ruʔ³ Y ro- < PTB *s/m/g-rus

[268] SIX A *t-ɹuk S tʰə-ruk, ru- PCN *t-ruk
L ti¹-rok² Y tʰu-ruk < PTB *d-ruk

▸ It is unknown whether the aspiration on the Sangtam and Yimchungrü prefixes derived from PCN or was a secondary development (perhaps by analogy to other numerals).

[267] SOW, SCATTER, THROW (SEEDS) A *ph-ɹuk S ʃu ? PCN *ph-ruk
L n̥¹-rok²- Y juk ?

▸ If the Sangtam and Yimchungrü forms are actual cognates, they show sporadic developments of PCN ***r-*** to ***ʃ-*** and ***j-***, respectively.
PCN prefixal ***ph-*** was preserved as such in Proto-Ao but yielded a syllabic nasal in Lotha, which shows place assimilation with the root initial.

[226] BACK (BODYPART) A *t-ɹuŋ- S a-ruŋ PCN *ruŋ
L – Y ruŋ < PTB *m-ruŋ

[227] BURN A *a-ɹuŋ S – PCN *ruŋ
L roŋ¹- Y – < PTB *ploŋ

▸ The PTB initial was reanalyzed as a prefix and lost, and the remaining ***l-*** underwent a sporadic (but not unexpected) change to ***r-*** in PCN:

PTB ***ploŋ*** > ****p-loŋ*** > ****loŋ*** > PCN ***ruŋ***. Although this sequence of changes is admittedly speculative, there do exist several other sets showing the loss of PTB stops preceding approximants:

PTB ***ploŋ*** RUN / FLEE > Lotha **joŋ^{3}-** 'run'
PTB ***s-glak*** COOK / BOIL (v.) > Lotha **e^{1}-lak^{2}-** 'boil (vi./vt.)'
PTB ***byam*** FLY (v.) > PAo ***a-jəm*** FLY / FLOW (290)
PTB ***grak*** CORD / TIE / BIND > PCN ***(h)rak*** BIND, TIE [257]
PTB ***s-grim*** CATCH / HOLD FAST > PCN ***hram*** CATCH, SEIZE, HOLD [139]
PTB ***klup*** COVER / WRAP > PCN ***a-hl[a/ə]p*** WRAP / COVER (v.) [158]
PTB ***pwaːy*** HUSK / CHAFF > PAo ***waj*** CHAFF, HUSK (269)

[99] ICE, SNOW, HAIL

C rə^{3}-	S ʃu-rə	PCN *rə(ʔ)
L ʃe^{1}rəʔ^{1}	Y a-ru	< PTB *ryal / *ser

▸ PCN ***rə(ʔ)*** developed either from PTB ***ryal*** or ***ser***. If the latter, palatalization of the onset and addition of an echo vowel could have yielded something like PCN ***ʃə.rə***, with the initial syllable reflected by Lotha **ʃe^{1}-** and Sangtam **ʃu-**.

[100] SNAKE

C pəɹ^{12}	S mə-rə	PCN *ph-rə
L n̥^{1}-rə^{1}	Y p^{h}u-ru	< PTB *s-b/m-ruːl

▸ Chungli **pəɹ^{12}** resulted from resyllabification of PCN ***ph-rə***.
The PTB ***b-*** prefix yielded the PCN ***ph-*** prefix, all instances of which were nasalized in both Lotha and Sangtam. The (synchronic?) place assimilation of the Lotha nasal prefix here indicates that the PCN form did not contain a fully vocalized prefix (in contrast to FOUR [112] and FIVE [12]), which would have instead yielded a disyllabic Lotha form with no nasal place assimilation.

[109] BOUNDARY, BORDER

A *a-ɹəʔ	S -rə	PCN *a-rəjʔ
L e^{1}-rəʔ^{3}	Y a-re-	< PTB *b-rəy

[192] BE HEAVY

A *a-ɹət	S rə-ti	PCN *rət ?
L –	Y –	< PTB *s-rəy-t

***hr-** sets:*

[125]	SPIRIT / DEMON	A -hɹəm	S -raŋ-	PCN *hraːm
		L -hran	Y rim-	
[139]	CATCH, SEIZE, HOLD	A *a-həm	S raŋ	PCN *hram
		L hrəm^{3}-at^{2}-	Y ram-	< PTB *s-grim

▸ PTB ***g-** was likely lost after its reanalysis as a prefix. If the PTB ***s-** prefix survived the loss of the root-initial ***g-**, it may have contributed to the voicelessness of the PCN initial: PTB ***s-grim** > ***s/g-rim** > ***s-rim** > PCN ***hram**.
The PCN ***hr-** initial was sporadically debuccalized to ***h-** in Proto-Ao.

[255]	CHOKE (vi.)	A *ahɹak	S –	PCN *a-hrak
		L e^{1}-hrək^{2}-	Y –	
[256]	Llouse, LICE	A *a-tshək	S a-ɣa	PCN *a-hr(j)ak
		L o^{1}-hrək^{2}	Y -ɾ̥jak	< PTB *s-r(y)ik

▸ PCN developed a voiceless ***hr-** initial (possibly from PTB ***s-r-**) and preserved the PTB medial palatal glide (in addition to its variable nature).

The PCN medial ***-j-** is reflected only in Proto-Ao, Sangtam, and Yimchungrü. The PCN ***hrj-** cluster was preserved as such in Yimchungrü but yielded PAo ***tsh-** and Sangtam **ɣ-**.

[111]	SEW, STITCH	A *a-hɹə	S ɣə	PCN *hrəj
		L və^{3}-	Y t^{h}i-re	

▸ It is interesting that the PCN ***-əj** rime conditioned voicing of the ***hr-** initial in both Sangtam and Lotha, but shifted their places of articulation in opposite directions: forward to Lotha **v-**, and backward to Sangtam **ɣ-**.[139]

[145]	SMELL (n.), ODOR	A –	S ɣəm	PCN *a-hrəm
		L o^{1}-hrəm^{1}	Y a-ɾ̥əm	< PTB *s-rim

[139] These changes could also be said to include spirantization (development of a fricative), since ***hr-** is technically an approximant in the phonemic system. In its acoustic properties, however, a voiceless approximant is already very similar to a voiceless fricative.

▸ The ***-ə-** nucleus in PCN ***a-hrəm** conditioned the development of ***hr-** to Sangtam **ɣ-**.
Yimchungrü has preserved the voicelessness of the PCN initial here, as reported in both Weidert 1987 (**ʔaʔhrɯm**) and Kumar 1973b (*arhüm*).

***(h)r-** sets:*

The following sets may involve variation in the voicing of the PCN initial. With the exceptions of BOAT [228] and BIND, TIE [257], the Proto-Ao forms all reflect PCN voiceless ***hr-**, while Lotha reflects voiced ***r-**:

[52] DISEASE, ILLNESS, AILMENT	A *hɹa[j]	S -ra	PCN *(h)raj
	L e[1]-ra[1]	Y –	

▸ The Sangtam form may reflect either voiced ***r-** or voiceless ***hr-**.

[257] BIND, TIE	A *a-ɹak	S ra?/rak-	PCN *(h)rak
	L rək[3]-	Y r̥ək	< PTB *grak

▸ The PTB initial likely underwent reanalysis as a prefix and subsequent loss:
PTB ***grak** > ****g-rak** > PCN ***(h)rak**
The PAo and Lotha forms both reflect PCN voiced ***r-**, the Yimchungrü form reflects voiceless ***hr-**, and the Sangtam form may reflect either ***r-** or ***hr-**.

[228] BOAT	A *(a-)ɹuŋ	S –	PCN *a-(h)ruŋ
	L o[1]-hroŋ[1]	Y –	< PTB *m-loŋ

▸ In this set, Lotha reflects a voiceless PCN initial, while Proto-Ao reflects a voiced one. The PCN form shows a sporadic ***l-** > ***(h)r-** development from PTB.

[101] INTESTINES	A *t-(a-)hɹə	S ɣə	PCN *a-(h)rə
	L e[1]-rə[1]	Y –	< PTB *ri:l

▸ Sangtam **ɣ-** developed from PCN ***hr-** preceding the ***-ə-** nucleus (in thise case, an open ***-ə** rime).

[110] CANE, RATTAN	A *a-hɹə	S –	PCN *a-(h)rəj
	L o[1]-rəʔ[3]	Y t[h]i-re	< PTB *s-rwi(y)

▸ Whether Yimchungrü **r-** here descended from PCN ***hr-** or ***r-** is unknown.

*III.5.5.4. *(h)l-*

Most instances of PCN ***l-*** and ***hl-*** descended from a split in PTB ***l-*** (conditioning unknown), with some sporadically deriving from PTB ***r-***.

Proto-Ao retained the phonemic contrast between ***l-*** and ***hl-***, but lost ***l-*** before ***-juk*** (SWALLOW [86]) and sporadically palatalized it to ***j-*** in at least one case (CENTER, MIDDLE [230]).

In Lotha, PCN ***l-*** generally yielded **l-** but underwent various changes before rimes with a high-front nucleus or diphthong: Three sets exhibit the spirantization and palatalization of ***l-*** to **ʒ-** before ***-əj(ʔ)*** (FOUR [112], MEDICINE, CREAM [113], and VINE / VEIN / SINEW [114]), while one set suggests that ***l-*** was spirantized to **z-** before ***-ik*** (TICKLE [259]). One might expect the same spirantization to also occur before ***-iŋ*** (having the same places of articulation as the ***-ik*** rime), but the only example shows ***l-*** palatalizing to **j-** before ***-iŋ*** (PLANT (V.) [215]). Two sets also suggests that the PCN ***lj-*** cluster was simplified to Lotha **j-** before ***-ak*** (LICK [258]) but spirantized to **ʒ-** before ***-u*** (SWALLOW [86]).

The regular development of ***hl-*** in Lotha is even less clear. There are only three cognate sets with possible Lotha reflexes: One preserves the initial as **hl-** (WRAP / COVER (V.) [158]), while another has **ʃ-** (BUY [59]). The third set shows that, just as with ***l-***, PCN ***hl-*** was spirantized/palatalized (and voiced) to **ʒ-** in Lotha before ***-əj(ʔ)*** (FLEA [115]).

In Sangtam, PCN ***l-*** was spirantized and palatalized to **ʒ-** before ***-əj***. The ***lj-*** cluster was also simplified to **j-** before ***-ak***, as in Lotha (LICK [258]), but yielded ***n^{j}-*** before ***-u*** (SWALLOW [86]). PCN ***l-*** was otherwise preserved as **l-** in Sangtam.

The fate of PCN ***hl-*** in Sangtam is unclear: The five cognate sets show three different Sangtam initials (**ʃ-**, **l-**, **h-**). Two of them suggest **l-** as the regular reflex of ***hl-*** in Sangtam, and it is likely that the **ʃ-** in FLEA [115] is a result of spirantization and palatalization of ***hl-*** before ***-əj(ʔ)*** (providing the voiceless parallel to ***l-*** > **ʒ-** / _ ***-əj**). For the remaining two reflexes, the conditioning environments which yielded **ʃ-** and **h-** are unknown.

In Yimchungrü, PCN ***l-*** was preserved as **l-**, except where it was palatalized to **j-** before ***-əj(ʔ)*** (FOUR [112], VINE / VEIN / SINEW [114]) and lost before ***-ju*** (SWALLOW [86]). The regular reflex of PCN ***hl-*** appears to be ***l-***, though there is one questionable Yimchungrü reflex containing **ʃ-**.

These developments are summarized in the table below:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*r- (sporadic), *l-	***l-**	Ø / _*-juk *j- (sporadic) *l- elsewhere	ʒ- / _ *-əj(ʔ) *lj- > ʒ- / _ *-u z- / _ *-ik j- / _ *-iŋ Ø / _ *-jak l- elsewhere	ʒ- / _ *-əj n- / _ *-ju Ø / _ *-jak l- elsewhere	j- / _ *-əj(ʔ) Ø / _ *-ju l- elsewhere
	***hl-**	*hl-	ʒ- / _ *-əj(ʔ) ʃ-, hl- elsewhere	ʃ- / _ *-əj(ʔ) h-, ʃ- / ? l- elsewhere	ʃ- / ? l- elsewhere

*Table 198: PCN *(h)l-*

***l-** sets:*

[34] FEMALE, WOMAN
A *-la S la- PCN *la
L -lo[1] Y a-li- ? < PTB *g-la

[35] BOW (n.)
M la- S -lu PCN *laʔ
L lo[2]- Y -ləʔ < PTB *g/b/m-la-y

[50] BE EASY
A *m-la[j] S a-mə-la PCN *m-laj
L e[1]-la[3]- Y mə-lə < PTB *lwa(ː)y

▸ The PTB medial ***-w-** following ***l-** was evidently not preserved in PCN.

[51] NAVEL, BELLY BUTTON
A *t-ph-la[j] S – PCN *ph-laj
L n̥[1]-la[1] Y – < PTB *m/s-la(ː)y

▸ The PCN ***ph-** prefix here (reflected only in the PAo form) may have developed from some alteration of PTB ***m-**.[140] PCN ***ph-** yielded a Lotha nasal prefix, which has undergone place assimilation to the root-initial **l-**.

[140] In speaking of the very same cognate set, Matisoff suggests the existence of allofamic variation between the PTB ***b-** and ***m-** prefixes: "In forms like Ao **[2]tɯ [2]pɯ [2]la**, Rengma **[1]a [2]bvɯ [3]li**, it might be plausible to treat the second syllables like dimidiations (syllabizations) of the labial prefix ***bV- ≍ *mV-**, since in that position many other languages have elements with unstressed vowels" (2008: 58).

[126]	PATH, ROAD, WAY	C lən^{1}	S laŋ	PCN *la:m
		L o^{1}-lan^{3}	Y lim-	< PTB *lam
[151]	BE WARM	A *a-ləm	S –	PCN *l[a/ə]m
		L ləm^{1}-	Y –	< PTB *s-lum ⪥ *lim
[178]	CHANGE / EXCHANGE	A *m-lən	S mə-li-	PCN *m-l[a:/a/ə]n
		L –	Y –	
[258]	LICK	A *m-ljak	S mə-ja	PCN *m-ljak
		L m̩^{1}-jak^{2}-	Y mə-ljak	< PTB *m/s-lyak

▸ Preceding PCN ***-ak**, Proto-Ao and Yimchungrü preserved the **lj-** cluster from PCN, while Lotha and Sangtam both simplified it to **j-**. (See SWALLOW [86] for the completely divergent behavior of PCN ***lj-** preceding ***-u(k)**.)

[207]	CUT, CHOP	A *a-laŋ	S –	PCN *laŋ
		L ləŋ^{1}-	Y –	
[57]	GROUND, EARTH / FIELD	A *a-li	S a-li	PCN *a-lej
		L o^{1}-li?^{3}	Y a-lo	< PTB *m-ley ⪥ *m-ləy
[58]	TONGUE	A *t-m-li	S mə-li	PCN *m-lej(?)
		L n̩^{1}-li?^{1}	Y mu-lo	< PTB *m/s-lay ⪥ *s-ley

▸ The PCN ***m-** prefix has assimilated in place to the root-initial ***l-** in Lotha.

[65]	BE, EXIST, LIVE (COPULA) / HAVE	A *a-li	S li	PCN *li
		L li^{1}-	Y la? ?	< PTB *s-ri(y)-t

▸ PTB ***r-** has sporadically yielded PCN ***l-** here.

[259]	TICKLE	M kə̀lìk	S –	PCN *k-lik
		L e^{1}-zək^{2}-	Y –	< PTB *g-li-k

▸ Mongsen may reflect the original PTB ***g-** prefix (> PCN ***k-**).
The PCN ***-ik** rime triggered the spirantization of PCN ***l-** to Lotha **z-**. (See the discussion of this reconstruction in the rimes section: §III.3.4.5.)

[215] PLANT (v.) A *a-liŋ S – PCN *liŋ
L jəŋ^{1}- Y –

▸ Since ***lik*** in PCN TICKLE [259] yielded Lotha **zək**, PCN ***liŋ*** here would be expected to yield Lotha **zəŋ**. Instead, the ***l-*** initial was perhaps palatalized to **j-** before ***-iŋ***, after which the rime underwent reanalysis in Lotha as **-jəŋ** (cf. §III.3.4.2):

PCN ***liŋ*** > (palatalization) ****jiŋ*** > (rime reanalysis) Lotha **jəŋ**

[87] BOIL (v.) A *m-lu S mə-lu- PCN *m-lu
L – Y –

[86] SWALLOW (v.) A *m-juk S mə-nʲə PCN *m-lju(k)
L n̥^{1}-ʒə^{1}- Y mu-ju < PTB *mlyəw-k

▸ Since SWALLOW and LICK [258] are the only two known instances of PTB ***ly-*** with CN reflexes, the following analysis is very tentative:

The PTB cluster ***ly-*** was preserved in PCN as ***lj-*** (as in LICK [258]), but underwent various changes when followed by PCN ***-u(k)***. In PAo and Yimchungrü the initial liquid was lost, while in Lotha the cluster was spirantized to **ʒ-** (which later triggered the reduction of ***-u*** to Lotha **-ə**). In Sangtam, the initial ***l-*** of the cluster became **n-** (either sporadically or regularly), yielding **n^{j}-**.

[229] STONE, ROCK A *(a-)luŋ S luŋ PCN *luŋ
L o^{1}-loŋ^{3} Y luŋ < PTB *r-luŋ

[230] CENTER, MIDDLE A *t-juŋ S a-luŋ- PCN *a-luŋ
L o^{1}-loŋ^{1}-o^{1} Y -luŋ

▸ PCN ***l-*** sporadically yielded PAo ***j-*** here.

[231] HEART / BE ROUND A *luŋluŋ, S a-mə-luŋ PCN *m-luŋ
*t-m-luŋ Y mu-luŋ, -luŋ < PTB *luŋ ⪤ *lum, *m-luŋ
L loŋ^{1}-

[112] FOUR A *ph-ləj S mə-ʒə PCN *phV$_{ʔ}$-ləj
L me^{1}-ʒə^{1} Y p^{h}i-ji < PTB *b-ləy

▸ When occurring before ***-əj**, PCN ***l-** was palatalized/spirantized to Yimchungrü **j-** and Lotha/Sangtam **ʒ-**.

PCN prefixal ***ph-** descended from PTB ***b-** and was nasalized in Lotha and Sangtam. The disyllabic Lotha form with no place-assimilation in the nasal supports the reconstruction of a full disyllable at the PCN level. (Contrast SWALLOW (v.) [86], in which the PCN ***m-** prefix assimilated to the root-initial ***ʒ-** in Lotha). The vowel quality of this PCN ***phV˭-** syllable, however, is unknown.

[113] MEDICINE, CREAM A *muləj S mu-jə PCN *mV˭-ləj ?
L mo[1]-ʒə[1] Y mo-li-

▸ The Central Naga forms in this set are undoubtedly cognate, but their development is problematic: Proto-Ao ***ləj** and Lotha **ʒə** clearly support the reconstruction of PCN ***ləj**, but this should have yielded Sangtam **ʒə** and Yimchungrü **ji**. Instead, Sangtam has **jə** (provided my interpretation of *moi* 'medicine' (Kumar 1973a) as /mu-jə/ is correct) and Yimchungrü has **li**. This Sang. **j-** : Yim. **l-** correspondence exists in only one other set:

PCN ***m-ljak** LICK > Sang. **mə-ja**, Yim. **mə-ljak** [258]

Perhaps the PCN root syllable was actually something like ***ljə**. However, this must remain in the realm of speculation until additional cognate sets are identified.

The Lotha disyllable with no nasal place assimilation supports the reconstruction of a fully vocalized PCN ***m-** prefix. The vowel quality of PCN ***mV˭-**, however, is unknown.

[114] VINE / VEIN / SINEW A *(t-)hləj S – PCN *th-ləj?
L -ʒə?[2] Y t[h]i-ji?-

▸ PCN ***th-ləj?** appears to have been phonologically reanalyzed in Proto-Ao. The aspiration of the ***th-** prefix was reinterpreted as voicelessness of the ***l-** initial, yielding PAo ***t-hləj**. (The disappearance of the glottal stop in PAo is unexpected.)

Lotha and Yimchungrü show the expected palatalization/spirantization of PCN ***l-** before ***-əj** to yield **ʒ-** and **j-**, respectively.

This PCN form is no doubt related to PKC ***tha-ruy** ≍ ***-hruy** VEIN / ARTERY / SINEW (VanBik 2009: #418).

[147] HEAD / HEART / MIND	A -ləm	S ləm-	PCN *ləm
	L ləm[1]-	Y ləm	< PTB *luŋ ⩙ *lum
[157] CUT (v.)	A *a-ləp	S –	PCN *ləp
	L –	Y lip-	< PTB *s-lep
[193] LEECH (WATER)	A *m-lət	S –	PCN *m-lV̩t
	L n̩[1]-la?[2]	Y –	< PTB *m-liːt

▸ As discussed in the rime section (§III.3.3.5), the vowel nucleus of this PCN etymon is unknown.

***hl-** sets:*

[208] BE LONG	A *a-hlaŋ	S a-ʃiŋ ?	PCN *a-hlaŋ
	L –	Y a-ʃaŋ ?	< PTB *m-raŋ

▸ It is not surprising that PTB ***r-** would sporadically shift to a lateral approximant, but the reason for devoicing to PCN ***hl-** is unknown.
Proto-Ao has preserved PCN ***hl-** as ***hl-**, while the Sangtam and Yimchungrü forms (of questionable cognacy) unexpectedly have **ʃ-**.

[59] BUY	A *a-hli	S a-li	PCN *a-hlej
	L ʃi-[3]	Y -lo	< PTB *g/m/s-lay ⩙ *r-ley

▸ Sangtam and Yimchungrü both contain **l-**, which is most likely their regular reflex of ***hl-**. The Lotha form with **ʃ-** is odd, but there is not enough evidence yet to eliminate it as a cognate.
The PTB source of this etymon was likely an allofamic combination like ***s-ley**, with the PTB ***s-** prefix inducing devoicing of the root initial in PCN.

[115] FLEA	A *a-hləj	S a-ʃə-	PCN *a-hləj(ʔ)
	L te[1]ʒəʔ[1]	Y –	< PTB *s-ləy

▸ PCN ***a-hləj(ʔ)** contains the palatal dipthong ***-əj**, which spirantized and palatalized the ***hl-** initial in both Lotha and Sangtam. In Lotha, the initial was also voiced during this process to yield **ʒ-**, merging with the reflexes of ***l-** before ***-əj**.

[158] WRAP / COVER (v.) A *a-hləp S (a-)həp- PCN *a-hl[a/ə]p
L hləp²- Y – < PTB *klup

▸ PTB ***klup** lost its initial velar stop, though the source of devoicing on the remaining lateral liquid is unknown.
Both Proto-Ao and Lotha preserved ***hl-** as such. Sangtam appears to have sporadically debuccalized the initial to **h-**.

[88] FIELD / GROUND A *a-hlu S lu PCN *hlu
L – Y -lu < PTB *low

▸ This set provides additional evidence that the reflexes of ***hl-** merged with **l-** in Sangtam and Yimchungrü.

III.5.6. Zero

Two cognate sets are reconstructed with an onset-less PCN syllable:

[40] I, ME (1SG) A – S i PCN *aj
L a³ Y i < PTB *ŋa-y

▸ The PTB initial ***ŋ-** was apparently lost (not a surprising development for a high-frequency function word).

[265] SWEEP A *a-uk S vu(ʔ/k) PCN *(w)uk
L – Y – < PTB *k/p-y(w)ak

▸ PCN ***(w)uk** SWEEP shows variation (at the phonological level) between /wuk/ and /uk/ (due to their phonetic similarity). The PAo form reflects the onset-less analysis (cf. the discussion in §III.5.5.1).

III.5.7. Unknown

The following cognate set shows perfect rime and semantic correspondences, but has an as yet un-reconstructible initial:

[175] BE OLD (OF THINGS) A *a-tʃən S a-zi PCN *a-C̥ən ?
L e¹-hen³- Y a-wən

III.5.8. Medial Approximants

Proto-Central Naga contained the medial glides ***-w-** and ***-j-**, and one set suggests the possibility of a ***-l-** liquid medial. The development of clusters involving these approximants is discussed in the following subsections.

*III.5.8.1. Medial *-w-*

The original PTB medial labiovelar glide ***-w-** was lost or coalesced with the vowel in most environments before the PCN stage. Nearly all instances of PCN ***-w-**, therefore, derive from other PTB sources. The following subsections discuss the medial labiovelar glide development at the PTB and PCN stages, respectively:

*PTB *-w-*

With the exception of ***-wi** (preserved in PCN), most PTB forms with medial ***-w-** show loss of the glide or coalescence (of some sort) with the vowel nucleus:

PTB medial + rime	*PCN reflex*	*fate of PTB *-w-*
*-wi	*-wi	preservation
*-wa(ː)y	*-aj	loss
*-wəy	*-əj(ʔ)	loss
*-wam	*-əm	coalescence
*-waːr	*-an	coalescence
*-war	*-ən	coalescence
*-wak	*-uk	coalescence

*Table 199: Fates of PTB medial *-w-*

Although the data is sparse, we may hypothesize that PTB ***-w-** was preserved before open-syllable monophthongs, disappeared before diphthongs, and coalesced with the vowel nucleus in closed syllables.

While PTB ***-wak** > PCN ***-uk** (§III.3.4.6) is the most natural example of coalescence, PTB ***-wam** > PCN ***-əm** (§III.3.2.3), PTB ***-waːr** > PCN ***-an** (§III.3.3.2), and PTB ***-war** > PCN ***-ən** (§III.3.3.3) are also treated as coalescence because the same PTB rimes yielded different PCN reflexes when not preceded by PTB medial ***-w-**. Though the exact mechanics of these changes are not clear, it appears that the presence of the medial glide contributed to the rime development.

The PCN etyma reflecting PTB medial ***-w-*** are discussed in their respective subsections, but are also repeated below for reference:

[50] BE EASY — A *m-la[j] — S a-mə-la — PCN *m-laj
L e^{1}-la^{3}- — Y mə-lə — < PTB *lwa(ː)y

▸ PTB ***-w-*** disappeared before ***-a(ː)y*** without affecting the rime.

[63] LAUGH / SMILE — A (*m-nəj) — S (mə-n^{j}ə) — PCN *m-nwi (≵ *m-nəj)
L – — Y mə-ne — < PTB *m-nwi(y)-k

▸ PTB ***-w-*** was preserved before ***-i*** in PCN and blocked the palatalization of PCN ***n-*** in Yimchungrü before disappearing.

[108] BLOOD — A *a-jəjʔ — S a-ʃə — PCN *a-(h)jəjʔ
L – — Y t^{h}i-<u>jiʔ</u> — < PTB *s-hywəy

▸ PTB ***-w-*** disappeared before ***-əy*** without affecting the rime.

[110] CANE, RATTAN — A *a-hɹə — S – — PCN *a-(h)rəj
L o^{1}-rəʔ^{3} — Y t^{h}i-<u>re</u> — < PTB *s-rwi(y)

▸ As in BLOOD (above), PTB ***-w-*** disappeared before ***-əy*** without affecting the rime. Note that the PCN form here descended from the PTB variant with ***-əy*** (***s-rwiy*** = ***s-rwəy***).

[140] SWELL, BE SWOLLEN — A – — S pəm- — PCN *pəm
L pəm^{1}- — Y pəm — < PTB *s-bwam

▸ The PTB medial ***-w-*** apparently contributed to the reduction of PTB ***-am*** > PCN ***-əm*** in this etymon (which otherwise would have yielded PCN ***-aːm***; cf. §III.3.2.1).

[167] BE SOUR — A *a-sən — S a-si — PCN *a-san
L then^{3}- — Y a-san, a-ʃo — < PTB *suːr ≵ <u>*swaːr</u>

▸ PTB ***-w-*** contributed to the development of PTB ***-aːr*** > PCN ***-an***.

[173] SELL — A – — S i — PCN *jən
L jen^{1}- — Y jin — < PTB *ywar

▸ PTB ***-w-*** contributed to the development of PTB ***-ar*** > PCN ***-ən***.

[79] HOLE	M (kupaʔ)	S -k^{h}i/(-ku)	PCN *a-khən (≷ *a-ku)
	C ta^{3}-kiʔ^{3}	Y -k^{h}ən/(-ku)	< PTB *kor ≷ *kwar
	L (o^{1}-kuʔ^{3})		

▸ As above, PTB ***-w-*** contributed to the development of PTB ***-ar*** > PCN ***-ən***.

[265] SWEEP	A *a-uk	S vu(ʔ/k)	PCN *(w)uk
	L –	Y –	< PTB *k/p-y(w)ak

▸ PTB medial ***-w-*** coalesced with the ***-ak*** rime to yield PCN ***uk*** (cf. §III.3.4.6). (The onset-less syllable was reanalyzed as containing a ***w-*** onset in the Sangtam branch.)

*PCN ***-w-***

With the exception of the PCN variant ***m-nwi*** LAUGH / SMILE [63], PCN forms with ***-w-*** reflect PTB etyma without medial glides. PCN ***-w-*** also appears almost exclusively with the ***-a(ʔ)*** rime and shows little interaction with the initials. This behavior warrants a subsection devoted to PCN ***-wa(ʔ)*** under the rimes (§III.3.1.2). The initial consonants in reconstructions containing PCN ***-w-*** are discussed in their respective subsections under §III.5. These sets are also repeated below for reference:

[36] SEARCH, SEEK$_1$	A *pwa-	S pu-	PCN *pwa
	L –	Y –	< PTB *pa
[38] BAMBOO$_2$	A –	S pu	PCN *pwa/pu
	L ve^{2}-puʔ^{3}	Y –	< PTB *g-p^{w}a ≷ *r-p^{w}a
[37] FATHER	A *t-pwaʔ	S u-va	PCN *a-pwaʔ
	L pu^{1}-	Y a-puʔ	< PTB *p^{w}a
[2] FOOT (PART)	A *t-m-phwa	S -mə-p^{h}a	PCN *m-ph(w)a
	L m̩^{1}-phoʔ^{3}	Y mə-fə	< PTB *p^{w}a-n
[9] LOINS / GROIN	A –	S a-mə-ka	PCN *m-k(w)a
	L ŋ̍^{1}-kuʔ^{3}	Y mə-kə	

[39] RAIN	C -lu[1]	S –	PCN *rwa/ru
	L e[1]-ruʔ[3]	Y –	< PTB *r-wa

*III.5.8.2. Medial *-j-*

Instances of the PTB medial palatal glide (represented by ***-y-**) following PTB ***s-**, ***ts-**, ***dz-**, and ***h-** coalesced with the initial to yield unit phonemes in PCN. These changes are discussed in their respective sections (§III.5.2.1, §III.5.2.2, §III.5.3.1, §III.5.3.2, §III.5.4.2, and §III.5.5.2).

One set suggests that PTB medial ***-y-** was lost following ***ŋ-** (PTB ***s-ŋya** > PCN ***a-hŋaʔ** FISH [13]), while another shows the possible sporadic loss of ***-y-** following PTB ***r-** (PTB ***ryal** > PCN ***rə(ʔ)** ICE, SNOW, HAIL [99]), contrasting with its preservation in LOUSE, LICE [256] (PTB ***s-r(y)ik** > PCN ***a-hr(j)ak**).

In other environments, PCN preserved PTB ***-y-** (***-j-**), though some instances of PCN ***-j-** have an unknown origin. Some sets suggest the development of PCN medial ***-j-** from an original PTB ***s-** prefix, as in Lepcha (Benedict 1943), but this is uncertain, since other sets seem to indicate that the PTB ***s-** prefix was instead responsible for devoicing of the root initial in PCN (cf. §III.4.4). In one set (PCN ***khjəj** DOG [104]), PCN appears to parallel Written Tibetan in the development of ***khj-** from PTB ***kw-** (cf. HPTB: 62 [fn.88]).

Proto-Ao lost the PCN medial ***-j-** without a trace following ***p-** and ***(h)n-**, but preserved it after ***th-** and possibly ***k-**. Instances of ***-j-** following ***m-** and ***hr-** interacted with the initials to yield PAo ***hn-** and ***tsh-**, respectively. The PCN ***lj-** cluster was preserved as PAo ***lj-** before ***-ak** but simplified to ***j-** before ***-uk**.

Lotha preserved PCN ***-j-** following ***p-**, ***m-**, ***(h)n-**, and ***k-**. Following ***th-** and ***kh-**, PCN ***-j-** interacted with the initials to yield Lotha **tʃh-** and **f-**, respectively. The PCN ***lj-** cluster simplified to Lotha **j-** before ***-ak** but spirantized to **ʒ-** before ***-u**.

Sangtam lost ***-j-** following ***p-**, but preserved it after ***k-** and ***(h)n-** (as the ambiguous **n**$^{\text{j}}$**-**). Medial ***-j-** interacted with the initials ***m-**, ***kh-**, and ***hr-** to yield Sangtam **n-**, **f-**, and **x/ɣ-**, respectively. The PCN ***lj-** cluster simplified to Sangtam **j-** before ***-ak** (as in Lotha) but nasalized to **n**$^{\text{j}}$**-** before ***-u**.

Yimchungrü lost ***-j-** following ***k(h)-** but preserved it after ***p-**, ***m-**, ***hr-**, and ***n-** (as the ambiguous **n**$^{\text{j}}$**-**). The PCN ***lj-** cluster was preserved as **lj-** before ***-ak** (as in PAo) but simplified to **j-** before ***-u** (cf. PCN ***ljuk** > PAo ***juk**).

These changes are summarized in the following tables:

PTB	*PCN*
*-y-	***sy-** > ***ʃ-** ***tsy-**, ***dzy-** > ***tʃ-** (and ***ts-**) ***hy-** > ***hj-** **Ø** / ***ŋ_** ***r_** (sporadic) ***-j-** / elsewhere

*Table 200: PCN reflexes of PTB medial ***-j-***

PCN	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
***-j-**	Ø / *p_ *(h)n _		Ø / *p_	Ø / *k(h)_
	*-j- / *th_ *k_	*-j- / *p_ *m_ *(h)n_ *k_	*-j- / *(h)n_ *k_	*-j- / *p_ *m_ *n_ *hr_
	*mj- > *hn-		*mj- > n-	
		*thj- > tʃh- *khj- > f-	*khj- > f-	
	*hrj- > *tsh-		*hrj- > x/ɣ-	
	*lj- > *lj- / _ *-ak > *j- / _ *-uk	*lj- > j- / _ *-ak > ʒ- / _ *-u	*lj- > j- / _ *-ak > n^j- / _ *-u	*lj- > lj- / _*-ak > j- / _ *-u

*Table 201: PCN medial ***-j-** and interaction w/ initials*

The interactions of the medial palatal glide with the initials are discussed in their respective sections. Sets containing ***-j-** are repeated here for reference:

[232] BE FLAT
A *(a)pak
L e^1-pjak^2-
S pa
Y -pjak
PCN *a-pjak
< PTB *r-pak

[195] BE DEAF
A –
L pəŋ^3-
S -piŋ
Y -pjaŋ/-peŋ-
PCN *p(j)aŋ
< PTB *l-baŋ ⨳ *m-baŋ

[234]	EYE	A (*t-nik) L (o^{1}-hmjək^{2})	S naʔ Y (mək)	PCN *mjak (≵ *hmik) < PTB *s-myak ≵ *s-mik
[235]	IN-LAW	A *(a-)hnak L o^{1}-mjak^{2}-	S – Y -mjak	PCN *mjak < PTB *s-maːk
[149]	PLANT (v.) / TRANSPLANT	A *a-thjəm L tʃhəm^{1}-	S – Y –	PCN *thj[a/ə]m
[191]	ABILITIVE (SUF.)	A *-thjət L -tʃhet^{2}	S – Y –	PCN *-thjət
[117]	FIFTY	A *th-nəm L ti^{1}-njan^{1}	S t^{h}ə-nʲaŋ Y t^{h}ə-nim	PCN *th-njaːm
[166]	BE DIRTY	A *m-nən L n̥^{1}-mjen^{3}/m̥^{1}-men^{3}-	S -nʲi Y a-mə-nʲan	PCN *m-njan
[238]	BE BLACK	A *a-nak L njək^{2}-	S a-nʲa(k) Y mə-rak	PCN *a-ɲjak < PTB *s-nak
[141]	PRESS, PUSH	A *a-nəm L njəm^{3}-	S nʲəm- Y nim	PCN *njəm
[154]	BE SOFT	A *a-nəp L e^{1}-njəp^{2}-	S – Y –	PCN *a-njəp
[118]	HEADSTRAP, TUMPLINE	C a^{3}-nəm^{1} L o^{1}-hnjan^{3}	S – Y –	PCN *a-hnjaːm
[240]	GUARD (v.)	A *a-hnak L hnjak^{2}-	S – Y –	PCN *hnjak

[142] BE LOW	C a³-nəm¹ L e¹-hnjəm³-	S -nʲəm Y –	PCN *a-hnjəm < PTB *s-nem ⩙ *s-nyam
[83] TWENTY	M məki; C mə²tsə² L mju¹kjuʔ¹	S məkjə Y muku	PCN *mu-kju < PTB *m-kul
[104] DOG	A *a-jəj L fə³-roʔ³	S fə-za Y kʰiʔ-	PCN *khjəj ? < PTB *d-kʷəy-n
[256] LOUSE, LICE	A *a-tshək L o¹-hrək²	S a-ɣa Y -r̥jak	PCN *a-hr(j)ak < PTB *s-r(y)ik
[258] LICK	A *m-ljak L m̥¹-jak²-	S mə-ja Y mə-ljak	PCN *m-ljak < PTB *m/s-lyak
[86] SWALLOW (v.)	A *m-juk L n̥¹-ʒə¹-	S mə-nʲə Y mu-ju	PCN *m-lju(k) < PTB *mlyəw-k

*III.5.8.3. Medial *-l-*

In the few PTB etyma with ***-l-**, the medial liquid tended to be lost, reanalyzed, or coalesced with the initial:

PTB ***s-bloŋ** > PCN ***puŋ** MALE (OF ANIMALS) [216]	loss
PTB ***ploŋ** > ****p-loŋ** > PCN ***ruŋ** BURN [227]	reanalysis
PTB ***klup** > ****k-lup** > PCN ***a-hl[a/ə]p** WRAP / COVER (v.) [158]	reanalysis
PTB ***m/ʔ-glak** > PCN ***a-tshak** BE COLD [247]	coalescence

One set, however, suggests the possibility of a PCN ***khl-** cluster preserved from PTB ***kl-**, though this is very tentative:

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-l-	***-l-**	?	*khl- > tʃh-	*khl- > tʃh-	Ø / *kh_

*Table 202: PCN medial *-l- and interaction w/ initials*

This reconstruction is discussed under PCN ***k(h)-*** (§III.5.1.3) and simply repeated here for reference:

[105] FECES, EXCREMENT	M [a]-tsə́ʔ; C səʔ[1]	S tʃʰə	PCN *a-khləjʔ ?
	L o[1]-tʃhəʔ[2]	Y kʰiʔ	< PTB *kləy

III.6. Discussion & Conclusion

This section summarizes the sound changes from Proto-Tibeto-Burman to Proto-Central Naga (§III.6.1), and from Proto-Central Naga to its daughter languages (§III.6.2). §III.6.3 presents sets of unique Central Naga etyma, and §III.6.4 discusses the relative chronology of particular sound changes.

III.6.1. PTB > PCN

The PTB rime changes are discussed in §III.6.1.1, while those in the initials are discussed in §III.6.1.2. §III.6.1.3 summarizes the medial changes. (Note that some medials interacted with rimes and/or initials and are therefore addressed in those sections.)

III.6.1.1. Rimes

Open

The PTB open monophthongs ***-a**, ***-i**, and ***-u** were all generally preserved in PCN, while there are no known PCN reflexes of the PTB secondary monophthongs ***-e** and ***-o**. PTB ***-i** and ***-u** were reduced to schwa after some onset clusters.

PCN preserved the PTB front diphthongs (***-əy**, ***-ey**, ***-a(ː)y**) but merged all the back diphthongs (***-əw**, ***-ow**, ***-a(ː)w**) with ***-u**.

Though most results of extrusion from PTB ***pʷa** remained ***pwa** in PCN, at least one instance inexplicably underwent an early ****-wa** > ****-u** change for some reason to yield PCN ***pu** (AXE [66]) (cf. §III.6.4.1).

Some PTB forms with open rimes gained glottal stops in PCN. The original PTB ancestor (if any) of PCN glottal stops has not been identified.

Bilabial-final

Before the bilabial nasal coda ***-m**, PTB ***-a** lengthened to yield PCN ***-aːm**. (There are as yet no known PCN reflexes of PTB ***-ap**.) PTB ***-o-**, ***-wa-**, and ***-e-** were all reduced to schwa before the bilabial codas ***-m** and ***-p**. The PTB high vowels ***-i-** and ***-u-** before bilabial codas were both split by some unknown conditioning factor into PCN ***-a-** and ***-ə-**.

Dental-final

Before the dental nasal coda ***-n**, PTB ***-a-** lengthened to yield PCN ***-aːn**. In the same environment, PTB ***-i-** was reduced to schwa to yield PCN ***-ən**.

The sound changes involving vowels followed by the dental stop coda ***-t** are not well-understood: PTB ***-a-** was preserved to yield PCN ***-at**, while the ***-əy** dipthong was reduced to schwa preceding suffixal ***-t** (PTB ***-əy-t** > PCN ***-ət**). The fates of PTB ***-i(ː)-** and ***-u-** preceding ***-t** are unclear.

Velar-final

PTB vowel nuclei preceding velar codas were generally preserved in PCN: PTB ***-a(ː)k/ŋ** > PCN ***-ak/ŋ**, PTB ***-i(ː)k/ŋ** > PCN ***-ik/ŋ**, and PTB ***-u(ː)k/ŋ** > PCN ***-uk/ŋ**. A few changes did occur to velarize two vowel nuclei: PTB ***-a(ː)-** yielded PCN ***-u-** when surrounded by velar consonants (specifically, the environments ***-w_k** and ***k_ŋ**), and ***-o-** was raised before *-**ŋ**, merging the rime with ***-uŋ**.

Liquid-final

Rimes with final ***-l** (***-i(ː)l**, ***-al**, ***-uːl**) were unconditionally reduced to an open/glottal-final schwa rime in PCN (***-ə(ʔ)**).

PTB final ***-r** was unconditionally merged with PTB ***-n**, but it is unknown whether this occurred before or after the changes in vowel nuclei preceding ***-r**. PTB ***-wa-**, ***-i(ː)-**, ***-o-** and ***-u(ː)-** preceding ***-r** were reduced to schwa (> PCN ***-ən**), while the glide + vowel combination in ***-waːr** somehow yielded PCN ***-an**. The PTB ***-a(ː)r** rime (without the medial glide) underwent some unknown split to yield both PCN ***-aːn** and ***-ən**.

**s-final*

PTB final and suffixal ***-s** was unconditionally merged with PTB ***-t**, but it is unknown whether this occurred before or after the changes in vowel nuclei preceding ***-t**. The two PTB ***s**-final rimes with known PCN reflexes (***-is**, ***-us**) both preserved their vowel nuclei (> PCN ***-it**, ***-ut**).

Other

PTB contrastive vowel length was lost in PCN, which developed its own system of vowel length on ***-a** from various PTB rimes.

III.6.1.2. Initials

The places of articulation in PTB simplex initials were generally preserved in PCN (though some sporadic interchange of ***r-** and ***l-** took place). Voiced and voiceless variants were merged and split in some way to yield a PCN voicing/aspiration contrast. A number of PCN voiceless initials (especially voiceless sonorants) appear to have descended from ***s-**prefixed voiced PTB initials (cf. §III.4.4).

Consonant clusters underwent various changes to yield PCN unit phonemes: PTB ***kr-** merged with some instances of ***s-** to yield PCN ***s-**, while ***sy-** merged with other instances of ***s-** to yield PCN ***ʃ-**. The PTB affricate clusters ***dz(y)-** and ***ts(y)-** underwent some unclear mergers/splits to yield the four-way PCN contrast: ***ts(h)-** and ***tʃ(h)-**. PTB ***gl-** also yielded PCN ***tsh-** in one set (BE COLD [247]). PTB ***hy-** generally coalesced into the PCN unit phoneme ***hj-** except where it sporadically yielded PCN ***hn-** (SCRATCH$_1$ (v.) [239]; likely due to rhinoglottophilia).

The PTB voiceless glottal fricative ***h-** appears to have buccalized to PCN ***x-** in one case (YAWN (v.) [17]). PTB ***ŋ-** was also sporadically lost in a high-frequency environment (I, ME (1SG) [40]).

In some sets, PTB initials preceding approximants were reinterpreted as prefixes, and often subsequently lost (cf. §A.4). In one set, the opposite reanalysis occurred: The PTB initial glide ***w-** prefixed with ***r-** was reanalyzed as a root-initial ***rw-** cluster (RAIN [39]).

In a sporadic development, some instances of initial ***p-** before ***-a** underwent extrusion to yield PCN ***pwa**.

III.6.1.3. Medials

The PTB medial labiovelar glide ***-w-** appears to have been preserved before open-syllable monophthongs (***-wi** > PCN ***-wi**), disappeared before diphthongs (***-wa(ː)y** > PCN ***-aj**, ***-wəy** > PCN ***-əj(ʔ)**), and coalesced with the vowel nucleus in closed syllables (cf. §III.6.1.1).

Instances of the PTB medial palatal glide ***-y-** following ***s-**, ***ts-**, ***dz-**, and ***h-** coalesced with the initial to yield unit phonemes in PCN (cf. §III.6.1.2). PTB medial ***-y-** may have been lost regularly following ***ŋ-** and sporadically following ***r-**. (In other environments, PTB medial ***-y-** was preserved in PCN.)

In the few PTB etyma with ***-l-**, the PTB medial liquid tended to be lost, reanalyzed, or coalesced with the initial (cf. §III.6.1.2), though one set suggests possibility of a PCN ***khl-** cluster preserved from PTB ***kl-** (FECES, EXCREMENT [105]).

III.6.2. PCN > CN

The following sections discuss the sound changes from PCN to its daughter languages.

III.6.2.1. Proto-Ao

Of all the CN languages, Proto-Ao preserved the most PCN open/glottal-final rimes, showing only one unconditional merger: PCN ***-ej(ʔ)**, ***-i(ʔ)** > PAo ***-i(ʔ)**. The PCN high diphthong ***-əj(ʔ)** also reduced to schwa in at least two environments (following ***h(r)-** and ***s-**).

In the bilabial- and dental-final rimes, however, Proto-Ao was the least conservative, merging all vowels to schwa (though preserving the final consonants).

PAo largely preserved vowel nuclei before the velar codas ***-k** and ***-ŋ**, reducing them to schwa in only a few cases (***-ak** > ***-ək** / ***ts(h)_**, ***hrj_**; ***-iŋ** > ***-əŋ** / *sibilant_).

PAo preserved all the PCN stop initials and aspiration contrasts. The fricative initials were also preserved except for PCN ***ʃ-**, which was dentalized to ***s-** and appears to have remained as ***ʃ-** only when followed by ***-aʔ** (though more examples are needed).

The dental affricates underwent a shift toward the palate, with PCN ***ts(h)-** palatalizing to PAo ***tʃ(h)-**. The only cases in which ***ts-** was preserved were those in which the PCN ***-ak** and ***-iŋ** rimes had reduced to ***-ək/ŋ** following ***ts-**, subsequently preventing the initial from taking part in the palatal shift (cf. §III.5.3.1). The PCN palatal affricates were generally preserved in PAo, though instances of ***tʃ-** appearing before ***-ə(j)(ʔ)** were dentalized to ***ts-**.

The voiced and voiceless sonorants (nasals and approximants) were mostly preserved, with a few changes: In the nasals, PCN ***hm-** merged with ***m-** and yielded PAo ***m-**, except where shifted backwards along the vocal tract to PAo ***n-** preceding the high-back rimes ***-ik/ŋ**. (One set also suggests the odd change of PCN ***mj-** > PAo ***hn-**: IN-LAW [235].) In the approximants, the strident cluster ***hrj-** yielded PAo ***tsh-**, while ***l-** was lost before ***-juk** and in one case sporadically shifted to ***j-** (CENTER, MIDDLE [230]).

The medial palatal approximant ***-j-** interacted with some initials (previous paragraph) but was lost in Proto-Ao following PCN ***p-** and ***(h)n-**.

III.6.2.2. Lotha

In the open/glottal-final rimes, Lotha was slightly less conservative than PAo, merging not only PCN ***-ej(ʔ)** and ***-i(ʔ)** (to **-i(ʔ)**) but also ***-wa(ʔ)** and ***-u(ʔ)** (to **-u(ʔ)**) and ***-ə(ʔ)** and ***-əj(ʔ)** (to **-ə(ʔ)**). While Lotha preserved the distinction between PCN ***-a(ʔ)** and ***-aj(ʔ)**, these rimes underwent a chain shift: ***-a(ʔ)** > **-o(ʔ)**, after which ***-aj(ʔ)** > **-a(ʔ)**.

As in PAo, Lotha mainly merged the vowel nuclei of bilabial-final rimes to schwa. The only exception was the PCN long rime ***-aːm**, which merged with dental-final ***-aːn** to yield Lotha **-an**. The vowel nuclei of other dental-final rimes were generally merged to **-e-**, though the developments in the ***t**-final rimes are still very unclear (cf. §III.3.3.5).

Before the velar codas ***-k/ŋ**, PCN ***-a-** was generally reduced to Lotha **-ə**, except where a PCN palatal initial or medial glide effected the preservation of ***-ak** as Lotha **-ak**. PCN ***-u-** was lowered to **-o-** and ***-i-** was reanalyzed as **-jə-**, except where ***-iŋ** was reduced to ***-əŋ** following a PCN sibilant initial.

Lotha largely preserved the PCN stop initials and their aspiration contrasts, though some instances of ****th-** (previously occlusivized from PCN ***s-**) were affricated, yielding **tsh-** preceding ***-iŋ**, ***-ə** and ***tʃh-** preceding ***-əj**. PCN ***th-** and ***kh-** were also altered in the presence of medial approximants: ***th-** coalesced with a following medial palatal glide ***-j-** by affricating and moving *backward* along the palate to **tʃh-**, while ***kh-** affricated and moved *forward* along the palate to the yield the same phoneme (**tʃh-**) by coalescence with ***-l-**. Preceding ***-j-**, ***kh-** coalesced with the glide to yield Lotha **f-**.

The PCN fricatives underwent a number of changes in Lotha: Instances of the glottal fricative ***h-** preceding ***-u** buccalized to **f-**, while the velar fricatives ***x-** and ***ɣ-** debuccalized to merge with the remaining instances of ***h-** and yield Lotha **h-**. PCN ***s-** was unconditionally occlusivized to Lotha **th-**. The voiceless palatal fricative ***ʃ-** was generally dentalized to **s-**, but was occasionally preserved as **ʃ-** under unknown conditioning factors. PCN ***z-** and ***ʒ-** merged to Lotha **z-**, though at least once instance of ***ʒ-** sporadically yielded **r-** (GRASS [16]).

Lotha largely preserved the PCN affricates. The only change observed was the dentalizing of ***tʃh-** to **tsh-** preceding ***-ak**.

Lotha unconditionally preserved the voicing distinction in the bilabial nasals, but generally merged the voiced and voiceless variants of the dental and velar nasals. Only when followed by the medial palatal glide ***-j-** did Lotha preserve the voicelessness of the PCN dental nasal ***hn-**.

Most of the PCN approximants developed straightforwardly in Lotha: PCN ***w-*** was preserved as Lotha **v-**, and its voiceless counterpart ***hw-*** debuccalized to **h-**. The voiceless palatal glide initial ***hj-*** was merged with its voiced counterpart **j-**, while the rhotic liquids were preserved as **r-** and **hr-** (except where ***hr-*** yielded Lotha **v-** before ***-əj**). The development of the lateral liquids ***(h)l-**, however, involved numerous divergent changes: The regular Lotha reflex of PCN ***l-*** is **l-**, while that of ***hl-*** is currently ambiguous between **ʃ-** and **hl-**. Preceding the high front diphthongal rime ***-əj(ʔ)**, both ***l-** and ***hl-** were spirantized to **ʒ-**. PCN ***l-*** was altered in various other conditioning environments, yielding **z-** before ***-ik** but **j-** before ***-iŋ**. The PCN ***lj-*** cluster was simplified to Lotha **j-** before ***-ak** but spirantized to **ʒ-** before ***-u**.

With regard to prefixes, Lotha nasalized the PCN ***ph-*** prefix to **m̥¹-** and may have split the PCN ***a-*** prefix into **e¹-** and **o¹-** by some as yet unknown process.

III.6.2.3. Sangtam

Given the nature of the data, the Sangtam developments are less clear than those of Proto-Ao and Lotha, but some principal changes may be observed: Like PAo and Lotha, Sangtam merged PCN ***-ej(ʔ)*** and ***-i(ʔ)*** to **-i(ʔ)**. As in Lotha, ***-ə(ʔ)*** and ***-əj(ʔ)*** were merged to **-ə**, and ***-wa(ʔ)*** and ***-u(ʔ)*** to **-u**, though some instances of ***-u(ʔ)*** yielded Sangtam schwa. PCN ***-a(ʔ)*** was regularly preserved as **-a(ʔ)**, but underwent an inexplicable shift to **-u(ʔ)** following the peculiarly heterogeneous set of initials ***j-**, ***s-**, ***ʃ-**, and ***ts-**. PCN ***-aj(ʔ)*** split into **-a** and **-i**, but the conditioning factors are unknown.

Sangtam followed Proto-Ao and Lotha in merging ***-a-*** and ***-ə-*** before ***-p**. Rimes with the bilabial nasal coda, however, developed differently: ***-əm*** was preserved as such, while ***-aːm*** and ***-am*** were merged and the coda velarized to yield **-aŋ**.

All dental-final codas were lost. Like Proto-Ao, Sangtam merged all dental nasal-final rimes (***-aːn**, ***-an**, ***-ən**), but their coda was elided and the vowels raised to yield **-i**. Before ***-t**, ***-i-*** was preserved while ***-a-*** and ***-ə-*** were merged to **-e**, but the remaining **t**-final rime developments are speculative.

The velar nasal coda ***-ŋ*** was preserved, while the Sangtam reflex of final ***-k*** varies (dialectally?) among **-k**, **-ʔ**, and null. PCN ***-u-*** was preserved in velar-final rimes, while ***-i-*** was preserved before ***-ŋ*** (and likely also before ***-k**, but no reflexes of PCN ***-ik*** have been identified yet). PCN ***-a-*** was preserved before ***-k**, but the Sangtam reflex of ***-aŋ*** varies inexplicably among **-aŋ**, **-iŋ**, and **-e**.

Like PAo and Lotha, Sangtam largely preserved the PCN stop initials and their aspiration contrasts, with two exceptions: The reflexes of ***ph-*** vary between **ph-** and **f-**, and ***kh-*** underwent the same changes as in Lotha (yielding **f-** by coalescence with ***-j-*** and **tʃh-** by coalescence with ***-l-**).

The PCN fricatives ***s-***, ***ʃ-***, and ***z-*** were all preserved in Sangtam. The voiced palatal fricative ***ʒ-*** appears to have regularly yielded **z-**, with sporadic instances of **j-** and **ʒ-**. The PCN voiced velar fricative ***ɣ-*** shifted forward to **v-**, while the reflex of ***x-*** is unknown. The glottal fricative ***h-*** was regularly preserved, with some sporadic losses or shifts to **f-**.

The PCN affricates were largely preserved in Sangtam, the only change being that of ***tʃ(h)-*** dentalizing to ***ts(h)-*** before ***-ak***.

Sangtam preserved no voicing distinctions in the nasals, merging them all to the voiced variants. PCN ***(h)m-*** and ***(h)n-*** also underwent various dentalization/palatalization processes dependent on the following rime: ***(h)m-*** was dentalized to **n-** before ***-iŋ*** (and by coalescence with ***-j-***) and palatalized to **n^{j}-** before ***-ən*** and ***-it***. Likewise, ***(h)n-*** was palatalized to **n^{j}-** before the rimes ***-i*** and ***-əj***, and by coalescence with ***-j-***.

As in Lotha, ***w-*** was preserved as **v-** and its voiceless counterpart ***hw-*** debuccalized to **h-**. PCN ***j-*** was preserved, while ***hj-*** may have yielded **ʃ-**. PCN ***r-*** and ***hr-*** were merged to **r-**, except for instances of ***hr-*** which yielded a velar fricative of unknown voicing (**x**/**ɣ**) before ***-ə-*** and ***-wa***, and by coalescence with the medial glide ***-j-***. PCN ***l-*** and ***hl-*** were regularly merged to **l-**, though with the following exceptions: Before ***-əj(ʔ)***, ***l-*** was spirantized to **ʒ-** and ***hl-*** to **ʃ-**; ***l-*** dropped out before ***-jak*** (as in Lotha) but nasalized (sporadically?) to **n-** before ***-ju***; and ***hl-*** yielded **h-** and **ʃ-** in some unknown conditioning environments.

As in Proto-Ao, the PCN medial palatal approximant ***-j-*** was lost in Sangtam following PCN ***p-***.

Like Lotha, Sangtam also nasalized the PCN ***ph-*** prefix to **mə-**.

III.6.2.4. Yimchungrü

As with Sangtam, the nature of the data renders the Yimchungrü developments less clear. Nevertheless, major changes may be identified: Yimchungrü is the only CN language to keep the reflexes of PCN ***-ej(ʔ)*** and ***-i(ʔ)*** distinct, yielding **-o** and **-e**, respectively. As in Sangtam, ***-wa(ʔ)*** and ***-u(ʔ)*** were merged to **-u(ʔ)**, with some instances of ***-u(ʔ)*** yielding schwa. The reflexes of ***-ə(ʔ)*** also vary inexplicably between **-u** and **-ə**, and those of ***-aj(ʔ)*** vary between **-a** and **-i** (like Sangtam). PCN ***-a(ʔ)*** regularly yielded Yimchungrü **-ə(ʔ)**, but was raised to **-i(ʔ)** following palatal initials. PCN ***-əj(ʔ)*** yielded **-e** following ***(h)r-*** and ****ʃ-** (< prior palatalization of ***s-***), but otherwise regularly lost the nucleus to yield **-i(ʔ)**.

Of all the CN languages, Yimchungrü maintained the most PCN distinctions in the bilabial-final rimes. The only rime to undergo a change was ***-aːm**, which was raised to ***-im** (but not merged with any other rime).

For the vowel nuclei followed by the dental nasal ***-m**, Yimchungrü preserved **-ə-** but merged ***-aː-** and ***-a-**, yielding **-an** or **-o** (likely depending on dialect). Though the development of the ***t**-final rimes is unclear, Yimchungrü appears to have merged ***-ə-** and ***-i-** to **-ə-** before ***-t**.

Vowel nuclei before velar codas were generally preserved, except for some cases in which Yimchungrü reduced them to schwa: ***-a-** in the environment of ***(h)r_k**, ***-i-** unconditionally before ***-k**, and some (unexplained) instances of ***-a-** and ***-i-** before ***-ŋ**.

As the other CN languages, Yimchungrü generally preserved the stop initials and their aspiration contrasts, though showing **ph-/f-** variation in the reflexes of ***ph-** (also seen in Sangtam). Note, however, that the Yimchungrü reflex of PCN initial ***th-** is unknown (though the reflex of PCN prefixal ***th-** is **th-**).

As to the fricatives, Yimchungrü preserved ***z-**, ***ʃ-**, and ***h-** (with a single sporadic shift to **n-**: HAIR / LEAF / FEATHER [148]). PCN ***s-** was largely preserved, except where it was palatalized to ***ʃ-** before ***-əj**. The reflexes of PCN ***ʒ-** vary inexplicably between **ʒ-** and **z-**. The voiced velar fricative ***ɣ-** was devoiced and debuccalized to **h-**, while the reflex of the voiceless ***x-** is unknown.

Yimchungrü preserved the aspirated and unaspirated dental affricates, but merged the palatal affricates into the unaspirated variant **tʃ-**.

Like Sangtam, Yimchungrü preserved no voicing distinctions in the nasals, and dentalized/palatalized various instances of ***(h)m-** and ***(h)n-**: ***(h)m-** was dentalized to **n-** before ***-it**, while ***(h)n-** was palatalized to **n^{j}-** before the rimes ***-i** and ***-əj**, and by coalescence with ***-j-** (as in Sangtam).

With regard to the approximant initials, PCN ***w-** was lost, while its voiceless counterpart ***hw-** was debuccalized to ***h-** (as in Lotha and Sangtam). PCN ***j-** was preserved, though ***hj-** may also have been debuccalized to ***h-**. PCN ***r-** was also preserved, while the Yimchungrü reflexes of ***hr-** appear to vary inexplicably in their preservation of its voicelessness. PCN ***l-** and ***hl-** merged to **l-**, with the following exceptions: ***l-** was palatalized to **j-** before ***-əj(ʔ)** but lost before ***-ju**, and ***hl-** may have sporadically shifted to ***ʃ-**.

Both PCN medial approximants ***-j-** and ***-l-** were lost in Yimchungrü following ***k(h)-**. The one instance of PCN ***-w-** before the ***-i** rime possibly blocked palatalization of the ***n-** initial before disappearing in Yimchungrü (LAUGH / SMILE [63]).

III.6.3. Unique Central Naga Etyma

For many PCN etyma, no PTB source has been reconstructed yet, though cognates may exist in other TB languages. These sets are listed in the following table:

PCN	*Gloss*	*Set #*
*p[a/ə]n	BE COMPLETE, SUFFICIENT, FULL	[179]
*p[a/ə]n	CARRY (BY HAND)	[180]
*phuʔ	POT	[70]
*maj	SALT	[41]
*hmit	RUB	[187]
*ta(ʔ)	QUOTATIVE	[5]
*tam	HIT, SLAP / PLAY (BEAT)	[127]
*a-tam	FLOOR	[128]
*tak	STING	[236]
*thj[a/ə]m	PLANT (V.) / TRANSPLANT	[149]
*-thjət	ABILITIVE (SUF.)	[191]
*-thaŋ	WHILE (CONTEMPORATIVE)	[199]
*thu	OIL, GREASE, FAT	[71]
*m-thət	KNOW	[190]
*th-njaːm	FIFTY	[117]
*m-njan	BE DIRTY	[166]
*nuk	MACHETE, DAO	[263]
*njəm	PRESS, PUSH	[141]
*a-njəp	BE SOFT	[154]
*a-hnjaːm	HEADSTRAP, TUMPLINE	[118]
*hnjak	GUARD (V.)	[240]
*m-k(w)a	LOINS / GROIN	[9]
*a-kam	YEAR / SEASON	[129]
*kam	BECOME	[130]
*a-kam	LIFE	[131]
*ki	WATER_1	[64]
*ku	INTERROGATIVE PRO.	[74]
*ku-ta	HOW?	[75]

PCN	*Gloss*	*Set #*
*khaj	READ / COUNT	[44]
*khuʔ	WOUND, INJURY / SCAR	[80]
*a-khu(t)	COUGH (v.)	[82]
*khəm ≍ *khəp	SHADOW, SHADE	[143]
*ŋa	MONKEY	[11]
*a-ʃaːm	RUN / WALK	[120]
*ʃam	FRIEND	[134]
*ʃaːn	GATHER, ASSEMBLE (OF PEOPLE)	[161]
*ʃiŋ	GINGER	[213]
*a-ʃə	CLOTH / SHAWL	[93]
*ziŋ	ORDER, COMMAND, LAW	[212]
*a-ʒa(ʔ)	GRASS	[16]
*a-m-ʒaːn	LOVE (v.)	[162]
*a-ʒ[a/ə]n	POWER / WRATH	[182]
*ʒ[aː/a/ə]n	GROW	[177]
*ʒak-	BE QUICK, QUICKLY	[245]
*m-ʒəm	POISON (n.)	[144]
*ɣaʔ	SWIM	[18]
*m-ɣaj	BLESS	[47]
*haːn	CARRY / PREGNANT / WEAR	[163]
*a-həm	HAIR / LEAF / FEATHER	[148]
*tsaj	WALK	[48]
*tsaj	CALL	[49]
*m-tsak	WASH, BATHE	[246]
*a-tsaŋ	RICE (HUSKED, UNCOOKED)	[203]
*tsiŋ	CELESTIAL / SKY / WEATHER	[214]
*a-tsuŋ	SHIELD	[221]
*tsha	BUILD, MAKE / DO	[21]
*tshaʔ	SPEAR (n.)	[23]
*a-tshan	MONEY / PRICE	[168]
*tshə	MITHUN, GAYAL (BOS FRONTALIS)	[94]
*m-tshə	TIE (v.)	[95]

PCN	*Gloss*	*Set #*
*tʃak	BREAK	[248]
*a-tʃha	WING	[24]
*tʃh[a/ə]n	BREATHE	[183]
*tʃhak	BEE	[251]
*a-wa	LEAF	[26]
*m-ja	PALM OF HAND	[30]
*ja	HEAR	[31]
*jaːm	SEARCH, SEEK$_2$	[122]
*m-jam	LOVE / FRIENDSHIP	[136]
*j[a/ə]n	SPIN (THREAD)	[184]
*juk	BUY / SELL	[266]
*juŋ	DRINK (v.)	[222]
*a-juŋ	RIVER	[223]
*ph-juŋ	URINATE / URINE	[225]
*hjaʔ	EARN / PAY WAGES	[32]
*a-hjaŋ	THREAD, YARN	[204]
*a-(h)ju	WORD / LANGUAGE	[89]
*hju ⩙ *hu	WEIGH	[90]
*a-hjəm ⩙ *a-həm	BREAD, BISCUIT / FLOUR	[146]
*th-ra	(TIMES) TEN	[33]
*ram	BURY / ENDURE, BEAR	[137]
*ram	HIDE, CONCEAL	[138]
*rak	DECEIVE	[254]
*ph-ruk	SOW, SCATTER, THROW (SEEDS)	[267]
*hraːm	SPIRIT / DEMON	[125]
*a-hrak	CHOKE (vi.)	[255]
*hrəj	SEW, STITCH	[111]
*(h)raj	DISEASE, ILLNESS, AILMENT	[52]
*m-l[aː/a/ə]n	CHANGE / EXCHANGE	[178]
*laŋ	CUT, CHOP	[207]
*liŋ	PLANT (v.)	[215]
*m-lu	BOIL (v.)	[87]

PCN	*Gloss*	*Set #*
*a-luŋ	CENTER, MIDDLE	[230]
*mV$_{ʔ}$-ləj	MEDICINE, CREAM	[113]
*th-ləjʔ	VINE / VEIN / SINEW	[114]
*a-C$_{ʔ}$ən	BE OLD (OF THINGS)	[175]

Table 203: PCN etyma with no known PTB ancestor

Some PCN forms appear to be genuine lexical innovations (or loans), having no known cognates in any other branch of Tibeto-Burman:[141]

PCN	*Gloss*	*Set #*
*a-tam	FLOOR	[128]
*-thaŋ	WHILE (CONTEMPORATIVE)	[199]
*-thjət	ABILITIVE (SUF.)	[191]
*hnjak	GUARD (v.)	[240]
*a-həm	HAIR / LEAF / FEATHER	[148]
*j[a/ə]n	SPIN (THREAD)	[184]
*hju ≷ *hu	WEIGH	[90]
*ram	BURY / ENDURE, BEAR	[137]

Table 204: PCN etyma with no known TB cognates

Future research will no doubt uncover cognates and yield PTB reconstructions, eliminating some etyma from these lists.

III.6.4. Relative Chronology

A majority of the PTB > PCN > CN onset and rime changes described in this chapter were unconditional developments,[142] with the result that the relative chronology of many of these changes cannot be determined. The descent of PTB ***s-min** into PCN as

[141] Based on a search of the STEDT database (http://stedt.berkeley.edu/search; 4 July 2013).

[142] An 'unconditional' rime change in the standard practice of Tibeto-Burman reconstruction is one which is not dependent on conditioning beyond that provided within the rime itself. For example, PCN ***-an** > PAo ***-ən** is an 'unconditional' rime change because it does not depend on interaction with an initial or medial consonant, despite the fact that the ***-a-** > ***-ə-** change is itself conditioned by the ***-n** coda. (Contrast PCN ***-aŋ** > PAo ***-aŋ**, in which the nuclear ***-a-** is preserved before the ***-ŋ** coda.)

hmən RIPEN, BE RIPE / BE COOKED [170], for example, contained no interaction between the onset and rime, and therefore could have occurred in one of two orders:

1) PTB ***s-min*** > (initial devoicing) ****hmin*** > (nucleus reduction) PCN ***hmən***
2) PTB ***s-min*** > (nucleus reduction) ****s-mən*** > (initial devoicing) PCN ***hmən***

There do exist a number of cases, however, in which developments are crucially ordered with respect to one another (e.g. chain shifts). These are discussed in the following sections (PTB > PCN changes in §III.6.4.1, PCN > CN changes in §III.6.4.2–§III.6.4.5).

III.6.4.1. PTB > PCN

*Pre-PCN ****-wa*** > ****-u***

As discussed in §III.3.1.2, the results of extrusion from PTB ***p^{w}a*** were normally preserved as ***pwa(ʔ)*** as PCN, whose rime only later coalesced to ***-u(ʔ)*** (in Lotha, Sangtam, and Yimchungrü). Complicating this scenario is the presence of one (relatively) unambiguous instance of PTB ***p^{w}a*** which yielded PCN ***pu*** (AXE [66]). Given the considerable time between the PTB and PCN stages and the sporadic nature of extrusion, it is possible that PTB AXE extruded to ****pwa*** before other instances of ***p^{w}a*** (listed in §III.3.1.2), and that this lexeme underwent a pre-PCN ****-wa*** > ****-u*** change that swept through the language at some point. Alternatively, AXE could have extruded to ****pwa*** with all the other instances of PTB ***p^{w}a***, and some now-lost conditioning factor rendered only AXE susceptible to the early ****-wa*** > ****-u*** change.

Both BAMBOO$_2$ [38] (< PTB ***g/r-p^{w}a***) and RAIN [39] (< PTB ***r-wa***) are reconstructed with PCN ***-wa/u*** ambiguity due to lack of evidence. In each set, the ***-u*** PCN form would have been the result of the same early ****-wa*** > ****-u*** change posited to explain AXE. It is interesting, therefore, that all three of these sets contain a PTB ***r-*** prefix—perhaps the conditioning factor that made these sets susceptible to the pre-PCN ****-wa*** > ****-u*** change?

Vowel reduction with onset changes

Two reductions of PTB open rimes to PCN schwa are conditioned by an onset that itself shows a change from PTB to PCN. The first open-rime reduction is as follows:

PTB ***-i*** > PCN ***-ə***

This change appears in only one set (PTB ***kri*** > PCN ***sə*** BILE / GALL-BLADDER [92]), which also exhibits onset coalescence:

PTB ***kr-*** > PCN ***s-***

As all other instances of PTB ***-i*** were preserved in PCN (§III.3.1.5), the rime reduction was clearly conditioned, but it is impossible to determine whether it occurred before or after the onset coalescence. If the rime reduction occurred first, it would have been conditioned by the ***kr-*** onset cluster (a). If it occurred second, it would have been conditioned by the ****s-*** initial (b):

(a) PTB ***kri*** > (rime reduction) ****krə*** > (onset coalescence) PCN ***sə***
or
(b) PTB ***kri*** > (onset coalescence) ****si*** > (rime reduction) PCN ***sə***

In addition, since there are no other changes proposed that would affect the possible intermediate forms ****krə*** or ****si***, the relative ordering of these two changes with respect to other PTB > PCN developments is unknown.

Note that since this set contains the only example of PTB ***kr-***, it is also technically impossible to know whether the onset change was unconditional or conditioned by the rime: That is, the coalescence of ***kr-*** to ***s-*** could have been conditioned by PTB ***-i*** (> ****si***). However, since no counterexamples have yet been found for PTB ***kr-*** > PCN ***s-***, this onset change is provisionally treated as unconditional for the sake of simplicity.[143]

The second case of open-rime reduction is as follows:

PTB ***-u*** > PCN ***-ə***

This change appears in only two sets, both of which also show onset coalescence/ devoicing (PTB ***ts(y)-***, ***dz(y)-*** > PCN ***tʃ-***):

PTB ***dz(y)u*** > PCN ***tʃə*** EGG [96]
PTB ***tsyu*** > PCN ***tʃə*** WATER_2 [97]

As all other instances of PTB ***-u*** were preserved in PCN (§III.3.1.6), the rime reduction was a conditioned change, but it is again impossible to determine whether it occurred

[143] Two Proto-Ao sets show other instances of PTB ***kr-*** yielding PAo ***tʃ(h)-*** (CRY, WEEP (156)) and SHAVE, SCRAPE (175)), suggesting that the PTB ***kr-*** > PCN ***s-*** change here is not actually unconditional—but no intermediate PCN forms have yet been successfully reconstructed for these sets.

before or after the onset coalescence/devoicing. If the rime reduction occurred first, it would have been conditioned by the ***dz(y)-/ts(y)-** onset clusters (a). If it occurred second, it would have been conditioned by the unit initial ****tʃ-** (b):

(a) PTB ***dzyu**, ***tsyu** > (rime red.) ****dzyə**, ****tsyə** > (coalesc./dev.) PCN ***tʃə**
or
(b) PTB ***dzyu**, **tsyu** > (onset coalesc./devoicing) ****tʃu** > (rime red.) PCN ***tʃə**

In addition, since there are no other changes proposed that would affect the possible intermediate forms ****dzyə/tsyə** or ****tʃu**, the relative ordering of these two changes with respect to other PTB > PCN developments is unknown.

Coda mergers with nucleus changes

The PTB coda ***-r** underwent nasalization to ***-n** and merged with the PCN reflexes of PTB ***-n**. At this point, there is not enough evidence to determine whether this merger took place before or after the nuclear vowel changes that occurred to yield the PCN ***-aːn/an/ən** rimes, especially given the unresolved overlap in some of the PTB > PCN rime developments. (PTB ***-a(ː)r** seems to have somehow yielded both PCN ***-aːn** and ***-ən**). The two possible orderings are diagrammed in the following tables:

PTB		*1. Nucleus changes*		*2. Coda merger (PCN)*
*-an, -a(ː)r	>	**-aːn, -aːr	>	*-aːn
*-waːr	>	**-war	>	*-an
*-a(ː)r, -war, -or, -uːr, -iːr, -in	>	**-ər, -ən	>	*-ən

*Table 205: Nucleus changes **before** coda merger*

PTB		*1. Coda merger*		*2. Nucleus changes (PCN)*
*-an, -a(ː)r	>	**-a(ː)n	>	*-aːn
*-waːr	>	**-waːn	>	*-an
*-a(ː)r, -war, -or, -uːr, -iːr, -in	>	**-a(ː)n, -wan, -on, -uːn, -i(ː)n	>	*-ən

*Table 206: Nucleus changes **after** coda merger*

Another coda merger occurred when PTB ***-s** underwent occlusivization to ***-t** (merging with the PCN reflexes of PTB ***-t**). The PCN ***t**-final rimes and their relationship to possible PTB etyma are less well-established than those with final ***-n**, so the relative ordering of the coda merger and nucleus changes must remain an open question for the present.

Chain shifts

Finally, two sets of PTB > PCN rime changes apparently each took place in a counterfeeding order (chain shift) in which lengthening of the vowel nucleus occurred first:

(a)

1. ***-am** > ***-aːm**
2. ***-um**, ***-im** > ***-am**

(b)

1. ***-an** > ***-aːn**
2. ***-waːr** > ***-an**

Had the second change in each set occurred first, it would have fed the lengthening change, with the result that PCN would lack short ***-am** and ***-an**.

III.6.4.2. PCN > PAo

Chain shifts

The PCN > Proto-Ao changes proposed in this chapter show two chain shifts, both in the initials. The first involves palatalization of the aspirated PCN ***tsh-** affricate to PAo ***tʃh-**:

1. ***tsh-** > ***tʃh-**
2. ***hrj-** > ***tsh-**

As seen in LOUSE, LICE [256], PCN ***hrj-** coalesced to yield an instance of PAo ***tsh-** which did not participate in the unconditional palatalization of PCN ***tsh-** to PAo ***tʃh-**, indicating that the onset coalescence occurred after the affricate palatalization.

The second chain shift involves palatalization of the unaspirated PCN ***ts-** affricate to PAo ***tʃ-**:

1. *__ > *__
2. *__ > *__ / _ *__

As seen in SEED [107], WATER$_2$ [97], EGG [96], and SALIVA, SPITTLE / SPIT (v.) [98], PCN ***tʃ-** preceding ***-ə(j)(ʔ)** underwent dentalization to yield instances of PAo ***ts-** which were not re-palatalized back to ***tʃ-**. The dentalization change must therefore have occurred after the palatalization process.

Velar-final rime reduction bled affricate palatalization

Proto-Ao exhibits reflexes of PCN ***-ak** and ***-iŋ** in which the vowel nuclei were both reduced to schwa (***-ək**, ***-əŋ**). A number of these reflexes contain instances of ***ts-** which failed to participate in the palatalization of PCN ***ts-** to PAo ***tʃ-** (the remaining reflexes contain other initials):

PCN ***tsiŋ** > PAo ***tsəŋ**	CELESTIAL, SKY, WEATHER [214]
PCN ***tsak** > PAo ***tsək**	WASH, BATHE [246]

It appears that the rime reduction was conditioned by the initial, and the resulting schwa-nuclear rime then prevented the initial from participating in the later palatalization change. These two changes can therefore be ordered as follows:

1. (***-ak** > ***-ək** and ***-iŋ** > ***-əŋ**) / ***ts** __ [144]
2. ***ts-** > ***tʃ-** / everywhere except _ ****-ək**, ****-əŋ**

The ordering of the rime reduction before the palatalization process also fits with the proposed development of BE COLD [247] and LOUSE, LICE [256] in Proto-Ao. (The palatalization change also affected the aspirated ***tsh-** but in that case was not blocked by reduced rimes.) Recall that ***hrj-** coalescence was crucially ordered after affricate palatalization:

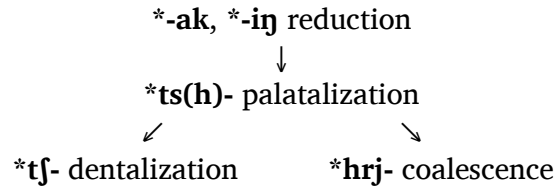
	BE COLD	LOUSE, LICE	
PCN	tshak	hrjak	
	tshək	hrjək	1. rime reduction
	tʃhək	—	2. affricate palatalization
PAo	—	tshək	3. ***hrj-** coalescence

[144] The ***-ak** > ***-ək** reduction was technically conditioned by ***ts-**, ***tsh-**, and ***hrj-** (cf. §III.3.4.4), while the ***-iŋ** > ***-əŋ** reduction was conditioned by any proto-sibilant (cf. §III.3.4.2).

Had affricate palatalization instead occurred before rime reduction, BE COLD would have palatalized to ***tʃhak**, removing the environment for ***-ak** to reduce to ***-ək**.

Summary

The PCN > PAo sound changes which can be ordered are summarized as follows:



(The relative ordering of the dentalization and coalescence changes cannot be determined.)

III.6.4.3. PCN > Lotha

Chain shifts

Several chain shifts occurred in the development from PCN to Lotha. In the open/glottal-final rimes, PCN ***-wa(ʔ)** first coalesced to **-u(ʔ)**, preventing any instances of ***-wa(ʔ)** from participating in the subsequent unconditional change of ***-a(ʔ)** to **-o(ʔ)**:

1. ***-wa(ʔ)** > **-u(ʔ)**
2. ***-a(ʔ)** > **-o(ʔ)**

These shifts of ***-(w)a(ʔ)** to **-u(ʔ)**/**-o(ʔ)** then allowed ***-aj(ʔ)** to lose the offglide and fill the gap left by ***-aʔ**:

1. ***-a(ʔ)** > **-o(ʔ)**
2. ***-aj(ʔ)** > **-a(ʔ)**

Whatever rime existed in LEECH (WATER) [193] (PCN ***m-lV̥t**) must also have yielded **-aʔ** only after ***-a(ʔ)** shifted to **-o(ʔ)** (otherwise the Lotha reflex would be **n̥^{1}-lo^{2}** instead of **n̥^{1}-la^{2}**).

In the dental- and bilabial-final rimes, PCN ***-an** first raised to ***-en**, allowing both ***-aːm** and ***-aːn** to shorten and merge to Lotha **-an**:

1. ***-an** > **-en**
2. ***-aːm**, ***-aːn** > **-an**

In the fricative initials, ***s-*** occlusivized to **th-** before ***ʃ-** dentalized to **s-**. In addition, though only one set suggests that PCN ***hl-*** yielded Lotha **ʃ-**, this change must have occurred after the dentalization of ***ʃ-**:

1. ***s-** > **th-**
2. ***ʃ-** > **s-**
3. ***hl-** > **ʃ-**

The voiced palatal fricative ***ʒ-*** also dentalized to **z-** before either ***(h)l-*** or ***lj-*** spirantized to **ʒ-**:

1. ***ʒ-** > **z-**
2. ***(h)l-** > **ʒ-** / _ ***-əj(ʔ)**
   ***lj-** > **ʒ-** / _ ***-u**

*Vowel reduction following intermediate ***f-* and ***ʒ-***

As discussed in §III.2.1.2, Lotha **f-** and **ʒ-** are followed only by open-syllable or glottal-final ***-ə(ʔ)**, which suggests that all vowels were reduced following **f-** and **ʒ-** at some point in the PCN > Lotha development. These reductions took place after the changes in PCN initials which yielded ****f-*** and ****ʒ-***, respectively (since ***f-*** is not reconstructed in PCN and PCN ***ʒ-*** yielded Lotha **r-/z-**):

1. ***h-** > **f-** / _ ***-u**
   ***khj-** > **f-**
2. ***-V(ʔ)** > **-ə(ʔ)** / ****f** _

1. ***(h)l-** > **ʒ-** / _***-əj(ʔ)**
   ***lj-** > **ʒ-** / _ ***-u**
2. ***-V(ʔ)** > **-ə(ʔ)** / ****ʒ** _

The results of these changes can be seen in the following sets:

WEIGH [90], STEAL [91]	PCN ***hu** > ****fu** > Lotha **fə**
DOG [104]	PCN ***khjəj** > ****fəj** > Lotha **fə**
FOUR [112], MEDICINE, CREAM [113] VINE / VEIN / SINEW [114], FLEA [115]	PCN ***(h)ləj** > ****ʒəj** > Lotha **ʒə**
SWALLOW [86]	PCN ***lju** > ****ʒu** > Lotha **ʒə**

It is unknown whether the ***-əj(ʔ)** > **-ə(ʔ)** rime reductions in some of these sets were part of the general ***-əj(ʔ)** monophthongization in Lotha or were triggered by the ****f-**/****ʒ-** initial.

Counterfeeding

When not followed by a palatal initial/medial, PCN ***-ak** was reduced to **-ək** in Lotha. However, there are two instances of unreduced **-ak** preceded by dental initials in Lotha (BE QUICK, QUICKLY [245] and BEE [251]). In these cases, the dental initials reflect original palatal initials, having undergone a dentalization change that occurred after the rime reduction:

1. ***-ak** > **-ək** / everywhere except ***pal.** _
2. ***ʒ-** > **z-**
   ***tʃh-** > **tsh-** / _ ***-ak**

Had the dentalization occurred first, it would have created more forms susceptible to the rime reduction. Since it occurred only after the rime reduction, these two changes were in a counterfeeding order.

Early occlusivization

Two changes show interactions that depend on their relative order with respect to the occlusivization of ***s-** to **th-**, namely the monopthongization of ***-əj(ʔ)** to ***-ə(ʔ)** and affrication of ****th-** to **tsh-** or **tʃh-** in certain environments (cf. WOOD [211], BILE [92], DIE [106]).

The ***s-** > **th-** occlusivization appears to have been a relatively early change, occurring before both ***ʃ-** > **s-** (as discussed above, under 'Chain shifts') and ***-əj(ʔ)** > **-ə(ʔ)**:

1. ***s-** > **th-**
2. ***-əj(ʔ)** > **-ə(ʔ)**

Had the monophthongization of ***-əj(ʔ)** occurred before the occlusivization of ***s-**, PCN ***səj** DIE [106] would have lost the offglide to become homophonous with ***sə** BILE [92], resulting in identical Lotha reflexes for these forms. Instead, both underwent occlusivization first, yielding ****thəj** for DIE and ****thə** for BILE. From there, we must speculate (without any additional evidence) that ****thəj** was palatalized and affricated to ****tʃhəj** by the palatal diphthong. Only then did the rime undergo monophthongization to **-ə**, yielding Lotha **tʃhə**:

1. ***s-** > **th-**
2. ****th-** > **tʃh-** / _ ***-əj(ʔ)** ??
3. ***-əj(ʔ)** > **-ə(ʔ)**

How BILE [92] came to yield Lotha **tshəʔ** from the intermediate form ****thə** is also unclear, but it is perhaps significant that there appear to be no /thə/ syllables in the synchronic phonology of Lotha. All instances of ****th-** may therefore have undergone affrication before ***-ə** as well, but this time to **tsh-**:

1. ***s-** > **th-**
2. ****th-** > **tsh-** / _ ***-ə(ʔ)** ??

Positioning ***s-** > **th-** early in the relative chronology also provides an explanation for WOOD [211], which yielded Lotha **tshəŋ** from PCN ***siŋ**. After occlusivization of the ***s-** initial, the intermediate form ****thiŋ** underwent affrication to ****tshiŋ**, whose rime was then reduced to **-əŋ** following the initial sibilant (a development proposed in §III.3.4.2). These changes are therefore ordered as follows:

1. ***s-** > **th-**
2. ****th-** > **tsh-** / _ ***-iŋ** ??
3. ***-iŋ** > **-əŋ** / ***sibilant** _

*Reanalysis of ***-ik, *-iŋ***

The phonological reanalysis of PCN ***-ik/ŋ** to Lotha **-jək/ŋ** interacted with two developments that affected ***l-** in these environments, namely its spirantization to **z-** and palatalization to **j-**.

PCN ***lik** in TICKLE [259] yielded Lotha **zək**, suggesting two possible paths of development: The reanalysis of PCN ***-ik/ŋ** to Lotha **-jək/ŋ** may have occurred first, yielding an intermediate ****ljək** form whose ****lj-** initial spirantized to **z-**. Alternatively, ***l-** could have first been spirantized to ****z-** before ***-ik**, after which ***-ik** paralleled the PCN ***-iŋ** rime in reducing to **-ək** following sibilant initials (cf. §III.3.4.2). The relative orderings of the sound changes involved in these two possible scenarios are diagrammed below:

1. ***-ik/ŋ** > **-jək/ŋ**
2. ****lj-** > **z-** / _ ****-ək**

? OR ?

1. ***l-** > **z-** / _ ***-ik**
2. ***-ik/ŋ** > **-ək/ŋ** / ***sibilant** _

PCN ***liŋ*** PLANT (v.) [215] might be expected to have followed a development similar to PCN ***lik*** TICKLE [259] and yielded Lotha **zəŋ**, but this is etymon is instead reflected by Lotha **jəŋ**. Apparently the ***l-*** initial was palatalized to **j-** before ***-iŋ**, after which the rime reanalysis of ***-iŋ** > **-jəŋ** took place, with the result that the ****j-** initial fused with the ****-j-** medial. The relative ordering of changes responsible for this development is diagrammed below:

1. ***l-** > **j-** / _ ***-iŋ**
2. ***-ik/ŋ** > **-jək/ŋ**

Crucial but undetermined ordering

The following sets of changes should be crucially ordered with respect to each other, but there are no examples to determine which orderings are correct.

The coalescence of PCN ***khl-*** and ***thj-*** to Lotha **tʃh-** fed or counterfed the dentalization of ***tʃh-** to **tsh-** before ***-ak**:

1. ***khl-**, ***thj-** > **tʃh-**
2. ***tʃh-** > **tsh-** / _ ***-ak** (feeding)

? OR ?

1. ***tʃh-** > **tsh-** / _ ***-ak**
2. ***khl-**, ***thj-** > **tʃh-** (counterfeeding)

The debuccalizations of PCN ***x-**, ***ɣ-**, and ***hw-** to **h-** fed or counterfed the buccalization of ***h-** to **f-** before ***-u** in Lotha:

1. ***x-**, ***ɣ-**, ***hw-** > **h-**
2. ***h-** > **f-** / _ ***-u** (feeding)

? OR ?

1. ***h-** > **f-** / _ ***-u**
2. ***x-**, ***ɣ-**, ***hw-** > **h-** (counterfeeding)

The spirantizations of both ***hr-** to **v-** (SEW, STITCH [111]) and ***(h)l-** to **ʒ-** (FOUR [112]; MEDICINE, CREAM [113]; VINE / VEIN / SINEW [114]; and FLEA [115]) in Lotha before ***-əj(ʔ)** are assumed to have been conditioned by the PCN palatal rime environment and to have taken place prior to the unconditional monophthongization of ***-əj(ʔ)** to Lotha **-ə(ʔ)**. However, there are no examples to determine which change came first, so the conditioning environment is technically ambiguous between ***-əj(ʔ)** and ***-ə(ʔ)**:

1. ***hr-** > **v-** / _ ***-əj(ʔ)**
   ***(h)l-** > **ʒ-** / _ ***-əj(ʔ)**
2. ***-əj(ʔ)** > **-ə(ʔ)**

   ? OR ?

1. ***-əj(ʔ)** > **-ə(ʔ)**
2. ***hr-** > **v-** / _ ***-ə(ʔ)**
   ***(h)l-** > **ʒ-** / _ ***-ə(ʔ)**

Summary

The numerous relative orderings (which can be determined) for the PCN > Lotha sound changes are diagrammed in the following figures:

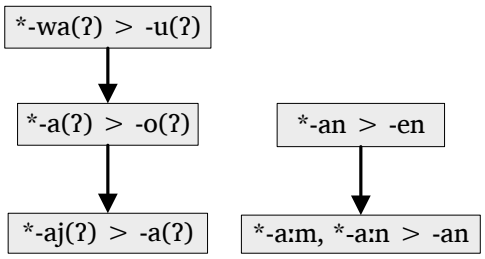


Figure 9: PCN > Lotha rime change chronologies

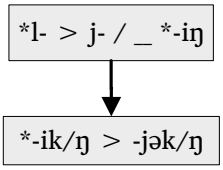


*Figure 10: PCN > Lotha ***l-** palatalization chronology*

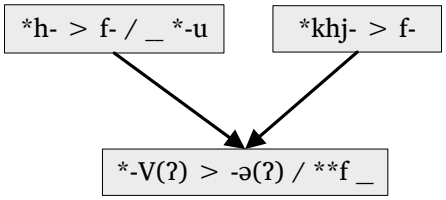


*Figure 11: PCN > Lotha intermediate ****f-** chronology*

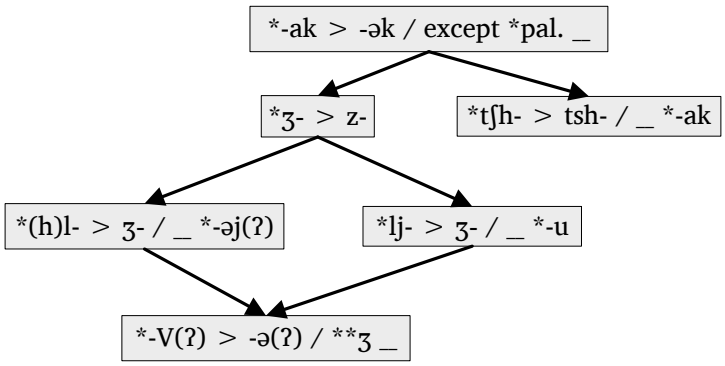


*Figure 12: PCN > Lotha chronology following ***-ak** reduction*

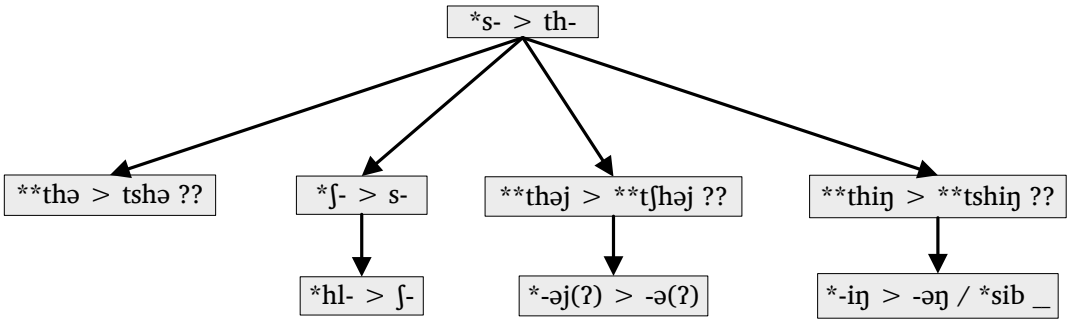


*Figure 13: PCN > Lotha chronology following ***s-** occlusivization*

III.6.4.4. PCN > Sangtam

Although many of the PCN > Sangtam sound changes are unclear (and were triggered by unknown conditioning factors), several developments can be ordered with respect to each other.

Chain shifts

The following chain shifts occurred:

Some instances of PCN ***-u(ʔ)*** reduced to Sangtam **-ə** (unclear conditioning) before ***-wa(ʔ)*** coalesced to **-u(ʔ)**:

1. ***-u(ʔ)** > **-ə***
2. ***-wa(ʔ)** > **-u***

This reduction of PCN ***-u(ʔ)** also occurred before some forms/dialects of Sangtam dropped or debuccalized the final ***-k** of ***-uk**:

1. ***-u(ʔ)** > **-ə**
2. ***-uk** > **-u(ʔ)**

PCN ***-ak** also shows this variation in preservation of the final ***-k** in Sangtam, and the development which dropped or debuccalized the coda in some dialect(s) appears to have taken place only after the conditioned velarization of PCN ***-a(ʔ)** to Sangtam **-u(ʔ)** (since no Sangtam forms have **-u(ʔ)** reflecting PCN ***-ak**):

1. ***-a(ʔ)** > **-u(ʔ)** / ***j**, ***s**, ***ʃ**, ***ts** _
2. ***-ak** > **-a(ʔ)**

Some instances of PCN ***-aŋ** also apparently shifted to Sangtam **-iŋ** and **-e** (again, unclear conditioning) prior to ***-a(ː)m** yielding **-aŋ**:

1. ***-aŋ** > **-iŋ**, **-e**
2. ***-a(ː)m** > **-aŋ**

The labialization of PCN ***ɣ-** to Sangtam **v-** took place prior to the conditioned development of **x/ɣ-** (voicing unknown) from instances of PCN ***hr-**:

1. ***ɣ-** > **v-**
2. ***hr-** > **x/ɣ-** / _ ***-ə-**, ***-waʔ**
   ***hrj-** > **x/ɣ-**

The dentalization of ***ʒ-** to **z-** occurred before ***l-** was spirantized and palatalized to **ʒ-** preceding the palatal diphthong:

1. ***ʒ-** > **z-**
2. ***l-** > **ʒ-** / _ ***-əj**

Nasals

The PCN bilabial and dental nasals underwent various dentalization/palatalization changes in Sangtam, and in all cases (including those whose place of articulation was preserved) the voicing contrast was lost. It is therefore simplest to to treat the voicing merger as having occurred first, after which bilabial and dental nasals were dentalized/palatalized in various environments:

1. ***(h)N-**, ***N-** > **N-**
2. dentalization/palatalization changes

After neutralization of the voicing contrast, the bilabial nasal ****m-** ultimately yielded the Sangtam palatalized **n^{j}-** initial preceding the PCN rimes ***-ən** and ***-it** (as seen in RIPEN, BE RIPE / BE COOKED [170] and RUB [187]: both Sangtam **n^{j}i**). It is significant, however, that other rimes which merged with ***-ən** and ***-it** to yield Sangtam **-i** did not trigger the same palatalization of the bilabial nasal initial, as seen in SALT [41] (PCN ***maj** > **mi**); FACE / SURFACE [42] (***hmaj** > **mi**); FIRE [54] (***mej(ʔ)** > **mi**); and PRICE, COST, VALUE [159] (***maːn** > **mi**). This disparity reveals that the palatalization of ****m-** to **n^{j}-** occurred before the merger of ***-ən** and ***-it** with ***-aj(ʔ)**, ***-ej(ʔ)**, and ***-aːn** (and presumably ***-an**) to **-i** was complete.

A likely scenario for this PCN > Sangtam change is as follows:

1. In the process of yielding **-i**, the ***-ən** and ***-it** rimes palatalized the bilabial nasal initial ****m-** to ****m^{j}-**.
2. All instances of ****m^{j}-** or ***mj-** (as in EYE [234]) dentalized to ****n-**.
3. Instances of ****n-** preceding ****-i** palatalized to **n^{j}-** (cf. SEVEN [61] and TWO [62]).

The full relative chronology is summarized below:

1. ***(h)N-**, ***N-** > **N-**
2. ***m-** > ****m^{j}-** / _ ***-ən**, ***-it** before/during ***-ən**, ***-it** > **-i**
3. ****m^{j}-**, ***mj-** > **n-**
4. ****n-** > **n^{j}-** / _ ***-i**

Crucial but undetermined ordering

The following sets of changes should be crucially ordered with respect to each other, but there are no examples to determine which orderings are correct.

The monophthongization of PCN ***-aj(ʔ)** to Sangtam **-a** fed or counterfed the conditioned velarization of ***-a(ʔ)** to **-u(ʔ)**:

1. ***-aj(ʔ)** > **-a**
2. ***-a(ʔ)** > **-u(ʔ)** / ***j**, ***s**, ***ʃ**, ***ts** _ (feeding)

? OR ?

1. ***-a(ʔ)** > **-u(ʔ)** / ***j**, ***s**, ***ʃ**, ***ts** _
2. ***-aj(ʔ)** > **-a** (counterfeeding)

The dentalization of ***tʃ(h)-** to **ts(h)-** preceding ***-ak** should be ordered relative to two related changes, but the data is not sufficient: ***khl-** > **tʃh-** and the loss/ debuccalization of coda ***-k** in ***-ak** > **-a(ʔ)**.

As seen in BAMBOO$_1$ [28], PCN ***hrwaʔ** yielded Sangtam **ɣu/xu**. What is not known, however, is whether the ***-waʔ** > **-u** coalescence occurred before or after the change in the initial. The conditioning environment for ***hr-** > **x/ɣ-** is therefore technically ambiguous between ***-waʔ** and ***-u**, but is treated as ***-waʔ** for simplicity.

Finally, the palatal diphthong rime ***-əj(ʔ)** presumably provided the environment responsible for the palatalization of ***n-** > **n^{j}-**, **l-** > **ʒ-**, and **hl-** > **ʃ-**, but there are no sets which clearly establish whether these palatalization changes occurred before or after ***-əj(ʔ)** was monophthongized to **-ə**.

Summary

Those relative orderings which can be determined for the PCN > Sangtam sound changes are diagrammed in the following figures:

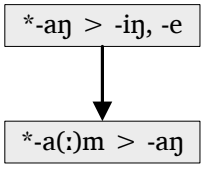


Figure 14: PCN>Sang. velar-final rime change chronology

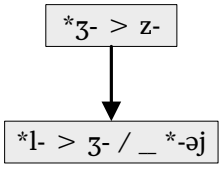


*Figure 15: PCN>Sang. ***l-** palatalization chronology*

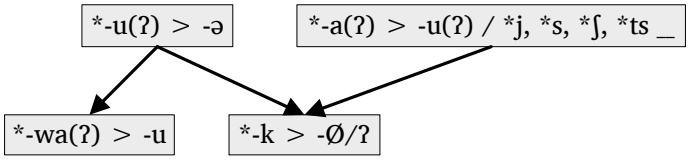


*Figure 16: PCN>Sang. chronology w.r.t. ***-wa** coalescence and velar coda loss*

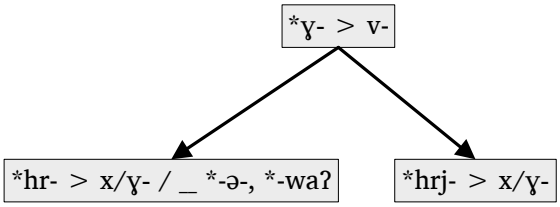


*Figure 17: PCN > Sang. chronology following *ɣ- labialization*

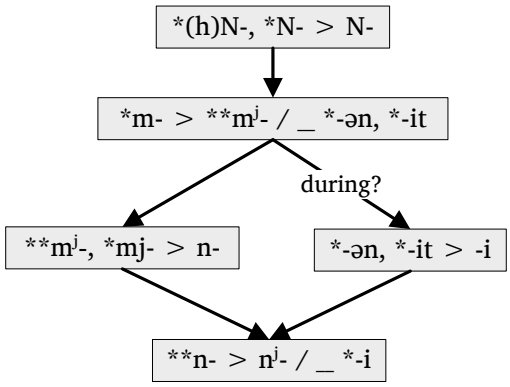


Figure 18: PCN > Sang. nasal chronology

III.6.4.5. PCN > Yimchungrü

As with Sangtam, although many of the PCN > Yimchungrü sound changes are unclear (and were triggered by unknown conditioning factors), several developments can be ordered with respect to each other.

Chain shifts

The following chain shifts occurred:

The raising of PCN ***-a(ʔ)*** to Yimchungrü **-i(ʔ)** following palatal initials took place only after all instances of ***-i(ʔ)*** were lowered to **-e**:

1. ***-i(ʔ)** > **-e***
2. ***-a(ʔ)** > **-i(ʔ)** / *palatal _*

This unconditional lowering of ***-i(ʔ)*** to **-e** also took place before ***-əj(ʔ)*** and some instances of ***-aj(ʔ)*** were monophthongized to **-i(ʔ)**:

1. ***-i(ʔ)** > **-e**
2. ***-əj(ʔ)** > **-i(ʔ)**
   ***-aj(ʔ)** > **-i(ʔ)**

Instances of ***-a(ʔ)** not following palatal initials were reduced to **-ə(ʔ)**, after which ***-aj(ʔ)** monophthongized to **-a** (unknown conditioning):

1. ***-a(ʔ)** > **-ə(ʔ)**
2. ***-aj(ʔ)** > **-a**

This reduction of ***-a(ʔ)** to **-ə(ʔ)** also likely took place before whatever process yielded **-u** from some instances of ***-ə(ʔ)**:

1. ***-a(ʔ)** > **-ə(ʔ)**
2. ***-ə(ʔ)** > **-u**

Note that ***-a(ʔ)** to **-ə(ʔ)** must have taken place *after* the coalescence of ***-wa(ʔ)** to **-u**, as there are no Yimchungrü reflexes of PCN ***-wa(ʔ)** with **-ə(ʔ)**:

1. ***-wa(ʔ)** > **-u**
2. ***-a(ʔ)** > **-ə(ʔ)**

Nasals and related changes

As in Sangtam, the voiced/voiceless nasals were likely first merged, after which some bilabial and dental nasals were dentalized/palatalized in various environments:

1. ***(h)N-**, ***N-** > **N-**
2. dentalization/palatalization changes

Following neutralization of the voicing contrast, the dentalization of ***m-** to **n-** before ***-it** (as in PCN ***hmit** > Yim. **nət** RUB [187]) took place prior to the reduction of ***-it** to **-ət**:

1. ***m-** > **n-** / _ ***-it**
2. ***-it** > **-ət**

This is evidenced by the failure of dentalization to appear in ***hmət** > **mət** EXTINGUISH / BLOW [189].

One PCN allofam is reconstructed with a medial labiovelar glide and ***-i** rime: ***m-nwi** LAUGH / SMILE [63]. The Yimchungrü reflex lost the medial labiovelar glide but also shows no palatalization of the dental nasal initial before ***-i**, indicating that the

medial glide was lost only after the palatalization process had occurred. The presence of the medial glide thus served to block palatalization of the initial in this form:

1. ***n-** > **n^{j}-** / _ ***-i**
2. ***-w-** > Ø

Assuming the loss of the medial labiovelar glide in Yimchungrü was an unconditional change (and not conditioned by a following ***-i** rime), it must have occurred only after ***-wa(ʔ)** coalesced to **-u**:

1. ***-wa(ʔ)** > **-u**
2. ***-w-** > Ø

The aforementioned palatalization of ***n-** to **n^{j}-** preceding ***-i** technically cannot be ordered with respect to the unconditional lowering of ***-i(ʔ)** to **-e** due to a lack of data, but this change was more likely to have been conditioned by the high ***-i** rime. It would therefore have taken place first:

1. ***n-** > **n^{j}-** / _ ***-i**
2. ***-i(ʔ)** > **-e**

*Palatalization of **s-*

The development of PCN ***səj** DIE [106] into Yimchungrü appears to involve the conditioned palatalization of ***s-** to **ʃ-** by the ***-əj** rime, after which the initial then conditioned the monophthongization and fronting of the rime to **-e**. (Other instances of ***-əj(ʔ)** monophthongized instead to **-i(ʔ)**.)

1. ***s-** > **ʃ-** / _ ***-əj**
2. ***-əj(ʔ)** > **-e** / ***(h)r**, ****ʃ** _

Crucial but undetermined ordering

The following sets of changes should be crucially ordered with respect to each other, but there are no examples to determine which orderings are correct.

The dentalization of ***ʒ-** to **z-** either bled or counterbled the raising of ***-a(ʔ)** to **-i(ʔ)** following palatal initials:

1. ***ʒ-** > **z-**
2. ***-a(ʔ)** > **-i(ʔ)** / *palatal _ (bleeding)

? OR ?

1. ***-a(ʔ)** > **-i(ʔ)** / *palatal _
2. ***ʒ-** > **z-** (counterbleeding)

This raising of ***-a(ʔ)** to **-i(ʔ)** following palatal initials also cannot be ordered with respect to the monophthongization of ***-aj(ʔ)** to **-a**.

The monophthongization of ***-aj(ʔ)** in the other direction, to **-i(ʔ)**, cannot be ordered with respect to the palatalization of ***n-** to **n^{j}-** before ***-i**: There are no known Yimchungrü reflexes of PCN ***(h)naj(ʔ)** to demonstrate if the diphthong first unglided to ****-i** and subsequently palatalized the initial.

Finally, the palatalization of ***l-** to **j-** before ***-əj(ʔ)** cannot be ordered relative to the monophthongization of the conditioning rime to **-i(ʔ)**, since there are no clear Yimchungrü reflexes of PCN ***li(ʔ)** to demonstrate whether it was ***-i(ʔ)** that later triggered the initial palatalization.

Summary

Those relative orderings which can be determined for the PCN > Yimchungrü sound changes are diagrammed in the following figures:

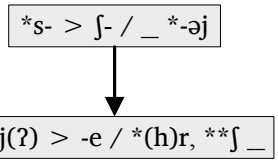


*Figure 19: PCN > Yim. *s- palatalization chronology*

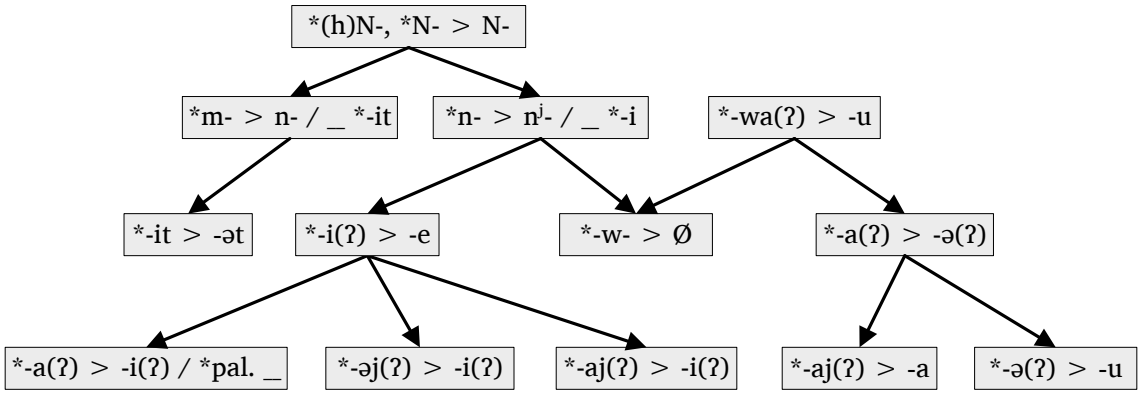


*Figure 20: PCN > Yim. chronology following nasal voicing merger and *-wa(ʔ) coalescence*

CHAPTER IV. CONCLUSION

This chapter investigates the relationship of Proto-Central Naga to other Tibeto-Burman languages based on shared sound changes (§IV.1) and closes the dissertation with some concluding remarks (§IV.2).

IV.1. PCN and Tibeto-Burman

Proto-Central Naga phonology is relatively conservative with respect to Proto-Tibeto-Burman, a trait which complicates the analysis of its genetic relationship to other TB languages. Nevertheless, four salient rime/coda innovations can be identified which serve to characterize the Central Naga group:

1.	PTB ***-a(ː)w**, ***-əw**, ***-ow**, ***-u** > PCN ***-u(ʔ)**	'back diphthong merger'
2.	PTB ***-r** > PCN ***-n**	'***r**-coda nasalization'
3.	PTB ***-s** > PCN ***-t**	'***s**-coda occlusivization'
4.	PTB ***-i(ː)l**, ***-al**, ***-uːl** > PCN ***-ə(ʔ)**	'***l**-rime erosion'

The discovery of three or all four of these sound changes in the reconstructed ancestral language of another subgroup would be good evidence for a higher-level subgrouping with Central Naga. Unfortunately, no published reconstruction of any Tibeto-Burman subgroup has been found to exhibit more than two of these innovations. However, there do exist TB subgroups, anciently attested languages (e.g. Written Tibetan and Written Burmese), and uncertainly classified languages which share one or two of these changes with Central Naga (discussed below).

Given the recent discovery of similar overcounting numeral systems in both the Central Naga and Angami-Pochuri languages (Coupe 2012a), an examination of the Angami-Pochuri group (henceforth, 'AP') for these sound changes is also in order, though the paucity of reliable data and lack of a phonological reconstruction complicates this task.

This investigation of shared sound changes was conducted primarily using the capabilities of the STEDT database web interface,[145] drawing upon the following sources of language data:

[145] Searches conducted in August 2013 ((http://stedt.berkeley.edu/search).

Proto-languages
Proto-Kuki-Chin (VanBik 2009)
Proto-Northern Naga (French 1983)
Proto-Tani (Sun 1993)
Proto-Tangkhulic (Mortensen 2003, 2012)
Proto-Karen (Luangthongkum forthcoming)
Proto-Ersuic (Yu 2012)
Proto-Lolo-Burmese (Matisoff 1972, 1978b, 1985, HPTB)
Proto-Tamang (Mazaudon 1978, 1994)
Proto-Bodo-Garo (Burling 1959)
Proto-Naish (Jacques & Michaud 2011)
Old Chinese (Baxter & Sagart 2011)

Anciently attested languages
Written Tibetan (Marrison 1967, TBL, ZMYYC, STC, Jäschke 1881, Weidert 1987)
Written Burmese (Benedict 1976, STC, TBL, ZMYYC, Matisoff 1974, Weidert 1987, Judson 1893)

Modern languages
Karbi (Marrison 1967, Grüssner 1978, Benedict 1972, Weidert 1987, Matisoff 1987 [data from Walker 1925])
Angami-Pochuri languages (Marrison 1967, Achumi 1998a/b, Nienu 1990a/b, Weidert 1987, STC)
Lepcha (Plaisier 2007, STC, Matisoff 1987 [data from Mainwaring 1898])
Jingpho (TBL, STC, ZMYYC, Weidert 1987)
Meithei (Marrison 1967, Singh 1991, Abbi & Mishra 1985)

IV.1.1. Back Diphthong Merger

Of the (proto-)languages surveyed, a complete, unconditional merger of all the PTB back diphthongs (***-a(ː)w**, ***-əw**, ***-ow**) with ***-u** is shared only by Karbi. This merger is exemplified in the following etymologies:

PTB ***raw** WITHERED / RESIDUE / CORPSE > Karbi **aru** 'carcass / corpse' (Matisoff 1987)
PTB ***tsow-s** FAT / OMENTUM > Karbi **jaŋthù** 'fat (n.)' (Weidert 1987: #98)
PTB ***məw** EAGLE / HAWK > Karbi **vo-mu** 'eagle, hawk, kite' (STC: #257)
PTB ***d-bu-s** HEAD / CENTER > Karbi **phu** 'head' (Marrison 1967)

The remaining languages exhibit a partial merger or none at all. The various forms in the Angami-Pochuri languages reflecting the PTB back diphthongs and ***-u** are

transcribed largely with a mix of back vowels and diphthongs, including **-u**, **-o**, **-ɯ**, **-ɤ**, '**-ü**', **-ou**, and **-uo**. No doubt many of these are simply allophonic/transcriptional variants, and a future reconstruction of Proto-Angami-Pochuri may reveal its participation in the back diphthong merger.

*IV.1.2. Nasalization of *-r Coda*

Most languages surveyed preserved some or all cases of PTB final ***-r**, while Jingpho, Proto-Lolo-Burmese, and Proto-Karen are the only ones which appear to have nasalized all instances to **-n**. The following table categorizes the developments of PTB final ***-r**:

preserved	*some preserved*	*lost*	***nasalized***
PKC	PTani (others > ***-l**)	AP	**Jingpho**
PNN	PTk (others > ***-n**)	PEr	**PLB**
WT	Meithei (others > **-n**)	PNaish	**PKar**
Lepcha	Karbi (others > **-n**)		
PTam	OC (others : ***-n**)		
	PBG (others > ***-l**)		

*Table 207: Development of PTB final ***-r***

The nasalization of PTB ***-r** > **-n** in Jingpho, Proto-Lolo-Burmese, and Proto-Karen is exemplified below:

PTB ***ser** HAIL / SLEET > Jingpho **sin**^{33} 'hail' (ZMYYC)
PTB ***baːr** BLOOM / FLOWER > Jingpho **^{1}nam^{2}pan** 'flower' (Weidert 1987: #247)
PTB ***tsyar** SUNSHINE > Jingpho **tʃan**^{33} 'sun' (ZMYYC)

PTB ***s(y)ar** LOUSE > PLB **san**$^{1/2}$ LOUSE (HPTB)
PTB ***baːr** BLOOM / FLOWER > WB **pàn** 'flower' (Weidert 1987: #247) (no PLB reconstruction)

PTB ***g-sar** NEW / FRESH > PKar **saN**^{A} 'new' (Luangthongkum forthcoming: #202)
PTB ***s-kyuːr** ≍ ***s-kwyaːr** SOUR / BE ACID > PKar **chjaN**^{B} 'sour' (Luangthongkum forthcoming: #268)
PTB ***s(y)ar** LOUSE > PKar **swɨN**^{B} 'louse (head~)' (Luangthongkum forthcoming: #179) (?)

*IV.1.3. Occlusivization of *-s Coda*

The occlusivization of the rare PTB final/suffixal ***-s*** in some or all instances was a frequent development. Of the languages surveyed, Proto-Tani, Proto-Northern Naga, Proto-Lolo-Burmese, Proto-Karen, Karbi, Lepcha, and Jingpho occlusivized all instances of PTB ***-s*** (where not sporadically lost):

preserved	*debuccalized*	*lost*	***occlusivized***	*unclear*
WT	PKC	PTk	**PTani**	OC
PTam		PBG	**PNN**	
		PEr	**PLB**	
		PNaish	**PKar**	
		Meithei	**Karbi**	
		AP	**Lepcha**	
			Jingpho	

*Table 208: Development of PTB final/suffixal ***-s***

The occlusivization of ***-s*** in the various languages is exemplified below:

PTB ***s-ni-s*** SEVEN > PTani ***kV-nɯt*** SEVEN (Sun 1993)
PTB ***s-ta-s*** HEAR > PTani ***tat²*** LISTEN / HEAR (Sun 1993)

PTB ***s-ni-s*** SEVEN > PNN ***Ç-nit*** SEVEN (French 1983: 544)
PTB ***s-ta-s*** HEAR > PNN ***Ç-taːt*** HEAR (French 1983: 502)
PTB ***r-tas*** THICK / SOLID / COARSE > PNN ***Ç-tat*** THICK (French 1983: 566)

PTB ***s-ni-s*** SEVEN > PLB ***ʔ-nit ~ *ši²*** SEVEN (HPTB: 477)
PTB ***g/s-ni-s*** TWO > PLB ***ʔ-nit ~ *ni²*** TWO (HPTB)
PTB ***m-ti-s*** WATER / FLUID / LIQUID / SOAK > PLB ***m/ʔ-tit^{H}*** WET / SOAK (HPTB)

PTB ***s-ni-s*** SEVEN > PKar ***ʔnwe^{A}***, ***ʔnwet^{D}*** SEVEN (Luangthongkum forthcoming: #250)
PTB ***s/m/g-rus*** BONE > PKar ***khrwit^{D}*** BONE (Luangthongkum forthcoming: #31) (?)

PTB ***r-tas*** THICK / SOLID / COARSE > Karbi **arthat** 'fat, thick, callous' (STC: #426)

PTB ***g/s-ni-s*** TWO > Lepcha **nyet** 'two' (Plaisier 2007)
PTB ***was** BEE / HONEY > Lepcha **vót** 'honey-bee' (Plaisier 2007)

PTB ***s-ni-s*** SEVEN > Jingpho **sənit** 'seven' (STC: #5)
PTB ***s-ta-s*** HEAR > Jingpho **mă^{31}tat^{31}** 'listen' (ZMYYC)
PTB ***r-tas*** THICK / SOLID / COARSE > Jingpho **that^{31}** 'thick' (ZMYYC)
PTB ***s/m/g-rus*** BONE > Jingpho **nrut** 'bone' (STC: #6)

PTB final/suffixal ***-s*** was preserved as such in Written Tibetan and Proto-Tamang, debuccalized to ***-ʔ*** in Proto-Kuki-Chin, and completely lost in Proto-Tangkhulic, Proto-Bodo-Garo, Proto-Ersuic, Proto-Naish, Meithei, and AP. The situation in Old Chinese is unclear, as the OC comparanda of PTB final/suffixal ***-s*** vary among ***-s*** (TWO; GET / RECEIVE / SEE), ***-t*** (SEVEN), and Ø (BONE) (all forms from Baxter & Sagart 2011):

PTB ***g/s-ni-s*** TWO : OC ***ni [j] -s*** TWO
PTB ***ŋa-s*** GET / RECEIVE / SEE : OC ***ŋ^{ʕ}a-s*** AWAKE, REALIZE

PTB ***s-ni-s*** SEVEN : OC **** [ts^{h}] i [t]*** SEVEN

PTB ***s/m/g-rus*** BONE : OC **** [g] ^{ʕ}rə*** BONES, SKELETON

*IV.1.4. Erosion of *l-final Rimes*

No other languages in this investigation reduced all PTB ***l***-final rimes to open/glottal-final schwa, though some lost the coda or vocalized it to ***-i***. The developments of PTB ***-l*** are summarized below:

preserved	*vocalized to **-i***	*lost*	*nasalized*	*mixed*
PTani	PEr (?)	PKar	Jingpho	PNN (> *-l, *-r, Ø)
PKC	Karbi	PNaish		PLB (> *-n, Ø)
PTk		AP		Meithei (> -l, -n)
PBG				OC (: *-n, *-r)
WT				
PTam				
Lepcha				

*Table 209: Development of PTB final *-**l***

Vocalization of the ***-l*** coda may have been the first step in reduction of the rime. This change occurred in Karbi and possibly in Proto-Ersuic (see Yu 2012 for conflicting developments):

PTB ***m-kul*** TWENTY / ALL > Karbi **iŋkòi** 'twenty' (Weidert 1987: #753)
PTB ***tal*** ARROW / BOW > Karbi **thai** 'arrow' (STC: 169 [fn.452])
PTB ***s-b/m-ruːl*** SNAKE > Karbi **phurūi(ʔ)~phirūi~phorūi** 'snake' (Weidert 1987: #215)

PTB ***s-mul*** HAIR (BODY) / FUR / FEATHER > PEr ***mui*^{2}** FEATHER, HAIR (OF BODY) (Yu 2012: 182)
PTB ***d-ŋul*** SILVER > PEr ***ŋui*^{1}** SILVER (Yu 2012: 182)

IV.1.5. Discussion

Although this study failed to establish any conclusive genetic relationships between Central Naga and other Tibeto-Burman/Sino-Tibetan languages on the basis of shared phonological innovations, it has identified some intriguing areas for further study:

First, as Coupe has discovered similar overcounting numeral systems in CN and Angami-Pochuri, a phonological reconstruction of the AP group is the next element necessary for comparing these two groups. Based on this study and also a cursory survey of the STEDT database, the AP languages appear to have undergone more phonological attrition than CN, losing or merging all codas except the nasals ***-m**, ***-n**, and ***-ŋ**.

Karbi (formerly 'Mikir', spoken in nearby Assam) is a Tibeto-Burman language with uncertain classification. Of the languages surveyed, it alone shared both the back diphthong merger and ***s**-coda occlusivization with PCN, and also shows vocalization of the ***l**-coda: a potential precursor to the complete erosion of ***l**-final rimes seen in PCN.

To a lesser extent, the presence of both ***s**-coda occlusivization and ***r**-coda nasalization in Proto-Lolo-Burmese, Proto-Karen, and Jingpho also warrants a closer look at their potential relationship with Central Naga.

The position of Lepcha (spoken primarily in Sikkim) within Tibeto-Burman has remained an unsolved problem for over a century (see Waddell 1899, Shafer 1950, Forrest 1962, Marrison 1967, Benedict 1972, Bauman 1976, Bodman 1988, Sun 1993, Burling 2003). A number of these studies have made mention of Lepcha's lexical affinity to Naga languages, and Shafer's classification even (prematurely) groups Lepcha with the CN languages (1950: 469–470; 1955: 106, 109–110). The occlusivization of ***s**-codas in Lepcha adds another potential link to Central Naga, albeit a very weak one.

Finally, also still to be explored in establishing genetic relationships is the use of additional types of evidence, such as grammatical and lexical innovations (cf. §I.3.3).

IV.2. Concluding Remarks

This historical analysis of the Central Naga languages has produced a number of original and useful results: reconstructions of the lexicon and phonology of Proto-Ao and Proto-Central Naga, a delineation of the sound changes from PTB to PCN, and a set of Tibeto-Burman languages/groups to which CN is potentially related.

No reconstruction is ever conclusive, however, and this is especially the case with Proto-Central Naga: The near total dependence on non-phonemic sources for Sangtam and Yimchungrü in this dissertation makes the reconstruction presented here ripe for revision as native-speaker linguists and other fieldworkers (Alexander Coupe, T. Temsunungsang, etc.) produce more reliable data using modern linguistic methods. The publication of broader and more detailed data from all CN languages will facilitate improvement of this PCN reconstruction in the following aspects:

1. Data from additional villages may reveal enough variation to warrant meso-reconstructions of Proto-Lotha, Proto-Sangtam, and Proto-Yimchungrü. There are also a number of undocumented Mongsen Ao and Chungli Ao dialects, an examination of which will no doubt lead to the refinement of Proto-Ao.

2. The Sangtam and Yimchungrü phonologies presented here are rudimentary and preliminary: Further investigation will clarify the inventories and identify synchronic allophones.

3. Many PTB > PCN and PCN > CN sound changes proposed here have unclear, abnormal, or rudimentary conditioning environments. Identification of additional cognate sets will likely allow these conditioning factors to be expressed in terms of natural classes instead of individual segments.

4. The PCN and PAo tone systems remain essentially unreconstructed, due to paucity of data or inscrutability of the tone correspondences. Additional data and further analysis may eventually fill this lacuna.

5. Mangmetong Mongsen is the only variety thus far to have been subjected to a comprehensive grammatical analysis (GMA). As more lects are studied, it may become possible to reconstruct the grammatical systems of PAo and PCN.

6. Finally, a more detailed understanding of the historical patterns of language contact in Nagaland will reveal to what extent sound changes have diffused

> across language boundaries and contributed to (or perhaps even generated) their patterns of differentiation (cf. Babel et al. 2013).

Research on the under-described TB languages of Burma spoken just over the border from Nagaland also has the potential to shed much light on the comparative study of the Naga languages. In particular, recent works by Saul (2005: 25) and Shi (2009: 3) have posited classifications that group the Makuri Naga language of Burma with Central Naga languages. This is clearly a claim that can be examined in light of the reconstruction presented here, and it may be found that Makuri can contribute to a revision of PCN.

It seems fitting to close with a reflection from a linguist on the state of research into the Tibeto-Burman languages of northeast India, penned only a decade ago:

> "…the languages of the people called 'Naga' are particularly confusing, and there may be no Tibeto-Burman region anywhere where the languages are so diverse." (Burling 2003: 182)

What could be taken by some as reason for despair presents to others a challenge to be overcome. It is my hope that this dissertation has risen to that challenge and advanced our diachronic understanding of the Naga languages in its own small way.

REFERENCES

Abbi, Anvita & Awadhesh K. Mishra. 1985. Consonant clusters and syllable structure of Meitei. *Linguistics of the Tibeto-Burman Area* 8(2). 81–92. Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23.

Acharya, K.P. 1975. *Lotha phonetic reader* (CIIL Phonetic Reader Series 14). Mysore: Central Institute of Indian Languages.

———. 1983. *Lotha grammar* (CIIL Grammar Series 10). Mysore: Central Institute of Indian Languages.

Achumi, N. 1998a. *Questionnaire (Sumi Naga, body parts)*. (unpublished). Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23.

———. 1998b. *Questionnaire (Sumi Naga, natural objects)*. (unpublished). Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23.

Avery, John. 1886. The Ao Naga language of southern Assam. *The American Journal of Philology* 7(3). 344–366.

Babel, Molly, Andrew Garrett, Michael J. Houser & Maziar Toosarvandani. 2013. Descent and diffusion in language diversification: A study of Western Numic dialectology. *International Journal of American Linguistics* 79(4). 445–489.

Baruah, Sanjib. 2003. Confronting constructionism: Ending India's Naga war. *Journal of Peace Research* 40(3). 321–338.

Bauman, James. 1976. An issue in the subgrouping of the Tibeto-Burman languages: Lepcha and Mikir. Paper prepared for the *9th International Conference on Sino-Tibetan Languages and Linguistics (ICSTLL)*, Copenhagen. 22–24 October 1976.

Baxter, William H. & Laurent Sagart. 2011. *Baxter-Sagart Old Chinese reconstruction (Version 1.00, 20 Feb. 2011)*. Online: http://crlao.ehess.fr/document.php?id=1217 (16 June 2013).

Benedict, Paul K. 1943. Secondary infixation in Lepcha. *Studies in Linguistics* 1(19).

———. 1972. *Sino-Tibetan: A conspectus* (Princeton-Cambridge Studies in Chinese Linguistics II). Contributing Editor, James A. Matisoff. New York: Cambridge University Press. ('STC')

———. 1973. Tibeto-Burman tones, with a note on teleo-reconstruction. *Acta Orientalia* 35. 127–138.

———. 1976. Rhyming dictionary of Written Burmese. *Linguistics of the Tibeto-Burman Area* 3(1). 1–93. Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23.

Bodman, Nicholas C. 1988. On the place of Lepcha in Sino-Tibetan: A lexical comparison. *Linguistics of the Tibeto-Burman Area* 11(1). 1–26.

Boruah, Bhimkanto. 1993. *Nagamese, the language of Nagaland*. New Delhi, India: Mittal Publications.

Bouchery, Pascal & Lemlila Sangtam. 2012. The kinship terminology of the Sangtam Nagas. *European Bulletin of Himalayan Research* 41. 9–29.

Brandreth, E.L. 1878. On the non-Aryan languages of India. *Journal of the Royal Asiatic Society of Great Britain and Ireland*, New Series, 10(1). 1–32.

Bratkievich, Alex. 2010. *Converbs in Chungli Ao: Canonical converbs in the coordination-subordination continuum*. Berkeley: University of California Qualifying Paper.

Brown, Nathan. 1851. Specimens of the Naga language of Asam. *Journal of the American Oriental Society* 2. 155 + 157–165.

Bruhn, Daniel. 2010a. *A tonal taxonomy of Chungli Ao verbs*. Berkeley: University of California Qualifying Paper.

———. 2010b. Unearthing the roots: Ao and Proto-Tibeto-Burman – The rimes. *UC Berkeley Phonology Lab Annual Report (2010)*. 210–258.

Burling, Robbins. 1959. Proto-Bodo. *Language* 35(3). 433–453. Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23.

———. 1983. The Sal languages. *Linguistics of the Tibeto-Burman Area* 7(2). 1–31.

———. 2003. The Tibeto-Burman languages of Northeastern India. In Graham Thurgood & Randy J. LaPolla (eds.), *The Sino-Tibetan languages*, 169–191. London & New York: Routledge.

Burling, Robbins & L. Amon Phom. 1998. Phom phonology and word list. *Linguistics of the Tibeto-Burman Area* 21(2). 13–42.

Butler, John. 1875. A rough comparative vocabulary of two more of the dialects spoken in the "Nágá Hills." *Journal of the Asiatic Society of Bengal* 44-I(3). 216–227.

Campbell, George. 1874. *Specimens of languages of India, including those of the aboriginial tribes of Bengal, the central provinces, and the eastern frontier*. Calcutta: Bengal Secretariat Press.

Clark, Edward W. 1879. A specimen of the Zoongee (or Zurngee) dialect of a tribe of Nagas, bordering on the valley of Assam, between the Dikho and Desoi rivers, embracing over forty villages. *Journal of the Royal Asiatic Society of Great Britain and Ireland*, New Series, 11(2). 278–286.

———. 1911. *Ao-Naga dictionary*. Calcutta: Baptist Mission Press.

Clark, Mrs. E.W. (Mary M.). 1893. *Ao Naga grammar with illustrative phrases and vocabulary*. Shillong: Assam Secretariat Printing Department.

Coupe, Alexander R. 1998. The acoustic and perceptual features of tone in the Tibeto-Burman language Ao Naga. *Proceedings of the 5th International Conference on Spoken Language Processing*, Vol. 2, 57–60. Canberra: The Australian Speech Science and Technology Association. Available on CD-ROM: *ICSLP-1998*, paper #0688.

———. 2002. Temporal deixis in Ao. *Melbourne Papers in Linguistics and Applied Linguistics* 1(1). 5–20.

———. 2003a. *A phonetic and phonological description of Ao: A Tibeto-Burman language of Nagaland, north-east India*. Canberra: Pacific Linguistics.

———. 2003b. *The Mongsen dialect of Ao: A language of Nagaland*. Victoria, Australia: La Trobe University dissertation.

———. 2007a. Converging patterns of clause linkage in Nagaland. In Matti Miestamo & Bernhard Wälchli (eds.), *New challenges in typology: Broadening the horizons and redefining the foundations*, 339–361. Berlin & New York: Mouton de Gruyter.

———. 2007b. *A grammar of Mongsen Ao*. Berlin & New York: Mouton de Gruyter. (‘GMA’)

———. 2008. Transitivity in Ao and other languages of Nagaland. Paper presented at the *Local Workshop on Transitivity*, RCLT, La Trobe University. 30 October 2008.

———. 2011a. Pragmatic foundations of transitivity in Ao. *Studies in Language* 35(3). 492–522.

———. 2011b. On core case marking patterns in two Tibeto-Burman languages of Nagaland. *Linguistics of the Tibeto-Burman Area* 34(2). 21–47.

———. 2012a. Overcounting numeral systems and their relevance to sub-grouping in the Tibeto-Burman languages of Nagaland. *Language and Linguistics* 13(1). 193–220.

———. 2012b. Referent tracking strategies in Mongsen Ao and Chang discourse: Creating cohesion in texts. Paper presented at the *22nd Annual Conference of the Southeast Asian Linguistics Society (SEALS)*, Agay, France. 31 May 2012.

———. 2013. Tense, but in the mood: Diachronic perspectives on the representation of time in Ao. *Language and Linguistics* 14(6). 1105–1138.

Dai Qingxia & Huang Bufan (eds.). 1992. 藏缅语族语言词汇 *Zàng-Miǎn yǔzú yǔyán cíhuì* [A Tibeto-Burman lexicon]. Beijing: Central Institute of Minorities. Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23. ('TBL')

Dalton, Edward T. 1872. *Descriptive ethnology of Bengal*. Calcutta: Office of the Superintendent of Government Printing.

Damant, G.H. 1880. Notes on the locality and population of the tribes dwelling between the Brahmaputra and Ningthi Rivers. *Journal of the Royal Asiatic Society of Great Britain and Ireland*, New Series, 12(2). 228–258.

Davis, A.W. 1892. In E.A. Gait, *Census of India, 1891. Assam. Vol I.–Report*, 163–176, cxxiv–cxxv. Shillong: Assam Secretariat Printing Office.

Denlinger, Paul B. 1976. Robert Shafer's *Introduction to Sino-Tibetan*: A review article. *Monumenta Serica* 32. 302–319.

Escamilla, Ramón M. 2010. *A preliminary semantics and typology of Chungli Ao descriptions of cutting and breaking (C&B) events*. Berkeley: University of California Qualifying Paper.

———. 2012. *An updated typology of causative constructions: Form-function mappings in Hupa (California Athabaskan), Chungli Ao (Tibeto-Burman) and beyond*. Berkeley: University of California dissertation.

Forrest, R.A.D. 1962. The linguistic position of Rong (Lepcha). *Journal of the American Oriental Society* 82(3). 331–335.

Fox, Anthony. 1995. *Linguistic reconstruction: An introduction to theory and method*. New York & Oxford: Oxford University Press.

French, Walter T. 1983. *Northern Naga: A Tibeto-Burman mesolanguage*. New York: City University of New York dissertation.

Grierson, George A. & Sten Konow (eds.). 1903–1928. *Linguistic survey of India* [11 volumes]. Calcutta: Office of the Superintendent of Government Printing. Reprinted (1967–1973) by Motilal Banarsidass (Delhi, Varanasi, Patna). ('LSI')

Government of India. 2010. *Part B: Distribution of the 100 non-scheduled languages – India, states & union territories – 2001 census*. Online: http://www.censusindia.gov.in/Census Data 2001/Census Data Online/Language/partB.aspx (21 October 2013).

Government of Nagaland. 2008. *Notification No. EDS/MIN-15/2004*. Online: http://nagaland.nic.in/functionaries/department/human/Edu-orders/English Medium.pdf (23 October 2013).

———. 2013. *Nagaland at a glance*. Online: http://nagaland.nic.in/profile/aglance.htm (23 October 2013).

Gowda, K.S. Gurubasave. 1972. *Ao-Naga phonetic reader* (CIIL Phonetic Reader Series 7). Mysore: Central Institute of Indian Languages.

———. 1975. *Ao grammar* (CIIL Grammar Series 1). Mysore: Central Institute of Indian Languages.

———. 1985. *Ao-English-Hindi dictionary* (CIIL Dictionary Series 1). Mysore: Central Institute of Indian Languages.

Grüssner, Karl-Heinz. 1978. *Arleng Alam, die Sprache der Mikir: Grammatik und Texte*. Wiesbaden: Franz Steiner Verlag. Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-21.

Hale, Austin. 1982. *Research on Tibeto-Burman languages* (Trends in Linguistics 14). Berlin & New York: Mouton.

Hodgson, Brian Houghton. 1849. On the aborigines of the eastern frontier. *Journal of the Asiatic Society of Bengal* 18(2). 967–975.

———. 1850. Aborigines of the north east frontier. *Journal of the Asiatic Society of Bengal* 19. 309–316.

Hoenigswald, Henry M. 1960. *Language change and linguistic reconstruction*. Chicago: University of Chicago Press.

Hoshi Michiyo. 1984. A Prakaa vocabulary: A dialect of the Manang language. In M. Tachikawa, K. Mikame, M. Hoshi & Y. Nagano (eds.), *Anthropological and linguistic studies of the Gandaki area in Nepal II* (Monumenta Serindica 12), 133–202. Tokyo: Institute for the Study of Languages and Cultures of Asia and Africa. Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2012-01-23.

Hutton, John Henry. 1921. *The Angami Nagas, with some notes on neighbouring tribes*. London: Macmillan and Co.

———. 1922. Introduction. In James P. Mills, *The Lhota Nagas*, xi–xxxix. London: Macmillan and Co.

———. 1965. The mixed culture of the Naga tribes. *Journal of the Royal Anthropological Institute of Great Britain and Ireland* 95(1). 16–43.

Jacques, Guillaume & Alexis Michaud. 2011. Approaching the historical phonology of three highly eroded Sino-Tibetan languages: Naxi, Na and Laze. *Diachronica* 28(4). 468–498.

Jäschke, Heinrich August. 1881. *A Tibetan-English dictionary, with special reference to the prevailing dialects*. London: Secretary of State for India in Council. Reprinted (1934, 1949, 1958, 1965, 1968, 1972, 1977, 1990) by Routledge & Kegan Paul. Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23.

Judson, Adoniram. 1893. *Burmese-English dictionary*. Rangoon: Superintendent, Government Printing, Burma.

Kauffmann, Hans E. 1939. Kurze Ethnographie der nördlichen Sangtam-Naga (Lophomi), Assam. *Anthropos* 34(1). 207–245.

Kumar, Braj Bihari. 1971a. *Ao Hindi English dictionary*. Kohima: Nagaland Bhasha Parishad.

———. 1971b. *Lotha Hindi English dictionary*. Kohima: Nagaland Bhasha Parishad.

———. 1973a. *Hindi Sangtam English dictionary*. Kohima: Nagaland Bhasha Parishad.

———. 1973b. *Hindi Yimchungrü English dictionary*. Kohima: Nagaland Bhasha Parishad.

Kurabe Keita. 2012. Jingpho dialogue texts with grammatical notes. *Asian and African Languages and Linguistics* 7. 121–153.

LaPolla, Randy J. 2000. Subgrouping in Tibeto-Burman: Can an individual-identifying standard be developed? How do we factor in the history of migrations and language contact? Paper presented at the *33rd International Conference on Sino-Tibetan Languages and Linguistics (ICSTLL)*, Bangkok and Trang, Thailand. 2–6 October 2000.

———. 2012. Comments on methodology and evidence in Sino-Tibetan comparative linguistics. *Language and Linguistics* 13(1). 117–132.

Lewis, M. Paul, Gary F. Simons & Charles D. Fennig, (eds.). 2013. *Ethnologue: Languages of the world, seventeenth edition.* Dallas, Texas: SIL International. Online version: http://www.ethnologue.com.

Lotha, K. Phyokhamo. 2004. *Vocabulary cum dictionary, Hindi-English-Lotha.* Āgarā: Kendrīya Hindī Saṃsthāna.

Luangthongkum, Theraphan. forthcoming. *A view on Proto-Karen phonology and lexicon.* Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23.

Mainwaring, George Byres. 1898. *Dictionary of the Lepcha-language*. Berlin: Unger Brothers.

Marrison, Geoffrey E. 1967. *The classification of the Naga languages of northeast India* (2 volumes). London: School of Oriental and African Studies, University of London dissertation.

Matisoff, James A. 1972. *The Loloish tonal split revisited* (Research Monograph 7). Berkeley: Center for South and Southeast Asian Studies, University of California, Berkeley. Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23.

———. 1973a. *The grammar of Lahu* (University of California Publications in Linguistics 75). Berkeley, Los Angeles, London: University of California Press. Reprinted 1982.

———. 1973b. Tonogenesis in southeast Asia. In Larry Hyman (ed.), *Consonant types and tone* (Southern California Occasional Papers in Linguistics 1), 71–95. Los Angeles: University of Southern California.

———. 1974. The tones of Jinghpaw and Lolo-Burmese: Common origin vs. independent development. *Acta Linguistica Hafniensia* (Copenhagen) 15(2). 153–212. Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23.

———. 1975. Rhinoglottophilia: The mysterious connection between nasality and glottality. In Charles A. Ferguson, Larry M. Hyman & John J. Ohala (eds.), *Nasálfest: Papers from a symposium on nasals and nasalization*, 266–287. Stanford: Language Universals Project, Department of Linguistics, Stanford University.

———. 1978a. *Variational semantics in Tibeto-Burman: The "organic" approach to linguistic comparison*. Philadelphia: Institute for the Study of Human Issues.

———. 1978b. *Mpi and Lolo-Burmese microlinguistics* (Monumenta Serindica 4). Tokyo: Institute for the Study of Languages and Cultures of Asia and Africa. Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23.

———. 1982. Proto-languages and proto-Sprachgefühl. *Linguistics of the Tibeto-Burman Area* 6(2). 1–64.

———. 1985. God and the Sino-Tibetan copula, with some good news concerning selected Tibeto-Burman rhymes. *Journal of Asian and African Studies* (ILCAA, Tokyo) 29. 1–81. Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23.

———. 1987. *Body part card file*. (unpublished). Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23. Includes Lepcha data from Mainwaring 1898 and Karbi data from Walker 1925.

———. 1988. *The dictionary of Lahu* (University of California Publications in Linguistics 111). Berkeley, Los Angeles, London: University of California Press.

———. 1992. The mother of all morphemes: Augmentatives and diminutives in areal and universal perspective. In Martha Ratliff & Eric Schiller (eds.), *Papers from the first annual meeting of the Southeast Asian Linguistics Society (SEALS) (1991)*, 293–349. Tempe, AZ: Arizona State University.

———. 1995. Sino-Tibetan numerals and the play of prefixes. *Bulletin of the National Museum of Ethnology* 20(1). 105–252.

———. 2000. An extrusional approach to *p-/w- variation in Sino-Tibetan. *Language and Linguistics* 1(2). 135–186.

———. 2003. *Handbook of Proto-Tibeto-Burman: System and philosophy of Sino-Tibetan reconstruction* (University of California Publications in Linguistics 135). Berkeley, Los Angeles, London: University of California Press. ('HPTB')

———. 2008. *The Tibeto-Burman reproductive system: Toward an etymological thesaurus* (University of California Publications in Linguistics 140). Berkeley, Los Angeles, London: University of California Press. ('TBRS')

Mazaudon, Martine. 1978. Consonantal mutation and tonal split in the Tamang subfamily of Tibeto-Burman. *Kailash* 6(3). 157–79. Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23. (The online STEDT version includes more data than the print version.)

———. 1994. *Problèmes de comparatisme et de reconstruction dans quelques langues de la famille tibéto-birmane*. Paris: Université de la Sorbonne Nouvelle Thèse d'État. Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23.

Mills, James Philip. 1922. *The Lhota Nagas*. London: Macmillan and Co.

———. 1926. *The Ao Nagas*. London: Macmillan and Co.

Mortensen, David. 2003. *Comparative Tangkhul*. Berkeley: University of California Qualifying Paper.

———. 2012. *Database of Tangkhulic languages*. (unpublished). Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-21.

Morey, Stephen. 2010. *SEAlang library Ahom dictionary*. Online: http://www.sealang.net/ahom/ (4 October 2013).

Murry, K.R., J.T. Yanthan & A. Patton (eds.). 1978. *Anglo-Lotha vocabulary*. Wokha, Nagaland: Lotha Literature Committee.

Nichols, Johanna. 1996. The comparative method as heuristic. In Mark Durie & Malcolm Ross (eds.), *The comparative method reviewed: Regularity and irregularity in language change*, 39–71. New York & Oxford: Oxford University Press.

Nienu, Vikuosa. 1990a. *Questionnaire (Angami Naga)*. (unpublished). Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23.

———. 1990b. *Questionnaire (Chokri)*. (unpublished). Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23.

Pittayaporn, Pittayawat. 2009. *The phonology of Proto-Tai*. Ithaca, NY: Cornell University dissertation.

Plaisier, Heleen. 2007. *A grammar of Lepcha*. Leiden & Boston: Brill. Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23.

Prince, Alan & Paul Smolensky. 1993. *Optimality Theory: Constraint interaction in generative grammar* (Rutgers University Center for Cognitive Science Technical Report 2). Rutgers Optmality Archive Version, 8/2002. Online: http://roa.rutgers.edu/files/537-0802/537-0802-PRINCE-0-0.PDF (9 January 2014).

Sanyal, Paroma. 2005. *Some aspects of the morpho-phonology of tones in Ao: An Optimality Theoretic approach*. Hyderabad: Central Institute of English and Foreign Languages MPhil thesis.

Sanyal, Paroma, T. Temsunungsang & K.G. Vijayakrishnan. 2006. Can phonology refer to grammatical categories?: The case of lexical reorganisation in Ao. Paper presented at the *26th Annual International Conference of South Asian Language Analysis (SALA)*, Mysore. 19–21 December 2006.

———. 2007. The phonological word as the domain of rule application: The case of Bangla, Tamil and Ao. Paper presented at the *Workshop on Phonological Words in South Asia and Southeast Asia*, University of Leipzig. 19–20 September 2007.

Saul, Jamie D. 2005. *The Naga of Burma: Their festivals, customs and way of life*. Bangkok: Orchid Press.

Shabdkosh. 2013. *English Hindi dictionary*. Online: http://shabdkosh.com/ (21 October 2013).

Shafer, Robert. 1950. The Naga branches of Kukish: Vocalism. *Rocznik Orientalistyczny* 16. 467–530.

———. 1953. Classification of the northernmost Naga languages. *Journal of the Bihar Research Society* 39(3). 225–264.

———. 1955. Classification of the Sino-Tibetan languages. *Word* 11. 94–111.

Shi, Vong Tsuh. 2009. *Discourse studies of Makuri Naga narratives*. Chiang Mai: Payap University MA thesis.

Sidwell, Paul. 2012. Proto Khasic, ms. Accessed via the *SEAlang Mon-Khmer etymological dictionary* (http://sealang.net/monkhmer/dictionary/) on 2013-10-4.

Singh, Nissor. 1906. *Khasi-English dictionary*. Shillong: Eastern Bengal and Assam Secretariat Press.

Singh, Ch. Yashwanta. 1991. *Questionnaire (Meithei)*. (unpublished). Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23.

Stamps, Robert H. 2003. *Aspidistra production and use*. Environmental Horticulture Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Online: http://edis.ifas.ufl.edu/ep147 (21 October 2013).

State of New Jersey. 2013. *Fast facts*. Online: http://www.nj.gov/nj/about/facts/facts/ (4 October 2013).

Sun Hongkai. 1981. 羌语简志 *Qiāng-yǔ jiǎnzhì* [A brief description of the Qiang language]. Beijing: Nationalities Press. Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2012-01-23.

Sun Hongkai et al. (eds.). 1991. 藏缅语语音和词汇 *Zàng-Miǎn-yǔ yǔyīn hé cíhuì* [Tibeto-Burman phonology and lexicon]. Beijing: Chinese Social Sciences Press. Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2013-10-23. ('ZMYYC')

Sun, Jackson Tianshin. 1993. *A historical-comparative study of the Tani (Mirish) branch in Tibeto-Burman*. Berkeley: University of California dissertation.

Temsunungsang, T. 2003. *The structure of Mongsen: Phonology and morphology*. Hyderabad: Hyderabad Central University MPhil thesis.

———. 2006. Pitch characteristics of lexical tone and intonation in Chungli. *Central Institute of English and Foreign Languages Occasional Papers in Linguistics* 12.

———. 2008. Tonality and the analysis of sub-minimal words in Ao. In Stephen Morey & Mark Post (eds.), *North East Indian linguistics*, 45–64. New Delhi: Cambridge University Press India.

———. 2009a. *Aspects of the prosodic phonology of Ao: An inter-dialectal study*. Hyderabad: The English and Foreign Languages University dissertation.

———. 2009b. Variation and the emergence of marked syllable structure. In Rajat Mohanty & Mythili Menon (eds.), *Proceedings of the seventh GLOW in Asia conference (2009)*, 275–294. Hyderabad: English and Foreign Languages University Press.

Temsunungsang, T. & Paroma Sanyal. 2005. Truncation in Ao verbal morphology. Paper presented at the *Sixth International Conference on South Asian Languages (ICOSAL)*, Osmania University, Hyderabad. 6–8 January 2005. (Also published in *Central Institute of English and Foreign Languages Occasional Papers in Linguistics* 11. 49–71.)

Thomason, Sarah G. 2008. Why I don't love the International Phonetic Alphabet. *Language Log*. Online: http://itre.cis.upenn.edu/~myl/languagelog/archives/005287.html (23 December 2013).

Turner, Ralph Lilley. 1962–1966. *A comparative dictionary of Indo-Aryan languages*. London: Oxford University Press. Includes three supplements, published 1969–1985. Accessed via Digital Dictionaries of South Asia (http://dsal.uchicago.edu/dictionaries/soas/) on 2013-10-25.

VanBik, Kenneth. 2009. *Proto-Kuki-Chin: A reconstructed ancestor of the Kuki-Chin languages* (STEDT Monograph Series 8). Berkeley: STEDT.

Waddell, Lawrence Austin. 1899. The Lepcha's or Rong's and their songs. *Internationales Archiv für Ethnographie* 17. 41–57.

Walker, George David. 1925. *A dictionary of the Mikir language*. Shillong: Assam Government Press.

Wayesha, Ahsi James. 2010. *A phonological description of Leinong Naga*. Chiang Mai: Payap University MA thesis.

Weidert, Alfons K. 1979. The Sino-Tibetan tonogenetic laryngeal reconstruction theory. *Linguistics of the Tibeto-Burman Area* 5(1). 49–127.

———. 1981. Star, moon, spirits, and the affricates of Angami Naga: A reply to James A. Matisoff. *Linguistics of the Tibeto-Burman Area* 6(1). 1–38.

———. 1987. *Tibeto-Burman tonology: A comparative account* (Current Issues in Linguistic Theory 54). Amsterdam & Philadelphia: John Benjamins.

Witter, W.E. 1888. *Outline grammar of the Lhōtā Nāgā language, with a vocabulary and illustrative sentences*. Calcutta: Government of India Central Printing Office.

Xobdo. 2013. *Xobdo.org: A multilingual online dictionary*. Online: http://xobdo.org/ (21 October 2013).

Xu Lin & Zhao Yansun (eds.). 1984. 白语简志 *Bái-yǔ jiǎnzhì* [A brief description of the Bai language]. Beijing: Nationalities Press. Accessed via the STEDT database (http://stedt.berkeley.edu/search) on 2012-01-23.

Yu, Dominic. 2012. *Proto-Ersuic*. Berkeley: University of California dissertation.

APPENDIX A. SOUND CHANGES: PTB > PCN

This appendix categorizes the PTB > PCN sound changes proposed (excluding retentions).

A.1. Rimes

Monophthongization

PTB ***-a(ː)w**, ***-əw**, ***-ow** > PCN ***-u(ʔ)** (§III.3.1.6)

Lengthening

PTB ***-am** > PCN ***-aːm** (§III.3.2.1)

PTB ***-an**, ***-ar** > PCN ***-aːn** (§III.3.3.1)

Reduction

PTB ***-i(ː)l**, ***-al**, ***-uːl** > PCN ***-ə(ʔ)** (§III.3.1.7)

PTB ***-i** > PCN ***-ə(ʔ)** / ***kr**_ (§III.3.1.7)

PTB ***-u** > PCN ***-ə(ʔ)** / ***tsy**_, ***dz(y)**_ (§III.3.1.7)

PTB ***-um**, ***-im**, ***-wam**, ***-em** > PCN ***-əm** (§III.3.2.3)

PTB ***-up/ip**, ***-op/wap**, ***-ep** > PCN ***-əp** (§III.3.2.6)

PTB ***-a(ː)r**, ***-war**, ***-or**, ***-uːr**, ***-iːr**, ***-in** > PCN ***-ən** (§III.3.3.3)

PTB ***-iːt/ut** ?, ***-əy-t** > PCN ***-ət** (§III.3.3.5)

Lowering

PTB ***-um**, ***-im** > PCN ***-am** (§III.3.2.2)

PTB ***-up/ip** > PCN ***-ap** (§III.3.2.5)

Velarization

PTB ***-oŋ** > PCN ***-uŋ** (§III.3.4.3)

PTB ***-a(ː)ŋ** > PCN ***-uŋ** / ***k** _ (§III.3.4.3)

Medial + rime coalesence

PTB ***-wak** > PCN ***-uk**	(§III.3.4.6)
PTB ***-wam** > PCN ***-əm**	(§III.3.2.3)
PTB ***-waːr** > PCN ***-an**	(§III.3.3.2)
PTB ***-war** > PCN ***-ən**	(§III.3.3.3)

Shortening

PTB ***-Vː-** > PCN ***-V-**	(throughout)

Unknown change

PTB ***-iːt** > PCN ***-V̥t**	(§III.3.3.5)

Coda nasalization

PTB ***-r** > PCN ***-n**	(§II.4.3)

Coda occlusivization

PTB ***-s** > PCN ***-t**	(§II.4.3)

Coda loss

PTB ***-i(ː)l**, ***-al**, ***-uːl** > PCN ***-ə(ʔ)**	(§III.3.1.7)

A.2. Initials

Devoicing, voicing/aspiration interchange

PTB ***s-Ç-** > PCN ***Ç̥-**	(§III.4.4)[146]
PTB ***T̥/T̬-** > (?) > PCN ***T(h)-**	(T = oral stop; §III.5.1)
PTB ***dz(y)-**, ***ts(y)-** > (?) > PCN ***ts(h)-**, ***tʃ(h)-**	(§III.5.3)
PTB ***N-** > PCN ***(h)N-**	(N = nasal; §III.5.4)
PTB ***A-** > PCN ***(h)A-**	(A = approximant; §III.5.5)
PTB ***gl-** > PCN ***tsh-**	(§III.5.3.1)

[146] The IPA diacritics ◌̬ and ◌̥ indicate voicing and voicelessness, respectively.

Dental~palatal interchange

PTB ***dz(y)-***, ***ts(y)-*** > (?) > PCN ***ts(h)-***, ***tʃ(h)-*** (§III.5.3)

Extrusion

PTB ***pʷa*** > PCN ***p(h)wa(ʔ)*** (§III.3.1.2, §III.5.1.1)

Initial + medial coalescence

PTB ***kr-*** > PCN ***s-*** (§III.5.2.1)
PTB ***sy-*** > PCN ***ʃ-*** (§III.5.2.1)
PTB ***hy-*** > PCN ***hj-*** (§III.5.5.2)
PTB ***gl-*** > PCN ***tsh-*** (§III.5.3.1)

Glide interchange

PTB ***r-*** > PCN ***(h)l-*** (sporadic) (§III.5.5.4)
PTB ***l-*** > PCN ***(h)r-*** (sporadic) (§III.5.5.3)

Buccalization

PTB ***h-*** > PCN ***x-*** (sporadic) (§III.5.2.3)

Rhinoglottophilia

PTB ***hy-*** > PCN ***hn-*** (sporadic) (§III.5.4.2)

A.3. Medials

Loss

PTB ***-wa(ː)y*** > PCN ***-aj*** (§III.5.8.1)
PTB ***-wəy*** > PCN ***-əj(ʔ)*** (§III.5.8.1)
PTB ***s-ŋy-*** > PCN ***hŋ-*** (§III.5.8.2)
PTB ***ry-*** > PCN ***r-*** (sporadic) ICE, SNOW, HAIL [99]
PTB ***s-bl-*** > PCN ***p-*** MALE (OF ANIMALS) [216]

Coalescence with rime

PTB ***-wak*** > PCN ***-uk*** (§III.3.4.6)

PTB ***-wam** > PCN ***-əm** (§III.3.2.3)
PTB ***-waːr** > PCN ***-an** (§III.3.3.2)
PTB ***-war** > PCN ***-ən** (§III.3.3.3)

Coalesence with initial

PTB ***kr-** > PCN ***s-** (§III.5.2.1)
PTB ***sy-** > PCN ***ʃ-** (§III.5.2.1)
PTB ***hy-** > PCN ***hj-** (§III.5.5.2)
PTB ***gl-** > PCN ***tsh-** (§III.5.3.1)
PTB ***dz(y)-**, ***ts(y)-** > (?) > PCN ***ts(h)-**, ***tʃ(h)-** (§III.5.3)

A.4. Other (Irregular) Changes

Echo vowel

PTB ***haːr** > ****haːn** > PCN ***haːn-a** CHICKEN [165]
PTB ***ser** > PCN ***ʃərə** ? ICE, SNOW, HAIL [99]

Phonological reanalysis

PTB ***r-w-** > PCN ***rw-** RAIN [39]
PTB ***mr-** > PCN ***m-r-** STARE, LOOK AT, WATCH [205]

Followed by loss of the reinterpreted initial:

PTB ***sy-** > ****s-y-** > PCN ***y-** ? IRON [174]
PTB ***pl-** > ****p-l-** > ****l-** > PCN ***r-** BURN [227]
PTB ***kl-** > ****k-l-** > PCN ***hl-** WRAP / COVER (v.) [158]
PTB ***gr-** > ****g-r-** > PCN ***(h)r-** BIND, TIE [257]
PTB ***s-gr-** > ****s/g-r-** > PCN ***hr-** CATCH, SEIZE, HOLD [139]

APPENDIX B. SOUND CHANGES: PCN > CN

This appendix categorizes the PCN > CN sound changes (excluding retentions) proposed in the dissertation. Note that some changes are classified under more than one category (e.g. PCN ***-a(ʔ)** > Lotha **-o(ʔ)** involves both raising and rounding).

B.1. Rimes

Monophthongization

PCN ***-aj(ʔ)** > Lotha **-a(ʔ)**	(§III.3.1.3)
PCN ***-aj(ʔ)** > Sang., Yim. **-a**, **-i**	(§III.3.1.3)
PCN ***-ej(ʔ)** > PAo, Lotha, Sang. **-i(ʔ)**	(§III.3.1.4)
PCN ***-ej(ʔ)** > Yim. **-o**	(§III.3.1.4)
PCN ***-əj(ʔ)** > Lotha, Sang. **-ə(ʔ)**	(§III.3.1.8)
PCN ***-əj(ʔ)** > Yim. **-e** / ***(h)r**, ****ʃ** _	(§III.3.1.8)
PCN ***-əj(ʔ)** > Yim. **-i(ʔ)**	(§III.3.1.8)
PCN ***-əj(ʔ)** > PAo ***-ə(ʔ)** / ***(h)r**, ***s** _	(§III.3.1.8)

Rounding

PCN ***-a(ʔ)** > Lotha **-o(ʔ)**	(§III.3.1.1)
PCN ***-ej(ʔ)** > Yim. **-o**	(§III.3.1.4)
PCN ***-a(ʔ)** > Sang. **-u(ʔ)** / ***j**, ***s**, ***ʃ**, ***ts** _	(‘velarization’; §III.3.1.1)
PCN ***-ə(ʔ)** > Yim. **-u**	(‘velarization’; §III.3.1.7)
PCN ***-a(ː)n** > Yim. **-o**	(§III.3.3.1, §III.3.3.2)

Raising

PCN ***-a(ʔ)** > Lotha **-o(ʔ)**	(§III.3.1.1)
PCN ***-a(ʔ)** > Yim. **-i(ʔ)** / *palatal _	(‘palatalization’; §III.3.1.1)
PCN ***-a(ʔ)** > Sang. **-u(ʔ)** / ***j**, ***s**, ***ʃ**, ***ts** _	(‘velarization’; §III.3.1.1)
PCN ***-ə(ʔ)** > Yim. **-u**	(‘velarization’; §III.3.1.7)

PCN ***-aːm** > Yim. **-im** (§III.3.2.1)
PCN ***-a(ː)n, *-ən** > Sang. **-i** ('palatalization'; §II.4.3)
PCN ***-a(ː)n** > Yim. **-o** (§III.3.3.1, §III.3.3.2)
PCN ***-an/t** > Lotha **-en/t** (§III.3.3.2)
PCN ***-at** > Sang. **-e** (§III.3.3.5)
PCN ***-aŋ** > Sang. **-iŋ, -e** ? (§III.3.4.1)

Lowering

PCN ***-əj(ʔ)** > Yim. **-e** / ***(h)r**, ****ʃ _** (§III.3.1.8)
PCN ***-it** > Lotha **-et** (§III.3.3.5)
PCN ***-ut** > Yim. **-o** ? (§III.3.3.5)
PCN ***-uk/ŋ** > Lotha **-ok/ŋ** (§III.3.4.6)
PCN ***-i(ʔ)** > Yim. **-e** (§III.3.1.5)

Backing

PCN ***-ej(ʔ)** > Yim. **-o** (§III.3.1.4)
PCN ***-ə(ʔ)** > Yim. **-u** ('velarization'; §III.3.1.7)

Fronting

PCN ***-ət** > Sang. **-e** (§III.3.3.5)
PCN ***-ən/t** > Lotha **-en/t** (§III.3.3.3)
PCN ***-əj(ʔ)** > Yim. **-e** / ***(h)r**, ****ʃ _** (§III.3.1.8)
PCN ***-ən** > Sang. **-i** ('palatalization'; §II.4.3)

Medial + rime coalescence

PCN ***-wa(ʔ)** > Lotha, Sang., Yim. **-u(ʔ)** (§III.3.1.2)

Reduction

PCN ***-a(ʔ)** > Yim. **-ə(ʔ)** (§III.3.1.1)
PCN ***-u(ʔ)** > Sang., Yim. **-ə(ʔ)** (§III.3.1.6)
PCN ***-Vm/p/n/t** > PAo ***-əm/p/n/t** (§II.4.1.5, §II.4.3)
PCN ***-am/p/ŋ** > Lotha **-əm/p/ŋ** (§III.3.2.2, §III.3.2.5, §III.3.4.1)
PCN ***-ap** > Sang. **-əp** (§III.3.2.5)

PCN ***-at** > Yim. **-ə** ? (§III.3.3.5)
PCN ***-it** > Yim. **-ət** (§III.3.3.5)
PCN ***-ut** > Sang. **-ə** ? (§III.3.3.5)
PCN ***-ak** > Yim. **-ək** / ***(h)r** _ (§III.3.4.4)
PCN ***-ak** > Lotha **-ək** (§III.3.4.4)
PCN ***-ak** > PAo ***-ək** / ***ts(h)**, ***hrj** _ (§III.3.4.4)
PCN ***-ik** > Yim. **-ək** (§III.3.4.5)
PCN ***-aŋ** > Sang. **-e** ? (§III.3.4.1)
PCN ***-aŋ,** ***-iŋ** > Yim. **-əŋ** / ? (§III.3.4.1, §III.3.4.2)
PCN ***-iŋ** > PAo, Lotha **-əŋ** / *sibilant _ (§III.3.4.2)

Shortening

PCN ***-aːm** > Yim. **-im** (§III.3.2.1)
PCN ***-aːm/n** > Lotha **-an** (§III.3.2.1)
PCN ***-aːm** > Sang. **-aŋ** (§III.3.2.1)
PCN ***-aːn** > Yim. **-an** (§III.3.3.1)

Reanalysis

PCN ***-ik/ŋ** > Lotha **-jək/ŋ** (§III.3.4.5)

Coda dentalization

PCN ***-aːm** > Lotha **-an** (§III.3.2.1)

Coda velarization

PCN ***-a(ː)m** > Sang. **-aŋ** (§III.3.2.1)

Coda loss/debuccalization

PCN ***-V̥t** > Lotha **-aʔ** ? (§III.3.3.5)
PCN ***-at,** ***-ət** > Sang. **-e** (§III.3.3.5)
PCN ***-at** > Yim. **-ə** ? (§III.3.3.5)
PCN ***-it** > Sang. **-i** (§III.3.3.5)
PCN ***-ut** > Lotha **-uʔ** ? (§III.3.3.5)
PCN ***-ut** > Yim. **-o** ? (§III.3.3.5)

PCN ***-ut** > Sang. **-ə** ? (§III.3.3.5)
PCN ***-aŋ** > Sang. **-e** ? (§III.3.4.1)
PCN ***-a(ː)n** > Yim. **-o** (§III.3.3.1, §III.3.3.2)
PCN ***-a(ː)n, *-ən** > Sang. **-i** (§II.4.3)
PCN ***-k** > Sang. **-Ø/ʔ** (§III.3.4.4, §III.3.4.5, §III.3.4.6)

Unknown change

PCN ***-V̥t** > Lotha **-aʔ** ? (§III.3.3.5)

B.2. Initials

(Af)frication

PCN ***ph-** > Sang., Yim. **f-** (§III.5.1.1)
PCN ***thj-** > Lotha **tʃh-** (§III.5.1.2)
PCN ***s-** > ****th-** > Lotha **tʃh-** / _ ***-əj** (§III.5.1.2)
PCN ***s-** > ****th-** > Lotha **tsh-** / _ ***-iŋ**, ***-ə** (§III.5.1.2)
PCN ***khj-** > Lotha, Sang. **f-** (§III.5.1.3)
PCN ***khl-** > Lotha, Sang. **tʃh-** (§III.5.1.3)
PCN ***w-** > Lotha, Sang. **v-** (§III.5.5.1)
PCN ***hj-** > Sang. **ʃ-** ? (§III.5.5.2)
PCN ***hrj-** > PAo ***tsh-** (§III.5.5.3)
PCN ***hr-** > Lotha **v-** / _ ***-əj** (§III.5.5.3)
PCN ***hr-** > Sang. **x/ɣ-** / _ ***-ə-**, ***-waʔ** (§III.5.5.3)
PCN ***hrj-** > Sang. **x/ɣ-** (§III.5.5.3)
PCN ***l-** > Lotha, Sang. **ʒ-** / _ ***-əj(ʔ)** (§III.5.5.4)
PCN ***l-** > Lotha **z-** / _ ***-ik** (§III.5.5.4)
PCN ***lj-** > Lotha **ʒ-** / _ ***-u** (§III.5.8.2)
PCN ***hl-** > Lotha **ʒ-** / _ ***-əj(ʔ)** (§III.5.5.4)
PCN ***hl-** > Sang. **ʃ-** / _ ***-əj(ʔ)** (§III.5.5.4)
PCN ***hl-** > Lotha, Yim. **ʃ-** / ? (§III.5.5.4)

Occlusivization

PCN ***s-*** > Lotha **th-** (§III.5.2.1)
PCN ***l-*** > Sang. **n-** / _ ***-ju*** (§III.5.5.4)

Rhinoglottophilia

PCN ***h-*** > Yim. **n-** (sporadic) (§III.5.2.4)

Labialization

PCN ***khj-*** > Lotha, Sang. **f-** (§III.5.1.3)
PCN ***ɣ-*** > Sang. **v-** (§III.5.2.3)
PCN ***hr-*** > Lotha **v-** / _ ***-əj*** (§III.5.5.3)

Palatalization

PCN ***ts(h)-*** > PAo ***tʃ(h)-*** (§III.5.3.1)
PCN ***thj-*** > Lotha **tʃh-** (§III.5.1.2)
PCN ***s-*** > ****th-** > Lotha **tʃh-** / _ ***-əj*** (§III.5.1.2)
PCN ***(h)m-*** > Sang. **n^{j}-** / _ ***-ən, -it*** (§III.5.4.1)
PCN ***(h)n-*** > Sang., Yim. **n^{j}-** / _ ***-i, -əj*** (§III.5.4.2)
PCN ***(h)nj-*** > Sang., Yim. **n^{j}-** (§III.5.4.2)
PCN ***khl-*** > Lotha, Sang. **tʃh-** (§III.5.1.3)
PCN ***s-*** > Yim. **ʃ-** / _ ***-əj*** (§III.5.2.1)
PCN ***l-*** > Lotha **j-** / _ ***-iŋ*** (§III.5.5.4)
PCN ***l-*** > Yim. **j-** / _ ***-əj(ʔ)*** (§III.5.5.4)
PCN ***l-*** > PAo ***j-*** (sporadic) (§III.5.5.4)
PCN ***l-*** > Lotha, Sang. **ʒ-** / _ ***-əj(ʔ)*** (§III.5.5.4)
PCN ***lj-*** > Lotha **ʒ-** / _ ***-u*** (§III.5.8.2)
PCN ***hl-*** > Lotha **ʒ-** / _ ***-əj(ʔ)*** (§III.5.5.4)
PCN ***hl-*** > Sang. **ʃ-** / _ ***-əj(ʔ)*** (§III.5.5.4)
PCN ***hl-*** > Lotha, Yim. **ʃ-** / ? (§III.5.5.4)

Dentalization

PCN ***(h)m-*** > PAo ***n-*** / _ ***-ik/ŋ*** (§III.5.4.1)
PCN ***mj-*** > PAo ***hn-*** ? (§III.5.4.1)

PCN ***(h)m-*** > Sang. **n-** / _ ***-iŋ** (§III.5.4.1)
PCN ***mj-*** > Sang. **n-** (§III.5.4.1)
PCN ***(h)m-*** > Yim. **n-** / _ ***-it** (§III.5.4.1)
PCN ***ʒ-*** > Lotha, Sang., Yim. **z-** (§III.5.2.2)
PCN ***ʃ-*** > PAo, Lotha **s-** (§III.5.2.1)
PCN ***tʃh-*** > Lotha **tsh-** / _ ***-ak** (§III.5.3.2)
PCN ***tʃ(h)-*** > Sang. **ts(h)-** / _ ***-ak** (§III.5.3.2)
PCN ***tʃ-*** > PAo ***ts-** / _ ***-ə(j)(ʔ)** (§III.5.3.2)
PCN ***hrj-*** > PAo ***tsh-** (§III.5.5.3)

Velarization

PCN ***hr-*** > Sang. **x/ɣ-** / _ ***-ə-**, ***-waʔ** (§III.5.5.3)
PCN ***hrj-*** > Sang. **x/ɣ-** (§III.5.5.3)

Loss

PCN ***l-*** > Lotha, Sang. **Ø** / _ ***-jak** (§III.5.5.4)
PCN ***l-*** > PAo **Ø** / _***-juk** (§III.5.5.4)
PCN ***h-*** > Sang. **Ø** (sporadic) (§III.5.2.4)
PCN ***w-*** > Yim. **Ø** (§III.5.5.1)
PCN ***l-*** > Yim. **Ø** / _***-ju** (§III.5.5.4)

Lenition

PCN ***ʒ-*** > Lotha **r-** (sporadic) (§III.5.2.2)
PCN ***ʒ-*** > Sang. **j-** (sporadic) (§III.5.2.2)

Debuccalization

PCN ***ɣ-**, ***x-*** > Lotha **h-** (§III.5.2.3)
PCN ***hw-*** > Lotha, Sang., Yim. **h-** (§III.5.5.1)
PCN ***hl-*** > Sang. **h-** ? (§III.5.5.4)
PCN ***ɣ-*** > Yim. **h-** (§III.5.2.3)
PCN ***hj-*** > Yim. **h-** ? (§III.5.5.2)

Buccalization

PCN ***h-*** > Lotha **f-** / _ ***-u** (§III.5.2.4)
PCN ***h-*** > Sang. **f-** (sporadic) (§III.5.2.4)

Voicing/De-aspiration

PCN ***hm-*** > PAo, Sang., Yim. **m-** (§III.5.4.1)
PCN ***hm-*** > PAo ***n-** / _ ***-ik/ŋ** (§III.5.4.1)
PCN ***hm-*** > Sang. **n-** / _ ***-iŋ** (§III.5.4.1)
PCN ***hm-*** > Sang. **nʲ-** / _ ***-ən, *-it** (§III.5.4.1)
PCN ***hm-*** > Yim. **n-** / _ ***-it** (§III.5.4.1)
PCN ***hn-*** > Lotha, Sang., Yim. **n-** (§III.5.4.2)
PCN ***hn-*** > Sang., Yim. **nʲ-** / _ ***-i**, ***-əj** (§III.5.4.2)
PCN ***hnj-*** > Sang., Yim. **nʲ-** (§III.5.4.2)
PCN ***hŋ-*** > Lotha, Sang., Yim. **ŋ-** (§III.5.4.3)
PCN ***tʃh-*** > Yim. **tʃ-** (§III.5.3.2)
PCN ***hj-*** > Lotha **j-** (§III.5.5.2)
PCN ***hr-*** > Lotha **v-** / _ ***-əj** (§III.5.5.3)
PCN ***hr-*** > Yim. **r-** ? (§III.5.5.3)
PCN ***hl-*** > Sang., Yim. **l-** (§III.5.5.4)
PCN ***hl-*** > Lotha **ʒ-** / _ ***-əj(ʔ)** (§III.5.5.4)

Devoicing

PCN ***mj-*** > PAo ***hn-*** ? (§III.5.4.1)

B.3. Prefixes

Raising (+Rounding)

PCN ***a-*** > Lotha **e¹-**, **o¹-** ? (§III.4.1)

Nasalization

PCN ***ph-*** > Lotha **m̥¹-** (§III.4.3)
PCN ***ph-*** > Sang. **mə-** (§III.4.3)

B.4. Medials

Loss

PCN ***-j-** > PAo, Sang. **Ø** / ***p_**	(§III.5.8.2)
PCN ***-j-** > PAo **Ø** / ***(h)n** _	(§III.5.8.2)
PCN ***-j-**, ***-l-** > Yim. **Ø** / ***k(h)** _	(§III.5.8.2, §III.5.8.3)
PCN ***-w-** > Yim. **Ø**	(§III.5.8.1)

Coalescence with initial

PCN ***thj-** > Lotha **tʃh-**	(§III.5.1.2)
PCN ***khj-** > Lotha, Sang. **f-**	(§III.5.1.3)
PCN ***khl-** > Lotha, Sang. **tʃh-**	(§III.5.1.3)
PCN ***mj-** > PAo ***hn-** ?	(§III.5.4.1)
PCN ***mj-** > Sang. **n-**	(§III.5.4.1)
PCN ***hnj-** > Sang., Yim. **n^{j}-**	(§III.5.4.2)
PCN ***hrj-** > PAo ***tsh-**	(§III.5.5.3)
PCN ***hrj-** > Sang. **x/ɣ-**	(§III.5.5.3)
PCN ***lj-** > Lotha **ʒ-** / _ ***-u**	(§III.5.8.2)

Coalescence with rime

PCN ***-wa(ʔ)** > Lotha, Sang., Yim. **-u(ʔ)**	(§III.3.1.2)

B.5. Other (Irregular) Changes

Echo vowels

PCN ***sak** > PAo (?) > Mongsen **[tə] -saka**	BREATH [242]

Phonological reanalysis

PCN ***r-hw-** > Sang. ***hrw-**	BAMBOO$_1$ [28]
PCN ***pw-** > ****p-w-** > ****w-** > Sang. **v-**	FATHER [37]
PCN ***uk** > ****wuk** > Sang. **vu(ʔ/k)**	SWEEP [265]
PCN ***p-hw-** > PAo ***phw-**	TOOTH [27]
PCN ***k-hwuŋ** > ****khwuŋ** > PAo ***khuŋ**	NECK [220]

PCN ***ph-j-** > ****p-hj-** > Mongsen **hj-**	URINATE / URINE [225]
PCN ***th-l-** > PAo ***t-hl-**	VINE / VEIN / SINEW [114]

APPENDIX C. SOUND CHANGES: PAO > AO

This section summarizes the Proto-Ao > Mongsen/Chungli sound changes proposed (excluding retentions). Note that some changes are classified under more than one category (e.g. PAo ***tʃh-*** > Ch **s-** involves dentalization as well as lenition).

C.1. Onsets

De-aspiration

PAo ***ph-*** > Ch **p-**	(§II.3.1.1: p.50)
PAo ***th-*** > Ch **t-**	(§II.3.1.2: p.52)
PAo ***kh-*** > Ch **k-**	(§II.3.1.3: p.55)
PAo ***tsh-*** > Ch [ts-] (/tʃ-/)	(§II.3.3.2: p.76) [147]

Voicing

PAo ***x-*** > Ch **w-**	(§II.3.2.3: p.63)
PAo ***hm-*** > Ch **m-**	(§II.3.4.1: p.77)
PAo ***hm-*** > Ch **n-** / _ ***-əj(ʔ)**	(§II.3.4.1: p.79)
PAo ***hn-*** > Ch **n-**	(§II.3.4.2: p.81)
PAo ***hŋ-*** > Ch **ŋ-**	(§II.3.4.3: p.84)
PAo ***hw-*** > Ch **w-**	(§II.3.5.1: p.86)
PAo ***hɹ-*** > Ch **ɹ-**	(§II.3.5.3: p.90)
PAo ***hl-*** > Ch **l-**	(§II.3.5.4: p.97)
PAo ***hl-*** > Ch **z-** / _ ***-əj(ʔ)**, ***-ik/ŋ**	(§II.3.5.4: pp.95–96)

Dentalization

PAo ***ʃ-*** > Mo **s-**	(§II.3.2.1: p.57)
PAo ***ʒ-*** > Mo **z-**	(§II.3.2.2: p.61)

[147] Recall that Chungli merged PAo ***ts-***, ***tsh-***, and ***tʃ-*** to /tʃ-/, but retained the reflexes of ***tsh-*** and ***ts-*** (in all environments except before ***-i***) as the [ts-] allophone of /tʃ-/ (cf. §II.3.3, especially Table 42).

PAo ***tʃh-*** >Mo **tsh-** / _ ***-ə(k)** (§II.3.3.1: p.72)
PAo ***tʃh-*** > Ch **s-** (§II.3.3.1: pp.70, 72)
PAo ***(h)m-*** > Ch **n-** / _ ***-əj(ʔ)** (§II.3.4.1: p.79)
PAo ***j-*** > Ch **z-** / _ ***-əj(ʔ)** (§II.3.5.2: p.90)

Lenition

PAo ***tʃh-*** > Ch **s-** (§II.3.3.1: pp.70, 72)
PAo ***ʒ-*** > Ch **j-** (§II.3.2.2: p.61)
PAo ***x-*** > Mo **hw-** (§II.3.2.3: p.63)
PAo ***ɣ-*** > Mo **w-** (§II.3.2.3: p.63)
PAo ***x/ɣ-*** > Ch **w-** (§II.3.2.3: p.63)

Labialization

PAo ***x-*** > Mo **hw-** (§II.3.2.3: p.63)
PAo ***ɣ-*** > Mo **w-** (§II.3.2.3: p.63)
PAo ***x/ɣ-*** > Ch **w-** (§II.3.2.3: p.63)

Loss

PAo ***hj-*** > Ch **Ø** (§II.3.5.2: p.87)
PAo ***h-*** > Ch **Ø** (§II.3.2.4: p.64)

Coalescence with rime

PAo ***(h)wa(ʔ)*** > Ch **u(ʔ)** (§II.3.5.1: p.87)

Palatalization

PAo ***ts-*** > Mo **tʃ-** / _ ***-ak/ŋ** (§II.3.3.2: p.75)
PAo ***ts-*** > Ch [tʃ-] (/tʃ-/) / _ ***-i** (§II.3.3.2: p.75)

Spirantization

PAo ***j-*** > Ch **z-** / _ ***-əj(ʔ)** (§II.3.5.2: p.90)
PAo ***(h)l-*** > Ch **z-** / _ ***-əj(ʔ)**, ***-ik/ŋ** (§II.3.5.4: pp.95–96)
PAo ***lj-*** > Ch **z-** (§II.3.6.3: p.102)

Cluster simplification

PAo ***lj-** > Mo **l-**	(§II.3.6.3: p.102)
PAo ***lj-** > Mo **j-** / (sporadic)	(§II.3.6.3: p.102)
PAo ***t(h)j-** > Ch **t-**	(§II.3.6.2: p.102)
PAo ***p(h)w-** > Mo **p(h)-**	(§II.3.6.1: p.101)

Cluster coalescence

PAo ***t(h)j-** > Mo **tʃ(h)-**	(§II.3.6.2: p.102)
PAo ***tj-** > Mo **tʃ-**	(§II.3.6.2: p.102)
PAo ***lj-** > Ch **z-**	(§II.3.6.3: p.102)
PAo ***lj-** > Ch **n-** / (sporadic)	(§II.3.6.3: p.102)

Fortition

PAo ***lj-** > Ch **n-** / (sporadic)	(§II.3.6.3: p.102)

C.2. Rimes

Raising/fronting ('brightening')

PAo ***-a(ʔ)** > Ch **-i(ʔ)** / ***ʃ**, ***ʒ**, ***tʃ**, ***tʃh** _	(§II.4.1.1: p.108)
PAo ***-u(ʔ)** > Ch **-i(ʔ)** / ***tʃ** _	(§II.4.1.3: p.114)
PAo ***-ə(ʔ)** > Ch **-i(ʔ)** / ***ʃ** _	(§II.4.1.4: p.116)

Raising/backing ('velarization')

PAo ***-a(ʔ)** > Ch **-u(ʔ)** / ***(h)ŋ** _	(§II.4.1.1: p.108)
PAo ***(h)wa(ʔ)**, ***-wa(ʔ)** > Ch **u(ʔ)**	((§II.3.5.1: p.87; §II.4.1.1: p.108)

Coalescence with medial

PAo ***(h)wa(ʔ)**, ***-wa(ʔ)** > Ch **u(ʔ)**	(§II.3.5.1: p.87; §II.4.1.1: p.108)

Reduction

PAo ***-V-** > Ch **-ə-** / ***z** _	(§II.4.1.1: p.110; §II.4.1.2: p.113)
PAo ***-i(ʔ)** > Mo **-ə(ʔ)** / ***ts** _	(§II.4.1.2: p.112)
PAo ***-ak/ŋ** > Ch **-ək/ŋ** / ***lj**, ***ts** _	(§II.4.5.1: p.128)

PAo ***-ik/ŋ*** > Ch ***-ək/ŋ*** (§II.4.5.2: p.130)
PAo ***-a(k)*** > Ch, Mo ***-ə(k)*** / (sporadic) (§II.4.1.1: p.110; §II.4.5.2: p.129)
PAo ***-uk/ŋ*** > Mo ***-ək/ŋ*** / (sporadic) (§II.4.5.3: p.132)

Monophthongization

PAo ***-əj(ʔ)*** > Mo ***-i(ʔ)*** (§II.4.1.5: p.119)
PAo ***-əj(ʔ)*** > Ch ***-ə(ʔ)*** (§II.4.1.5: p.119)
PAo ***-aj*** > Ch, Mo ***-a*** (§II.4.1.5: p.117)

Metathesis

PAo ***-ə*** > Ch metathesis / ***(h)ɹ_#*** (§II.4.1.4: p.117)

Vowel harmony

PAo ***V*** > Ch ***u*** / (sporadically in env. of ***u***) (§II.4.1.1: p.108)

APPENDIX D. CHARTS: PTB > PCN > CN

The charts in the following sections summarize the PTB > PCN > CN sound changes in the rimes (§D.1), initials (§D.2), medials (§D.3), and prefixes (§D.4).

D.1. Rimes

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-a	***-a(ʔ)**	*-a(ʔ)	-o(ʔ)	-u(ʔ) / *j, *s, *ʃ, *ts _ -a(ʔ) else.	-i(ʔ) / *pal. _ -ə(ʔ) else.
*-a-y, *-a(ː)y	***-aj(ʔ)**	*-aj(ʔ)	-a(ʔ)	-a, -i	-a, -i
*-ey	***-ej(ʔ)**	*-i(ʔ)	-i(ʔ)	-i(ʔ)	-o
*-i	***-i(ʔ)**				-e
*pʷa, *wa (reanalyzed: **-wa)	***-wa(ʔ)**	*-wa(ʔ)	-u(ʔ)	-u	-u
*-a(ː)w, *-əw, *-ow, *-u *pʷa, (*wa ?)	***-u(ʔ)**	*-u(ʔ)		-u, -ə	-u(ʔ), -ə(ʔ)
*-i(ː)l, *-al, *-uːl *-i / *kr_ *-u / *tsy_, *dz(y)_	***-ə(ʔ)**	*-ə(ʔ)	-ə(ʔ)	-ə	-ə, -u
*-əy	***-əj(ʔ)**	*-ə(ʔ) / *(h)r, *s _ *-əj(ʔ) else.			-e / *(h)r, **ʃ _ -i(ʔ) else.
*-am	***-aːm**	*-əm	-an	-aŋ	-im
*-um, *-im	***-am**		-əm		-am
*-um, *-im, *-wam, *-em	***-əm**			-əm	-əm
*-up/ip	***-ap**	*-əp	-əp	-əp	-ap
*-up/ip, *-op/wap, *-ep	***-əp**				-əp

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-an, *-a(ː)r	***-aːn**	*-ən	-an	-i	-an, -o
*-waːr	***-an**		-en		-ən
*-a(ː)r, *-war, *-or, *-uːr, *-iːr, *-in	***-ən**				
*-at	***-at**	*-ət	-e[t]	-e	-ə ʔ
*-iːt/ut ʔ, *-əy-t	***-ət**		-et	-i	-ət
*-is	***-it**				
*-us	***-ut**		-uʔ ʔ	-ə ʔ	-o ʔ
*-iːt ʔ	***-V̥t**		-aʔ ʔ	—	—
*-aŋ	***-aŋ**	*-aŋ	-əŋ	-aŋ, -iŋ, -e ʔ	-aŋ, -əŋ
*-i(ː)ŋ	***-iŋ**	*-əŋ / *sib. _ *-iŋ else.	-əŋ / *sib._ -jəŋ else.	-iŋ	-iŋ, -əŋ
*-u(ː)ŋ, *-oŋ, *-a(ː)ŋ / *k _	***-uŋ**	*-uŋ	-oŋ	-uŋ	-uŋ
*-a(ː)k	***-ak**	*-ək / *ts(h), *hrj _ *-ak else.	-ak / *pal._ -ək else.	-a(ʔ/k)	-ək / *(h)r _ -ak else.
*-ik	***-ik**	*-ik	-jək	ʔ	-ək
*-u(ː)k, *-wak, *-əw-k	***-uk**	*-uk	-ok	-u(ʔ/k)	-uk

Table 210: PTB > PCN > CN sound changes (rimes)

D.2. Initials

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*p-, *b-	***p-**	*p-	p-	p-	p-
	***ph-**	*ph-	ph-	ph-, f-	ph-, f-
*t-, *d-	***t-**	*t-	t-	t-	t-
ʔ	***th-**	*th-	tsh- / _ *-iŋ, *-ə tʃh- / _ *-əj *thj- > tʃh- th- else.	th-	ʔ

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*k-, *g-	***k-**	*k-	k-	k-	k-
	***kh-**	*kh-	*khj- > f- *khl- > tʃh- kh- else.	*khj- > f- *khl- > tʃh- kh- else.	kh-
*s-, *kr-	***s-**	*s-	th-	s-	ʃ- / _ *-əj s- else.
*s-, *sy-	***ʃ-**	*ʃ- / _ -aʔ *s- else.	ʃ- / ? s- else.	ʃ-	ʃ-
*(t)sy- ?	***z-**	*z-	z-	z-	z-
	***ʒ-**	*ʒ-	r- (sporadic) z-	j-, ʒ- (sporadic?) z-	z-, ʒ-
?	***ɣ-**	*ɣ-	h-	v-	h-
*h-	***x-**	*x-		?	?
	***h-**	*h-	f- / _ *-u h- else.	f-, Ø- (sporadic) h-	n- (sporadic) h-
*dz(y)-, *ts(y)-, *gl-	***ts-**	*ts- / _ **-ək, **-əŋ *tʃ- else.	ts-	ts-	ts-
	***tsh-**	*tʃh-	tsh-	tsh-	tsh-
*dz(y)-, *ts(y)-	***tʃ-**	*ts- / _ *-ə(j)(ʔ) *tʃ- else.	tʃ-	ts- / _ *-ak tʃ- else.	tʃ-
	***tʃh-**	*tʃh-	tsh- / _ *-ak tʃh- else.	tsh- / _ *-ak tʃh- else.	
*m-	***m-**	*n- / _ *-ik/ŋ *mj- > *hn- ? *m- else.	m-	n- / _ *-iŋ *mj- > n- n^j- / _ *-ən, *-it m- else.	n- / _ *-it m- else.
	***hm-**		hm-		
*n-	***n-**	*n-	n-	n^j- / _ *-i, *-əj *(h)nj- > n^j- n- else.	n^j- / _ *-i, *-əj *(h)nj- > n^j- n- else.
*n-, *hy- (sporadic)	***hn-**	*hn-	hn- / _ *-j- n- else.		
*ŋ-	***ŋ-**	*ŋ-	ŋ-	ŋ-	ŋ-
	***hŋ-**	*hŋ-			
*w-	***w-**	*w-	v-	v-	Ø
	***hw-**	*hw-	h-	h-	h-

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*y-	***j-**	*j-	j-	j-	j-
*y-, *hy-	***hj**	*hj-		ʃ- ?	h- ?
*l- (sporadic), *r-	***r-**	*ɹ-	r-	r-	r-
	***hr-**	*hrj- > *tsh- *hɹ- else.	v- / _ *-əj hr- else.	x/ɣ- / _ *-ə-, *-waʔ *hrj- > x/ɣ- r- else.	r-, r̥- ?
*r- (sporadic), *l-	***l-**	Ø / _*-juk *j- (sporadic) *l- else.	ʒ- / _*-əj(ʔ) *lj- > ʒ- / _ *-u z- / _ *-ik j- / _ *-iŋ Ø / _ *-jak l- else.	ʒ- / _ *-əj n- / _ *-ju Ø / _ *-jak l- else.	j- / _ *-əj(ʔ) Ø / _ *-ju l- else.
	***hl-**	*hl-	ʒ- / _ *-əj(ʔ) ʃ-, hl- else.	ʃ- / _ *-əj(ʔ) h-, ʃ- / ? l- else.	ʃ- / ? l- else.
*ŋ- (sporadic)	**Ø-**	Ø-	Ø-	Ø-	Ø-
?	***C$_ʔ$-**	*tʃ-	h-	z-	w-

Table 211: PTB > PCN > CN sound changes (initials)

D.3. Medials

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-w-	***-w- / _ *-i**	?	?	?	Ø
	Ø / _ *-a(ː)y, *-əy				
	***-wam > *-əm** ***-waːr > *-an** ***-war > *-ən** ***-wak > *-uk**	(see rimes table)			
*p^{w}a, *wa (reanalyzed: *-wa)	***-wa(ʔ)**	*-wa(ʔ)	-u(ʔ)	-u	-u

*Table 212: PTB > PCN > CN sound changes (medial ***-w-**)*

PTB	*PCN*
*-y-	***sy-** > ***ʃ-** ***tsy-**, ***dzy-** > ***tʃ-** (and ***ts-**) ***hy-** > ***hj-** **Ø** / ***ŋ_** ***r_** (sporadic) ***-j-** / elsewhere

*Table 213: PTB > PCN sound changes (medial ***-j-**)*

PCN	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
***-j-**	Ø / *p, *(h)n _		Ø / *p_	Ø / *k(h)_
	*-j- / *th, *k _	*-j- / *p, *m, *(h)n, *k _	*-j- / *(h)n, *k _	*-j- / *p, *m, *n, *hr _
	*mj- > *hn-		*mj- > n-	
		*thj- > tʃh-		
		*khj- > f-	*khj- > f-	
	*hrj- > *tsh-		*hrj- > x/ɣ-	
	*lj- > *lj- / _ *-ak > *j- / _ *-uk	*lj- > j- / _ *-ak > ʒ- / _ *-u	*lj- > j- / _ *-ak > n^j- / _ *-u	*lj- > lj- / _ *-ak > j- / _ *-u

*Table 214: PCN > CN sound changes (medial ***-j-**)*

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
*-l-	***-l-**	?	*khl- > tʃh-	*khl- > tʃh-	Ø / *kh_

*Table 215: PTB > PCN > CN sound changes (medial ***-l-**)*

D.4. Prefixes

PTB	*PCN*	*PAo*	*Lotha*	*Sangtam*	*Yimchungrü*
?	***a-**	*a-	e[1]-, o[1]-	a-	a-
*m-	***m-**	*m-	m̩[1]-	mə-	mə-
*p-	***p-**	*p-	?	?	?
*s-b/m- ?	***ph-**	*ph-	m̩[1]-	mə-	phV-
*d-	***t-**	*t-	tV-	t(h)ə-	tə-
?	***th-**	*th-	t(h)V-	thə-	thə-
*g/k-	***k-**	*k-	?	?	?
*r-	***r-**	?	?	(reanalyzed)	?
*s-C̬-	***C̬-**	(see initials table)			

Table 216: PTB > PCN > CN sound changes (prefixes)

APPENDIX E. CHARTS: PTB > PAO > AO

The charts in the following sections summarize the PTB > PAo > Mongsen/Chungli sound changes in the onsets (§E.1) and rimes (§E.2).

E.1. Onsets

	PTB	*PAo*	*Mongsen*	*Chungli*
stops:	*b-, *p-	***p-**	p-	p-
	*s-p-, *b-	***ph-**	ph-	
	*d-, *t-	***t-**	t-	t-
	?	***th-**	th-	
	*k-, *g-	***k-**	k-	k-
	*(s-)k-	***kh-**	kh-	
fricatives:	*s- *kr- / _ *-i	***s-**	s-	s-
	*sy-	***ʃ-**		
	*-r- clusters?	***z-**	z-	z- j-
	?	***ʒ-**		
	?	***ɣ-**	w-	w-
	*h- ?	***x-**	hw-	
	*h-	***h-**	h-	Ø
affricates:	*dz(y)-, *ts(y)-, *kr-	***tʃ-**	tʃ-	tʃ-
		***tʃh-**	tsh- / _ *-ə(k) tʃh- elsewhere	s-
	*ts(y)-, *dz(y)-, *kl-, *ky-	***ts-**	tʃ- / _ *-ak/ŋ ts- elsewhere	tʃ- / _ *-i tʃ- [ts-] elsewhere
	*(s-)ry- ?	***tsh-**	tsh-	tʃ- [ts-]

	PTB	*PAo*	*Mongsen*	*Chungli*
nasals:	*m-	***m-**	m-	n- / __ *-əj(ʔ) m- elsewhere
	?	***hm-**	hm-	
	*n-	***n-**	n-	n-
	*s-n- ?	***hn-**	hn-	
	*ŋ-	***ŋ-**	ŋ-	ŋ-
	*g-n-, *s-ŋ- ?	***hŋ-**	hŋ-	
glides:	*w-	***w-**	w-	*(h)wa(ʔ) > u(ʔ) w- elsewhere
		***hw-**	hw-	
	ly- / _-əw *y-	***j-**	j-	z- / _ *-əj(ʔ) j- elsewhere
	*y-	***hj-**	hj-	Ø
liquids:	*r-, *l-	***ɹ-**	ɹ-	ɹ-
	*(s-)r-	***hɹ-**	hɹ-	
	*l-, *r-, *hl-	***l-**	l-	z- / _ *-əj(ʔ), *-ik/ŋ l- elsewhere
	*l-, *r-	***hl-**	hl-	
clusters:	*pʷa, *p-wa	***p(h)wa-**	p(h)a-	pu-
	?	***tj-**	tʃ-	t-
	?	***thj-**	tʃh-	
	*ly- / _ *-ak	***lj-**	j- sporadically l- elsewhere	n- sporadically z- elsewhere

Table 217: PTB > PAo > Mongsen/Chungli sound changes (onsets)

E.2. Rimes

	PTB	*PAo*	*Mongsen*	*Chungli*
open/ glottal-final:	*-a	***-a(ʔ)**	-ə(ʔ) sporad. -a(ʔ) else.	-i(ʔ) / *pal. sib. _ (*ʃ-, *ʒ-, *tʃ(h)-) -u(ʔ) / *(h)ŋ _ , or sporad. near u *(h)wa(ʔ), *-wa(ʔ) > u(ʔ) -ə(ʔ) / *z _ , or sporadically -a(ʔ) elsewhere
	*-a(ː)y	***-aj**	-a	-a

	PTB	*PAo*	*Mongsen*	*Chungli*
	*-i, *-ey	***-i(ʔ)**	-ə(ʔ) / *ts _ -i(ʔ) else.	-ə(ʔ) / *z _ -i(ʔ) elsewhere
	*-u, *-əw, *-ow, *-a(ː)w	***-u(ʔ)**	-u(ʔ)	-i(ʔ) / *tʃ _ -u(ʔ) elsewhere
	reduced: *-a, *-i, *-u, *-əy, *-i(ː)l	***-ə(ʔ)**	-ə(ʔ)	-i(ʔ) / *ʃ _ metathesis / *(h)ɹ_# (sporadic?) -ə(ʔ) elsewhere
	*-əy	***-əj(ʔ)**	-i(ʔ)	-ə(ʔ)
bilabial-final:	*-Vp	***-əp**	-əp	-əp
	*-Vm	***-əm**	-əm	-əm
dental-final:	*-Vt	***-ət**	-ət	-ət
	*-Vs			
	*-Vn	***-ən**	-ən	-ən
	*-Vr			
alveolar-final:	?	***-əɹ**	-əɹ	-əɹ
velar-final:	*-a(ː)k	***-ak**	-ək sporad. -ak else.	-ək / *ts, *lj _ , or sporadically -ak elsewhere
	*-aŋ	***-aŋ**	-aŋ	-əŋ / *ts _ -aŋ elsewhere
	*-ik	***-ik**	-ik	-ək
	*-iŋ	***-iŋ**	-iŋ	-əŋ
	*-u(ː)k, *-wak, *-əw-k	***-uk**	-ək sporad. -uk else.	-uk
	*-u(ː)ŋ, *-oŋ, *-a(ː)ŋ / *k_	***-uŋ**	-əŋ sporad. -uŋ else.	-uŋ
	reduced: *-ak, *-ik	***-ək**	-ək	-ək
	reduced: *-aŋ, *-iŋ	***-əŋ**	-əŋ	-əŋ

Table 218: PTB > PAo > Mongsen/Chungli sound changes (rimes)

APPENDIX F. RECONSTRUCTIONS: PAO

The following table provides an index to the Proto-Ao reconstructions from Chapter II, alphabetized by PAo gloss:

PAo gloss	*PAo form*	*Set #*
ABANDON, LEAVE / AWAY (SUF.)	*tjuk	(376)
ABILITIVE (SUF.)	*-thjət	(379)
AFFIX, STICK (v.)	*m-naʔ	(239)
AGENTIVE NOM. / MASC. GENDER (SUF.)	*-əɹ	(386)
ALLOW, PERMIT	*m-la	(343)
ALWAYS	*t-thi	(46)
ANIMAL / MEAT	*(a-)ʃaʔ	(88)
ASK, REQUEST	*m-ʃaʔ	(89)
AWAIT	*a.ta	(24)
AWAKE, ARISE	*tʃhak	(165)
BACK (BODYPART)	*t-ɹuŋ-thuŋ	(317)
BAG	*hjaŋ.khu	(77)
BAMBOO	*a-hwaʔ	(274)
BAMBOO SHOOT	*(a-)zi	(128)
BAMBOO SHOOT (FERMENTED)	*i.tsak	(193)
BANANA	*ma.ŋu	(208)
BANANA LEAF / ASPIDISTRA LEAF	*a-həm	(138)
BASE / LOWER RANGE	*a-liŋ	(333)
BASKET$_1$	*(a-)ku	(60)
BASKET$_2$	*m-luk	(354)
BE BORN / GIVE BIRTH	*a-su(ʔ)	(99)
BEAN	*hlu.li	(339)
BEAR, ENDURE	*a.ɹəm	(323)
BECOME / LIVE	*a-kəm	(70)
BELIEVE	*a-maŋ	(213)

PAo gloss	*PAo form*	*Set #*
BELLY	*t-puk	(11)
BELT, STRAP (FOR WEAVING)	*a-phi	(18)
BILE / GALL BLADDER	*t-(a-)sə	(102)
BIND (W/ BAMBOO)	*a-ɹak	(309)
BIRD	*wa-zaʔ	(127)
BISCUIT	*a-hjəm	(280)
BITTER	*a-khaʔ	(74)
BLACK	*a-nak	(240)
BLESS	*m-ɣa[j]	(133)
BLOCK, STOP UP	*a-thaŋ	(44)
BLOOD	*a-jəjʔ	(299)
BLOOM (v.)	*a-puŋ	(12)
BLOW	*a-phu	(21)
BOAST	*a.tʃhə.khəm	(85)
BOAT	*(a-)ɹuŋ	(316)
BODY / CORPSE	*(t/a-)maŋ	(214)
BOIL (vt.)	*m-lu	(353)
BONE	*t-ɹət	(325)
BOUNDARY, BORDER	*a-ɹəʔ	(319)
BOW / SLINGSHOT	*li-tʃak	(150)
BRAID, KNIT, PLAIT	*m-tsi	(197)
BRAIN	*t-ku-luk	(356)
BREAK$_1$	*ɹak.saʔ	(95)
BREAK$_2$	*tʃak	(148)
BREAST	*ma.ma	(206)
BROOD, HATCH	*a-muk	(218)
BURN (vi./vt.)	*a-ɹuŋ	(315)
BURY	*a-ɹəm	(322)
BUY	*a-hli	(337)
CALL	*a-tʃaj	(145)
CANE, RATTAN	*a-hɹə	(303)
CARRY (SHOULDER)	*a-pu	(10)

PAo gloss	*PAo form*	*Set #*
CARRY / BY HAND	*hən	(139)
CAT	*-nəj	(254)
CATCH	*a-phwaʔ	(375)
CELESTIAL	*tsəŋ-	(190)
CENTER, MIDDLE	*t-juŋ	(286)
CHAFF, HUSK	*waj	(269)
CHEST	*t-kuʔ	(61)
CHEW	*m-tʃak	(149)
CHICKEN	*a-hən	(140)
CHIN_1	*t-k[h]əm	(71)
CHIN_2	*t-m-khaʔ	(75)
CHOKE / DROWN (vi.)	*a.hɹak	(301)
CLEAN (vt./vi.)	*m-ɹək	(327)
CLEAR	*tʃaŋ-tʃaj	(147)
CLOSE (v.)	*a-tʃhiʔ	(167)
CLOTH / SHAWL	*(a-)sə	(100)
COLD	*m-kuŋ	(64)
COLLIDE, BUMP	*a-tshək	(203)
COME	*a-ɹa (?)	(308)
COMPLETE, SUFFICIENT	*a-pən	(16)
CONCEAL	*m-jəm	(294)
COOK	*a-tʃhu	(170)
COUGH (v.)	*a.khət	(86)
CORN	*mən.ti	(30)
CORNER	*ki.nik	(55)
COUNT / READ	*a-zəŋ	(131)
CREATE, BUILD	*ʒaŋ.lu	(120)
CROW (n.)	*waj-hɹu	(270)
CROW (v.)	*a-khuŋ	(79)
CRY, WEEP	*a-tʃəp	(156)
CUP	*ma.ɹuk	(207)
CURRY	*(a-)hən	(141)

PAo gloss	*PAo form*	*Set #*
CUT (v.)	*a-ləp	(362)
CUT, HACK	*a-laŋ	(346)
DANGER, ACCIDENT	*lən.tuŋ	(35)
DARK	*a-maŋ	(212)
DECEIVE	*kə.lak	(67)
DEER	*m-tʃhə	(180)
DELIBERATE	*a.saʔ	(94)
DESIDERATIVE (SUF.)	*-məj	(225)
DIE	*a-sə	(101)
DIFFICULT / HARD	*a-tʃhak	(164)
DIG	*a-tu(ʔ)	(32)
DIRT, RUBBISH	*tʃaj.naʔ	(146)
DIRTY	*m-nən	(264)
DISAPPEAR / LOSE	*tʃhaj-maʔ	(163)
DISEASE	*hɹa[j]	(300)
DIVIDE, APPORTION	*a-ləm	(364)
DOG	*a-jəj	(298)
DOWNWARD MOTION (SUF.)	*-ljak	(380)
DREAM (n./v.)	*maŋ	(215)
DRINK_1	*a-tʃəm	(157)
DRINK_2	*a-juŋ	(285)
DRY	*a-kuŋ	(66)
EAR	*t-hna-ɹuŋ	(231)
EARN / PAY WAGES	*a-hjaʔ	(275)
EASY	*m-la[j]	(344)
EAT	*a-tʃaʔ	(143)
EDGE, BANK	*khəm	(82)
EGG	*hən-tsə	(185)
EIGHT	*thi ⩙ *tshət	(47)
END, FINISH	*a-thəm	(50)
ENOUGH	*p-ɹi	(311)
EXCESSIVE	*a.li	(350)

PAo gloss	*PAo form*	*Set #*
EXCHANGE	*m-lən	(369)
EYE	*t-nik	(244)
FACE / SURFACE	*t-ma[j]	(211)
FALL, PLUMMET	*(a-)tsə(k)	(187)
FATHER	*t-pwaʔ	(371)
FATHOM	*a-hnəm	(237)
FEEL COLD	*a.tʃhək	(181)
FEMININE SEMANTIC GENDER (SUF.)	*-la	(341)
FIELD	*a-hlu	(338)
FIFTY	*th-nəm	(261)
FILL, BE FULL	*a-səŋ	(116)
FINGER / TOE	*t-m-juŋ	(287)
FIRE	*mi(ʔ)	(216)
FISH	*a-hŋaʔ	(265)
FIVE	*pha-ŋa	(17)
FLAT / MAT	*(a.)pak	(5)
FLEA	*a-hləj	(331)
FLOOR	*a-təm	(40)
FLOWER	*hna.ɹu	(230)
FLY / FLOW	*a-jəm	(290)
FOLLOW	*a-hni	(235)
FOOT (PART)	*t-m-phwa	(373)
FOOT / LEG	*t-tsaŋ	(194)
FOUR	*ph-ləj	(328)
GAPE, OPEN MOUTH	*a-ka	(52)
GATHER, ASSEMBLE (vi.)	*sən-təp	(113)
GENERAL NOMINALIZER (SUF.)	*-paʔ	(3)
GINGER	*səŋ.muk	(117)
GNASH, GRIND TEETH	*tʃhi-təp	(168)
GO	*a-wa	(272)
GO DOWN	*a-hla (?)	(335)
GO IN, ENTER	*a-ʒa	(118)

PAo gloss	*PAo form*	*Set #*
GOD, DEITY	*tsəŋ-hɹəm	(305)
GRASS	*a-ʒa(ʔ)	(119)
GROUND, EARTH	*a-li	(349)
GROW UP	*a-ʒən	(126)
GUARD (v.)	*a-hnak	(233)
HANG (vt.)	*hi.tjak	(136)
HAPPY	*p-la	(342)
HARD	*m-ɹaŋ	(310)
HATCH (vi.)	*ɹə.ljak	(318)
HE, SHE (3SG)	*pa	(1)
HEAD_1	*ku	(56)
HEAD_2	*ləm	(363)
HEAR, LISTEN	*a-hŋaj	(266)
HEART	*t-m-luŋ	(361)
HEAVY	*a-ɹət	(324)
HIT, BEAT	*a-ljak	(381)
HOLD	*a-həm	(137)
HORN OF ANIMAL	*t-jəj	(297)
HOUSE	*(a-)ki	(54)
HOW?	*ku-ta	(23)
HOWL, SCREAM	*a.sa	(93)
HUNDRED	*nuk.laŋ	(252)
I, ME (1SG)	*ni	(242)
INSECT (CRAWLING)	*m-sən	(110)
INTERROGATIVE PRONOUN	*ku	(57)
INTESTINES	*t-(a-)hɹə	(304)
INTO (SUF.)	*-uk	(384)
IRON	*(a-)jən	(296)
ITCH (v.)	*m-sak	(96)
JOIN	*a-luk	(355)
JUMP	*a-puŋ	(13)
KILL	*sət	(106)

PAo gloss	*PAo form*	*Set #*
KNEE	*t-m-kuk	(62)
KNOW$_1$	*m-tət	(41)
KNOW$_2$	*a-ʃi	(91)
LATE	*m-nu	(250)
LAUGH / SMILE	*m-nəj	(255)
LAW	*-zəŋ	(130)
LEAD (v.)	*a-ni	(243)
LEAF	*t-wa	(273)
LEAK, DRIP	*a-sən	(111)
LEECH (WATER)	*m-lət	(368)
LICK	*m-ljak	(382)
LIFT / AWAKEN	*m-su	(98)
LIVE, BE, EXIST	*a-li	(348)
LIVER	*t-m-sən	(112)
LIZARD	*saŋ-	(97)
LOCATIVE NOMINALIZER (SUF.)	*-tjən	(377)
LONG	*a-hlaŋ	(336)
LOOK, STARE	*a.tsi	(195)
LOUSE	*a-tshək	(202)
LOVE (v.)	*m-jəm	(293)
LOW	*a-nəm	(259)
LUCK, FORTUNE	*th-ja	(281)
MACHETE, DAO	*(a-)nuk	(251)
MARROW	*t-liŋ-la	(352)
MASCULINE NOMINALIZER (SUF.)	*-tʃhaŋ	(166)
MEDICINE, DRUG	*mu.ləj	(217)
MITHUN	*(a-)tʃhə	(178)
MONEY	*(a-)tʃhən	(176)
MONKEY	*ʃa-ŋa	(267)
MORTAR	*tʃhəm	(173)
MOUNTAIN	*t-nəm	(260)
MOUTH	*t-paŋ	(7)

PAo gloss	*PAo form*	*Set #*
MUSHROOM	*kuŋ.hɹə	(65)
NAIL (FINGER/TOE)	*t-m-zəŋ	(132)
NAME	*t-niŋ	(246)
NAVEL	*t-ph-la[j]	(345)
NEAR	*a.hna[j]	(229)
NECK	*t-khuŋ	(80)
NECKLACE	*a-hlik	(334)
NEGATIVE (VERBAL PFX.)	*mə-	(221)
NEST / WEB (OF SPIDER)	*t-səp	(103)
NEW	*a-sən	(108)
NINE	*th-ku	(59)
NIT	*(a-)hɹu-tsə (?)	(186)
NO (REFUSAL)	*maʔ	(209)
OIL	*thu-tsə	(48)
OLD	*a-tʃən	(159)
PADDY, GRAIN	*(a-)tsak	(192)
PAINT (v.)	*a-təp	(38)
PECK, BITE	*(m-)tsi	(196)
PERFORATE / SEW	*a-hɹə	(302)
PERSON	*(a-)məjʔ	(226)
PINCH	*m-tshək	(201)
PINEAPPLE	*tʃu.ɹu	(154)
PLANT$_1$ (v.)	*a-liŋ	(332)
PLANT$_2$ (v.)	*a-thjəm	(378)
POISON	*m-ʒəm	(123)
POKE, JAB	*a-tuʔ	(33)
POSSESS (ALIENABLY)	*a-kha	(73)
POSSESS (INALIENABLY)	*a-kət	(72)
POUR	*ʃə-uk	(92)
POUR OUT	*i-ljak	(383)
POWER, WRATH	*a-ʒən	(125)
PRIEST	*pwaʔ-ti-əɹ	(31)

PAo gloss	*PAo form*	*Set #*
PROHIBITIVE (PFX.)	*tə-	(36)
PROMISE, BE CONFIDENT	*naŋ.ljak	(241)
PULL	*a-tshəʔ	(200)
PUNCH, SPEAR (V.)	*a-tsəŋ	(191)
PUNJI SPIKE	*a-tʃhu	(169)
PUSH, PRESS	*a-nəm	(258)
QUICKLY	*ʒak.ta	(25)
QUOTATIVE, THUS	*ta	(22)
REACH, ARRIVE	*a-thuŋ	(49)
READY	*ɹ-nəm	(262)
RECIPROCAL / COLLECTIVE (SUF.)	*-təp	(39)
RED	*m-ɹəm	(320)
REPETITIVE (SUF.)	*-ʃi	(90)
REQUEST (V.)	*m-pi-ʃi	(9)
RESPOND, REPLY$_1$	*laŋ.ləj	(329)
RESPOND, REPLY$_2$	*laŋ.ljak	(347)
REST, OBSERVE	*a-muŋ	(220)
RETURN, TURN BACK	*m-jəp	(289)
RICE (COOKED)	*(a-)tʃa	(142)
RICE (HUSKED, UNCOOKED)	*(a-)tʃaŋ	(152)
RICE BEER	*(a-)ʒə	(122)
RIVER	*a-juŋ	(284)
ROAST$_1$	*a-tsək	(188)
ROAST$_2$	*a-ɹu	(312)
ROAST, WARM (V.)	*a-hwaŋ	(268)
ROLL, SPIN	*a-luŋ	(357)
ROUND	*luŋluŋ	(360)
RUN	*a-səm	(104)
RUST	*(a-)tʃhuŋ (?)	(171)
SALIVA, SPITTLE	*m-tsə	(184)
SALT	*m-tsə	(183)
SAVE, RESCUE	*khəm.ljak	(84)

PAo gloss	*PAo form*	*Set #*
SAY	*a-ʃa	(87)
SCOLD, THREATEN	*m-ɹən	(326)
SCRATCH (v.)	*a-hnak	(232)
SEARCH FOR, SEEK$_1$	*a-jəm	(291)
SEARCH FOR, SEEK$_2$	*pwa-ʃi	(370)
SEED, NUT	*(t-)tʃaŋ	(151)
SELL	*a-juk	(282)
SEND	*ʒuk	(121)
SEVEN	*th-ni ⩾ *th-nət	(248)
SEVER	*a-thaŋ	(45)
SHADOW, SHADE	*a-khəm	(83)
SHADOW / SOUL	*t-(a-)hməj-la	(228)
SHAVE, SCRAPE	*a-tʃhət	(175)
SHIELD	*(a-)tʃuŋ	(155)
SHIN	*t-m-ʒən	(124)
SHORT	*a-tshə	(199)
SHY	*a.hjak	(276)
SIBLING/BROTHER (OLDER)	*t-ti	(29)
SIBLING (YOUNGER)	*t-nu	(249)
SING	*a-tən	(42)
SIT	*a-mən	(222)
SIX	*t-ɹuk	(314)
SKIN, RIND, SHELL	*t-kəp	(68)
SKY	*a-niŋ	(247)
SLAP	*a-maʔ	(210)
SLEEP	*a-jəp	(288)
SLICE, SAW / SWIM	*a-ɣaʔ	(134)
SMELL (vi./vt.)	*m-hnəm	(236)
SMOKE	*mu-khu-ləj	(78)
SOFT	*a-nəp	(256)
SOME, A LITTLE	*t-ɹa	(306)
SON	*(t-)tʃa-əɹ	(144)

PAo gloss	*PAo form*	*Set #*
SON-IN-LAW / BROTHER-IN-LAW	*(a-)hnak	(234)
SOUR	*a-sən	(109)
SOW (v.)	*a-thən	(51)
SOW, SCATTER	*ph-ɹuk	(313)
SPEAR	*(a-)məj	(224)
SPIN (THREAD)	*a-jən	(295)
SPINDLE	*paŋ	(6)
SQUEEZE	*a.tʃət	(158)
START, BEGIN	*tən.ljak	(43)
STEM, TRUNK	*t-tuŋ	(34)
STING	*m-tak	(27)
STONE, ROCK	*(a-)luŋ	(358)
STRIKE, BEAT	*a-təp	(37)
STUFF, POSSESSIONS	*u.sət	(107)
SUCK / KISS	*m-tʃhəp	(172)
SUGAR CANE	*mu.tsi	(198)
SUN / DAY	*nəj	(253)
SWAGGER, SWAY	*ka.ləj	(53)
SWALLOW	*m-juk	(283)
SWEEP	*a-uk	(385)
SWEET	*a-m-jaŋ	(227)
SWELL, BE SWOLLEN	*a-wak	(271)
TARO	*(a-)məj	(223)
TENDER, SOFT	*a.nik	(245)
THAT (ONE), DEMONSTRATIVE	*a-tʃu	(153)
THICK	*m-ləm	(367)
THIGH	*t-phi	(19)
THINK	*phi-ləm	(20)
THREAD, YARN	*a-hjaŋ	(277)
THREE	*a-səm	(105)
THUNDER	*tsəŋ-muk	(219)
TIE (v.)	*m-tʃhə	(179)

PAo gloss	*PAo form*	*Set #*
TIME	*hma.paŋ	(8)
(TIMES) TEN	*th-ɹa	(307)
TIRED	*ph-ləm	(366)
TOGETHER	*khə.ləm	(81)
TONGUE	*t-m-li	(351)
TOOTH	*t-phwa	(374)
TOUCH	*taŋ.tʃhaʔ	(28)
TRAP, CATCH	*a-tʃhaʔ	(162)
TWO	*a-nət	(263)
UNCLE (MATERNAL) / FATHER-IN-LAW	*t-ku	(58)
VAPOR	*hmi.luŋ	(205)
VILLAGE	*(a-)jəm	(292)
VINE / VEIN	*(t-)hləj	(330)
WAIST	*t-(p-)ɹəm	(321)
WARM	*a-ləm	(365)
WASH (HANDS)	*m-tsək	(189)
WATER	*(a-)tsə	(182)
WEAR, PUT ON	*a-tʃhəm	(174)
WEAVE	*a-tak	(26)
WEIGH	*hju	(278)
WELL, POND	*tsə-pwaʔ	(372)
WELL, SATISFIED	*a-nəm	(257)
WHITE	*m-səŋ	(114)
WHO?	*ʃə-paʔ	(4)
WIDOW	*(a-)hmi-	(204)
WILD PIG	*puŋ.jəj	(14)
WILLING	*m-luŋ	(359)
WIN	*a-kuk	(63)
WING	*t-(a-)tʃha	(161)
WIND (n.)	*m-puŋ	(15)
WOOD	*(a-)səŋ	(115)
WORD	*(a-)hju	(279)

PAo gloss	*PAo form*	*Set #*
WORK, JOB	*hma.pa	(2)
WOUND, SORE	*khu-ma	(76)
WRAP, FOLD	*a-hləp	(340)
WRING, SQUEEZE	*m-tʃhən	(177)
WRITE	*zə-lu	(129)
YAM	*(a-)tʃha	(160)
YAWN	*xa-m-sa	(135)
YEAR	*(a-)kəm	(69)
YOU (2SG)	*na(ŋ)	(238)

Table 219: Index of PAo reconstructions (by proto-gloss)

APPENDIX G. RECONSTRUCTIONS: PCN

The following table provides an index to the Proto-Central Naga reconstructions from Chapter III, alphabetized by PCN gloss:

PCN gloss	*PCN form*	*Set #*
ABILITIVE (SUF.)	*-thjət	[191]
ANIMAL / MEAT, FLESH	*a-ʃaʔ	[15]
AXE	*pu	[66]
BABY, CHILD	*[h]ŋaj	[45]
BACK (BODYPART)	*ruŋ	[226]
BAMBOO$_1$	*r-hwaʔ	[28]
BAMBOO$_2$	*pwa/pu	[38]
BE BORN / GIVE BIRTH	*su(ʔ)	[84]
BE, EXIST, LIVE (COPULA) / HAVE	*li	[65]
BECOME	*kam	[130]
BEE	*tʃhak	[251]
BELT, STRAP, ROPE (WEAVER'S)	*a-phi	[60]
BENCH, BLOCK / PILLOW	*m-kham	[132]
BILE / GALL BLADDER	*a-sə	[92]
BIND, TIE	*(h)rak	[257]
BITE	*m-kak	[241]
BITTER	*a-khaʔ	[10]
BLACK	*a-ɲjak	[238]
BLESS	*m-ɣaj	[47]
BLOOD	*a-(h)jəjʔ	[108]
BLOW	*phu	[69]
BOAT	*a-ruŋ	[228]
BODY / CORPSE	*a-maŋ	[198]
BOIL (v.)	*m-lu	[87]
BONE	*a-rut	[188]

PCN gloss	*PCN form*	*Set #*
BOUNDARY, BORDER	*a-rəjʔ	[109]
BOW (n.)	*laʔ	[35]
BREAD, BISCUIT / FLOUR	*a-hjəm ≋ *a-həm	[146]
BREAK	*tʃak	[248]
BREATH	*sak	[242]
BREATHE	*tʃh[a/ə]n	[183]
BUILD, MAKE / DO	*tsha	[21]
BURN	*ruŋ	[227]
BURY / ENDURE, BEAR	*ram	[137]
BUY	*a-hlej	[59]
BUY / SELL	*juk	[266]
CALL	*tsaj	[49]
CANE, RATTAN	*a-(h)rəj	[110]
CARRY (BY HAND)	*p[a/ə]n	[180]
CARRY (SHOULDER/BACK)	*pu(ʔ)	[67]
CARRY / PREGNANT / WEAR	*haːn	[163]
CATCH, SEIZE, HOLD	*hram	[139]
CELESTIAL / SKY / WEATHER	*tsiŋ	[214]
CENTER, MIDDLE	*a-luŋ	[230]
CHANGE / EXCHANGE	*m-l[aː/a/ə]n	[178]
CHEST	*t-kuʔ	[78]
CHEW	*m-tʃak	[250]
CHICKEN	*haːn-a	[165]
CHOKE (vi.)	*a-hrak	[255]
CLEAN / BE CLEAR	*tsaŋ	[201]
CLOTH / SHAWL	*a-ʃə	[93]
COLD	*a-tshak	[247]
COMPLETE, SUFFICIENT, FULL	*p[a/ə]n	[179]
COUGH (v.)	*a-khu(t)	[82]
CURRY	*a-haːn	[164]
CUT (v.)	*ləp	[157]
CUT, CHOP	*laŋ	[207]

PCN gloss	*PCN form*	*Set #*
DARK	*a-ma(ŋ)	[197]
DEAF	*p(j)aŋ	[195]
DECEIVE	*rak	[254]
DIE	*səj	[106]
DIFFICULT / BE HARD / BE DEAR, COSTLY	*a-tʃhak	[252]
DIRTY	*m-njan	[166]
DISEASE, ILLNESS, AILMENT	*(h)raj	[52]
DOG	*khjəj	[104]
DOOR	*khaːm	[119]
DREAM	*maŋ	[196]
DRINK (v.)	*juŋ	[222]
DRY / BE THIN, LEAN	*a-kuŋ	[219]
EAR	*hnaʔ	[7]
EARN / PAY WAGES	*hjaʔ	[32]
EASY	*m-laj	[50]
EAT	*tsaʔ	[19]
EGG	*tʃə	[96]
EXTINGUISH / BLOW	*hmət	[189]
EYE	*mjak ≋ *hmik	[234]
FACE	*tʃak	[249]
FACE / SURFACE	*hmaj	[42]
FATHER	*a-pwaʔ	[37]
FECES, EXCREMENT	*a-khləjʔ	[105]
FEMALE, WOMAN	*la	[34]
FIELD / GROUND	*hlu	[88]
FIFTY	*th-njaːm	[117]
FINGER / TOE	*m-juŋ	[224]
FIRE	*mej(ʔ)	[54]
FISH	*a-hŋaʔ	[13]
FIVE	*pha-ŋa	[12]
FLAT	*a-pjak	[232]
FLEA	*a-hləj(ʔ)	[115]

PCN gloss	*PCN form*	*Set #*
FLOOR	*a-tam	[128]
FOOT (PART)	*m-ph(w)a	[2]
FOUR	*phV$_{ʔ}$-ləj	[112]
FRIEND	*ʃam	[134]
FRUIT / SEED	*a-sej	[56]
GAPE, OPEN MOUTH	*ka	[8]
GATHER, ASSEMBLE (OF PEOPLE)	*ʃaːn	[161]
GINGER	*ʃiŋ	[213]
GO	*wa	[25]
GRASS	*a-ʒa(ʔ)	[16]
GROUND, EARTH / FIELD	*a-lej	[57]
GROW	*ʒ[aː/a/ə]n	[177]
GUARD (v.)	*hnjak	[240]
HAIR (FACE / HEAD)	*a-tshaːm	[121]
HAIR / LEAF / FEATHER	*a-həm	[148]
HAND, ARM	*khat	[186]
HARD / BE STRONG	*m-raŋ	[206]
HE, SHE (3SG)	*pa	[1]
HEAD	*ku	[73]
HEAD / HEART / MIND	*ləm	[147]
HEADSTRAP, TUMPLINE	*a-hnjaːm	[118]
HEAR	*ja	[31]
HEAR, LISTEN	*a-hŋaj	[46]
HEART / BE ROUND	*m-luŋ	[231]
HEAVY	*rət	[192]
HIDE, CONCEAL	*ram	[138]
HIT, SLAP / PLAY (BEAT)	*tam	[127]
HOLE	*a-ku ⩙ *a-khən	[79]
HOT / HURT	*tsha	[22]
HOUSE / VILLAGE	*a-jam	[135]
HOW?	*ku-ta	[75]
I, ME (1SG)	*aj	[40]

PCN gloss	*PCN form*	*Set #*
ICE, SNOW, HAIL	*rə(ʔ)	[99]
IN-LAW	*a-mjak	[235]
INTERROGATIVE PRONOUN	*ku	[74]
INTESTINES	*a-(h)rə	[101]
IRON	*jən	[174]
ITCH (v.)	*m-sak	[243]
JUNGLE, FOREST	*raːm	[123]
KNEE	*m-khuk	[264]
KNOW	*m-thət	[190]
LAUGH / SMILE	*m-nəj ≍ *m-nwi	[63]
LEAF	*a-wa	[26]
LEECH (WATER)	*m-lV̥t	[193]
LICK	*m-ljak	[258]
LIFE	*a-kam	[131]
LIFT / AWAKEN	*m-su	[85]
LIVER	*m-sən	[172]
LIZARD	*ʃaŋ-	[200]
LOINS / GROIN	*m-k(w)a	[9]
LONG	*a-hlaŋ	[208]
LOUSE, LICE	*a-hr(j)ak	[256]
LOVE (v.)	*a-m-ʒaːn	[162]
LOVE / FRIENDSHIP	*m-jam	[136]
LOW	*a-hnjəm	[142]
MACHETE, DAO	*nuk	[263]
MALE (OF ANIMALS)	*puŋ	[216]
MAT	*a-phak	[233]
MEDICINE, CREAM	*mV̥-ləj	[113]
MITHUN, GAYAL (BOS FRONTALIS)	*tshə	[94]
MONEY / PRICE	*a-tshan	[168]
MONKEY	*ŋa	[11]
MORTAR	*tsh[a/ə]m	[150]
MOTHER	*ja	[29]

PCN gloss	*PCN form*	*Set #*
MOUTH$_1$	*mən	[169]
MOUTH$_2$	*paŋ	[194]
NAIL (BODYPART)	*m-[z/ʒ]a[ː]n	[176]
NAME	*a-miŋ	[209]
NAVEL, BELLY BUTTON	*ph-laj	[51]
NECK	*a/k-hwuŋ	[220]
NERVE, VEIN / POWER, STRENGTH	*a-saʔ	[14]
NEST / WEB	*a-sap	[152]
NEW	*a-saːn	[160]
NINE	*t-ku	[77]
NO (REFUSAL)	*maʔ	[3]
NOSE	*na(ʔ)	[6]
OIL, GREASE, FAT	*thu	[71]
OLD (OF THINGS)	*a-C$_ʔ$ən	[175]
ONE	*khaj	[185]
ORDER, COMMAND, LAW	*ziŋ	[212]
OTTER	*raːm	[124]
PALM OF HAND	*m-ja	[30]
PATH, ROAD, WAY	*laːm	[126]
PERSON, HUMAN	*a-[h]məjʔ	[102]
PLANT (V.)	*liŋ	[215]
PLANT (V.) / TRANSPLANT	*thj[a/ə]m	[149]
POISON (N.)	*m-ʒəm	[144]
POT	*phuʔ	[70]
POWER / WRATH	*a-ʒ[a/ə]n	[182]
PRESS, PUSH	*njəm	[141]
PRICE, COST, VALUE	*a-maːn	[159]
PUS	*a-hnaj	[43]
QUICK, QUICKLY	*ʒak-	[245]
QUOTATIVE	*ta(ʔ)	[5]
RAIN	*rwa/ru	[39]
READ / COUNT	*khaj	[44]

PCN gloss	*PCN form*	*Set #*
RICE (HUSKED, UNCOOKED)	*a-tsaŋ	[203]
RIPEN, BE RIPE / BE COOKED	*hmən	[170]
RIVER	*a-juŋ	[223]
RUB	*hmit	[187]
RUN / WALK	*a-ʃaːm	[120]
SALIVA, SPITTLE / SPIT (v.)	*m-tʃə	[98]
SALT	*maj	[41]
SCRATCH$_1$ (v.)	*a-hnak	[239]
SCRATCH$_2$ (v.)	*m-ʃak	[244]
SEARCH, SEEK$_1$	*pwa	[36]
SEARCH, SEEK$_2$	*jaːm	[122]
SEED	*ma-tʃəjʔ	[107]
SEED, NUT	*tsaŋ	[202]
SELL	*jən	[173]
SEVEN	*th-ni(t)	[61]
SEW, STITCH	*hrəj	[111]
SHADOW, SHADE	*khəm ≍ *khəp	[143]
SHIELD	*a-tsuŋ	[221]
SHOULDER	*puʔ	[68]
SHY / BE ASHAMED	*a-hjak	[253]
SIBLING (YOUNGER)	*nu	[72]
SIX	*t-ruk	[268]
SKIN / COVER (n.)	*kəp	[155]
SKY / YEAR	*niŋ	[210]
SLEEP	*jap	[153]
SMELL (n.), ODOR	*a-hrəm	[145]
SMELL / STINK	*m-hnaːm	[116]
SMOKE	*khuʔ	[81]
SNAKE	*ph-rə	[100]
SOFT	*a-njəp	[154]
SON	*tsaʔ	[20]
SONG	*khən	[171]

PCN gloss	*PCN form*	*Set #*
SOUR	*a-san	[167]
SOW, SCATTER, THROW (SEEDS)	*ph-ruk	[267]
SPEAR (n.)	*tshaʔ	[23]
SPIN (THREAD)	*j[a/ə]n	[184]
SPIRIT / DEMON	*hraːm	[125]
SPRING FORTH / ORIGINATE / BE BORN	*puk	[260]
STARE, LOOK AT, WATCH	*m-raŋ	[205]
STEAL	*a-hu	[91]
STEM, TRUNK / POST / TREE	*tuŋ	[218]
STING	*tak	[236]
STOMACH, BELLY	*puk	[261]
STONE, ROCK	*luŋ	[229]
SUCK / KISS	*m-tshəp	[156]
SUN / DAY	*nəj	[103]
SWALLOW (v.)	*m-lju(k)	[86]
SWEEP	*(w)uk	[265]
SWELL, BE SWOLLEN	*pəm	[140]
SWIM	*ɣaʔ	[18]
TAIL	*a-hmej	[55]
THIGH	*phej	[53]
THREAD, YARN	*a-hjaŋ	[204]
THREE	*a-sam	[133]
THUNDER	*[h]muk	[262]
TICKLE	*k-lik	[259]
TIE (v.)	*m-tshə	[95]
(TIMES) TEN	*th-ra	[33]
TONGUE	*m-lej(ʔ)	[58]
TOOTH	*p-hwa	[27]
TWENTY	*mu-kju	[83]
TWO	*a-ni(t)	[62]
UNCLE / FATHER-IN-LAW	*ku	[76]
URINATE / URINE	*ph-juŋ	[225]

PCN gloss	*PCN form*	*Set #*
VINE / VEIN / SINEW	*th-ləjʔ	[114]
WALK	*tsaj	[48]
WARM	*l[a/ə]m	[151]
WASH, BATHE	*m-tsak	[246]
WATER_1	*ki	[64]
WATER_2	*a-tʃə	[97]
WEAR (CLOTHES)	*m-p[a/ə]n	[181]
WEAVE	*tak	[237]
WEIGH	*ɦju ≋ *hu	[90]
WHILE (CONTEMPORATIVE)	*-thaŋ	[199]
WIND (n.)	*m-puŋ	[217]
WING	*a-tʃha	[24]
WOOD	*siŋ	[211]
WORD / LANGUAGE	*a-(h)ju	[89]
WOUND, INJURY / SCAR	*khuʔ	[80]
WOUND, SORE	*ɦma	[4]
WRAP / COVER (v.)	*a-hl[a/ə]p	[158]
YAWN (v.)	*xa	[17]
YEAR / SEASON	*a-kam	[129]

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