CHAPTER 4

RECONSTRUCTION

4.0 Introduction

Chapters 1 to 3 considered background information for Chin languages, the selection of languages used to be representative of Chin languages in the reconstruction of Proto Chin, and the description of these languages. This chapter will focus on the reconstruction of Proto Chin.

4.1 General

The primary data for this study is a list of 443 words[19] for each language under study. The wordlist is provided in the appendices. This wordlist covers several semantic domains with linguistic terms appropriate to Southeast Asia, in particular domains such as nature, plants, food, animals, body parts, human relationships, home, numbers, dimensions, physical descriptions, taste, question words and various verbs.

The data for Kaang, Khumi (Paletwa), Mara, Hakha and Mizo are from unpublished data collected by Seung Kim and Noel Mann and the author retranscribed. Data for Tedim is based on the author's transcription of his own speech as a native speaker.

Wordlists for these six languages were tabulated for comparison. Possible loan words were eliminated. Loanwords from Old Mon, Karen, Jingphaw were identified on the basis of Luce (1959), Benedict (1972) and Bradley (1978); and loanwords from Burmese and Hindi on the basis of the author's own knowledge. Burmese influence is present in these languages but to a lesser extent than in Plain Chin noted by Stern

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[19] The wordlist was developed by the SIL International for use in Southeast Asia.

(1962). Loans from Hindi (or other Indian languages) are mostly found in Mizo due to close contact. For instance, the word for 'candle' (No. 215) in Mizo is identical to the Hindi word [bom˥ba˥ti:˩], while Hakha, Mara and Khumi use the Burmese word [pʰa˥joŋ˥daiŋ˩]. Khumi has the word [saniŋ] for 'year' (No. 018) which seems to be borrowed from Jingphaw [saniŋ] which is also *s-nik in Proto Loloish (Benedict 1972). The Khumi word [panhi] for 'mouth' (No. 130) seems to be borrowed from Old Mon [pa:ŋ]. According to Luce (1985:85) the southern Chin languages' word for 'buffalo' (No. 088) is from Karen. 'Buffalo' for Hakha, Mara and Kaang is [na] and in Khumi [pa˥na:˩], which appears to be borrowed from the Sgaw Karen word [pəna˩]. (c.f. Lar Baa 2001:93). Numbers and percentages of identified loan words found in each languages are shown in Table 43. Khumi has 6.32% as the highest and Tedim has 1.13% as the lowest number of loans out of 443 words in the present data.

Language	Number of loans	Percentage of 443 word corpus
Tedim	5	1.13%
Mizo	8	1.81%
Mara	9	2.03%
Kaang	12	2.71%
Hakha	14	3.16%
Khumi	28	6.32%

Table 43. Percentage of loan words in Chin languages

Proto Chin is assumed to be monosyllabic and the reconstruction is conducted on the basis of root syllables. Peripheral syllables are eliminated. Correspondences in phonemes are compared to establish Proto Chin.

Bradley (1979) observes that initial consonants, rhymes and tones comprise the three basic systems in the comparative analysis of Tibeto-Burman languages. However, there is no evidence in the present data that the rhymes must be considered as a unit. Therefore the reconstruction is based on initial consonants, vowel nuclei and codas. (For tones, see section 4.6).

4.2 Initial consonants

Let us begin the consideration of initial consonants with a more detailed review of previous reconstructions of initial consonants.

A major concern of previous work has been to account for the presence of [g] in Tedim, but not in other modern Chin languages. Ono (1965) reconstructed the initial consonants of Proto Kuki-Chin[20] as shown in Table 44. He claims *g "to be absorbed in some other phonemes" (1965:19), but without speculating which.

Ono's Proto-Kuki-Chin initial consonants (1965:19)				
Velar stops	*k	*kʰ	*g	
Dental stops	*t	*tʰ	*d	
Bilabial stops	*p	*pʰ	*b	
Nasals (voiced)	*ŋ	*n	*m	
Nasals (voiceless)	*hŋ	*hn	*hm	
Affricates and Fricatives	*c	*cʰ	*s	*z
Semi vowels and Glottals	*w	*j	*h	*ʔ
Liquids	*r	*hr	*l	*hl
Consonant clusters	*kr	*kʰr	*kl	*kʰl

Table 44. Ono's (1965) Proto Kuki-Chin initial consonants

Solnit (1979) attempted to establish the phonological relationship between Tedim and Mizo (which he calls Lushai) based on the reconstructed *r. He considers separately simple initials, initial clusters and finals. Table 45 shows Solnit's (1979:118) simple initials.

	Tedim	Mizo
*g- (or K-N *k-)	k	k
*k- (or K-N *kʰ-)	χ	kʰ
*r- *g-r-, or *k-r-	g	r

Table 45. Solnit's (1979) simple initial consonants

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[20] Bhaskararao (1996) also discussed the initial consonants in Lushai (Mizo) and Tedim. In many cases, he agrees with Ono (1965) however he also mentions some exceptions, many of such exceptions are the result of either misspellings or synonyms.

Table 46 shows Solnit's (1979:118) initial consonant clusters.

	Medial *-r-		Medial *-l-	
Initial	Tedim	Lushai	Tedim	Lushai
*g-	k	tr	k	tl
*k-	χ	$t^h r$	χ	$t^h l$
*b-, *p-	$p^{(h)}$	$t^{(h)}r$	$p^{(h)}$	$t^{(h)}l$

Table 46. Solnit's (1979) initial clusters

Table 47 shows Solnit's (1979:119) final consonants.

	Tedim	Lushai
*-k	k	k
*-r	k	r

Table 47. Solnit's (1979) reconstructed final consonants

The summary of previous literature on reconstruction of consonants shows that Proto Chin had voiced, voiceless and aspirated series of stops, except voiced dorsal stop, which is assumed to be absorbed in some other phoneme. There are nasal and liquid series with their respective voiceless counterparts. Proto Chin also had voiceless and voiced coronal fricative and glottal fricative and voiceless aspirated and unaspirated coronal affricates. There are also semivowels.

Four consonant clusters can occur. The first consonant of the consonant cluster is restricted to voiceless aspirated and unaspirated alveolar (Solnit adds voiced velar stop) and the second consonant is limited to liquids. Bhaskararao posits voiceless retroflex stop and voiced coronal stop with their aspirated counterpart as the first consonant in consonant clusters. He also discusses proto *r and *k as final consonants.

Having discussed the previous literature, the next consideration is the reconstruction of Proto Chin initial consonants based on the data at hand.

The data are taken from the word lists provided in Appendix A. The left hand column shows the reference number of the word, the second column is the English gloss and the remaining columns are the cognate words in the selected languages.

4.2.1 Stops

*p. The cognate set in Table 48 indicates an unambiguous initial voiceless labial stop *p in Proto Chin. This is a very stable initial consonant, showing no change in any daughter language.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
050	mushroom	paʌ	pa:ʌ	pa˧	po˧	pa˥	pa˧
169A	man	pa˧	pa˩	pa:˥	po˥	-	pa˧
172	father	paʌ	pa:˩	pa:˩	po˥	pa˧	pa:i˧
288	give	piaʌ	pe:˩	pe:k˧	pia˥	pe:k˥	pe˧
320	pay	pi:aʌ	pe:˩	pe:k˩	pia˧	pei˥	-
346	thin	paʌ	pan˥	pan˩	pa:˥	pa:˥	pan˥

Table 48. Proto Chin initial voiceless labial stop *p

*pʰ. The cognate set in Table 49 shows that Proto Chin also had an initial voiceless aspirated labial stop *pʰ. This sound is suspect in Mara because it shares only one cognate words out of five in the cognate set.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
153	thigh	pʰei˩	-	pʰei˩	-	pʰa:i˧	pʰei˧
192	mat	pʰek˧	pʰer˥	pʰer˩	pʰia˧	pʰak˧	pʰak˥
302	bury corpse	pʰu:m˧	pʰu:mʌ	pʰum˧	-	pʰun˥	-
304	dry something	pʰo˧	pʰo:˥	pʰo:˥	-	-	pʰo˩
411B	pangolin	pʰu˩	pʰu:˥	pʰu:˧	-	pʰei?˥	pʰu:˧

Table 49. Proto Chin initial voiceless aspirated labial stop *pʰ

*b. The cognate set in Table 50 shows the voiced labial stop *b in Proto Chin.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
057A	banana	banˇ	banˇ	ban˧	baːˈ	-	-
069	cooked rice	bu˧	-	bu˧	-	bu˧	bu˧
094	bird's nest	buˉ	buːˇ	bu˥	bu˧	bu˥	buːˉ
128	cheek	biaːŋ˧	biaŋ˥	biaŋˇ	baiˈ	be˧	beːŋˇ
393	tired	-	-	ba˥	ba˧	bai˥	boŋ˥

Table 50. Proto Chin initial voiced labial stop *b

*t. The data in Table 51 illustrates the voiceless coronal stop *t in Proto Chin.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
023	water	tuːiˉ	tuiˉ	tiːˉ	tiˇ	tui˥	tuiˇ
049B	bamboo shoot	toːi˧	toːi˧	toːiˇ	te˧	tuiˉ	toiˇ
150B	finger nail	tinˉ	tinˉ	tinˇ	te˥	sin˧	tin˧
196	weave cloth	-	taʔ˥	taʔ˥	saˇ	-	taʔ˥
342	short length	tomˉ	toːiˉ	toːiˇ	-	toi˧	toiˇ

Table 51. Proto Chin initial voiceless coronal stop *t

*tʰ. The cognate set in Table 52 exemplifies an unambiguous voiceless aspirated coronal stop *tʰ in Proto Chin.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
143	liver	tʰinˇ	tʰin˧	tʰinˇ	tʰi˧	tʰin˧	tʰin˥
162	fat	tʰaːuˇ	tʰauˇ	tʰaːuˇ	tʰau˧	tʰau˧	tʰaːu˥
164	blood	tʰiˉ	tʰi˧	tʰiːˇ	tʰiːˇ	tʰiːˉ	tʰiˇ
211	firewood	tʰiŋˉ	tʰiŋˉ	tʰiŋˉ	tʰei˧	tʰiŋ˧	tʰiŋˇ
266	itch	tʰak˧	tʰak˧	tʰak˧	tʰa˧	tʰaːkˉ	tʰak˥
324	three	tʰum˧	tʰumˉ	tʰumˇ	tʰo˧	tʰun˧	tʰumˇ
351	deep	tʰuːkˉ	tʰuːkˇ	tʰuk˧	tʰu˧	tʰoːk˧	tʰukˉ

Table 52. Proto Chin initial voiceless aspirated alveolar stop *tʰ

*d. The data in Table 53 illustrates the initial voiced coronal stop *d in Proto Chin. Khumi shares very few cognate words in the present data. Therefore the initial voiced coronal stop *d is suspect in Khumi.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
149B	finger	-	daŋˈ	doŋ˧	do˥	-	-
232	drink	do:n˧	-	din˥	do˧	-	-
272	stand	diŋ˧	diŋˈ	diar˩	dia˧	di:˥	dʉi˥
273B	kneel	din˩	-	-	-	du:˥	doŋˋ
357	straight	-	-	diŋ˧	do˥	-	diŋ˦
400	correct	dik˧	dik˧	-	do˥	-	-

Table 53. Proto Chin initial voiced coronal stop *d

*k. The cognate set in Table 54 illustrates the unambiguous initial voiceless dorsal stop *k in Proto Chin.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
018	year	kum˩	kum˩	kum˩	ko˧	-	kum˦
079B	porcupine	ku˧	ku˧	ku˧	ku˥	-	ku˧
089	horn of buffalo	ki:˦	ki:˩	ki:˧	ki˩	ki˥	ki:˩
313	shoot	ka:p˦	ka:p˩	ka˧	ka˥	ka:˥	ka:p˥
330	nine	kua˦	kua˦	kua˩	ki:˩	ko˥	ko˩
426	bend	ko:i˦	koi˩	ko:i˥	ko˥	kon˦	-

Table 54. Proto Chin initial voiceless dorsal stop *k

*kʰ. The data in Table 55 illustrates the unambiguous initial voiceless aspirated dorsal stop *kʰ in Proto Chin.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
115	bee	kʰo:i˧	kʰo:i˥	kʰo:i˩	kʰei˧	kʰoi˦	kʰo:i˩
154	knee	kʰuk˦	kʰu:p˩	kʰuk˧	kʰu˥	kʰu˥	kʰu:k˥
183	village	kʰua˦	kʰua˥	kʰua˩	kʰi:˧	-	kʰo˥
214B	smoke fire	kʰu˦	kʰu:˩	kʰu:˥	kʰu˧	kʰu˥	kʰu:˦
376	bitter	kʰa:˦	kʰa:˩	kʰa:˥	kʰa:˩	kʰa:˥	kʰa˥

Table 55. Proto Chin initial voiceless aspirated dorsal stop *kʰ

4.2.2 Nasals

*m. The cognate set provided in Table 56 illustrates the initial labial nasal *m in Proto Chin.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
005	cloud	me:i˦	-	mei˥	mei˦	ma:i˥	mei˥
125	eye	mit˦	mit˦	mit˦	-	mek˦	mik˥
171	person	mi˥	mi˦	mi:˥	-	mi:˥	-
261B	sleep	mu˦	mu˥	-	mo˥	-	-
263	dream	maŋ˥	maŋ˥	maŋ˦	ma:˦	maŋ˥	maŋ˦

Table 56. Proto Chin initial labial nasal *m

*n.The data in Table 57 shows unambiguously the initial coronal nasal *n in Proto Chin.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
170B	woman	nu˦	-	nu:˥	no˥	mi˥	nu˦
173	mother	nu˥	nu:˥	nu:˥	no˥	nu:˦	no:i˥
264	hurt	na:˦	na:˥	-	-	na:˥	na˦
417A	thou (2s)	naŋ˥	naŋ˥	naŋ˦	na˦	naŋ˥	naŋ˥
420A	you (2p)	no˥	-	nan˦	na˥	naŋ˦	naŋ˦
440A	yr. bro. of m.	na:u˦	nau˥	nau˦	-	nau˥	nau˥

Table 57. Proto Chin initial coronal nasal *n

*ŋ. The data in Table 58 shows the initial dorsal nasal *ŋ in Proto Chin. Hakha, Mara and Khumi share only two cognate sets out of five in the data.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
033	silver	ŋu:n˥	-	ŋun˥	ŋo˥	-	ŋui˥
251A	think	ŋai˦	ŋai˦	-	-	-	ŋai?˥
255	love	-	ŋai˦	-	-	ŋa:i˥	na˥
326	five	ŋa˦	ŋa:˦	ŋa:˥	ŋa˦	ŋa:˦	ŋa˦

Table 58. Proto initial Chin dorsal nasal *ŋ

*m̥. The data in Table 59 illustrates the initial voiceless labial nasal *m̥ in Proto Chin.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
096	feather	mulˀ	m̥ulˉ	m̥ulˉ	m̥iˋ	muiˀ	m̥ʉiˉ
120	face	maiˀ	m̥a:iˀ	m̥a:iˇ	m̥eˋ	m̥aiˉ	m̥a:iˇ
182	name	minˉ	m̥inˉ	minˇ	moˉ	m̥inˀ	m̥inˋ
212	fire	meiˀ	meiˀ	meiˇ	meiˉ	m̥aiˉ	meiˇ
409	ripe	minˉ	minˉ	m̥inˇ	m̥aˉ	m̥inˀ	m̥inˋ

Table 59. Proto Chin initial voiceless labial nasal *m̥

Mizo, Hakha, Mara, Khumi and Kaang preserve the *m̥ inconsistently, without any discernible conditioning environment, but the voiceless feature has been lost in Tedim.

Rule 1. Voicing (Tedim)

*m̥ > m/$___

*n̥. The selection of data in Table 60 shows the initial voiceless coronal nasal *n̥ in Proto Chin.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
002	sun	niˉ	ni:ˉ	ni:ˇ	niˀ	n̥i:ˉ	n̥iˇ
087	milk	no:iˀ	n̥uˉ	n̥ukˉ	n̥oˋ	n̥uˉ	-
127	nose	na:kˇ	n̥arˉ	n̥a:rˇ	n̥aˉ	naˉ	n̥aˉ
166	pus	na:iˉ	n̥a:iˉ	n̥a:iˇ	neˉ	n̥a:iˀ	naiˋ
244	laugh	nu:iˉ	nuiˀ	ni:ˉ	n̥iˉ	n̥uiˉ	n̥ʉiˋ
323	two	niˉ	n̥iˉ	n̥iˉ	neˉ	-	n̥iˉ
344	short height	niamˀ	n̥iamˀ	niamˇ	n̥aiˉ	n̥enˉ	nemˉ

Table 60. Proto Chin initial voiceless coronal nasal *n̥

Mizo, Hakha, Mara, Khumi and Kaang keep the voiceless coronal nasal *n̥ without any discernible conditioning environment, but the voiceless has been lost in Tedim.

Rule 2. Voicing (Tedim)

*n̥ > n/$___

/ŋ̊/. Table 61 contains all the cognate sets relevant to initial voiceless dorsal nasals [ŋ̊]. Due to extremely limited data, this segment is not posited as a proto phoneme (but it will be discussed in section 4.5 under symmetrical considerations).

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
101	fish	ŋaⱭ	ŋ̊a:Ⅴ	ŋa:˦	ŋa˥	ŋa:˥	ŋa:Ⱡ
253	forget	ŋil˦	ŋ̊il˦	-	-	-	ŋi?˥
257	wait	ŋakⱭ	ŋ̊a:kⅤ	ŋ̊a˦	ha:˥	gi:ŋⱭ	ŋaŋ˥

Table 61. Chin initial voiceless dorsal nasal /ŋ̊/

All the languages in the sample have a voiced nasal series. Voiceless nasals appear in all languages except Tedim but without any apparent predictable environment. Moreover the status of voiceless dorsal nasal [ŋ̊] is such that it is impossible to posit it as a proto phoneme based on the limited data and needs to be reconsidered under symmetrical considerations.

4.2.3 Trill

*r. From the cognate sets in Table 62, we may infer that Proto Chin had a coronal trill *r which became a voiced dorsal stop /g/ in Tedim. The g ~ r correspondence is consistent for all language in the sample except Khumi, which shows two instances of [r] and two instances of [ɣ].

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
048	bamboo	gua˦	rua˦	ruaⅤ	ra˦	ɣu:˥	ro:Ⅴ
102	snake	gul˦	ru:l˥	rulⅤ	ri˦	ɣi˥	ru:iⅤ
159	bone	gu˦	ru˦	ru˦	ru˦	-	ru˦
299	grind	goi˦	rialⱭ	rialⱭ	ria√	-	re:tⅤ
327	six	guk˦	ruk˦	ruk˦	ru:˦	ruk˥	ruk˦
328B	seven	gi˦	ri˦	ri?˥	ri˦	ri?˥	ri˦
329	eight	giatⱭ	riatⅤ	riatⅤ	reⅤ	-	retⱭ

Table 62. Proto Chin initial coronal trill *r

The [g] reflex in Tedim is best viewed as the result of a two-step process. The first step is velarization, where the coronal trill *r becomes dorsal fricative /ɣ/ in all environments.

Rule 3. Velarization (Tedim)

*r > ɣ/$___

The next sound change is strengthening. The voiced dorsal fricative /ɣ/ becomes the voiced dorsal stop /g/ in Tedim.

Rule 4. Strengthening (Tedim)

*ɣ > g/$___

Thus, the original coronal trill *r appears as voiced dorsal stop /g/ after undergoing Rules 3 and 4. According to Solnit (1979:115) this sound change is "somewhat out of the ordinary". However, there is ample evidence that the velarization of r ~ ɣ, at least, is not uncommon. The following tendencies of sound change prove that Rule 4 is a possible process. Solnit (1979:115) says; "There are indications of a velar/uvular point of articulation for *r̠: its normal reflex in both Karen and Lahu is the dorsal /ɣ/". Morover, Luce's (1985) transcription of Tedim (during the Chin Hills linguistic tour of 1954) shows that nearly all voiced dorsal stops /g/ were allophones of the voiced dorsal fricative /ɣ/ as shown in the following examples: 'six' as [ᵑguk / ɣuk], 'seven' as [s'agiʔ/s'aɣiʔ], 'bone' as [ᵑguʔ/ɣuʔ], snake as [ᵑgul/ɣul]. According to Lehman, (1990:19) native speakers of Mara pronounce their name [maɣa]. Hock and Joseph (1996:259) also say that "/r/ is generally pronounced as a dorsal fricative /ɣ/ in modern standard French." All these evidences support that /g/ in Tedim as the reflex of *r of Proto Chin[21] is not so far of the ordinary.

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[21] This initial consonant shift is sociolinguistically prominent: some Chin political leaders, particularly in India, such as H. Kam Khen Thang (1986), and S. Prim Vaiphei (1986) have attempted to group Chin people based only on this initial consonant as "R-group" and "Non R-group" or "G-group".

*ŗ. Proto Chin possessed a voiceless coronal trill *ŗ as the cognate set in Table 63 illustrates.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
110	louse head	hik˧	ŗik˧	ŗik˧	ŗi˧	hik˩	ŗik˥
331	ten	-	-	ŗa:˩	ŗa:˧	ha˥	ŗa˩
365	green	hiŋ˧	ŗiŋ˥	ŗiŋ˩	ŗeo˧	-	-

Table 63. Proto Chin initial voiceless coronal trill *ŗ

This initial consonant coronal trill *ŗ becomes a glottal fricative /h/ in Tedim and Khumi by dropping the oral articulation and keeping the feature of voicelessness, which appears as /h/.

Rule 5. Lenition (Khumi and Tedim)
*ŗ > h/$___

4.2.4 Fricatives

/f/. Table 64 shows that Mizo and Hakha have voiceless labial fricative /f/ in their consonant inventory.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
053	sugarcane	tu˧	fu:˥	fu:˩	su˧	sik˧	tu˧
220	spear	tei˩	fei˩	fei˩	sei˥	-	tei˧

Table 64. Chin initial voiceless labial fricative /f/

Two cognate words of the voiceless labial fricative /f/ in Mizo and Hakha have a sound correspondence with voiceless coronal stop /t/ in Tedim and Kaang, voiceless coronal fricative /s/ in Mara and Kaang. Kaang has the voiceless labial fricative /f/ in its consonant inventory but there is no consistent sound correspondence to the other languages in the current data. The sound change system looks consistent but due to insufficient cognate sets in the current data no sound change rule can be established at this point. This phoneme will be reconsidered in section 4.5.

*v. The cognate set in Table 65 illustrates the unambiguous initial voiced labial fricative *v in Proto Chin.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
001	sky	va:nˇ	va:nˇ	va:nˇ	va˧	va:nˈ	-
074	bear	vom˧	vom˥	vomˇ	vau˧	von˧	vomˈ
085	pig	vo:k˧	vok˧	vok˧	vo˧	-	vok˥
093	bird	va˥	vaˇ	va:˥	vo˥	va˧	va:ˈ
176	husband	-	-	va:ˇ	va˧	va˥	va˧

Table 65. Proto Chin initial voiced labial fricative *v

*s. The cognate set in Table 66 illustrates that all the languages unambiguously have retained the initial voiceless coronal fricative *s which is not obscure to assign as the proto phoneme.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
122	hair	samˈ	samˈ	samˇ	sa˧	sa:n˥	sam˧
207	mortar	sumˈ	sumˈ	sumˇ	so˧	sun˥	sum˧
208	pestle	suk˧	-	sumˇ	-	-	suk˥
293	launder	so:pˈ	su:ˇ	suk˧	so˥	suk˥	-
341	long	sa:uˈ	-	sauˇ	-	sau˥	sauˇ
343	tall	sa:ŋ˧	sa:ŋ˥	sa:ŋˇ	sa˧	saŋˈ	-

Table 66. Proto Chin initial voiceless coronal fricative *s

*z. The cognate set in Table 67 shows that Proto Chin possessed an initial voiced coronal fricative *z.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
056	liquor	zu:˧	zu:˥	zu:ˇ	-	-	juˇ
076	monkey	zo:ŋ˧	zo:ŋ˥	zo:ŋˇ	zau˧	-	jo:ŋˈ
080	rat	zuˈ	zuˇ	zu:˧	zu˥	ju˥	ju:ˈ
097	fly	zuaŋ˧	-	zuaŋ˥	zo˧	-	joŋˈ
168	urine	zun˧	zunˇ	zunˇ	zo˧	jun˧	jun˧
318	sell	zuak˧	zuar˥	zuar˥	zia˧	jo:ˈ	joiˈ

Table 67. Proto Chin initial voiced alveolar fricative *z

The proto form *z becomes a palatal approximant /j/ before back vowels in Khumi and Kaang. Since all instances of /j/ in Khuimi and Kaang in the present data precede back vowels, it is not clear whether this restriction is due to a conditioning environment in the sound change or to a phonotactic restriction on /j-/ initial syllables in Khumi and Kaang.

Rule 6. Palatalization (Kaang and Khumi)

*z > j/$___

*h. The selection of data in Table 68 illustrates that Proto Chin possessed an initial voiceless glottal fricative *h.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
040B	tree bark	ho:ŋ˧	-	ho:ŋ˧	hau˧	-	hok˥
059	mango	ha:i˧	ha:i˥	ha:i˩	hai˧	-	hai˩
133	tooth	ha:˧	ha:˥	ha:˩	ha˧	ha˧	-
238	yawn	ha:m˩	ham˩	ham˧	ha˧	ha:n˩	ha:m˥
256	hate	hua˦	hua˦	huat˧	ho:˥	-	-

Table 68. Proto Chin initial voiceless glottal fricative *h

4.2.5 Affricates

*ts. Table 69 shows that Mizo, Hakha and Mara have a voiceless coronal affricate /ts/ in their consonant inventory, which corresponds to a voiceless coronal stop in Tedim, Khumi and Mara. (Although Tedim [ti:˩] 'salt' (071) and [til˧] 'saliva' (132) have initial affiriates phonetically, they may be analysed as having underlying stops synchronically; cf. section 3.1.3.)

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
071	salt	ti:˩	tsi:˩	tsi˧	-	-	ti:˧
113	snail	-	tseŋ˩	tsaŋ˧	tsa:˥	ten˥	-
132	saliva	til˧	tsil˧	tsi:˩	tsi˧	-	ti˧
142	lungs	tuap˦	tsuap˩	tsuap˧	tso˥	to:˥	to:p˧
301	dig	to˦	tso˥	tso?˧	tso˧	-	to˩
415A	earth worm	taŋ˦	tsaŋ˥	tsaŋ˩	tsa˥	-	taŋ˧

Table 69. Proto Chin initial voiceless coronal affricate *ts

/t/ in the etyma above should be viewed as the reflex of a proto-phoneme *ts, because we have already established an unambiguous proto phoneme *t in Proto Chin (cf. Table 52). Therefore, we may posit a rule of deaffrication to account for the /t/ in Kaang, Khumi and Tedim.

Rule 7. Deaffrication (Kaang, Khumi and Tedim)
*ts > t/$___

*tʃʰ. Table 70 shows that Mizo, Hakha and Mara have voiceless coronal fricative /tʃʰ/ in their consonant inventory.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
019A	east	sua?˧	tʃʰak˧	tʃʰua?˥	tʃʰi˧	si˧	-
021A	north	sak˧	-	tʃʰak˧	-	si˥	si:p˥
345	thick	sa˧	tʃʰa?˧	tʃʰa?˥	tʃa˧	sa:˥	sa˥
345	thick	sa?˧	tʃʰa?˧	tʃʰa?˥	tʃa˧	sa:˥	sa˥
399	bad	sia˦	tʃʰia˩	tʃʰia˩	tʃʰe:˧	si:˥	se˥
399	bad	sia˦	tʃʰia˩	tʃʰia˩	tʃʰe:˧	si:˥	se˥
412	crested	suaŋ˧	tʃʰuaŋ˥	tʃʰuaŋ˩	tsa˧	-	siŋ˥

Table 70. Proto Chin initial voiceless aspirated coronal affricate *tʃʰ

The proto phoneme is changed to /s/ in Kaang, Khumi and Tedim. /s/ in the etyma above should be viewed as the reflex of a proto-phoneme *tʃʰ, because we have already established an unambiguous proto phoneme *s in Proto Chin (cf. Table 67). Therefore, we may posit a rule of spirantization to account for the /s/ in Kaang, Khumi and Tedim.

Rule 8. Spirantization (Kaang, Khumi and Tedim)
*tʃʰ > s/$___

4.2.6 Lateral approximants

*l. The cognate set in Table 71 unambiguously shows the initial lateral approximant *l in Proto Chin.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
119	head	lu:˧	lu:˥	lu:˩	lu:˧	lu:˦	lu˧
131	tongue	le:i˧	lei˥	lei˩	lei˧	lai˧	lei˧
140	navel	la:i˧	la:i˦	la:i˩	le˧	luŋ˥	lai˩
141	heart	luŋ˧	luŋ˥	luŋ˧	lo˥	luŋ˥	luŋ˧
312	dance	la:m˧	la:m˧	la:m˩	la:˧	lan˦	lam˩
325	four	li˧	li:˧	li˩	li˧	li˧	li˩
432	warm	lu:m˧	lum˥	lum˧	lo:˧	-	-

Table 71. Proto initial Chin lateral approximant *l

*l̥. The data in Table 72 exemplifies the initial voiceless lateral approximant *l̥ in Proto Chin. The proto voiceless lateral approximant *l̥ becomes a voiced lateral approximant /l/ in Tedim.

Rule 9. Voicing (Tedim)
$$*l̥ > l/\$\_\_\_$$

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
011	shadow	li:m˩	l̥im˩		r̥i˧	-	l̥ip˧
029	stone	luŋ˦	luŋ˦	l̥uŋ˩	lo˧	l̥oŋ˧	luŋ˧
041	thorn	liŋ˧	li:ŋ˧	l̥iŋ˩	l̥eo˧	l̥iŋ˦	l̥iŋ˩
057B	banana	la˦	l̥a:˦	la˧	la˧	-	-
358	far	la˦	l̥a:˧	l̥a:˧	l̥a˧	l̥a˧	-
382	hot	-	lum˧	-	lo˧	-	l̥ok˧
413	water leech	li:t˦	l̥i:t˩	l̥i:t˧	l̥i˧	-	li:t˦

Table 72. Proto initial Chin voiceless lateral approximant *l̥

4.2.7 Initial consonant clusters

*kr. The proto initial consonant cluster, composed of voiceless dorsal stop with medial coronal trill *kr is found in Kaang as in the cognate set shown in Table 73. This sound is doubtful in Khumi for it shares only one cognate word in the current data.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
020A	west	-	tʰlaŋ˦	tlak˦	tla˦	-	krak˥
226	weep	kap˦	ʈap˦	ʈap˦	-	-	krap˥
283	fall	kia˩	tla:˩	tla:˥	tla˦	ka:k˥	krui˥

Table 73. Proto Chin initial consonant cluster *kr

The proto alveolar trill *r as medial in Kaang is lost in Tedim and the voiceless dorsal stop /k/ is retained.

Rule 10. Deletion (Tedim)
*r > ∅/C___

The medial coronal trill *r in Proto Chin is retained in Kaang and becomes the coronal lateral approximant /l/ in Mizo, Hakha, and Mara.

Rule 11. Sporadic (Hakha, Mara and Mizo)
*r > l /C___

The coronal lateral approximant /l/ as a medial affects the initial voiceless dorsal stop /k/ causing it to become a voiceless coronal stop /t/ by place assimilation in Mizo, Hakha and Mara.

Rule 12. Assimilation (Hakha, Mara and Mizo)
*k > t /$_l

The consonant cluster /tl/ is merged into a single consonant and becomes voiceless retroflex stop /ʈ/ in Mizo and Hakha.

Rule 13. Merging (Hakha and Mizo)
*tl > ʈ/$___

*kʰr. The cognate set for the initial consonant cluster of the aspirated dorsal stop with a medial coronal trill *kʰr is shown in Table 74.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
003	moon	kʰaːˋ	tʰlaːˋ	tʰlaˋ	tʰla˧	tʰlaː˧	kʰraːˊ
095	wing	kʰaˋ	tʰlaːˋ	tʰla˧	tʰlo˧	-	pʰraːˉ
121	brain	kʰuakˊ	tʰluakˋ	tʰluakˋ	tʰli˧	-	kʰroːkˊ
165	sweat	kʰoˊ	tʰlanˋ	tʰlanˋ	tʰlai˧	-	kʰranˊ
200	sew	kʰuːi˧	tʰuiˉ	tʰitˉ	kʰoˉ	kʰok˧	kʰruiˋ

Table 74. Proto Chin consonant cluster *kʰr

The process of phonological change is the same as with *kr. Khumi shares only two cognate words out of five, and the sound change is inconsistent. For instance, the word 'sew' has initial /kʰ/ and the word 'moon' has initial /tʰl/. Therefore this phonological change is obscure in Khumi.

The recovery of the proto segments *kʰr and *kr is consistent with previous studies. According to Benedict (1972) the word 'sweat' in Proto Tibetan is *krwiy, 'sew' is *krwi(y), and 'weep' is *krap. The exact lexical form appears in Kaang for the verb 'to weep'. By taking into account these instances, Shafer's claim about the close relationship between Southern Chin languages and Proto Kuki-Chin is confirmed. As Peiros (1998:180) notes:

> Shafer has investigated the history of Kuki-Chin group and … He has shown that some Southern Kuki-Chin languages maintain Proto Kuki-Chin and possibly Proto Sino-Tibetan prefixes.

4.3 Nucleus

This section considers the reconstruction of Proto Chin vowel nucleus, which can be, analyzed under two subsections: monophthong and diphthong nuclei.

4.3.1 Monophthong vowels

*i. The data in Table 75 shows unambiguous evidence for the close unrounded front vowel *i in Proto Chin.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
002	sun	ni˦	ni:˥	ni:˩	ni˧	n̥i:˥	ni˩
089	horn (of buffalo)	ki:˧	ki:˥	ki:˦	ki˥	ki˦	ki:˩
164	blood	tʰi˧	tʰi˥	tʰi:˩	tʰi:˥	tʰi:˧	tʰi˩
323	two	ni˦	n̥i˦	ŋi?˦	-	m̥i:˥	ŋi˦
325	four	li˦	li:˦	li˩	li˦	li˦	li˩
013	day	ni˦	ni:˧	-	-	ni:˧	ni:p˧
066B	corn	mim˦	mim˥	-	mei˩	-	pim˧
201	needle	pʰim˦	-	tʰim˩	-	-	prim˩
357	straight	-	ŋil˥	diŋ˦	-	-	diŋ˧
386	heavy	gik˦	rit˦	rit˥	ri̥:˦	gi:?˦	ri?˥

Table 75. Proto Chin close unrounded front vowel *i

Close unrounded front vowel *i in the nucleus of closed syllables becomes close central vowel /ɨ/ in Kaang.

Rule 14. Fronting or Centralization (Kaang)
*i > ɨ/C___C

*u. The cognate set in Table 76 shows that Proto Chin unambiguously had the close rounded back vowel *u.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
056	liquor	zu:˦	zu:˥	zu:˩	-	-	ju˩
080	rat	zu˧	zu˥	zu:˦	zu˥	ju˥	ju:˧
094	bird's nest	bu˧	bu:˥	bu˥	bu˦	bu˥	bu:˧
119	head	lu:˦	lu:˦	lu:˩	lu:˦	lu:˧	lu˦
214B	smoke fire	kʰu˧	kʰu:˥	kʰu:˥	kʰu˦	kʰu˥	kʰu:˧
028	dust	vui˦	vut˦	vut˥	-	-	vɨt˥
096	feather	mul˧	m̥ul˧	mul˦	-	mui˧	mɨi˦
213	ashes	vut˦	-	vut˦	-	pʰu:˥	vɨt˥
244	laugh	nu:i˦	nui˧	ni:˦	-	n̥ui˥	nɨi˥

Table 76. Proto Chin close rounded back vowel *u

In closed syllables (including those with palatal off glide diphthongs) as exemplified in the last four words of the table, the close rounded back vowel *u changed to close unrounded central vowel /ɨ/ in Kaang.

Rule 15. Fronting or Centralization (Kaang)
*u > ʉ/C___

*a. The cognate set of Table 77 illustrates that there was an open vowel *a in Proto Chin.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
003	moon	kʰaːˇ	tʰlaːˇ	tʰlaˇ	tʰla˧	tʰlaː˧	kʰraːˈ
101	fish	ŋaˈ	ŋ̊aːˋ	ŋaː˧	ŋa˥	ŋaː˧	ŋaːˈ
135	chin	kʰaːˈ	kʰə˧	kʰa˧	ka˧	-	kʰa˧
326	five	ŋa˧	ŋaː˧	ŋaːˇ	ŋa˧	ŋaː˧	ŋa˧
376	bitter	kʰaːˈ	kʰaːˇ	kʰaː˧	kʰaːˋ	kʰaː˥	kʰa˥
257	wait	ŋ̊akˈ	ŋ̊aːkˇ	ŋ̊a˧	ha˧	-	ŋəŋ˥
334	many	tamˈ	tamˈ	tamˇ	sa˧	-	dəm˥
050	mushroom	paˈ	paːˈ	pa˧	po˧	pa˥	pa˧
093	bird	va˧	vaˋ	vaː˥	vo˥	va˧	vaːˈ
169A	man	pa˧	paˋ	paː˥	po˥	-	pa˧
172	father	paˈ	paːˋ	paːˇ	po˥	pa˧	paːi˥

Table 77. Proto Chin open vowel *a

Open vowel *a in Proto Chin changed to open mid central vowel /ə/ in Kaang in closed syllables. (Note that Kaang [paːi˧] 'father' (172), which has a long [aː] nucleu, is not affected.)

Rule 16. Raising or Centralization (Kaang)
*a > ə/C___C

Rules 15 and 16 can be summarized as "vowels become central vowels in closed syllables."

Rule 17. Centralization (Kaang)
*V > V(Central) /C___C

The open vowel *a becomes close mid back vowel /o/ after labial stops and fricatives in Mara, as exemplified in Table 77.

Rule 18. Raising (Mara)
*a > o/C[labial]___

*o. The cognate set in Table 78 illustrates the close mid rounded back vowel /o/ in Proto Chin. Mara has the most shared cognate words. This sound is suspect in Khumi due to limited correspondence words.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
092	elephant tusk	-	ŋoˇ	hoˉ	no˩	no˩	-
116	fly	tʰoˇ	tʰo:ˇ	tʰoˇ	tʰo˩	-	-
142	lungs	-	-	-	tsoˇ	to:ˉ	to:p˩
301	dig	to˥	tsoˉ	tso?˩	tso˩	-	toˇ
304	dry something	pʰo˩	pʰo:ˉ	pʰo:ˉ	zo:˩	-	pʰoˇ
380	dry, to be dry	-	ro:ˉ	ro˩	tso:˥	-	roŋˉ
394B	blind	to:ˇ	-	tsoˉ	tso˩	-	-

Table 78. Proto Chin mid close back vowel *o

*e. The cognate set of Proto Chin *e is provided in Table 79. Most languages retain /e/ as their reflex of Proto Chin *e.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
083	bite	pet˩	seˉ	se?˩	-	kekˉ	-
152	leg	kʰe:ˇ	ke:˥	ke:ˇ	-	-	-
288	give	pia˥	pe:ˇ	pe:k˩	piaˉ	pe:kˉ	pe˩
320	pay	pi:a˥	pe:ˇ	pe:kˇ	pia˩	peiˉ	kʰreŋˉ

Table 79. Proto Chin mid open front vowel *e

In Mara (and in some Tedim cognates), *e is diphthongized and becomes a close unrounded front vowel with open vowel /ia/.

Rule 19. Diphthongization (Mara)
*e > ia/___$

4.3.2 Diphthongs

*ei. The cognate set in Table 80 exemplifies unambiguously the diphthong *ei in Proto Chin.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
005	cloud	meːiꜜ	-	meiꜜ	meiꜜ	maːiꜜ	meiꜜ
090	tail	meiꜜ	meiꜜ	meiꜝ	m̥eiꜜ	maiꜛ	meiꜜ
131	tongue	leːiꜜ	leiꜛ	leiꜜ	leiꜜ	laiꜜ	leiꜜ
212	fire	meiꜜ	meiꜜ	meiꜝ	meiꜛ	maiꜛ	meiꜝ
416A	1 (1s)	keiꜜ	keiꜜ	keiꜜ	keiꜜ	kaiꜛ	keiꜝ

Table 80. Proto Chin diphthong *ei

The diphthong *ei became /ai/ in Khumi.

Rule 20. Lowering (Khumi)
*ei > ai /C___ $

***ai**. Proto Chin possessed the diphthong *ai as the selected data in Table 81 shows.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
120	face	maiꜜ	m̥aːiꜜ	m̥aːiꜝ	meꜝ	m̥aiꜛ	m̥aːiꜝ
140	navel	laːiꜜ	laːiꜜ	laːiꜝ	leꜜ	-	laiꜝ
166	pus	naːiꜜ	n̥aːiꜛ	n̥aːiꜝ	n̥eꜜ	n̥aːiꜜ	ŋaiꜝ
359	near	naːiꜜ	n̥aːiꜜ	naiʔꜜ	n̥eꜜ	ŋaiꜛ	-

Table 81. Proto Chin diphthong *ai

The proto phoneme *ai coalesces to /e/ in Mara.

Rule 21. Coalescence (Mara)
*ai > e /C___ $

***ui**. Table 82 is the cognate set which shows evidence for the proto phoneme of the diphthong *ui in Proto Chin.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
023	water	tuːiꜜ	tuiꜜ	tiːꜜ	tiꜝ	tuiꜛ	tuiꜝ
098	egg	tuːiꜜ	tuiꜛ	tiꜜ	tiꜜ	tuiꜜ	tuiꜜ
244	laugh	nuːiꜜ	nuiꜜ	niːꜜ	ŋiꜜ	ŋ̊uiꜛ	n̥ʉiꜝ

Table 82. Proto Chin diphthong *ui

The proto phoneme *ui is monophthongized to a single close unrounded front vowel in Hakha and Mara.

<div align="center">

Rule 22. Fusion (Hakha and Mara)
*ui > i /____ $

</div>

*ua. The data in Table 83 show evidence for a close rounded back vowel-to-open vowel diphthong *ua in Proto Chin.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
007	rain	guaꜜ	ruaꜜ	ruaꜛ	-	kʰoːⱽ	kʰoꜜ
019A	east	suaꜜ	-	tʃʰuaʔꜛ	tʃʰiꜛ	-	-
183	village	kʰuaꜜ	kʰuaꜛ	kʰuaⱽ	kʰiːꜜ		kʰoꜜ
234	vomit	luaⱽ	luakⱽ	luakꜛ	liꜛ	lokꜛ	lokꜛ
330	nine	kuaⱽ	kuaⱽ	kuaⱽ	kiːⱽ	koꜛ	koⱽ

<div align="center">

Table 83. Proto Chin diphthong *ua

</div>

The proto phoneme *ua becomes a close unrounded front vowel /i / in Mara.

<div align="center">

Rule 23. Fusion (Mara)
*ua > i/C____ $

</div>

The same proto phoneme *ua becomes a close mid back rounded vowel /o/ in Kaang and Khumi. Khumi shares comparatively few cognate words in the cognate set.

<div align="center">

Rule 24. Coalescence (Kaang and Khumi)
*ua > o /C____ $

</div>

*oi. The selection of cognate set in Table 84 illustrates that Proto Chin had the diphthong *oi.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
049B	bamboo shoot	toiꜜ	toiꜜ	toiⱽ	-	tuiⱽ	toiⱽ
115	bee	kʰoːiꜜ	kʰoːiꜜ	kʰoːiⱽ	-	kʰoiⱽ	kʰoːiⱽ
342	short length	-	toːiⱽ	toːiⱽ	-	toiꜜ	toiⱽ
426	bend	koːiⱽ	koiⱽ	koːiꜛ	koꜜ	konⱽ	
427	lift	toiꜜ	tsoiⱽ	tsoiꜛ	tsoꜜ		-

<div align="center">

Table 84. Proto Chin diphthong *oi

</div>

Although data is scare, *oi appears to regularly develop into a *o in Mara.

Rule 25. Monophthongization (Mara)
*oi > o/C___$

*au. Proto Chin had the diphthong *au as shown in Table 85.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
162	fat	tʰaːuˇ	tʰauˇ	tʰaːuˇ	tʰau˧	tʰau˧	tʰaːuˊ
341	long	saːuˊ	-	sauˇ	-	sauˉ	sauˇ
347	fat (to be)	tʰau˧	tʰaːuˉ	tʰauˇ	tʰoː˧	-	tʰauˋ
349	wide/breadth	-	zauˉ	kauˉ	ko˧	kauˉ	kauˋ
440A	yr. bro. of m	naːu˧	nauˉ	nau˧	-	nauˉ	nauˇ

Table 85. Proto Chin diphthong *au

The proto vowel nucleus *au, which is preserved in Tedim, Mizo, Hakha, Khumi and

Kaang, coalescence into /o/ in Mara.

Rule 26. Coalescence (Mara)
*au > o /C___$

(Note that Mara [tʰau˧] 'fat' (162) irregularly retains the older *au nucleus. This may

be due to speakers consciously making distinction between [tʰau˧] 'fat' and [tʰoː˧]

'to be fat' (347)).

*ia. The diphthong /ia/ in the nucleus position is unambiguous as Table 86 illustrates.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
128	cheek	biaːŋ˧	biaŋˉ	biaŋˇ	bai˧	be˧	beːŋˋ
242	lick	liakˊ	liakˋ	liaʔˇ	liaˉ	lekˊ	leːkˊ
299	grind	-	rialˊ	rialˊ	riaˇ	-	reːtˋ
329	eight	giatˊ	riatˋ	riatˇ	reˋ	-	retˊ
344	short height	niamˊ	n̥iamˊ	niamˇ	n̥aiˉ	n̥enˉ	nem˧
399	bad	siaˊ	tʃʰiaˇ	tʃʰiaˇ	tʃʰeː˧	seː˧	tʰe˧

Table 86. Proto Chin diphthong *ia

The proto phoneme is monophthongized to close mid unrounded front vowel /e/ in

Khumi and Kaang. Mara shows partial evidence for this change.

Rule 27. Monophthongization (Kaang and Khumi)
*ia > e /C___$

4.4 Codas

The analysis of codas is divided according to types of final consonant such as nasals, trills, stops and lateral approximants.

4.4.1 Nasal codas

*m. The cognate set in Table 87 displays the Proto Chin coda *m.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
122	hair	sam˧	sam˧	sam˥	sa˧	sa:n˥	sam˧
184	road/path	lam˧	-	lam˥	la:˥	lan˧	lam˥
238	yawn	ha:m˥	ham˥	ham˥	ha˧	ha:n˧	ha:m˥
312	dance	la:m˧	la:m˧	la:m˥	la:˧	lan˧	lam˥
207	mortar	sum˧	sum˧	sum˥	so˧	sun˥	sum˧
302	bury corpse	pʰu:m˧	pʰu:m˧	pʰum˧	bo:˥	pʰun˥	bui˧
324	three	tʰum˧	tʰum˧	tʰum˥	tʰo˧	tʰun˧	tʰum˥

Table 87. Proto Chin coda *m

The labial nasal as coda becomes a coronal nasal in Khumi.

Rule 28. Alveolarization (Khumi)
*m >n /C___$

The nasal coda is dropped out of Mara.

Rule 29. Deletion (Mara)
*m > ∅ /C___$

It is worth noted that the *m coda, which is preserved in Tedim, Mizo, Hakha and Kaang becomes an coronal *n in Khumi. Coronal nasal final syllables have tended to move toward losing their nasal finals with the vowel becoming nasalized as evidenced by Zotung, a Southern Chin language. For instance the word 'forest' in Zotung is /rã/ and 'three' is /tʰũ/ (Kaw Kung p.c. April 1, 2001), (cf. Tedim /gam/ 'forest', /tʰum/ 'three'). This is true also of Burmese (cf. Mann 1998:38).

Mara has lost all trace of the original nasal coda, and has only open syllables with oral vowels.

*n. The coronal nasal coda *n is also posited as a proto phoneme, but Mara drops it based on the cognate set shown in Table 88.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
001	sky	vaːnˇ	vaːnˇ	vaːnˇ	vaˉ	vaːn˄	-
012	night	zaːnˇ	zaːnˇ	zanˇ	zeˉ	-	tʰan˦
057A	banana	banˇ	banˇ	ban˦	baːˉ	-	pan˦
143	liver	sinˇ	tʰin˦	tʰinˇ	tʰiˉ	tʰin˦	sin˦
150B	fingernail	tin˄	tin˄	tinˇ	teˉ	sin˦	tin˦
409	ripe	min˦	min˦	m̥inˇ	m̥aˉ	m̥in˄	m̥inˇ
346	thin	pa˄	pan˦	panˇ	paːˉ	paː˦	pan˦

Table 88. Proto Chin coda *n

Rule 30. Deletion (Mara)
*n > ∅/C___$

*ŋ. We may posit a dorsal nasal coda *ŋ for Proto Chin based on the cognate set in Table 89. Predictably, the coda does not appear in Mara.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
263	dream	maŋ˄	maŋ˄	maŋ˦	maːˉ	maŋ˦	maŋ˦
029	stone	luŋ˄	luŋ˄	luŋˇ	loˉ	l̥oŋ˦	luŋ˦
141	heart	luŋ˦	luŋ˦	luŋ˦	loˉ	luŋ˦	luŋ˦
038A	tree	tʰiŋ˄	tʰiŋ˄	tʰiŋ˦	tʰoˉ	tʰiŋ˦	tʰiŋˇ
211	firewood	tʰiŋ˄	tʰiŋ˄	tʰiŋ˄	tʰeiˉ	tʰiŋ˦	tʰiŋˇ
076	monkey	zoːŋ˦	zoːŋ˦	zoːŋˇ	zauˉ	-	joːŋˇ
417A	thou (2s)	naŋ˄	naŋ˄	naŋ˦	naˉ	naŋ˦	naŋˇ

Table 89. Proto Chin coda *ŋ

Rule 31. Deletion (Mara)
*ŋ > ∅/C___$

Rules 29, 30 and 31 can be summarized as Rule 32 shows: Mara deletes all final nasal consonants.

Rule 32. Deletion (Mara)
*N > ∅/___$

4.4.2 Trill coda

*r. Based on the evidence of Tedim, Mizo and Hakha in Table 90 we may reconstruct an coronal trill *r as Proto Chin coda.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
034	iron	tʰikʌ	tʰirʌ	tʰiar˦	tʰiaˇ	-	tʰiˇ
099	chicken	ak˦	a:r˦	a:rˇ	o:˦	a:ʌ	a:iˇ
127	nose	na:kˇ	ŋar˦	na:rˇ	ŋa˦	na˦	ŋa˦
318	sell	zuak˦	zuar˦	zuar˦	zia˦	jo:ʌ	joiˇ
368	new	tʰa:k˦	tʰar˦	tʰarˇ	tʰia˦	tʰa˦	tʰaiˇ
375	sour	tʰukʌ	tʰu:rʌ	tʰorˇ	tʰu˦	tʰo:kʌ	tʰuiʌ

Table 90. Proto Chin coda *r

Mizo and Hakha keep the proto phoneme. The other languages have gone through various phonological changes with respect to *r.

The coda *r has a voiceless dorsal stop /k/ reflex in Tedim. We may presume that the coda *r underwent the same developments that change the initial *r > g (Rules 3, 4). The voiced dorsal stop /g/ then becomes a voiceless dorsal stop /k/ through final devoicing.

Rule 33. Devoicing (Tedim)
*g > k/___$

In Mara, Kaang and Khumi, Proto Chin coda *r is lost.

Rule 34. Deletion (Kaang, Khumi and Mara)
*r > ∅/___$

4.4.3 Stop codas

*p. Table 91 shows that Proto Chin possessed the voiceless labial stop *p coda. The coda is lost in Mara and Khumi.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
142	lungs	tuap˧	tsuap˥	tsuap˦	tso˥	to:˦	to:p˦
226	weep	kap˨	t̪ap˨	t̪ap˨	-	ga˨	krap˦
241	suck	to:p˧	hi:p˧	dop˨	so˨	jo:˧	jo:n˧
313	shoot	ka:p˧	ka:p˥	ka˨	ka˨	ka:˦	ka:p˦

Table 91. Proto Chin coda *p

Rule 35. Deletion (Mara and Khumi)
*p > ∅/___$

*t. The cognate set in Table 92 shows that Proto Chin had the voiceless coronal stop *t as one of the codas. Mara and Khumi lost this coda. This sound change rule is suspect in Khumi due to very few cognates in the current data.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
145	hand	kʰut˨	kut˨	kut˦	ku˨	-	kut˦
277	enter	lut˧	lu:t˥	lut˦	-	-	lut˨
329	eight	giat˧	riat˥	riat˥	re˥	-	ret˧
413	water leech	li:t˧	l̪i:t˥	li:t˦	li˦	-	li:t˧
414	land leech	vo:t˨	vat˨	vut˨	va˨	va˦	vət˦

Table 92. Proto Chin coda *t

Rule 36. Deletion (Mara and Khumi)
*t > ∅/___$

*k. The cognate set in Table 93 illustrates that there was a voiceless dorsal stop *k in Proto Chin as coda but lost in Mara.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
121	brain	kʰuak˧	tʰluak˥	tʰluak˥	tʰli˦	-	kʰro:k˧
154	knee	kʰuk˧	kʰu:p˥	kʰuk˨	kʰu˦	kʰu˦	kʰu:k˦
266	itch	tʰak˨	tʰak˨	tʰak˨	tʰa˨	tʰa:k˧	tʰak˦
327	six	guk˨	ruk˨	ruk˨	ru:˨	ruk˦	ruk˨
351	deep	tʰu:k˧	tʰu:k˥	tʰuk˨	tʰu˦	tʰo:k˦	tʰuk˧

Table 93. Proto Chin coda *k

Rule 37. Deletion (Mara)
*k > ∅/___$

(Note that the coda *k is irregularly lost in Khumi [kʰuꜜ] 'knee' (154))

Rules 35, 36 and 37 can be summarized as Rule 38; any stop coda is lost in Mara.

Rule 38. Deletion (Mara)
*S > ∅/___$

4.4.4 Lateral approximant coda

It is unproblematic to posit the lateral approximant *l at the proto Chin level based on the cognate sets in Table 94.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
132	saliva	tilꜜ	tsilꜛ	tsiːlꜜ	tsiꜜ	-	tiꜜ
144	intestines	gilꜜ	rilꜛ	rilꜜ	riꜜ	giꜛ	riꜜ
253	forget	ŋilꜜ	ŋ̊ilꜜ	pʰilꜜ	-	-	ŋiʔꜛ
292	wash	silʌ	silʌ	ʈoːlꜜ	siːꜛ	siꜛ	-
096	feather	mulʌ	m̥ulʌ	mulꜜ	m̥iꜜ	muiʌ	mɨiꜜ
102	snake	gulꜜ	ruːlꜛ	rulꜜ	riꜜ	giꜛ	ruːiꜜ
136	beard	mulʌ	m̥ulʌ	mulꜜ	m̥iꜜ	muiꜛ	mɨiꜜ

Table 94. Proto Chin coda *l

The proto phoneme of lateral approximant *l as coda is lost in Mara, Khumi and Kaang.

Rule 39. Deletion (Mara, Kaang and Khumi)
*l > ∅/___$

4.5 Symmetrical considerations

In this section, the consonant and vowel inventories derived in this reconstruction are be analyzed as to whether they are symmetrically distributed or not. This step is important and necessary for a completed phonological reconstruction. The completed phonological reconstruction is expected to be more or less symmetrical because "...crosslinguistically, phonological systems tend toward symmetry" (Hock and Joseph 1996:151).

4.5.1 Consonant inventory

Table 96 is the consonant inventory of Proto Chin based on the reconstruction.

	Labial	Coronal	Dorsal	Glottal
Voiceless stops	*p	*t	*k	/ʔ/
Voiceless aspirated stops	*pʰ	*tʰ	*kʰ	
Voiced stops	*b	*d		
Voiced nasals	*m	*n	*ŋ	
Voiceless nasals	*m̥	*n̥	/ŋ̊/	
Voiced trill		*r		
Voiceless trill		*r̥		
Voiceless alveolar affricate		*ts		
Voiceless aspirated affricate		*tʃʰ		
Voiceless fricatives	/f/	*s		*h
Voiced fricatives	*v	*z		
Voiced lateral approximant		*l		
Voiceless lateral approximant		*l̥		

Table 95. Non-symmetrical consonant inventory of Proto Chin

The reconstructed consonant inventory at this point has some asymmetries. One of these apparent is the lack of a reconstructable voiced dorsal stop *g, as noted by Ono (1965). Secondly, the voiceless labial fricative /f/ is potentially a proto phoneme as the data in Table 64 of section 4.2.4 suggests though data are limited. Thirdly, due to limited data, the voiceless dorsal nasal's status is also doubtful as shown in Table 61 in section 4.2.2. Therefore the consonant inventory of the reconstruction should be reconsidered.

Cross-linguistic tendencies require that we seek a symmetrical consonant inventory which a reconstruction without *g does not satisfy. Proto Chin *g is not readily reconstructable from the data, but it is possible to trace it considering sound changes in Chin languages. In Tedim, /v/ and /g/ appear in free variation: for instance, Tedim [vuiV]~[guiV] 'millet plants sprout'; [vui˧]~[gui˧] 'carry the corpse to the grave, bury.' According to Bhasakararao (1996:45), Tedim [guai˧] 'wither' or 'shrivel' corresponds to Mizo [vuai˧] but in fact, both pronunciations are possible in Tedim.

Although the initial reconstruction of a proto phoneme *v appeared unambiguous, the picture becomes more complicated if we consider cognate forms from Thawr,[22] a Chin language of central Chin State. Thawr has the voiced dorsal fricative /ɣ/ which corresponds to the voiced labial fricative /v/ in other Chin languages as shown in Table 96.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang	Thawr
001	sky	vaːnˇ	vaːnˇ	vaːnˇ	va˩	vaːn˩	-	ɣoːnˊ
024	river	-	-	vaˇ	va˩	va˩	-	ɣoˇ
074	bear	vom˩	vom˥	vomˇ	vau˩	von˩	vomˈ	ɣomˇ
085	pig	voːk˩	vok˩	vok˩	vo˩	oːk˥	vok˥	ɣok˩
091	elephant	-	-	vuiˇ	-	-	vʉiˇ	ɣuiˇ
093	bird	va˥	vaˈ	vaː˥	vo˥	va˩	vaː˦	ɣo˦
176	husband	-	-	vaːˇ	va˩	va˥	va˩	ɣoˇ
275	crawl	vakˇ	vakˇ	-	-	vak˥	-	ɣok˦

Table 96. Proto Chin voiced velar stop *g

From this data, it can be conjectured that a Proto Chin *g merged with a voiceless labial fricative *v (which is itself in free variation with [w]). This was most likely a two-stage process. The first step was spirantization, the voiced dorsal stop *g becoming a voiced dorsal fricative /ɣ/ (Rule 40).

Rule 40. Spirantization (Hakha, Mara, Mizo, Kaang, Khumi, Tedim, Thawr)
*g > ɣ/$___

The voiced dorsal fricative /ɣ/ then became a voiced labiovelar approximant /w/, in free variation with the voiced labiodental fricative /v/.

Rule 41. Labialization (Hakha, Mara, Mizo, Kaang, Khumi and Tedim)
*ɣ > w ~ v /$___

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[22] Thawr is a language spoken only in Lamtuk and Ruavan village, Central Chin State; and composed of 110 families and 700-1000 estimated population. (Personal communication with Mang Hmun, a Thawr speaker from Lamtuk village on April 20, 2001.)

Rules 3 and 4 prove the process how dorsal stop /g/ in Tedim is the reflex of the proto coronal trill *r and rule 40 and 41 prove the process how voiced labial fricative /v/ in all language under study is the reflex of the proto dorsal stop *g. Both processes have /ɣ/ as an intermediate step. There is no evident that *g and *r are not in a merger. Therefore it requires how to keep the two sound change processes separate. The possible hypothesis is to prove that the occurrence of the two sound change rules must have been at different time. There are two possibilities as provided in Table 97.

	Proto Chin	Stage I	Stage II	Stage III	Present
Scenario I	*g	>ɣ	>w ~ v	>v	>v (All)
	*r		>ɣ	>g	>g (Tedim)
Scenario II	*g		>ɣ	>w ~ v	>v (All)
	*r	>ɣ	>g		>g (Tedim)

Table 97. Sound change process for *r and *g

The Scenario I is more likely because Scenario II requires the sound change *g > ɣ and *ɣ > g at the same time. It may also be observed that the sound change process *r > ɣ > g/$___ is more recent than the *g > ɣ > w ~ v /$___, based on Luce's (1959) transcription on the Chin Hills linguistic tour in 1954, in which the present sound [g] is transcribed as [ɣ] consistently.

The second asymmetry is the uncertain status of *f. In section 4.2.4, this phoneme with its possible sound correspondence was briefly discussed based on limited cognate sets. Addition to the current data, Bhaskararao (1996) provides some consistent sound correspondences between Tedim and Mizo (See appendix G). The present hypothesis is that the proto phoneme *s still preserved in Mara and Khumi, has reflexes of /f/ in Hakha and Mizo, /t/ in Tedim and Kaang. The author is not confident of this due to the absence of a voiced counterpart *v, the existence of the /ts/ and /t/ in the set of reflexes of the purative proto phoneme *f and the limited data presently available. More investigation is required on this point.

The third asymmetry concerns the voiceless dorsal nasal *ŋ̊. The labial and coronal nasals have their respective voiceless counterparts in Proto Chin (cf. Table 60 and 61). Taking into account the cross-linguistic tendencies of symmetry, it is possible to posit the voiceless velar nasal as a proto phoneme. Based on four additional Mizo words from Bhasakararao (1996:127) shown in Table 98, the voiceless velar nasal in Mizo consistently corresponds with voiced dorsal nasal in Tedim.

No.	Gloss	Tedim	Mizo
1	wild boar	ŋal˧	ŋ̊al
2	put down	ŋak˨	ŋ̊at
3	neck	ŋoŋ˧	ŋ̊oŋ
4	fast	ŋol˧	ŋ̊ei

Table 98. Tedim /ŋ/ and Mizo /ŋ̊/ of Bhaskararao (1996)

The data in Table 98 strengthen the hypothsis that the *ŋ̊ should be reconstructed for languages in northern Chin State; but the status of *ŋ̊ as a proto phoneme of Southern Chin languages is still tenuous.

No.	Gloss	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
101	fish	ŋa˧	ŋ̊a:˥	ŋa:˨	ŋa˩	ŋa:˩	ŋa:˧
253	forget	ŋil˨	ŋ̊il˨	-	-	-	ni̥ʔ˩
257	wait	ŋak˧	ŋ̊a:k˥	ŋ̊a˨	-	-	ŋaŋ˩

Table 99. Proto Chin voiceless velar nasal *ŋ̊

Therefore the voiceless feature becomes voiced in Tedim.

Rule 42. Voicing (Tedim)
*ŋ̊ > ŋ/$___

Rules 1, 2, 9 and 42 can be summarized that the initial voiceless nasal series *N̥ and voiceless liquids in the proto language became voiced in Tedim.

Rule 43. Voicing (Tedim)
*C̥[Sonorants] > C/$___

	Front	Back
Close	*i	*u
Close mid	*e	*o
Open	*a	

Table 101. Proto Chin vowel inventory

4.6 Tones

The consideration of tone is the most complicated part of this analysis. Luce (1985) comments that the tones or rather the Tone-Patterns are the binding factor which joins Chin languages together from north to south, and from east to west. On the basis of 17 varieties of Chin languages Luce identifies six common tones with each tone number's (shown superscripted) associated tonal description: [1]High Level, [2]High Falling, [3]Mid Rising or Level, [4]Mid Falling, [5]Low Level and [6]Low Falling (but some dialects appear to distinguish only two or three tones; Low Level and Low Falling are rare). From these he identifies five tone patterns. His provisional conclusion of Chin Tone Pattern (1985:83) says:

(i) Three tones, the origin of Tone-Patterns I, II, and III, were once the norm in Chin languages.

(ii) Each of the three tones affected open, nasal and -*l*/-*r* finals.

(iii) Tone-Pattern I did not admit a final stop- with the exception of certain -*k*/-*r* finals in the northernmost dialects, where the older final was the -*r*, probably uvular, and not the -*k*.

(iv) Where Tone Patterns II and III now divide themselves into *a* and *b*, the division is not very ancient nor widespread in Chin, but depended on the original presence or absence of a final stop, stopped finals being confined to II*b* and III*b*.

(v) The distinction between II*b* and III*b* depended on whether the old medial vowel before the stop was short or long.

(vi) The presence of a large number of apparently open finals in III*b* (e.g. 'father', 'mother', 'children', 'fish', 'flesh', 'bird', 'breast', 'horns') points to the loss (as an Archiac Chinese) or [SIC] a number of sonant plosives (especially –*g*) after the long vowel.

Luce's conclusions are summarized in Table 102.

	Smooth syllable			Stopped syllable
	Open	Nasal	Liquid	
Tone Pattern I	yes	yes	yes	no
Tone Pattern IIa	yes	yes	yes	no
Tone Pattern IIb	no	no	no	yes (short medial vowel)
Tone Pattern IIIa	yes	yes	yes	no
Tone Pattern IIIb	no	no	no	yes (long medial vowel)

Table 102. Co-occurrence of Luce's Chin Tone Patterns and syllable types

Luce's data includes the selected languages used in this thesis except Kaang. There are two Khumi varieties, Ahriang and Awa. (The Khumi dialect used in this thesis is Paletwa Khumi.) Luce shows 46 examples of words for Tone Pattern I, 23 words for Tone Pattern IIa, 19 words for Tone Pattern IIb, 26 words for Tone Pattern IIIa and 26 words for Tone Pattern IIIb. The present tonal analysis is based on the words that are found in Luce's data within each pattern. The correspondence of the tone numbers in this data and Luce's data is shown in Table 103. The number after the decimal point refers to a subtype of Luce's tonal categories based on the current data.

Luce No.	Luce tone	Present No.	Present symbol	Present tone
1	High Level	1	˥	High Level
2	High falling	2	˥˩	High Falling
		2.5	˦	Falling
3	Mid Rising/Level	3	˧˦	Mid Rising
		3.2	˨	Low rising
		3.5	˧	Level
		3.8	˦	Rising
4	Mid falling	4	˥	Mid Falling
5	Low Level	5	˩	Low Level
6	Low falling	-	-	-

Table 103. Tone number of Luce data and present data

Tone-Pattern I occurs with smooth syllables[23] and does not in general allow stopped syllables. Tone I occurs in stopped syllables with final /k/ in Tedim but these are a reflex of the *r.

Table 104 shows the 25 words from the current data, which correspond, to Luce's examples. Luce says Tone-Pattern I is high level tone in Tedim and Mizo, low level tone in Hakha, low falling tone in Mara, high falling tone in Ahriang Khumi, high falling and mid falling tone in Awa Khumi.

No.	Gloss	Tedim		Mizo		Hakha		Mara		Khumi		Kaang	
037	forest	gam˧	3.5	ram˥	1	ram˅	2.5	ra˧	3.5	-	-	-	-
048	bamboo	gua˧	3.5	rua˧	3.5	rua˅	2.5	ra˧	3.5	gu:˥	3	ro:˅	2.5
053	sugarcane	tu˧	3.5	fu:˥	1	fu:˅	2.5	su˧	3.5	sik˧	3.5	tu˧	3.5
059	mango	ha:i˧	3.5	ha:i˥	1	ha:i˅	2.5	hai˧	3.5	-	-	hai˅	2.5
074	bear	vom˧	3.5	vom˥	1	vom˅	2.5	vau˧	5	von˧	5	vom˥	2
076	monkey	zo:ŋ˧	3.5	zo:ŋ˥	1	zo:ŋ˅	2.5	zau˧	5	-	-	jo:ŋ˥	2
098	egg	tu:i˧	3.5	tui˥	1	ti˥	1	ti˧	5	tui˥	3.8	tui˧	3.5
099	chicken	ak˧	3.5	a:r˥	1	a:r˅	2	o:˧	3.5	a:˥	3.8	a:i˅	2.5
102	snake	gul˧	3.5	ru:l˥	3	rul˅	2.5	ri˧	5	gi˥	1	ru:i˅	2.5
119	head	lu:˧	3.5	lu:˥	1	lu:˅	2.5	lu:˧	3.5	lu:˥	3.8	lu˧	3.5
131	tongue	le:i˧	3.5	lei˥	1	lei˅	2.5	lei˧	5	lai˧	3.5	lei˧	3.5
132	saliva	til˧	3.5	tsil˥	1	tsi:l˅	2.5	tsi˧	5	-	-	ti˧	3.5
133	tooth	ha:˧	3.5	ha:˥	1	ha:˅	2.5	ha˧	5	ha˧	5	-	-
140	navel	la:i˧	3.5	la:i˥	3.8	la:i˅	2.5	le˧	3.5	luŋ˥	1	lai˅	2.5
141	heart	luŋ˧	3.5	luŋ˥	1	luŋ˧	3.5	lo˥	1	luŋ˥	1	luŋ˧	3.5
144	intestines	gil˧	3.5	ril˥	1	ril˅	2.5	ri˧	5	gi˥	1	ri˧	5
182	name	min˧	3.5	min˥	1	min˅	2.5	mo˧	3.5	min˥	3.8	min˥	2
312	dance	la:m˧	3.5	la:m˥	3.5	la:m˅	2.5	la:˧	3.5	lan˥	3.8	lam˥	2
318	sell	zuak˧	3.5	zuar˥	1	zuar˥	1	zia˧	5	jo:˥	3.8	joi˥	2
324	three	tʰum˧	3.5	tʰum˥	3.8	tʰum˅	2.5	tʰo˧	3.5	tʰun˧	3.5	tʰum˅	2.5
325	four	li˧	3.5	li:˧	3.5	li˅	2.5	li˧	3.5	li˧	3.5	li˅	5
326	five	ŋa˧	3.5	ŋa:˧	3.5	ŋa:˅	2.5	ŋa˧	3.5	ŋa:˧	3.5	ŋa˧	3.5
343	tall	sa:ŋ˧	3.5	sa:ŋ˥	1	sa:ŋ˅	2.5	sa˧	3.5	san˥	3.8	-	-
347	fat	tʰau˧	3.5	tʰa:u˥	1	tʰau˅	2.5	tʰo:˧	5	tʰo˥	3	tʰau˥	2
364	red	san˧	3.5	sen˥	1	sen˅	2.5	sai˧	3.5	tʰin˥	3	sen˧	5

Table 104. Examples of Tone-Pattern I

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[23] I am using Luce's terminology here, smooth syllable means non stopped syllables (i.e. open syllables and those with nasal and liquid finals)

Based on Luce's Pattern I as the proto form, the tonal correspondence within the languages can be seen in Table 105.

	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
Luce's data	High Level	High Level	Low Level	Low Falling	High Falling/ Mid Falling High Falling	-
Present data	Mid	High Level	Falling	Level Low Level	Rising	Level Falling

Table 105. Luce's tone and the tonal equivalents based

on the current data in Tone-Pattern I

Tone-Pattern IIa occurs in smooth syllables, and not in stopped syllables. According to Luce, the structure of Tone-Pattern IIa is mid falling in Tedim and Mizo, high falling in Hakha, low level in Mara and Ahriang Khumi, and mid falling in Awa Khumi.

The present data has 13 words from Luce's examples as shown in Table 106.

No.	Gloss	Tedim		Mizo		Hakha		Mara		Khumi		Kaang	
003	moon	kʰaːˇ	2.5	tʰlaːˇ	2.5	tʰlaˇ	2.5	tʰla˧	3.5	tʰlaˑ˧	3.5	kʰraːˈ	3.8
012	night	zaːnˇ	2.5	zaːnˇ	2.5	zanˇ	2.5	ze˧	5	-	-	tʰanˈ	3
018	year	kumˇ	2.5	kumˇ	2.5	kumˇ	2.5	ko˧	5	-	-	kumˈ	3.8
095	wing	kʰaˇ	2.5	tʰlaːˇ	2.5	tʰlaˑ˧	1	tʰlo˧	3.5	-	-	pʰraːˈ	3
123	forehead	talˇ	2.5	tsalˇ	2.5	tsalˇ	2.5	-	-	-	-	tai˧	3.5
127	nose	naːkˇ	2.5	ŋaˈ	1	ŋaːrˇ	2.5	na˧	5	naˈ	1	ŋa˧	3.5
143	liver	sinˇ	2.5	tʰin˧	5	tʰinˇ	2.5	tʰi˧	3.5	tʰin˧	3.5	sinˈ	3
146	elbow	kiuˇ	2.5	kiuˇ	2.5	kiuˇ	2.5	kʰi˧	3.5	kʰuˈ	1	kiːˈ	3.8
152	leg	kʰeːˇ	2.5	ke˧	4	keːˇ	2.5	-	-	kʰoːkˈ	3.8	kʰoːˈ	3.8
168	urine	zunˇ	2.5	zunˇ	2.5	zunˇ	2.5	zo˧	3.5	jun˧	5	juŋ˧	3.5
224	see	muˇ	2.5	m̥uː˧	5	mu?ˈ	1	mo˧	3.5	-	-	m̥uˈ	1
250	sing	saˇ	2.5	-	-	saˈ	1	sa˧	3.5	sak˧	3.5	-	-
332	hundred	zaːˇ	2.5	zaːˇ	2.5	za˧	3.5	za˧	3.5	-	-	-	-

Table 106. Examples of Tone-Pattern IIa

The tonal correspondence of Chin languages is provided based on Luce's Pattern IIa as the proto form in Table 107.

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	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
Luce's data	Mid Falling	Mid Falling	High Falling	Low Level	Low Level/ Mid Falling	-
Present data	Falling	Falling	Falling	Mid	Mid?	Mid, Rising

Table 107. Luce's tone and the tonal equivalents based on
the current data in Tone-Pattern IIa

The Tone-Pattern IIb is restricted to stopped syllables with short medial vowel. The present data has 15 out of 19 the words, which Luce uses as examples, as shown in Table 108.

No.	Gloss	Tedim		Mizo		Hakha		Mara		Khumi		Kaang	
007	rain	gua˨	5	rua?˨	5	rua?˥	1	-		-	-	-	-
085	pig	vo:k˨	5	vok˨	5	vok˨	5	vo˨	5	o:k˥	3	vok˥	1
125	eye	mit˨	5	mit˨	5	mit˨	5	-	-	mek˨	5	mik˥	1
145	hand	kʰut˨	5	kut˨	5	kut˥	1	ku˨	5	-	-	kut˥	1
147	armpit	zak˨	5	zak˨	5	zak˨	5	-		jak˥	1	-	-
159	bone	gu˨	5	ru˨	5	ru˨	5	ru˨	3.5	hu˨	5	ru˨	5
226	weep	kap˨	5	ṭap˨	5	ṭap˨	5	-	-	ga˨	3.5	krap˥	1
261A	sleep	i˨	5	-	-	i˥	3.5	-	-	i˥	1	ip˥	1
266	itch	tʰak˨	5	tʰak˨	5	tʰak˨	5	tʰa˨	3.5	tʰa:k˧	3.8	tʰak˥	1
322	one person	kʰat˨	5	kʰat˨	5	kʰat˨	5	kʰa˨	3.5	-	-	-	-
323	two	ni˨	5	ṇi˨	5	ṇi?˨	5	ṇe˨	5	mi˥	3	ṇi˨	5
327	six	guk˨	5	ruk˨	5	ruk˨	5	ru:˨	3.5	ruk˥	1	ruk˨	5
328B	seven	gi˨	5	ri˨	5	ri?˥	1	ri˨	3.5	ri?˥	1	ri˨	5
345	thick	sa˨	5	tʃʰa?˨	5	tʃʰa?˥	1	tʃa˨	5	tʰa:˥	3	tʰa˨	1
410	rice seedling	-	5	-	3.5	tsaŋ˩	2.5	tsa˨	3.5	saŋ˨	3.5	taŋ˥	1

Table 108. Examples of Tone-Pattern IIb

The structure of Pattern IIb for Luce is mid falling in Tedim and Mizo, high falling in Hakha, low level in Mara and low level in Ahriang Khumi and mid rising in Awa Khumi. The tone correspondence of Chin languages based on Tone-Pattern IIb can be viewed in Table 109.

	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
Luce's data	Mid Falling	Mid Falling	High Falling	Low Level	Low Level/ Mid Rising	-
Present data	Low Level	Low Level	High Level Low Level	Mid Low Level	High Level Mid Rising	High Level Low Level

Table 109. Luce's tone and the tonal equivalents based on

the current data in Tone-Pattern IIb

Tone-Pattern IIIa occurs at smooth syllables. The voiceless velar stop appears as final, as the reflect of *r. The present data has 17 out of the 26 words which Luce uses as examples, as Table 110 shows.

No.	Gloss	Tedim		Mizo		Hakha		Mara		Khumi		Kaang	
023	water	tuːiˌ	3.8	tuiˊ	3.8	tiːˌ	3.8	tiˋ	2	tuiˊ	3	tuiˋ	2.5
026	earth/soil	leiˌ	3.8	leiˊ	3	leiˋ	2.5	leiˋ	2.5	-	-	lei˧	3.5
029	stone	luŋˌ	3.8	luŋˌ	3.8	luŋˋ	2.5	loˊ	1	n̩loŋˊ	1	luŋ˧	5
038A	tree	siŋˌ	3.8	tʰiŋˌ	3.8	tʰiŋ˧	3.5	tʰoˊ	1	tʰiŋˊ	1	siŋˋ	2.5
081	dog	uiˌ	3.8	uiˌ	3.8	uiˋ	2.5	iːˋ	2	uiˊ	3	uiˋ	2.5
090	tail	meiˌ	3.8	meiˌ	3.8	meiˋ	2	m̩ei˧	3.5	maiˊ	1	meiˌ	4
096	feather	mulˌ	3.8	m̩ulˌ	3.8	m̩ul˧	3.5	miˋ	2	muiˌ	3.8	mui˧	5
120	face	maiˌ	3.8	ma:iˌ	3.8	ma:iˋ	2.5	m̩eˋ	2	m̩aiˊ	1	ma:iˋ	4
122	hair	samˌ	3.8	samˌ	3.8	samˋ	2.5	sa˧	3.5	sa:nˊ	3	sam˧	5
150B	fingernail	tinˌ	3.8	tinˌ	3.8	tinˋ	2.5	teˊ	1	sin˧	3.5	tin˧	5
164	blood	tʰiˌ	3.8	tʰiˊ	1	tʰiːˋ	2.5	tʰiːˋ	2	tʰiːˌ	3.8	sʰiˌ	4
184	road/path	lamˌ	3.8	-	-	lamˋ	2.5	la:ˊ	1	lan˧	3.5	lamˋ	2.5
186	house	inˌ	3.8	inˌ	3.8	inˋ	2.5	oːˊ	1	inˌ	3.8	imˋ	2.5
212	fire	meiˌ	3.8	meiˌ	3.8	meiˋ	2.5	meiˊ	1	m̩aiˊ	3	meiˋ	2.5
317	buy	leiˌ	3.8	leiˌ	3.8	-	-	leiˊ	1	-	-	lei˧	3.5
330	nine	kuaˌ	3.8	kuaˌ	3.8	kuaˋ	2.5	kiːˋ	2	koˊ	1	koˋ	2.5
375	sour	tʰukˌ	3.8	tʰuːrˌ	3.8	tʰorˋ	2.5	tʰuˊ	1	tʰoːkˌ	3.8	tʰuiˌ	3.8

Table 110. Examples of Tone-Pattern IIIa

The Tone-Pattern IIIa for Luce is mid rising in Tedim and Mizo, low level in Hakha, high level in Mara and Ahriang Khumi, and high falling in Awa Khumi. The tone correspondence of Chin languages in Pattern IIIa is shown in Table 111.

	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
Luce's data	Mid Rising	Mid Rising	Low Level	High Level	High Level/ High Level, High Falling	-
Present data	Rising	Rising	Falling	High Level High Falling	Mid Rising Rising High Level	Falling Low Level

<p align="center">Table 111. Luce's tone and the tonal equivalents based on
the current data in Tone-Pattern IIIa</p>

Tone-Pattern IIIb occurs with stopped syllables, restricted to a long medial vowel before the stop. Luce (1985:83) suggests that many of the open syllables in the Tone-Pattern IIIb category are the result of the loss of final stops, especially –g. The present data has 16 out of the 26 words which Luce uses as examples, as shown in Table 112.

No.	Gloss	Tedim		Mizo		Hakha		Mara		Khumi		Kaang	
089	horn	ki:ʌ	3.8	ki:ⱽ	2.5	ki:˧	3.5	kiⱽ	2	ki˥	1	ki:ⱽ	2.5
093	bird	va˥	1	vaⱽ	2.5	va:˥	3.5	vo˥	1	va˧	3.5	va:ʌ	3.8
101	fish	ŋaʌ	3.8	ŋ̊a:ⱽ	2.5	ŋa:˧	3.5	ŋa˥	1	ŋa:˧	1	ŋa:ʌ	3.8
121	brain	kʰuakʌ	3.8	tʰluakⱽ	2.5	tʰluakⱽ	2.5	tʰli˥	1	-	-	kʰro:kʌ	3.8
135	chin	kʰa:ʌ	3.8	kʰa˧	3.5	kʰa˧	3.5	ka˧	3.5	-	-	kʰa˧	3.5
142	lungs	tuapʌ	3.8	tsuapⱽ	2.5	tsuap˧	3.5	tsoⱽ	2	to:˥	1	to:p˧	3.5
154	knee	kʰukʌ	3.8	kʰu:pⱽ	2.5	kʰuk˧	5	kʰu˥	1	kʰu˥	1	kʰu:k˥	1
161A	flesh	sa˧	1	ti:ⱽ	2.5	tak˧	5	sa˧	3.5	-		-	-
167	excrement	e:kʌ	3.8	e:kⱽ	2.5	e:k˧	3.5	e:˥	1	i˧	5	e:k˥	3
172	father	paʌ	3.8	pa:ⱽ	2.5	pa:ⱽ	2.5	po˥	1	pa˧	3.5	pa:i˧	3.5
173	mother	nuʌ	3.8	nu:ⱽ	2.5	nu:ⱽ	2.5	no˥	1	nu:˧	3.5	no:i˥	1
222	hear	zaʌ	3.8	-	-	tʰei˥	1	tʰei˧	5	tʰa:iʌ	3.8	ja˧	1
288	give	piaʌ	3.8	pe:ⱽ	2.5	pe:k˧	3.5	pia˧	1	pe:k˥	3	pe˧	3.5
329	eight	giatʌ	3.8	riatⱽ	2.5	riatⱽ	2.5	reⱽ	2	-	-	ret ʌ	3.8
376	bitter	kʰa:ʌ	3.8	kʰa:ⱽ	2.5	kʰa:˧	3.5	kʰa:ⱽ	2	kʰa:˧	1	kʰa˧	1
399	bad	siaʌ	3.8	tʃʰiaⱽ	2.5	tʃʰiaⱽ	2.5	tʃʰe:˧	3.5	si:˧	1	tʰe˥	1

<p align="center">Table 112. Examples of Tone-Pattern IIIb</p>

According to Luce's analysis, the structure of Pattern IIIb is mid rising in Tedim, high falling in Mizo, high level in Hakha, Mara and Ahriang Khumi, and high falling in Awa Khumi. The tone correspondence of Chin languages within Tone Pattern IIIb is shown in Table 113.

	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
Luce's data	Mid Rising	High Falling	High Level	High Level	High Level/ High Falling	-
Present data	Rising	Falling	Mid Falling	High Level High Falling Mid	High Level Mid	High Level Mid Rising

Table 113. Luce's tone and the tonal equivalents based on the
current data in Tone-Pattern IIIb

A summary of the tone correspondence for all Tone Patterns in Chin languages based on Luce's Tone Patterns can be seen in Table 114.

Tone Pattern	Data	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
Tone Pattern I	Luce's data	HL	HL	LL	LF	HF/MF,HF	-
	Present data	*M*	*HL*	*F*	*L/LL*	*R*	*M/F*
Tone Pattern IIa	Luce's data	MF	MF	HF	LL	LL/MF	-
	Present data	*F*	*F*	*F*	*M*	*M?*	*M/R*
Tone Pattern IIb	Luce's data	MF	MF	HF	LL	LL/MR	-
	Present data	*LL*	*LL*	*HL/LL*	*M/LL*	*HL/MR*	*HL/LL*
Tone Pattern IIIa	Luce's data	MR	MR	LL	HL	HL/HL,HF	-
	Present data	*R*	*R*	*F*	*HL/HF*	*MR/R./HL*	*F/LL*
Tone Pattern IIIb	Luce's data	MR	HF	HL	HL	HL/HF	-
	Present data	*R*	*F*	*M/F*	*HL/MF/M*	*HL/M*	*HL/M/R*

Table 114. Chin tonal relationship

This analysis shows that there are comparatively clearer tonal correspondences between Tedim, Mizo and Hakha. However, tone in Mara, Khumi and Kaang are split within the Patterns, tremendously complicated and without predictable environments. Thus, while a reconstruction of proto Northern Chin may be proposed from this data, a reconstruction of Proto Chin tone is incomplete[24] and cannot at present be proposed. Therefore this thesis will be limited to a segmental reconstruction for Proto Chin.

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[24] Work in progress by Fraser Bennett and Noel Mann on the analysis of Chin tones initially confirms Luce's Tonal Patterns.

4.7 Summary

This section summarizes the phonological reconstruction of the Proto Chin syllable in terms of onsets, vowel nuclei and codas. The onset correspondences are shown in Table 115.

Proto Chin	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
*p	p	p	p	p	p	p
*t	t	t	t	t	t	t
*k	k	k	k	k	k	k
*b	b	b	b	b	b	b
*d	d	d	d	d	d	d
*g	v	v	v	v	v	v
*p^h	p^h	p^h	p^h	p^h	p^h	p^h
*t^h	t^h	t^h	t^h	t^h	t^h	t^h
*k^h	k^h	k^h	k^h	k^h	k^h	k^h
*m	m	m	m	m	m	m
*m̥	m	m̥	m̥	m̥	m̥	m̥
*n	n	n	n	n	n	n
*n̥	n	n̥	n̥	n̥	n̥	n̥
*ŋ	ŋ	ŋ	ŋ	ŋ	ŋ	ŋ
*ŋ̥	ŋ	ŋ̥	ŋ̥	-	-	ŋ̥
*r	g	r	r	r	r	r
*r̥	h	r̥	r̥	r̥	h	r̥
*s	s	s	s	s	s	s
*z	z	z	z	z	j	j
*h	h	h	h	h	h	h
*ts	t	ts	ts	ts	t	t
*tʃ^h	s	tʃ^h	tʃ^h	tʃ^h	s	s
*l	l	l	l	l	l	l
*l̥	l	l̥	l̥	l̥	l̥	l̥

Table 115. Chin onset correspondences

All languages discussed in this thesis uniformly have the voiced labial fricative /v/ reflex for the voiced dorsal stop *g. The identification of this reflex solves some of the questions raised by Ono (1965). The proto *r has the reflex /g/ in initial position and /k/ in final position in Tedim and is consistent with the work of Ono (1965), Solnit (1979) and Bhaskararao (1996). Tedim does not have voiceless counterparts for nasals and liquids. Kaang and Khumi do not share the voiced coronal fricative but

have the voiced palatal approximant. Considering the onset correspondences, Tedim is the most innovative with nine reflexes, followed by Khumi (six), Kaang (four), Mara (two) and Hakha and Mizo with one reflex each.

The vowel correspondences are shown in Table 116.

Proto Chin	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
*i	i	i	i	i	i	i
*e	e	e	e	e	e	e
*a	a	a	a	a	a	a
*o	o	o	o	o	o	o
*u	u	u	u	u	u	u
*ia	ia	ia	ia	ia	e	e
*ei	ei	ei	ei	ei	ai	ei
*ai	ai	ai	ai	e	ai	ai
*au	au	au	au	au	au	au
*oi	oi	oi	oi	o	oi	oi
*ui	ui	ui	i	i	ui	ui
*ua	ua	ua	ua	i	o	o

Table 116. Chin vowel correspondences

Evidence for reconstructing the simple vowel nuclei shows that Khumi has three reflexes, Mara four, Kaang two, and Hakha one. There are significant gaps in diphthongs. Considering vowel correspondences, the Southern languages are more innovative than the Northern languages. Chin coda correspondences are displayed in Table 117.

Proto Chin	Tedim	Mizo	Hakha	Mara	Khumi	Kaang
*m	m	m	m	-	m	m
*n	n	n	n	-	n	n
*ŋ	ŋ	ŋ	ŋ	-	ŋ	ŋ
*r	k	r	r	-	-	-
*p	p	p	p	-	-	p
*t	t	t	t	-	-	t
*k	k	k	k	-	k	k
*l	l	l	l	-	-	-

Table 117. Chin coda correspondences

Tedim, Mizo and Hakha retain the Proto Chin coda except for *r in Tedim. Mara appears to be the most innovative language and behaves differently from the other Chin languages by dropping all codas. Kaang retains Proto Chin nasal codas, but is innovative in the loss of stopped and liquid codas. In Khumi, labial nasal codas have become coronal nasals. The coda *p and *t are lost in Khumi. Mara, Khumi and Kaang have lost the liquid codas. Therefore the coda correspondences show that Mara is extremely innovative, followed by Khumi and Kaang. Northern languages are relatively conservative when compared to the Southern languages.