1967

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Recommended Citation

Smith, Kenneth D. (1967) "A phonological reconstruction of Proto Central North Bahnaric," *Work Papers of the Summer Institute of Linguistics, University of North Dakota Session*: Vol. 11, Article 11.

DOI: 10.31356/silwp.vol11.11

Available at: <https://commons.und.edu/sil-work-papers/vol11/iss1/11>

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A PHONOLOGICAL RECONSTRUCTION OF
PROTO CENTRAL NORTH BAHNARIC

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0. Introduction

The North Bahnaric¹ languages in Viet Nam (Thomas, 1966) include Bahnar, Rengao, Sedang, Halăng, Jeh, Mđndm, Kđyong, Hrê, and Cua, all located in the mountain highlands of Central Viet Nam between Pleiku and An Khe in the south and the northern areas of Kontum and Quang Ngai provinces. In this paper four of these languages are compared: Bahnar, Jeh, Halăng, and Sedang. Of the North Bahnaric languages Bahnar is the second largest (est. pop. 85,000; S.I.L., 1966) and the southernmost, though ranging up to Kontum City. The Halăng (10,000) are in the central western portion of Kontum Province, between the main north-south river and the Cambodian and Laotian borders. The Jeh (10,000) are in northern Kontum Province, between DakSut and Quang Tin Province. The Sedang (40,000) are located in the central areas of Kontum Province, northeast of DakTo and centering about Toumorong. Bahnar and Halăng are separated from Jeh and Sedang only by Kđyong (mutually intelligible with Halăng; Cooper, 1966:87) in the west and Rengao in the central areas. The other three cited languages of North Bahnaric are all to the east of the above-mentioned languages. From south to north they are Mđndm, Hrê, and Cua.

Because of unresolved phonological problems in Sedang phonemics (Smith, 1967a) and the need to clarify them before literacy materials could be prepared, the author undertook a study of Sedang dialects (1967b, 1967c). Though the phonological problems were resolved in this latter study, other problems became evident in the relations between Kontum languages. The present study was undertaken in an attempt to understand more fully the relationships between these languages. The study also complements similar studies in other areas of Viet Nam; namely: Proto-East-Katuic (D. M. Thomas, 1967), Proto-Mnong (Blood, 1966); and Proto-Chamic, a Malayo-Polynesian

¹What Thomas has previously termed Bahnaran and Stiengan subgroups under the Bahnaric division of the Mon-Khmer family of languages, he now terms as North Bahnaric and South Bahnaric, respectively.

language (Lee, 1966).

Specific relations which were not understood prior to this study include the following features of these languages. (1) Jeh, Halǎng, and Sedang have a distinctive vowel register contrast. In Jeh and Halǎng normal vowels (first register) are in opposition to lax, breathy and deep vowels (second register). In Sedang tense, laryngealized vowels (first register) are in opposition to normal vowels (second register). Bahnar does not have such a register contrast; nor has it been clear how Bahnar relates to it. (2) Bahnar has nine vowel positions, Sedang seven, and both Jeh and Halǎng five. (3) Bahnar, Jeh and Halǎng have vowel length contrast between short and long vowels, whereas Sedang does not. (4) Bahnar alone has the semi-vowel in the word pattern. (5) Jeh, Halǎng, and Sedang have central-glided vowels, whereas Bahnar does not. (6) Sedang alone has back-glided and front-glided vowels. (7) Vowel shifts have been noted to be both frequent and unpredictable in Sedang (Smith, 1967b, 1967c).

The data used in this paper was obtained from "Proto-Jeh-Halǎng" (Thomas and Smith, 1967) (PJH) with Bahnar (B) cognates added by John E. Banker and Sedang (S) cognates by the author. The data is all based upon phonemic transcriptions (Banker, 1961; Gradin, 1966; Cooper, 1966; Smith, 1967a).

The orthography used here is essentially the Vietnamese quốc-ngũ, with generally the same values as in Vietnamese, except as noted below.

The general word form in Jeh, Halǎng, and Sedang is (Cə)CVC, in Bahnar is (Cə)CSVC. The latter word form with the inclusion of the semi-vowel corresponds to the reconstructed word form for Proto-Central-North-Bahnaric (PCNB). Each portion of the word, including vowel nasalization, is discussed in the following sections.

1.0 Main syllable initial consonants

1.1 Single consonants

The initial consonants of each of the three languages, as charted below, are identical except that S does not have y. The reconstructed initial consonants are also identical to the chart below except that *s_t is posited in order to isolate an interesting exception to *s.

p	t	ch	k	q
b ²	d	j	g	
m	n	nh	ng	
w	s	y		h
	l	r		

nh is [ñ]; q (glottal stop) is written in all positions except word initial before vowels.

²Banker's analysis of Bahnar initial consonants (1961) results in

Reconstructed single consonants:³

*p	< p : p : p	(36)	exc.: 462
*t	< t : t : t	(37)	exc.: 182, 340
*ch	< ch : ch : ch	(4)	18, 215, 338, 480C
	s : ch : ch before *h	(13)	Aspiration was assigned to this set because B <u>s</u> ~ B <u>chh</u> .
	# : ch : ch " *ø/*h	(3)	82, 243C, 456; indecision due to B #
	ch : ch : t " *r	(1)	56
*k	< k : k : k	(32)	exc.: 385 ₂ , 416
	ø : k : ø before *hl	(1)	384
*b	< b : b : p	(28)	
*d	< d : d : t	(18)	
	d : d : d before *r	(9)	exc.: 439
	d : d/t : t " *r, without *CV-	(2)	223, 267
	d : ø : # " *l	(1)	47
*j	< j : j : ch	(15)	
	i- : j : ch after *q	(2)	205, 479
	ø : j : ch " *q, before *e	(1)	222
	g : j : ch before *y	(1)	265
	j : d : t " *r	(1)	271
	j : # : k " *rø, without *CV-	(1)	343
*g	< g : g : k	(7)	
	g : k : k after *q	(1)	92

33 consonants: the above 19 plus qb, qd, qj, hm, hn, hnh, hng, qm, qn, qnh, qng, qw, ql, gy. Reanalyzing these complex unit phonemes using the cluster center and cluster modifier approach (Smith, 1967a), Bahnar cluster centers and cluster modifiers are identical to Sədang.

³In every correspondence set the three languages will be given in the following order: B : PJH : S. PJH forms are not prefixed with * to avoid confusion with PCNB, except in the cognate lists of Section 8. # indicates the absence of an item in the data. Parentheses around a phoneme, as in *ch(h), indicates an indecision pertaining to the inclusion of that phoneme in reconstruction. A slash between two phonemes, as in *d/t, indicates either that both forms occur in the current language or an indecision between the two alternatives in reconstruction. ø represents a zero, or absent, phoneme. Hyphens are used to distinguish cluster modifiers and semi-vowels from single consonants and cluster centers, and to distinguish semi-vowels (in B) and glide starting points (in PJH and S) from vowels.

In the above reconstructions it is observed that the reconstructed voiced stops have voiceless reflexes in S. This accounts for the high frequency of voiceless stops over voiced stops in S (e.g., a sample Sədang lexicon count shows 34 b's, 268 p's). This reconstruction does not account for S (prenasalized) b, d, j, or g.

*m	> m	: m	: m	(27)	
*n	> n	: n	: n	(15)	exc.: 385 ₁
	∅	: ∅	: n	(2)	48, 285
			before *l		
*nh	> nh	: nh	: n	(1)	358
	nh	: ∅	: s	(1)	61
			after *q (before *r)		
	#	: nh	: s	(1)	114
			" *q, after *ă		
	ng	: n	: n	(1)	268
			" *q, before *a		
	nh	: nh	: nh/ng	(1)	435
			after *q, before *u		
*ng	> ng	: ng	: ng	(9)	
	nh	: ∅	: ng	(1)	481
			before *y		
	ng	: ∅	: ∅	(1)	370
			" *l		
			after *h, before long vowel	(1)	28; note word 157
*l	> l	: l	: l	(18)	exc.: 262
	l	: -l	: l	(1)	160; note word 251
			after *po-		
	-l	: l	: -l	(1)	353
			" *jo-		
	∅	: l	: #		
			before *w		

The correspondence sets for each reconstructed phoneme may be assumed to exclude the environments for which succeeding and otherwise overlapping sets are defined (e.g., *ch > ch : ch : ch does not occur before *h because *ch > s : ch : ch is later defined as occurring only before *h). If an apparent environment restriction is enclosed in parentheses its exclusion will not result in ambiguity. If such an environmental restriction is not enclosed in parentheses it is required to avoid ambiguity. Following the correspondence set is given (in parentheses) the number of occurrences of the set in the data, excluding any exception(s) ("exc.:" given). If there are less than five instances of a given correspondence each instance will be identified by the word number for convenient reference to the cognate lists of Section 9.

Other abbreviations: CG (central-glided vowel reflex), BG (back-glided vowel reflex), FG (front-glided vowel reflex), L (vowel length), R (vowel register), irreg (irregular). Diacritics inconsistent with Vietnamese: ˘ (short vowel), ˙ (lax, breathy vowel), ˥ (tense, laryngealized vowel), ˧ (nasalization).

*r > r : r : r	(18) exc.: 80 (B <u>h</u>)
-r : r : -r after *jo-	(1) 499
*h > h : h : h	(12)
-h : h/-h : h after *mo-	(1) 27
h : h : -h " *po-	(1) 45
# : ∅ : h before *Vy	(1) 125
h : h : q " *yč	(1) 257
h- : ∅ : h- " *yđ	(1) 273
*s > s : s : s	(15) exc.: 40, 143
*s _t > t : s : s	(2) 279, 445
*w > w : w : w	(3) 131, 147, 189
u : # : w after *h	(1) 216
u : ∅ : ∅ before *V, after *h	(1) 129
n : n : w " *V, " *q	(1) 8
*y > y : y : s	(5) exc.: 134
i : i : i before *č	(1) 243A
i : y : i after *ka-	(1) 26 (S CG)
y : y : i " *ha-	(1) 432 (S BG)
i : i : ∅ before *č	(1) 229
i : ∅ : # " *đ	(1) 395
*q > q : q : q	(4) 15, 264, 357, 364
∅ : ∅ : ∅ (word initial)	(10)

1.2 Consonant clusters

Each of the initial consonants in the three languages may be a cluster center except h and q. ch and j are cluster centers only in B (chh, which fluctuates with s, and jr). Cluster modifiers are the same for all three languages. Voiceless cluster modifiers (occurring before the onset of voicing) are q-, h-, and -h (preglottalization, voicelessness, and aspiration.) Voiced cluster modifiers (occurring at or after the onset of voicing) are -r and -l. Each of these are reconstructed below.

(1) Preglottalization before voiced consonants, *q¹:

*q- > q- : ∅ : ∅ before *b, *d, *j, *g, *y	(30) note word 272
q- : q- : ∅ " *m, *n, *nh, *ng, *l	(12) note word 378
q- : q- : q- " *m, *l, *y, after *CV-	(3) 8, 206, 320
q- : ∅ : ∅ " *nhr	(1) 61
∅ : q- : # " *ng, after *na-	(1) 306

In the above sets it is observed that PJH has less preglottalization than B, and S less than PJH. In the reflexes above S has preglottalization in only three instances. Other instances of preglottalization in S, howeverbeit relatively uncommon, are unaccounted for in this reconstruction.

(2) Voicelessness before nasals and voiced orals, *h-:

*h- > h- : ∅ : h-	(7)	occurring before *m, *ng, *l, *r; note J <u>11</u> , 115
h : ∅ : h- before *w	(1)	216
h- : h : h " *ngV.	(1)	28
# : h- : h- " *mV	(1)	78
h : h : ∅ " *wV	(1)	129

(3) Aspiration of voiceless stops, *-h:

*-h > -h : -h : -h after *p, *t, *k	(12)	82, 243C, 456 are undeterminable due to B #
∅ : ∅ : ∅ " *ch	(13)	
h- : -h- : h- " *k before *l	(1)	384

(4) Clusters of stops and nasals with l, *-l:

*-l > -l : -l : -l	(16)	occurring with *p, *k, *kh, *b; exc.: 236
-l : l/-l : ∅ after *n	(2)	48, 285
-l : l : l " *ng	(1)	370
∅ : l : # " *d	(1)	47

(5) Clusters of stops, nasals, and s, with r, *-r:

*-r > -r : -r : -r	(31)	occurring with *p, *t, *k, *b, *d, *j, *s; note words 133, 143, 385 ₂
∅ : ∅ : -r after *ch	(1)	56
∅ : -r : -r " *qd	(1)	267
∅ : -r : ∅ " *m	(1)	14
∅ : r : -r " *nh	(1)	61

Instances of both voiced and voiceless modifiers are common in B, uncommon in S. The following complex clusters have been reconstructed: *qbl, *qdl, *qdr, *qnhr, *khl (47, 52, 61, 236, 267, 384).

2.0 Semi-vowels w and y

The analysis of B includes semi-vowels w and y. Cooper (1966:94) includes w and y as liquids which can occur as last members of clusters in Halāng. Jch has no similar feature outside of vowel glides ia and ua.

The only instances of possible labialization in S have alternate interpretations: kw is interpreted as kô-, introducing a back-glided vowel; and hw is interpreted as voicelessness before w. In this reconstruction semi-vowels account for some of the PJH and S glides (see Section 4.2) as well as for the B semi-vowels and PJH cluster modifiers. After *w and *y with short vowels, PJH has long vowels.

*w- (before long vowels):

> w	: ø	: ø	after *CV1	(1)	36
u	: w-	: ô-	" *s	(1)	44 (S CG)

(before short vowels):

u-	: u-	: u-	before *ăn (after *m, *y)	(3)	240, 461, 463 (S CG)
ø	: u-	: ô-	" *ăt " *r, *qd	(2)	458, 459 (S #); (S FG)
u-	: u-	: ô-	" *at " *j	(1)	467 (S #)
			" *ăt (" *p)	(1)	460 (S FG)
u-	: u	: o	" *čy (" *j)	(1)	415

*y- (before long vowels):

> ø	: i-	: ø	before *dyh (after *r)	(1)	269
			" *d " *h	(1)	273
			" *ong (" *t)	(1)	277
i	: ø	: ø	" *ah (" *r)	(1)	80
i	: i-	: ø	" *d " *qm	(1)	274
ø	: #	: i	" *u (" *ch)	(1)	480C
i-	: #	: i-	" *a (" *p)	(1)	402 (S CG)
ø	: y	: i-	" *dn (" *ng)	(1)	481 (S CG)

(before short vowels):

i-	: i-	: i-	before *čt (after *h, *p, *ng)	(3)	29, 257, 258 (S FG)
			" *ăq (" *qb)	(1)	272 ₂ (S CG)
			" *ăng (" *j)	(1)	265 (S CG)
i-	: ø	: i	" *čng " *t	(1)	182
ø	: ø	: i	" *čng " *hr, *kl	(1)	180, 181
i-	: i-	: ø	" *čm (" *l)	(1)	260
ø	: #	: i-	" *ăm (" *hr)	(1)	365A (S CG)
			" *čw (" *q)	(1)	229

3.0 Nasalization

Nasalization is very infrequent in each of the languages--to the extent that it is often disregarded in writing, especially in B and J. B and PJH indicate nasalization in only one word in the data (word 129) whereas S indicates it for seven or eight words. In the entire Sedang lexicon only 63 words have nasalization of the vowel. The environment in which nasalization occurs is very restrictive: nasalization is preceded by glottal, h, or w; is followed by a phonetically open syllable or voiceless stop. Nasalization is reconstructed from nasalized vowel reflexes and from sets of cognates where nasal consonants correspond to nasalization-permitting environments without the nasal consonant. Nasalization is rapidly disappearing; the factors which have caused the slight retention of nasalization or the creation of nasal consonants are not at all clear and consequently are only ambiguously defined below.

V > ∅	: ∅	: V	after *q	(3)	15, 357, 364
			" *h	(1)	149
#	: ng	: V~V	" *h	(1)	125
m	: m	: V	" *w	(1)	8
V	: V	: V	" *hw	(1)	129
ng	: ∅	: V	" *qy	(1)	229
∅	: nh	: #	" *qy	(1)	395
n	: nh	: ng	V " *hy	(1)	273
∅	: ∅	: nh	" *hy	(1)	257

4.0 Vowels

4.1 Vowel structure in the current languages

Bahnar.--B has nine vowel positions and contrastive long and short vowels, although the short vowels occur in only six of the nine positions. (u does not occur in the cognate lists.)

Short			Long		
ĩ		ũ	i	u	u
	ø		ê	o	ô
č	ă	ö	c	a	o

Proto-Jeh-Halång.--PJH has only five vowel positions, contrastive long, short and glided vowels, and contrastive vowel register (clear first register vs. breathy or deep second register vowels). The short breathy vowels occur in only three positions; glided vowels in only two. (PJH *â was reconstructed on the basis of only one instance of J â : H â.)

Clear, 1st register						Breathy, second register					
Short		Long		Glided		Short		Long		Glided	
ĩ	ũ	i	u	ia	ua	ĩ	ũ	ĩ	ũ	ĩa	ũa
č	ǒ	o	o					č	ò		
ă		a				ă		(à)			

Sedang.--S has seven vowel positions, single vowels in contrast with central-glided (only four positions), back-glided (only three positions), and front-glided (two positions in clear register only) vowels, and contrastive vowel register (laryngealized first register vs. clear second register vowels). (Back glides ôô, iô, and uô do not occur in the cognate lists.)

Laryngealized, 1st register						Clear, 2nd register								
Single			Central glided		Back glided		Single			Central glided		Back glided		Front glided
í	ú		ía	úa	iô	uô	i	u		ia	ua	iô	uô	ie
ê	ô		êa	ôa	êô		ê	ô		êa	ôa	êô		ôa
é	á	ó					c	a	o					

4.2 Basis of assignments

Register.--As has already been shown (Smith, 1967b, 1967c) PJH clear vowels correspond to Sedang laryngealized vowels and are designated as first register vowels. PJH breathy or deep vowels correspond to S clear vowels and are designated as second register vowels. B does not have a vowel register contrast.

PJH has register contrast in all environments whereas S loses the distinction before voiceless stops and h, as well as in open syllables which are reflexes of *q, *r, and *l. In these cases the register can be determined on the basis of PJH alone. Fifteen instances of S clear vowels before final nasals corresponding to PJH first register (in 67 other corresponding instances S has laryngealized vowels) are mostly either loan words or S u which only rarely is laryngealized. Only three instances of PJH breathy vowel corresponding to S laryngealized vowel were found (words 247, 426, 477). Thus the correspondence of the PJH and S first and second registers is amazingly consistent.

Although the register of Khmer vowels is a reflex of the former nature (i.e., voicing) of the initial consonants (Jenner, 1966:37) no such correspondence is evidenced in these languages. Sample count (first register occurs about three times more frequently than second register in the data):

	1st reg.	2nd reg.
following voiceless stops	43	14
" voiced stops	16	12
" aspirated stops	13	5
" stops plus <u>l</u>	6	4
" stops plus <u>r</u>	6	2
" nasals	22	8

Register is not related to vowel length; it is noted, however, that short and second register vowels are more infrequent than the long and first register vowels. A sample count:

	Long	Short
2nd reg.	43	37
1st reg.	138	82

Register has been found related to vowel height in Bahnar. The PJH and S first register words are overwhelmingly low vowels in B; the PJH and S second register words are overwhelmingly high vowels in B. The following B vowel charts indicate the number of occurrences of each register in PJH and S corresponding to the B vowel (B u does not occur in the data). The dotted lines divide high vowels from low vowels based on their frequency with the corresponding register of PJH and S.

First Register

Long vowels				Short vowels			
i	5	u	5	ĩ	2	ũ	3
ê	1	ô	12	ẽ	16	õ	14
e	16	a	62	ă	39	ø	8

Second Register

Long vowels				Short vowels			
i	9	u	19	ĩ	7	ũ	10
ê	2	ô	1	ẽ	4	õ	2
e	2	a	0	ă	1	ø	13

Consequently the vowel height as reflected in B gives a basis for reconstructing the vowels of PCNB. The vowels of PCNB do not have a vowel register contrast; rather, the PCNB low vowels have first register reflexes in PJH and S;⁴ and the PCNB high vowels have second register reflexes in PJH and S.

⁴This accounts for what seemed an unusual recitation of vowel letters by a Halång speaker, Din, Cooper's teacher. Rather than saying a-e-i-o-u with all clear vowels, he unconsciously pronounced the two high vowels with breathiness (the second register): a-e-ĩ-o-ù.

Length.--S has no length contrast; B has no length contrast before final q, h, yh, and yq; H has no length contrast before q and h; and J has no length contrast before h, only a weak contrast before q. PJH reconstructed the length contrast in all environments except before h. Excepting for these differences PJH and B long and short vowels correspond exactly, except that for reflexes of *wV̄ and *yV̄, Bahnar has short and PJH long vowels. Accordingly contrastive vowel length has been retained in the reconstruction. Vowel length has been posited before final *h as the only factor that has caused the loss of some final h's in S: final h after short vowels has been retained; final h after long vowels has been lost. With a shifting of the vowels before h in the other languages the length contrast has become unnecessary and consequently lost.

Vowel glides.--No vowel glides have been reconstructed in PCNB. The current glides in PJH and S are reflexes of the semi-vowels, and certain vowels and final consonants.

The starting point i of PJH glide ia is a reflex of *y or, if followed by a nasal, *e. The starting point of PJH ia is *y or, if followed by a nasal or stop, *i. The starting point of PJH ua is *w or *o; of PJH ua, *d or *u. The end point a of the glides is often a reflex of *ě, *d, *ā, or is associated with the following stop or nasal consonant.

The starting point i of S glides ia, ía, and iô is a reflex of *i or *y; of S ie is *yV̄ or *ØV̄. The starting point u of S glides ua and úa are reflexes of *w, *o, or, if followed by a nasal, *u. The starting point of S uô is a reflex of *u; of S ôe is *w. Of S êa and êa, is *a; of S ôa and ôa is *o; of S êô is *e or *a. The end point a of the central glides is often a reflex of *ă, *č, *ă, *d, of is associated with the following stop or nasal consonant. The end point ô of the S back glides is a reflex of *w or a final velar consonant. The end point e of the S front glides is a reflex of a low vowel (central or front) followed by a voiceless stop (voiceless stops preceded by low vowels are lost in S). Because they are otherwise difficult to spot, correspondence sets which are associated with S glides are so noted in the correspondence lists below.

Vowel positions.--The different vowel patterns have already been presented. B u does not occur in the data; furthermore it has been possible to collapse the two lower front and back vowels (ê and ç, ô and o), resulting in a reconstruction having six long and six short vowels as follows:

	Short			Long		
High	*ĩ	*ð	*ũ	*i	*d	*u
Low	*ě	*ă	*ô	*e	*a	*o

Final consonants in the languages of Viet Nam usually have more effect on the vowel systems than do the initial consonants (Thomas, 1966). This is very evident in this study: each vowel correspondence is defined by the final consonant; occasionally it is necessary to define the correspondence further by the preceding consonant or semi-vowel. Preceding consonants (or semi-vowels) which most frequently affect the vowel corres-

pondences are y, qy, w, and s. Also l and r (alone and in the clusters dr, jr, chr, tr, hl, kl) frequently affect the vowels. Other such consonants are n, qn, gd, t, qj, chh, q, h, qb, p, m, and k.

As register contrast developed between the high and low vowels of PJH and S, the high vowels (having become the laxer vowels) were able to shift down and the low vowels (having become the tenser) were able to shift up without interference or merging with other vowels. This accounts for the frequent shifts found in the S area (Smith, 1967b) with the front and back vowels. In the four sets given below it is seen how the low vowels, after they became laryngealized in S have been able to spread to higher vowels while the high vowels, remaining clear, have spread to lower vowels, without conflict. Each of the forms given below is current among S dialects; the double underlined form is accepted as standard.

*phĩq > S phi, phêi, phe, phai 'full after eating' (word 239)

*phe > S phí, phêi, phé, phái 'husked rice' (word 171)

*choq > S chó, chố, chôu 'dog' (word 280)

*ch(h)ũr > S chu 'pig' (word 456)

4.3 Reconstructed vowels

I. Short vowels

A. High vowels (reflected by 2nd register)

PCNB	B	PJH	S		
*ĩ >	ĩ	: ì	: e	before *k	(2) 251, 390
				" *m	(1) 252
	ĩ	: ì	: ai	" *q	(3) 238, 239, 469
	ĩ	: ì	: ê	" *n	(1) 253
	ě	: ì	: e	" *nh	(1) 249
	ĩ	: ì	: i	" *l	(1) 254
	ě	: ă	: ê	" *y	(2) 160, 162
	i	: ì	: e	" *h	(2) 241, 255
	ĩ	: ĩ	: êa	" *ch	(1) 246 (S CG); PJH R irreg, after *q

(The instances of long vowel reflexes above are before *h and *q where the languages today have no, or very weak, length contrast.)

*ð > ð : ǣ : a	before *p	(2)	142, 143
	" *k	(2)	149, 150
	" *m	(2)	151, 385 ₁
	" *ng	(3)	154, 155, 156
	" *r	(1)	159
	" *w	(2)	164, 165
ĩ : ǣ : a	" *t	(1)	146 (after *j)
ě : ǣ : a	" *n	(1)	152
ø : ǣ : a	" *yh	(1)	163 (B L irreg)
ð : ǣ : o	" *l	(1)	158
ó : ǣ : ê	" *y	(1)	161 (B L irreg); exc.: 128
ð : è : êi	" *q	(2)	204, 206
ð : ò : o	" *q after *q	(1)	357
ó : è : a	" *h	(1)	207
u : è : o	" *yh after *qj	(1)	205
*ũ > ũ : ǔ : o	before *t	(1)	453
	" *k	(3)	444, 445, 446
	" *nh	(1)	450
	" *ng	(1)	452
ũ : ǔ : ua	" *m	(3)	421, 442, 449 (S CG)
ũ : ǔ : u	" *ng after *h	(1)	451
	" *r	(2)	455 (B L irreg), 456
ũ : ò : ôu	" *q after *p	(1)	356
õ : ò : ôu	" *q after *m	(1)	355
u : ù : ô	" *h	(6)	
u : u : u	" *yh	(1)	406
õ : ũ : a	" *k after *s	(1)	437 (PJH R irreg)

(The instances of B and PJH long vowels above are similar to those noted above under *ĩ.)

B. Low vowels (reflected by 1st register)

*ě > ě	: ě	: ê	before *p	(1)	208
			" *ch	(1)	210
			" *q	(3)	212, 218, 378 ₂
ě	: ě	: é	" *nh	(1)	220
			" *ng	(3)	213, 214, 215
ě	: ě	: ê	" *w	(1)	340 (S BG)
			" *y	(1)	219
ě	: ĭ	: í	" *q after *s	(1)	245 ₂ (S relar.)
ĩ	: ě	: ê	" *n	(1)	211 (S R irreg)
e	: ă	: êa	" *yh	(1)	138 (S CG)
ě	: ø	: ø	" *r (after *y)	(1)	243A
ě	: a	: é	" *m (" *y)	(1)	260
ð	: a	: é	" *n (" *qy)	(1)	264
ě	: a	: e	" *t (" *y)	(3)	29, 257, 258 (S FG)
ă	: a	: e	" *t " *w	(1)	460 (S FG)
ě	: e	: ø	" *ng " *y	(3)	180, 181, 182
ě	: i	: ê	" *w " *y	(1)	229 (S BG)
ě	: ø	: ø	" *y " *w	(1)	415
i	: i	: e	" *h	(3)	196, 227, 228

(The two instances of B long vowels above are before *yh and *h where B has no length contrast. The six instances of PJH long vowels are after *w and *y which lengthen the vowel in PJH or before *h. S clear vowels occur only before final consonants which have not permitted laryngealization; S ên above is one exception.)

*ă > ă	: ă	: a	before *p	(5)	
			" *t	(5)	
			" *r	(3)	87 ₂ (S R irreg), 116, 117
			" *q	(9)	(77, 78 PJH L irreg)
ă	: ă	: á	" *m	(7)	
			" *n	(1)	108
			" *ng	(7)	
			" *y	(1)	129
ă	: ă	: êa	" *k	(3)	96, (S borrowed), 97, 98 (S CG)
ð	: ă	: á	" *w	(2)	121, 123
ă	: ă	: êa	" *ng after *hl	(1)	115 (S CG)

ă	:	a	:	êa	before	*k	after	*h	(1)	23 (S CG)
ă	:	a	:	a	"	*k	"	*y	(1)	26 (S CG)
					"	*q	"	*y	(1)	272 ₂ (S CG)
ă	:	a	:	e	"	*t	"	*w	(2)	458, 467 (S FG)
ǫ	:	a	:	#	"	*t	"	*dw	(1)	459
ă	:	a	:	á	"	*n	"	*w	(3)	240, 461, 463 (S CG)
					"	*ng	"	*y	(1)	265 (S CG)
ă	:	#	:	a	"	*m	"	*y	(1)	365A (S R irreg; S CG)
a	:	a	:	a	"	*h			(1)	80

(PJH long vowels and S clear vowels follow same patterns mentioned above.)

*ǫ >	ǫ	:	ǫ	:	o	before	*k		(7)
						"	*q		(4) 376, 376A, 378 ₁ , 379
	ǫ	:	ǫ	:	ó	"	*ng		(8)
	ũ	:	#	:	ó	"	*ng	after	*jr (1) 343
	ǫ	:	u	:	ô/ôu	"	*q	"	*n, *t (2) 393, 396
	ǫ	:	ũ	:	ó	"	*ng	"	*dr (1) 439
						"	*y		(1) 440
	ũ	:	u	:	ôu	"	*q	after	*y, *s (2) 395, 397
	ũ	:	ua	:	ôu	"	*q	"	*qj (1) 479
	u	:	u	:	ô	"	*h		(2) 409, 411
	ũ	:	ũ	:	ua	"	*t		(1) 454

II. Long vowels

A. High vowels (reflected by 2nd register)

*i >	i	:	î	:	ai	before	*∅		(3) 234, 235, 236 ₂
	i	:	ia	:	ia	"	*t		(1) 275 (S CG)
						"	*k		(1) 276 (S CG)
						"	*ng		(1) 279 (S CG)
	e	:	i	:	e/ê	"	*p		(2) 221, 222
	e	:	î	:	i	"	*p	after	*h (1) 237 (B#)
						"	*w		(1) 243 (S BG)
	#	:	î	:	ia	"	*r		(2) 243B, 243C (S CG)

*d >	d	: è	: ia	before *m	(2)	194, 195 (S CG)
				" *r	(1)	200 (B #)(S CG)
				" *l	(1)	198 (S CG)
	ô	: è	: #	" *l after *qn	(1)	199
	ô	: ùa	: ô	" *ng	(1)	478
	ô	: ùa	: a	" *n (after *y)	(1)	481 (S CG)
	o	: ò	: ô	" *y	(2)	350, 351 (B #)
	ô	: ò	: ôu	" *ø	(1)	358
	d	: ò	: ê	" *y after *l	(1)	353
				" *m " *n	(1)	344
	d	: o	: #	" *h	(1)	294
	#	: à	: ê	" *ng after *y	(1)	277
	ø	: à	: êi	" *ø " *y	(2)	273 (B #), 274
*u >	u	: ù	: ua	before *m	(2)	420, 423
	u	: ù	: au	" *ø	(1)	418
	u	: ù	: u	" *ø after *s, *y	(2)	419, 480C
	u	: u	: u	" *ch	(1)	381
	ô	: u	: u	" *p	(1)	380
	o	: u	: ôu	" *h	(4)	408, 410, 412, 413
	ô	: u	: o	" *ng	(5)	(398 S ô, 403 B u) Exc.: 475 contrasts with 362A
	u	: uà	: uô	" *m after *s, *qb	(2)	472, 473
				" *ng " *chh, *qy	(2)	474, 476 (S BG)
	u	: #	: o	" *yq	(1)	480A

B. Low vowels (reflected by 1st register)

*e >	e	: e	: aí	before *ø	(8)	
	e	: e	: êi	" *h	(3)	188, 190, 192
	e	: e	: ie	" *k	(1)	177 (S FG)
	e	: #	: é	" *n	(1)	75
	e	: ia	: e	" *m	(2)	244 (PJH <u>i</u>), 259
	e	: i	: ê	" *w	(1)	231 (S BG)
	i	: ia	: iá	" *ng	(3)	247, 265, 267 (after *t, *tr, *qdr) (S CG)
	e	: i	: í	" *l	(1)	233A (B #)
				" *ng after *dr, *k	(2)	223, 224

	e	:	e	:	í	before	*h	after	*w	(1)	189
	ê	:	ia	:	ia	"	*n	"	*l	(1)	262 (S CG)
	e	:	#	:	a	"	*ng	"	*w	(1)	147
	i	:	i	:	e	"	*h	"	*r	*dr, *kl	(3) 196, 227, 228
	e	:	ă	:	e	"	*yh			(1)	141
*a >	a	:	a	:	êa	"	*ng			(14)	(S CG)
						"	*m			(6)	(")
						"	*r			(1)	58 (")
	a	:	a	:	êa	"	*p			(5)	(")
						"	*k			(3)	22, 24, 310 (")
	a	:	a	:	ê	"	*w			(7)	(S BG)
						"	*y			(7)	
						"	*n			(2)	36, 59
						"	*nh			(1)	35
	a	:	a	:	ê	"	*yh			(3)	76, 268, 271
	o	:	a	:	ê	"	*yh after	*y		(1)	269
	a	:	a	:	á	"	*ø			(12)	(402 after *y)(S CG)
						"	*ng after	*chr, *s		(2)	40, 56
	a	:	a	:	a	"	*h			(6)	exc.: 81 S <u>êa</u>
						"	*p after	*q		(1)	15
						"	*ng	"	*w	(1)	44 (S CG)
*o >	o	:	o	:	o	before	*h			(8)	
	o	:	o	:	ô	"	*y			(5)	416 B L irreg, PJH <u>u</u>
	o	:	o	:	ôa	"	*ng			(9)	(S CG)
	o	:	o	:	ôa	"	*p			(3)	301 (S borrowed), 302, 303 (S CG)
						"	*k			(2)	314, 354 (PJH <u>ôq</u>) (S CG)
	o	:	o	:	ôu	"	*ø			(4)	236 ₁ , 281, 285, 286
	o	:	o	:	úa	"	*h			(4)	144, 317, 319, 320 (S CG)
						"	*r			(2)	332, 334 (S CG)
	o	:	o	:	ua	"	*t			(3)	305, 306, 307 (S CG)
	ô	:	u	:	ú/úa	"	*m			(5)	(S CG?)
	#	:	ua	:	ôu	"	*l			(1)	465
	ô	:	u	:	u	"	*ch			(1)	382
	ô	:	ua	:	u	"	*yh			(3)	405 (PJH <u>u</u>), 466, 470
						"	*yq			(1)	392

ô	:	a	:	ô	before	*nh	(1)	14
ô	:	#	:	uô	"	*p after	*qd	(1) 433 (S BG)
ô	:	ua	:	#	"	*n	"	*p/(q)b (1) 462
u	:	u	:	ô	"	*nh	"	*r, *dr (2) 409, 411
ô	:	o	:	uá	"	*m	"	*tr (1) 315 (S CG)

5.0 Final consonants

Bahnar has the fullest set of final consonants; Sedang has the smallest set (the Sedang cognates for this study follow the laryngealized series--not the delaryngeal-denasalized counterparts--retaining the final nasals (Smith, 1967b); consequently no final q, yq, or wq is listed for Sedang). These two sets are charted below.

Bahnar				Sedang		
p	t	ch	k	p	t	k
m	n	nh	ng	m	n	ng
w	l r	y		w	y	
		yh	h	yh		h
		yq	q			

Only B has final ch and nh. Otherwise PJH is identical to B except that PJH also has wq. (Though PJH has been reconstructed to include both r and l, J lacks r.) The reconstructed final consonants for PCNB pattern similarly to Bahnar.

Reconstructed final consonants:

*p >	p	:	p	:	p	after high vowels	(6)
	p	:	p	:	∅	" low "	(16)
*t >	t	:	t	:	t	" high "	(3) 146, 275, 453
	t	:	t	:	∅	" low "	(16)
*ch >	ch	:	k	:	k	" front high vowels	(1) 246
	ch	:	t	:	t	" back "	(1) 381
	ch	:	k	:	∅	" front low "	(1) 210
	ch	:	t	:	i	" back "	(1) 382
*k >	k	:	k	:	k	" high vowels	(9)
	k	:	k	:	∅	" low "	

(It is observed from the above correspondences that the voiceless stops after high vowels have been retained in S, after low vowels have been lost.)

- *m > m : m : m (37)
 *n > n : n : n (18)
 *nh > nh : ng : ng after front vowels (3) 220, 225, 249
 nh : n : n " central and back vowels (2) 35, 450; exc.: 14
 *ng > ng : ng : ng (30)
 *w > o : w : ø (11)
 u : w : u after short central vowels (4)
 *y > i : y : i " long vowels (but not *a) or short vowels preceded
 by *h, *l, *r, *w (14) exc.: 353 (long vowel,
 S ø), 160 (after *l,
 S ø)
 i : y : ø after *a and other short vowels (10)

(It is assumed that in B transcription final i and y do not imply anything other than what is already implied in or written with the vowel.)

- *l > l : l : ø (6)
 *r > r : r : ø (13)
 *h > h : h : h after short vowels (15)
 h : h : ø " long " (22)
 *q > q : q : ø (32) exc.: 245₂
 *ø > ø : ø : ø (34)
 *yh > ih : yh : ih after short back vowels (1) 406
 ih : yh : h " " central " (2) 163, 205
 h : yh : h " " front " (1) 138
 ih : yh : i " long back " (3) 405, 466, 470
 h : yh : i " " front and central vowels (5)
 *yq > iq : yq : i (2) 392, 480A

6.0 Presyllables

Each of the three languages have an optional unstressed presyllable (preliminary syllable). The quality of the presyllable vowel is non-contrastive except before *q in PJH and S where a- contrasts with i-. B and PJH have identical presyllable consonants; S does not have the palatal or voiced stops. These are charted below. The S lo- presyllable occurs only as an affix. B a- ~ B hø-; B sø- ~ B hø-; S ho- ~ S ro-.

The presyllable is the least stable part of the word in these languages as evidenced by the following reconstructions. Many of the correspondence sets may be considered only a statement of the occurrences of the presyllables in the current languages rather than a firm reconstruction, especially for the bulk of correspondence sets which are illustrated by only one example.

*pa- > pɔ- : pa- : po- (1) 39
pɔ- : pa- : p- before *h (1) 45
pɔ- : p- : po- " *l (1) 160; note 251

*ta- > tɔ- : ta- : to- (11)
tɔ- : (ta-) : h- before *m, *n, *w (5) 25, 147, 281, 398, 454;
exc.: 396
tɔ- : cha-/ka- : to- " *ch (1) 215

*cha- > chɔ- : cha- : (cho-) (1) 379 (S borrowed)
tɔ- : ka- : ko- before *nh (1) 268
tɔ- : ka- : ko- " *p (1) 50
tɔ- : ta- : ko- " *n (1) 286

*ka- > kɔ- : ka- : ko- (21)
kɔ- : q- : ko- before *m (1) 355
hɔ- : ka-/ø : ho- " *qm (1) 320
k- : k-/ka- : ko- " *nl (2) 48 (PJH ka-), 285 (PJH k-)
k- : ka- : k- " *y (1) 26
: ka- : to- " *tr (1) 165
k- : ø : ø " *ty (1) 182

*ba- > pɔ- : ba- : po- (4) 105, 161, 439, 446
bɔ- : (ma-) : mo- before *ng (1) 70
bɔ- : ba- : pu- " *b (1) 167

*da- > dɔ- : da- : #	(1)	430
td- : da- : to- before *qb, *g	(2)	113, 442
dɔ- :h-/ta-: h- " *m	(1)	14
*ja- > j- : ja- : t- before *r	(1)	449
g- :ta-/ja-: k- " *l	(1)	353
*ga- > kɔ- : ga- : ko-	(7)	exc.: 344
hɔ- : ga- : ko- before *qj	(1)	205
*na- > pɔ- : ma- : mo-	(4)	
p- :p-/ma-: mo- before *h	(1)	27
*ra- > rɔ- : ra- : ro-	(6)	also 451 (PJH ø)
rɔ- : r- : r- before *q	(1)	264
*qa- > hɔ-/a-: a- : ø before *r, *dr, *s, *k, *th (8) (192 PJH ka-/a-)		
ø : a- : ø " *jr	(1)	271
ø : ø : a- " *l, *j	(2)	221, 303
*sa- > hɔ-/sɔ-: i-: ho-	(5)	
sɔ- : sa- : ø before *s	(1)	296
*ha- > hɔ-/sɔ-: ha-: ho- before *n, *g, *ngl (3) 106, 159, 370		
hɔ- : ha- : h- " *m?	(1)	152
hɔ- : ø : ho- " *qg	(1)	92
ø : ø : ho- " *qV	(2)	8, 229
a- : # : ho- " *dr	(1)	330
a-/hɔ-:ha-/ma-: ø " *dr	(1)	12
h- : ø : a- " *r	(1)	175
hɔ- : ha- : r- " *y	(1)	432
hɔ- : (ha-) : a- " *qb	(1)	236

*(Ca-) < (suggestive presyllable supplied) > if one language has a presyllable, the others do not (9)

*__ < (presyllable not supplied) > if one language has no presyllable, the other two languages have different presyllables (5)

7.0 Doublets

In seven cognate sets the current languages evidence a contraction of doublets, with different aspects of the former doublet reflected in each of the present languages. These sets are listed below with possible reconstructions.

*qbĩq qbyǎq	> qiǎq/qbiǎq	: (qb)iaq	: ia/iqia	272	'little'
*haqbo habli	> hoqbo	: hobli	: alai	236	'corn'
*(ra)tǎp dǎr	> tǎp dǎr	: tǎp	: rota tá	87	'encircle'
*tǎq sěq	> tǎsěq	: tǎq sǐq	: toxín	245	'little'
*tĩk palĩk	> tĩk pǎlik	: (ta)lĩk	: #	251	'stub toe'
*qlǒq qlěq	> lǒlěq	: qlǒq	: qlo	378	'know'
*kaqnǒm krôm	> kǒqnǒm rôm	: krum	: kodam	385	'underneath'

3.0 Cognate lists

The almost 500 words of the Proto-Jeh-Halǎng examples (Thomas and Smith, 1967) were numbered in sequence and have been used as the basis of the numbering of words in this study. In some instances the letters A, B, etc., have been affixed to the numbers for words missed in the initial numbering or added to the basic PJH list. Numbers missing from the list below indicate PJH words for which no B or S cognates have been found. Subscripts ₁ and ₂ on word numbers indicate the first and second parts of doublets. To the right of the gloss for each cognate set below is noted apparently non-cognate words; irregular phonemes of cognate words, identifying irregular consonants by the subscripts _i (initial consonant) and _f (final consonant); both J and H forms where PJH is unresolved, with recommended ("rec") PJH resolution of the problem.

	PCNB	B	PJH	S	
1.	*hla	hla	*la	hlá	'leaf'
2.	*ka	ka	*ka	ká	'fish'
3.	*chha	sa	*cha		'cat'; see 85
4.	*kha		*kha	khá	'expensive'; B <u>kǎp</u>
5.	*pha	pha	*pha	phá	'different'
6.	*pla	pla	*pla	plá	'blade'; PJH 'arrow'
7.	*ma	ma	*ma		B 'uncle'; PJH 'aunt'
8.	*haqwa	qma	*qma	hoqvá	'rightside'
10.	*sada	sǒda	*ida	hotá	'handspan'
12.	*hadra	adra	*-dra	drá	'drying rack'; J <u>ma-</u> , H <u>ha-</u>
14.	*damronh	dǒmǒnh	*-mra	hmǒi	'day after tomorrow'; J <u>h-</u> , H <u>ta-</u> ; PJH VC _f irreg
15.	*kaqap	kǒqap	*kaqap	koqá	'yawn'
17.	*kalap	kǒlap	*kalap	kolêa	'ternite'
18.	*sap	kǒchap	*kachap	kochêa	'fish scales'
19.	*sap	sap	*sap		'tasteless'; S <u>blap</u>
21.	*tap	tap	*tap	têa	'slap'
22.	*qdak	qdak	*dak	têa	'water'
23.	*hǎk	hǎk	*hak	hêa	'vomit'

24.	*klak	klak	*klak	klêa	'intestines'
25.	*tanap	tônâp		hnêa	'difficult'
26.	*kayăk	kiăk	*kayak	kia	'corpse'
27.	*maham	pham	*-ham	mohêam	'blood'; J <u>p-</u> ; H <u>ma-</u>
28.	*tahngam	tôhngam	*taham	tohêam	'eight'
29.	*tangyêt	tôngiêt		tongic	'malaria'; S also <u>tongê</u>
31.	*qngam	qngam	*qngam	ngêam	'sweet'
32.	*tam	tam	*tam	têam	'not yet'
33.	*katam	kôtam	*katam	kotêam	'crab'
34.	*pam	pam	*pam	pêam	'fish trap'
35.	*tanh	tanh	*tan	tên	'weave'
36.	*ralwan	rôwan	*ralan		'play'
38.	*jang	jang	*jang	chêang	'work'
39.	*pagang	pôgang	*pagang	pokêang	'medicine'
40.	*sang	sang	*sang	hiang	'finished'
41.	*rang	rang	*rang	rêang	'flower'
42.	*kang	kang	*kang	kêang	'chin'
43.	*klang	klang	*klang	klêang	'eagle'
44.	*swang	suang	*swang	xôang	'dance'
45.	*pahang	pôhang	*pahang	phêang	'roast'
46.	*yang	yang	*yang	xêang	'spirit'
47.	*qdlang	pôqđang	*-lang		'on back'; J <u>sa-</u> , H <u>q-</u>
48.	*kanlang	klang	*kalang	konêang	'water trough'
50.	*chapang	tôpang	*kapang	kopêang	'palm'
51.	*brang	brang	brang	prêang	'scattered'
52.	*qblang	qblang	*blang		'thorny tree'
53.	*tang	tang	*tang	têang	'instead of'
56.	*chrang	gô chang	*chang	tráng	'post'
57.	*pang	pang	*(t)pang		'pound'; S <u>pang</u> irreg.
58.	*qbar	qbar	*bar	pêa	'two'
59.	*khan	khan		khên	'say'; PJH <u>war</u>
60.	*aw	ao	*aw	ôô	'shirt'
61.	*qnhrâw	qnhaô	*raw	xrêô	'wash'; S also <u>xrêa</u>
62.	*qnaw	qnao	*qnaw	nêô	'new'
64.	*naw		*naw	nêô	'more'
65.	*yaw	yao	*yaw	xêô	'no more'

66.	*haw	hao	*haw	hêô	'climb'
67.	*chh__	sa	*chaw	chôu	'ignite'
68.	*kraw	krao	*kraw	krêô	'call'
69.	*pay	pai	*pay	pê	'cook'
70.	*bangay	bôngai	*(m)ngay	mongê	'people'; rec PJH *ma-; J ma-, H ø
71.	*saqngay		*iqngay	hongê	'far'
72.	*saday	hódai	*iday		'together'; S <u>dêi</u> irreg CV-, C _i , V, & C _f
73.	*(ma)may	mómay	*may	mê	B 'older sister'; J 'daughter-in-law'; H 'sister'; S sister-in-law, daughter-in-law'
74.	*bray	brai	*bray	prê	'thread'
75.	*kapen	kôpen		kopên	'loincloth'; PJH *halay
76.	*katayh	kótaih	*katayh	kotêi	'hip'; B C _f irreg
77.	*qbăq	bă/qbăq	*baq	pa	'father'
78.	*hmăq		*hmaq	hma	'acquaintance'
79.	*pah	pah	*pah	pa	'chop, split'
80.	*ryăh	hiach	*rah	rah	'have holes'
81.	*mah	mah	*mah	mêa	'gold'; B <u>maih</u> C _f irreg; S <u>mêa</u> <u>morêi</u>
82.	*kach(h)ah		*kachah	kocha	'charcoal'
83.	*tablah	(tô)blah	*(t)blah	topla	'fight'; rec PJH ta-
84.	*blah	blah	*blah		'skirt'; PCNB *ă? because S #
85.	*kăp	kăp	*kăp	ka	'eat'
87 ₁ .	*(ra)tăp	tăp	*tăp	rota	'encircle'
87 ₂ .	...dăr	...dăr		...tá	
88.	*lăp	lăp	*lăp		'want'
89.	*katăp	kótăp	*katăp	kota	'egg'
90.	*gajăp	kôjăp	*gajăp		'sturdy'; S <u>kra</u>
91.	*măt	năt	*măt	ma	'eye'
92.	*haqgăt	hógăt	*kăt	hoka	'elbow-finger distance'
93.	*băt	băt	*băt	pa	'miss'; B, H 'remember'
94.	*(ta)păt	păt	*păt	topa	'put out fire'
95.	*săt	săt	*săt		'weave mats'
96.	*năk	năk	*năk		'fish net'; S <u>nak</u> VC _f irreg, borrowed?

97.	*arāk	arāk	*rāk		'keep'
98.	*qdāk	qdāk	*dāk	têa	'spear'
102.	*lām	lām	*lām		'in, into'; B also <u>lōm</u>
103.	*mām	mām	*mām	mām	'salt fish'
104.	*trām	trām	*trām		'soak'
105.	*baqdām	pōqdām	*badām	potām	'five'
106.	*hanām	hónām	*hanām	honām	'year'; B also <u>sónām</u>
107.	*krām	krām	*krām	krām	'sink'
108.	*băn		*băn	păn	'raise animals'; B <u>rong</u>
109.	*măng	măng	*măng	máng	'night'
110.	*răng	răng	*răng	ráng	'dry (tree)'
111.	*chhăng	săng	*chăng	cháng	'sword'; J, H 'knife'
113.	*daqbăng	tōqbăng	*dabăng	topáng	'bamboo sprout'
114.	*qnh_ăng		*qnhăng	xáng	'bitter'; B <u>tăng</u> VN borrowing
115.	*hlăng	hlăng	*(l)lăng	hléang	'clear'; J <u>lì-</u> , H <u>l-</u>
116.	*pār	pār	*pār		'to fly'; S <u>konêa</u> retains infix - <u>đn-</u>
117.	*manār	pōnār	*manār	mona	'wing'; note infix - <u>an-</u>
121.	*chhăw	sôu	*chăw	cháu	'grandchild'
123.	*tadrăw	tōdrôu	*-drăw	todráu	'six'; J <u>ta-</u> , H <u>drô-</u> , rec * <u>ta-</u> ; S also <u>todrôu</u>
125.	*h__y		*ngăy	hai ~ hai	'day, sun'; B <u>qnār</u> , <u>nār</u>
127.	*pl__y	plēi/plăy	*plăy	plai	'fruit'
128.	*adrôy	hōdrôi	*adrăy	drai	'pestle'
129.	*hwăy	huay	*hăy	ái	'have'; B also <u>huệi</u>
131.	*wăq	wăq	*wăq	va	'want'
132.	*păq		*păq	pa	'side of'; B <u>qbôt</u>
133.	*krăq	krăq	*răq	kra	'old'; J <u>drăq</u> , H <u>krăq</u> , rec * <u>k-</u>
134.	*yăq	yăq	*yăq	ja	'grandmother'; S C _i irreg
136.	*sakăq	sōkăq	*ikăq		'back basket'; B also <u>hōkăq</u>
138.	*dêyh	deh	*dăyh	têah	'sound'
141.	*kachheyh	kōseh	*kachăyh	kochêi	'sneeze'
142.	*tōp		*tăp	tap	'set in'
143.	*__ōp	srōp	*săp	xap	'wear'; B also <u>hrōp</u>
144.	*qdon	qdon		tuán	'ear'; PJH <u>păt</u>

146.	*jõt	mĩnh	*jất	chat	'ten'
147.	*taweng	tóweng		hvang	'throw'
149.	*hۆk	hۆk	*hắk	hạk	'happy'
150.	*pők		*pắk	pak	'stab'; B <u>qbet</u>
151.	*krõm	kodrõm	*krẳm	kram	'crowded'; B infix
152.	*ha(m)õn	hõbẽn	*hamản	hman	'pants'
154.	*hơng		*hằng	hang	'peppery'; B <u>hơ</u>
154A.	*hắng	pohắng		háng	'pepper'
155.	*gõng	gõng	*gắng	kang	'spirit pole'
156.	*põng	põng	*pắng	pang	'pound'
157.	*hngăm	hngăm		hngám	'heavy'
158.	*kõl	kõl	*kắl	ko	'head'
159.	*hagõr	hõgõr	*-gắr	hoka	'drum'; J <u>ng-</u> , H <u>ha-</u> , rec. * <u>ha-</u>
160.	*palĩy	põlỏi	*plắy	polê	'village'; S C _f irreg
161.	*badõy	põdỏi	*badắy	potê	'rest'
162.	*ragĩy	rõgỏi	*ragắy	rokê	'skillful'
163.	*qbõyh	qbih	*bắyh	pah	'snake'
164.	*gadõw	kõd õu	*gadắw	kotau	'run'
165.	*(ka)trõw		*katrắw	totrau	'pigeon'
166.	*e		*e	ái	'have'; B <u>qděi</u>
167.	*bube	bõbe	*ba(q)be	pupái	'goat'; J <u>buq-</u> , H <u>ba-</u> , rec * <u>bu(q)-</u>
169.	*kane	kõne	*kane	konái	'rat'
171.	*phe	phe	*phe	phái	'husked rice'
172.	*kase		*kase	koxái	'string'; B <u>tõlỏi</u>
173.	*nge	ngc	*nge	ngế	'people'; S V irreg
175.	*hare	hre	*re	arái	'rattan'
176.	*re	re	*(q)re		'pan gold'
177.	*qbek	qbek	*bek	pie	'be fat'
178.	*ramăq	rõmăq		roma	'fat'
180.	*klyěng	klěng	*kleng	klíng	'forehead'
181.	*hryěng	hrěng	*reng	hríng	'hundred'
182.	*katyěng	kiěng	*teng	tíng	'tail'
184.	*athay	athay		thế	'command'
188.	*pch	pch	*pch	pêi	'pound rice'
189.	*weh	weh	*weh	ví	'turn aside'

190.	*taqneh		*(ta)qneh tonêi	'dirt'; J Ø, II <u>ta-</u> , rec * <u>ta-</u>
192.	*aseh	aseh	*(k)aseh xêi	'horse'; J <u>a-</u> , II <u>ka-</u>
194.	*plôm	plôm	*plêm pliam	'leech'
195.	*klôm	klôm	*klêm kliam	'liver'
196.	*arêh	arih	reh	'live'
197.	*_p__ng	kópðng	*pêng popeng	'above'
198.	*tôl	tôl	*têl tia	'answer'
199.	*kaqnôl	kôqnôl	*ka(q)nêl	'heel'; J Ø, II <u>q</u> , rec *q
200.	*tôr		*têr tia	'comb of chicken'
203.	*s__q	sîq	*sêq xoi	'err'
204.	*kasôq	kôsôq	*sêq xêi/koxêi	'afternoon'
205.	*gaqjôyh	hóqiuih	*gajôq) kochoh	'wet'
206.	*taqlôq		*taqlêq toqlêi	'easy'
207.	*tapôh	tópôh	*tapêh topah	'seven'
208.	*têp	têp	*têp	'pick up'; S <u>têk</u>
210.	*têch	têch	*têk tê	'sell'
211.	*chhên	sîn	*chên chên	'cooked'
212.	*jêq	jêq	achê	'near'
213.	*pêng		*pêng péng	'shoot'
214.	*manêng		*manêng monéng	'crossbow'
215.	*tachêng	tóchêng	*(ka)chêng tochéng	'think'; J <u>cha-</u> , II <u>ka-</u>
216.	*hwa	hua	hva	'gibbon'
218.	*bêq	bêq	*bêq	'imperative'
219.	*khêy	...	*khêy khê	'month, moon'; B also <u>khay</u>
220.	*sanênh	sônênh	*inêng honéng	'tooth'
221.	*alip	lep	*lip alep	'grasshopper'
222.	*gaqjip	kôqep	*gajip kochêp	'centipede'
223.	*dreng	dreng	*dring tring	'yellow'
224.	*keng		*king king	'edge'
225.	*pl__nh	plênh	*pling pleng	'sky'
227.	*adrêh	adrih	*(a)drih dreh	'unripe'
228.	*klêh		*(ta)klih kleh	'fall'
229.	*haqyêw	qngiêo	*iw hoqêô	'leftside'
231.	*mew	meo	*miw mêô	'cat'; PJH 'wild cat'
233A.	*prel		*pril prí	'ice, hail'

234.	*mi	mi	*mĩ	mai	'brother-in-law'
235.	*ti	ti	*tĩ	(tai)	'hand'
236 ₁ .	*haqbo	hoqbo			'corn'
236 ₂ .	...haqbli		*hablĩ	alai	
237.	*(ga)hip		*(ga)hĩp	hip	'suitcase'; J Ø, H <u>ga-</u>
238.	*jĩq	jĩq	*jĩq	chai	'sick'
239.	*phĩq	phĩq	*phĩq	phai	'full after eating'
240.	*ramwăn	rômuan		romuân	'soft'
241.	*tĩh	ti h	*tĩh		'big'
243.	*phiw	pheo	*phĩw	phiô	'happy'
243A.	*yěr	iěr	*ir	í	'chicken' (following 1st of two dissimilar forms in PJH paper)
243B.	*mir		*nĩr	mia	'rib'
243C.	*ch(h)ir		*chĩr	chia	'dig'
244.	*chhem	sem	*chĩm	chem	'bird'; PJH V irreg
245 ₁ .	*tăq	tô-	*tăq	to-	'little'
245 ₂ .	...sěq	...sěq	...sĩq	...xín	S relaryngeal- ization
246.	*ĩch	ĩch	*ĩk	êak	'excrement'
247.	*treng	tring		triáng	'tube'; PJH <u>ĩng</u>
248.	*qd__ng	qding	*dĩng		'bamboo pipe'
249.	*qbĩnh	qběnh	*bĩng	peng	'full'
251.	*tĩk palĩk tĩk pōlik		*(ta)lĩk		'stub toe'; J <u>těk lěk</u> , H <u>talĩk</u>
252.	*rĩm	rĩm	*(l/r)ĩm	rem	'every'; J <u>lěm</u> ; H <u>rĩm</u> ; rec *r
253.	*tachhĩn	tōsĩn	*(ta)chĩn	tochên	'nine'; J <u>ta-</u> , H <u>chô-</u>
254.	*jĩl	jĩl	*jĩl	chi	'deer'
255.	*ĩh	ih	*ĩyh	ch	'2nd sg.', J '1st & 3rd sg.', rec reanalysis of PJH to *ĩh
257.	*hyět	hiết	*hiat	qnhic	'wound'
258.	*rapyět	rōpiết	*rapiat	ropic	'tongue'; S also <u>ropê</u>
259.	*chhem	sem	*chiam	chem	'feed'; B also <u>sēm</u>
261.	*gaqd__m	kōqdĩm	*gadiam	koťém	'onion'
262.	*len	jên	*lian	lián	'money'
264.	*raqyễn	rōqđn	*rian	rén	'bite'
265.	*jyăng	giăng	*jiang	chiáng	'friend'

266.	*(ra)teng		*(ra)tiang	tiáng	'handle'; J <u>tiang</u> , H <u>rotiang</u>
267.	*qdreng	qding	*triang	triáng	'drinking straw'
268.	*chaqnhayh	tđqngiah	*kaqnaiyh	konêi	'fingernail'
269.	*ryayh	rđh	*riayh	rêi	'root'
271.	*ajrayh	jrah	*adriayh	trêi	'floor'
272 ₁ .	*qbĩq	qiăq		i-	'little'
272 ₂ .	...qbyăq	/qiăq	*qbiaq	...ia/ia	H <u>qbiaq</u> , J <u>qviaq</u>
273.	*hyđ	hnan	*nhĩa	hngêi	'house'; B VC _f irreg
274.	*qmyđ	qmi	*qmĩa	mêi	'rain'
275.	*prit	prit	*priat	priat	'banana'
276.	*jik		*jiak	chiak	'rice field'
277.	*tyđng		*tiang	têng	'dry'
279.	*kas _t ing	kđting	*kasiang	koxiang	'bone'
281.	*tamo	tđmo	*(ta)mo	hmôu	'stone'
282.	*bl__		*blo	pló	'ferment'
285.	*kanlo	klo	*klo	konôu	'husband'
286.	*chano	tđno	*tano	konôu	'male' (B, J, H. animal, S human)
288.	*qboh	qboh	*boh	po	'salt'
289.	*oh	oh	*oh	o	'younger sibling'
290.	*loh		*loh	lo	'go out'; B <u>lêch</u>
291.	*joh	joh	*joh	po	'peck'; S C ₁ irreg
293.	*koh	koh	*koh	ko	'chop'; S also <u>kó</u>
294.	*tđh	tđh	*toh		'green bean'
296.	*sasoh	sđsoh	*sasoh	xo	'only'; J 'idle'; B also <u>hoh</u> , <u>soh</u> , <u>hđhoh</u>
297.	*ragoh	(rđ)goh	*(ra)goh		'clean'; J <u>goh</u> ; H <u>ragoh</u> ; S <u>hra</u>
299.	*katoh	kđtoh	*katoh	koto	'drop, drip'
300.	*qmăng	qmăng		măng	'door'
301.	*khop	khop	*khop	khôp	'religion, pray'; S borrowed
302.	*kop	kop	*kop	kôa	'turtle'
303.	*ajop	jop	*jop	achôa	'fly'
305.	*gadrot	kđdrot	*gadrot	kodrua	'bee'
306.	*maqngot	pđngot	*m/paqngot	mongua	'hungry'; S 'to lack'; J <u>pa-</u> , H <u>mă-</u> , rec <u>ma-</u>

307.	*sot		*sot	xua	'harvest rice'
310.	*tak	tak		têa	'spear'
314.	*rok	rok	*rok	rôa	'banana bud'
315.	*trom	trôm	*trom	truám	'hole'
317.	*kon	kon	*kon	kuán	'child'
319.	*mon	mon	*mon	muán	'nephew'
320.	*kaqmon	hóqmon	*(ka)qmon	hoqmuán	'legend'; J <u>ka-</u> , H $\emptyset$
321.	*tadrong	tódrong	*drong	todrôang	'matter'; J <u>ta-</u> , H <u>dra-</u>
322.	*gong	gong	*gong	kôang	'gong'
323.	*long	long	*long		'try'; B also <u>pôlong</u>
324.	*qlong	qlong	*qlong	lôang	'tree'
325.	*ong	ong	*ong	ôang	'wasp'
326.	*bong	bong	*bong	pôang	'casket'
327.	*tong	tong	*tong	tôang	'tools'
328.	*yong	yong	*yong	xôang	'bed'
329.	*akong	kong	*(a)kong		'bracelet'; J $\emptyset$, H <u>ha-</u>
330.	*hadroy	adroi		hodrôi	'first'; B also <u>adrol</u> ; PJH <u>rol</u>
332.	*por	por	*por	púa	'cooked rice'; S usually <u>hme</u>
334.	*kor	kor	*kor	kúa	'shave'
336.	*roy	roi	*roy	rôi	'fly'
338.	*choy		*choy	chôi	'plant rice'; B <u>jai</u> C _i V irreg
339.	*hloy	hloi	*loy	hlôi	'immediately'
340.	*__têw	tônêo		rotêô	'waist'; PJH *(taq)noy, J $\emptyset$, H <u>ta-</u>
343.	*jrông	jrông		krông	'back basket'
344.	*gandm	gôndm	*kanôm		'rely on'
346.	*br__ng		*brông	prông	'lax vowel'
347.	*j__ng	jông	*jông	chêang	'foot'; B also <u>jông</u> ; S also <u>chiang</u>
350.	*khôy	khôi	*khôi	khôi	'customs'
351.	*lôy		*lôi	lôi	'stop'
353.	*jalôy	glôy	*-lôi	klê	'swim'; J <u>ta-</u> , H <u>ja-</u> ; S C _f irreg
354.	*qbok	qbok	*bôq	pôa	'grandfather'; PJH VC _f irreg

355.	*kamũq	kơmỗq	*qnoq	komôu	'dirty'
356.	*pũq	pũq	*pòq	pôu	'carry on back'
357.	*taqởq	tởqởq	*taqởq	to-ợ	'burp'; S 'to serve'
358.	*nhơ	nhô	*nhò	nôu	'uncle'; H 'step-father'; S 'mother, aunt'
360.	*bők	bők	*bők	po	'hoe'
361.	*qdők	qdők	*dők	to	'monkey'
362.	*ngők		*ngők	ngo	'mountain'; B <u>kông</u>
362A.	*kung	kông		kong	B 'mountain', S 'jungle'
363.	*(ka)tők	tők	*katők	to	'get on'
364.	*kaqợk		*kaqợk	koqợ	'cough'
365.	*hők	hők	*hők	hok	'study'; S C _f irreg, VN loan
365A.	*mahryăn	pơhrăm		mohriam	'study'
366.	*rők		*rők	ro	'cow'; B <u>rômo</u>
367.	*kống	kống	*kống	kóng	'arm'
368.	*ống	ống	*ống	óng	'son-in-law'
369.	*rống	rống	*rống	róng	'back'; B 'in back of'
370.	*hanglống	sơnglống	*halống	holóng	'star'
371.	*chhống	sống	*chống		'eat rice'
372.	*trống	trống	*trống	tróng	'eggplant'
373.	*srống	hrống	*srống	xrống	'spike'
374.	*tống		*tống	tóng	'please'
376.	*jởq	jởq	*jởq	cho	'correct'
376A.	*trởq	trởq		tro	'correct'
378 ₁ .	*qlởq	lở-	*qlởq	qlo	'know'; S 'certainty'
378 ₂ .	*...qlởq	...lởq			
379.	*chakhởq	chơkhởq	*chakhởq	chokhông	'shoe'; S borrowed and relaryngealized
380.	*rup	rôp	*rup	rup	'catch'
381.	*huch	huch	*hut	hut	'suck'
382.	*hmoch	hmôch	*mut	hmui	'ant'
384.	*khlom	hlôm	*khlum	hlúm	'blow'; J <u>kl</u> , H <u>hl</u>
385 ₁ .	*kaqnởm	kởqnởm		kodam	'underneath'
385 ₂ .	*...kron	...rôm	*krum		
386.	*nom	nởm	*num	núm	'whiskers': B V irreg
387.	*phom	phôm	*phum	phuám	'pass gas'

388.	*tom	tôm	*tum	tún	'all, enough'
390.	*klĭk	klĭk		klek	'deaf'
392.	*koyq		*kuyq	kukui	'back of head'; B <u>kǝng</u> <u>koch</u> ; J <u>kǝng</u> <u>kǝyq</u> ; H <u>kuyq</u>
393.	*tǝq	tǝq	*tuq	tô	'hot'; B also <u>tǝq</u>
395.	*__qyǝq	tǝqiǝq	*ma(q)nhuq		'scare'; J $\emptyset$, H <u>q</u>
396.	*tanǝq	tǝnǝq	*tanuq	tonôu	'brave'
397.	*kasǝq		*kasuq	koxôu	'sweat'; B pǝquh
398.	*tamung	tǝmông	*mung	hmông	'rooster'; S V irreg
399.	*sadrung	hǝdrông	*idrung	hodrong	'worn'
400.	*__h__ng	rǝhing	*(ta)hung	hêng	'thirst', H 'want'; J <u>ta-</u> , H $\emptyset$
402.	*pya	pia		pía	'melon'; PJH *- <u>pung</u>
403.	*plung	plung	*plung	plong	'boat'; B V irreg
404.	*(ta)tung	tǝtông	*tung	tong	'steal'
405.	*loyh		*luyh	lui	'pluck feathers'; B <u>bǝch</u>
406.	*nǝyh	muih	*muyh	muih	'slash'
408.	*tuh	toh	*tuh	tôu	'breast'
409.	*rǝh	ruh	*ruh		'fall'; PJH R irreg
410.	*chhuh	soh	*chuh	chôu	'set fire'
411.	*adrǝh	adruh	*dadruh	drôh	'girl'; B also <u>hǝdruh</u> ; PJH reduplication of C _i ; PJH R irreg
412.	*gaqduh	kǝqdoh	*gaduh	kotôu	'bark'
413.	*kachhuh	kǝsoh	*kachuh	kochôu	'spit'
415.	*jwǝy	juǝi	*juy	chói	'deer'; B also <u>joi</u>
416.	*koy	kǝi	*kuy	chôi	'lizard'; B <u>bar</u> <u>k</u> .; S C _i irreg
418.	*blu	blu	*blù	plau	'thigh'
419.	*kasu	kǝsu	*kasù	koxu	'rubber' (Fr., VN loan)
420.	*qdum	qdum	*dùm	tuam	'red, ripe'
421.	*hǝm	hǝm	*hǝm	huam	'bathe'; B also <u>hum</u>
423.	*um	um	*ùm	uam	'winnow'
425.	*qbǝh	qbuh	*bǝh	pôh	'roast'
427.	*(ka)kǝh	(kǝ)kuh	*kùh	kôh	'greet'; S also <u>koh</u>
428.	*mǝh	muh	*mùh	môh	'nose'

429.	*trũh	truh	*trũh	trôh	'arrive'
430.	*danũh	dõnuh	*danũh		'poor'
432.	*hayũh	hõyuh	*hayũh	riôh	'steam'
433.	*kaqdop	kõqdõp		kotuô	'fist'; PJH <u>*kapũq</u>
435.	*qnhuy	qnhui	*qnhũy	ngôi/nhôi	'smoke'
437.	*sũk	sõk	*sũk	xak	'hair'
439.	*badrõng	põdrõng	*badrũng	potrõng	'rich'; S C _i irreg
440.	*qlõy		*qlũy	lói	'broken off, crippled'
442.	*dagũm	tõgũm	*dagũm	gun	'help'; PJH & S both irreg, B loans
444.	*ũk	ũk	*ũk	ok	'pour'
445.	*s _t ũk	tũk	*sũk	xol:	'clouds'
446.	*badũk	põdũk	*badũk	potok	'stomach'
449.	*jarũm	jrũm	*jarũm	truam	'needle'
450.	*ũnh	ũnh	*ũn	on	'fire'
451.	*rahũng	rõhũng	*hũng	rohung	'papaya'
452.	*gadũng	kõdũng	*gadũng	kotong	'pocket'
453.	*mũt	mũt	*mũt	mot	'enter'; B also <u>mõt</u>
454.	*tanĩt	tõmũt	*-mũt	hmua	'insert'; J <u>q-</u> , H <u>ta-</u> ; PJH R irreg, rec *ũ
455.	*jũr	jur	*jũr	chu	'down'; B L irreg; S also <u>ju</u>
456.	*ch(h)ũr		*chũr	chu	'pig'; B <u>nhũng</u>
458.	*rwãt	rãt	*ruat	rõc	'buy'; B also <u>rõt</u>
459.	*qdwãt	qđõt	*duat		'pull out, fall apart'
460.	*pwẽt	puãt	*n/paquat	põc	'half'; J <u>na-</u> , H <u>pa-</u>
461.	*pwãn	puãn	*puan	puãn	'four'
462.	*__on	põn	*buan		'lie down (animal)'
463.	*ywãn	yuãn	*yuan	xuãn	'Vietnamese'
465.	*(q)bol		*bual	põu	'lizard'; S also <u>bõu</u>
466.	*royh	rõih	*ruayh	rui	'elephant'
467.	*jwãt	juãt	*juaq		'step, step on'; C _f irreg
469.	*jĩq	jĩq		chai	'sick'
470.	*poyh	põih	*puayh	pui	'calf of leg'
472.	*qbun	qbun	*buãn	põm	'tuber'
473.	*kasum		*kasuãm	koxõm	'lizard'
474.	*qyung	qiung	*yuãng	xuõng	'get up, stand'

475.	*kung	kung	*guàng	kông	'house steps'; PJH C _i irreg
476.	*chhung	sung	*chuàng	chuông	'axe'
477.	*tr__ng	trong	*truàng	tróang	'road'; R irreg
478.	*tóng	tông	*tuàng	tông	'carry on pole'
479.	*qjǒq	qiǔq	*juaq	chôu	'sour'
480A.	*luyq	luiq		loi	'believe'
480C.	*chyu	chu		chIU	'obey'
481.	*ngyón	nhôn	*yuàn	ngian	'1st pl. excl.'
482.	*br__ng		*brong	próng	'tense vowel'
260.	*lyǎn	liǎn	*lian	lén	'good'; B also <u>qlǒng</u>
483.	*hodang	hodang	*hodang	rotcang	'Sedang Tribe'
484.	*bohnar	bohnar		bohnéa	'Bahnar Tribe'

9.0 Conclusion

This is an introductory study in Proto Central North Bahnaric inasmuch as only about 400 words have been compared (for about one hundred of these only two languages have cognates). It serves to establish the initial and final consonant correspondences, the vowel features of length and register (as being a reflex of vowel height), and certain vowel correspondences. The presyllable, semi-vowels, nasalization, and some vowel correspondences are weak and tentative. In many cases there is only one example of a particular correspondence; in other cases a particular correspondence could justifiably have been assigned to another proto-phoneme. More data and discussions with those familiar with the languages will enable greater attestation for the proto-phonemes of PCNB.

The initial seven curiosities relating to the relations between these languages (see Section 0.) have been basically satisfied.

The study not only was dependent upon, but validated most of the PJH reconstructions of Thomas and Smith (1967).

The branching relations of these languages as made evident from this study, are shown below.

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