A PHONOLOGICAL RECONSTRUCTION OF

PROTO CENTRAL NORTH BAHNARIC

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0. Introduction

The North Bahnaric languages in Viet Nam (Thomas, 1966) include Bahnar, Rengao, Sedang, Halăng, Jeh, Mdnm, Kdyong, 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 Kdyong (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 Mdnm, 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-Inong (Blood, 1966); and Proto-Chamic, a Malayo-Polynesian

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1What Thomas has previously termed Bahnaran and Stiengan subgroups under the Bahnaric division of the ien-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, Halāng, and Sedang have a distinctive vowel register contrast. In Jeh and Halāng 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 Halāng five. (3) Bahnar, Jeh and Halāng 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, Halāng, 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-Halāng" (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 quoc-ngu, with generally the same values as in Vietnamese, except as noted below.

The general word form in Jeh, Halāng, 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 is posited in order to isolate an interesting exception to *s.

\[
\begin{array}{cccccccc}
p & t & ch & k & q \\
b^2 & d & j & g \\
m & n & nh & ng \\
w & s & y & h \\
l & r \\
\end{array}
\]

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

\[^2\text{Banker's analysis of Bahnar initial consonants (1961) results in}\]

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SIL-UND Workpapers 1967
Reconstructed single consonants: ³

*p < p : p : p
*t < t : t : t
*ch < ch : ch : ch
  s : ch : ch before *h

33 consonants: the above 19 plus gh, gd, gj, hm, hn, hnh, hng, gn, qn, qnh, qng, gw, ql, qy. Reanalyzing those complex unit phonemes using the cluster center and cluster modifier approach (Smith, 1967a), Bahnar cluster centers and cluster modifiers are identical to Sêdang.

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. ∅ 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 Sêdang lexicon count shows 14 b's, 268 p's). This reconstruction does not account for S (prenasalized) b, d, j, or g.

\[
\begin{align*}
&m \succ m : m : m & \quad \text{(27)} \\
&n \succ n : n : n & \quad \text{(15) exc.: 385} \\
&\emptyset : \emptyset : n \quad \text{before *l} & \quad \text{(2) 48, 285} \\
&nh \succ nh : nh : n & \quad \text{(1) 358} \\
&nh : \emptyset : s \quad \text{after *q (before *r)} & \quad \text{(1) 61} \\
&\# : nh : s & \quad \ast q, \text{ after *ã} & \quad \text{(1) 114} \\
&ng : n : n & \quad \ast q, \text{ before *a} & \quad \text{(1) 268} \\
&nh : nh : nh/ng \quad \text{after *q, before *u} & \quad \text{(1) 435} \\
&ng \succ ng : ng : ng & \quad \text{(9)} \\
&nh : \emptyset : ng \quad \text{before *y} & \quad \text{(1) 481} \\
&ng : \emptyset : \emptyset \quad \ast l & \quad \text{(1) 370} \\
&\emptyset : l : # \quad \text{before *w} & \quad \text{(18) exc.: 262} \\
&l \succ l : l : l & \quad \text{(1) 160; note word 251} \\
&l : -l : l & \quad \ast po- & \quad \text{(1) 353} \\
&-l : l : -l & \quad \ast jo- & \quad \text{(1) 353} \\
\end{align*}
\]

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 \succ ch : ch : ch does not occur before *h because *ch \succ 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).
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 ji). Cluster modifiers are the same for all three languages. Voiceless cluster modifiers (occurring before the onset of voicing) are q-, h-, and -h (proglottalization, 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) Proglottalization before voiced consonants, *q:\n
*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 *ma- (1) 306
In the above sets it is observed that PJII has less preglottalization than B, and S less than PJII. In the reflexes above S has preglottalization in only three instances. Other instances of preglottalization in S, however, relatively uncommon, are unaccounted for in this reconstruction.

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

\[ *h- \rightarrow h- : \emptyset : h- \]

(7) occurring before *m, *ng, *l, *r; note J 11, 115

\[ h : \emptyset : h- \text{ before } *w \]

(1) 216

\[ h- : h : h \]

" *ngV* (1) 28

\[ # : h- : h- \]

" *mV* (1) 78

\[ h : h : \emptyset \]

" *wV* (1) 129

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

\[ *h- \rightarrow -h : -h : -h \text{ after } *p, *t, *k \]

(12) 82, 243C, 456 arc undeterminable due to B #

\[ \emptyset : \emptyset : \emptyset \]

" *ch (13) 384

\[ h- : -h- : h- \]

" *k before *l (1) 384

(4) Clusters of stops and nasals with l, *-1:

\[ *-1 \rightarrow -1 : -1 : -1 \]

(16) occurring with *p, *k, *kh, *b; exc.: 236

\[ -1 : 1/-1 : \emptyset \text{ after } *n \]

(2) 48, 285

\[ -1 : 1 : 1 \]

" *ng (1) 370

\[ \emptyset : 1 : # \]

" *d (1) 47

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

\[ *-r \rightarrow -r : -r : -r \]

(31) occurring with *p, *t, *k, *b, *d, *j, *s; note words 133, 143, 3852

\[ \emptyset : \emptyset : -r \text{ after } *ch \]

(1) 56

\[ \emptyset : -r : -r \]

" *qd (1) 267

\[ \emptyset : -r : \emptyset \]

" *m (1) 14

\[ \emptyset : r : -r \]

" *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 \( y \) and \( y \) as liquids which can occur as last members of clusters in Niläng. Joh 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 \(k\dot{a}\), 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):

\[w : \emptyset : \emptyset \text{ after } *\text{CVl} \quad (1) \quad 36\]
\[u : w- : \delta- \quad *s \quad (1) \quad 44 \text{ (S CG)}\]

(before short vowels):

\[u- : u- : u- \text{ before } *\ddot{a}n \text{ (after } *u, *y) \quad (3) \quad 240, 461, 463 \text{ (S CG)}\]
\[\emptyset : u- : \delta- \quad *\ddot{a}t \quad *r, *q\ddot{d} \quad (2) \quad 453, 459 \text{ (S } \ddot{h}); \text{ (S FG)}\]
\[u- : u- : \delta- \quad *\dot{a}t \quad *j \quad (1) \quad 467 \text{ (S } \ddot{h})\]
\[\quad \quad *\dot{e}t \quad (" *p) \quad (1) \quad 460 \text{ (S FG)}\]
\[u- : u : o \quad *\dot{e}y \quad (" *j) \quad (1) \quad 415\]

\[y-\] (before long vowels):

\[\emptyset : i- : \emptyset \text{ before } *\text{dyh} \text{ (after } *r) \quad (1) \quad 269\]
\[\quad \quad *\ddot{d} \quad *h \quad (1) \quad 273\]
\[\quad \quad *\ddot{d}ng \quad (" *t) \quad (1) \quad 277\]
\[i : \emptyset : \emptyset \quad *\text{ah} \quad (" *r) \quad (1) \quad 80\]
\[i : i- : \emptyset \quad *\ddot{d} \quad *q\ddot{m} \quad (1) \quad 274\]
\[\emptyset : \# : i \quad *u \quad (" *ch) \quad (1) \quad 480c\]
\[i- : \# : i- \quad *a \quad (" *p) \quad (1) \quad 402 \text{ (S CG)}\]
\[\emptyset : y : i- \quad *\ddot{d}n \quad (" *ng) \quad (1) \quad 481 \text{ (S CG)}\]

(before short vowels):

\[i- : i- : i- \text{ before } *\dot{c}t \text{ (after } *h, *p, *ng) \quad (3) \quad 29, 257, 258 \text{ (S FG)}\]
\[\quad \quad *\ddot{a}q \quad (" *qb) \quad (1) \quad 272_2 \text{ (S CG)}\]
\[\quad \quad *\ddot{a}n\ddot{g} \quad (" *j) \quad (1) \quad 265 \text{ (S CG)}\]
\[i- : \emptyset : i \quad *\ddot{e}n\ddot{g} \quad *t \quad (1) \quad 182\]
\[\emptyset : \emptyset : i \quad *\ddot{e}n\ddot{g} \quad *\ddot{h}r, *\ddot{k}\ddot{l} \quad (1) \quad 180, 101\]
\[i- : i- : \emptyset \quad *\ddot{e}n \quad (" *l) \quad (1) \quad 260\]
\[\emptyset : \# : i- \quad *\ddot{a}m \quad (" *hr) \quad (1) \quad 365a \text{ (S CG)}\]
\[\quad \quad *\ddot{e}w \quad (" *q) \quad (1) \quad 229\]
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. D and PJII 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 y, 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.

\[
\begin{array}{cccc}
\emptyset & \emptyset & \emptyset \\ 0 & 0 & 0 \\
\hline \\
\emptyset & \emptyset & \emptyset \\ 0 & 0 & 0 \\
\end{array}
\]

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. (â does not occur in the cognate lists.)

<table>
<thead>
<tr>
<th>Short</th>
<th>Long</th>
</tr>
</thead>
<tbody>
<tr>
<td>ì</td>
<td>è</td>
</tr>
<tr>
<td>é</td>
<td>ë</td>
</tr>
<tr>
<td>ë</td>
<td>ë</td>
</tr>
<tr>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>o</td>
<td>o</td>
</tr>
</tbody>
</table>

Proto-Jeh-Halăng.—PJII 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. (PJII *â was reconstructed on the basis of only one instance of J â : H â.)
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 ɔə̯, ɪə̯, and ʊə̯ do not occur in the cognate lists.)

Laryngealized, 1st register

<table>
<thead>
<tr>
<th>Single</th>
<th>Central</th>
<th>Back</th>
<th>Glided</th>
</tr>
</thead>
<tbody>
<tr>
<td>ĩ</td>
<td>ũ</td>
<td>ɨə̯</td>
<td>ʊə̯</td>
</tr>
<tr>
<td>ə̯</td>
<td>ə̯</td>
<td>ə̯</td>
<td>ə̯</td>
</tr>
<tr>
<td>ə̯</td>
<td>ə̯</td>
<td>ə̯</td>
<td>ə̯</td>
</tr>
</tbody>
</table>

Clear, 2nd register

<table>
<thead>
<tr>
<th>Single</th>
<th>Central</th>
<th>Back</th>
<th>Glided</th>
</tr>
</thead>
<tbody>
<tr>
<td>ī</td>
<td>ũ</td>
<td>ɨə̯</td>
<td>ʊə̯</td>
</tr>
<tr>
<td>ə̯</td>
<td>ə̯</td>
<td>ə̯</td>
<td>ə̯</td>
</tr>
<tr>
<td>ə̯</td>
<td>ə̯</td>
<td>ə̯</td>
<td>ə̯</td>
</tr>
</tbody>
</table>

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 those 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 ɨ 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):
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:

<table>
<thead>
<tr>
<th></th>
<th>Long</th>
<th>Short</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd reg.</td>
<td>43</td>
<td>37</td>
</tr>
<tr>
<td>1st reg.</td>
<td>138</td>
<td>82</td>
</tr>
</tbody>
</table>

Register has been found related to vowel height in Dahhar. 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 ü 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**

<table>
<thead>
<tr>
<th>Long vowels</th>
<th>Short vowels</th>
</tr>
</thead>
<tbody>
<tr>
<td>i-5</td>
<td>i-2</td>
</tr>
<tr>
<td>e 18</td>
<td>e 16</td>
</tr>
<tr>
<td>a 62</td>
<td>a 39</td>
</tr>
<tr>
<td>o 35</td>
<td>o 14</td>
</tr>
</tbody>
</table>

**Second Register**

<table>
<thead>
<tr>
<th>Long vowels</th>
<th>Short vowels</th>
</tr>
</thead>
<tbody>
<tr>
<td>i-9</td>
<td>i-7</td>
</tr>
<tr>
<td>e 2</td>
<td>e 4</td>
</tr>
<tr>
<td>a 0</td>
<td>a 1</td>
</tr>
<tr>
<td>o 1</td>
<td>o 2</td>
</tr>
</tbody>
</table>

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; and the PCNB high vowels have second register reflexes in PJH and S.

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4 This accounts for what seemed an unusual recitation of vowel letters by a Halâng 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-i-o-ù.
Length.--S has no length contrast; B has no length contrast before final g, h, yh, and yq; H has no length contrast before g and h; and J has no length contrast before h, only a weak contrast before q. PJII reconstructed the length contrast in all environments except before h. Excepting for these differences PJII and B long and short vowels correspond exactly, except that for reflexes of *wV and *yV, Bahmar has short and PJII 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 PCHB. The current glides in PJII and S are reflexes of the semi-vowels, and certain vowels and final consonants.

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

The starting point i of S glides ia, ia, and i6 is a reflex of *i or *y; of S ie is *yV or *eV. The starting point u of S glides ua and ua are reflexes of *w, *o, or, if followed by a nasal, *u. The starting point of S uó is a reflex of *u; of S é is *w. Of S éa and éa, is *a; of S éa and éa is *o; of S ée is *e or *e. The end point a of the central glides is often a reflex of *e, *e, *a, of is associated with the following stop or nasal consonant. The end point é of the S back glides is a reflex of *w or a final velar consonant. The end point é 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 ú does not occur in the data; furthermore it has been possible to collapse the two lower front and back vowels (ê and ê, ê and ê), resulting in a reconstruction having six long and six short vowels as follows:

<table>
<thead>
<tr>
<th>Short</th>
<th>Long</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>*i</td>
</tr>
<tr>
<td></td>
<td>*ê</td>
</tr>
<tr>
<td></td>
<td>*u</td>
</tr>
<tr>
<td>Low</td>
<td>*e</td>
</tr>
<tr>
<td></td>
<td>*ã</td>
</tr>
</tbody>
</table>

Final consonants in the languages of Viet Han 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 \( y, ay, w, \) 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 \( n, an, ad, t, aj, chh, q, h, ab, p, m, \) 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 tense) 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.

| *phiq | S phi, phêi, phe, phai | 'full after eating' (word 239) |
|*phe | S phi, phêi, phê, phái | 'husked rice' (word 171) |
|*choq | S chô, chô, chôm | 'dog' (word 230) |
|*ch(h)ûr | S chu | 'pig' (word 456) |

4.3 Reconstructed vowels

I. Short vowels

A. High vowels (reflected by 2nd register)

<table>
<thead>
<tr>
<th>PCNB</th>
<th>B</th>
<th>PJH</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>*i&gt;</td>
<td>í : i : e</td>
<td>before *k</td>
<td>(2) 251, 390</td>
</tr>
<tr>
<td></td>
<td>&quot;</td>
<td>&quot;m</td>
<td>(1) 252</td>
</tr>
<tr>
<td></td>
<td>í : i : ai</td>
<td>&quot;</td>
<td>*q</td>
</tr>
<tr>
<td></td>
<td>í : i : ê</td>
<td>&quot;</td>
<td>*n</td>
</tr>
<tr>
<td></td>
<td>e : ë : e</td>
<td>&quot;</td>
<td>*nh</td>
</tr>
<tr>
<td></td>
<td>í : ë : i</td>
<td>&quot;</td>
<td>*l</td>
</tr>
<tr>
<td></td>
<td>ë : ã : ë</td>
<td>&quot;</td>
<td>*y</td>
</tr>
<tr>
<td></td>
<td>í : ë : e</td>
<td>&quot;</td>
<td>*h</td>
</tr>
<tr>
<td></td>
<td>í : ë : ãa</td>
<td>&quot;</td>
<td>*ch</td>
</tr>
</tbody>
</table>

(The instances of long vowel reflexes above are before *h and *q where the languages today have no, or very weak, length contrast.)
*ə > ə : ą : a before *p
  "  *k  (2) 142, 143
  "  *m  (2) 149, 150
  "  *ng  (3) 151, 385
  "  *r  (1) 159
  "  *w  (2) 164, 165

i : ą : a  "  *t  (1) 146 (after *j)
ě : ą : a  "  *n  (1) 152
ø : ą : a  "  *yh  (1) 163 (B L irreg)
š : ą : o  "  *l  (1) 158
d : ą : ē  "  *y  (1) 161 (B L irreg); exc.: l28
š : ē : ņi  "  *q  (2) 204, 206
š : o : o  "  *q after *qj (1) 357
d : ē : a  "  *h  (1) 207
u : ē : o  "  *yh after *qj (1) 205

*ū > ŭ : ū : o before *t
  "  *k  (3) 444, 445, 446
  "  *nh  (1) 450
  "  *ng  (1) 452
ū : ū : ua  "  *m  (3) 421, 442, 449 (S CG)
ū : ū : u  "  *ng after *h (1) 451
  "  *r  (2) 455 (B L irreg), 456
ū : o : źu  "  *q after *p (1) 356
o : o : źu  "  *q after *m (1) 355
u : ź : ź  "  *h  (6)
ū : u : u  "  *yh  (1) 406
ś : ź : 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 *i.)
B. Low vowels (reflected by 1st register)

*ě > ě : ě : è before *p

<table>
<thead>
<tr>
<th>Signal</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Čh</td>
<td>210</td>
</tr>
<tr>
<td>*q</td>
<td>212, 218, 378</td>
</tr>
<tr>
<td>*nž</td>
<td>213, 214, 215</td>
</tr>
<tr>
<td>*w</td>
<td>340 (S Dg)</td>
</tr>
<tr>
<td>*y</td>
<td>219</td>
</tr>
<tr>
<td>ě : ě : ě before *p</td>
<td>(1) 208</td>
</tr>
</tbody>
</table>

*ě : ě : è before *p

<table>
<thead>
<tr>
<th>Signal</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>*č</td>
<td>220</td>
</tr>
<tr>
<td>*q</td>
<td>212, 218, 378</td>
</tr>
<tr>
<td>*nž</td>
<td>213, 214, 215</td>
</tr>
<tr>
<td>*w</td>
<td>340 (S Dg)</td>
</tr>
<tr>
<td>*y</td>
<td>219</td>
</tr>
<tr>
<td>ě : ě : è before *p</td>
<td>(1) 208</td>
</tr>
</tbody>
</table>

*ě : ě : ě before *p

<table>
<thead>
<tr>
<th>Signal</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ě : ě : è before *p</td>
<td>(1) 208</td>
</tr>
</tbody>
</table>

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

*ě > ě : ě : è before *p

<table>
<thead>
<tr>
<th>Signal</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>*t</td>
<td>29, 257, 258 (S FG)</td>
</tr>
<tr>
<td>*r</td>
<td>39, 257, 258 (S FG)</td>
</tr>
<tr>
<td>*q</td>
<td>96 (S borrowed), 97, 98 (S CG)</td>
</tr>
</tbody>
</table>

*ě > ě : ě : è before *p

<table>
<thead>
<tr>
<th>Signal</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ě : ě : è before *p</td>
<td>(1) 208</td>
</tr>
</tbody>
</table>

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

*ě > ě : ě : è before *p

<table>
<thead>
<tr>
<th>Signal</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ě : ě : è before *p</td>
<td>(1) 208</td>
</tr>
</tbody>
</table>

(These instances of B long vowels above are before *yḥ and *ḥ where B has no length contrast. The six instances of PJII long vowels are after *w and *y which lengthen the vowel in PJII or before *ḥ. S clear vowels occur only before final consonants which have not permitted laryngealization; S ēn above is one exception.)
ã : a : êa before *k after *h (1) 23 (S CG)
ã : a : a " *k " *y (1) 26 (S CG)
" *q " *y (1) 272, 272a (S CG)
ã : a : e " *t " *v (2) 458, 467 (S FG)
œ : a : # " *t " *dœ (1) 459
ã : a : á " *n " *v (3) 240, 461, 463 (S CG)
" *ng " *y (1) 265 (S CG)
a : a : a " *h (1) 30

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

*Ö > Ò : Ò : o before *k

   " *q (4) 376, 376a, 378, 379

Ò : Ò : ó " *ng (8)
ũ : # : ó " *ng after *jr (1) 343
ö : u : õ/ðu " *q " *n, *t (2) 393, 396
œ : ũ : ó " *ng " *dr (1) 439
" *y (1) 440
ũ : u : õu " *q after *y, *s (2) 395, 397
ũ : ua : õu " *q " *qj (1) 479
u : u : õ " *h (2) 409, 411
ũ : ũ : ua " *t (1) 454

II. Long vowels

A. High vowels (reflected by 2nd register)

*i > i : ì : ai before *Ø

i : ià : 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 : ì : i " *p after *h (1) 237 (B#)
" *w (1) 243 (S DG)
# : ì : ia " *r (2) 243B, 243C (S CG)
*d > ð : è : ia before *m (2) 194, 195 (S CG)
  " *r (1) 200 (B #)(S CG)
  " *l (1) 198 (S CG)
ð : è : # " *l after *qn (1) 199
ð : ùa : ð " *ng (1) 478
ð : ùa : a " *n (after *y) (1) 481 (S CG)
o : ò : ð " *y (2) 350, 351 (B #)
ð : ò : ðu " *ø (1) 358
ð : ò : ê " *y after *l (1) 353
  " *m " *n (1) 344
ð : o : # " *h (1) 294
# : à : ê " *ng after *y (1) 277
ø : à : ëì " *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
ð : u : u " *p (1) 380
o : u : ðu " *h (4) 408, 410, 412, 413
ð : u : o " *ng (5) (398 S ð, 403 B u) Exc.: 475 contrasts with 362A
u : uà : uð " *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 : è : aí before *ø (8)
e : e : èi " *h (3) 188, 190, 192
e : e : ie " *k (1) 177 (S FG)
e : # : é " *n (1) 75
e : ia : e " *m (2) 244 (FJII E), 259
e : i : è " *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

-100-
e : e : í before *h after *w (1) 189
e : ia : iá " *n " *l (1) 262 (S CG)
e : # : a " *ng " *w (1) 147
i : i : e " *h " *r *dr, *k1 (3) 196, 227, 228
e : ã : e " *yh (1) 141

*a a : a : ãa " *ng (14) (S CG)
" *m (6) ("
" *r (1) 58 ("

a : a : ãa " *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

d : 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 ãa
" *p after *q (1) 15
" *ng " *w (1) 44 (S CG)

*o o : o : o before *h (8)
o : o : ó " *y (5) 416B L irreg, PJH u
o : o : ãa " *ng (9) (S CG)
o : o : ãa " *p (3) 301 (S borrowed), 302, 303 (S CG)
" *k (2) 314, 354 (PJH ãg) (S CG)
o : o : ãu " Ø (4) 236, 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)
ð : u : ú/úa " *m (5) (S CG?)
# : ua : ãu " *l (1) 465
ð : u : u " *ch (1) 382
ð : ua : u " *yh (3) 405 (PJH u), 466, 470
" *yq (1) 392
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.

<table>
<thead>
<tr>
<th>Bahnar</th>
<th>Sedang</th>
</tr>
</thead>
<tbody>
<tr>
<td>p t ch k</td>
<td>p t k</td>
</tr>
<tr>
<td>m n nh ng</td>
<td>m n ng</td>
</tr>
<tr>
<td>w l r y</td>
<td>w y</td>
</tr>
<tr>
<td>yh h</td>
<td>yh h</td>
</tr>
<tr>
<td>yq q</td>
<td></td>
</tr>
</tbody>
</table>

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 PJHB pattern similarly to Bahnar.

Reconstructed final consonants:

- **p > p : p : p** after high vowels (6)
  - p : p : Ø   " low " (16)
- **t > t : t : t** after high vowels (3) 146, 275, 453
  - t : t : Ø   " low " (16)
- **ch > ch : k : k** after front high vowels (1) 246
  - ch : t : t   " back " " (1) 381
  - ch : k : Ø   " front low " (1) 210
  - ch : t : i   " back " " (1) 382
- **k > k : k : k** after high vowels (9)
  - k : k : Ø   " 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 : n
*n > n : n : n
*nh > nh : ng : ng after front vowels
  nh : n : n " central and back vowels
*ng > ng : ng : ng
*w > o : w : o
  u : w : u after short central vowels
*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
*r > r : r : ø
*h > h : h : h after short vowels
  h : h : ø " long "
*q > q : q : ø
*ø > ø : ø : ø
*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 non­contrastive 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 hd-; B ad- ~ B hd-; S ho- ~ S ro-.
The reconstructed presyllable consonants are identical with B and PJH. B *d-, PJH *a-, PJH *g-, S *l-, S *o-, and S *q- are unaccounted for in this reconstruction.

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.

Reconstructed presyllables:

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

*ta- > td- : ta- : to- (11)

*cha- > chd- : cha- : (cho-) (1) 379 (S borrowed)

*ka- > kd- : ka- : ko- (21)

*ba- > pd- : ba- : po- (4) 105, 161, 439, 446
bd- : (ma-) : mo- before *ng (1) 70
bd- : ba- : pu- " *b (1) 167
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.
### Cognate lists

The almost 500 words of the Proto-Jeh-Ialâng 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 D or S cognates have been found. Subscripts 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 (initial consonant) and $f$ (final consonant); both J and H forms where PJH is unresolved, with recommended ("rec") PJH resolution of the problem.

<table>
<thead>
<tr>
<th>PCNB</th>
<th>D</th>
<th>PJH</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. *hla</td>
<td>hla</td>
<td>*la</td>
<td>hlá</td>
</tr>
<tr>
<td>2. *ka</td>
<td>ka</td>
<td>*ka</td>
<td>ká</td>
</tr>
<tr>
<td>3. *chha</td>
<td>sa</td>
<td>*cha</td>
<td></td>
</tr>
<tr>
<td>4. *kha</td>
<td>sa</td>
<td>*kha</td>
<td>khá</td>
</tr>
<tr>
<td>5. *pha</td>
<td>pha</td>
<td>*pha</td>
<td>phá</td>
</tr>
<tr>
<td>6. *pla</td>
<td>pla</td>
<td>*pla</td>
<td>plá</td>
</tr>
<tr>
<td>7. *ma</td>
<td>ma</td>
<td>*ma</td>
<td></td>
</tr>
<tr>
<td>8. *haqwâ</td>
<td>qma</td>
<td>*qma</td>
<td>hoqvá</td>
</tr>
<tr>
<td>9. *sada</td>
<td>sda</td>
<td>*ida</td>
<td>hotá</td>
</tr>
<tr>
<td>10. *hadra</td>
<td>adra</td>
<td>*-dra</td>
<td>drá</td>
</tr>
<tr>
<td>11. *damronh</td>
<td>domênh</td>
<td>*-mra</td>
<td>hmôi</td>
</tr>
<tr>
<td>12. *kaqap</td>
<td>kôqap</td>
<td>*kaqap</td>
<td>koq</td>
</tr>
<tr>
<td>13. *kalap</td>
<td>kôlap</td>
<td>*kalap</td>
<td>kolêa</td>
</tr>
<tr>
<td>14. *sap</td>
<td>kôchap</td>
<td>*kachap</td>
<td>kochôa</td>
</tr>
<tr>
<td>15. *tap</td>
<td>tap</td>
<td>*tap</td>
<td>tôa</td>
</tr>
<tr>
<td>16. *qdak</td>
<td>qdak</td>
<td>*dak</td>
<td>tôa</td>
</tr>
<tr>
<td>17. *hâk</td>
<td>hâk</td>
<td>*hak</td>
<td>hêa</td>
</tr>
</tbody>
</table>
24. *klak klak *klak klêa 'intestines'
25. *tanap tdnap hñêa 'difficult'
26. *kayâk kiâk *kayak kia 'corpse'
27. *naham pham *-ham mohêam 'blood'; J p-; II n- 
28. *tahngam tdhngam *taham tohêam 'eight'
29. *tangyêt tôngiêêt tongie 'malaria'; S also tongê
30. *qngam qngam *qngam ngêam 'sweet'
31. *tam tam *tam têam 'not yet'
32. *taman kótam *katam kóta'm 'crab'
33. *pam pam *pam pêam 'fish trap'
34. *tanh tanh *tan tên 'weave'
35. *ralwan rôwan *ralan 'play'
36. *jang jang *jang chêang 'work'
37. *pagang pdgang *pagang pokêang 'medicine'
38. *sang sang *sang hiêang 'finished'
39. *rang rang *rang rêang 'flower'
40. *kang klang *klang kêang 'chin'
41. *swang suang *swang xêang 'dance'
42. *pahang pdhâng *pahang phêang 'roast'
43. *yang yang *yang xêang 'spirit'
44. *qdlâng pdqdlâng *-lang 'on back'; J sa-; II q-
45. *kang klang *kalang konêang 'water trough'
46. *brang brang brang *brang prêang 'scattered'
47. *qblâng qblâng *blang 'thorny tree'
48. *tang tang *tang têang 'instead of'
49. *chrang gê chang *chang trêang 'post'
50. *pang pang *(t)pang 'pound'; S pang irreg.
51. *qbar qbar *bar pêa 'two'
52. *qbrâng qbrâng *brang 'two'
53. *khan khan khan 'say'; PJH war
54. *aw ao *aw ñê 'shirt'
55. *qnhraw qnhao *raw xrôa 'wash'; S also xrôa
56. *qaw qnaw *qaw nêô 'new'
57. *naw naw *naw nêô 'more'
58. *yaw yao *yaw xêô 'no more'

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<table>
<thead>
<tr>
<th>No.</th>
<th>Word 1</th>
<th>Word 2</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>66</td>
<td>*haw</td>
<td>hao</td>
<td>'climb'</td>
</tr>
<tr>
<td>67</td>
<td>*chh</td>
<td>sa</td>
<td>'ignite'</td>
</tr>
<tr>
<td>68</td>
<td>*kraw</td>
<td>kreo</td>
<td>'call'</td>
</tr>
<tr>
<td>69</td>
<td>*pay</td>
<td>pai</td>
<td>'cook'</td>
</tr>
<tr>
<td>70</td>
<td>*bangay</td>
<td>bɔŋgai</td>
<td>'people'; rec PJH ma-; J ma-, II Ø</td>
</tr>
<tr>
<td>71</td>
<td>*saqngay</td>
<td>iqngay</td>
<td>hongé 'far'</td>
</tr>
<tr>
<td>72</td>
<td>*saday</td>
<td>hɔdai</td>
<td>'together'; S dëi irreg CV-, C_i, V, &amp; C_f</td>
</tr>
<tr>
<td>73</td>
<td>*(ma)may</td>
<td>mdmay</td>
<td>may mê B 'older sister'; J 'daughter-in-law'; H 'sister'; S 'sister-in-law, daughter-in-law'</td>
</tr>
<tr>
<td>74</td>
<td>*bray</td>
<td>brai</td>
<td>'thread'</td>
</tr>
<tr>
<td>75</td>
<td>*kapon</td>
<td>kdpun</td>
<td>'loincloth'; PJH *halay</td>
</tr>
<tr>
<td>76</td>
<td>*katayh</td>
<td>kɔtaih</td>
<td>'hip'; B C_f irreg</td>
</tr>
<tr>
<td>77</td>
<td>*qb aç</td>
<td>bã/qb aç</td>
<td>'father'</td>
</tr>
<tr>
<td>78</td>
<td>*hnaq</td>
<td>hmaq</td>
<td>'acquaintance'</td>
</tr>
<tr>
<td>79</td>
<td>*pah</td>
<td>pa</td>
<td>'chop, split'</td>
</tr>
<tr>
<td>80</td>
<td>*ryañ</td>
<td>hiah</td>
<td>'have holes'</td>
</tr>
<tr>
<td>81</td>
<td>*mah</td>
<td>mah</td>
<td>'gold'; B naj C_f irreg; S mê morêl</td>
</tr>
<tr>
<td>82</td>
<td>*kach(h)ah</td>
<td>kachah</td>
<td>kocha 'charcoal'</td>
</tr>
<tr>
<td>83</td>
<td>*tablåh</td>
<td>(td)blåh</td>
<td>toplå 'fight'; rec PJH ta-</td>
</tr>
<tr>
<td>84</td>
<td>*blåh</td>
<td>blåh</td>
<td>'skirt'; PCNB *ã? because S #</td>
</tr>
<tr>
<td>85</td>
<td>*kåp</td>
<td>käp</td>
<td>'eat'</td>
</tr>
<tr>
<td>871</td>
<td>*(ra)tåp</td>
<td>tåp</td>
<td>'rotæ' 'encircle'</td>
</tr>
<tr>
<td>872</td>
<td>...dår</td>
<td>...dår</td>
<td>...tå</td>
</tr>
<tr>
<td>88</td>
<td>*låp</td>
<td>låp</td>
<td>'want'</td>
</tr>
<tr>
<td>89</td>
<td>*katåp</td>
<td>kdtåp</td>
<td>'egg'</td>
</tr>
<tr>
<td>90</td>
<td>*gaçåp</td>
<td>kçjåp</td>
<td>'sturdy'; S kra</td>
</tr>
<tr>
<td>91</td>
<td>*måt</td>
<td>mât</td>
<td>'eye'</td>
</tr>
<tr>
<td>92</td>
<td>*haçåq</td>
<td>hdtåq</td>
<td>'elbow-finger distance'</td>
</tr>
<tr>
<td>93</td>
<td>*båt</td>
<td>båt</td>
<td>'miss'; B, H 'remember'</td>
</tr>
<tr>
<td>94</td>
<td>*(tå)påt</td>
<td>påt</td>
<td>'put out fire'</td>
</tr>
<tr>
<td>95</td>
<td>*såt</td>
<td>sat</td>
<td>'weave mats'</td>
</tr>
<tr>
<td>96</td>
<td>*nåk</td>
<td>nåk</td>
<td>'fish net'; S nak VC_f irreg, borrowed?</td>
</tr>
</tbody>
</table>
97. *arāk arāk *rāk 'keep'
98. *qdaḵ qdaḵ *dāk tāa 'spear'
102. *lām lām *lām 'in, into'; B also lām
103. *mām mān *mām mām 'salt fish'
104. *trām trām *trām 'soak'
105. *baqām poqām *badām potām 'five'
106. *hanām hdnām *hanām honān 'year'; B also sdnān
107. *krān krām *krām krām 'sink'
108. *bān bān pān 'raise animals'; B rong
109. *mān̄ māng māng 'night'
110. *rān̄ rāng rāng 'dry (tree)'
111. *chān̄g sāng *chāng chāng 'sword'; J, H 'knife'
113. *daqābāng tōqābāng *dābāng tōpāng 'bamboo sprout'
114. *qnhān̄g *qnhāng xāng 'bitter'; B tāng VN borrowing
115. *hlān̄g hlāng *(1)lān̄g hlēang 'clear'; J lī-, H l-
116. *pār pār *pār 'to fly'; S konē retains infix -d̪n-
117. *manār pūnār *manār mona 'wing'; note infix -an-
121. *chhāw sū *chāw chāu 'grandchild'
123. *tadrāw tōdrāw *-drāw tōdrāu 'six'; J ta-, H dr-, rec *ta-; S also todrāu
125. *hān̄ *ngāy hai - hāi 'day, sun'; B qnār, nār
127. *plān̄ plēj/pley *plāy plai 'fruit'
128. *adrāy hddrāi *adrāy drai 'pestle'
129. *hūy hūy *hūy aī 'have'; B also huği
131. *wāq wāq *wāq va 'want'
132. *pāq *pāq pa 'side of'; B qbōt
133. *krāq krāq *rāq kra 'old'; J drāq, H krāq, rec *k-
134. *yāq yāq *yāq ja 'grandmother'; S C î irreg
136. *sakāq sōkāq *ikāq 'back basket'; B also hōkāq
138. *dāy hēh *dāy hēh 'sound'
141. *kachhayh kōsh *kachhayh kōsh 'sneeze'
142. *tāp tāp tap 'set in'
143. *ūp srāp *sāp xap 'wear'; B also hrāp
144. *qdon qdon tuān 'ear'; PJH pāt
| 146. | *jåt  | mình | *jåt  | chat | 'ten' |
| 147. | *taweng | tåweng | | | 'throw' |
| 149. | *hôk  | hôk  | *hôk  | hakt | 'happy' |
| 150. | *påk  | *påk  | pak  | 'stab'; B qbet |
| 151. | *krôm  | kôdrôm  | *krôm  | kran | 'crowded'; B infix |
| 152. | *ha(m)ôn  | hôbôn  | *hanÔn  | hman  | 'pants' |
| 154. | *hông  | *hông  | hang  | 'peppery'; B ho |
| 154A. | *hâng  | pôhâng  | hâng  | 'pepper' |
| 155. | *ông  | gông  | *gông  | kang  | 'spirit pole' |
| 156. | *pông  | pông  | *pông  | pang  | 'pound' |
| 157. | *hngâm  | hngâm  | hngâm  | 'heavy' |
| 158. | *kôl  | kôl  | *kôl  | ko  | 'head' |
| 159. | *hágor  | hôgor  | *-går  | hoka  | 'drum'; J ng-, H ha-, rec. 'ha-' |
| 160. | *pâliy  | pdlôi  | *plôy  | polê  | 'village'; S C f irreg |
| 161. | *bôdôy  | pôddî  | *bôdôy  | potô  | 'rest' |
| 162. | *rqôy  | rdôgî  | *rqôy  | rokô  | 'skillful' |
| 163. | *qôyhy  | qôbih  | *bôyhy  | pah  | 'snake' |
| 164. | *gadôw  | kôdiôu  | *gadôw  | kotau  | 'run' |
| 165. | *(ka)trôw  | *kattrôw  | totroau  | *pîgon  | 'pigeon' |
| 166. | *e  | *e  | aî  | 'have'; B gdôi |
| 167. | *bûbe  | bôbe  | *ba(q)be  | pûpåî  | 'goat'; J buq-, H ha-, rec. 'bul(q)-' |
| 169. | *kane  | kône  | *kane  | konåi  | 'rat' |
| 170. | *pê  | pê  | *pê  | phái  | 'husked rice' |
| 172. | *kase  | kase  | koxåi  | 'string'; B tålôi |
| 173. | *nge  | nge  | *nge  | ngê  | 'people'; S V irreg |
| 175. | *häre  | hre  | *re  | aråi  | 'rattan' |
| 176. | *re  | re  | *(q)re  | 'pan gold' |
| 177. | *qôpek  | qôpek  | *bek  | pie  | 'be fat' |
| 178. | *ramôq  | rômôq  | roma  | 'fat' |
| 180. | *klyêng  | klêng  | *klêng  | klêng  | 'forehead' |
| 181. | *hrêng  | hrêng  | *reng  | hrêng  | 'hundred' |
| 182. | *katyêng  | kiêng  | *teng  | ting  | 'tail' |
| 184. | *athay  | athay  | thê  | 'command' |
| 188. | *pêh  | pêh  | *pêh  | pêi  | 'pound rice' |
| 189. | *weh  | weh  | *weh  | ví  | 'turn aside' |
190. *taqneh *(taqneh tonəi 'dirt'; J ø, H ta-, rec *ta-
192. *aseh aseh *(kasq)əxəi 'horse'; J a-, H ka-
194. *plöm plöm *pləm pliam 'leech'
195. *klöm klm *kləm kliam 'liver'
196. *arən areh reh 'live'
197. *pəng kdpəng *pəng popeng 'above'
198. *tdl tdl *təl tia 'answer'
199. *kaqndl kdqnəl *(k)ənəl 'heal'; J ø, H q, rec *q
200. *tər *tər tia 'comb of chicken'
203. *səq siq *səq xoi 'err'
204. *kasəq kdsəq *səq xəi/koxəi 'afternoon'
205. *gajqəq həqiuh *(gajqəq) kəcoh 'wet'
206. *taqloq *taqləq toqləi 'easy'
207. *tapəh təpəh *tapəh topəh 'seven'
208. *təp təp *təp 'pick up'; S tək
210. *tək təch *tək tē 'cell'
211. *cənən sən *chən chən 'cooked'
212. *jəq jəq ačə 'near'
213. *pəng *pəng pəng 'shoot'
214. *manəng *mənəŋ monəŋ 'crossbow'
215. *təcəŋ təcəŋ *(k)əcəŋ tochəŋ 'think'; J cha-, H ka-
216. *hwa hua hva 'gibbon'
218. *bəq bəq *bəq 'imperative'
219. *khəy *khəy khə 'month, moon'; B also khay
220. *sənənən sənych *iŋəng honəŋ 'tooth'
221. *alip ləp *lip aləp 'grasshopper'
222. *gajip kəqep *gajip kochəp 'centipede'
223. *dnəŋ dəŋ *drəŋ trəŋ 'yellow'
224. *kəŋ *kəŋ kəŋ 'edge'
225. *plənh plənh *pling pləŋ 'sky'
227. *adrəh adrih *(a)drih arəh 'unripe'
228. *kələh *(ta)kələh kələh 'fall'
229. *haqyəw qngiə *iəw hoqəə 'loftside'
231. *məw məo *miw məə 'cat'; PJH 'wild cat'
233A. *prəl *prəl prə 'ice, hail'
234. *mi  
235. *ti  (tai)  
236. *haqbo  
236. ...haqbo   
237. *(ga)hip  
238. *jiq  
239. *phiq  
240. *ramuán  
241. *tih  
242. *phiw  
243. *yër  
243B. *mir  
243C. *ch(h)ir  
244. *chhom  
245. *täq  
245. ...sèq   
246. *ičh  
247. *trong  
248. *qd_ ng  
249. *qbînh  
251. *tîk  
252. *rîm  
253. *tachhîn  
254. *jîl  
255. *îh  
257. *hyòt  
258. *râpyòt  
259. *chhom  
261. *gaqd_m  
262. *len  
264. *raqyên  
265. *jyâng  

*brother-in-law'  
*hand'  
'corn'  
'suitcase'; J ø, H  
'sick'  
'full after eating'  
'soft'  
'big'  
'happy'  
'chicken' (following 1st  
of two dissimilar forms  
in PJH paper)  
'rib'  
'dig'  
'bird'; PJH V irreg  
'little'  
'sstub toe'; J têk lôk,  
H talîk  
'excrement'  
'tube'; PJH  
'bamboo pipe'  
'full'  
'stub toe'; J têk lôk,  
H talîk  
'every'; J lêm; H rîn;  
rec *t  
'ninc'; J ta-, H chd-  
'deer'  
'2nd sg.', J '1st & 3rd  
sg.', rec reanalysis  
of PJH to *îh  
'wound'  
'tongue'; S also  
'feed'; B also sêm  
'onion'  
'money'  
'bite'  
'friend'