Melanau and the Languages of Central Sarawak

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0. Introduction

The people who speak Melanau are by far the largest indigenous language group in Central Sarawak, Borneo, Malaysia. Therefore, the various varieties of Melanau spoken along the coast and in a few enclaves along the Rajang River are of intrinsic interest. This article will explore a series of questions related to Melanau and other language communities of Central Sarawak:

1. What are the varieties of Melanau and how are they related? (Sections 1 and 2)
2. In view of Chou’s conclusion that Bintulu is not a variety of Melanau, what is the relationship between Melanau and Bintulu? (Section 3)
3. How valid is the claim that Melanau and the Kajang languages form a linguistic grouping? (Section 4)
4. What are the relationships among the varieties of Punan and Penan? And how are Punan and Penan related to Melanau, Bintulu and the Kajang languages? (Sections 4 and 5)

Through the process of comparing these languages, we will conclude that (a) Melanau is a coherent language cluster, (b) Sihan is not an integral part of the Kajang grouping, as earlier thought, (c) Melanau, Bintulu, the Kajang languages, and the Penan languages are united by the effects of several significant and pervasive sound changes, and (d) Sihan, Ukit, Bukat, Bukitan, Punan Busang, Punan Batu, and Punan Bah form an outer cluster of languages that are related to the first four, but not as closely.

Accurate population figures for the speakers of these languages are not easy to come by. Those currently available to me are as follows:¹

<table>
<thead>
<tr>
<th>Language</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melanau (all varieties)</td>
<td>130,800 (Sarawak government estimate)</td>
</tr>
<tr>
<td></td>
<td>121,220 (Ethnologue)²</td>
</tr>
<tr>
<td>Bintulu</td>
<td>4,200</td>
</tr>
<tr>
<td>Lahanan</td>
<td>350</td>
</tr>
<tr>
<td>Kejaman</td>
<td>500</td>
</tr>
<tr>
<td>Sekapan</td>
<td>750</td>
</tr>
<tr>
<td>Penan, Western</td>
<td>3,400</td>
</tr>
<tr>
<td>Penan, Eastern</td>
<td>6,400</td>
</tr>
<tr>
<td></td>
<td>10,000 to 12,000 (Mackenzie)³</td>
</tr>
<tr>
<td>Sihan</td>
<td>50</td>
</tr>
<tr>
<td>Ukit</td>
<td>120</td>
</tr>
<tr>
<td>Bukat</td>
<td>?</td>
</tr>
</tbody>
</table>

¹ All population figures are from Ethnologue, 16th edition, unless indicated otherwise.
² The total for Ethnologue is the sum of Melanau, Central 113,000, Matu-Daro 7,600, Kanowit-Tanjong 200, and Sibu 420.
³ There is a discrepancy between the figure for Eastern Penan given by Mackenzie (2006), who has considerable field contact with the several groups of Eastern Penan, and the figure from other sources, which indicate smaller numbers for Eastern Penan but still larger than for Western Penan.
It appears that these languages includes one large group: the Melanau, two medium-sized groups numbering in the thousands: the two Penan languages and Bintulu, and the remainder, all small groups, numbering about one thousand or fewer. The numbers for the small groups are small enough that viability is a factor that should be carefully studied.

It may not be possible to sustain an independent language project for the smaller languages unless (1) isolation should promote special viability due to small contact with other languages, and/or (2) there are speakers who are strong advocates of language strengthening through development. However, if the smaller languages are grouped with the large and the medium-sized groups, it may be possible to facilitate language-development activities for all these languages.

The present investigation has been carried out by comparing a series of wordlists and dictionaries of these languages. The Melanau lexical material and the major part of the analysis of Melanau varieties are drawn largely from Chou 2002. For other sources of data the reader is directed to appendix A: Sources of the language data used in this study.

By application of the principles of the comparative method, inferences are drawn concerning sound changes that have affected various languages of Central Sarawak. These sound changes have affected the entire lexicon and have taken place over a long period of time. In recent years it has come to be recognized that the comparative method is a powerful tool for identifying linguistic relationships that significantly impact comprehension among speakers of related languages.

1. The varieties of Melanau

Eleven varieties of Melanau are included in Grace Chou’s 2002 thesis entitled *A Reconstruction of Proto-Melanau*. They are Rajang (RG), Matu (MU), Igan (IN), Oya (OA), Mukah (MH), Medong (MG), Sungai Ud (UD), Dalat (DT), Balingian (BN), Kanowit (KT), Tanjong (TG). The geographic location of these varieties of Melanau is shown on the map she provided.

---

Chou states that in 1990 there were 96,000 people classified as Melanau. The Population and Housing Census of Sarawak 2000 shows 112,984 Melanau people, and an estimate by the same agency in 2006 shows a figure of 130,800.

Each of these dialects is different linguistically from the others in some way. In this study it is assumed that a sound change shared by two or more varieties suggests a period of common linguistic development, resulting in phonological similarity. Varieties that do not share that sound change are assumed not to have participated in that period of common development. It is further assumed that varieties that share similar lexical material have experienced interaction, whether through common lexical inheritance (shared cognates) or through dialect borrowing, resulting in lexical similarity. In general, the findings from lexical similarity modify and refine the outline of linguistic history developed from the study of phonological similarity.

Chou examines both lexical and phonological differences in Melanau.

1.1 Lexical Similarity

She presents two analyses of lexical similarity and difference: 1) the percentage of shared cognates that Kroeger calculated from the seven Melanau wordlists of Blust and 2) the percentage of shared cognates that she calculated from her own eleven Melanau wordlists. The Kroeger calculation is given in figure 1, and the Chou calculation is given in figure 2.
From Chou’s calculations we can deduce that the Mukah, Oya, Igan, Dalat, Medong, and Sungai Ud lists are relatively similar, and these dialects can be taken as a set of Core Melanau dialects. Apart from the Mukah-Igan comparison all of them show that at least 80% of their vocabulary is cognate.

Kanowit and Tanjong are also relatively similar with 82% of their vocabulary cognate. Matu and Rajang are nearly as similar to each other with 79% of their vocabulary cognate. From these data it appears that there are four relatively tight-knit groups of Melanau dialects:

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5 The cognate percentages of figure 2 show that Bintulu is lexically divergent and suggest strongly that it should not be considered as a part of the Melanau dialects.
1) Mukah-Oya-Igan-Dalat-Medong-Sungai Ud,
2) Matu-Rajang,
3) Kanowit-Tanjong, and
4) Balingian.

The Matu-Rajang group is almost uniformly similar to the Core Melanau group. Matu is slightly more similar to Core Melanau (68%–72%) than Rajang is (61%–71%). Balingian is about as similar to the Core Melanau group (65%–70%) as the Matu-Rajang group is. So, we see that the coastal dialects form a loose cluster inasmuch as all comparisons with the Melanau Core Group are at 61% cognate or higher. The groups at the northern and southern ends, Balingian and Matu-Rajang are a bit more distant from each other (55%–57%).

The river dialects of Kanowit and Tanjong, while similar to each other, show a greater separation from the coastal dialects than do the coastal dialects to one another. The cognate percentages between members of the river dialect group and members of the coastal dialect group range from 52% to 62%. Although the range of similarity of the river group to the three coastal groups is almost the same, the river group is slightly closer to the Matu-Rajang group (59%–62%), not quite as close to the Core Melanau Group (52%–61%), and farther yet from Balingian (49%–54%).

We may also get an idea about the relative levels of comprehension if we add the cognate percentages of each dialect with all the others. For example, when we add the percentages of all dialects with Igan, we find that Igan dialect has a relatively high total of 759. By contrast, Kanowit has a total of only 572, i.e., a much lower percentage of cognates overall. This suggests that while Igan is likely to be relatively well understood by the other Melanau dialects, Kanowit is likely to be less well understood by the others. The totals of cognate percentages for each dialect are given below:

<table>
<thead>
<tr>
<th>Dialect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balingian</td>
<td>613</td>
</tr>
<tr>
<td>Mukah</td>
<td>711</td>
</tr>
<tr>
<td>Oya</td>
<td>733</td>
</tr>
<tr>
<td>Igan</td>
<td>759</td>
</tr>
<tr>
<td>Medong</td>
<td>759</td>
</tr>
<tr>
<td>Sungai Ud</td>
<td>750</td>
</tr>
<tr>
<td>Dalat</td>
<td>754</td>
</tr>
<tr>
<td>Matu</td>
<td>687</td>
</tr>
<tr>
<td>Rajang</td>
<td>692</td>
</tr>
<tr>
<td>Kanowit</td>
<td>572</td>
</tr>
<tr>
<td>Tanjong</td>
<td>604</td>
</tr>
</tbody>
</table>

One might object that the Core Melanau dialects are favored in this type of calculation since there are six of them and they have relatively high cognate percentages with others of that group, whereas the others have only one other dialect with a high cognate percentage or in the case of Balingian, no other.

If we take just one representative dialect of each of the four groupings listed above, we find the following totals:
If Dalat is chosen as the representative of the Core Melanau dialects rather than Mukah, the following is the result:

<table>
<thead>
<tr>
<th>Language</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balingian</td>
<td>181</td>
</tr>
<tr>
<td>Mukah</td>
<td>194</td>
</tr>
<tr>
<td>Matu</td>
<td>186</td>
</tr>
<tr>
<td>Tanjong</td>
<td>171</td>
</tr>
</tbody>
</table>

On the basis of this type of calculation we see that the Core Melanau dialects have on average a higher percentage of cognates with the other three groups than do any of the three “outlier” groupings. Dalat seems to have a slightly higher overall percentage of cognates and is closer to Matu than Mukah is, but the difference may be negligible.

Ajid Che Kob presented a paper entitled “Variations in Melanau: Phonology and Lexicals” at the SEALS XVI Conference in 2006. He showed data from the Mukah, Oya, Igan, Dalat, Balingian, Matu, and Dáo dialects but not theriver dialects of Kanowit and Tanjong. When he compared sound changes and lexical differences, he concluded that the southwestern coastal dialects of Matu and Dáo are relatively distinct from the others. Within the remaining group he separated the Balingian subgroup from the Mukah-Oya-Igan-Dalat subgroup. Thus, his three groups of coastal Melanau dialects are essentially the same as those drawn from Chou’s data.

The sounds of Melanau

The symbols used in each of the data sources for the languages cited in this study are retained essentially unchanged except that the complex symbol “dʒ” used for the voiced palatal affricate has been replaced by the more commonly used symbol “j”. The symbols “w” and “y” mark the labial and palatal semivowels. In most cases the symbols used are conventions of the International Phonetic Alphabet. However, some of the earlier sources use marks such as breve, macron, and even word-final “h”, but the exact significance of these marks is not clear. Since the symbols from various sources have been retained, a single sound may be represented by more than one mark. For example, glottal stop is indicated by “ʔ”, “’”, “-” and perhaps other marks. In the reconstructions of Proto Malayo-Polynesian and other proto-languages the conventional symbol “q” for glottal stop is retained. In materials from Blust and some others the symbol “e” indicates schwa and the symbol “é” indicates the mid front vowel.

The basic phonological system of the Melanau varieties is shown in Chou’s chart that follows:
The predominant canonical shape of Melanau words is CV-CVC. Less commonly, there is no initial or medial consonant, yielding V-CVC, CV-VC or even V-VC. Rarely, there is no final consonant, CV-CV. A few words have only one syllable, CVC.

At the end of Melanau words the following vowel-semivowel sequences occur, exemplifying the typical VC rhyme:

```
iw   --
   -- uy
əw  əy
aw  ay
```

The voiced fricative v occurs only in Balingian. The alveolar trill r occurs only in Balingian, Kanowit and Tanjong. The vowels e and o occur only in Kanowit and Tanjong.

Most of the sounds of Melanau exhibit little variation from one speech variety to another and require little comment. However, a few merit some discussion.

### s and h

Chou states that in Medong, Sungai Ud, Dalat, and Igan [s] and [h] are positional allophones of /s/ with [h] in final position and [s] in other positions.

```
[sŋoR]  /siŋuR/  ‘cold’ (Igan)
[piseʔ]  /pisik/  ‘cook’
[btiʔ]  /btiʔ/  ‘leg’
```

In the first three of these varieties [s] and [tʃ] freely vary in non-final position.

```
[puʔ]  ~  [puʔ]  /puʔ/  ‘wash (clothes)’ (Dalat)
```
In the other varieties s and h exhibit contrast in some environments.

- [?ubas] /ubas/ ‘new’ (Matu)
- [tibah] /tibah/ ‘to call’
- [tu’s] /tus/ ‘needle’ (Rajang)
- [lidu’h] /iduh/ ‘thunder’

Apparently s and h occur in all positions only in the river dialects of Kanowit and Tanjong, but even there the contrasts appear to be few.

- [ha’] /hay/ ‘who’ (Tanjong)
- [sia”] /siaw/ ‘chicken’
- [niha”] /nhiaw/ ‘lose’
- [?asə”] /asəw/ ‘dog’
- [?iduh] /iduh/ ‘that
- [tus] /tus/ ‘needle’

R and r

The uvular trill occurs in all the varieties except Tanjong.

- [Raŋa’] /Raŋaw/ ‘finger’ (Igan)
- [maRih] /maRis/ ‘angry’ (Igan)
- [siŋoR] /siŋuR/ ‘cold’ (Medong, Sungai Ud, Dalat, Igan)

The alveolar trill occurs only in Balingian, Kanowit, and Tanjong. In Balingian and Kanowit the two trills contrast only in medial position, where the contrast arises largely because of Malay borrowings.

- [?urʊŋ] /urʊŋ/ ‘nose’ (Balingian)
- [ruRo] /ruRu/ ‘grass’
- [tʊrʊŋ] /tʊrʊŋ/ ‘eggplant’ (Kanowit)
- [baRat] /baRat/ ‘heavy’

In Tanjong the only trill that occurs is the alveolar trill.

- [baɾat] /baɾat/ ‘heavy’ (Tanjong)

k and ?

These two posterior stops contrast in all varieties of Melanau. However, in all varieties except Medong, Kanowit, and Tanjong final /k/ is pronounced as [?] following specified vowels, with the list varying slightly from one variety to another. For example, in Dalat final /k/ is pronounced as [?] following /u/ but as [k] following other vowels. In other words, it is the quality of the vowel that shows whether the final consonant is /k/ or [?].

- [pusu?] /pusu?/ ‘wash (clothes)’ (Dalat)
- [mano?] /manuk/ ‘bird’
- [bo?] /buk/ ‘hair’
V before back consonants

In all varieties of Melanau except the river dialects, Kanowit and Tanjong, the high vowels /i/ and /u/ have special pronunciations before certain back consonants. In Oya and Mukah the low vowel, /a/, also has a special pronunciation. In many but not all cases the special pronunciations are centralizing diphthongs, which Blust calls “breaking vowels”.

The list of following consonants that trigger the special pronunciations varies somewhat from one variety to another. For example, in Medong /i/ is pronounced as [i’] before final ŋŋ, and /u/ is pronounced as [o] before k, ŋ, or R.

[tili’ŋ] /tiliŋ/ ‘to fly’ (Medong)
[bok] /buk/ ‘hair’
[gadoŋ] /gaduŋ/ ‘green’
[sĩñoR] /siŋuR/ ‘cold’

In Oya /i/ is pronounced as [i’] before k or ŋ, /u/ is pronounced as [u’] before k or ŋ, and /a/ is pronounced as [e’] before k or ŋ.

[?isi’ŋ] /isiŋ/ ‘ring’ (Oya)
[budu’k] /buduk/ ‘leg’
[?itu’ŋ] /ituŋ/ ‘count’
[bite’ŋ] /bitaŋ/ ‘star’

In Kanowit and Tanjong these same vowels are pronounced as steady-state vowels regardless of the following consonant.

[puti?] /puti/? ‘white’ (Kanowit)
[?usuk] /usuk/ ‘chest’
[?ipuŋ] /ipuŋ/ ‘woods’
[?anak] /anak/ ‘child’

1.2 Phonological Similarity

Chou describes a set of twelve sound changes that affect some but not all varieties of Melanau. These can be summarized as follows:

1. Lowering of high vowels in final syllables before k, ?, ŋ
2. Raising of a to i before final k
3. Addition of h after an otherwise final a
4. Loss of final velar nasal ŋ after i, u, a
5. Softening of b to v and d to r between vowels
6. Changing of s to h finally
7. Changing of R to h
8. Loss of h and R in weak positions
When Chou plots the dialects affected by each of these sound changes, she concludes, based on the changes, that there are six clusters of dialects:

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medong-Sungai Ud</td>
<td>MG-UD</td>
</tr>
<tr>
<td>Dalat-Igan</td>
<td>DT-IN</td>
</tr>
<tr>
<td>Oya-Mukah</td>
<td>OA-MH</td>
</tr>
<tr>
<td>Matu-Rajang</td>
<td>MU-RG</td>
</tr>
<tr>
<td>Balingian</td>
<td>BN</td>
</tr>
<tr>
<td>Kanowit-Tanjong</td>
<td>KT-TG</td>
</tr>
</tbody>
</table>

Each of these clusters has undergone a unique set of changes.

If we mark the sound changes that occur with each dialect cluster, the following picture emerges:

<table>
<thead>
<tr>
<th></th>
<th>MG-UD</th>
<th>DT-IN</th>
<th>OA-MH</th>
<th>MU-RG</th>
<th>BN</th>
<th>KT-TG</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>6</td>
<td>+</td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td>½</td>
<td>½</td>
</tr>
</tbody>
</table>

1. lowering  
2. raising  
3. addition  
4. loss  
5. softening  
6. changing  
7. changing  
8. loss

The following abbreviations for the Melanau varieties were developed by Chou and are adopted here:

MG Medong, UD Sungai Ud, DT Dalat, IN Igan, OA Oya, MH Mukah, MU Matu, RG Rajang, BN Balingian, KT Kanowit, TG Tanjong.

The final change, loss of h and R in weak positions, is common and, furthermore, its distribution is mixed. Thus, it will not be considered further for these purposes. However, when we examine the other seven changes, we observe that each cluster is defined by a unique set of changes. Balingian has undergone three of the changes. Dalat-Igan, Oya-Mukah, and Kanowit-Tanjong have each undergone two changes. Matu-Rajang has undergone one change, and Medong-Sungai Ud has undergone none of these changes. We observe that Oya-Mukah, Balingian, and Kanowit-Tanjong have all undergone change 6, and only Oya-Mukah and Balingian have undergone change 7. These last two changes are natural ones and, as such, cannot bear a great deal of weight in determining the grouping of Melanau dialects. Of the remaining five changes we may observe that Medong, Sungai Ud, Oya, and Mukah have undergone none of these, and apparently represent a conservative core area.

We might also pause to examine the allophonic variation that affects the various Melanau dialects. One variation, o > e before y, is found in all the dialects, so for our purposes it is non-diagnostic. However, there are two variations that, interestingly, are found in the coastal dialects but not in the river dialects: 1) Centralizing diphthongs (“breaking vowels”) occur generally before the back consonants k, ?, n in all of the coastal dialects except Dalat-Igan. (The dialect-specific details are somewhat complex and need not concern us here.) 2) Word-final velar stop becomes glottal stop after one or more of the cardinal vowels in all coastal
dialects except Medong. These phonetic changes appear to reinforce the separation of the river
dialects from the coastal dialects.

**Implications for orthography development**

What implications for orthography are there if the Core Melanau area is used as a base for
materials intended to be used through the Melanau dialect network? Three come to mind
immediately.

1) The dialects of Oya, Mukah, Medong, Sungai Ud, and the coastal outliers of Matu,
Rajang, and Balingian have a centralizing-diphthong pronunciation of i before back consonants,
usually k, ?, q. Oya, Mukah, and Rajang have a centralizing-diphthong pronunciation of u
before back consonants. Oya and Mukah but not the others have a centralizing-diphthong
pronunciation of a before back consonants. The other dialects have a single-vowel
pronunciation of those vowels.

These pronunciation differences will not necessarily present a problem for orthography.
Presumably they could be written as “i”, “u” and “a”. However, if speakers of those core
dialects have developed a custom of thinking of those centralizing diphthongs as two vowels
and write them with sequences of vowel symbols, resistance might develop to the notion of
writing them with single vowel symbols throughout the dialect network.

2) The ivé dialects of Kanowit and Tanjong have developed contrasts between i and e, u
and o, but in the coastal dialects there is no consistent contrast between i and e, u and o. A
strictly phonemic writing of the river dialects might require e and o in addition to i and u.
However, the contrast between those front and back vowels is quite restricted, and it should be
acceptable to write only the four vowels—i, u, e (representing /o/) and a—that contrast in the
Core Melanau dialects.

3) In Medong, Sungai Ud, Dalat, and Igan s and h do not contrast. The sibilant
pronunciation is found in initial and medial position, whereas the h pronunciation is found in
final position. However, in the other dialects, including the core dialects of Oya and Mukah,
there is a contrast between s and h.

One would expect that it would be acceptable to adopt an orthography that writes both s and
h and spells words as they are pronounced, regardless of their phonemic status. It might be
necessary to teach Medong, Sungai Ud, Dalat, and Igan speakers to write both letters, but this
may pose no problem in any case because these fricatives are positional variants and because
speakers are used to writing both letters in the national language.

**2. Proto Melanau**

In Chou’s reconstruction of Proto Melanau (PMel), the ancestral language that gave rise to
the modern varieties of Melanau, the proposed set of sounds is rather similar to the sound set
shown in figure 3.
Figure 4. Proto-Melanau consonants (Chou 2002)

To this set I would suggest that it is necessary to add *h, as discussed in the next section, entitled “Development of *s and *h”.

Most of these consonants develop without change in the modern varieties of Melanau. For example, the voiceless alveolar stop *t is retained as t in all varieties, e.g., *tana ‘earth’ > tana in all varieties today. Note also *toluh ‘egg’ develops as toluh in Medong, Sungai Ud, Dalat, Oya, Mukah and Balingian, but it develops as toluy in Igan, Matu, Rajang, Kanowit and Tanjong. The end of this word develops differently in different areas, but the initial consonant has the same straightforward development.

The PMel consonants that require some discussion as to their development are *s, *h, *R, *b and *d.

**Development of *s and *h**

As mentioned above, in Medong, Sungai Ud, Dalat, and Igan [s] (varying to [tʃ]) occurs in initial and medial position, and [h] occurs in final position. From a phonemic viewpoint these can be viewed as variants of the s phoneme. Given that understanding, we can state that the PMel fricative *s developed differently in non-final and final positions:

<table>
<thead>
<tr>
<th>PMel</th>
<th>MG</th>
<th>UD</th>
<th>DT</th>
<th>IN</th>
<th>OA</th>
<th>MH</th>
<th>MU</th>
<th>RG</th>
<th>BN</th>
<th>KT</th>
<th>TG</th>
</tr>
</thead>
<tbody>
<tr>
<td>-*s-</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>s</td>
</tr>
<tr>
<td>*s#</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>h</td>
<td></td>
<td>h</td>
<td>s</td>
<td>s</td>
<td>h</td>
<td>h</td>
<td>h</td>
</tr>
</tbody>
</table>
PMel *siah ‘salt’ MG siah, UD siah, DT siah, IN siah, OA siah, MH siah, MU siah, RG siah, BN siah, KT siah, TG siah.⁶

PMel *naniş ‘cry’ MG mônaniş [mɔnaniʃ], UD mônaniş, DT mônaniş, IN mônaniş, OA mônaniş, MH mônaniş, MU mônaniş, RG naniş, BN mônaniş, KT naniş, TG naniş.

It should be noted that in final position among those varieties in which s and h contrast it is Matu and Rajang that retain s while in the others *s becomes h. However, there is another group of Melanau word sets that have h in Matu and Rajang as well as in the other varieties. Cf. the following sets:

PMel *duduh, *liduh ‘thunder’ MG dudus [duduh], UD dudus, DT dudus, IN dudus, OA duduh, MH duduh, MU liduh, RG liduh, KT duduhən, TG duduhan.

PMel *duah ‘two’ MG duah, UD duah, DT duah, IN duah, OA duah, MH dua, MU duah, RG duah, BN dua, KT duah, TG duah.⁷

It appears that PMel *h should be reconstructed as well as *s. Forms that have developed from a PMel form with final *s retain final s in Matu and Rajang, but those that have developed from a PMel form with final *h retain final h in Matu and Rajang. These are the only two dialects in the Melanau dialect network that retain evidence of the contrast between *s and *h in final position.

There are a few forms in Kanowit that have initial h before a vowel, whereas cognate forms in all other varieties begin with a vowel.

*(h)atay ‘liver’ KT hatay, all others atay.

*(h)uduŋ ‘nose’ KT hudoŋ, BN uŋ, DT, IN udu, all others uduŋ.

This may be taken as evidence for initial *h in PMel, but that is far from certain.

Further evidence of contrast between *s and *h in PMel is found in medial position. Forms that have developed from a PMel form with medial *s retain s in every variety. However, the medial PMel *h is retained only in Balingian, Kanowit, and Tanjong; elsewhere it is lost.

<table>
<thead>
<tr>
<th>PMel</th>
<th>MG</th>
<th>UD</th>
<th>DT</th>
<th>IN</th>
<th>OA</th>
<th>MH</th>
<th>MU</th>
<th>RG</th>
<th>BN</th>
<th>KT</th>
<th>TG</th>
</tr>
</thead>
<tbody>
<tr>
<td>-<em>s-</em></td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>s</td>
</tr>
<tr>
<td>-<em>h-</em></td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
<td>h</td>
<td>h</td>
<td>h</td>
<td>h</td>
</tr>
</tbody>
</table>

PMel *lasu? ‘hot’ MG lasu?, UD lasu?, DT lasu?, IN lasu?, OA lasu?, MH lasu?, MU lasu?, RG lasu?, BN molasu?, KT lasu?, TG lasu?.

⁶ The Melanau cognate sets are drawn from Chou 2002, although the format used here to display the sets differs slightly from hers.

⁷ Even though there is no final h in the Mukah and Balingian forms labeled ‘salt’ and ‘two’, other forms that seem to have developed from final *h do have h in those dialect forms, e.g., * təluh ‘egg’ MG təluh, UD təluh, DT təluh, OA təluh, MH təluh, BN təluh.
PMel *asow ‘dog’ every dialect asow.

PMel *babuhut ‘breathe’ MG bøbuut, UD bøbuut, DT bøbuut, IN bøbuut, OA bøbuut, MH bøbuut, MU bøbuut, RG bøbuut, KT babuhut, TG bøbuut.

PMel *wahan ‘dry’ MH waŋ, Matu muŋ, RG muŋ, BN uhaŋ, KT bahan, TG bahan.

**Development of *R**

We have noted above that it is in Matu and Rajang that evidence for contrast between *s and *h in final position is preserved. So, it is perhaps not surprising that the relatively scant evidence for final *R is preserved in those same two varieties. In addition, Medong, Sungai Ud, Dalat, and Igan, which do not distinguish evidence for final *s from evidence for final *h, do preserve evidence for final *R.

<table>
<thead>
<tr>
<th>PMel</th>
<th>MG</th>
<th>UD</th>
<th>DT</th>
<th>IN</th>
<th>OA</th>
<th>MH</th>
<th>MU</th>
<th>RG</th>
<th>BN</th>
<th>KT</th>
<th>TG</th>
</tr>
</thead>
<tbody>
<tr>
<td>-R#</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>h</td>
<td>R</td>
<td>R</td>
<td>h</td>
<td>h</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>


PMel *pasiR ‘sand’ IN pasiR, RG pasiR.

PMel *kubuR ‘bury’ MU kubuR.

There is some evidence that *R also occurred in initial position. The correspondences seem to be as follows with the crucial evidence found in Matu and Rajang:

<table>
<thead>
<tr>
<th>PMel</th>
<th>MG</th>
<th>UD</th>
<th>DT</th>
<th>IN</th>
<th>OA</th>
<th>MH</th>
<th>MU</th>
<th>RG</th>
<th>BN</th>
<th>KT</th>
<th>TG</th>
</tr>
</thead>
<tbody>
<tr>
<td>#R-</td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
<td>R</td>
<td>R</td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
</tr>
</tbody>
</table>

PMel *Ramut ‘root’ UD amut, DT amut, IN amut, OA amut, MH amut, MU Ramut.

PMel *Rusuk ‘chest’ DT usuk, MH usuk, MU Rusuk, BN usuk, KT usuk, TG usuk.

PMel *p-Raman ‘flow’ MG paman, UD paman, DT paman, IN paman, OA paman, MH paman, MU Raman, RG Raman, BN paman, TG maman.

The evidence for PMel *R is richer in medial position. The following development is attested in a number of sets reflecting *R in medial position:
PMel *maRaw ‘woman’ MG məRaw, UD a məRaw, DT məRaw, IN məRaw, OA aməRaw, MH a mahaw, MU məRaw, RG məRaw, BN a məRaw, KT məRaw, TG aməRaw.

PMel *gaRut ‘scratch’ MG gaRut, UD əmaRut, DT əmaRut, IN gaRut, OA məghut, MH məghut, MU gaRut, RG gaRut, TG əganRut.

PMel *maRat ‘narrow’ UD maRat, IN maRat, OA mahat, MU məRat, RG maRat, TG marat.


However, there is another group of sets that seem to reflect *R in medial position but have developed in a rather different way. That development is as follows:

<table>
<thead>
<tr>
<th>PMel</th>
<th>MG</th>
<th>UD</th>
<th>DT</th>
<th>IN</th>
<th>OA</th>
<th>MH</th>
<th>MU</th>
<th>RG</th>
<th>BN</th>
<th>KT</th>
<th>TG</th>
</tr>
</thead>
<tbody>
<tr>
<td>-*R-</td>
<td>Ø</td>
<td>Ø</td>
<td>Ø</td>
<td>Ø</td>
<td>Ø</td>
<td>Ø</td>
<td>R</td>
<td>R</td>
<td>h</td>
<td>R</td>
<td>r</td>
</tr>
</tbody>
</table>

PMel *daRat ‘blood’ MG daa?, UD daa?, DT daa?, IN daa?, OA daa?, MH daa?, MU daRa?, RG daRa?, BN daha, KT daRa?, TG dara?.

PMel *baRat ‘heavy’ MG baat, UD baat, DT baat, IN baat, OA baat, MH baat, MU bəRat, RG baRat, BN bahat, KT bəRat, TG bərat.

PMel *tuRut ‘swim’ MG tuun, UD tuun, DT tuun, IN tuun, OA tuun, MH tuun, MU tuRut, RG tuRut, BN tuun.

PMel *gaRup, *ma-gaRup, *g-əm-aRup ‘blow’ MG əmaRup, UD əmaRup, DT əmaRup, IN gaup, OA gaup, MH məgaRup, BN məghRup, TG tarup.

The two correspondence sets could be taken as evidence for two separate phonemes in PMel. However, since there seems to be just one correspondence set in initial and final positions, it seems unlikely that there were two types of *R occurring in medial position only.

The explanation may lie in the quality of the vowels on both sides of the *R. The first, more full, correspondence set seems to occur when the flanking vowels are of different quality, and the second set in which many reflexes are Ø seems to occur when the flanking vowels are of the same quality.

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8 Chou recognized this different group of sets and regarded them as sets in which the reflex of *R is lost entirely since the reflex is Ø in MG, UD, DT, IN, OA, and MH.

9 The resultant CVVC forms in MG, UD, DT, IN, OA, and MH include sequences of vowels across a syllable boundary.

10 Medial h in the Igan form is not expected. It might possibly be a borrowing from Balingian.
Other partial sets do seem to support this notion. Cf. the following sets, reflecting the full correspondence set, that have flanking vowels of differing qualities:

PMel *aRuh ‘trail’ DT aRus, IN aRus, OA aRuh, MU aRuh, RG aRuh.

PMel *kəRias ’mosquito’ IN kəRias, RG kiRias.

PMel *maRih or *maRis ‘angry’ IN maRis.

It should be noted that the evidence for medial *h and this second set reflecting medial *R is found only in MU, RG, KT, and TG. Compare those two correspondence sets:

<table>
<thead>
<tr>
<th>PMel</th>
<th>UD</th>
<th>MG</th>
<th>DT</th>
<th>IN</th>
<th>OA</th>
<th>MH</th>
<th>MU</th>
<th>RG</th>
<th>BN</th>
<th>KT</th>
<th>TG</th>
</tr>
</thead>
<tbody>
<tr>
<td>-<em>h</em></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>h</td>
<td>h</td>
<td>h</td>
<td></td>
</tr>
<tr>
<td>-<em>R</em></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>R</td>
<td>R</td>
<td>h</td>
<td>R</td>
<td>r</td>
</tr>
</tbody>
</table>

Thus, the following sets with zero in many dialects may reflect the second correspondence set of medial *R. It is interesting to note that they have flanking vowels of the same quality. However, since these sets lack evidence from MU, RG, KT or TG, it is uncertain whether they reflect a medial *R or a medial *h.

PMel *daRat or *dahat ‘sea’ DT daat, IN dat, OA daat, MH daat, BN dahat.

PMel *buRaw or *buhaw ‘run’ BN buhaw.

PMel *juhu? or *juRu? ‘tear (juice eye)’ BN juhu? mata.

**Development of *b and *d**

The voiced labial stop *b develops unchanged in all varieties except Balingian, where it becomes v in medial position. In other positions it remains as b. Similarly, the voiced alveolar stop *d develops unchanged in all varieties except Balingian, where it becomes r in medial position but continues as d in other positions.

PMel *abøy ‘afternoon’ MG abøy, KT abøy, IN abøy, OA abøy, MH abøy, MU abøy, RG abøy, BN avøy.

PMel *bolabaw ‘rat’ MG bolabaw, DT bolabaw, MH bolabaw, MU bolabaw, RG bolabaw, BN bolavaw, KT bolabaw, TG bolabaw.

PMel *ŋadan ‘name’ MG ŋadan, UD ŋadan, DT ŋadan, IN ŋadan, OA ŋadan, MH ŋadan, MU ŋadan, RG ŋadan, BN ŋan, KT ŋadan, TG ŋadan.

PMel *uduŋ ‘nose’ MG uduŋ, UD uduŋ, DT udu, IN udu, OA uduŋ, MH uduŋ, MU uduŋ, RG uduŋ, BN uruŋ, KT hudoŋ, TG uduŋ.

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11 The last set cited, *gaRup, seems to be a counterexample to that hypothesis.

12 This set may be considered to have the same vowel flanking the medial consonant since PMel *aw is the development of an earlier final *u.
3. Melanau and Bintulu

Grace Chou and others have noted the similarities that Bintulu bears to the Melanau dialects. There are many lexical similarities between Melanau and Bintulu, especially between Balilingian Melanau and Bintulu. There are also phonological similarities between the two. However, she notes that Bintulu has two mid vowels, e and o, in addition to the basic four, i, u, a, and a, generally found in Melanau. Of course, the Kanowit and Tanjong varieties of Melanau also have those two mid vowels.

Most of the Melanau dialects have special vowel pronunciations, often centralizing diphthongs (“breaking vowels”), which occur when the vowel precedes specific back consonants. (Cf. “V before back consonants” in section 1.) Some of those same special pronunciations are also found in Bintulu.

However, in the Melanau dialects the special pronunciations occur only before specific consonants and, thus, are non-contrastive, i.e., non-phonemic. By contrast, in Bintulu those special pronunciations are said to contrast with the usual pronunciations in these same environments and, thus, the two pronunciations are said to contrast, i.e., to be phonemic. Cf. Bintulu mili? ‘choose’ versus mali? ‘old’ and ta?u? ‘know’ versus tuu? ‘correct’. However, it seems that further checking of these apparent contrasts is needed. The form ta?u? may not have a final ? phonemically since it corresponds to forms in other languages that are ta?u or something similar. In other words, final ? may simply be a mirroring of medial ?. The forms pasuk ‘kill’ and masu’k ‘dead’ appear to show a contrast, but they are doubtless based on the same root, which is probably pasuk. In fact, Blust records the inflected form as masu?. Thus, it may well be that Bintulu is like the Melanau languages in having two vowel pronunciations that are non-contrastive, i.e., are conditioned by the following consonant.

It is also noted that Bintulu has v and r in intervocalic position where most Melanau dialects have b and d, respectively. However, as Chou notes, the same is true of Balilingian Melanau. Many of the languages of central Sarawak (the Kajang and Penan languages and others) have developed v, β, or w from medial *b and r from medial *d. It appears that this regional development in central Sarawak has impacted not only Bintulu but also Balilingian Melanau.

| UD  | abus   | UD  | abuk   |
| BN  | avuh   | IN  | abuk   |
| BU  | avus ‘cloud’ | MU | abuk   |
| BU  | avuk ‘dust’ |
| RG  | dudəw   | MG, UD, OA, MH, MU, |
| TG  | udəw   | RG, TG | uduŋ |
| BN  | ruRu   | DT, IN | udu |
| BU  | uRəw/urəw ‘grass’ | KT | hudoŋ |
| BN  | urŋ   |
| BU  | uRŋ/urŋ ‘nose’ |
There are at least two other consonantal sound changes in which Bintulu diverges from the varieties of Melanau. These are hardening of medial *y and *w to z and b, respectively:

PMel *VyV ~ BU VzV
MG, UD, MH, 
MU, TG     kayɔw
DT, IN, OA, 
RG, BN, KT    kayaw
BU  kazɔw ‘tree, wood’

PMel *VwV ~ BU VbV
MG, UD, DT, IN, OA, 
MH, MU, BN    sawa
RG sawah
KT, TG sawan
BU    saba ‘spouse’

For further discussion of these sound changes and additional examples of them see the following section, which shows the developments of sounds in Melanau, Bintulu, and the Kajang and Penan languages.

Chou cites several special lexical forms that are shared by Bintulu and at least some Melanau languages but not by neighboring languages and do not seem to be retentions from the ancestor language, Proto Malayo-Polynesian. Those may show evidence of a period of common development for Melanau and Bintulu. Note the following sets:

<table>
<thead>
<tr>
<th>Bintulu</th>
<th>Melanau</th>
</tr>
</thead>
<tbody>
<tr>
<td>maw</td>
<td>*mamɔw ‘afraid’</td>
</tr>
<tr>
<td>subut</td>
<td>*subut ‘bite’</td>
</tr>
<tr>
<td>muɓa</td>
<td>*mubah ‘split’</td>
</tr>
<tr>
<td>kulɔs</td>
<td>*kɔnɔlis ‘squeeze’</td>
</tr>
<tr>
<td>tɔgɔr</td>
<td>tɔgur (BN) ‘thunder’</td>
</tr>
<tr>
<td>tilib</td>
<td>tilib (BN) ‘wing’</td>
</tr>
</tbody>
</table>

cf. Iban kibut ‘bite’, Ida’an mɑŋaɓput

cf. Bidayuh *pɑɾɔs ‘wring’

cf. Timugon Murut tingkalur
4. Melanau, Bintulu, the Kajang and Penan languages

In this section we will begin the exploration of relationships between Melanau and Bintulu and other languages of Central Sarawak. In this section we compare Melanau and Bintulu on the one hand with the Kajang and Penan languages on the other. In section 5 we compare these four language groupings with still other languages of Central Sarawak. Ultimately, we will conclude (1) that Melanau, Bintulu, and the Kajang and Penan languages do have significant features in common that unite them as a grouping, and (2) that Sihan, Bukat, Bukitan, Punan Busang, Punan Batu, and Punan Bah form an outer cluster of languages that are related to the first four, but not as closely.

The Kajang languages

The Kajang languages are a linguistic group toward the interior from the Melanau and Bintulu areas. It is composed of Lahanan, Kejaman, Sekapan, and Tatau. For some time it has been thought that Kajang is related to Melanau in a Melanau-Kajang linguistic grouping. Iain Clayre, well acquainted with the Melanau languages, was of the opinion (1971:120) that “links [of Sekapan] with the Melanaus are hard to dispute.” Alexander (1989:55) states that “the Kajang, including the Lahanan, also claim to have close links to the Melanau, a coastal group who, like the Kajang were originally sago rather than hill rice consumers.” Ethnologue (16th edition), lists both Melanau and Kajang languages as part of a “Melanau-Kajang” grouping. Nevertheless, although certain similarities are obvious, a special linguistic link between Melanau and the Kajang languages has not yet been clearly demonstrated.

The Lahanan (Rousseau: Austronesian Basic Vocabulary Database website) and Kejaman-Sekapan (Strickland 1995) wordlists seem to be especially reliable sources for Kajang since they include detail such as the glottal stop and perhaps other phonological contrasts that are lacking in some older published sources.

The Penan languages

In the introduction to his dictionary of Eastern Penan (ms. 2006) Mackenzie states that Eastern Penan and Western Penan are closely related and that they differ to a modest degree in their phonology. Mackenzie’s dictionary is the primary source of data for Eastern Penan. The primary sources for Western Penan are Ray’s (1913) wordlist for Punan Nibong, Kaboy’s (1965) wordlist for Punan Silat, and the primer labeled simply as Penan.

Lexical comparison

In calculations conducted as part of this study a comparison of lexical items in Melanau with those in other languages of central Sarawak shows that Melanau shares an especially high percentage (74.8%) of vocabulary with the Kajang languages. Melanau shares a somewhat lower percentage of vocabulary with Bintulu (66.8%), followed by a still lower percentage of vocabulary with the Penan languages (65.5%).

These percentages of shared vocabulary can perhaps be seen more clearly through the following display:

13 Nibong and Silat are apparently the names of rivers on which there are Penan settlements.
A fuller discussion of the lexical comparison of the grouping of Melanau, the Kajang languages, Bintulu and the Penan languages with still other languages of central Sarawak may be found in section 5 entitled “Other Languages of Central Sarawak”.

**Phonological developments**

A number of consonants and vowels inherited from Proto Malayo-Polynesian\(^\text{14}\) (or a more recent ancestor language) have changed in one or more of these four language groups.

In some cases all four show a common change from the ancestor language. For example, final open high vowels develop as rising diphthongs in all four language groupings. Specifically, \( *i > \ddot{a}y \) in Melanau, the Kajang languages, Bintulu, and the Penan languages, and \( *u > \ddot{a}w \) generally in all four.

Furthermore, the voiced stops \( *b \) and \( *d \) have double reflexes in all of the four except Melanau. Specifically, \( *b > v/b \) in Kajang, Bintulu, and Penan, and \( *d > r/d \) in Bintulu and Penan.\(^\text{15}\)

These shared changes provide the most persuasive evidence that the four language clusters form a coherent grouping. For further detail of these developments and a chart of the distribution of these changes see “Summary of sound changes” at the end of section 5.

In many other cases one or two of the languages develop in one way and the others develop in a somewhat different way. For example, in medial position \( *y \) develops as \( y \) in Melanau, Kajang, and Penan but as \( z \) in Bintulu.

In a few cases a sound develops in three slightly different ways. For example, in medial position \( *w \) develops as \( w \) in Melanau and Penan, as \( b \) in Bintulu, and as \( gw \) in the Kajang languages.

We will now consider these phonological changes more carefully, first the consonantal and then the vocalic.

**Consonantal changes: \(*?\)**

In final position, glottal stop continues as \( ? \) in Melanau and Bintulu. In the Kajang languages and Eastern Penan the final glottal is lost after a high vowel but is generally preserved following \( a \) or \( o \).\(^\text{16}\) In those same languages when glottal stop follows a high vowel, \( u \) is often

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\(^{14}\) Cf., among various sources, the Proto Austronesian wordlist on the Austronesian Basic Vocabulary Database website.

\(^{15}\) The voiced stop \( *d \) does change in Kajang to \( r \), but uniformly so.

\(^{16}\) The notation in some written sources leaves considerable uncertainty. In the materials of Strickland and Rousseau the \( ? \) is generally clear. In the materials of Urquhart the vowel is often followed by \( h \), which may be his method of writing glottal stop or may simply indicate an open, somewhat lengthened vowel. In the materials of
changed to o.\textsuperscript{17} i is often changed to e, and the glottal is lost. In Western Penan the final glottal is generally lost.

<table>
<thead>
<tr>
<th></th>
<th>Melanau</th>
<th>Bintulu</th>
<th>Kajang</th>
<th>W &amp; E Penan</th>
</tr>
</thead>
<tbody>
<tr>
<td>?#</td>
<td>?</td>
<td>?</td>
<td>o/?</td>
<td>o, o/?</td>
</tr>
</tbody>
</table>

*\textit{dilaq} ‘tongue’ Proto Melanau *jəla?, Bintulu jela?, Kajang: Lahanan jila?, Western Penan jela, Eastern Penan jela’. (83)\textsuperscript{18}

*\textit{basəq} ‘wet’ Proto Melanau *basa?, Bintulu (Chou) basa?, (Blust) base?, Kajang: Lahanan (Rousseau) basa?, Eastern Penan basa’. (306)

Also, *\textit{utaq} ‘vomit’ (125), *\textit{luzəq} ‘spit’ (154), *\textit{baqbaq} ‘mouth’ (81), *\textit{baRəq} ‘swollen’ (503).

*\textit{jauq} ‘far’ Proto Melanau *jahu?, Bintulu jau?, Kajang: Kejaman mejo, Lahanan (Rousseau) biju, Western Penan jo, Eastern Penan ju. (302)

*\textit{putiq} ‘white’ Proto Melanau *puti?, Kajang: Lahanan (Rousseau) puti, Kejaman (Ray) pote, Lahanan, Sekapan, Kejaman (Urquhart) puteh, Western Penan puti. (329)

Also, *\textit{piliq} ‘choose’ (164), *\textit{titiq} ‘breast’ (94).

When glottal stop occurs at the onset of the final syllable, i.e., between vowels, it is generally retained in Melanau, Bintulu, the Kajang languages, and Eastern (but often not Western) Penan.

*\textit{daqun} ‘leaf’ Proto Melanau *daʔun, Bintulu raʔun, Kajang: Lahanan daʔun, Kejaman daʔun, Western Penan daun, Eastern Penan da’un. (30)

*\textit{jaget} ‘bad’ Proto Melanau *jaʔat, Bintulu jaʔes, Kajang: Lahanan (Rousseau) jiʔat, Lahanan (Urquhart) ja-at, Kejaman ja-at, yat, Sekapan jat, Western Penan sat, saat, Eastern Penan sa’at. (169)

Also, *\textit{taqun} ‘year’ (20), *\textit{taqu} ‘right (hand)’ (184), *\textit{baqeRu} ‘new’ (323).

However, in Melanau when the preceding vowel is u, the glottal stop drops out.

*\textit{buqut} ‘afraid, fear’ Proto Melanau *buut/*buud, Kajang: Lahanan (Rousseau) poʔut, Lahanan (Urquhart) bout, Sekapan bout, Kejaman bout. (179)

\textsuperscript{17} except in Rousseau’s Lahanan wordlist, where it is usually u.

\textsuperscript{18} A number following a set corresponds to the number of that set in the array of sets at the end of this paper and to the number assigned to that set in my database of Austronesian languages.
*bituqan* ‘star’ Melanau: Tanjong bituqan, Kajang: Lahanan (Rousseau) kətuʔən, Lahanan (Urquhart) ketuan, Sekapan (Urquhart) keteun, Kejaman (Urquhart) ketuan, Kejaman (Ray) katoën. (10)

In the Kajang languages glottal stop is often marked in intervocalic position, but when between two a’s, it is often written with the symbol “‘”.

*taqu* ‘know’ Proto Melanau *taʔaw, *taʔəw, Bintulu taʔuʔ?, Kajang: Kejaman-Sekapan (Strickland) ta-an ‘know’, ba-au ‘foolish’. (261)

*jaqet* ‘bad’ Proto Melanau *jaʔat, Bintulu jaʔes, Kajang: Lahanan (Rousseau) jiʔat, Lahanan (Urquhart) jaʔat, Kejaman jaʔat, yat, Sekapan jat, Western Penan sat, saat, Eastern Penan sa’at. (169)

Also, *baære* ‘new’ (323), *kaqaw* ‘you (sg.)’ (340).

Consonantal changes: *R*

Evidence for the sound *R* seems to continue in these languages. Blust writes the sound in Mukah as [ɾ]. Generally in Melanau and Bintulu the uvular trill is retained, but in the other languages it often is simply [h] or zero.

In medial position, i.e., between vowels, it develops as *R* in Proto Melanau and Bintulu, as h in Eastern Penan and as zero in the Kajang languages and Western Penan. Chou records “R” in all varieties of Melanau except Oya, Mukah, Balingian, and Tanjong and labels this correspondence as Proto Melanau *R*. In most instances of the same words Blust records zero. In Bintulu both Chou and Blust generally record zero, but in a few words Chou records “R” and Blust records “r”. Although in Eastern Penan there is no final consonant, the development of the high vowels shows that the vowel was followed by a consonant and was not in an open syllable; cf. *bibi* ‘lips’ > Eastern Penan bevé, not *bevei. (80)

<table>
<thead>
<tr>
<th></th>
<th>Melanau</th>
<th>Bintulu</th>
<th>Kajang</th>
<th>W &amp; E Penan</th>
</tr>
</thead>
<tbody>
<tr>
<td>RVRV</td>
<td>R</td>
<td>R/r</td>
<td>ø</td>
<td>ø, h</td>
</tr>
<tr>
<td>R#</td>
<td>h</td>
<td>ø</td>
<td>ø</td>
<td>ø, ø</td>
</tr>
</tbody>
</table>

*daRaq* ‘blood’ Proto Melanau *daRaʔ, Bintulu (Chou) Raak, Bintulu (Blust) raʔ, Kajang: Lahanan (Rousseau) laʔa, Lahanan (Urquhart) dah, Sekapan-Kejaman (Urquhart) dah, Kejaman (Ray) dā, Western Penan (Ray) dō, (Kaboy) de, Eastern Penan daha. (68)

*beRat* ‘heavy’ Proto Melanau *baRat, Bintulu vat, Kajang: Lahanan (Rousseau) baat, Lahanan (Urquhart) bat, Sekapan-Kejaman (Urquhart) bat, Sekapan-Kejaman (Strickland) maβat, Western Penan baat, Eastern Penan bahat. (313)

Also, *baRiw* (and *baRuRy*) ‘wind’ (13), *teRas* ‘ironwood’ (33), *zuRuq* ‘juice’ (175), *haRiRi* ‘post’ (273), *ma-buRuRuk* ‘rotten’ (305), *diRi* ‘stand’ (132), *qiRi* ‘salt’ (219), *bəRas* ‘husked rice’ (216), *kaRat* ‘bite’. (There are several problems in this set with both consonants and vowels, but the medial consonant does seem to show the development *R > Proto Melanau *R ~ Kajang ø.)
In final position *R develops as h in Melanau and as zero in Bintulu, the Kajang languages, and the Penan languages.

*taluR ‘egg’ Proto Melanau *təluh, Bintulu təlu, Kajang: Lahanan təlu, Kejaman (Ray) təlo, Western Penan təlo, elu, ilo, Eastern Penan ilo. (51)

*bibiR ‘lips’ Melanau: Mukah (Blust) bibih, Kajang: Kejaman (Ray) bevē, Western Penan bivi, Eastern Penan bevē. (80)

Also, *dɔŋR ‘hear’ (117), *niuR (?) ‘coconut’ (38), *akaR ‘vine, creeper’ (32), *layaR ‘sail’ (537).

As happened elsewhere in some Bornean languages, final *R in some words developed quite early as *y. However, there is no evidence for this development in the Penan languages.

*ikuR ‘tail’ Proto Melanau *ikuy, Bintulu ikuy, Kajang ikuy, but Western Penan iku, Eastern Penan iko. (50)

*taluR ‘egg’ Proto Melanau *təluh but Igan, Matu, Rajang, Kanowit and Tanjong təluy, but Bintulu təlu and Kajang: Lahanan (Rousseau) təlu, Kejaman (Ray) telo, Western Penan təlo, elu, ilo, Eastern Penan ilo. (51)

Also, *tuduR ‘sleep’ (133).

Apparently, the *R > *y development also took place in medial position as in the following set:

*kaRaw ‘scratch’ Melanau: Balingian məgayaw, Bintulu məgazaw, Kajang: Kejaman (Ray) umanyau. (122)

**Consonantal changes: *s**

In medial position *s continues in these languages expect in Kejaman, where both s and c are found. In final position *s develops as s in Melanau and Bintulu and as zero in the Kajang and Penan languages.

<table>
<thead>
<tr>
<th></th>
<th>Melanau</th>
<th>Bintulu</th>
<th>Kajang</th>
<th>W &amp; E Penan</th>
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</thead>
<tbody>
<tr>
<td>VsV</td>
<td>s</td>
<td>s</td>
<td>s/c</td>
<td>s</td>
</tr>
<tr>
<td>s#</td>
<td>s</td>
<td>s</td>
<td>Ø</td>
<td>Ø</td>
</tr>
</tbody>
</table>

*nipis (PMP-Blust) ‘thin’ Proto Melanau *dipis, *lipis, Bintulu (Blust) malipis, Kajang: Lahanan nipi, Kejaman (Ray) lipi, Western Penan nipi, Eastern Penan něpé. (322)

*bətis ‘leg, calf’ Proto Melanau *bətis, Bintulu (Ling Roth) betas, Kajang: Lahanan bəti, Sekapan-Kejaman (Urquhart) beti, Kejaman (Ray) bətī, Western Penan bətī, Eastern Penan bətē. (109)

Consonantal changes: *w

In medial position *w develops as w in Melanau and in the Penan languages, as b in Bintulu and as gw in the Kajang languages. The same development takes place in Bintulu and the Kajang languages when the w is a phonetic semivowel inserted automatically in the vowel sequence ua.

<table>
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<tr>
<th></th>
<th>Melanau</th>
<th>Bintulu</th>
<th>Kajang</th>
<th>W &amp; E Penan</th>
</tr>
</thead>
<tbody>
<tr>
<td>VwV</td>
<td>w</td>
<td>b</td>
<td>gw</td>
<td>w</td>
</tr>
</tbody>
</table>

*sawa* ‘wife, spouse’ Proto Melanau *sawa, Bintulu saba, Kajang: Lahanan (Rousseau) sawa[k, Kejaman (Ray) sagwā. (251)

*Cawaq* (?) ‘spider’ Melanau: Mukah bələbawa?, Rajang katawa?, Balingian, Tanjong bəlawat, Kajang: Lahanan (Rousseau) tə|lawa?, Western and Eastern Penan kelawa’.

(63)

Also, *qali-wati ‘worm’ (60), *bawæ ‘creek’ (508), *tawa ‘laugh’ (176), *baway (?) ‘climb’ (142).

*dua* ‘two’ Proto Melanau *duah, Bintulu (Blust) ba, Kajang: Lahanan (Rousseau) luqwa, Lahanan, Kejaman, Sekapan (Urquhart) degua, Kejaman-Sekapan (Strickland) daqua but Tatau dua, Western Penan keruah ‘second’, Eastern Penan duah. (282)

*buaq* ‘fruit’ Proto Melanau *bua?, Kajang: Lahanan (Rousseau) bugwa, Kejaman (Ray) bəgwa, Western Penan (Ray) buǭ, (Kaboy) bue’, Eastern Penan bua. (35)

Also, *tuaq* Proto North Sarawak (Blust) ‘we (dual)’ (346).

Consonantal changes: *y

In medial position *y develops as y in Melanau and in the Kajang and Penan languages and as z in Bintulu. The same development takes place in Bintulu when y is inserted automatically between the vowels of the diverse vowel sequence ia. Thus, *y and *w are parallel in this respect in Bintulu.

<table>
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<tr>
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<th>Melanau</th>
<th>Bintulu</th>
<th>Kajang</th>
<th>W &amp; E Penan</th>
</tr>
</thead>
<tbody>
<tr>
<td>VyV</td>
<td>y</td>
<td>z</td>
<td>y</td>
<td>y</td>
</tr>
</tbody>
</table>

*kayu* ‘tree, wood’ Proto Melanau *kayw, Bintulu kazw, Kajang: Sekapan kayu, Kejaman kayau, Western Penan kayu, Eastern Penan kayeu. (28)

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19 In two examples the sequence *awa developed as awa in Lahanan (Rousseau). This may be the development of the consonant w rather than the phonetic w inserted in the sequence ua, or it may have been a special development of w between two a’s.
**kaRaw** ‘scratch’ Melanau: Balingian mágayaw, Bintulu megazaw, Kajang: Kejaman (Ray) umanyau. (122)

Also, *Raya ‘big’ (295), *buaya ‘crocodile’ (55), *layaR ‘sail’ (537).

**diaq** ‘good’ Proto Melanau *dia?, Bintulu daza?, Kajang: Lahanan, Kejaman ya, ia, Sekapan (Urquhart) jia, Tatau jak, Western Penan jiên, jian, Eastern Penan jian. (170)

**ma-hiaq** ‘shy’ Proto Melanau *mia?, Bintulu maza?, Eastern Penan menya. (456)

**Consonantal changes: *b**

In medial position *b continues as b in Melanau, except in Balingian where it becomes v. However, in Bintulu it develops as v, b, or ð under conditions that are unclear. In the Kajang languages it develops as v (ð in Strickland’s Kejaman-Sekapan wordlist) or b. Similarly, in the Penan languages *b develops as v or b.

Although some sets have b in one Kajang language and v in another, quite often all the Kajang languages uniformly have either v or b. The paucity of data makes it difficult to say whether a stop (plosive) in Bintulu generally corresponds to a stop in the Kajang languages, and/or the Penan languages, but there certainly are examples of that. It appears that a stop in Bintulu, the Kajang languages and the Penan languages generally occurs before a low vowel *a or *e whereas a fricative in those languages generally occurs before a high vowel *i or *u. However, at this point it must be acknowledged that the distribution of the stop and fricative reflexes in Bintulu, the Kajang languages and the Penan languages is uncertain.

<table>
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<tr>
<th></th>
<th>Melanau</th>
<th>Bintulu</th>
<th>Kajang</th>
<th>W &amp; E Penan</th>
</tr>
</thead>
<tbody>
<tr>
<td>VbV</td>
<td>b</td>
<td>v/b/ð</td>
<td>v/b/ð</td>
<td>v/b</td>
</tr>
</tbody>
</table>

**i-babaw** ‘above’ Proto Melanau *(bas) babaw, Bintulu ñaw, Kajang: Kejaman-Sekapan (Strickland) baw, nñaw ‘climb into’, Eastern Penan bau. (522)

**baqbaq** ‘mouth’ Proto Melanau *bða?, Kajang: Lahanan (Rousseau) ba?, Lahanan, Sekapan, Kejaman (Urquhart) bah, Kejaman (Ray) bã, Eastern Penan uba ‘opening’. (81)

**abu** ‘ashes’ Proto Melanau *abow, Bintulu avow, Kajang: Kejaman (Ray) avo, Western Penan avo, avou, Eastern Penan aveu. (226)

**bibiR** ‘lips’ Melanau: Mukah (Blust) bibih, Bintulu (Ling Roth) bivi, Kajang: Kejaman (Ray) bevẽ, Western Penan bivi, Eastern Penan bevê. (80)

Consonantal changes: Voiced stops in final position

While the voiced stop *b becomes a fricative in medial position in some contexts, *b remains a stop, varying from voiced to voiceless in final position in Melanau and Bintulu. In fact, it appears that all three final voiced stops vary from voiced to voiceless in those two groups. The scant evidence suggests that in the Kajang and Penan languages voiced stops in final position have uniformly become voiceless.

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<tr>
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<th>Melanau</th>
<th>Bintulu</th>
<th>Kajang</th>
<th>W &amp; E Penan</th>
</tr>
</thead>
<tbody>
<tr>
<td>b#</td>
<td>b~p</td>
<td>b~p</td>
<td>p</td>
<td>p</td>
</tr>
<tr>
<td>d#</td>
<td>d~t</td>
<td>d~t</td>
<td>t</td>
<td>t</td>
</tr>
<tr>
<td>g#</td>
<td>g~k</td>
<td>g~k</td>
<td>k</td>
<td>k</td>
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</table>

*tilib (?) ‘wing, fly’ Melanau: Balingian tilib, Matu titip, Bintulu (Chou) tilib, Bintulu (Blust) tilip, Kajang: Lahanan (Rousseau), Kejaman (Ray) m-nilip, Sekapan-Kejaman (Strickland) m-nilipan. (48, 141)

*likuj > *likud ‘back (person)’ Melanau: Kanowit ikut, Tanjong likut, Bintulu likud, Kajang: likut, Western Penan likot, Eastern Penan likot. (99)

*molud (?) ‘sleep’ Melanau: Kanowit molud, Tanjong molut, Kajang: Lahanan (Rousseau), Kejaman (Urquhart) and Tatau molut, Sekapan (Urquhart) belut, Sekapan-Kejaman (Strickland) mo-htag. (133)

*buqud (?) ‘fear, afraid’ Melanau: Kanowit buud, Tanjong buut, Kajang: Lahanan (Rousseau) po-ut, Lahanan, Sekapan, Kejaman (Urquhart) bout. (179)

*tutug ‘pound’ Proto Melanau *tutug, Bintulu (Chou) tutug, Bintulu (Blust) tutuk, Eastern Penan metëk ‘pound with feet’. (190)

Consonantal changes: *d

In medial position *d continues in Melanau as d, except in Balingian, where it becomes r. In Bintulu and the Kajang and Penan languages *d becomes r. However, in both Bintulu and the Penan languages some sets continue with d rather than r, but the distribution is undefined.

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<tr>
<th></th>
<th>Melanau</th>
<th>Bintulu</th>
<th>Kajang</th>
<th>W &amp; E Penan</th>
</tr>
</thead>
<tbody>
<tr>
<td>VdV</td>
<td>d</td>
<td>R, r</td>
<td>r</td>
<td>r</td>
</tr>
</tbody>
</table>

*ma-qudip ‘(a)live’ Proto Melanau *mudip ‘grow’, *tudip ‘(a)live’, Bintulu (Chou) muR/op, (Blust) murip, Kajang: Lahanan, Sekapan, Kejaman (Urquhart) murip, Kejaman (Ray) morip, Western Penan morip, Eastern Penan urip. (328)
*udu (?) ‘grass’ Proto Melanau *dudow, Bintulu (Chou) uRow, Bintulu (Blust) urow, Lahanan (Rousseau) urow, Eastern Penan ureu ‘general word for plants’. (518)

*dedhuR Proto North Sarawak (Blust) ‘woman’ Bintulu (Chou) ṭuṭu, Bintulu (Blust) ṭuṭu, Western Penan (Ray) ṭu, (Kaboy) redu, Eastern Penan redo. (253)

*duduR (?) ‘thunder’ Proto Melanau *duduh, Kajang: Lahanan, Sekapan, Kejaman (Urquhart) deru, Eastern Penan lengedo. (15)

Also, *bidiq (?) ‘lie down’ (131), *kədaŋ ‘stand’ (132), *madam (?) ‘rotten’ (305), *si-ida ‘they’ (345).

Proto Malayo-Polynesian *j becomes *d in northern Sarawak and has the same development as *d: Melanau d ~ Bintulu r ~ Kajang r ~ Penan r.

*haj > *m-adok ‘smell’ Proto Melanau *madok, Lahanan (Rousseau) ḋ-arek, Lahanan, Sekapan (Urquhart) marak, Kejaman (Urquhart) meṇarok, Western Penan medok ‘smell’, marak ‘kiss’, Eastern Penan marek. (119)

*pajan > *ŋ-adan ‘name’ Proto Melanau *ŋadan, Bintulu ṣaran, Kajang: Lahanan (Rousseau) aran, Kejaman (Ray) ārā, Western Penan ngarān, Eastern Penan ngaran. (260)

*a(N)ji > *t-adi ‘younger sibling’ Kajang: Lahanan (Urquhart) tareke (cognate?), Sekapan (Urquhart) areh, Kejaman (Urquhart) arek, Eastern Penan padé ‘sibling’. (247)

*pajæs > *pados ‘painful, sick’ Proto Melanau *pödis or *pödh, Melanau: Matu pados’hot’, Bintulu (Chou) padaš, (Blust) pedes. (435)

Also, *ujuŋ > *uduŋ ‘nose’ (84), *pajay > *paday ‘rice with husk’ (215), *kəjaŋ > *kədaŋ ‘stand’ (132).

**Consonantal changes: initial *d, *l, *n

Interchange among *d, *l and *n in initial position occurs in certain sets (which sets are not yet predictable) in Kajang and less commonly in Melanau and Bintulu. This type of variation appears not to affect the Penan languages.

When *d occurs in initial position in certain sets, it may vary to 𝑙 in Kajang and, less commonly, Melanau.

*daRaq ‘blood’ Proto Melanau *daRa, Bintulu (Chou) Raak, Bintulu (Blust) raʔ, Kajang: Lahanan (Rousseau) laʔa, Lahanan, Sekapan, Kejaman (Urquhart) dah, Kejaman (Ray) dā, Western Penan (Ray) dō, (Kaboy) de, Eastern Penan daha. (68)

*duha > *dua ‘two’ Proto Melanau *duah, Bintulu ɓa, Kajang: Lahanan (Rousseau) luqwa, Lahanan, Sekapan, Kejaman (Urquhart) dequa, Kejaman-Sekapan (Strickland) dəgwa(h), Tatau dua, Western Penan keruah ‘second’, Eastern Penan duah. (282)
*qalejaw* > *daw* ‘day’ Proto Melanau *law, Bintulu daw, Kajang: Lahanan (Rousseau) daw, Sekapan (Urquhart) dau, Lahanan, Kejaman (Urquhart), Tatau lau, Kejaman- Sekapan ṕaw, Western Penan dau, Eastern Penan dau. (19)

*ulkan* (?) ‘near’ Melanau: Balingian dekin, Kajang: Lahanan (Rousseau) ļakin, Kejaman (Ray) dēken, Kejaman-Sekapan (Strickland) baliku ‘approach’ (cognate?). (303)

Similar alternations are found in certain sets when *l* or *n* occurs in word-initial position. When *l* is in initial position, it varies to nn.

*nipan* > *lipon* ‘teeth’ Proto Melanau *nipōn, Bintulu nipen, Kajang: Lahanan (Rousseau) nipōn, Lahanan, Kejaman (Urquhart) nyipen, Sekapan (Urquhart) nipen, Kejaman (Ray) nyipān, Western Penan jipān, Eastern Penan jipen. This appears to be the only set in which this type of alternation occurs in the Penan languages, and even in this case the alternation is not to l or n. (82)

*liqar* ‘neck’ Kajang: Lahanan (Rousseau) kənʔa, Lahanan (Urquhart) noa, Kejaman (Urquhart) loah. (92)

When *n* is in initial position, it varies to l and/or to d.

*nipis* (PMP-Blust) ‘thin’ Proto Melanau *dipis, Melanau: Oya, Mukah lipih, Balingian məlipih, Bintulu melipis, Kajang: Lahanan (Rousseau) nipi, Kejaman (Ray) lipi, Western Penan nipi, EasternPenan népé. (322)

*ma-Ruqanay* > *manay* ‘man, male’ Proto Melanau *lay, Bintulu (Chou) nanay, Bintulu (Blust) manay, Kajang: Lahanan (Rousseau) liley (may not be cognate), Lahanan (Urquhart) ledai, Sekapan, Kejaman (Urquhart) dejai, Kejaman (Ray) dēlae, Eastern Penan manai. (252)

*nipay* > *nipa* ‘snake’ Proto Melanau *dipa, Bintulu nipapa, Kajang: Lahanan (Rousseau) nipapa, Kejaman (Ray) nyipā. (54)

*nąmuq* ‘mosquito’ Proto Melanau *nəmuk, Bintulu (Chou) nəmok, Bintulu (Blust) temuk, Kajang: Lahanan (Rousseau) diamok, Eastern Penan nyamuk ‘general word for flying, biting insect’. (62)

The following set also seems to exemplify the *n ~ l ~ d* alternation, but not in initial position. Neither the Melanau nor the Kajang forms seem to indicate a straightforward development of the reconstructed form:

*anaduq* ‘long’ Proto Melanau *láaw, Mukah áləw, Kajang: Lahanan (Rousseau and Urquhart) larun, Sekapan, Kejaman (Urquhart) daro, Tatau lalou. (298)
Consonantal change: *ŋ

In final position *ŋ continues as ŋ in Melanau, Bintulu, Penan and in most Kajang languages. However, in some words it becomes final r in the Urquhart (1955) wordlists for Kejaman and Sekapan (Kajang).

*îpuŋ (?) ‘forest’ Melanau: Tanjong îpuŋ, Kajang: Lahanan (Urquhart) îpoŋ bakan, Kejaman (Ray) îpōŋ, Sekapan, Kejaman (Urquhart) îpur. (27)

*ujuŋ > *uduŋ ‘nose’ Proto Melanau *uduŋ, Bintulu uruŋ, Kajang: Lahanan (Rousseau), Lahanan, Kejaman (Urquhart) uruŋ, Sekapan-Kejaman (Strickland) uruŋ, Kejaman (Ray) uruŋ, Sekapan (Urquhart) urur, Eastern Penan rong. (84)

*tutuŋ ‘burn’ Kajang: Lahanan (Urquhart) notoŋ, Kejaman (Urquhart) notur, Western Penan potong, Eastern Penan potong. (231)

*guðuŋ ‘green’ Proto Melanau *guðuŋ, Bintulu (Chou) guðoŋ, Bintulu (Blust) guðuŋ, Kajang: Sekapan (Urquhart) guður, Tatau guðuoŋ, Western Penan guðuŋ, Eastern Penan marung. (328)

Kajang: Sekapan (Urquhart) sebir ‘ear’, Kejaman (Ray) seviĕŋ. (87)

Kajang: Lahanan (Rousseau) mengavang ‘blue’, Kejaman (Urquhart) aver ‘yellow’, Kejaman (Ray) mengavang ‘yellow’. (363, 330)

Melanau: Mukah liaŋ ‘light (adj.)’, Kajang: Lahanan (Urquhart) keyiŋ, Sekapan, Kejaman (Urquhart) keyir. (418)

Vocalic change: *i

The development of the high vowels *i and *u is rather different in closed syllables versus open syllables.

In a closed syllable, *i is protected from change, i.e., it continues as i, in all four of these languages with the following exceptions: In the Kajang languages *i becomes e before *i or *R, and the final consonant is lost. In Eastern Penan *i becomes é before a final fricative, i.e., *s or *R, or before *?, and the final consonant is lost.

\[
\begin{array}{|c|c|c|c|c|}
\hline
& \text{Melanau} & \text{Bintulu} & \text{Kajang} & \text{W & E Penan} \\
\hline
\text{iC#} & i & i & i & i \\
\hline
\text{i#} & ãy & ãy & ãy & i, ãy \\
\hline
\text{ay#} & ay & ay & ay & ay \\
\hline
\end{array}
\]

*lanjît ‘sky’ Proto Melanau *lanjît, Bintulu lanjît, Kajang: lanjît, Western and Eastern Penan langît. (11)
**sipsip** ‘suck’ Melanau: Tanjong *nsip, Bintulu (Blust) *sip, Kajang: Lahanan (Rousseau) *sisp, Western Penan menyesp. (146)

**bibir** ‘lips’ Melanau: Mukah (Blust) *bibi, Bintulu (Ling Roth) *bivi, Kajang: Kejaman (Ray) *bevē, Western Penan *bivi, Eastern Penan bevé. (80)

**nipsis** (PMP-Blust) ‘thin’ Proto Melanau *dipis, Melanau: Oya, Mukah *lipih, Balingian *lipih, Bintulu (Chou) *lipi’s, (Blust) *melipis, Kajang: Lahanan (Rousseau) *nipi, Kejaman (Ray) *lipi, Western Penan *nipi, Eastern Penan nēpē. (322)

**batis** ‘leg, calf’ Proto Melanau *batis, Bintulu (Ling Roth) *batas (vowel i expected in final syllable), Kajang: Lahanan *bati, Sekapan-Kejaman (Urquhart) *beti, Kejaman (Ray) *bēti, Western Penan *bēti, Eastern Penan betē. (109)

**putiq** ‘white’ Proto Melanau *puti, Kajang: Lahanan (Rousseau) *puti, Lahanan, Sekapan, Kejapan (Urquhart) *puteh, Kejaman (Ray) *pote, Western Penan *pote. (329)

**titiq** ‘breast’ Bintulu *titi, Kajang: Kejaman (Ray) *lēgwā-ĕtē ‘nipple’, Western Penan eti, Eastern Penan étē. (94)


The sequence *iw seems to be unstable. In some situations it develops in a straightforward manner as *iw or *yu. However, in others the sequence is reversed to *uy.

**baRiw** ‘wind’ Melanau: Tanjong *baRiw (< *baRiw), Bintulu (Chou) *bawuy [baRuy?], Bintulu (Blust) *bawuy, Kajang: Lahanan (Rousseau) *bawuy, Sekapan, Kejaman (Urquhart) *bawuy, Kejaman (Ray) *bawuy. The Bintulu and Lahanan forms reflect metathesis from *iw to *uy. (13)

Note that the converse happened as well. Namely, the sequence *uy at times reversed to *iw.

**iku** ‘tail’ Proto Melanau *iku, Oya *ikiw, Mukah *tiw, Bintulu *iku, Kajang *iku. (50)

In a final open syllable *i became *ay in Melanau, Bintulu, the Kajang and Penan languages.

**tali** ‘rope’ Proto Melanau *talāy, Bintulu *talei, Kajang: Lahanan (Rousseau) *talo, Kejaman (Ray) talei, Western Penan *tāli, Eastern Penan *talei. (206)

**bali** ‘buy’ Proto Melanau *bālo, Bintulu *meley, Kajang: Kejaman (Ray) *bebēlei, Eastern Penan *belih (final consonant not expected). (263)

**nupi** ‘dream’ Proto Melanau *tupsi, Bintulu *nupey, Kajang: Lahanan (Urquhart) nyupen, Kejaman (Urquhart) penopei, Western Penan *nyupen, Eastern Penan *nyupen. The final n in Penan is presumably a person-marking suffix. (135)

**kali** ‘dig’ Kajang: Lahanan (Rousseau) nałeʔ, Eastern Penan ngalei. (149)

Also, *kami ‘we (exclusive)’ (342), *isi ‘flesh’ (505).
Vocalic change: *ay

The sequence *ay in final position developed as ay in Melanau, Bintulu, the Kajang languages, and the Penan languages. Thus, this development is only slightly different phonetically from the development of *i in word-final open syllables. The beginning of the sequence was slightly higher: *i# > ay versus *ay > ay.

*atay ‘liver’ Proto Melanau *(h)atay, Kajang: Lahanan (Rousseau) atay, Lahanan, Kejaman, Sekakan (Urquhart), Kejaman (Ray) atai, Western Penan atai, Eastern Penan atai. (103)

*manay ‘man, male’ Proto Melanau *lay, *nòlay, Bintulu manay, Kajang: Lahanan (Urquhart) ledai, Sekakan, Kejaman (Urquhart) dejai, Kejaman (Ray) dêlae, Eastern Penan manai. (252)

Also, *i-say ‘who’ (338), *m-atay ‘dead’ (129), *baway (?) ‘climb’ (142), *pajay > *paday ‘unhusked rice’ (215).

Vocalic change: *u

In closed syllables *u remains u in Melanau, u in Bintulu, and u in the Kajang languages in most contexts. In Kajang the pronunciation is lowered to o before back consonants, before k and ɲ in particular, especially in Lahanan and Kajaman; it is lowered to o before i in the Kajang languages generally, except for Lahanan (Rousseau) and Kejaman-Sekakan (Strickland). At this point it is not clear whether the lowered pronunciation is a phonetic variant of u before back consonants or whether o and u contrast in those positions. Lowering of vowels before back consonants is common in the languages of Central and Southern Sarawak. In the Penan languages *u in closed syllables is generally lowered to o.

<table>
<thead>
<tr>
<th></th>
<th>Melanau</th>
<th>Bintulu</th>
<th>Kajang</th>
<th>W &amp; E Penan</th>
</tr>
</thead>
<tbody>
<tr>
<td>uC#</td>
<td>u</td>
<td>u</td>
<td>u</td>
<td>u/o</td>
</tr>
<tr>
<td>u#</td>
<td>ow</td>
<td>ow</td>
<td>ow/ow/aw</td>
<td>o/u/ou, ow</td>
</tr>
<tr>
<td>aw#</td>
<td>aw</td>
<td>aw</td>
<td>aw</td>
<td>aw</td>
</tr>
</tbody>
</table>

*likuj > *likud ‘back (person)’ Melanau: Kanowit ikut, Tanjong likut, Bintulu likud, Kajang: likut, Western Penan likot, Eastern Penan likot. (99)

*têluR ‘egg’ Proto Melanau *têluh, Bintulu tôlu, Kajang: Lahanan (Rousseau) tôlu, Kejaman (Ray) telo, Western Penan élo, elu, ilo, Eastern Penan ilo. (51)

*uunj > *udunj ‘nose’ Proto Melanau *uđunj, Bintulu (Chou) uRôŋ, (Blust) urunj, Kajang: Lahanan (Rousseau) and Lahanan-Kejaman (Urquhart) urunj, Kejaman (Ray) urôŋ, Kejaman-Sekakan (Strickland) uńj, Sekapan (Urquhart) urur, Eastern Penan rong. (84)

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20 Chou generally writes the vowel as o in this position in her Bintulu materials.
**manuk** ‘bird’ Proto Melanau *manuk, Bintulu (Chou) manok, Bintulu (Blust) manuk, Kajang: Lahanan (Rousseau and Urquhart), Kejaman (Urquhart) manok, Tatau manuk.

(47)

**labuq** ‘house’ Proto Melanau *labu?, Kajang: Lahanan (Rousseau) lǝvu, Lahanan and Sekapan (Urquhart) levoh, Kejaman (Urquhart) levo, Kejaman (Ray) levō, Western Penan lebo, Eastern Penan lebo. (271)


In a final open syllable *u becomes ow in Melanau and Bintulu. In the Kajang languages and Penan languages the development was similar, but it varies from language to language. It is ow in Lahanan (Rousseau). ow in Kejaman-Sekapan (Strickland), and au/aw in the others. In Western Penan and ow in Eastern Penan.

*asu* ‘dog’ Proto Melanau *asow, Bintulu asow, Kajang: Lahanan (Rousseau) asow, Kejaman (Urquhart) asow, Sekapan (Urquhart) and Tatau asow, Western Penan (Ray) asu, (Kaboy) aso, Eastern Penan aseu. (59)

*talu* ‘three’ Proto Melanau *tɔlɔw, Bintulu lɔw, Kajang: Lahanan (Rousseau) tɔlow, Lahanan (Urquhart) telo, Sekapan (Urquhart) tilau, Kejaman (Urquhart) telau, Tatau teleu, Sekapan-Kejaman (Strickland) tɔŋaw, Eastern Penan teleu. (283)

Also, *i-aku ‘I’ (339), *qulu ‘head’ (76), *kutu ‘lice’ (126), *dudu ‘grass’ (518, 416).

### Vocalic change: *aw

The sequence *aw in final position develops as aw in Melanau, Bintulu, the Kajang languages, and the Penan languages. Thus, this development is only slightly different from the development of *u in final open syllables in that the vowel of the vowel-semivowel sequence is a bit lower than the vowel of the sequence that developed from *u in open syllables. Note the parallel with the developments of *i and *ay.

*makaw ‘walk’ Proto Melanau *makaw, Melanau: Kanowit, Tanjong lakaw, Balingian malakaw, Bintulu (Chou) malakaw, (Blust) lakaw, Kajang: Lahanan (Rousseau) bɔlakaw, Lahanan, Sekapan, Kejaman (Urquhart) belakaw, Tatau melakau, Western Penan malakau, Eastern Penan lakau. (138)

*law > *daw ‘day’ Proto Melanau *law, Bintulu daw, Kajang: Lahanan (Rousseau) daw, Sekapan (Urquhart) dau, Lahanan, Kejaman (Urquhart), Tatau lau, Kejaman-Sekapan (Strickland) tɔaw, Western Penan dau, Eastern Penan dau. (19)

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21 In the Kajang languages o rather than a diphthong occurs in words that have a final open *u. This is more common in the wordlists of Urquhart and Ray than in those of Rousseau and Strickland.
**takaw** ‘steal’ Proto Melanau *tikaw, Bintulu menekaw, Kajang: Kejaman (Ray) menyêkau, Western Penan (Ray) menakau, (Kaboy) menakou, Eastern Penan nekau. (163)

Also, *kaRaw > *kayaw ‘scratch’ (122), *i-babaw ‘above’ (522), *danaw ‘lake’ (508), *ḅlabaw ‘rat’ (58).

**Vocalic change: *ə**

The central vowel *ə occurs only in closed syllables, where it becomes ø in Melanau and Bintulu. In the Kajang languages it generally becomes ø in Lahanan (Rousseau) and Kejaman-Sekapan (Strickland), occasionally e (schwa?) in Lahanan (Urquhart) and Kejaman (Urquhart), often ā (schwa?) in Kejaman (Ray) and elsewhere it becomes a. In Eastern Penan it becomes ø (“e”) and in Western Penan it becomes a. It is impossible to determine whether a in some of the transcriptions represents a central vowel or is truly a low open vowel.

<table>
<thead>
<tr>
<th></th>
<th>Melanau</th>
<th>Bintulu</th>
<th>Kajang</th>
<th>W &amp; E Penan</th>
</tr>
</thead>
<tbody>
<tr>
<td>aC#</td>
<td>ø</td>
<td>ø</td>
<td>ø, ā, a</td>
<td>a, ø</td>
</tr>
</tbody>
</table>

**nipṇ > *lipṇ ‘teeth’** Proto Melanau *nipṇ, Bintulu nipṇ, Kajang: Lahanan (Rousseau) nipṇ, Lahanan, Kejaman (Urquhart) nyipṇ, Sekapan (Urquhart) nipṇ, Kejaman (Ray) nyipṇ, Western Penan jipṇ, Eastern Penan jipṇ. (82)

**m-adak ‘sniff, smell’** Proto Melanau *maḍk, Kajang: Lahanan (Rousseau) ṃ-arək,
Lahanan, Sekapan (Urquhart) marak, Kejaman (Urquhart) mengarak, Western Penan (Kaboy) medok ‘smell’, marak ‘kiss’, Eastern Penan marek. (119)

Also, *kajən (?) ‘dull’ (308), *iŋət ‘tie’ (159), *ma-qitəm ‘black’ (327), *jaqet ‘bad’ (169), *dalam ‘inside’ (510), *ikan > *i̯ən (?) ‘fish’ (53).

The developments of the central vowel *ə are rather straightforward in these four languages or language groups. The same can be said for the developments of the low vowel *a. The significance of these developments will be seen only when we consider the developments of the vowels in other neighboring groups, where the developments are rather different.

**Vocalic change: *a**

The low vowel *a occurs in both open and closed syllables. In both environments it continues as a in Melanau, Bintulu, and the Kajang and Penan languages. The a in open syllables is usually recorded as ah in Kejaman-Sekapan (Strickland) and occasionally as ah in Lahanan, Sekapan, and Kejaman (Urquhart). It is usually recorded as ā in Kejaman (Ray); elsewhere it is a. In Western Penan *a is recorded as ā in Ray’s wordlist and as a in other sources; in Eastern Penan it is a, but when followed by the person-marker -n, it is ø.

<table>
<thead>
<tr>
<th></th>
<th>Melanau</th>
<th>Bintulu</th>
<th>Kajang</th>
<th>W &amp; E Penan</th>
</tr>
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<tbody>
<tr>
<td>aC#</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a, a</td>
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<tr>
<td>a#</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>ā, ah/ən</td>
</tr>
</tbody>
</table>
*ŋajan > *ŋadan ‘name’ Proto Melanau *ŋadan, Bintulu ŋaran, Kajang: Lahanan (Rousseau) aran, Kejaman (Ray) ārā, Western Penan ŋarān, Eastern Penan ŋaran. (260)

*ma-baRaqt > *baRaṭ ‘heavy’ Proto Melanau *baRaṭ, Bintulu vat, Kajang: Lahanan (Rousseau) baat, Lahanan, Sekapan, Kejaman (Urquhart) bat, Kejaman-Sekapan (Strickland) maṭat, Western Penan baat, Eastern Penan bahat. (313)

*utaq ‘vomit’ Proto Melanau *puta?, Bintulu pute?, Kajang: Lahanan (Rousseau) nuta?, Eastern Penan luta. (125)

*dilaq ‘tongue’ Proto Melanau *jila?, Bintulu jōla?, Kajang: Lahanan (Rousseau) jīla?, Lahanan, Kejaman (Urquhart) jīla, Kejaman (Ray) gyela, Sekapan (Urquhart) jīdah, Western Penan (Ray) jēlā, (Kaboy) jēla, Eastern Penan jēla’. (83)

Also, *uzan ‘rain’ (14), *bulan ‘moon’ (9), *tulaŋ ‘bone’ (70), *ma-kapal ‘thick’ (321), *kilat, also *kōlāt (?) ‘lightning’ (16), *anak ‘child’ (256), *bōdak ‘flower’ (34), *luzaq ‘spit’ (154), *daRaq ‘blood’ (68), *ma-hiaq ‘shy’ (456), *baqbaq ‘mouth’ (81).

*mata ‘eye’ Proto Melanau *mata, Bintulu mata, Kajang: Lahanan (Rousseau), Kejaman (Urquhart) matah, Lahanan (Urquhart) matā, Kejaman (Ray) matā, Western Penan (Ray) matān, (Kaboy) matan, Eastern Penan maten. (88)

*duha > *dua ‘two’ Proto Melanau *duah, Bintulu (Chou) ɓa, Bintulu (Blust) ba, Kajang: Lahanan (Rousseau) luğwā, Lahanan, Sekapan, Kejaman (Urquhart) degua, Kejaman-Sekapan (Strickland) degwah, Tatau dua, Western Penan (primer) keruah ‘second’, Eastern Penan duah. (282)

Also, *taliŋa ‘ear’ (87), *buŋa ‘flower’ (34), *nipa ‘snake’ (54), *t-ama ‘father’ (248), *t-ina ‘mother’ (249).

**Sihan**

Sihan has generally been classified as a Kajang language (cf. *Ethnologue*, 16th edition). Luhat (1989:49) states, “‘The term Kajang was introduced in the sociological literature by Edmund Leach to designate six minor ethnic groups of central Sarawak—the Punan, Kejaman, Sekapan, Lahanan, Seping, and Bemali...The term Kajang is also applicable to other small groups living along the Rajang River like the Sihan, Ukit, Tanjong, Kanowit, and the Bukitan.”

However, examination of the data on which this study is based brings this classification into question. There are a number of sound changes that distinguish Sihan from the Kajang languages, and in many sets the Sihan form is quite different from those in the Kajang languages.22

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22 It must be observed, however, that lexical comparisons do not show the distinctiveness of Sihan in any conclusive way. We find that Sihan shares with the Kajang languages 61.4% similar vocabulary (89 items out of 145 compared) although this is higher than the 54.2% vocabulary that Sihan shares with Melanau. However, when we compare Lahanan and Kejaman-Sekapan, both of which are Kajang languages, we find that they share only
The development of vowels in the Kajang languages is similar to that in Melanau, Bintulu, and the Penan languages, whereas the development in Sihan is different.

\*u# > Kajang ow, òw, but > Sihan u

\*talù ‘three’ Kajang: Lahanan (Rousseau) telow, Lahanan (Urquhart) telo, Sekapan-Kejaman (Strickland) tọŋ̊w, Tatau telew, Sekapan (Urquhart) tilaw, Kejaman (Urquhart) telaw, Sihan tōlu. (283)

\*qulu ‘head’ Kajang: Kejaman (Urquhart) olau, Kejaman (Ray), Tatau ulau, Sekapan-Kejaman (Strickland) uŋ̊aw, Sihan ulu. (76)

\*dudu (?) ‘grass’ Kajang: Lahanan (Rousseau) urow, Sihan uru. (518)

\*i# > Kajang oy, but > Sihan i

\*tali ‘rope’ Kajang: Lahanan (Rousseau) talɔy, Kejaman (Ray) talei, Sihan tali. (206)

\*isi ‘flesh’ Kajang: Lahanan (Rousseau) sey, Kejaman (Ray) sei, Sihan ohĩ. (505)

\*aw > Kajang aw, but > Sihan o

\*daw ‘day’ Kajang: Lahanan (Rousseau) daw, Sekapan (Urquhart) dau, Lahanan, Kejaman (Urquhart), Tatau lau, Kejaman-Sekapan (Strickland) ñaw, Sihan alo?. (19)

\*kaRaw > *kayaw ‘scratch’ Kajang: Kejaman (Ray) umanyau, Sihan ɔmawo. (122)

\*ay > Kajang ay, but > Sihan e

\*manay ‘man, male’ Kajang: Lahanan (Urquhart) ledai, Sekapan, Kejaman (Urquhart) dejai, Kejaman (Ray) dëlae, Sihan ale. (252)

\*bulay (?) ‘left (hand)’ Kajang: Lahanan (Rousseau) bujay, Sihan bulleh. (183)

\*o > Kajang ɔ, ã, a, but > Sihan o

\*nipɔn > *lipɔn ‘teeth’ Kajang: Lahanan (Rousseau) njipɔn, Lahanan, Kejaman (Urquhart) nyipn̊, Sekapan (Urquhart) nipan, Kejaman (Ray) nyip̊n̊, Sihan ̊nipo. (82)

\*m-adɔk ‘sniff, smell’ Kajang: Lahanan (Rousseau) ŋ-arɔk, Lahanan, Sekapan (Urquhart) marak, Kejaman (Urquhart) mengarak, Sihan madok. (119)

60% of their vocabulary, although it should be noted that the lists available for these two Kajang languages have only 40 items in common, a very small sample.
Similarly, the development of labial consonants in medial position in Sihan shows differences from the development in the Kajang languages.

On the basis of these pervasive phonological developments we conclude that Sihan is not one of the Kajang languages and, for that matter, is not especially similar to the Kajang languages. As observed in the conclusion (d) stated in section 0, Sihan, Ukit, Bukat, Bukitan, Punan Busang, Punan Batu, and Punan Bah form an outer cluster of languages that are related to the Melanau, Bintulu, Kajang, and Penan cluster, but not as closely.

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23 This sole example of medial *b in both Kajang and Sihan with the *b > Kajang bb is not a convincing example because in all the Kajang forms the b is initial. However, there are other sets, lacking a Sihan form, which show medial b in Kajang: po-oba ‘speak’ Lahanan, Kejaman and Sekapan (Urquhart), uba? ‘speak’ Kejaman-Sekapan (Strickland), pooled ‘speak’ Kejaman (Ray); babaŋ ‘shoulder’ Lahanan (Rousseau), mebang ‘shoulder’ Lahanan (Urquhart); aba? ‘where?’ Lahanan (Rousseau), aba Kejaman (Ray) ‘where?’.
5. Other Languages of Central Sarawak

There are a number of other languages in Central Sarawak that exhibit similarities to this grouping of Melanau, Bintulu, and the Kajang and Penan languages. The similarities may be phonological or lexical or both. One important question, however, is the extent of the similarities. These additional languages compared are Sihan, Ukit, Bukat, Bukitan, Punan Busang, Punan Batu, and Punan Bah.24

In section 5 these similarities will be examined, and it will be concluded, as stated above, that these additional languages form an outer cluster of languages that, while related to the cluster of Melanau, Bintulu, Kajang, and Penan, are less closely connected.

There are other languages/dialects with still other designations that have been included in the comparison and have been found to be generally very similar to one of those already included. Lisum appears to be similar to Bukat, while Punan Speng and Bah Mali are similar to Western Penan.

5.1 Lexical Comparison

As noted in section 4.1 (“Lexical comparison”), Melanau and the Kajang languages have a relatively high percentage (74.8%) of shared lexical items. Melanau has a somewhat lower percentage of lexical items shared with Bintulu (66.8%) and the Penan languages (65.5%).

As noted previously, there are many sets of words that show cognates in all four members of the Melanau-Bintulu-Kajang-Penan grouping. As we extend our study into the larger number of languages of central Sarawak, we find that there are many sets that show matches in virtually all of the languages. Consider the following set as representative of this large number of sets with common vocabulary:

*buŋa ‘flower’ Proto Melanau *buŋa, Bintulu buŋa, Kajang: Kejaman-Sekapan (Strickland)

buŋa, Western Penan bunga, Eastern Penan bun‘a’, Sihan buŋa, Ukit buŋa, Baketan vunţa, Punan Bah bunga. (34)

A survey of approximately 250 sets used in this study reveals that 133 of those sets are quite uniform in lexical content. This does not, of course, mean that the forms are identical or even similar in every language in every case, but all or most of the forms are cognate in those sets. Thus, we note that more than half of the sets show considerable lexical similarity.

However, it is the other, non-uniform, sets that are more revealing in that they show which pairs of languages or language groupings have greater lexical similarity and which have less. The following set, glossed ‘sea’ and exhibiting eight apparently unrelated word sets, illustrates this lexical scatter:

Proto Melanau *daRat, Bintulu (Chou) Rat, (Blust) rat;

Kajang: Lahanan (Rousseau) baŋat, Sekapan (Urquhart) baŋat, Kejaman (Ray) bāngat,

Western Penan bāngat, Eastern Penan ba banget, Sihan baŋat, Punan Bah banget;

Ukit kala, Bukitan kala;

24 For a listing of sources of the data for these languages, see appendix A.
Punan Batu tasik;
Kejaman (Urquhart) nava, Ukit iva;
Kejaman (Urquhart) lojau;
Bukat lɔlpak;
Punan Bah nunuop ‘sea’ (8)

When we compare Melanau with all the other languages of this study we find the following indices of lexical similarity:

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
<th>Matches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kajang</td>
<td>74.8%</td>
<td>160/214</td>
</tr>
<tr>
<td>Bintulu</td>
<td>66.8%</td>
<td>125/187</td>
</tr>
<tr>
<td>Penan</td>
<td>65.5%</td>
<td>144/220</td>
</tr>
<tr>
<td>Bukitan (incl. Ukit, Bukat)</td>
<td>63.9%</td>
<td>133/208</td>
</tr>
<tr>
<td>Punan Bah</td>
<td>61.8%</td>
<td>115/186</td>
</tr>
<tr>
<td>Sihan</td>
<td>54.2%</td>
<td>83/153</td>
</tr>
<tr>
<td>Punan Busang, Punan Batu</td>
<td>50.9%</td>
<td>83/163</td>
</tr>
</tbody>
</table>

This display shows that 214 sets have forms for both Melanau and Kajang and that of those 214 sets 160 (or 74.8%) are cognate. The percentage of shared items that are similar and presumed to be cognate ranged down to a low of 50.9% for Punan Busang and/or Punan Batu.

However, we should note that Melanau is really a cluster of varieties. The same is true of several others: Penan includes Western Penan and Eastern Penan. Bukitan includes Ukit, Bukat, Bukitan.25 Punan Busang and Punan Batu seem to be quite similar and are grouped for this purpose. In these calculations if one variety in a group shows a matching form, it is calculated as a lexical match even if other varieties in that group show a different, apparently non-cognate item.

Clearly, this method of counting matches has inflated the percentage of cognates to some extent. Let us look at the Kajang languages in this regard. The Rousseau wordlist for Lahanan and the Strickland wordlist for Kejaman-Sekapan appear to be the most reliable of all the Kajang wordlists, at least from the standpoint of phonological detail. When calculating the lexical similarity between those two wordlists and Melanau, we find that Kejaman-Sekapan (Strickland) is 66.7% cognate with Melanau (38 out of 57) and that Lahanan (Rousseau) is 58.2% cognate (85 out of 146) with Melanau. Each of these is significantly lower than the 74.8% figure for Kajang in general. When we include these two sources for the Kajang languages rather than the Kajang languages as a whole, we find the following indices of lexical similarity:

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
<th>Matches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bintulu</td>
<td>66.8%</td>
<td>125/187</td>
</tr>
<tr>
<td>Kejaman-Sekapan</td>
<td>66.7%</td>
<td>38/57</td>
</tr>
<tr>
<td>Penan</td>
<td>65.5%</td>
<td>144/220</td>
</tr>
<tr>
<td>Bukitan (incl. Ukit, Bukat)</td>
<td>63.9%</td>
<td>133/208</td>
</tr>
</tbody>
</table>

25 Some sources include lexical material labeled as Baketan, Bketan, and Pakatan. It is not known to what extent these are distinct varieties or even whether they are simply variant labels for essentially the same speech variety.
From these figures of lexical similarity we see that all the languages of this study are within a fairly small range of lexical similarity. In this study Bintulu, Kejaman-Sekapan, and the Penan languages share the highest lexical similarity with Melanau with only about one percentage point separating the group. The remaining languages of the study have a lower percentage of lexical similarity with Melanau and slightly larger increments of difference, ranging from increases of 1.6% to 4.0%. While Melanau, Bintulu, Kejaman-Sekapan, and the Penan languages seem especially similar lexically, there is no clear break point in the entire group from the standpoint of lexical similarity.

Let us ponder what advantage there may be in calculating figures of lexical similarity for individual members of a group rather than for the group as a whole. If we are seeking an indication of historical relatedness, comparing group with group may serve us well because we may assume that a cognate found in one member of the group was also found in the past in other members of that group. However, if we are seeking an indication of current lexical similarity, there may well be value in calculating the lexical similarity of individual members of the group because for various reasons the lexical inventory of languages of a group may vary considerably.

### 4.2 Phonological Comparison

We turn now to consider the phonological changes that developed throughout this larger group of languages as a result of certain key sound changes. All of the changes are of significance. However, it is the development of the vowels that are of special importance is distinguishing the Melanau-Bintulu-Kajang-Penan group from the other group.

1. Retention of the glottal stop generally in both final and medial positions; as a retention, this is not, strictly speaking, a sound change
2. Preservation of *R in medial position in Melanau and Bintulu; loss in the other languages
3. Preservation of *s in final position in Melanau and Bintulu; loss in the other languages
4. Hardening of the semivowel *w to b in Bintulu and *gw in the Kajang languages and of the semivowel *y to z in Bintulu
5. Split of *b into w and b in Bintulu, the Kajang languages and the Penan languages
6. Split of *d into r and d in Bintulu and the Penan languages

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26 However, *R is apparently preserved in final position in a couple of examples in Bukitan, sets 51 and 92.
27 However, *s is preserved as h in Punan Busang in three examples, sets 129, 174, and 314.
28 The phonetically supplied medial w is also hardened to g in Bukitan in one example, set 282.
29 The medial semivowel *y is hardened to j inconsistently in Ukit, Bukat, and Bukitan in three examples, 28, 122, and 295.
30 Weak evidence for a split reflex of medial *b also appears in Ling Roth’s Punan Dyaks wordlist that apparently represents a variety of Punan Bah.
7. Preservation of evidence for final *b, *d, *g in Melanau and Bintulu; devoicing of these final voiced stops in the other languages

8. Diphthongization of the high vowels, *i and *u in Melanau, Bintulu, the Kajang languages, and the Penan languages.

9. Monophthongization of *ay and *aw to e and o in Sihan, Ukit, Bukat, Bukitan, Punan Busang, Punan Batu, and Punan Bah; retention as a vowel-semivowel sequence in the other languages.

10. Merger of *ə in closed syllables and *a# as a in Bukat and as o in Sihan, Ukit, Bukitan, Punan Busang, Punan Batu, and Punan Bah; retention of the contrast as o and a in the other languages.

**Consonantal change:** *

In final position glottal stop continues as ? in Melanau and Bintulu. In the Kajang languages and Eastern Penan final glottal is lost after a high vowel but is generally preserved following a. Final *? is generally lost in Western Penan. Final glottal stop occurs quite regularly in Sihan and Bukat (but not in Ukit or Bukitan). Punan Batu regularly shows final h in cognate forms; this may be Urquhart’s method of marking glottal stop or it might mark an open vowel as seems to be the case in Punan Busang. In the Punan Bah materials of Kaboy glottal is marked in some sets but not in those of Urquhart or Ling Roth.

<table>
<thead>
<tr>
<th></th>
<th>Melanau</th>
<th>Bintulu</th>
<th>Kajang</th>
<th>W &amp; E Penan</th>
<th>Sihan</th>
<th>Ukit, Bukat, Bukitan</th>
<th>Punan Busang, Punan Batu</th>
<th>Punan Bah</th>
</tr>
</thead>
<tbody>
<tr>
<td>q#</td>
<td>?</td>
<td>?</td>
<td>o/?</td>
<td>o, o/?</td>
<td>?</td>
<td>o, ?, o</td>
<td>o, h</td>
<td>o, ?, h</td>
</tr>
</tbody>
</table>

*In this and similar charts of reflexes (developments of sounds of the proto-language in the several languages) sounds separated by the slash are alternate, competing developments. Sounds separated by commas represent the developments in different languages of the grouping. For example, in this chart *q# > W & E Penan o, o? indicates that in Western Penan the reflex is o whereas in Eastern Penan the reflex is o in some sets and ? in others.

**tanoq** ‘earth’ Proto Melanau *tana?, Bintulu tane?, Kajang: Lahanan tana, Western Penan tana, Eastern Penan tana’, Sihan tano?, Ukit tana, Bukat tana?, Bukitan tano, Punan Batu tanoh, Punan Bah (Ling Roth) tanoh. (2)

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31 There is also evidence for a split reflex of medial *d in Punan Batu. The more common reflex is r, but the reflex s is found in four sets, 15, 132, 198, 328.

32 In final position *i is diphthongized in Punan Bah, generally in Kaboy’s wordlist and occasionally in Urquhart’s.

33 In Punan Bah *a# is retained as ay in one example and *aw is retained as aw in a few.

34 The notation in some written sources leaves considerable uncertainty. In the materials of Strickland and Rousseau ? is generally clear. In the materials of Urquhart the vowel is often followed by h, which may be his method of writing the glottal stop or may simply indicate an open, somewhat lengthened vowel. In the materials of Ray the vowel is often written as ¯h as the only indication that there is a final glottal. However, it should be noted that when the vowel a is in word-final position, it is also sometimes written as ¯a and sometimes as a.
*utaq* ‘vomit’ Proto Melanau *putaʔ, Bintulu putaʔ, Kajang: Lahanan (Rousseau) putaʔ, Eastern Penan luta, Sihan nutaʔ, Bukat nutaʔ. (125)

*dilaq* ‘tongue’ Proto Melanau *jolaʔ, Bintulu jolaʔ, Kajang: Lahanan (Rousseau) jillaʔ, Lahanan, Kejaman (Urquhart) jila, Kejaman (Ray) gyela, Sekapan (Urquhart) jidah, Western Penan jela, Eastern Penan jela’, Sihan jalo, Ukit jala, Bukat jalaʔ, Bukitan jela, Punan Busang jala, Punan Batu jala, Punan Bah (Urquhart and Kaboy) jela, (Ling Roth) jilih. (83)

*buaq* ‘fruit’ Proto Melanau *buaʔ, Kajang: Lahanan (Rousseau) buqwa, Kejaman (Ray) bēgwa, Kejaman-Sekapan (Strickland) buʔan, Western Penan buō, bue’, Eastern Penan bua, Sihan buaʔ, Ukit buaʔ, Bukat buaʔ, Baketan buā, Punan Busang bua, Punan Bah (Kaboy) bua’, (Ling Roth) buah. (35)

*jauq* ‘far’ Proto Melanau *jahuʔ, Bintulu jauʔ, Kajang: Lahanan biju, Kajang: Kejaman mejo, Western Penan jo, Eastern Penan ju, Sihan mjuʔ, Bukat bujuʔ, Baketan mojo. (302)

*jatuq* ‘fall’ Proto Melanau *jatuʔ, Bintulu gatuʔ, Kejaman-Sekapan (Strickland) jatəwʔ, Eastern Penan jato. (144)

*labuq* (?) ‘house’ Proto Melanau *lobuʔ, Kajang: Lahanan (Rousseau) ləvu, Lahanan, Sekapan (Urquhart) levoh, Kejaman (Urquhart) levo, Kejaman (Ray) levō ‘country’, Kejaman-Sekapan (Strickland) lapaw ‘hut’ (cognate?), Western Penan (Ray) lebō, Eastern Penan lebo ‘settlement’, Ukit (Ray) labo, (Urquhart) lavoh, Bukat lau, Baketan lau, Ukit (Urquhart) laoh, (Noeb) lauk, Punan Busang lavu, Punan Batu lavoh, Punan Bah lovu. (271)

*isiq* ‘small’ Melanau: Balingian isiʔ, Bintulu disiʔ, Kajang: Tatau mahieʔ, Western Penan siek, Eastern Penan sǐik, Sihan isiʔ, Ukit isi, Bukat esiʔ, Bukitan isi, Punan Batu sik, Punan Bah (Urquhart) isut. (318)

*titiq* ‘breast’ Bintulu titiʔ, Kajang: Kejaman (Ray) lēgwā-ētē ‘nipple’, Western Penan eti, Eastern Penan étē. (94)

When glottal stop occurs as onset of the final syllable, i.e., between vowels, it is generally retained in Melanau, Bintulu, and the Kajang and Penan languages. Medial glottal stop occurs quite regularly in Sihan and at times in Bukat but not in Ukit or Bukitan. It occurs in some sets in Punan Busang but not in Punan Batu. In the Punan Bah materials of Kaboy glottal is marked in some sets but not in those of Urquhart or Ling Roth.

35 Medial glottal occurs regularly in Eastern Penan but only in some sets in Western Penan.
*daqun* ‘leaf’ Proto Melanau *daʔun, Bintulu raʔun, Kajang: Lahanan daʔun, Kejaman daun, Western Penan daun, Eastern Penan daʔun ‘fan palm’, Sihan daʔun, Ukit daun, Bukat daʔun, Baketan dauʔun, Punan Bah (Ling Roth) du-um (cognate?). (30)

*jaqat* ‘bad’ Proto Melanau *jaʔat, Bintulu jaʔes, Kajang: Lahanan (Rousseau) jiʔat, Lahanan, Kejaman (Urquhart) ja-ʔat ‘ugly’, Kejaman (Ray) yat, Sekapan (Urquhart) jaʔat, Western Penan sat, saat, Eastern Penan sa’at, Sihan joʔo, Ukit (Ray) jeot, Ukit (Urquhart) jot, Bukat iut, Punan Busang jiet, Punan Batu yit. (169)

*taqu* ‘right (hand)’ Proto Melanau *taʔaw, *taʔew, Bintulu taʔew, Kajang: Lahanan (Rousseau) taʔo, Western Penan menaʔow, Eastern Penan naʔau, Sihan taʔu, Bukat tau, Punan Busang taʔu, Punan Bah (Kaboy) taʔau. In sets that have medial glottal stop the reflexes of *u in Melanau, Eastern Penan, and perhaps in Western Penan and Punan Bah are like the reflexes for *aw rather than the usual reflexes of *u. (184)

*buqud* (?) ‘fear, afraid’ Melanau: Kanowit buud, Tanjong buut, Kajang: Lahanan (Rousseau) poʔut, Lahanan, Sekapan, Kejaman (Urquhart) bout, Sihan buʔut, Ukit (Ray) buut, Bukat but, Baketan mahut, Bukitan maut, Punan Busang avut, Punan Batu aput, Punan Bah (Urquhart) bout, (Kaboy) bu’ut. (179)

*paqit* ‘bitter’ Proto Melanau *paʔit ‘guts’, Kajang: Lahanan, Kejaman (Urquhart) pait, Baketan (Urquhart) pai, Punan Busang paʔi, Punan Batu pai, Punan Bah (Urquhart) pait. (238)

*taqun* ‘year’ Proto Melanau *taʔun, Bintulu taʔun, Kajang: Kejaman tauʔun, Eastern Penan taʔun, Bukat taun, Baketan tauʔun. (20)

The development of the glottal stop in the various languages will not be used as an indicator of language grouping for a combination of two reasons: (1) the glottal stop seems to have been preserved in general in both positions in all groups, and (2) the notation used in recording the data for some of the languages makes it difficult to be certain of the presence or absence of the glottal stop.

The sound *R, where it is preserved, seems to continue in these languages as a lenis uvular trill. Blust writes the sound in Mukah as [ᵻ]. In some positions it seems to be simply [h] or zero.

In medial position, i.e., between vowels, *R develops as *R in Proto Melanau and Bintulu, as h in Eastern Penan and as zero in the Kajang languages and Western Penan. In the other languages it generally develops as a, but instances of h are found in some examples in Sihan, Ukit, Bukat, Punan Busang, and Punan Batu.

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36 There are a few examples in Melanau of a rather than *R.
Melanau Bintulu Kajang W & E Penan Sihan Ukit, Bukat, Bukitan Punan Busang, Punan Batu Punan Bah

<table>
<thead>
<tr>
<th>VRV</th>
<th>R</th>
<th>R, r</th>
<th>ø</th>
<th>ø, h</th>
<th>ø/h/r</th>
<th>ø/h, ø/h, ø</th>
<th>ø/h, h(?)</th>
<th>ø, ø, ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>R#</td>
<td>h</td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
<td>ø, ø, ø</td>
<td>ø, - , ø/r</td>
<td>ø</td>
</tr>
</tbody>
</table>

*daRaq* ‘blood’ Proto Melanau *daRa?, Bintulu (Chou) Raak, (Blust) ra?, Kajang: Lahanan (Rousseau) la?a, Lahanan (Urquhart) dah, Sekapan-Kejaman (Urquhart) dah, Kejaman (Ray) da, Western Penan (Ray) dò, (Kaboy) de, Eastern Penan dah, Sihan da?, Ukit (Ray) daa, (Urquhart) dah, Bukat da?, Baketan (Ray) da, Bukitan (Urquhart) dah, Punan Busang da, Punan Batu dah, Punan Bah (Urquhart and Kaboy) da, (Ling Roth) dah, (Punan Rajang) (Ray) daa. (68)

*baRat* ‘heavy’ Proto Melanau *baRat, Kajang: Lahanan (Rousseau) baat, Lahanan (Urquhart) bat, Sekapan-Kejaman (Urquhart) bat, Western Penan baat, Eastern Penan bahat; *ma-baRat* ‘heavy’ Bintulu vat, Sekapan-Kejaman (Strickland) maβat, Ukit mawat, Bukat mawat, Bukitan mawat, Punan Busang muvat ‘weight’, Punan Batu mafat, Punan Bah (Urquhart) movat, (Kaboy) kovat ‘weight’. (313)

*taRas* ‘ironwood’ Proto Melanau *taRas, Eastern Penan taha; *kaRas (or *kaRay ?) ‘hard’ Ukit (Ray) kahai, (Urquhart) keheh, Punan Busang kehe, Punan Batu kehi. (33, 312)

*zuRuq* ‘juice’ Proto Melanau *juRu?, Bukitan juu. (175)

*hadiRi* ‘post’ Melanau: Mukah (Blust) dii ‘housepost’, (Ling Roth) dirih, Bintulu (Ling Roth) rié, Eastern Penan lihei. (273)

*baRiw* ‘wind’ Melanau: Kanowit and Tanjong bariw, Bintulu (Blust) baruy, Kajang: Lahanan (Rousseau) bauy, Sekapan and Kejaman (Urquhart) bayu, Kejaman (Ray) baiu; but Western Penan kapo, Eastern Penan kepu, Sihan bala$i, Ukit and Bukat salit, Bukitan balu, Punan Busang poi, Punan Bah po(w)i. (Bintulu and Lahanan forms reflect metathesized *uy rather than *iw; the Penan languages, Bukitan, Punan Busang, and Punan Bah may ultimately be related to *baRiw but not very directly.) (13)

*baRas* ‘husked rice’ Melanau (Ling Roth) baah, Bintulu berá, Kajang: Kejaman (Ray) ba, Baketan (Ray) baa, (Punan) (Noeb) ba, Punan Batu bah. (216)

*baRaq* ‘swollen’ Kajang: Lahanan (Rousseau) baa ‘swell’, Western Penan bee, Eastern Penan baha’. (503)
**buRu** ‘run, escape’ Melanau: Balingian buhaw (< Proto Melanau *buRaw ?), Kajang: Lahanan, Sekapan, Kejaman (Urquhart) buau, Punan Busang buou, Punan Bah (Urquhart) buo, (Kaboy) buou. (153)

**qasiRa** ‘salt’ Proto Melanau *siah, Kajang: Kejaman-Sekapan (Strickland) sio, Kejaman (Ray) siyă, Ukit (Ray) jio, Bukat sia, Baketan (Ray) jio. (219)

In final position *R develops as h in Melanau and as zero in Bintulu, the Kajang languages and the Penan languages. In the other languages the result is generally zero, but there are two examples in Bukitan with a final r.

**taluR** ‘egg’ Proto Melanau *tluh, Bintulu tlu, Kajang: Lahanan (Rousseau) tlu, Kejaman (Ray) tlo, Western Penan elo, elu, ilo, Eastern Penan ilo, Sihan tlu, Ukit tlu, Baketan (Ray) ilor, Punan Busang talun, Punan Bah tlu; **talu** Melanau: Igan, Matu, Rajang, Kanowit and Tanjong tlu, Bukat taloy. (51)

**bibiR** ‘lips’ Melanau: Mukah (Blust) bibih, Bintulu (Ling Roth) bivi, Kajang: Kejaman (Ray) bevĕ, Western Penan bivi, Eastern Penan bevĕ. (80)

**dapaR** ‘hear’ Bintulu ę̃νa, Kajang: Kejaman dę̃a, Western Penan nę̃ingo, Punan Batu rangoh. (117)

**niuR** (?) ‘coconut’ Melanau: Mukah (Blust) buaʔ bə̱n̪u, Bintulu (Ling Roth) vinego, Kajang: Kejaman (Ray) nyiau, Western Penan nyiu, Ukit anyu, Baketan (Ray) nyu, Punan Bah (Punan Rejang) (Ray) nioh. (38)

**akaR** ‘vine, creeper’ Proto Melanau *akah ‘root’, Bintulu (Blust) bakeh, Kajang: Kejaman (Ray) laka, Western Penan aka-kayu, Eastern Penan laka, Sihan oka, Ukit oka, Baketan ŏkă, Punan Bah (Punan Rejang) (Ray) oka. (32)

**apuR** ‘lime’ Bintulu (Ling Roth) apō, Western Penan apō-sapa, Eastern Penan apo sepa’. (245)

**dadhuR** Proto North Sarawak (Blust) ‘woman’ Bintulu (Chou) Radv, (Blust) radu, Western Penan (Ray) dō, (Kaboy) redu, Eastern Penan redo, Sihan oro (may reflect something like *dada), Ukit doro, Bukat doro, Bukitan oro, Punan Busang oro, Punan Batu oro, Punan Bah oro. (253)

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37 It is interesting to note that the vowel in Bintulu and Kajang: Lahanan is u; similarly, the Bintulu vowel in the set labeled ‘lips’ is i and the Kajang: Kejaman (Ray) vowel is e. This may suggest that there was a final h. If the vowels were truly word-final, the reflexes should be vowel-semivowel sequences.
*liqR ‘neck’ Kajang: Lahanan (Rousseau) kənʔa, Lahanan (Urquhart) noa, Kejaman (Urquhart) loah, Sihan təʔo, Ukit (Ray) to, (Urquhart) ter, Bukitan (Urquhart) potor, (Noeb) puto, Punan Batu loh. (92)

As happened elsewhere in some Bornean languages, final *R in some words developed quite early as *y.

*taluR ‘egg’ Proto Melanau *təluh, Bintulu təlu, Kajang: Lahanan (Rousseau) təlu, Kejaman (Ray) təlo, Western Penan člo, elu, ilo, Eastern Penan ilo, Sihan talu, Ukit talu, Baketan (Ray) ilor, Punan Busang talun, Punan Bah telu; *təluy Melanau: Igan, Matu, Rajang, Kanowit and Tanjong təluy, Bukat taloy. (51)

*ikuR > *ikuy ‘tail’ Proto Melanau *ikuy, Bintulu ikuy, Kajang ikuy, Western Penan iku, Eastern Penan iko, Sihan ukui, Bukat ukey, Punan Busang ukui, Punan Bah boki. The Penan forms reflect the regular development of final *R rather than the development as *y. (50)

*tuduR > *teduy ‘sleep’ Proto Melanau *tuduy, Ukit turui, Bukat turuy, Baketan matuoi, Punan Busang turui, Punan Bah (Urquhart) betorui, (Kaboy) metorui, (Ling Roth) muturih. (133)

Apparently, the *R > *y development also took place in medial position as in the following set:

*kaRaw > *kayaw ‘scratch’ Melanau: Balingian məgayaw, Bintulu (Chou) şəmazaw, (Blust) şərṣəzaw, Kajang: Kejaman (Ray) umanyau, Sihan şomayö, Ukit məyo, Baketan maio, Punan Bah (Punan Rejang) (Ray) şaməio. (122)

**Consonantal change: *s**

In final position *s develops as s in Melanau and Bintulu and as zero in all the other languages and groups. However, in a few examples Punan Busang exhibits h.

<table>
<thead>
<tr>
<th></th>
<th>Melanau</th>
<th>Bintulu</th>
<th>Kajang</th>
<th>W &amp; E Penan</th>
<th>Sihan</th>
<th>Ukit, Bukat, Bukitan</th>
<th>Punan Busang, Punan Batu</th>
<th>Punan Bah</th>
</tr>
</thead>
<tbody>
<tr>
<td>s#</td>
<td>s</td>
<td>s</td>
<td>ø</td>
<td>ø</td>
<td>ø</td>
<td>ø/ø, ø</td>
<td>ø</td>
<td>ø</td>
</tr>
<tr>
<td>VsV</td>
<td>s</td>
<td>s</td>
<td>s, c²</td>
<td>s</td>
<td>s</td>
<td>s</td>
<td>s, s</td>
<td>s</td>
</tr>
</tbody>
</table>

²The primary development in Ray’s Kejaman wordlist is c.
*nipis* (PMP-Blust) ‘thin’ Proto Melanau *dipis, *lipis, Bintulu (Chou) môlepe’s, (Blust) melipis, Kajang: Lahanan (Rousseau) nipi, Kejaman (Ray) lipi, Western Penan nipi, Eastern Penan népé. (322)

*batis* ‘calf, leg’ Proto Melanau *bâtis, Bintulu (Ling Roth) betas, Kajang: Lahanan bâti, Sekapan-Kejaman (Urquhart) beti, Kejaman (Ray) bêti, Western Penan bêti, Eastern Penan bêti, Ukit bati, Bukat bati, Baketan bati, Punan Busang batin, Punan Batu batin, Punan Bah (Urquhart and Kaboy) beti, (Ling Roth) biti. (368, 109)

*pajas* ‘hot, spicy’ Proto Melanau *pâdis or *pâyih (crucial evidence from Matu and Rajang lacking) ‘sick’, Bintulu (Chou) pâdos, Bintulu (Blust) pedes ‘sick’, Paketan (Ling Roth) maparo ‘sick’, Punan Busang paroh ‘ill’, Punan Bah pero ‘ill’. (314, 435, 458)

*tanjis* ‘cry’ Proto Melanau *nankan, Bintulu (Chou) mañet, (Blust) menêt, Kajang: Kejaman (Ray) nañi, (Rousseau) nañih, Western Penan (Ray) mâño, (Kaboy) mange, Eastern Penan manga, Ukit nangih, Bukat nañi, Baketan menange, Punan Busang nangih, Punan Bah (Kaboy) menangi, (Punan Rejang) (Ray) manangis. (174)

*ma-panas* ‘hot’ Proto Melanau *panas, Kajang pana, Western Penan pano, pane, Eastern Penan pana. (314)

*kâbâs* (?) ‘dead’ Proto Melanau *kôpôs ‘dead’, *kôbis ‘kill’, Kajang: Kejaman-Sekapan (Strickland) kaßo ‘die’, Sihan kômaßo ‘kill’, Ukit kavôh, Bukat kâvô, Baketan kauwo, Bukitan (Urquhart) mekawôh ‘die’, Punan Busang kavôh, Punan Batu kavôh, Punan Bah (Urquhart) mekôvôh, (Kaboy) mekovo, (Ling Roth) mukôvôh, (Sellato) makoßôh. (129)

*taRas* ‘ironwood’ Proto Melanau *taRas, Eastern Penan taha; *kôRas (or *kâRay?) ‘hard’ Ukit (Ray) kahai, (Urquhart) keheh, Punan Busang kehe, Punan Batu kehi. (33, 312)

*amis* ‘sweet’ Melanau: Mukah temihi (< *mis), Bintulu (Ling Roth) temis, Kajang mi, Western Penan me, Eastern Penan mé, Baketan (Ray) mamis, Punan Bah metomi. (240)

*Ratus* ‘hundred’ Melanau Ratus, Kajang: Lahanan, Sekapan, Kejaman (Urquhart) atu, Kejaman-Sekapan (Strickland) atu, Tatau jatus, Eastern Penan ato, Ukit aiatu, Bukitan (Urquhart) juatu, Punan Batu jiatu, Punan Bah jiatu. (291)

*ubas* ‘new’ Proto Melanau *ubas, Sihan uβa, Ukit uwah, Bukat uva, Baketan (Ray) wâa, Bukitan (Urquhart) wah, Punan Bah (Urquhart) ova. (323)

In medial position *s develops as s in all the languages and groups of this study. In Ray’s wordlist of Kejaman (Kajang) the primary development is c. In Sihan, Ukit, Bukat, Bukitan,
Punan Busang, and Punan Batu some forms exhibit \( h \) while other exhibit \( s \). In Punan Bah (all three sources) some forms exhibit zero while others exhibit \( s \).

*basq* ‘wet’ Proto Melanau *basa?, Bintulu (Chou) basa?, (Blust) base?, Kajang: Lahanan (Rousseau) basa?, Eastern Penan basa’, Sihan basiąk, Bukitan (Ling Roth) basoh, Punan Bah (Kaboy) meso’ut (cognate?). (306)

*isap, sipsip* ‘suck’ Proto Melanau *susap, Melanau: Tanjong nisip, Bintulu (Blust) susip, Kajang: Lahanan (Rousseau) nisip, Western Penan menyesip, Sihan nisip, Punan Bah (Kaboy) menyisip. (146)

*m-asak* ‘cook’ Proto Melanau *pisak, Bintulu masak, Western Penan mesak, Eastern Penan kesak, Bukat isak. (222)

*m-asom* ‘sour’ Bintulu (Ling Roth) mesam, Kajang: Kejaman (Ray) çham, Western Penan meçhám, Eastern Penan mesem, Ukit masom, Bukatan masám, Punan Bah (Punan Rejang) (Ray) moöm. (239)

*pasak* ‘blind’ Bintulu (Ling Roth) peset, Western Penan puso, Eastern Penan peseu, Punan Busang pasok, Punan Bah (Kaboy) pesok. (116)

*asu* ‘dog’ Proto Melanau *asow, Bintulu asew, Kajang: Lahanan (Rousseau) asow, Lahanan, Kejaman (Urquhart) asau, Sekapan (Urquhart), Tatau aso, Western Penan asu, aso, Eastern Penan asau, Ukit asu, Bukat asu, Bukatan ahüh, Bukitan (Urquhart) au, (Noeb) aoh, Punan Busang ahu, Punan Batu ahu, Punan Bah (Urquhart and Kaboy) au, (Ling Roth) auh. (59)

*lasuq* ‘hot’ Proto Melanau *lasu?, Baketan loa (melahu), Punan Busang lahu, Punan Bah (Kaboy) belou, (Punan Rejang) (Ling Roth) eloh. (314)

*isi* ‘flesh’ Proto Melanau *saw, Bintulu Chou maçisi?, Kajang: Lahanan (Rousseau) saw, Kejaman (Ray) sei, chei, Western Penan sin, Easern Penan sin, Sihan ohi, Bukat sini, Bukitan (Ling Roth) oyi, oi, Punan Busang hin, Punan Bah (Kaboy) sin. (505)

*Rusuk* ‘chest’ Proto Melanau *Rusuk, Kajang: Kejaman (Ray) usok, uchok, Western Penan (Ray) uchök, usök, (Kaboy) usuk, Ukit (Ray) ohok. (93)

**Consonantal change: \( w \) and \( y \)**

In medial position \( w \) develops as \( w \) in Melanau and in the Penan languages, as \( b \) in Bintulu and as \( gw \) in the Kajang languages. The same development takes place when \( w \) is a phonetic semivowel inserted automatically in the vowel sequence \( ua \). In Sellato’s wordlist for Beketan and in Bukitan the form meaning ‘two’ has a \( g \) inserted in the sequence \( ua \), similar to the development in the Kajang languages.
**sawa** ‘spouse’ Proto Melanau *sawa, Bintulu saba, Kajang: Lahanan (Rousseau) sawak, Kejaman (Ray) saqwā, Sihan awo, Punan Bah (Ling Roth) pawoh. (251)

**qali-wati** ‘worm’ Melanau: Matu, Mukah kajiqwat, Igan, Oya, Mukah kolojiwat, Bintulu kekebet, Kajang: Kejaman (Ray) kaqwa, Bukitan owon. (60)

**tuaq** Proto North Sarawak (Blust) ‘we (dual)’ Melanau: Balingian tua, Kajang: Kejaman-Sekapan (Strickland) təgwah, Eastern Penan tua. (346).

**buaq** ‘fruit’ Proto Melanau *bua?, Kajang: Lahanan (Rousseau) bugwa, Kejaman (Ray) bēgwa, Kejaman-Sekapan (Strickland) buan, Western Penan buō, bue’, Eastern Penan bua, Sihan bua?, Ukit bua, Bukat bua?, Bekatana buā, Punan Busang bua, Punan Bah (Kaboy) bua’, (Ling Roth) buah. (35)

**duha > dua** ‘two’ Proto Melanau *duah, Bintulu (Chou) ɓa, (Blust) ba, Kajang: Lahanan (Rousseau) lugwa, Lahanan, Sekapan, Kejaman (Urquhart) degua, Kejaman-Sekapan (Strickland) dəgwah, Tatau dua, Western Penan keruah ‘second’, Eastern Penan duah, Sihan duq, Ukit duo, Bukat dua, Beketan (Sellato) lugo, Bukitan duqoh, Punan Batu duo, Punan Bah duo. (282)

In medial position *y develops as z in Bintulu and as y in the other languages. The same development takes place when y is inserted automatically between the vowels of the diverse vowel sequence ia. Thus, *y is parallel to *w in this respect. In Ukit, Bukat and Bukitan *y develops as j in several forms.

**kayu** ‘tree, wood’ Proto Melanau *kayw, Bintulu kazw, Kajang: Sekapan kayu, Kejaman kayau, Western Penan kayu, Eastern Penan kayu, Sihan kayu, Ukit kiau, Bukat kiou, Beketan kajo, Bukitan pokaju, Punan Batu kayu, Punan Bah kayu. (28, 229)

**Raya** ‘big’ Proto Melanau *rayŋ, Bintulu azen, azeh, Sekapan (Urquhart), Kejaman (Urquhart, Ray) ada (cognate?), Western Penan (Ray) jau, ja-au (cognate?), Eastern Penan ja’au (cognate?), Sihan ayo, Ukit ajo, Bukat ajō?, Punan Busang ayo, Punan Bah (Urquhart and Kaboy) ayo, (Ling Roth) aioh. (295)
**buaya** ‘crocodile’ Melanau: Matu, Daro bayah, Mukah, Dalat baya, Kajang: Kejaman (Ray) baiyă, Western Penan baiā, Eastern Penan bayah, Ukit boai, Baketan baia, Punan Bah buai. The Ukit and Punan Bah forms do not seem to reflect a form with medial *y. (55)

**kaRaw > *kayaw** ‘scratch’ Melanau: Balingian mọqayaw, Bintulu (Chou) gọmazaw, (Blust) mọqazaw, Kajang: Kejaman (Ray) umanyau, Sihan ọmọyọ, Ukit majo, Baketan maio, Punan Bah (Punan Rejang) (Ray) gamaio. (122)

**diaq** ‘good’ Proto Melanau *dia/, Bintulu da?/, Kajang: Lahanan, Kejaman ya, ia, Sekapan (Urquhart) jia, Tatau jak, Western Penan jiēn, jian, Eastern Penan jian, Sihan jian, Ukit jian, Bukat jian, Bukitan jian, Punan Busang jian, Punan Batu jian, Punan Bah jia. The jan in Ukit, Bukat and Bukitan may reflect just the final syllable of the reconstructed form, i.e., *diaq > diya? > ya? > ja?. (170)

**ma-hiaq** ‘shy’ Proto Melanau *mia/, Bintulu məza/, Eastern Penan menya. (456)

**Consonantal change: *b**

In medial position *b continues as b in Melanau, except in Balingian where it becomes v. However, in Bintulu it develops as v, b, or f. In the Kajang languages it develops as v (β in Strickland’s Kejaman-Sekapan wordlist) or b. Similarly, in the Penan languages *b develops as v or b.

It appears that a stop in Bintulu, the Kajang languages, and the Penan languages generally occurs before a low vowel *a or *o whereas a fricative in those languages generally occurs before a high vowel *i or *u. However, at this point it must be acknowledged that the distribution of the stop and fricative reflexes is uncertain.

Punan Bah, also has two reflexes, b and v. In many cases a stop in Bintulu and the Kajang and/or Penan languages is matched by a stop in Punan Bah, once again often before a low vowel. Ukit, Bukat, Punan Busang, and most Punan Bah sources have v. Sihan has β. Bukitan/Baketan generally shows w, but before u it is sometimes h/ø. In Punan Batu the reflex is usually v but occasionally f.

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<td>b/v</td>
<td>β</td>
<td>v, v, w/h/ø</td>
<td>v, v/f</td>
<td>v, v, v/b</td>
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38 Most of the Punan Bah forms consistently show the fricative reflex v. These are from Urquhart’s and Ray’s wordlists labeled Punan Bah and from Ray’s wordlist labeled Punan Rejang. It is in Ling Roth’s wordlist labeled Punan Dyaks, which usually is very similar to the others, where there is weak evidence for a double reflex, b or v.
*i-babaw* ‘above’ Proto Melanau *(bas) baw, Bintulu baw, Kajang: Kejaman-Sekapan (Strickland) baw, nɔbaw ‘climb into’, Punan Bah (Urquhart) mobau, (Kaboy) nivou;

*baw* ‘high’ Lahanan, Sekapan, Kejaman (Urquhart) bau, Eastern Penan bau, Punan Busang ovou, Punan Batu fu, Punan Bah (Kaboy) ma’bau. (522, 298)

*baqbaq* ‘mouth’ Proto Melanau *(b)baba?, Kajang: Lahanan (Rousseau) baba?, Lahanan, Sekapan, Kejaman (Urquhart) ba, Kejaman (Ray) ba, Eastern Penan uba ‘opening’, Sihan baṣa, Ukit bava, Bukat bava, Bukitan bawa, Punan Bah (Urquhart) bava, (Punan Dyaks) (Ling Roth) buhah. (81)

*mubal* ‘hit’ Proto Melanau *mubal, Bintulu mubal, Western Penan meban ‘beat’. (178)

*bəlabaw* ‘rat’ Proto Melanau *bəlabaw, Kajang: Lahanan (Rousseau) blavow, Kejaman (Ray) blavau, Pakatan (Ling Roth) belauo, Punan Bah (Punan Rejang) (Ray) glavau, (Ling Roth) blabau. (58)

*tabak* ‘stab’ Proto Melanau *tubək, Bintulu tumbək, Eastern Penan tebek. (145)

*kəbəs* (?) ‘dead’ Proto Melanau *kəbas ‘dead’, *kəbis ‘kill’, Kajang: Kejaman-Sekapan (Strickland) kaʃo ‘die’, Sihan kɔmaʃo ‘kill’, Ukit kavoh, Bukat kav, Baketan kauwo, Bukitan (Urquhart) mekawoh ‘die’, Punan Busang kavoh, Punan Batu kavoh, Punan Bah (Urquhart) mekavo, (Kaboy) mekovo, (Ling Roth) məkəʃo, (Sellato) məkəʃo, (129)

*bibiR* ‘lips’ Melanau: Mukah (Blust) bibih, Bintulu (Ling Roth) bivi, Kajang: Kejaman (Ray) bevə, Western Penan bivi, Eastern Penan bevve. (80)

*abu* ‘ashes’ Proto Melanau *abəw, Bintulu avəw, Kajang: Kejaman (Ray) avo, Western Penan (Ray) avo, (Kaboy) avou, Eastern Penan aveu, Sihan aʃu, Ukit (Ray) avo, Bukat avu, Baketan (Ray) ahə, Punan Bah avu. (226)

*nabuq* ‘fall’ Proto Melanau *labu?, Kajang: Lahanan (Rousseau) bəlavu, Kejaman-Sekapan (Strickland) təbo, Tatu tuvʊ, Sihan bəlaʃu, Punan Bah belavu’. (144)

*ləbuq* (?) ‘house’ Proto Melanau *ləbu?, Kajang: Lahanan (Rousseau) ləvu, Lahanan, Sekapan (Urquhart) levoh, Kejaman (Urquhart) levo, Kejaman (Ray) levə ‘country’, Kejaman-Sekapan (Strickland) ləpaw ‘hut’ (cognate?), Western Penan (Ray) lebə, Eastern Penan lebo ‘settlement’, Ukit (Ray) labo, (Urquhart) lavoh, Bukat lavu, Baketan lau, Bukitan (Urquhart) lauh, (Noeb) lauk, Punan Busang lavu, Punan Batu lavoh, Punan Bah lovu. (271)
*balabaŋ* (?) ‘butterfly, moth’ Proto Melanau *balabaŋ, Kajang: Kejaman (Ray) kababan, Ukit (Ray) kalamavang, Baketan klumbang, Punan Bah (Punan Rejang) (Ray) tamavang. (65)


*ma-baRat* ‘heavy’, Bintulu vat, Sekapana-Kejaman (Strickland) mařat, Ukit mawat, Bukat mavat, Bukitman mawat, Punan Busang muvat ‘weight’, Punan Batu mafat, Punan Bah (Urquhart) movat, (Kaboy) kovat ‘weight’; *baRat* Proto Melanau *baRat, Kajang: Lahanan (Rousseau) baat, Lahanan (Urquhart) bat, Sekapan-Kejaman (Urquhart) bat Western Penan baat, Eastern Penan bahat. (313)

*babuy* (?) ‘pig’ Kajang: Kejaman (Ray) babui, Tatau babui, Eastern Penan babui ‘bearded pig’, Ukit babui, Baketan bahoi-lau, Bukitan (Kaboy) bo’ui, Punan Bah (Ling Roth) baboe. (437, 438)

*labiq* (?) ‘come’ Proto Melanau *labi?, Western Penan (Ray) avē, (Kaboy) ave, Eastern Penan avē, Sihan laβi?, Baketan, Bukitan labi. (509)

**Consonantal change: voiced stops in final position.**

While the voiced stop *b becomes a fricative in medial position in some contexts, *b varies from voiced to voiceless in final position. In fact, it appears that all three voiced stops vary to voiceless in final position. It may be that this devoicing process operates only in Melanau and Bintulu because in all the other languages the examples of final voiced stops are uniformly voiceless except for one example in Sihan.

*tilib* (?) ‘wing, fly’ Melanau: Balingian tilib, Matu titip, Bintulu (Chou) tilib, Bintulu (Blust) tilip, Kajang: Lahanan (Rousseau), Kejaman (Ray) mənilip, Sekapan-Kejaman (Strickland) mənilipan, Sihan nulip, Baketan menulip, Punan Busang nulip. (48, 141)

*malud* (?) ‘sleep’ Melanau: Kanowit malud, Tanjong malut, Kajang: Lahanan (Rousseau), Kejaman (Urquhart) and Tatau malut, Sekapan (Urquhart) belut, Sekapan-Kejapan (Strickland) ma-ŋut, Sihan malod, Punan Batu malut. (133)

*buqud* (?) ‘fear, afraid’ Melanau: Kanowit buud, Tanjong buut, Kajang: Lahanan (Rousseau) poʔut, Lahanan, Sekapan, Kejaman (Urquhart) bout, Sihan buʔut, Ukit (Ray) buut, Bukat but, Baketan mahut, Bukitan maut, Punan Busang avut, Punan Batu aput, Punan Bah (Urquhart) bout, (Kaboy) bu’ut. (179)

*likuj > *likud* ‘back (person)’ Melanau: Kanowit ikut, Tanjong likut, Bintulu likud, Kajang: likut, Western Penan likot, Eastern Penan likut, Sihan likut. (99)
*tutug* ‘pound’ Proto Melanau *tutog, Bintulu (Chou) tutog, Bintulu (Blust) tutuk, Eastern Penan meték (cognate?). (190)

**Consonantal change: *d***

In medial position *d* continues in Melanau as *d* except in Balingian, where it becomes *r*. In all the other languages *d* becomes *r*. However, a relatively large number of the Bintulu forms have *d* rather than *r*. Similarly, a number of Eastern Penan forms have *d* rather than the more usual *r*. Some of the Punan Batu forms have *s* rather than the more usual *r*. In most cases the reflexes other than *r* (**d**,**d**,**d**,**d**) occur before a high vowel **u** or **i**, but some sets show *r* occurring before a high vowel. In most sets with a low vowel the reflex of the preceding consonant is *r*.

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<td><strong>-d</strong>-</td>
<td><strong>d</strong></td>
<td>r/d**</td>
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<td>r, r/d**</td>
<td>r</td>
<td>r</td>
<td>r, r/s</td>
<td>r</td>
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*ma-quadip* ‘(a)live’ Proto Melanau *mudip ‘grow’, *tudip ‘(a)live’ (Melanau: Balingian murip), Bintulu (Chou) muRap, (Blust) murip, Kajang: Lahanan, Sekapan, Kejaman (Urquhart) murip, Kejaman (Ray) morip, Western Penan morip, Eastern Penan urip, Sihan mörp, Ukit morip, Bukat musip, Bukitan musip, Punan Busang morip, Punan Batu mosip, Punan Bah (Urquhart) merip, (Kaboy) morip, (Punan Dyaks) (Ling Roth) murip. (328)

*(d)udu* (?) ‘grass’ Proto Melanau *dudəw, Bintulu (Chou) uRəw, (Blust) urəw, Kajang: Lahanan (Rousseau) urow, Eastern Penan ureu ‘general word for plants’, Sihan uru, Bukat uru. (518)

*duduR* (?) ‘thunder’ Proto Melanau *duduh, Kajang: Lahahan, Sekapan, Kejaman (Urquhart) deru, Eastern Penan lengedo (cognate?), Ukit duru, Bukat duru, Bukitan duru, Punan Busang duru, Punan Batu dusu. (15)

*dadhuR* Proto North Sarawak (Blust) ‘woman’ Bintulu (Chou) Rədu, (Blust) rədu, Western Penan (Ray) də, (Kaboy) redux, Eastern Penan redo, Sihan soro (may reflect something like *dada), Ukit doru, Bukat dərə, Bukitan oro, Punan Busang oroh, Punan Batu oro, Punan Bah oro. (253)

*bidiq* (?) ‘lie down’ Proto Melanau *bidiʔ, Kajang: Lahahan (Rousseau and Urquhart), Sekapan (Urquhart) mi, Kejaman (Urquhart) mereh, Ukit miri, Bukat miriʔ, Bukitan meri, Punan Batu meri, Punan Bah idi. (131)
*madam* (?) ‘rotten’ Proto Melanau *madam, Kajang: Lahanan (Rousseau) maram, Sihan maram, Bukat maram, Punan Busang maram, Punan Bah meram. (305)

*si-ida* ‘they’ Melanau: Tanjong dah, Kajang: Lahanan (Rousseau) sirə(bukən), Lahanan (Urquhart) oreh, Sekapan (Urquhart) urəŋ, Sekapan-Kejaman (Strickland) cirah, Kejaman (Urquhart) sirə, Eastern Penan rêh, Sihan do, Ukit do, Bukat dəh, Punan Batu loh, Punan Bah do. (345)

*budi* ‘belly’ Kejaman (Ray) buri, Western Penan bori, Eastern Penan boré, Baketan bure, Punan Bah (Punan Rejang) (Ray) buri, (Ling Roth) buret. (101)

*dadəm* ‘feel cold’ Proto Melanau *dadəm, Western Penan (Ray) dərəm, (Kaboy) darum, Eastern Penan darem, Sihan bəlarəm, Ukit darum, Baketan merarəm, Punan Busang larəm, Punan Bah (Punan Rejang) (Ray) blərom, (Ling Roth) blərum. (315)

Proto Malayo-Polynesian *j* becomes *d* in northern Sarawak and has the same development as *d: Melanau d ~ Bintulu r ~ Kajang r ~ Western Penan r ~ Eastern Penan r ~ Sihan r ~ Ukit r ~ Bukat r ~ Bukitan r ~ Punan Busang r ~ Punan Bah r.

*uju > *uduŋ ‘nose’ Proto Melanau *uduŋ, Bintulu (Chou) uRoŋ, (Blust) uruŋ, Kajang: Lahanan (Rousseau) əoŋ, Kejaman (Ray) urəŋ, Kejaman-Sekapan (Strickland) urəŋ, Sekapan (Urquhart) urur, Western Penan ōngin, Eastern Penan rong, Sihan uruŋ, Ukit uruŋ, urong, Bukat uruŋ, Bukitan uruŋ, Punan Batu urong, Punan Bah (Urquhart) uruŋ, (Ling Roth) urong. (84)

*hajək > *m-adək ‘smell, sniff’ Proto Melanau *madək, Kajang: Lahanan (Rousseau) nə-rek, Lahanan, Sekapan (Urquhart) marək, Kejaman (Urquhart) meŋarak, Western Penan medək ‘smell’, marək ‘kiss’, Eastern Penan marek, Sihan madək, Ukit marok, Bukat marək, Bukitan arok, Punan Busang marok ‘kiss’, Punan Batu marok, Punan Bah (Urquhart) mederk, (Kaboy) medək. (119)

*pəjan > *pə-adən ‘name’ Proto Melanau *pədan, Bintulu əran, Kajang: Lahanan (Rousseau) aran, Kejaman (Ray) ārə, Western Penan ngərən, Eastern Penan ngəran, Sihan ərə (a rather than o is expected in Sihan and Baketan), Ukit aran, Bukat aran, Baketan ngəro, Bukitan (Noeb) ngərəm ko ‘your name’, Punan Bah (Punan Rejang) (Ray) ngəran. (260)

*pəjay > *pəday ‘rice with husk’ Kajang: Sekapan-Kejaman (Strickland) paray, Kejaman (Ray) parai, Western Penan parai, Eastern Penan parai, Bukat pare, Baketan parei, Punan Bah (Punan Rejang) (Ray) pare. (215)
*a(N)ji > *t-adi ‘younger sibling’ Kajang: Lahanan (Uruquhart) tareke (cognate?), Sekapan (Uruquhart) areh, Kejaman (Uruquhart) arek, Eastern Penan padé ‘sibling’, Ukit arek, Bukat arek, Bukitan areh, Punan Batu arin, Punan Bah arin. (247)

*pajəs > *pədəs ‘painful, sick’ Proto Melanau *pədis or *pədih ‘painful’, Melanau: Matu pədəs’hot’, Bintulu (Chou) pədəs, (Blust) pədəs, Pakatan (Ling Roth) maparo, Punan Busang paroh, Punan Bah pero. (435)

*kəŋ > *əkəŋ ‘stand’ Proto Melanau *kədəŋ, Kajang: Lahanan (Rousseau) nəkəŋ, Lahanan (Uruquhart) tokareŋ, Sekapan (Uruquhart) kerəŋ, Kejaman (Ray) nekariŋ, Western Penan dəŋ, Eastern Penan nekedəŋ, Sihan nikərin, Ukit nekaring, Bukat nəkariŋ, Bukitan nakaring, Punan Busang nekaring, Punan Batu rasing, Punan Bah (Uruquhart) nekaring, (Kaboy) nekerəŋ. (132)

Consonantal change: initial *d, *l and *n.
When *d occurs in initial position in certain sets (which sets is not yet predictable), it varies in some languages to l. The variant l occurs most often in the Kajang languages, but there seem to be examples in Melanau, Sihan, Ukit, Bukat, Bukitan, Punan Busang, Punan Batu, and Punan Bah as well.

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<td>*#n</td>
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*duha > *dua ‘two’ Proto Melanau *duah, Bintulu (Chou) ɓa, (Blust) ba, Kajang: Lahanan (Rousseau) luwa, Lahanan, Sekapan, Kejaman (Uruquhart) degua, Kejaman-Sekapan (Strickland) dəgwə(h), Tatau dua, Western Penan keruah ‘second’, Eastern Penan duah, Sihan du, Ukit duo, Bukat du, Beketan (Sellato) luŋo, Bukitan duغو, Punan Batu duo, Punan Bah duo. (282)
**qalejaw > **daw ‘day’ Proto Melanau *law, Bintulu daw, Kajang: Lahanan (Rousseau) daw, Sekapan (Urqhart) dau, Lahanan, Kejaman (Urqhart), Tatau lau, Kejaman-Sekapan (Strickland) ɨaw, Western Penan dau, Eastern Penan dau, Sihan aloʔ, mata-alo ‘sun’, Ukit aloh, Bukat halo, Bukitan (Urqhart) alo, Punan Busang lou, Punan Batu alo, Punan Bah (Urqhart and Ling Roth) elo, (Kaboy) elou. (19)

*dakin (?) ‘near’ Melanau: Balingian dekin, Kajang: Lahanan (Rousseau) lakin, Kejaman (Ray) dêken, Kejaman-Sekapan (Strickland) baliku ‘approach’ (cognate?), Sihan dák. (303)

*anaduq ‘long’ Proto Melanau *lalów, Mukah alów, Kajang: Lahanan (Rousseau and Urquhart) larun, Sekapan, Kejaman (Urqhart) daro, Tatau lalou. The (intermediate?) reconstruction that lies behind these forms seems to be something like *dadu. (298)

Similar alternations are found in certain sets when *l or *n occurs in initial position. When *l is in initial position, it varies to n. Only two examples are available so far, and both of them involve alternations with still other consonants. So, it may be preferable to include these two sets with the next grouping that illustrates *n-initial stems varying to *l-initial and *d-initial stems.

*nipan > *lipan ‘teeth’ Proto Melanau *nìpôn, Bintulu nipen, Kajang: Lahanan (Rousseau) nìpôn, Lahanan, Kejaman (Urqhart) nyipen, Sekapan (Urqhart) nipa, Kejaman (Ray) nyipán, Western Penan jipän, Eastern Penan jipen, Sihan ñipo ‘incisor’, Buketan nyıpö, Punan Batu nìpën, Punan Bah (Urqhart) nyipe, (Ling Roth) nyipan. (82)

*liqor ‘neck’ Kajang: Lahanan (Rousseau) kònuʔa, Lahanan (Urqhart) noa, Kejaman (Urqhart) loah, Sihan ṭoʔo, Ukit (Ray) to, (Urqhart) te, Bukitan (Urqhart) potor, (Noeb) puto, Punan Batu loh. (92)

When *n is in initial position, it varies to l and/or to d.

*nipis (PMP-Blust) ‘thin’ Proto Melanau *dipis, Melanau: Oya, Mukah lipih, Balingian məlipih, Bintulu (Chou) məlîpe’s, (Blust) melipis, Kajang: Lahanan (Rousseau) ṭipi, Kejaman (Ray) lipi, Western Penan nipí, Eastern Penan népê. (322)

*ma-Ruqanay > *manay ‘man, male’ Proto Melanau *lay, *nalay, Bintulu (Chou) nanay, Bintulu (Blust) manay, Kajang: Lahanan (Rousseau) lìley (may not be cognate), Lahanan (Urqhart) lèdai, Sekapan, Kejaman (Urqhart) dejai, Kejaman (Ray) dèlæ, Eastern Penan manai, Sihan ale, Ukit (Ray) lolei, Ukit (Urqhart) noleh, Bukat nólë, Baketan (Ray) alei, Bukitan (Urqhart) alei, Punan Bah (Urqhart) eli, Punan Bah (Punan Rejang) (Ray) alei. (252)

*nipay > *nipa ‘snake’ Proto Melanau *dipa, Bintulu ñipa, Kajang: Lahanan (Rousseau) ñipa, Kejaman (Ray) nyipä. (54)
*namuk* ‘mosquito’ Proto Melanau *ṇamuk, Bintulu (Chou) ṇamok, Bintulu (Blust) temuk,
Kajang: Lahanan (Rousseau) diamok, Eastern Penan nyamok ‘general word for flying,
biting insect’, Ukit nyamok, Bukat ṇamok, Baketan nyamok, Punan Bah nyamok. (62)

**Consonantal change:** *ŋ*

In final position *ŋ* develops as ŋŋ ŋŋ in most Kajang languages. However, in some words it becomes final r in the Urquhart wordlists for Kejaman and Sekapan. This development does not seem to take place in other languages.

*ipu* (? ‘forest’ Melanau: Tanjong ipuŋ, Kajang: Lahanan (Urquhart) ipoŋ bakan,
Kejaman (Ray) ipoŋ, Sekapan, Kejaman (Urquhart) ipur, Punan Bah ipoŋ, ipung. (27)

*uju > *udu* ‘nose’ Proto Melanau *uduŋ, Bintulu (Chou) uRon, (Blust) uruŋ, Kajang:
Lahanan (Rousseau) and Lahanan-Kejaman (Urquhart) uruŋ, Kejaman (Ray) uruŋ,
Kejaman-Sekapan (Strickland) uruŋ, Sekapan (Urquhart) urur, Western Penan ŏngin,
Eastern Penan ronŋ, Sihan uruŋ, Ukit uruŋ, uruŋ, Bukat uruŋ, Bukitan uronŋ, Punan,
Batu uronŋ, Punan Bah (Urquhart) urung, (Ling Roth) uronŋ. (84)

*tutu* ‘burn’ Kajang: Lahanan (Urquhart) notoŋ, Kejaman (Urquhart) notur, Western Penan
potonŋ, Eastern Penan potonŋ, Sihan nutŋ, Ukit tutong, Bukat nutŋ, Bukitan tutung,
Punan Busang tutonŋ, Punan Batu tutonŋ, Punan Bah (Urquhart) potonŋ, (Kaboy)
potung. (231)

*gaduŋ* ‘green’ Proto Melanau *gadaŋ, Bintulu (Chou) gadoŋ, Bintulu (Blust) gadaŋ,
Kajang: Sekapan (Urquhart) gadur, Tatau gadoŋ, Western Penan gaduŋ, Eastern
Penan marung, Punan Bah (Urquhart) gadong, (Kaboy) gadung. (328)

**Vocalic changes:** *i and *ay, *u and *aw

In a closed syllable *i is protected from change, i.e., it continues as i, in all the languages of this study with the few exceptions already noted for the Kajang languages and Eastern Penan. The development of *i as e before certain consonants and the metathesis of *iw to *uy seems to be restricted to Bintulu, Kajang and Penan; there is no evidence for them in the additional languages of this expanded study.

*ma-qudip* ‘(a)live’ Proto Melanau *mudip ‘grow’, *tudip ‘(a)live’ (Melanau: Balingian
murip), Bintulu (Chou) muRap, (Blust) murip, Kajang: Lahanan, Sekapan, Kejaman
(Urquhart) murip, Kejaman (Ray) morip, Western Penan morip, Eastern Penan urip,
Sihan morip, Ukit morip, Bukat murip, Bukitan murip, Punan Busang morip, Punan
Batu mosip, Punan Bah (Urquhart) merip, (Kaboy) morip, (Punan Dyaks) (Ling Roth)
murif. (328)
*lanjit ‘sky’ Proto Melanau *lanjit, Bintulu lanjit, Kajang: lanjit, Western and Eastern Penan lanjit, Baketan langêt, Punan Bah lanjit. (11)

*bibiR ‘lips’ Melanau: Mukah (Blust) bibih, Bintulu (Ling Roth) bivi, Kajang: Kejaman (Ray) bevē, Western Penan bivi, Eastern Penan bevē. (80)

*batis ‘leg, calf’ Proto Melanau *bətis, Bintulu (Ling Roth) betas (vowel i expected in final syllable), Kajang: Lahanan bəti, Sekapan-Kejaman (Urquhart) beti, Kejaman (Ray) bətī, Western Penan bəti, Eastern Penan betē, Ukit bati, Bukat bati, Bukitan bati, Punan Busang, Punan Batu batin, Punan Bah beti. (109)

*titiq ‘breast’ Bintulu titiʔ, Kajang: Kejaman (Ray) lēgwā-ētē ‘nipple’, Western Penan eti, Eastern Penan étē. (94)

In a final open syllable *i becomes ay in Melanau, Bintulu, Kajang, and Eastern Penan. It also becomes ay in Tuton Kaboy’s Punan Bah wordlist but less often in Urquhart’s wordlist labeled House Punan Bah. It generally continues as i in the other languages.

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<td>ow, o</td>
<td>o, ow, aw</td>
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*nupi ‘dream’ Proto Melanau *tupəy, Bintulu nupey, Kajang: Lahanan (Urquhart) nyupei, Kejaman (Urquhart) penopei, Western Penan nyupi, Eastern Penan nyupin, Ukit nupik, Bukitan (Urquhart) nupi, Punan Busang nupi, Punan Batu nupi, Punan Bah (Urquhart) pampi, (Tuton Kaboy) penupei. The final k and n are presumably person-marking suffixes. (135)

*tali ‘rope’ Proto Melanau *taləy, Bintulu taley, Kajang: Lahanan (Rousseau) taləy, Kejaman (Ra y) talei, Western Penan tali, Eastern Penan talei, Sihan tali, Bukat trari (?), Baketan (Ray) tali. (206)

*bali ‘buy’ Proto Melanau *baləy, Bintulu meley, Kajang: Kejaman (Ray) pebēlei, Eastern Penan belih, Baketan (Ray) pōli, (Noeb) molih. (263)
**isi** ‘flesh’ Proto Melanau *say, Bintulu (Chou) məŋisiʔ?, Kajang: Lahanan (Rousseau) sey, Kejaman (Ray) sei, chei, Western Penan sin, Eastern Penan sin, Sihan ohî, Bukat sini, Bukitan (Ling Roth) oyi, oi, Punan Busang hin, Punan Bah (Kaboy) ein. (505)

The sequence *ay in final position develops as ay in Melanau, Bintulu and the Kajang languages. It continues as ay in Western and Eastern Penan and in one example in Punan Bah. Thus, this development is only slightly different from the development of *i in final open syllables. The beginning of the sequence was slightly higher: *i# > ay, *ay > ay. The sequence becomes e in Sihan, Ukit, Bukat, Bukitan, Punan Batu, and generally in Punan Bah although in some cases it is recorded as ei rather than as e. At this point it cannot be stated with certainty whether e and ei are distinct developments or are equivalent.

**pajay > *paday** ‘rice with husk’ Kajang: Sekapan-Kejaman (Strickland) paray, Kejaman (Ray) parai, Western Penan parai, Eastern Penan parai, Bukat pare, Baketan parei, Punan Bah (Punan Rejang) (Ray) pare. (215)

**atay** ‘liver’ Proto Melanau *(h)atay, Kajang: Lahanan (Rousseau) atay, Lahanan, Kejaman, Sekapan (Urquhart), Kejaman (Ray) atai, Western Penan atai, Eastern Penan atai, Ukit atoi, Bukat ate, Bukitan atoi, Punan Bah etei. This is the only available example of *ay > oi in Ukit and Bukitan. (103)

**ma-Ruqanay > *manay** ‘man, male’ Proto Melanau *lay, *nalay, Bintulu (Chou) nanay, Bintulu (Blust) manay, Kajang: Lahanan (Rousseau) liley (may not be cognate), Lahanan (Urquhart) ledai, Sekapan, Kejaman (Urquhart) dejai, Kejaman (Ray) délæ, Eastern Penan manai, Sihan ale, Ukit (Ray) lolei, Ukit (Urquhart) noleh, Bukat nole, Baketan (Ray) alei, Bukitan (Urquhart) aleh, Punan Bah (Urquhart) eli, Punan Bah (Punan Rejang) (Ray) ale. (252)

**i-say** ‘who’ Proto Melanau *say, Bintulu say, Kajang: Lahanan, Sekapan, Kejaman (Urquhart) che, Eastern Penan sé (something like say expected), Sihan ne, Ukit kermhe, Bukat heʔ, Bukitan hei, Punan Batu hein, Punan Bah ei. (338)

**m-atay** ‘dead’ Proto Melanau *matay, Western Penan matai, Eastern Penan matai, Ukit mati (Malay loan?), Punan Bah patay ‘corpse’. (129)

**bulay** (?) ‘left (hand)’ Proto Melanau *bulay, Bintulu bulay, Kajang: Lahanan (Rousseau) bujay, Sihan buleh, Bukat bule. (183)

**uay** ‘rattan’ Proto Melanau *way, Eastern Penan uay, Bukat wei. (45)

**tay** ‘go’ Kajang: Lahanan (Urquhart) na-ai, Sekapan (Urquhart) taï, tei, Western Penan ãngai, Eastern Penan tai, Baketan munute, Punan Bah (Urquhart) de. (565)
In a final closed syllable *u becomes u in Melanau, u in Bintulu,\(^{39}\) and u in the Kajang languages in most contexts. In Kajang the pronunciation is lowered to o before back consonants, before k and ŋ in particular, especially in Lahanan and Kajaman; it is lowered to o before ʔ in the Kajang languages generally except for Lahanan (Rousseau) and Kejaman-Sekapan (Strickland). At this point it is not clear whether the lowered pronunciation is a phonetic variant of u before back consonants or whether o and u contrast in those positions. Lowering of vowels before back consonants is common in the languages of Central and Southern Sarawak. In the Penan languages *u in closed syllables generally is lowered to o. In Sihan and Punan Bah *u becomes u; in Ukit, Bukat, Bukitan, Punan Busang and Punan Batu it becomes u in many contexts but is lowered to o before back consonants, as in the Kajang languages.

\*likuj > *likud ‘back (person)’ Melanau: Kanowit ikut, Tanjong likut, Bintulu likud, Kajang: likut, Western Penan likot, Eastern Penan likot, Sihan likut. (99)

\*taluR ‘egg’ Proto Melanau *talu, Bintulu talu,\(^{40}\) Kajang: Lahanan (Rousseau) talu, is ow in Western and Eastern Penan. In the other languages *u generally continues as the plain vowel u or occasionally o.

Kejaman (Ray) têlo, Western Penan êlo, elu, ilo, Eastern Penan ilo, Sihan talu, Ukit talu, Baketan (Ray) ilor, Punan Busang talun, Punan Bah telu; *talyu Melanau: Igan, Matu, Rajang, Kanowit and Tanjong talyu, Bukat taloy. (51)

\*uju > *uduŋ ‘nose’ Proto Melanau *uduŋ, Bintulu (Chou) uRoŋ, (Blust) uruŋ, Kajang: Lahanan (Rousseau) and Lahanan-Kejaman (Urquhart) uruŋ, Kejaman (Ray) uruŋ, Kejaman-Sekapan (Strickland) uruŋ, Sekapan (Urquhart) urur, Western Penan onŋin, Eastern Penan onŋ, Sihan uruŋ, Ukit uruŋ, uruŋ, Bukat uruŋ, Bukitan uruŋ, Punan Batu uronŋ, Punan Bah (Urquhart) uruŋ, (Ling Roth) uronŋ. (84)

\*manuk ‘bird’ Proto Melanau *manuk, Bintulu (Chou) manok, Bintulu (Blust) manuk, Kajang: Lahanan (Rousseau and Urquhart), Kejaman (Urquhart) manok, Tatau manuk, Punan Busang manok, Punan Batu manuk. (47)

\*labuq (?) ‘house’ Proto Melanau *labu?, Kajang: Lahanan (Rousseau) łœvu, Lahanan, Sekapan (Urquhart) levoh, Kejaman (Urquhart) levo, Kejaman (Ray) levœ ‘country’, Kejaman-Sekapan (Strickland) łapaw ‘hut’ (cognate?), Western Penan (Ray) lebœ, Eastern Penan lebo ‘settlement’, Ukit (Ray) labo, (Urquhart) lavoh, Bukat lavu, Baketan

\(^{39}\) Chou generally writes the vowel as o in this position in her Bintulu materials.

\(^{40}\) It is interesting to note that the vowel in Bintulu and Kajang: Lahanan is u; similarly, the Bintulu vowel in the set labeled ‘lips’ is i and the Kajang: Kejaman (Ray) vowel is e. This may suggest that there was a final h. If the vowels were truly word-final, the reflexes should be vowel-semivowel sequences.

\(^{41}\) Western Penan has two sources: Ray’s wordlist from Punan Nibong and Tuton Kaboy’s wordlist from Punan Silat. In the Ray wordlist u and o are commonly found while in the Kaboy wordlist ou and o are found. The sound that Kaboy transcribes as ou is probably very similar to what Mackenzie writes as eu.
lau, Bukitan (Urquhart) laoh, (Noeb) lauk, Punan Busang lavu, Punan Batu lavoh, Punan Bah lovu. (271)


In a final open syllable *u becomes aw in Melanau and Bintulu. In the Kajang languages the development is similar, but it varies from language to language. It is ow in Lahanan (Rousseau), aw in Kejaman-Sekapan (Strickland) and au/aw in the others. It is aw in Western and Eastern Penan. In the other languages *u generally continues as the plain vowel u or occasionally o.

*asu ‘dog’ Proto Melanau *asəw, Bintulu asew, Kajang: Lahanan (Rousseau) asow, Lahanan, Kejaman (Urquhart) asau, Sekapan (Urquhart), Tatau aso, Western Penan asu, aso, Eastern Penan asu, Ukit asu, Bukat asu, Baketan aho, Bukitan (Urquhart) atu, (Noeb) aoh, Punan Busang atu, Punan Batu atu, Punan Bah (Urquhart and Kaboy) atu, (Ling Roth) auh. (59)

*batu ‘stone’ Proto Melanau *batəw, Bintulu batəw, Kajang: Lahanan (Rousseau) batow, Lahanan (Urquhart) bataw, Sekapan and Kejaman bato, Western Penan bato, batou, Eastern Penan batew, Sihan batu, Bukat batu, Bukitan (Urquhart) batow, Punan Busang batu, Punan Bah batu. (4)

*talω ‘three’ Proto Melanau *tələw, Bintulu təw, Kajang: Lahanan (Rousseau) telow, Lahanan (Urquhart) telo, Sekapan-Kejaman teləw, Tatau telow, Sekapan (Urquhart) tilaw, Kejaman (Urquhart) telaw, Eastern Penan teləw, Sihan təlu, Bukat talu, Bukitan (Urquhart) tulu, Punan Batu tulu, Punan Bah (Urquhart) telu, Punan Bah (Ling Roth) tulu. (283)

*(d)udu (?) ‘grass’ Proto Melanau *dudəw, Bintulu (Chou) uRəw, (Blust) urəw, Kajang: Lahanan (Rousseau) urow, Eastern Penan ureu ‘general word for plants’, Sihan uru, Bukat uru. (518)

*abu ‘ashes’ Proto Melanau *abəw, Bintulu avəw, Kajang: Kejaman (Ray) avo, Western Penan (Ray) avo, (Kaboy) avou, Eastern Penan aveu, Sihan aʃu, Ukit (Ray) avo, Bukat avu, Baketan (Ray) ahō, Punan Bah avu. (226)

*taqu ‘right (hand)’ Proto Melanau *taʔaw, *taʔew, Bintulu taʔew, Kajang: Lahanan (Rousseau) taʔo, Western Penan menaʔow, Eastern Penan naʔau, Sihan taʔu, Bukat tau, Punan Busang taʔu, Punan Bah (Kaboy) taʔau. In sets that have a medial glottal stop the
reflexes of *u in Melanau, Eastern Penan and perhaps in Western Penan and Punan Bah are like the reflexes for *aw rather than the usual reflexes of *u. (184)

*anu ‘what’ Proto Melanau noun, Bintulu anəw, Kajang: Lahanan (Rousseau) and Tatau naw, Western Penan ino?, Eastern Penan inəw, Sihan nu, Bukat doanu, Punan Busong anənu, Punan Batu ano, Punan Bah nu. (335)

*bulu ‘feather, (body) hair’ Proto Melanau *buləw, Bintulu bulew, Kajang: Lahanan (Rousseau) bulow ‘hair of the head’, bulun ‘feather’, Western Penan bulun, Eastern Penan bulun, Sihan bulu ‘body hair’, bulun ‘feather’, Bukat bulu, Punan Bah (Kaboy) bulu. (49)

*kutu ‘lice’ Proto Melanau *kutəw, Bintulu kutew, Kajang: Lahanan (Rousseau) kutow, Kajaman (Ray) gutaw, Western Penan kutun, Eastern Penan gutu ‘head louse’, Sihan lutu, Ukit kutu, Bukat kutu, Baketan kutō, Punan Bah (Punan Rejang) (Ray) gutu. (126)

*qulu ‘head’ Proto Melanau *uləw, Bintulu uləw, Kajang: Kejaman (Urquhart) olau, Kejaman (Ray), Tatau ulaw, Sekapan-Kejaman (Strickland) uləw, Western Penan ulun, Eastern Penan ulun, Sihan ulu, Punan Bah Bulu ulun. (76)

The sequence *aw in final position develops as aw in Melanau, Bintulu, the Kajang languages, Western and Eastern Penan, and apparently in a few cases in Punan Bah. It becomes ow in Punan Busang and generally in Punan Bah (Kaboy). However, it becomes o in Sihan, Ukit, Bukat, Bukitan, Punan Batu, and in Punan Bah (Urquhart).

*takaw ‘steal’ Proto Melanau *tikaw, Bintulu meəkaw, Kajang: Kejaman (Ray) menyēkau, Western Penan (Ray) menakau, (Kaboy) menakou, Eastern Penan nekau, Baketan (Ray) nyiko, Punan Busang nyikow, Punan Bah menyikow. (163)

*qalejaw > *daw ‘day’ Proto Melanau *ləw, Bintulu dəw, Kajang: Lahanan (Rousseau) dəw, Sekapan (Urquhart) dau, Lahanan, Kejaman (Urquhart), Tatau lau, Kejaman-Sekapan (Strickland) żəw, Western Penan dau, Eastern Penan dau, Sihan alo?, mata-alo ‘sun’, Ukit aloh, Bukat halo, Bukitan (Urquhart) alo, Punan Busang lou, Punan Batu alo, Punan Bah (Urquhart and Ling Roth) elo, (Kaboy) elo. (19)

*kaRaw > *kayaw ‘scratch’ Melanau: Balingian məgayaw, Bintulu Chou gəmazaw, (Blust) megazaw, Kajang: Kejaman (Ray) umanyaw, Sihan gemayō, Ukit majo, Baketan maio, Punan Bah (Punan Rejang) (Ray) gamaio. (122)

*i-babaw ‘above’ Proto Melanau *(bas) baw, Bintulu əw, Kajang: Kejaman-Sekapan (Strickland) baw, nəbaw ‘climb into’, Punan Bah (Urquhart) mobau, (Kaboy) nivou;
*baw* ‘high’ Lahanan, Sekapan, Kejaman (Urquhart), Tatau mebau, Eastern Penan bau, Punan Busong ovou, Punan Batu fu, Punan Bah (Kaboy) ma’bau. (522, 298)

*balabaw* ‘rat’ Proto Melanau *bəlabaw*, Kajang: Lahanan (Rousseau) blavow, Kejaman (Ray) blavau, Pakatan (Ling Roth) belauo, Punan Bah (Punan Rejang) (Ray) glavau, (Ling Roth) blabau. (58)

*ayaw* ‘enemy’ Kajang: Lahanan (Urquhart) anyau, Kejaman (Urquhart) ayau, Western Penan ayaw, Eastern Penan ayaw, Punan Busang penganyou, Punan Batu nganyoh, Punan Bah nganyo, nganyou. (407)

Thus, we observe that the final high vowels *i* and *u* are diphthongized to /əy/ and /əw/ in Melanau, Bintulu, the Kajang languages and the Penan languages, whereas they continue generally as /i/ and /u/ in the other languages. By contrast, the diphthongs *ay* and *aw* continue as /əy/ and /əw/ in Melanau, Bintulu, the Kajang languages, and in Eastern Penan (and in some cases in Western Penan), whereas they become /e/ and /o/ in the other languages. The high vowels and diphthongs develop one way in Melanau, Bintulu, the Kajang languages, and the Penan languages whereas they develop in another way in Sihan, Ukit, Bukat, Bukitan, Punan Busang, Punan Batu, and Punan Bah.

In general, in final position in the Melanau-Bintulu-Kajang-Penan group high vowels as well as vowel-semivowel sequences develop as *diphthongs* whereas in the Sihan-Ukit-Bukat-Bukitan-Punan Batu-Punan Bah group high vowels as well as vowel-semivowel sequences develop as *single vowels*. This is a key innovation with pervasive implications. It is of great importance in sub-grouping the languages of Central Sarawak.

**Vocalic changes: *ə* and *a**

The central vowel *ə* occurs only in closed syllables, where it continues as /ə/ in Melanau and Bintulu. In the Kajang languages it generally is /ə/ in Lahanan (Rousseau) and Kejaman-Sekapan (Strickland), occasionally /e/ (schwa?) in Lahanan (Urquhart) and Kejaman (Urquhart), often /ā/ (schwa?) in Kejaman (Ray), and elsewhere it becomes /a/. In Eastern Penan it continues as /ə/ and in Western Penan it becomes /a/. It is not possible to be certain whether the /a/ in some of the transcriptions represents a central vowel pronunciation or whether it truly is a low open vowel. In Bukat it continues as /ə/. In Sihan, Punan Busang, and Punan Bah (Kaboy) it becomes /o/, and in Ukit, Bukitan, Punan Batu, and in Punan Bah (Urquhart and Ling Roth) it becomes /o/ or /u/.

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<th>Sihan</th>
<th>Ukit, Bukat, Bukitan</th>
<th>Punan Busang, Punan Batu</th>
<th>Punan Bah</th>
</tr>
</thead>
<tbody>
<tr>
<td>aC</td>
<td>ā</td>
<td>ā</td>
<td>ā, ā, a</td>
<td>a, ā</td>
<td>o</td>
<td>o/u, o, o/u</td>
<td>o, o/u</td>
<td>o/u, o, o/u</td>
</tr>
<tr>
<td>aC</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a, a</td>
<td>o</td>
<td>o/u, o, o/u</td>
<td>o, o/u</td>
<td>o/u, o, o/u</td>
</tr>
<tr>
<td>a#</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>ā, ah/ən</td>
<td>o</td>
<td>o, o, o</td>
<td>o, o, o</td>
<td>o, o, o</td>
</tr>
</tbody>
</table>

64
*nipan > *lipon ‘teeth’ Proto Melanau *nipon, Bintulu nipen, Kajang: Lahanan (Rousseau) nipon, Lahanan, Kejaman (Urquhart) nyipen, Sekapan (Urquhart) nipan, Kejaman (Ray) nyipän, Western Penan jipän, Eastern Penan jipen, Sihan ñipo ‘incisor’, Buketan nyipö, Punan Batu nyipen, Punan Bah (Urquhart) nyipe, (Ling Roth) nyipan. (82)

*gatap ‘bite’ Proto Melanau *kiRap, Kajang: Lahanan (Rousseau) teip, Kejaman (Ray) mëtëp, Western Penan (Ray) ngetëp, Eastern Penan ngetep ‘bite off’. (147)

*ikat ‘tie’ Melanau: Balingian ikat, Bintulu (Chou) mikat, Bintulu (Blust) miket, Kajang: Lahanan (Rousseau) mikat, Western Penan memikat, Eastern Penan telikut, Sihan majiät (cognate?), Punan Bah mejot (cognate?). (159)

*hajok > *m-adok ‘smell, sniff’ Proto Melanau *madok, Kajang: Lahanan (Rousseau) ñ-arek, Lahanan, Sekapan (Urquhart) marak, Kejaman (Urquhart) mëgarak, Western Penan medok ‘smell’, marak ‘kiss’, Eastern Penan marek, Sihan madok, Ukit marok, Bukat marok, Bukitan arok, Punan Busong marok ‘kiss’, Punan Batu marok, Punan Bah (Urquhart) mederk, (Kaboy) medok. (119)

*pajas > *padas ‘painful, sick’ Proto Melanau *pådis or *pådih ‘painful’, Melanau: Matu padas’hot’, Bintulu (Chou) padas, (Blust) pedës, Pakatan (Ling Roth) maparo, Punan Busong paroh, Punan Bah pero. (435)

*dalam ‘inside’ Melanau: Balingian daläm, Kajang: Kejaman-Sekapan (Strickland) ałəm, Western Penan (Kaboy) dalom, (primer) lem, Eastern Penan lem, Sihan lalom, Punan Busong lalom, Punan Bah ta’lalom. (510)

*alam ‘night’ Proto Melanau *malom, Bintulu kəlom, Kajang: Lahanan (Urquhart) malem, Sekapan, Kejaman malam, Eastern Penan malem ‘yesterday’ but merem ‘night’, Sihan malöm, Ukit malom, Bukat malom, Baketan (Ray) maläm, Bukitan (Urquhart) malum, Punan Batu malum, Punan Bah (Urquhart) malum, (Punan Dyaks) (Ling Roth) malun. (22)

*m-asam ‘sour’ Bintulu (Ling Roth) mesam, Kajang: Kejaman (Ray) çham, Western Penan meçhäm, Eastern Penan mesem, Ukit masom, Baketan masäm, Bukitan (Noeb) masuom, Punan Bah (Punan Rejang) (Ray) moöm. (239)

*anəm ‘six’ Melanau: Mukah nəm, Kajang: Kejaman-Sekapan (Strickland), Tatau nam, Lahanan, Sekapan, Kejaman (Urquhart) anum, Eastern Penan nem, Ukit (Urquhart) anum, Bukat anəm, Bukitan (Urquhart) anum, Punan Batu anum, Punan Bah (Urquhart) anum, (Ling Roth) num. (286)

*ma-qitam ‘black’ Melanau: Balingian mətəm, Bintulu (Chou) mitəm, Bintulu (Blust) miten, Kajang: Tatau metəm, Eastern Penan narəm, Sihan urəm, Bukitan urum, Punan Busang urum, Punan Batu terum, Punan Bah (Urquhart) mungurum, (Kaboy) mengurum, (Ling Roth) murum. (327)

The low vowel *a occurs in both open and closed syllables. In closed syllables it becomes a in all the languages.

In open syllables in Melanau, Bintulu, and the Kajang languages it continues as a. It is usually recorded as ah in Kejaman-Sekapan (Strickland) and occasionally as ah in Lahanan, Sekapan, and Kejaman (Urquhart). It is usually recorded as ā in Kejaman (Ray); elsewhere it is a. In Western Penan it is recorded as ā, and in Eastern Penan it generally continues as a, but before the suffix -n it becomes e. It becomes a in Bukat, o in Sihan, Ukit, Bukitan, Punan Busang, Punan Batu, and Punan Bah.

*tulɑŋ ‘bone’ Proto Melanau *tulɑŋ, Bintulu tulɑŋ, Kajang: Lahanan (Rousseau) tulwaŋ, Lahanan, Kejaman (Urquhart) tolɑŋ, Kejaman (Ray) tolɑŋ, Sekapan (Urquhart) todia (cognate ?), Western Penan tulɑŋ, Eastern Penan tulɑŋ, Sihan tylɑŋ, Ukit tolɑŋ, Bukat tɔlaŋ, Bukitan tolɑŋ, Punan Busang tolɑŋ, Punan Batu tolɑŋ, Punan Bah (Urquhart and Kaboy) tolɑŋ, (Ling Roth) tulɑŋ. (70)

*ŋəjan > *ŋ-ədan ‘name’ Proto Melanau *ŋədan, Bintulu ɲaran, Kajang: Lahanan (Rousseau) aran, Kejaman (Ray) ərə, Western Penan ngərən, Eastern Penan ngəran, Sihan ɲaro (a rather thə in Sihan and Baketan), Ukit aran, Bukat aran, Baketan ngaro, Bukitan (Noeb) ngaram ko ‘your name’, Punan Bah (Punan Rejang) (Ray) ngəran. (260)

*anak ‘child’ Proto Melanau *anak, Bintulu anak, Kajang: Lahanan (Rousseau and Urquhart), Kejaman-Sekapan (Strickland) anak, Sekapan (Urquhart) aniak, Kejaman (Urquhart) anək, Kejaman (Ray) anə, Western Penan anak, Eastern Penan anak, Ukit anak, Bukat anak, Baketan anak, Punan Batu anak, Punan Bah (Urquhart) enak, (Ling Roth) anak. (256)

*uəzan ‘rain’ Proto Melanau *uəjan, Bintulu uəjan, Kajang: Lahanan (Rousseau and Urquhart), Kejaman (Ray), Tatau uəjan, Sekapan, Kejaman (Urquhart) həjan, Sihan uəjan, Punan Batu uəjan, Punan Bah usan. (14)
*ma-kapal* ‘thick’ Proto Melanau *kapan, Bintulu (Chou) bəkapan, Bintulu (Blust) mekapan, Kajang: Lahanan (Rousseau) kapan, Kejaman (Ray) kapən, Western Penan (Ray) kapan, (Kaboy) mekapan, Eastern Penan kapan, Sihan kapan, Ukit kapan, Bukat kapan, Baketan kəpən, Punan Busang kapan, Punan Bah mekəpən. (321)

*utaq* ‘vomit’ Proto Melanau *putaʔ, Bintulu putuʔ, Kajang: Lahanan (Rousseau) nutaʔ, Eastern Penan luta, Sihan nutaʔ, Bukat nutaʔ. (125)

*dilaq* ‘tongue’ Proto Melanau *jelaʔ, Bintulu jalaʔ, Kajang: Lahanan (Rousseau) jillaʔ, Lahanan, Kejaman (Urquhart) jila, Kejaman (Ray) gyela, Sekapan (Urquhart) jidata, Western Penan (Ray) jēlē, (Kaboy) jela, Eastern Penan jela’, Sihan jalo, Ukit jala, Bukat jalaʔ, Bukitan jela, Punan Busong jala, Punan Batu jala, Punan Bah (Urquhart and Kaboy) jela, (Ling Roth) jila. (83)

*baqbaq* ‘mouth’ Proto Melanau *babaʔ, Kajang: Lahanan (Rousseau) baʔ, Lahanan, Sekapan, Kejaman (Urquhart) bah, Kejaman (Ray) bă, Eastern Penan uba ‘opening’, Sihan baʃa, Ukit bava, Bukat bava, Bukitan bawa, Punan Bah (Urquhart) bova, (Punan Dyaks) (Ling Roth) bubah. (81)

*daRaq* ‘blood’ Proto Melanau *daRaʔ, Bintulu (Chou) Raak, (Blust) raʔ, Kajang: Lahanan (Rousseau) laʔa, Lahanan (Urquhart) dah, Sekapan-Kejaman (Urquhart) dah, Kejaman (Ray) də, Western Penan (Ray) dō, (Kaboy) de, Eastern Penan dahə, Sihan daʔ, Ukit (Ray) daa, (Urquhart) dah, Bukat daʔ, Baketan (Ray) da, Bukitan (Urquhart) dah, Punan Busang da, Punan Batu dah, Punan Bah (Urquhart and Kaboy) da, (Ling Roth) dah, (Punan Rajang) (Ray) daʔ. (68)

*buaq* ‘fruit’ Proto Melanau *buaʔ, Kajang: Lahanan (Rousseau) bugwa, Kejaman (Ray) bēgwa, Kejaman-Sekapan (Strickland) buʔan, Western Penan (Ray) buō, (Kaboy) bue’, Eastern Penan bua, Sihan buaʔ, Ukit bua, Bukat buaʔ, Baketan buă, Punan Busang bua, Punan Bah (Kaboy) bua’, (Ling Roth) buah. (35)

*mata* ‘eye’ Proto Melanau *mata, Bintulu mata, Kajang: Lahanan (Rousseau), Kejaman (Urquhart) mata, Lahanan (Urquhart) matəh, Kejaman (Ray) matə, Western Penan (Ray) matən, (Kaboy) matan, Eastern Penan maten, Sihan mato, Ukit mato, mater, Bukat matə, Bukitan mato, Punan Busong matan, Punan Batu matan, Punan Bah mato. (88)

*taliŋŋ* ‘ear’ Proto Melanau *(tə)liŋŋa, Bintulu taliŋŋa, Kajang: Kejaman (Ray) telinga, Western Penan (Ray) kēlingən, (Kaboy) engən, Eastern Penan kelingen, Baketan tulingo. (87)
*duha > *dua ‘two’ Proto Melanau *duah, Bintulu (Chou) ɓa, (Blust) ba, Kajang: Lahanan (Rousseau) lugwa, Lahanan, Sekapan, Kejaman (Urquhart) degua, Kejaman-Sekapan (Strickland) daqwa(h), Tatu duah, Western Penan keruah ‘second’, Eastern Penan duah, Sihan du, Ukit du, Bukat du, Beketan (Sellato) lugo, Bukitan duogh, Punan Batu duo, Punan Bah duo. (282)

*lima ‘five’ Melanau: Mukah lima, Kajang: Sekapan-Kejaman (Strickland) limah, Sekapan (Urquhart), Tatu lima, Eastern Penan lemah, Sihan limo, Ukit limoh, Bukat (Sellato) lime, Bukitan limoh, Punan Batu limoh, Punan Bah (Urquhart) limo, (Ling Roth) limoh. (285)

*t-ina ‘mother’ Proto Melanau *tina, Kanowit ina, Bintulu tina, Kajang: Lahanan (Rousseau) hina|m, Lahanan, Sekapan, Kejaman (Urquhart) ina, Kejaman (Ray) inän, Western Penan tinen, Eastern Penan tinen, Sihan ino, Ukit inyuk, Bukat ina, Bukitan ina, Punan Batu ina, Punan Bah (Urquhart) inek, (Ling Roth) ini. (249)

*sawa ‘spouse, wife’ Proto Melanau *sawa, Bintulu saba, Kajang: Lahanan (Rousseau) sawa|k, Kejaman (Ray) saqwa, Sihan awo, Punan Bah (Ling Roth) pawoh. (251)

Thus, in Melanau, Bintulu, the Kajang languages, and the Penan languages developments of */a (in closed syllables) and of */a in open syllables remained distinct, but in the other languages they merged, generally as o but in Bukat as a.

Summary of sound changes

As seen in the preceding sections, there are a number of developments resulting from various sound changes that are shared by two or more languages or groups of languages but not by all. These developments exemplify several kinds of phonological processes:

1. Preservation of *R in medial position in Melanau and Bintulu; loss in the other languages.
2. Preservation of *s in final position in Melanau and Bintulu; loss in the other languages.
3. Hardening of the semivowel *w to b in Bintulu and to gw in the Kajang languages and of the semivowel *y to z in Bintulu.
4. Split of *b into w and b in Bintulu, the Kajang languages and the Penan languages.
5. Split of *d into r and d in Bintulu and the Penan languages.
6. Preservation of evidence for final *b, *d, *g in Melanau and Bintulu; devoicing of these final voiced stops in the other languages.

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42 However, *R is apparently preserved in final position in a couple of examples in Bukitan, sets 51 and 92.
43 However, *s is preserved as h in Punan Busang in three examples, sets 129, 174, and 314.
44 The phonetically supplied medial w is also hardened to g in Bukitan in one example, set 282.
45 The medial semivowel *y is hardened to j inconsistently in Ukit, Bukat, and Bukitan in three examples, 28, 122, and 295.
46 Weak evidence for a split reflex of medial *b also appears in Ling Roth’s Punan Dyaks wordlist that apparently represents a variety of Punan Bah.
47 There is also evidence for a split reflex of medial *d in Punan Batu. The more common reflex is r, but the reflex s is found in four sets, 15, 132, 198, 328.
7. Diphthongization of the high vowels, *i and *u in Melanau, Bintulu, the Kajang languages, and the Penan languages.

8. Monophthongization of *ay and *aw to e and o in Sihan, Ukit, Bukat, Bukitan, Punan Busang, Punan Batu, and Punan Bah; retention as a vowel-semivowel sequence in the other languages.

9. Merger of *a in closed syllables and *a# as o in Bukat and as o in Sihan, Ukit, Bukitan, Punan Busang, Punan Batu, and Punan Bah; retention of the contrast as o and a in the other languages.

From the following chart it is evident that these sound changes divide the languages of Central Sarawak into two groups. In this chart the order of the sound changes has been altered so as to show the groupings more clearly. Changes 7, 4, 5 and 3 affected Melanau, Bintulu, the Kajang languages, and the Penan languages especially. Change 5 did not affect Penan. Change 3 is the least general evidence of this group since it affected only Bintulu and Penan.

Changes 8, 9, 6, 1, and 2 affected Sihan, Ukit, Bukat, Bukitan, Punan Busang, Punan Batu, and Punan Bah. Of this group changes 8 and 9 affected all of these languages. Changes 6, 1 and 2, all weakening/devoicing processes, affected Kajang and Penan as well.

On the basis of these sound changes we conclude that Melanau, Bintulu, Kajang, and Penan form one group, and Sihan, Ukit, Bukat, Bukitan, Punan Busang, Punan Batu, and Punan Bah form another. Because Kajang and Penan participated in changes 6, 1, and 2 of the latter group, they form something of a link between the two groups.

<table>
<thead>
<tr>
<th></th>
<th>Melanau</th>
<th>Bintulu</th>
<th>Kajang</th>
<th>W &amp; E</th>
<th>Sihan</th>
<th>Ukit, Bukat, Bukitan</th>
<th>Punan Busang, Punan Batu</th>
<th>Punan Bah</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.*i, *u</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>(+)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.*b-</td>
<td>(+)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>(+)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.*d-</td>
<td>(+)</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(+)</td>
</tr>
<tr>
<td>3.*w-, -*y-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td>(+)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.*ay, *aw</td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>9. *aC, *a#</td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>6.*b#, *d#, *g#</td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>1.*R-</td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>2.*s#</td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td>(+)</td>
</tr>
</tbody>
</table>

48 In final position *i is diphthongized in Punan Bah, generally in Kaboy’s wordlist and occasionally in Urquhart’s.
49 In Punan Bah *ay is retained as ay in one example and *aw is retained as aw in a few.
6. Boundedness of this study

The languages of this study seem clearly to be rather closely related, some pairs, more so than others. So, the question naturally occurs whether there are other languages that should be compared with those included in this study. In other words, are the languages of this group a coherent cluster or simply part of a larger string or network of related languages? A definitive answer to that question lies outside the scope of this study. However, the following preliminary investigation suggests that neighboring language groupings are not especially related to this grouping in any clear way. In other words, it suggests that the languages under attention do indeed form a coherent cluster.

Lexical comparisons

If we were to compare this group of languages with neighboring groupings, some likely candidates would be the Kenyah group, the Kayan group, the Lower Baram languages, and the Punan Kelai languages such as Aoheng, Seputan, and Kereho. A preliminary comparison of Melanau and Eastern Penan with Kenyah, Berawan (Lower Baram), Punan Kelai, and Kayan, undertaken here, shows considerable lexical differentiation. Cf. the following lexical sets in which quite distinct forms in the various languages represent a single meaning:

*taqun, *duman ‘year’ Melanau ta?un, Eastern Penan ta’un, Kenyah uman, Berawan taun, Punan Kelai te’on, Kayan duman. (20)
*balak, *pu(n)ti ‘banana’ Melanau balak, Eastern Penan balak, Kenyah pati, Kiput (Lower Baram) puttay, Kayan (Blust) pattey, (Southwell) puté’. (36)
*kulit, *anit (?) ‘skin’ Melanau kulit, Eastern Penan kulit, Kenyah anit, Berawan kulai?, Punan Kelai laës, Kayan anit. (66)
*likud, *laqun (?) ‘back’ Melanau likut, Eastern Penan likot, Kenyah likut, Berawan likon, Punan Kelai maë ‘èng, Kayan la’ung. (99)
*bituq, *bitaŋ, *kænuhay (?), *kelawing (?) ‘star’ Melanau bitaŋ, Eastern Penan kenyuhai, Kenyah betu?en, Berawan təkəbin, Punan Kelai tel’an, Kayan kelawing. (10)

50 Mackenzie in the Introduction to his Dictionary of Eastern Penan states, “Eastern Penan is closely related to Western Penan, spoken in the Silat River drainage and elsewhere. It is also (somewhat less) closely related to Kenyah… These two latter languages differ to a modest degree from Eastern Penan in their phonology, but the high proportion of distinct vocabulary that distinguishes the three languages render them, to a large extent, mutually unintelligible.”

**ikan**, **saləwaj (?)**, **atuk (?)**, **puta (?)**, **masik (?)** ‘fish’ Melanau ikan, Eastern Penan seluɑŋ, Kenyah atuk, Berawan puta, Punan Kelai atuk, Kayan masik. (53)

**kapi (?)**, **bəzu (?)**, **baRa, ɭaqip (?)** ‘shoulder’ Melanau kapəy, Eastern Penan pesun, Kenyah liʔip, Berawan bikh, Punan Kelai le’ip, Kayan la’ip. (100)

**Phonological comparisons**

One of the characteristic and frequent developments of Melanau, Bintulu, Kajang, and Penan is the diphthonization of final high vowels, i.e., *i#* > /ye/, *u#* > /we/. Of the four neighboring groupings only Punan Kelai shows this development. The other three groupings retain the single-state vowels.

**tali** ‘rope’ Proto Melanau *talɵy, Bintulu taley, Kajang: Lahanan (Rousseau) talɵy, Kejaman (Ray) talei, Western Penan tali, Eastern Penan talei, Sihan tali, Bukat trari (?), Baketan (Ray) tali, Kenyah tali, Berawan taleh, Punan Kelai tlaə, Kayan talé’. (206)

**kami** ‘we (exclusive)’ Proto Melanau *kamaŋy, Kajang: Lahanan, Sekapan, Kejaman (Urquhart) kami, Kejaman-Sekapan (Strickland) kamaŋy, Western Penan amę’, Eastern Penan amę, Kenyah amęʔ, Berawan kameh, Punan Kelai maʔə, Kayan kamé’. (342)

**asu** ‘dog’ Proto Melanau *asəw, Bintulu asew, Kajang: Lahanan (Rousseau) asow, Lahanan, Kejaman (Urquhart) asau, Sekapan (Urquhart), Tatau aso, Western Penan asu, aso, Eastern Penan asu, Ukit asu, Bukat asu, Baketan ahũh, Bukitan (Urquhart) au, (Noeb) aoh, Punan Busang ahu, Punan Batu ahu, Punan Bah (Urquhart and Kaboy) au, (Ling Roth) auh, Kenyah asu, Berawan acoh, Punan Kelai asaw, Kayan aso’. (59)

**təlu** ‘three’ Proto Melanau *təlaw, Bintulu ləw, Kajang: Lahanan (Rousseau) telow, Lahanan (Urquhart) telo, Sekapan-Kejaman (Strickland) təlaw, Tatau telew, Sekapan (Urquhart) tilaw, Kejaman (Urquhart) telaw, Eastern Penan telow, Sihan təlu, Bukat telu, Bukitan (Urquhart) telu, Punan Batu tulu, Punan Bah (Urquhart) telu, Punan Batu (Ling Roth) tulu, Kenyah telu, Berawan təloh, Punan Kelai atlaw, Kayan telo’. (283)

Melanau, Bintulu, (some) Kajang, and Penan maintain as distinct the developments of *əC and *a#. However, Sihan, Ukit/Bukat/Bukitan, Punan Busang/Batu, and Punan Bah merge them, generally as the vowel o. Of the four neighboring groupings Kenyah and Kayan maintain the distinction, but Berawan and Punan Kelai seem to merge them, as o (Berawan) or a (Punan Kelai).

**hajak >** **m-adək** ‘smell, sniff’ Proto Melanau *madək, Kajang: Lahanan (Rousseau) ḥ-arek, Lahanan, Sekapan (Urquhart) marak, Kejaman (Urquhart) mengarak, Western Penan medok ‘smell’, marak ‘kiss’, Eastern Penan marek, Sihan madok, Ukit marok,
Bukat marök, Bukitan arok, Punan Busang marok ‘kiss’, Punan Batu marok, Punan Bah (Urquhart) mederk, (Kaboy) medok, Kenyah m-adek, Berawan m|arə?, Kayan arek.

(119)


*dədəm ‘dark, night’ (Proto North Sarawak) (Blust) Kajang: Lahanan (Rousseau) lərəm, Lahanan, Kejaman (Urquhart) derəm, Kejaman (Ray) dəɾəm, Sekapan (Urquhart) dəm, Western Penan (Ray) dəməm, Eastern Penan merəm, Berawan dicum, Punan Kelai dəm, Kayan lədem. (22)

*məta ‘eye’ Proto Melanau *mata, Bintulu mata, Kajang: Lahanan (Rousseau), Kejaman (Urquhart) mata, Lahanan (Urquhart) matah, Kejaman (Ray) matə, Western Penan (Ray) matən, (Kaboy) matən, Eastern Penan maten, Sihan məto, Ukit məto, mater, Bukat mata, Bukitan mata, Punan Busang mata, Punan Batu mata, Punan Bah məto, Kenyah mata, Berawan matəh, Punan Kelai mtən, Kayan mata’. (88)

*tə-məta ‘father’ Proto Melanau *tama, *ama, Bintulu tama, Kajang: Lahanan (Rousseau) ama?, Lahanan, Kejaman (Urquhart) amah, Kejaman (Ray) amān, Western Penan (Ray) tamēn, (Kaboy) tamən, (primer) tamen, Eastern Penan tamen, Sihan ama?, Ukit åmon, Bukat ama?, Bukitan ama, Punan Busang ma, Punan Batu amah, Punan Bah (Urquhart) omek, (Ling Roth) umak, Kenyah tamen (a > e/-n), Berawan tanəh, Punan Kelai mam, Kayan taman. (248)

In Bintulu both semivowels are hardened intervocalically, i.e., *VwV > b, *VyV > z. Ukit/Bukat/Bukitan undergo a similar hardening, i.e., *VwV > g and *VyV > j. In Kajang intervocalic *w is hardened, i.e., *VwV > gw.

Of the four neighboring groupings here under consideration medial semivowels are hardened in Punan Kelai, i.e., *VwV > g, *VyV > j.

In Berawan also medial semivowels are hardened, i.e., *VwV > b, *VyV > j. Furthermore, in Berawan medial fricatives undergo similar hardening, i.e., *VRV > k, *VsV > c.

*sawa ‘spouse, wife’ Proto Melanau *sawa, Bintulu saba, Kajang: Lahanan (Rousseau) sawa|k, Kejaman (Ray) sagwā, Sihan awo, Punan Bah (Ling Roth) pawoh, Berawan bi?eh, Belait sabah, sabeh, Punan Kelai segun, Kayan hawan. (251)

*tə-wə ‘laugh’ Proto Melanau *tətawa, Bintulu betawa, Kenyah petawa, Berawan tabeh. (176)

*duha > *duə ‘two’ Proto Melanau *duah, Bintulu (Chou) ba, (Blust) ba, Kajang: Lahanan (Rousseau) lugwa, Lahanan, Sekapan, Kejaman (Urquhart) degua, Kejaman-Sekapan
(Strickland) dāqwa(h), Tatau dua, Western Penan keruah ‘second’, Eastern Penan duah, Sihan duô, Ukit duo, Bukat dua, Beketan (Sellato) lugo, Bukitan duôgh, Punan Batu dua, Punan Bah dua, Kenyah dua, Berawan labih, Punan Kelai ago’, Kayan dua’. (282)

**kayu** ‘tree, wood’ Proto Melanau *kayo/w, Bintulu kazo/w, Kajang: Sekapan kayu, Kejaman kayau, Western Penan kayu, Eastern Penan kayeu, Sihan kayu, Ukit kiau, Bukat kiou, Baketan kajó, Bukitan pokaju, Punan Batu kayu, Punan Bah kayu, Kenyah kayu, Berawan kai:uh, Punan Kelai jaw, Kayan kayo’. (28, 229)

**Raya** ‘big’ Proto Melanau *ayaŋ, Bintulu azen, azeh, Sekapan (Urquhart), Kejaman (Urquhart, Ray) ada (cognate?), Western Penan (Ray) jau, ja-au (cognate?), Eastern Penan ja’au (cognate?), Sihan ayo?, Ukit ajo, Bukat ajö?, Punan Busang ayo, Punan Bah (Urquhart and Kaboy) ayo, (Ling Roth) aioh, Kenyah bio?, Berawan kij:iuh, Kayan aya’. (295)

*kaRaw > *kayaw ‘scratch’ Melanau: Balingian mɔgayaw, Bintulu (Chou) ǥomazaw, (Blust) məgazaw, Kajang: Kejaman (Ray) umanyau, Sihan ǥemayō, Ukit majo, Baketan maio, Punan Bah (Punan Rejang) (Ray) ǥamaiño Kenyah ǥemayaw, Punan Kelai enjiu, Kayan kamau. (122)

**baRas** ‘husked rice’ Melanau (Ling Roth) baah, Bintulu bera, Kajang: Kejaman (Ray) ba, Baketan (Ray) baa, (Punan) (Noeb) ba, Punan Batu bah, Berawan bək:ah, Kayan bahah. (216)

*ma-baRat* ‘heavy’, Bintulu vat, Sekapan-Kejaman (Strickland) mañat, Ukit mawat, Bukat mawat, Bukitan mawat, Punan Busang muvat ‘weight’, Punan Batu mafat, Punan Bah (Urquhart) movat, (Kaboy) kovat ‘weight’; *baRat* Proto Melanau *baRat, Kajang: Lahanan (Rousseau) baat, Lahanan (Urquhart) bat, Sekapan-Kejaman (Urquhart) bat Western Penan baat, Eastern Penan bahat, Kenyah baat, Berawan bəkkiʔ, Punan Kelai bahat, Kayan bahat (313)

**asu** ‘dog’ Proto Melanau *asəw, Bintulu asew, Kajang: Lahanan (Rousseau) asow, Lahanan, Kejaman (Urquhart) asau, Sekapan (Urquhart), Tatau aso, Western Penan asu, aso, Eastern Penan aseu, Ukit asu, Bukat asu, Baketan ahiu, Bukitan (Urquhart) au, (Noeb) aoh, Punan Busang ahu, Punan Batu ahu, Punan Bah (Urquhart and Kaboy) au, (Ling Roth) auh, Kenyah asu, Berawan acoh, Punan Kelai asaw, Kayan aso’. (59)

**m-asak** ‘cook’ Proto Melanau *pisak, Bintulu masak, Western Penan mesak, Eastern Penan kesak, Bukat isak, Kenyah əsək, Berawan pacəʔ, Kayan sak ‘cooked’. (222)

Like many of the languages included in this study (apart from Melanau and Bintulu) these neighboring languages weaken fricatives in final position. Like most, Kenyah loses the final
fricatives completely. In Kayan both *R and *s become h. In Berawan *R# > ø, but *s > h. In this respect Punan Kelai was apparently the most conservative of these neighboring languages in that *R > h, but *s is preserved unchanged.

*タル ‘egg’ Proto Melanau *タル, Bintulu タル, Kajang: Lahanan (Rousseau) タル, Kejaman (Ray) テル, Western Penan ゼル, elu, ilo, Eastern Penan イロ, Sihan タル, Ukit タル, Bukat タロ, Baketan (Ray) イロ, Punan Busang タル, Punan Bah タル, Kenyah タル, Berawan タル, Punan Kelai クル, Kayan タル. (51)

*ビビ ‘lips’ Melanau: Mukah (Blust) ビビ, Bintulu (Ling Roth) ビビ, Kajang: Kejaman (Ray) ベービ, Western Penan ビビ, Eastern Penan ビベ, Kenyah ビベ, Berawan ビ, Kayan ビビ. (80)

*アカ ‘vine, creeper’ Proto Melanau *アカ ‘root’, Bintulu (Blust) バケ, Kajang: Kejaman (Ray) ラカ, Western Penan カヤ, Eastern Penan カ, Sihan カ, Ukit カ, Buketan カ, Punan Bah (Punan Rejang) カ, Berawan カ, Punan Kelai カ. (32)

*ダ ducks Proto North Sarawak (Blust) ‘woman’ Bintulu (Chou) ラフ, (Blust) ラフ, Western Penan (Ray) ド, (Kaboy) レフ, Eastern Penan レフ, Sihan オ, Ukit オ, Buketan オフ, Punan Busang オフ, Punan Batu オフ, Punan Bah オフ, Kenyah ルト, Berawan ディ, Punan Kelai マド, Kayan ル. (253)

*タンジ ‘cry’ Proto Melanau *ナンジ, Bintulu (Chou) マジ, (Blust) メジ, Kajang: Kejaman (Ray) ナジ, (Rousseau) ナジ, Western Penan (Ray) マンゴ, (Kaboy) マンゴ, Eastern Penan マンゴ, Ukit ナジ, Buketan ナジ, Punan Busang ナジ, Punan Bah ナジ, (Kaboy) ナジ, (Punan Rejang) ナジ, Kenyah ナジ, Berawan ナジ, Punan Kelai ナジ, Kayan ナジ. (174)

*nipis (PMP-Blust) ‘thin’ Proto Melanau *ディピ, Melanau: Oya, Mukah リピ, Balingian リピ, Bintulu (Chou) リペ, (Blust) メリピ, Kajang: Lahanan (Rousseau) ピピ, Kejaman (Ray) リピ, Western Penan ピピ, Eastern Penan ナピ, Kenyah ピピ, Berawan リピ, Punan Kelai ピ, Kayan ニピ. (322)

In conclusion, although we can note that one or another of the neighboring groupings does show phonological developments in common with some of the languages of this study, it does not appear at this stage that there is any special relationship between any of the neighboring groups and the original groupings considered in this study.

51 However, there is evidence that some of the other Lower Baram languages preserve final *R as r. Cf. Berawan ビ, Belait ビィ ‘lips’, Berawan (Batu Belah) アリ, Lelak アポ ‘lime’.

52 In the first example the development in Punan Kelai is オ rather than ハ.
Appendix A: Sources of the language data used in this study

Bintulu
Blust, Robert. Austronesian Basic Vocabulary Database: Bintulu
Chou, Grace. A Reconstruction of Proto-Melanau

Bukat
Rousseau, Jerome. Austronesian Basic Vocabulary Database: Bukat
Thambiah, Shanti. Culture as Adaptation: Change among the Bhuket of Sarawak, Malaysia.

Bukitan
Ling Roth, Henry. Pakatan wordlist
Noeb, Jonas. unpublished wordlist for Bukitan/Baketan
Ray, Sidney H. The Languages of Borneo
Sandin, Benedict. The Living Legends: Borneans telling their tales
Urquhart, Ian A.N. Some Interior Dialects

Kejaman
Ray, Sidney H. The Languages of Borneo
Strickland, S.S. Materials for the Study of Kejaman-Sekapan Oral Tradition
Urquhart, Ian A.N. Some Interior Dialects

Lahanan
Rousseau, Jerome. Austronesian Basic Vocabulary Database: Lahanan
Urquhart, Ian A.N. Some Interior Dialects

Melanau
Ajid Che Kob. Variations in Melanau: Phonology and Lexicals.
Blust, Robert. Sketches of the morphology and phonology of Bornean languages 2: Mukah (Melanau)
Blust, Robert. Austronesian Basic Vocabulary Database: Mukah Melanau
Chou, Grace. A Reconstruction of Proto-Melanau
Ling Roth, Henry. Milanau wordlist
Penan
Kaboy, Tuton. Punan Vocabularies (Punan Silat)
Ling Roth, Henry. Punan wordlist
Mackenzie, Ian. Dictionary of Eastern Penan
Noeb, Jonas. unpublished wordlist for Penan
Primers: Surat Jah Pekalei Purung, Surat Pekalai Purung éh keruah néh and Surat Pekalai Purung éh kepat néh
Ray, Sidney H. The Languages of Borneo
Sandin, Benedict. The Living Legends: Borneans telling their tales
Urquhart, Ian A.N. Some Interior Dialects

Punan (various)
Kaboy, Tuton. Punan Vocabularies (Punan Busang, Punan Bah)
Noeb, Jonas. unpublished wordlist for Punan (Punan Bah?)
Ray, Sidney H. The Languages of Borneo
Sandin, Benedict. The Living Legends: Borneans telling their tales
Urquhart, Ian A.N. Some Interior Dialects

Sekapan
Strickland, S.S. Materials for the Study of Kejaman-Sekapan Oral Tradition
Urquhart, Ian A.N. Some Interior Dialects

Sihan

Tatau
Noeb, Jonas. unpublished wordlist for Bahasa Tatau

Ukit
Ray, Sidney H. The Languages of Borneo
Urquhart, Ian A.N. Some Interior Dialects
Appendix B: Array of cognate sets

*tanɔ̀* ‘earth’ Proto Melanau *tana?, Bintulu tane?, Kajang: Lahanan tana, Western Penan
tana, Eastern Penan tana’, Sihan tano?, Ukit tana, Bukat tana?, Bukitan tano, Punan Batu
tanoh, Punan Bah (Ling Roth) tanoh. (2)

*batu* ‘stone’ Proto Melanau *batɔw, Bintulu batɔw, Kajang: Lahanan (Rousseau) batow,
Lahanan (Urquhart) bataw, Sekapan and Kejaman bato, Western Penan (Ray) bato,
(Kaboy) batou, Eastern Penan batew, Sihan batu, Bukat batu, Bukitan (Urquhart) bato,
Punan Busang batu, Punan Bah batu. (4)

*daRat* ‘sea’ Proto Melanau *daRat, Bintulu (Chou) Rat, (Blust) rat. (8)

*baŋŋ* ‘sea’ Kajang: Lahanan (Rousseau) baŋ/uni0259t, Sekapan (Urquhart) bang/uni0259it, Kejaman (Ray)
bangat, Western Penan bangat, Eastern Penan ba banget, Sihan baŋ/uni0259t, Punan Bah bangit.
(8)

*bulan* ‘moon’ Proto Melanau *bulan, Bintulu bulan, Kajang bulan, Ukit bulan, Bukitan
bulan, Punan Batu bulan, Punan Bah bulan. (9)

*bituŋ* ‘star’ Melanau: Tanjong bituŋ, Kajang: Lahanan (Rousseau) kɔtu?ɔn, Lahanan
(Urquhart) ketuan, Sekapan (Urquhart) keteun, Kejaman (Urquhart) ketuan, Kejaman
(Ray) katoën, Sihan kata?en, Ukit (Ray) betoen, Baketan bêtuën, Bukitan letuen, Punan
Batu tuen, Punan Bah betuen; *bitaŋ* Proto Melanau *bitaŋ, Kejaman: Tatau bitang,
Bintulu bitaŋ. (10)

*laŋŋ* ‘sky’ Proto Melanau *laŋŋ, Bintulu laŋŋ, Kajang: laŋŋ, Western and Eastern Penan
laŋŋ, Baketan langët, Punan Bah laŋŋ. (11)

*baRiw* ‘wind’ Melanau: Kanowit and Tanjong bariw, Bintulu (Blust) baruy, Kajang:
Lahanan (Rousseau) baiu, Sekapan and Kejaman (Urquhart) bayu, Kejaman (Ray) baiu;
Western Penan kapo, Eastern Penan kepu, Sihan bolași, Ukit and Bukat salit, Bukitan
balu, Punan Busang poi, Punan Bah po(w)i. Bintulu and Lahanan forms reflect
metathesized *uy rather than *iw; the Penan languages, Bukitan, Punan Busang, and
Punan Bah may be related to *baRiw but not very directly. (13)

*uzan* ‘rain’ Proto Melanau *ujan, Bintulu ujan, Kajang: Lahanan (Rousseau and Urquhart),
Kejaman (Ray), Tatau ujan, Sekapan, Kejaman (Urquhart) hujan, Sihan ujian, Punan
Batu ujan, Punan Bah usan. (14)

*duduR* (?) ‘thunder’ Proto Melanau *duduh, Kajang: Lahanan, Sekapan, Kejaman
(Urquhart) deru, Eastern Penan lengedo (cognate?), Ukit duru, Bukat duru, Bukitan
duru, Punan Busang duru, Punan Batu dusu. (15)
**qalejaw** > **daw** ‘day’ Proto Melanau *law, Bintulu daw, Kajang: Lahanan (Rousseau) daw, Sekapan (Urqhart) dau, Lahanan, Kejaman (Urqhart), Tatau lau, Kejaman-Sekapan (Strickland) ḡaw, Western Penan dau, Eastern Penan dau, Sihan alo?, mata-al ‘sun’, Ukit aloh, Bukat halo, Bukitan (Urqhart) alo, Punan Busang lou, Punan Batu alo, Punan Bah (Urqhart and Ling Roth) elo, (Kaboy) elou. (19)

**taqun** ‘year’ Proto Melanau *taʔun, Bintulu taʔun, Kajang: Kejaman tauʔun, Eastern Penan taʔun, Bukat taun, Baketan tauʔun. (20)

**aləm** ‘night’ Proto Melanau *maləm, Bintulu kələm, Kajang: Lahanan (Urqhart) malem, Sekapan, Kejaman maləm, Eastern Penan malem ‘yesterday’ but merem ‘night’, Sihan maləm, Ukit maləm, Bukat maləm, Baketan (Ray) maləm, Bukitan (Urqhart) malum, Punan Batu malum, Punan Bah (Urqhart) malum, (Punan Dyaks) (Ling Roth) malun. (22)

**dadəm** ‘dark, night’ (Proto North Sarawak) (Blust) Kajang: Lahanan (Rousseau) lərəm, Lahanan, Kejaman (Urqhart) deram, Kejaman (Ray) dərəm, Sekapan (Urqhart) dam, Western Penan (Ray) merəm, Eastern Penan merem. (22)

**ləbi** ‘evening” Proto Melanau *abəy, Bukitan (Noeb) lamei, Punan Bah (Kaboy) belomei. (24)

**ipuŋ** (?) ‘forest’ Melanau: Tanjong ipuŋ, Kajang: Lahanan (Urqhart) ipoŋ bakan, Kejaman (Ray) ipōŋ, Sekapan, Kejaman (Urqhart) ipur, Punan Bah ipong, ipunŋ. (27)

**kayu** ‘tree, wood’ Proto Melanau *kayəw, Bintulu kazəw, Kajang: Sekapan kayu, Kejaman kayau, Western Penan kayu, Eastern Penan kayeu, Sihan kayu, Ukit kiau, Bukat kiou, Baketan kajō, Bukitan pokaju, Punan Batu kayu, Punan Bah kayu. (28, 229)

**daqun** ‘leaf’ Proto Melanau *daʔun, Bintulu raʔun, Kajang: Lahanan daʔun, Kejaman dauʔun, Western Penan daun, Eastern Penan daʔun ‘fan palm’, Sihan daʔun, Ukit daun, Bukat daʔun, Baketan dauʔun, Punan Bah (Ling Roth) du-um (cognate?). (30)

**akaR** ‘vine, creeper’ Proto Melanau *akah ‘root’, Bintulu (Blust) bakeh, Kajang: Kejaman (Ray) laka, Western Penan aka-kayu, Eastern Penan laka, Sihan oka, Ukit oka, Baketan ōkā, Punan Bah (Punan Rejang) (Ray) oka. (32)

**Ramut** ‘root’ Proto Melanau *Ramut, Bintulu (Chou) amot, (Blust) amut, Kajang: Lahanan (Rousseau) amut, Punan Bah amut. (32)

**təRas** ‘ironwood’ Proto Melanau *təRas, Eastern Penan taha; *kəRas (or *kəRay ?) ‘hard’ Ukit (Ray) kahai, (Urqhart) keheh, Punan Busang kehe, Punan Batu kehi. (33, 312)
*buŋa 'flower’ Proto Melanau *buŋa, Bintulu buŋa, Kajang: Kejaman-Sekapan (Strickland) buŋa, Western Penan bunga, Eastern Penan bunga’, Sihan buŋa, Ukit bunga, Baketan vungä, Punan Bah bunga. (34)

*bajak > *bādak ‘flower’ Proto Melanau *bādak, Kajang: Lahanan (Rousseau) bārak, Kejaman (Ray) bērak, Western Penan (Ray) bučhak, Eastern Penan busak, Bukat bārak, Punan Busang bārak, Punan Bah (Punan Rejang) (Ray) bārak. (34)

*buaq ‘fruit’ Proto Melanau *buaq?, Kajang: Lahanan (Rousseau) buqwa, Kejaman (Ray) bēqwa, Kejaman-Sekapan (Strickland) buqan, Western Penan (Ray) buo, (Kaboy) bue’, Eastern Penan bua, Sihan bua?, Ukit bua, Bukat bua?, Baketan bua, Punan Busang bua, Punan Bah (Kaboy) bua’, (Ling Roth) buah. (35)

*niuR (?) ‘coconut’ Melanau: Mukah (Blust) bua?, Bintulu (Ling Roth) viño, Kajang: Kejaman (Ray) nyiau, Western Penan nyiu, Ukit anyu, Baketan (Ray) nyu, Punan Bah (Punan Rejang) (Ray) nioh. (38)

*uay ‘rattan’ Proto Melanau *way, Eastern Penan uay, Bukat wei. (45)

*manuk ‘bird’ Proto Melanau *manuk, Bintulu (Chou) manok, Bintulu (Blust) manuk, Kajang: Lahanan (Rousseau and Urquhart), Kejaman (Urquhart) manok, Tatau manuk, Punan Busang manok, Punan Batu manuk. (47)

*bulu ‘feather, (body) hair’ Proto Melanau *bulow, Bintulu bulew, Kajang: Lahanan (Rousseau) bulow ‘hair of the head’, bulun ‘feather’, Western Penan bulun, Eastern Penan bulun, Sihan bulu ‘body hair’, bulon ‘feather’, Bukat bulu, Punan Bah (Kaboy) bulu. (49)

*ikuR ‘tail’ Proto Melanau *ikuy, Bintulu ikuy, Kajang ikuy, Western Penan iku, Eastern Penan iko, Sihan ukui, Bukat ukey, Punan Busang ukui, Punan Bah boki. The Penan forms reflect the regular development of final *R rather than the development as *y. The vowel of the penult matches in Melanau, Bintulu, Kajang and Penan but not the others. (50)

*taluR ‘egg’ Proto Melanau *talu, Bintulu talu,53 Kajang: Lahanan (Rousseau) talu, Kejaman (Ray) tēlo, Western Penan ēlo, elu, ilo, Eastern Penan ilo, Sihan talu, Ukit talu, Baketan (Ray) ilor, Punan Busang talun, Punan Bah telu; *taluy Melanau: Igan, Matu, Rajang, Kanowit and Tanjong taluy, Bukat taloy. (51)

53 It is interesting to note that the vowel in Bintulu and Kajang: Lahanan is u; similarly, the Bintulu vowel in the set labeled ‘lips’ is i and the Kajang: Kejaman (Ray) vowel is e. This may suggest that there was a final h. If the vowels were truly word-final, the reflexes should be vowel-semivowel sequences.
*ikan > *ijan (?) ‘fish’ Melanau: Tanjong ijan, Kanowit ijan, Bintulu (Chou) njan, Bintulu (Blust) enje’n, Kajang: Lahanan (Rousseau) gion, Lahanan (Urquhart) diun, Sekapan (Urquhart) jan, Kejaman (Urquhart) jen, Kejaman (Ray) iyên, Sihan ajen, Ukit (Ray) ajon, (Urquhart) aijn, Bukat ajen, Punan Busang jen, Punan Batu aijn. (53)

*nipay > *nipa ‘snake’ Proto Melanau *dipa, Bintulu nipà, Kajang: Lahanan (Rousseau) nipà, Kejaman (Ray) nyipà. (54)

*say (?) ‘snake’ Sihan acai, Ukit asai, Bukat sawe, Baketan asai, Punan Busang kavun, Punan Bah esai. (54)

*buaya ‘crocodile’ Melanau: Matu, Daro bayah, Mukah, Dalat bayah, Kajang: Kejaman (Ray) baiyä, Western Penan baiā, Eastern Penan bayah, Ukit boai, Baketan baia, Punan Bah buai. The Ukit and Punan Bah forms reflect something like *buay, while the other forms reflect something like *baya. (55)

*babaw ‘rat’ Proto Melanau *bəlabaw, Kajang: Lahanan (Rousseau) blavow, Kejaman (Ray) blavau, Pakatan (Ling Roth) belauo, Punan Bah (Punan Rejang) (Ray) glavau, (Ling Roth) blabau but Bintulu (Chou) bəlitet, (Blust) belitit, Western Penan blèmo, Eastern Penan moséng, Ukit musing, Bukat musiŋ, Baketan blabut. (58)

*asu ‘dog’ Proto Melanau *asow, Bintulu asew, Kajang: Lahanan (Rousseau) asow, Lahanan, Kejaman (Urquhart) asau, Sekapan (Urquhart), Tatau aso, Western Penan asu, aso, Eastern Penan aseu, Ukit asu, Bukat asu, Baketan ahūh, Bukitan (Urquhart) au, (Noeb) aoh, Punan Busang ahu, Punan Batu ahu, Punan Bah (Urquhart and Kaboy) au, (Ling Roth) auh. (59)

*qali-wati ‘worm’ Melanau: Matu, Mukah kaijwat, Igan, Oya, Mukah kəläjiwat, Bintulu kekebet, Kajang: Kejaman (Ray) kaqwa, Bukitan owon. (60)

*namuk ‘mosquito’ Proto Melanau *namuk, Bintulu (Chou) namok, Bintulu (Blust) temuk, Kajang: Lahanan (Rousseau) diamok, Eastern Penan nyamok ‘general word for flying, biting insect’, Ukit nyamok, Bukat namok, Baketan nyamok, Punan Bah nyamok. (62)

*Cawaq (?) ‘spider’ Melanau: Mukah bəlabawa?, Rajang katawa?, Balingian, Tanjong balawat, Kajang: Lahanan (Rousseau) təlawa?, Western and Eastern Penan kelawa’. (63)

*bələbəng (?) ‘butterfly, moth’ Proto Melanau *bələban, Kajang: Kejaman (Ray) kababan, Ukit (Ray) kalamavang, Baketan klumbang, Punan Bah (Punan Rejang) (Ray) tamavang. (65)

*tulaŋ* ‘bone’ Proto Melanau *tulaŋ, Bintulu tulaŋ, Kajang: Lahanan (Rousseau) tulwaŋ, Lahanan, Kejaman (Urquhart) tolaŋ, Kejaman (Ray) tolāŋ, Sekapan (Urquhart) todia (cognate ?), Western Penan tulāŋ, Eastern Penan tulāŋ, Sihan tulaŋ, Ukit tolaŋ, Bukat tolaŋ, Bukitan tolaŋ, Punan Busang tolaŋ, Punan Batu tulāŋ, Punan Bah (Urquhart and Kaboy) tolen, (Ling Roth) tulāŋ. (70)

*qulu* ‘head’ Proto Melanau *ulůw, Bintulu ulůw, Kajang: Kejaman (Urquhart) olau, Kejaman (Ray), Tatau ulau, Sekapan-Kejaman (Strickland) ulůw, Western Penan ulun, Eastern Penan ulun, Sihan ulu, Punan Batu ulun. (76)

*abuk* ‘head hair’ Proto Melanau *buk, Bintulu buk, Kajang: Lahanan and Kejaman (Urquhart) bok, Sekapan (Urquhart) buk, Kejaman (Ray) bōk, Western Penan bok, Eastern Penan bok, Sihan išu, Ukit (Ray) ivuk, (Urquhart) iboh, Punan Batu ipok, Punan Bah (Urquhart) ivok, (Ling Roth) ibok. (79)

*bibiR* ‘lips’ Melanau: Mukah (Blust) bibih, Bintulu (Ling Roth) bivi, Kajang: Kejaman (Ray) bevē, Western Penan bivi, Eastern Penan bevē. (80)

*baqbaq* ‘mouth’ Proto Melanau *baba?, Kajang: Lahanan (Rousseau) ba?, Lahanan, Sekapan, Kejaman (Urquhart) bah, Kejaman (Ray) bā, Eastern Penan uba ‘opening’, Sihan baβa, Ukit bava, Bukat bava, Bukitan bawa, Punan Bah (Urquhart) bova, (Punan Dyaks) (Ling Roth) bubah. (81)

*nipn > *lipon* ‘teeth’ Proto Melanau *nipön, Bintulu nipen, Kajang: Lahanan (Rousseau) nipön, Lahanan, Kejaman (Urquhart) nyipen, Sekapan (Urquhart) nipen, Kejaman (Ray) nyipān, Western Penan jipān, Eastern Penan jipen, Sihan ŋipo ‘incisor’, Buketan nyipō, Punan Batu nyipen, Punan Bah (Urquhart) nyipe, (Ling Roth) nyipan. (82)

*ujuŋ > *uduŋ ‘nose’ Proto Melanau *uduŋ, Bintulu (Chou) uRoŋ, (Blust) uruŋ, Kajang: Lahanan (Rousseau) and Lahanan-Kejaman (Urquhart) uruŋ, Kejaman (Ray) urōng, Kejaman-Sekapan (Strickland) uruŋ, Sekapan (Urquhart) urur, Western Penan ōngin, Eastern Penan rong, Sihan uruŋ, Ukit urunŋ, urōng, Bukat uruŋ, Bukitan uronŋ, Punan Batu urōng, Punan Bah (Urquhart) urung, (Ling Roth) urong. (84)

*taliŋa ‘ear’ Proto Melanau *(ta)liŋa, Bintulu taliŋa, Kajang: Kejaman (Ray) telinga, Western Penan (Ray) kēlingān, (Kaboy) engan, Eastern Penan kelingen, Baketan tulingo. (87)

*mata ‘eye’ Proto Melanau *mata, Bintulu mata, Kajang: Lahanan (Rousseau), Kejaman (Urquhart) mata, Lahanan (Urquhart) matah, Kejaman (Ray) matā, Western Penan (Ray) matān, (Kaboy) matan, Eastern Penan maten, Sihan mato, Ukit mato, mater, Bukat mata, Bukitan mato, Punan Busang maten, Punan Batu matan, Punan Bah mato. (88)

*liŋəR ‘neck’ Kajang: Lahanan (Rousseau) kənuʔa, Lahanan (Urquhart) noa, Kejaman (Urquhart) loah, Sihan tōʔo, Ukit (Ray) to, (Urquhart) ter, Bukitan (Urquhart) potor, (Noeb) puto, Punan Batu loh. (92)

*Rusuk ‘chest’ Proto Melanau *Rusuk, Kajang: Kejaman (Ray) usok, uchok, Western Penan (Ray) uchōk, usōk, (Kaboy) usuk, Ukit (Ray) ohok; Eastern Penan kebah, Baketan ōwōŋ, Punan Busang oranŋ, Punan Bah ota. (93)

*titiq ‘breast’ Bintulu titiʔ, Kajang: Kejaman (Ray) lēgwā-ētē ‘nipple’, Western Penan eti, Eastern Penan étē. (94)

*likuj > *likud ‘back (person)’ Melanau: Kanowit ikut, Tanjong likut, Bintulu likud, Kajang: likut, Western Penan likot, Eastern Penan likut, Sihan likut. (99)

*budi ‘belly’ Kejaman (Ray) buri, Western Penan bori, Eastern Penan borē, Baketan bure, Punan Bah (Punan Rejang) (Ray) buri, (Ling Roth) buret. (101)

*atay ‘liver’ Proto Melanau *(h)atay, Kajang: Lahanan (Rousseau) atay, Lahanan, Kejaman, Sekapan (Urquhart), Kejaman (Ray) atai, Western Penan atai, Eastern Penan atai, Ukit atoi, Bukat ateʔ, Bukitan atoi, Punan Bah etei. This is the only available example of *ay > oi in Ukit and Bukitan. (103)

*batis ‘leg, calf’ Proto Melanau *bətis, Bintulu (Ling Roth) betas (vowel i expected in final syllable) , Kajang: Lahanan bəti, Sekapan-Kejaman (Urquhart) beti, Kejaman (Ray) bēti, Western Penan bēti, Eastern Penan betē, Ukit bati, Bukat bati, Bukitan bati, Punan Busang batin, Punan Batu batin, Punan Bah (Urquhart and Kaboy) beti, (Punan Dyaks) (Ling Roth) biti. (109, 368)
*pasak* ‘blind’ Bintulu (Ling Roth) peset, Western Penan puso, Eastern Penan peseu, Punan Busang pasok, Punan Bah (Kaboy) pesok. (116)

*danja*R ‘hear’ Bintulu gəŋja, Kajang: Kejaman dēŋa, Western Penan nəรงingo, Punan Batu rangoh. (117)

*hajak > *m-adak* ‘smell, sniff’ Proto Melanau *madak, Kajang: Lahanan (Rousseau) ŋ-arek, Lahanan, Sekapan (Urquhart) marak, Kejaman (Urquhart) menəarak, Western Penan medok ‘smell’, marak ‘kiss’, Eastern Penan marek, Sihan madok, Ukit marok, Bukat marok, Bukitan arok, Punan Busang marok ‘kiss’, Punan Batu marok, Punan Bah (Urquhart) mederk, (Kaboy) medok. (119)

*kaRaw > *kayaw* ‘scratch’ Melanau: Balingian məgayaw, Bintulu (Chou) gəmazaw, (Blust) megazaw, Kajang: Kejaman (Ray) umanyau, Sihan əməyō, Ukit majo, Baketan maio, Punan Bah (Punan Rejang) (Ray) gamaio. (122)

*utaq* ‘vomit’ Proto Melanau *puta?, Bintulu puta?, Kajang: Lahanan (Rousseau) nuta?, Eastern Penan luta, Sihan nuta?, Bukat nuta?. (125)

*kutu* ‘lice’ Proto Melanau *kutəw, Bintulu kutew, Kajang: Lahanan (Rousseau) kutow, Kajaman (Ray) gutau, Western Penan kutun, Eastern Penan gətə ‘head louse’, Sihan lutu, Ukit kutu, Bukat kutu, Baketan kutō, Punan Bah (Punan Rejang) (Ray) gutu. (126)

*m-atay* ‘dead’ Proto Melanau *matay, Western Penan matai, Eastern Penan matai, Ukit mati (Malay loan?), Punan Bah patay ‘corpse’. (129)

*kaBAS (?)* ‘dead’ Proto Melanau *kəpəs ‘dead’, *kəbis ‘kill’, Kajang: Kejaman-Sekapan (Strickland) kaʃə ‘die’, Sihan kəmaʃə ‘kill’, Ukit kəvoh, Bukat kəva, Baketan kauwo, Bukitan (Urquhart) mekəwow ‘die’, Punan Busang kəvoh, Punan Batu kəvoh, Punan Bah (Urquhart) mekəvoh, (Kaboy) mekəvo, (Ling Roth) məkəboh, (Sellato) məkəboh. (129)

*kuduq* ‘sit’ Proto Melanau *kudəʔ, Bintulu (Chou) kəduʔ?, (Blust) kudəʔ, Sihan muruk, Ukit muruk, Bukat murok, Baketan məɾək, Bukitan (Urquhart) merok, (Noeb) muruk, Punan Batu mutok, Punan Bah (Urquhart) murung. (131) Punan Batu suggests that the medial consonant was *t while Sihan, Ukit, Bukat, Baketan, Bukitan, and Punan Batu suggest that the final consonant was *k and Punan Bah that it was *ŋ.

*muŋu ą* ‘sit’ Proto Melanau *muŋuʔ, Kajang: Lahanan (Rousseau) uŋu, Lahanan (Urquhart) unŋo, Kajang: Sekapan (Urquhart) runŋo, Kejaman (Urquhart) ungau, Kejaman (Ray) unŋo, Western Penan menyun (cognate ?), Eastern Penan nyun (cognate ?). (131)
*bidiq* (ʔ) ‘lie down’ Proto Melanau *bidiʔ*, Kajang: Lahanan (Rousseau and Urquhart), Sekapan (Urquhart) miri, Kejaman (Urquhart) mereh, Ukit miri, Bukat miriʔ, Bukitan meri, Punan Batu meri, Punan Bah id. (131)

*kajang* > *kadan* ‘stand’ Proto Melanau *kadaŋ*, Kajang: Lahanan (Rousseau) nəkřiŋ, Lahanan (Urquhart) tokareŋ, Sekapan (Urquhart) keraŋ, Kejaman (Ray) nekariŋ, Western Penan dang, Eastern Penan nekedéŋ, Sihan nikarim, Ukit nekaring, Bukat nəkariŋ, Bukitan nakaring, Punan Busang nekaring, Punan Batu rasing, Punan Bah (Urquhart) nekaring, (Kaboy) nekereng. (132)

*tuduR* > *tuduy* ‘sleep’ Proto Melanau *tuduy*, Ukit turui, Bukat turuy, Baketan maturoii, Punan Busang turui, Punan Bah (Urquhart) betorui, (Kaboy) metorui, (Ling Roth) muturihi. (133)

*m̥olud* (ʔ) ‘sleep’ Melanau: Kanowit m̥olud, Tanjong m̥olut, Kajang: Lahanan (Rousseau), Kejaman (Urquhart) and Tatau m̥olut, Sekapan (Urquhart) belut, Sekapan-Kejapan (Strickland) ma-ʃut, Sihan malud, Punan Batu malut. (133)

*nupi* ‘dream’ Proto Melanau *tupay*, Bintulu nupey, Kajang: Lahanan (Urquhart) nyupei, Kejaman (Urquhart) penopei, Western Penan nyupin, Eastern Penan nyupin, Ukit nupik, Bukitan (Urquhart) nupi, Punan Busng nupi, Punan Batu nupi, Punan Bah (Urquhart) pampi, (Kaboy) penupei. The final k and n are presumably person-marking suffixes. (135)

*lakaw* ‘walk’ Proto Melanau *makaw*, Melanau: Kanowit, Tanjong lakaw, Balingian məlakaw, Bintulu (Chou) məlakaw, (Blust) lakaw, Kajang: Lahanan (Rousseau) bəlakaw, Lahanan, Sekapan, Kejaman (Urquhart) belakau, Tatau mekakau, Western Penan melakau, Eastern Penan lakau; Sihan makeap, Ukit makia bati, Bukat mak yap, Bukitan machap, Punan Busang keyap, Punan Batu keap, Punan Bah mekayap. (138)


*nabuq* ‘fall’ Proto Melanau *labuʔ*, Kajang: Lahanan (Rousseau) bəlavu, Kejaman-Sekapan (Strickland) təboŋ, Tatau təvəŋ, Sihan bəlaʃu, Punan Bah belavu’. (144)

*jatuq* ‘fall’ Proto Melanau *jatutʔ*, Bintulu gatuʔ, Kejaman-Sekapan (Strickland) jatəʔʔ, Eastern Penan jato. (144)

*tabak* ‘stab’ Proto Melanau *tubək*, Bintulu tumək, Eastern Penan tebek. (145)
*isap*, *sipsip* ‘suck’ Proto Melanau *susap*, Melanau: Tanjong *nisip*, Bintulu (Blust) *susip*, Kajang: Lahanan (Rousseau) *nisip*, Western Penan *menyesip*, Sihan *nisip*, Punan Bah (Kaboy) *menyisip*. (146)

*subut* ‘bite’ Proto Melanau *subut*, Bintulu *subut*, Punan Bah mo’ot. (147)

*kali* ‘dig’ Kajang: Lahanan (Rousseau) *nale?*, Eastern Penan *ngalei*, Bukat *nali*, Punan Bah (Punan Rejang) (Ray) *ngali*. (149)


*ikat* ‘tie’ Melanau: Balingian *ikat*, Bintulu (Chou) *mikat*, Bintulu (Blust) *miket*, Kajang: Lahanan (Rousseau) *mikat*, Western Penan *memikat*, Eastern Penan *telikut*, Sihan *majot* (cognate?), Punan Bah *mejot* (cognate?). (159)


*piliq* ‘choose’ Proto Melanau *piliq*, Bintulu *miliq*, Eastern Penan *meyevelé*. (164)


*zuRuq* ‘juice’ Proto Melanau *juRuq*, Bukitan *juu*. (175)
*tawa* ‘laugh’ *tawat*, Bintulu betaba. (176)

*mubal* ‘hit’ Proto Melanau *mubal*, Bintulu mubal, Western Penan meban ‘beat’. (178)

*buqud* (?) ‘fear, afraid’ Melanau: Kanowit buud, Tanjong buut, Kajang: Lahanan (Rousseau) po?ut, Lahanan, Sekapan, Kejaman (Urquhart) bout, Sihan bu?ut, Ukit (Ray) buut, (Urquhart) but, Bukat but, Baketan mahut, Bukitan maut, Punan Busang avut, Punan Batu aput, Punan Bah (Urquhart) bout, (Kaboy) bu’ut. (179)

*bulay* (?) ‘left (hand)’ Proto Melanau *bulay*, Bintulu bulay, Kajang: Lahanan (Rousseau) bujay, Sihan bulah, Bukat bulay. (183)

*taqu* ‘right (hand)’ Proto Melanau *ta?aw, *ta?ew, Bintulu ta?ew, Kajang: Lahanan (Rousseau) ta?o, Western Penan mena?ow, Eastern Penan na?au, Sihan ta?u, Bukat tau, Punan Busang ta?u, Punan Bah (Kaboy) ta?au. In sets that have medial glottal stop the reflexes of *u in Melanau, Eastern Penan and perhaps in Western Penan and Punan Bah are like the reflexes for *aw rather than the usual reflexes of *u. (184)


*tutug* ‘pound’ Proto Melanau *tutug, Bintulu (Chou) tutog, Bintulu (Blust) tutuk, Eastern Penan meték ‘pound with feet’ (cognate?). (190)

*saluy* (?) ‘canoe’ Melanau (Ling Roth) salūi, Kajang: Lahanan and Sekapan (Urquhart) salui, Tatau alul (cognate?), Ukit (Ray) aloie, (Urquhart) kalui, Baketan aloi, Bukitan alui, Punan Bah salui; Western Penan and Eastern Penan alut. (198)

*aruk* ‘canoe’ Kajang: Kejaman (Urquhart) aroh, (Ray) arök, Punan Busang aruk, Punan Batu asuk. (198)

*pala* (?) ‘paddle’ Melanau (Ajid Che Kob) pela(h), Kajang: Kejaman (Ray) pēla, Western Penan (Ba Mali) (Ray) pēla, Ukit mōllo, Baketan polō; Western Penan bezai, Eastern Penan besai, Punan Bah (Ling Roth) busai, (Punan Rejang) (Ray) basai. (199)

*tali* ‘rope’ Proto Melanau *talay, Bintulu taley, Kajang: Lahanan (Rousseau) taluy, Kejaman (Ray) talei, Western Penan tali, Eastern Penan talei, Sihan tali, Bukat trari (?), Baketan (Ray) tali. (206)

*pajay > *paday* ‘rice with husk’ Kajang: Sekapan-Kejaman (Strickland) paray, Kejaman (Ray) parai, Western Penan parai, Eastern Penan parai, Bukat parei, Baketan parei, Punan Bah (Punan Rejang) (Ray) pare. (215)
*baRas* ‘husked rice’ Melanau (Ling Roth) baah, Bintulu berá, Kajang: Kejaman (Ray) ba, Baketan (Ray) baa, (Punan) (Noeb) ba, Punan Batu bah. (216)

*nasiq* ‘cooked rice’ Melanau: Mukah nasi?, Rajang asi?, Kajang: Tatau nasé, Bukitan asì. (217)

*qasiRa* ‘salt’ Proto Melanau *siah, Kajang: Kejaman-Sekapan (Strickland) sio, Kejaman (Ray) siyâ, Ukit (Ray) jio, Bukat sia, Baketan (Ray) jio. (219)

*m-asak* ‘cook’ Proto Melanau *pisak, Bintulu masak, Western Penan kesak, Bukatan isak. (222)

*abu* ‘ashes’ Proto Melanau *abów, Bintulu avów, Kajang: Kejaman (Ray) avó, Western Penan (Ray) avó, (Kaboy) avou, Eastern Penan aveu, Sihan abóu, Ukit (Ray) avó, Bukat avu, Baketan (Ray) ahoő, Punan Bah avu. (226)

*tutun* ‘burn’ Kajang: Lahanan (Urquhart) noton, Kejaman (Urquhart) notur, Western Penan potong, Eastern Penan potong, Sihan nuton, Ukit tutong, Bukat nuton, Bukatan tutung, Punan Busang tutong, Punan Batu tutung, Punan Bah (Urquhart) potong, (Kaboy) putung. (231)

*tunu* ‘burn’ Proto Melanau *tinów, Bintulu tinew, Western Penan ponyo, Eastern Penan tuneu ‘burn’, benyeu ‘burnt to a crisp’. (231)

*paqit* ‘bitter’ Proto Melanau *pa?it ‘guts’, Kajang: Lahanan, Kejaman (Urquhart) pait, Baketan (Urquhart) pai, Punan Busang pa?ii, Punan Batu pai, Punan Bah (Urquhart) pait. (238)

*m-asam* ‘sour’ Bintulu (Ling Roth) mesam, Kajang: Kejaman (Ray) čham, Western Penan mečhám, Eastern Penan mesem, Ukit masom, Baketan masam, Punan Bah (Punan Rejang) (Ray) moőm. (239)

*amis* ‘sweet’ Melanau: Mukah temih (<*mis), Bintulu (Ling Roth) temis, Kajang mi, Western Penan me, Eastern Penan mé, Baketan (Ray) mamis, Punan Bah metomi. (240)

*apuŘ* ‘lime’ Bintulu (Ling Roth) apó, Western Penan apó-sapa, Eastern Penan apo sepa’. (245)

*a(N)ji > *t-adi* ‘younger sibling’ Kajang: Lahanan (Urquhart) tareke (cognate?), Sekapan (Urquhart) areh, Kejaman (Urquhart) arek, Eastern Penan padé ‘sibling’, Ukit arek, Bukat arik, Bukitan areh, Punan Batu arin, Punan Bah ari. (247)

*t-ama* ‘father’ Proto Melanau *tama, *ama, Bintulu tama, Kajang: Lahanan (Rousseau) ama?, Lahanan, Kejaman (Urquhart) amah, Kejaman (Ray) amân, Western Penan (Ray) tamên, (Kaboy) taman, (primer) tamen, Eastern Penan tamen, Sihan ama?, Ukit ămon,
Bukat ama?, Bukitan ama, Punan Busang ma, Punan Batu amah, Punan Bah (Urquhart) omek, (Ling Roth) umak. (248)

*t-ina ‘mother’ Proto Melanau *tina, Kanowit ina, Bintulu tina, Kajang: Lahanan (Rousseau) hina|m, Lahanan, Sekapan, Kejaman (Urquhart) ina, Kejaman (Ray) inän, Western Penan tinen, Eastern Penan tinen, Sihan ino, Ukit inyuk, Bukat ña, Bukitan ina, Punan Batu ina, Punan Bah (Urquhart) inek, (Ling Roth) ini. (249)

*sawa ‘spouse, wife’ Proto Melanau *sawa, Bintulu saba, Kajang: Lahanan (Rousseau) sawa|k, Kejaman (Ray) saqwâ, Sihan awo, Punan Bah (Ling Roth) pawoh but Bintulu bana, Sihan hanhen, Bukat sone, Baketan ale, Punan Bah ile, Eastern Penan banen. (251)

*bana ‘spouse, husband’ Bintulu bana, Eastern Penan banen, Sihan hanhen, Ukit sonin, Bukat sone, Baketan ale (cognate?), Punan Bah ile (cognate?). Last two forms probably fit better with set (252). (251)

*ma-Ruqanay > *manay ‘man, male’ Proto Melanau *lay, *nlay, Bintulu (Chou) nanay, Bintulu (Blust) manay, Kajang: Lahanan (Rousseau) liley, Lahanan (Urquhart) ledai, Sekapan, Kejaman (Urquhart) dejai, Kejaman (Ray) dêlæe, Eastern Penan manai, Sihan ale, Ukit (Ray) lolei, Ukit (Urquhart) noleh, Bukat nole, Baketan (Ray) alei, Bukitan (Urquhart) aleh, Punan Bah (Urquhart) eli, Punan Bah (Punan Rejang) (Ray) ale. (252)

*dadhuR Proto North Sarawak (Blust) ‘woman’ Bintulu (Chou) Râdu, (Blust) râdu, Western Penan (Ray) dô, (Kaboy) redo, Eastern Penan redo, Sihan ñro (may reflect something like *dda), Ukit doro, Bukat dôro, Bukitan oro, Punan Busang oroh, Punan Batu oro, Punan Bah oro. (253)

*anak ‘child’ Proto Melanau *anak, Bintulu anak, Kajang: Lahanan (Rousseau and Urquhart), Kejaman-Sekapan (Strickland) anak, Sekapan (Urquhart) anik, Kejaman (Urquhart) anek, Kejaman (Ray) anã, Western Penan anak, Eastern Penan anak, Ukit anak, Bukat anak, Baketan anak, Punan Batu anak, Punan Bah (Urquhart) enak, (Ling Roth) anak. (256)

*sakay ‘friend’ Melanau: Mukah, Dalat sakay, Kajang: Sekapan (Urquhart) sakai, Ukit sakai, Bukitan sakai, Eastern Penan bakêh (cognate?). (258)

*pajan > *ŋ-adan ‘name’ Proto Melanau *ŋadan, Bintulu ŋaran, Kajang: Lahanan (Rousseau) aran, Kejaman (Ray) ŋârã, Western Penan ngârân, Eastern Penan ngaran, Sihan ŋaro (a rather than o is expected in Sihan and Baketan), Ukit aran, Bukat aran,
Baketan ngaro, Bukitan (Noeb) ngaram ko ‘your name’, Punan Bah (Punan Rejang) (Ray) ngaran. (260)


*bali* ‘buy’ Proto Melanau *bɔλɔy, Bintulu meley, Kajang: Kejaman (Ray) pebèlei, Eastern Penan belih, melih, Baketan (Ray) pòli, (Noeb) molih. (263)

*læbuq* (?) ‘house’ Proto Melanau *læbu?, Kajang: Lahanan (Rousseau) lɔvu, Lahanan, Sekapan (Urquhart) levoh, Kejaman (Urquhart) levo, Kejaman (Ray) levó ‘country’, Kejaman-Sekapan (Strickland) lɔpaw ‘hut’ (cognate’?), Western Penan (Ray) lebɔ, Eastern Penan lebo ‘settlement’, Ukit (Ray) labo, (Urquhart) lavoh, Bukatan lau, Bukitan (Urquhart) laoh, (Noeb) lauk, Punan Busong lavu, Punan Batu lavoh, Punan Bah lovu. (271)

*hadiRi* ‘post’ Melanau: Mukah (Blust) dii ‘housepost’, (Ling Roth) diri, Bintulu (Ling Roth) rie, Eastern Penan lihei. (273)

*duha > *dua* ‘two’ Proto Melanau *duah, Bintulu (Chou) ɓa, (Blust) ba, Kajang: Lahanan (Rousseau) ɗugwa, Lahanan, Sekapan, Kejaman (Urquhart) degua, Kejaman-Sekapan (Strickland) dɔgwa(h), Tatau dua, Western Penan keruah ‘second’, Eastern Penan duah, Sihan duɔ, Ukit duɔ, Beketan (Sellato) lugo, Bukitan dugo, Punan Batu duɔ, Punan Bah duo. (282)

*talu* ‘three’ Proto Melanau *tɔlɔw, Bintulu ɭaw, Kajang: Lahanan (Rousseau) telow, Lahanan (Urquhart) telo, Sekapan-Kejaman (Strickland) tɔlɔw, Tatau telow, Sekapan (Urquhart) tilaw, Kejaman (Urquhart) telaw, Eastern Penan telɔw, Sihan tɔlu, Bukat talu, Bukitan (Urquhart) tolu, Punan Batu tolu, Punan Bah (Urquhart) telu, Punan Bah (Ling Roth) tulu. (283)

*lima* ‘five’ Melanau: Mukah lima, Kajang: Sekapan-Kejaman (Strickland) limah, Sekapan (Urquhart), Tatau lima, Eastern Penan lemah, Sihan limo, Ukit limoh, Bukat (Sellato) limo, Bukitan limoh, Punan Batu limoh, Punan Bah (Urquhart) limo, (Ling Roth) limoh. (285)

*anɔm* ‘six’ Melanau: Mukah ɭɔm, Kajang: Kejaman-Sekapan (Strickland), Tatau nam, Lahanan, Sekapan, Kejaman (Urquhart) anum, Eastern Penan nem, Ukit (Urquhart) anum, Bukat anɔm, Bukitan (Urquhart) anum, Punan Batu anum, Punan Bah (Urquhart) anum, (Ling Roth) num. (286)

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*Ratus* ‘hundred’ Melanau Ratus, Kajang: Lahanan, Sekapan, Kejaman (Urquhart) –atu, Kejaman-Sekapan (Strickland) atu, Tatau jatus, Eastern Penan ato, Ukit aiatu, Bukitan (Urquhart) juatu, Punan Batu jiatu, Punan Bah jiatu. (291)

*Raya* ‘big’ Proto Melanau *ayəŋ, Bintulu azəŋ, azeh, Sekapan (Urquhart), Kejaman (Urquhart, Ray) ada (cognate?), Western Penan (Ray) jau, ja-au (cognate?), Eastern Penan ja’au (cognate?), Sihan ayoʔ, Ukit ajo, Bukat ajəʔ, Punan Busang ayo, Punan Bah (Urquhart and Kaboy) ayo, (Ling Roth) aioh. (295)

*imiq* (?) ‘short’ Melanau: Balingian imiʔ, Bintulu (Blust) ɓiʔ, Bintulu (Chou) jibšʔ, Kajang: Tatau mamiek (“silent k”). (296)

*anaduq* ‘long’ Proto Melanau *lələw, Mukah aləw, Kajang: Lahanan (Rousseau and Urquhart) larun, Sekapan, Kejaman (Urquhart) daru, Tatau lalou. The (intermediate ?) reconstruction that lies behind these forms seems to be something like *dadu*. (298)

*jauq* ‘far’ Proto Melanau *jahuʔ, Bintulu jauʔ, Kajang: Lahanan biju, Kajang: Kejaman mejo, Western Penan jo, Eastern Penan ju, Sihan mojuʔ, Bukat bujuʔ, Baketan mojo. (302)

*dakin* (?) ‘near’ Melanau: Balingian dekin, Kajang: Lahanan (Rousseau) 1əkin, Kejaman (Ray) ɗekeiten, Kejaman-Sekapan (Strickland) baliku ‘approach’ (cognate?), Sihan dakin. (303)

*madam* (?) ‘rotten’ Proto Melanau *madam, Kajang: Lahanan (Rousseau) maram, Sihan maram, Bukat maram, Punan Busang maram, Punan Bah meram. (305)

*basaq* ‘wet’ Proto Melanau *basəʔ, Bintulu (Chou) basəʔ, (Blust) baseʔ, Kajang: Lahanan (Rousseau) basəʔ, Eastern Penan basə’ Sihan başək, Bukitan (Ling Roth) basoh, Punan Bah (Kaboy) meso’út (cognate?). (306)

*ma-baRat* ‘heavy’ Bintulu vat, Sekapan-Kejaman (Strickland) maʃat, Ukit mawat, Bukat mavat, Bukitan mawat, Punan Busang nuvat ‘weight’, Punan Batu mafat, Punan Bah (Urquhart) movat, (Kaboy) kovat ‘weight’; *baRat* Proto Melanau *baRat, Kajang: Lahanan (Rousseau) baat, Lahanan (Urquhart) bat, Sekapan-Kejaman (Urquhart) bat, Western Penan baat, Eastern Penan baat. (313)

*ma-panas* ‘hot’ Melanau: Mukah (Blust) panas ‘feeling of anger’, Kajang pana ‘warm’, Western Penan pano, pane, Eastern Penan pana. (314)

*lasuq* ‘hot’ Proto Melanau *lasuʔ, Baketan loa (melahu), Punan Busang lahu, Punan Bah (Kaboy) belou, (Punan Dyaks) (Ling Roth) eloh. (314)
*pajás* ‘hot, spicy’ Proto Melanau *pədis or *pədīh (crucial evidence from Matu and Rajang lacking) ‘sick’, Bintulu (Chou) pədəs, Bintulu (Blust) pedəs ‘sick’, Paketan (Ling Roth) maparo ‘sick’, Punan Busang paroh ‘ill’, Punan Bah pero ‘ill’. (314, 435, 458)

*dadəm* ‘feel cold’ Proto Melanau *dadəm, Western Penan (Ray) dəɾəm, (Kaboy) darum, Eastern Penan darem, Sihan balarəm, Ukit darum, Baketan merarəm, Punan Busang larom, Punan Bah (Punan Rejang) (Ray) blarum, (Ling Roth) blarum. (315)

*isiq* ‘small’ Melanau: Balingian isiʔ, Bintulu disiʔ, Kajang: Tαtαu mahieʔ, Western Penan siek, Eastern Penan si'ik, Sihan isiʔ, Ukit isiʔ, Bukat esiʔ, Bukitan isi, Punan Batu sik, Punan Bah (Urqquhart) isut. (318)

*ma-kapal* ‘thick’ Proto Melanau *kapan, Bintulu (Chou) bəkəpan, Bintulu (Blust) mekapan, Kajang: Lahanan (Rousseau) kapan, Kejaman (Ray) kapən, Western Penan (Ray) kapan, (Kaboy) mekapan, Eastern Penan kapan, Sihan kapan, Ukit kapan, Bukat kapan, Baketan kəpən, Punan Busang kapan, Punan Bah mekopen. The forms of this set seem to reflect an intermediate reconstruction such as *kapan. (321)

*nipis* (PMP-Blust) ‘thin’ Proto Melanau *dipis, Melanau: Oya, Mukah lipih, Balingian məlipih, Bintulu (Chou) məlipe’əs, (Blust) melipis, Kajang: Lahanan (Rousseau) nipi, Kejaman (Ray) lipi, Western Penan nipi, Eastern Penan nəpə; Sihan mən̥akan, Ukit ləriŋə, Bukat biring, Baketan məring, Punan Bah məlirιŋə. (322)

*baqaRu* ‘new’ Proto Melanau *baʔaw, Melanau: Balingian bahaw, Sungai Ud, Mukah, Oya baʔəw, Bintulu vəw, Kajang: Lahanan (Rousseau), Lahanan and Sekapan (Urqquhart) bəw, Kejaman (Urqquhart) ba-au, Kejaman (Ray) bəhu. (323)

*ubas* ‘new’ Proto Melanau *ubas, Sihan uβa, Ukit uwa, Bukat uva, Baketan (Ray) wa, Bukitan (Urqquhart) wah, Punan Bah (Urqquhart) ova. (323)

*ma-qitəm* ‘black’ Melanau: Balingian mətəm, Bintulu (Chou) mitəm, Bintulu (Blust) mətən, Kajang: Tαtαu metəm, Eastern Penan narom, Sihan urəm, Bukitan urəm, Punan Busang urəm, Punan Batu terum, Punan Bah (Urqquhart) məngurom, (Kaboy) mengurom, (Ling Roth) murum. (327)

*gaduŋ* ‘green’ Proto Melanau *gaduŋ, Bintulu (Chou) gadəŋ, (Blust) gaduŋ, Kajang: Sekapan (Urqquhart) gadur, Tαtαu gaduŋə, Western Penan gaduŋə, Eastern Penan marung, Punan Bah (Urqquhart) gadəŋ, (Kaboy) gaduŋə. (328)

*ma-qudíp* ‘(a)live’ Proto Melanau *mudip ‘grow’, *tudip ‘(a)live’ (Melanau: Balingian murip), Bintulu (Chou) muɾəp, (Blust) murip, Kajang: Lahanan, Sekapan, Kejaman (Urqquhart) murip, Kejaman (Ray) morip, Western Penan morip, Eastern Penan уріп,
Sihan mörîp, Ukit morîp, Bukat murîp, Bukitan murîp, Punan Busang morîp, Punan Batu mosîp, Punan Bah (Urquhart) merîp, (Kaboy) morîp, (Punan Dyaks) (Ling Roth) murîf. (328)

*putiq ‘white’ Proto Melanau *puti?, Kajang: Lahanan (Rousseau) puti, Lahanan, Sekapan, Kejaman (Urquhart) puteh, Kejaman (Ray) pote, Western Penan pote. (329)

*m-apuq ‘white’ Proto Melanau *m-apuh, Bintulu (Chou) mapu?, (Blust) mapu?, Kajang: Tatau mapo’. (329)

*kuniŋ ‘yellow’ Proto Melanau *kuniŋ, Bintulu kuniŋ, Kajang: Lahanan (Rousseau) kuniŋ, Sekapan (Urquhart) and Tatau kuning, Sihan kuniŋ, Ukit kuning, Bukitan kuning, Punan Bah kuning, Western Penan kuning. (330)

*anu ‘what’ Proto Melanau nôw, Bintulu anôw, Kajang: Lahanan (Rousseau) and Tatau nôw, Western Penan inô?, Eastern Penan inôw, Sihan nu, Bukat doanu, Punan Busong aŋnu, Punan Batu ano, Punan Bah nu. (335)

*i-say (or *sai ?) ‘who’ Proto Melanau *say, Bintulu say, Kajang: Lahanan, Sekapan, Kejaman (Urquhart) che, Eastern Penan sé (something like say expected), Sihan ne, Ukit kermhe, Bukat he?, Bukitan hei, Punan Batu hein, Punan Bah ei. (338)

*aku ‘I’ Proto Melanau *akôw, Bintulu akôw, Kajang: Lahanan (Rousseau) akôw, Lahanan, Sekapan, Kejaman (Urquhart), Tatau akau, Kejaman-Sekapan (Strickland) akôw, Eastern Penan akeu, Sihan njôk, Ukit jerk, Bukat jôp, Bukitan ho, Punan Batu ajo, Punan Bah oah. (339)

*ikaw ‘you (sg.)’ Bintulu (Chou and Blust) ikôw, Kajang: Lahanan (Rousseau) ikôw, Lahanan, Sekapan, Kejaman (Urquhart) ikôw, Kejaman-Sekapan (Strickland) ikôw;

*kaqaw Proto Melanau *kaqaw, Bintulu (Chou) i-kahu, Kajang: Tatau ka-au, Eastern Penan ka’au, Sihan koarop, Ukit kôh, Bukitan kou, Punan Batu okkôh, Punan Bah kou. (340)

*sìa ‘he, she’ Melanau: Mukah, Dalat siôn, Bintulu isa, Kajang: Kejaman-Sekapan (Rousseau) ica, Lahanan (Urquhart) ji (cognate?), Kejaman (Urquhart), Tatau ia, Eastern Penan éh, iah, Ukit oh, Bukat en, Bukitan hen, Punan Batu en, Punan Bah oh. (341)

*kami ‘we (exclusive)’ Proto Melanau *kamay, Kajang: Lahanan, Sekapan, Kejaman (Urquhart) kami, Kejaman-Sekapan (Strickland) kamay, Western Penan amé’, Eastern Penan amé. (342)
**kalu** (?) ‘you (pl.)’ Melanau: Mukah (Blust) kelew, Bintulu ɲelew, Kejaman-Sekapan (Strickland) kəɬəw, ɲɪɬəw, Eastern Penan keteleu (three or more), Bukat kom|talu. (344)

**si-ida** ‘they’ Melanau: Tanjong dah, Kajang: Lahanan (Rousseau) sirə(bukən), Lahanan (Urquhart) oreh, Sekapan (Urquhart) uranŋ, Sekapan-Kejaman (Strickland) cirah, Kejaman (Urquhart) sira, Eastern Penan réh, Sihan do, Ukit do, Bukat dəh, Punan Batu loh, Punan Bah do. (345)

**tuaq** Proto North Sarawak (Blust) ‘we (dual)’ Melanau: Balingian tuah, Kajang: Kejaman-Sekapan (Strickland) təgwah, Eastern Penan tuah. (346).

**bātis** ‘calf, leg’ Proto Melanau *bətis, Bintulu (Ling Roth) betas(vowel i expected in final syllable), Kajang: Lahanan bəti, Sekapan-Kejaman (Urquhart) beti, Kejaman (Ray) běti, Western Penan bəti, Eastern Penan bëti, Ukit bəti, Bukat bəti, Bukitan bəti, Punan Busang batin, Punan Batu batin, Punan Bah (Urquhart and Kaboy) beti, (Punan Dyaks) (Ling Roth) biti. (368, 109)

**ayaw** ‘enemy’ Kajang: Lahanan (Urquhart) anyau, Kejaman (Urquhart) ayau, Western Penan ayaw, Eastern Penan ayaw, Punan Busang penganyou, Punan Batu nganyoh, Punan Bah nganyo, nganyou. (407)

**pajas > *pədəs** ‘painful, sick’ Proto Melanau *pədis or *pədih ‘painful’, Melanau: Matu pədəs’hot’, Bintulu (Chou) pədəs, (Blust) pedəs, Pakatan (Ling Roth) mapəro, Punan Busang paroh, Punan Bah pero. (435)

**babuy** (?) ‘pig’ Kajang: Kejaman (Ray) bavui, Tatau bavui, Eastern Penan babui ‘bearded pig’, Ukit bavui, Baketan bahoi-lau, Bukitan (Noeb) bo’ui, Punan Bah (Punan Dyaks) (Ling Roth) baboe. (437, 438)

**ma-hiaq** ‘shy’ Proto Melanau *miaʔ, Bintulu məzaʔ, Eastern Penan menya. (456)

**baRaq** ‘swollen’ Kajang: Lahanan (Rousseau) baa ‘swell’, Western Penan bee, Eastern Penan baha’. (503)

**isi** ‘flesh’ Proto Melanau *səy, Bintulu (Chou) məńisiʔ, Kajang: Lahanan (Rousseau) səy, Kejaman (Ray) sei, chei, Western Penan sin, Eastern Penan sin, Sihan ohĩ, Bukat sini, Bukitan (Ling Roth) oyi, oi, Punan Busang hin, Punan Bah (Kaboy) ein. (505)

**bawəŋ** ‘lake, creek’ Kajang: Lahanan (Rousseau) bawaŋ, Kejaman (Ray) baŋwoŋ, Western Penan bawaŋ, Eastern Penan bawəŋ ‘pool’, Sihan bawaŋ, Baketan bauoŋ. (508)

**tasik** ‘lake’ Melanau: Matu tasik [tasiʔ], Bintulu (Chou) tasiʔ. (508)
**labiq** (?) ‘come’ Proto Melanau *labi?, Western Penan (Ray) avê, (Kaboy) ave, Eastern Penan avé, Sihan labi?, Baketan, Bukitan labi. (509)

**dalam** ‘inside’ Melanau: Balingian dalm, Kajang: Kejaman-Sekapan (Strickland) aţom, Western Penan (Kaboy) dalom, (primer) lem, Eastern Penan lem, Sihan lalom, Punan Busang lalom, Punan Bah ta’lalom. (510)

**(d)udu** (?) ‘grass’ Proto Melanau *duţw, Bintulu (Chou) urw, (Blust) urw, Kajang: Lahanan (Rousseau) urow, Eastern Penan ureu ‘general word for plants’, Sihan uru, Bukat uru. (518)

**i-babaw** ‘above’ Proto Melanau *(bas) baw, Bintulu baw, Kajang: Kejaman-Sekapan (Strickland) baw, nţbaw ‘climb into’, Punan Bah (Urquhart) mobau, (Kaboy) nivou; **baw** ‘high’ Lahanan, Sekapan, Kejaman (Urquhart), Tatau mebau, Eastern Penan bau, Punan Busang ovou, Punan Batu fu, Punan Bah (Kaboy) ma’bau. (522, 298)

**tay** ‘go’ Kajang: Lahanan (Urquhart) na-ai, Sekapan (Urquhart) tai, tei, Western Penan āngai, Eastern Penan tai, Baketan munute, Punan Bah (Urquhart) de. (565)

### Appendix C: Index of cognate sets

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