



SKETCHES OF THE MORPHOLOGY AND PHONOLOGY OF BORNEAN LANGUAGES

1: UMA JUMAN (KAYAN)

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Overview of the Projected Series of Sketches

This paper begins (pp. 9-37) with an overview of the material and intellectual background (sects. 0-2), descriptive conventions (sect. 3) and organization (sects. 4-6) of a projected series of seven linguistic sketches. The six section headings with subdivisions are thereafter applied to the first sketch in the series under the general heading 'Uma Juman' beginning with section 4.

0. INTRODUCTION

The following sketch of the morphology and phonology of Uma Juman, a Kayan dialect spoken on the Balui branch of the Rejang river, is the first in a series intended to provide similar coverage for a number of the languages of central and northern Sarawak. The material on which these sketches are based was collected during a linguistic field trip conducted in the Miri and Baram Districts, from April to November, 1971, and the depth of coverage of various features of the languages largely reflects the goals of that enterprise.¹ As noted elsewhere (Blust 1973, 1974), the principal aim of data collection was to assemble materials necessary to test the claims of a subgrouping/reconstructional hypothesis (the 'Proto-North Sarawak Vowel Deletion Hypothesis') originally proposed (Blust 1969) to explain the seemingly anomalous appearance of a series of phonemic voiced aspirates in first-hand material obtained for the Bario dialect of Kelabit, and parallel discrepancies in other languages of the area for which limited published data were available.² In all, comparative material was collected for some forty-one distinct speech communities. From this relatively broad sample seven languages - Uma Juman (Kayan), Mukah (Melanau), Bintulu (North

Sarawak isolate), Miri (Lower Baram), Kiput (Lower Baram), Long Anap (Kenyah) and Bario (Kelabit) - representing roughly the basins of the Rejang and Baram river systems and the 200-mile coastal strip between them, have been selected for closer study.

1. DATA COLLECTION

Because fieldwork was primarily intended to test the specific predictions of the vowel deletion hypothesis, the data collection plan was to some extent predetermined. At the same time it seemed desirable to include certain additional information from a more comprehensive point of view. To satisfy the first requirement a list was drawn up of all known Kelabit lexical items that contain a voiced aspirate, together with representative items containing the homorganic plain voiced stops, and an attempt was made at the beginning of work with each informant to identify cognates of these words. As the work advanced and the full set of correspondences between the languages under consideration became clearer, reflexes of PNS *S clusters were discovered in a number of comparisons where a Kelabit cognate was lacking or unknown. Since the time available for elicitation in any one language rarely exceeded twenty contact hours, it quickly became apparent that a relatively uniform data collection procedure was needed to ensure maximum comparability of the resulting corpora. Moreover, it was clear for obvious reasons that, under the circumstances, only the morphology and phonology of the languages examined could profitably be investigated. To satisfy the second requirement it was decided to record enough additional lexical material to enable the regular reflexes of all or most PAN phonemes to be stated with some degree of confidence. This task was begun by transcribing the Swadesh 200-word basic vocabulary, from which a tentative statement of most reflexes was formulated. The further determination of reflexes then proceeded through a combination of semantic and formal elicitation; the meanings of existing reconstructions that contain an instance of some proto-phoneme were asked, and where this failed to turn up a sought-after item the formal generation of the anticipated reflex was used as a supplementary elicitation technique. After some five to six hours of informant work this procedure normally resulted in a corpus of 600-700 words, slightly less than half of which had an established PAN prototype. These data provided the basis for an autonomous phonemicization of the language. For those languages in which further informant work was undertaken, a thorough effort was then made to analyze each recorded word into its constituent morphemes, and to elicit all other permissible morphologically complex shapes of each

root, wherever possible in sentence context. Finally, historical information, particularly the evidence of conditioned changes, was used to accelerate the discovery of phonological alternations. Once it was known, for example, that PAN *b produced [b] in initial position in Uma Juman but [v] elsewhere, it followed that these phonetic segments should alternate in prefixed forms that do not involve nasal substitution, and an active search was made for prefixed shapes of [b]-initial roots.

2. GOALS AND ASSUMPTIONS

The theory of language adopted is roughly the standard theory of generative phonology presented in Chomsky and Halle (1968), though departures from orthodoxy have been made where it is felt that these can be justified. In principle the goal of each description, then, has been to construct an explicit theory of the morphology and phonology of the language described. However, this statement is in need of immediate qualification. The present study makes no attempt at serious theoretical innovation in its synchronic analyses, nor does it claim that these analyses are in any sense definitive. Though the descriptions are intended to represent an approximation of the speaker's competence, as a result of limited time in the field and the subsequent inaccessibility of most informants it has sometimes been necessary to fall back on a simple description of the corpus. Moreover, descriptive formalism has been kept to a minimum, and when used is normally accompanied by an ordinary language paraphrase. The latter practice has been followed for two reasons. First, it was felt that the formal statement of phonological rules (P-rules) solely in terms of distinctive features might interfere with the intelligibility of the presentation for those unaccustomed to working within the distinctive feature framework. Second, it was discovered in the early stages of data collection that the environments of some apparently related phonological processes cannot be characterized in terms of natural classes. Thus, in a language like Mukah, where a process of breaking regularly affects high vowels (> [iə, uə]) before word-final /ŋ/ and /k/ (but not /g/), and a similar process affects /a/ (> [eə]) before /ŋ/, /k/ and /r/ ([ʋ]) the description of the breaking environment in terms of distinctive features offers no clear advantage over a simple enumeration of the corresponding whole segments.³

What this methodological allegiance means in the present context, then, is a commitment to certain principles which distinguish generative grammar in fundamental ways from most earlier approaches to the study

of language. Specifically, the descriptions seek to capture generalizations wherever they can be found, and to distinguish those generalizations that are linguistically significant from those that are not. In terms of the phonemic representations of morphemes (lexical representation), it follows that a separate level of morphophonemics is not recognized.⁴ Since this decision results in lexical representations which are sometimes much more abstract than the level of autonomous phonemics (AP), a discussion of the general approach is perhaps in order. Consider the following pairs of Bario Kelabit words in phonetic transcription:

a)	['ʔayək]	<i>a whisper:</i>	['ŋǎyǎk]	<i>to whisper,</i>
	['ʔurat]	<i>a wound:</i>	['ŋūrat]	<i>to wound,</i>
	['ʔate:]	<i>death:</i>	['ŋǎte:]	<i>kill,</i>
	['ʔanūk]	<i>clothing:</i>	['ŋǎnūk]	<i>to dress, put on clothing,</i>
b)	['linūh]	<i>thought:</i>	[ŋǎ'linūh]	<i>think,</i>
	['lulun]	<i>what is rolled up; anything rolled up:</i>	[ŋǎ'lulun]	<i>roll up,</i>
	['rudap]	<i>sleep; to sleep:</i>	[ŋǎ'rudap]	<i>put s.o. (as a child) to sleep,</i>
	['lǎŋŋū:]	<i>slipped off (of a bracelet, shirt, skin of snake, etc.):</i>	[ŋǎ'lǎŋŋū:]	<i>remove anything that encircles.</i>

In each of these pairs of words the first member is related to the second through the prefixation of an element [ŋ]- or [ŋǎ]- which marks a predicate that is always active, generally transitive, and sometimes causative. It seems clear from their complementation and semantic similarity that [ŋ]- and [ŋǎ]- are different phonetic realizations of a single underlying prefix. Given only the above information, however, it is impossible to determine the phonemic shape of this element unambiguously. Since [ŋ]- only occurs before vowel-initial roots and there is a general morpheme structure constraint against prevocalic shwa, we could posit a plausible rule of shwa deletion that would allow us to derive the morphologically complex words under a) from underlying forms /ŋə+ayək/ 'to whisper', /ŋə+urat/ 'to wound', etc. (glottal onset and various other phonetic details irrelevant to the point at issue are not discussed here). Similarly, since Bario Kelabit permits no consonant clusters within a morpheme and allows phonetic consonant clusters across morpheme boundary only in medial position, we could posit a plausible rule of shwa epenthesis which converts underlying forms /ŋ+linuh/ 'think', /ŋ+lulun/ 'roll up', etc. to their stated surface realizations. In short, neither vowel-initial nor liquid-initial roots qualify as crucial evidence capable of deciding between

these equally plausible alternative hypotheses. An examination of roots that begin with a plain (i.e. unaspirated) stop, however, provides the basis for a motivated choice. Consider the following pairs of words:

c) ['buwən]	odor:	['mūwə̃n]	sniff, smell,
['kəttəp]	mark left by a bite:	['ŋə̃ttəp]	to bite,
['paʔid]	what is used to wipe; anything used to wipe:	['māʔɪd]	wipe,
['diyuʔ]	bath; bathe (o.s.):	['nɪyũʔ]	bathe s.o. (as a mother bathing her child).

A comparison of these forms with the similar pairs listed under a) and b) shows clearly that the substitution of a homorganic nasal in roots that begin with a plain stop is most reasonably analyzed as a third phonetic realization of the still indeterminate verb-forming prefix /ŋə/ or /ŋ/. Nothing in the structure of Kelabit morphemes, or any known phonological rule, suggests that underlying forms /ŋə+buən/ 'sniff, smell', /ŋə+kəttəp/ 'to bite', etc. would result in the attested pronunciations. To maintain that the prefix under consideration is /ŋə/ it is necessary to posit a rule which deletes shwa across morpheme boundary just before vowels and plain stops. If, instead, we assume that the shape of this prefix is /ŋ/ a more natural overall statement becomes possible. No word-initial consonant clusters are permitted in phonetic representations. To block such non-permitted surface clusters an underlying sequence of nasal plus plain stop is broken up by nasal substitution.⁵ In liquid-initial roots this means of cluster avoidance is not available and consonant sequences are separated by shwa epenthesis.⁶ If the rather obvious generalization underlying these three phonetically distinct but semantically similar and mutually exclusive shapes is to be captured in terms of plausible phonological processes, then, the forms in question must be written: /ŋ+ayək/ 'to whisper', /ŋ+urat/ 'to wound', /ŋ+linuh/ 'think', /ŋ+lulun/ 'roll up', /ŋ+buən/ 'sniff, smell', /ŋ+kəttəp/ 'to bite', etc. (where + indicates morpheme boundary).

The issue of abstractness in phonology is a vexed and inconclusive one, and it is possible that the level of representation adopted here will be changed in future publications on Kayan. Kiparsky (1968) has pointed out that the phonological theory presented in Chomsky and Halle (1968) implicitly allows underlying phonological distinctions which never appear on the surface. He calls this relationship between deep and surface representations absolute neutralization, and proposes a condition on underlying representations (the 'alternation condition')

which would exclude such a relationship from phonological theory. Hyman (1970), on the other hand, maintains that the adoption of Kiparsky's alternation condition would make it impossible to state some linguistically significant generalizations in phonology. One of his principle arguments is an appeal to pattern congruity. To explain certain phonotactic asymmetries Hyman posits two underlying vowels /ɔ/ and /ɛ/ for Nupe, both of which are realized as surface [a].

Although the debate as stated tends to suggest that there are just two generally motivated levels of abstractness beyond the simple recognition of allophonic conditioning (one which adopts the alternation condition and one which does not), there seems to be some support for a third, intermediate level. Thus, the alternation condition can be violated by abstract representations which do not permit absolute neutralization in Kiparsky's sense. Such a case would occur where the level of representation was determined in part by considerations of pattern congruity, but where the abstract underlying segment posited for this purpose was otherwise found in the phonological inventory.

A level of representation of this type would be more abstract than that advocated by Kiparsky in that it would permit underlying segments that never appear on the surface in the morphemes in question, but would be less abstract than that advocated by Hyman in that it would limit the range of possible underlying segments to those that actually appear on the surface in some morphemes. As in Hyman's analysis, the justification of such abstract segments would be their hypothetical effects on attested segments prior to the application of a rule deleting them or shifting them to some other phonetic realization. Kiparsky (1971) has called such rules (i.e. rules the environment of which is obliterated by the application of a subsequent rule) opaque.

To summarize, we see three generally motivated levels of abstractness beyond the simple recognition of allophonic conditioning:

- 1) a level motivated by the desire to capture the relationship between alternating forms
- 2) a level motivated by the desire to explain phonotactic asymmetries through absolute neutralization in the morpheme
- 3) a level motivated by the desire to explain phonotactic asymmetries (and exceptions to rules) through absolute neutralization in the phonological inventory.

Although an appeal is never made to 3) in any of the following sketches, 2) is permitted, as in the Mukah rule of breaking, which applies before $-/k/$ ([ʔ]), but not before $-/?/$ ([ʔ]), where both $/k/$ and $/?/$ are independently required in the phoneme inventory. The level of

abstractness adopted is thus intermediate between that of Kiparsky (1968) and Hyman (1970). To the extent that it incorporates synchronic observations that would be omitted in a less abstract analysis, the level of representation adopted here treats as part of the synchronic grammar observations that would otherwise be treated as part of the history of the language.

Despite its distinct advantages in describing many phonological regularities, a systematic phonemic (SP) analysis sometimes introduces diachronic complications which it is possible to avoid by adopting a lower level of abstraction for purposes of lexical representation. This situation arises in particular where restructuring (a change in underlying representation) has occurred on the SP level. Restructuring can result either from borrowing or from rule change. As the complications introduced by these two types of change differ in certain ways they are best discussed separately.

Restructuring through borrowing can perhaps most clearly be described if we first examine a situation in which borrowing has not led to a change in underlying representation. There is in Uma Juman a well-exemplified rule of lowering by which high vowels become non-high before word-final /h/, /ʔ/, /i/ and /r/. A few words nonetheless exhibit a high vowel before final /h/ or /ʔ/ ([ʔa'niḥ] 'this', [ba'giʔ] 'share, division', [sədi'riʔ] 'oneself', [ʔi'tuʔ] 'we (dual incl.)', [la'buʔ] 'gourd'). To reflect the general fact that phonetic high vowels rarely occur in the stated environments words of this type are regarded as exceptions to lowering, and are stored in the lexicon with exception features: /aniḥ/ [-lowering], etc. Where an etymology is known (as with bagi (Skt.) 'divide', PAN (B) *s(ae)ŋ(dDj)iri 'self', labu (Skt.) 'gourd') such words inevitably prove to be loans, sometimes displaying exceptions to more than one historical change. For ease of later reference these facts are summarized below:

systematic phonemic (SP)	/i/	/u/
autonomous phonemic (AP)	/e/ [e]<*i /i/ [i]<*i(L)	/o/ [o]<*u /u/ [u]<*u(L)

The above summary indicates that phonetic segments [e], [i], [o] and [u] occur in the previously mentioned environments. Where an etymology is available it is clear that [i] and [u] in these environments appear only in loanwords. In an AP analysis the fact of contrast - however minimal - compels us to posit a distinct phoneme (/e/, /i/, /o/ and /u/) for each of these segments. From a historical standpoint it follows that PAN *i and *u have undergone phonemic split as a result

of the elimination of environmental conditioning through borrowing. An SP analysis, on the other hand, acknowledges only /i/ and /u/ together with certain exceptions to lowering, but explicitly denies that borrowing has led to restructuring. Whatever objections one might have to a phonemic analysis that potentially distinguishes the members of a phonetic minimal pair solely by the presence or absence of an exception feature to a rule, for comparative purposes it makes little difference whether facts of the type under consideration are regarded as part of the history of a language or of the speaker's knowledge. Both analyses recognize the same historical irregularities in the same forms, and neither phonemicization seriously impairs our ability to describe their history clearly.

As just noted, comparative evidence reveals that some exceptions to lowering are probable loans. We might, therefore, mark these items as [+foreign] and tentatively adopt a convention that [+foreign] implies [-lowering], thus accounting for the observed irregularities in terms of direct and indirect inheritance. There are, however, two major problems with this approach. First, since the use of comparative data to arrive at phonemic representations is disallowed in any analysis which purports to reflect the speaker's knowledge of his language, it is possible to identify loans only in terms of exception features. But under this condition words like [ʔa'nih] 'this' and [ʔi'tuʔ] 'we (dual incl.)' must be treated as loans even though it is improbable that words with these meanings would be borrowed, and no plausible source language for them has yet been identified. Second, and more important, some loanwords identifiable on the basis of comparative evidence cannot be identified on the basis of exception features. While a fact of this kind poses no difficulties for the synchronic description, it creates complications in reconciling the optimal independently motivated synchronic grammar with a historical description of the same language. This situation arises whenever borrowing leads to restructuring. Thus, in Uma Juman [b] and [v] show the following distributional frequencies in the collected corpus:⁷

	initial	intervocalic	postconsonantal	final
[b]	58	14	3	0
[v]	1	34	0	3

In addition to their partial complementation, these segments alternate in forms such as [bɛ'toŋ] 'swollen': [pɛvɛ'toŋ] 'cause s.t. to swell', [bi'ti:] 'stand': [pɛvi'ti:] 'make s.o. stand', [bu'loʔ] 'body hair, fur, feathers': [pɛvu'loʔ] 'let hair or feathers drop on s.t. (as when skinning an animal, plucking a chicken, etc.)'. Assuming an SP level of

lexical representation, this alternation must be described as the result of a P-rule leniting /b/ in intervocalic position across morpheme boundary. Moreover, it seems clear that the partial complementation of [b] and [v] is most reasonably explained on the assumption that the domain of application of this rule extends also to final /b/. Given the undeniable contrast of [b] and [v] in intervocalic position within a morpheme, however, it is impossible to claim that the lenition of /b/ is regular in intervocalic position without positing a more abstract analysis of the segments in question. This can be accomplished by assuming that all instances of intervocalic [b] are underlying clusters /mb/ while all instances of [v] (both intervocalic and final) are underlying stops /b/. The cluster analysis of [b] permits us to preserve the integrity of a P-rule which is strongly motivated; in addition, it agrees by and large with comparative evidence. If this more abstract level of representation is adopted, the grammar of Uma Juman must be enriched by the addition of a rule of cluster reduction ordered after the rule of lenition to convert e.g. /kələmbit/ to [kələ'bit] 'shield', /timbaŋ/ to [ti'baŋ] 'weigh' or /tumbu/ to [tu'bu:] 'grow'. A few phonetic clusters occur, however, and must be treated as exceptions to cluster reduction: /təmbaga?/ [-CR] 'copper', /həmbək/ [-CR] 'selfish', /həmbuŋ/ [-CR] 'extension piece', /həmpuʔ/ [-CR]⁸ 'blowpipe', /hənguk/ [-CR] 'hiccough', anak /hənduŋ/ [-CR] 'son or daughter-in-law'. Some of these exceptions can be explained historically as a result of borrowing, as with /təmbaga?/ [-CR] 'copper', known to be ultimately a Sanskrit loanword. A similar explanation can be applied to the intervocalic [b] in certain other words, as [la'bu?] < labu (Skt.) 'gourd' and [ri'bu:] < *ribu 'thousand'. It seems clear that these items were borrowed after the changes *mb > [b] and *b > [v] in intervocalic position. As already noted, [la'bu?] 'gourd' was also borrowed after the historical change that lowered high vowels before certain final consonants. Unlike the reflexes of *i and *u in loans, however, intervocalic [b] in loanwords cannot be treated as an exception to a synchronic rule since it has fallen together with the reflex of *mb (and the output of the proposed synchronic rule of cluster reduction) in directly inherited words. Given the above assumptions, then, forms like [la'bu?] 'gourd' and [ri'bu:] 'thousand' must be written /lambu?/ [-lowering] and /rimbu/, and we are constrained to state that b > -mb- in loanwords even though this change did not occur phonetically. These facts are summarized below:

SP	/b/	/mb/	
AP	/v/ [v] < *b	/mb/ [mb] < mb(L)	
		/b/ [b] < { *mb b(L)	

Parallel to [b] and [v], [d] and [r] in Uma Juman are in partial complementation, having the following distribution in known forms:

	initial	intervocalic	postconsonantal	final
[d]	22	25	1	0
[r]	3	68	0	33

Of the three r-initial items, one ([rɪ'git] 'money') is clearly a Malay loan, and there are strong reasons to believe that the other two ([ra'sun] 'poison' and [rɪ'bu:] 'thousand') have been borrowed, probably from Malay. In two other words ([ra'mē:] ~ [la'mē:] 'bustling, lively' and [ru'gi?] ~ [lu'gi?] 'loss'), both of which are probable loans, [r] varies freely with [l]. Evidence of contrast for [d] and [r] in directly inherited words is thus found only in intervocalic position. On the basis of this distribution it might be possible to capture the relationship between these segments in a manner comparable to the treatment of [b] and [v]: we can exclude [r] from phonemic transcriptions, deriving all instances of this segment from underlying /d/ and all instances of -[d]- from underlying /nd/.⁹ To a large extent this interpretation of the synchronic facts corresponds to changes that have occurred in the history of the language. As with [b] and [v], however, some words that contain -[d]- were borrowed after the change of *d to [r] in intervocalic and final positions (ku'da?) ~ [ku'da:] 'horse'); on the evidence of synchronic data alone these items must be written phonemically with a nasal cluster they do not contain phonetically and almost certainly n (/kunda/).

Moreover, restructuring as a result of rule change has introduced diachronic complications into the phonological analysis of some directly inherited words. Uma Juman [r] has four ultimate historical sources: PAN *d, *D, *j and *r; *d, *D and *j apparently first fell together before coalescing with *r. The interpretation of [r] as /d/ in words such as [ʔa'ran] (/adan/) 'name' or [pa're:] (/pade/) 'rice in the field; riceplant' recapitulates a historical change independently inferrable from comparative evidence. In certain other words, however, ([su'rat] < *surat 'letter', [ʔa'rəp] ~ [ha'rəp] < *qarep 'hope') the similar interpretation (/sudat/, /adəp/ ~ /hadəp/) requires us to admit an unnatural historical change (*r > d in intervocalic and final positions) which did not take place phonetically. There is evidently no way to remedy this situation: either the synchronic generalization is captured by uniting [d] and [r] under /d/, which permits the derivation of [r] by a natural synchronic rule (/d/ → [r] in intervocalic and final positions) but forces us to recognize an unnatural historical change,

or the synchronic generalization is captured by uniting [d] and [r] under /r/ (/surat/ 'letter', /arəp/ ~ /harəp/ 'hope'), which permits a natural historical statement (*d, *r > r) but forces us to recognize an unnatural P-rule (/r/ → [d] in initial and post-consonantal positions).¹⁰ Because these sketches are primarily intended as basic materials for dealing with a historical problem, whenever a phonemic analysis leads us to posit a historical change that has not taken place phonetically, it is rejected and the possible synchronic generalization left unstated. With respect to the problem under consideration, then, a rule is posited to account for the alternation of root-initial [b] and [v], but distinct phonemes /b/, /v/, /d/ and /r/ are recognized in intervocalic and final position within a morpheme. Other problems of the same type will be discussed in the descriptions of individual languages.

In a few cases I have shown a certain tolerance for phonetic implausibility in P-rules where it appears that such tolerance permits a significant generalization to be made, and the synchronic implausibility has a natural historical explanation. Thus, while the nasal replacement of initial obstruents in a language like Long Anap can be described in a straightforward manner if we assume that [s] is an underlying palatal ([p|'lɛ?] 'choice': [m|'lɛ?] 'choose', [tə'pa?] 'man's traditional haircut': [nə'pa?] 'cut the hair in the traditional style', [su'rat] 'letter': [nū'rat] 'write', [sə'ŋɪt] 'urine', [nə'ŋɪt] 'urinate' etc.) the similar relationships are less direct in Uma Juman, where historically non-medial *s has shifted to [h]. Consider the following fragmentary morphological paradigms: [ʔa'nɪt] 'skin, hide': [ŋə'nɪt] 'to skin', [li'sun] 'smoke': [ŋəli'sun] 'to smoke (intr.)', [pa'ʔət] 'bite': [mə'ʔət] 'to bite', [ba'sa:] 'wet': [mə'sa:] 'dampen', [təli'se:] 'comb': [nəli'se:] 'to comb', [kəli'ŋɪ:] 'mirror': [ŋəli'ŋɪ:] 'look at o.s. in a mirror', [ha'duy] 'work': [nə'duy] 'to work', [ha'ga?] 'what is used to hit, anything used to hit': [nə'ga?] 'to hit with s.t.'. As with Bario Kelabit and Long Anap, the semantic similarity and mutually exclusive distribution of the phonetic prefixes [ŋ], [ŋə] and homorganic nasal substitution can be explained on the assumption of a single underlying prefix /ŋ/ together with rules that relate this element to its various surface realizations. The nasal substitution of h-initial stems, however, is then described implausibly, since the assimilation of /ŋ/ to /h/ in e.g. /ŋ+hady/ → [nə'duy] 'to work' or /ŋ+haga?/ → [nə'ga?] 'hit with s.t.' results in the palatal nasal [n̄]. This fact might be taken as evidence that [h] is an underlying palatal, but if we assume underlying forms /ŋ+sady/ 'to work' or /ŋ+saga?/ 'hit with s.t.' it is necessary to posit a rule changing word-initial

/s/ to [h] which has at least 23 exceptions. Furthermore, any attempt to treat intervocalic [h] as a palatal will result in additional historical complications, since [h] in this environment derives from PAN *R. In such cases I have adopted a lower level of abstraction for purposes of lexical representation (thus /ŋ+hady/ 'to work', /ŋ+haga?/ 'hit with s.t.', etc.) and tolerate some phonetic implausibility in the P-rules. Similarly, where an alternation can only be treated as a phonological process by resort to the use of ad hoc features or atypical clusters (as with Kiput [b] ~ [s]) I have simply stated the alternation.

One other major phonemic problem which recurs in the description of various languages should be mentioned here. PAN reconstructions contain only the vowels *a, *i, *u and *e (shwa). Since the latter never occurs in open final syllables, in many daughter languages that have developed mid-front and mid-back vowels from original final diphthongs the shwa has come to be in complementary distribution with both [e] and [o]. Despite the phonetic similarity and complementation of shwa with these historically secondary vowels, I have chosen to represent all three segments as phonemically distinct. There are two reasons for this decision. First, given the generally accepted claim in generative phonology that the value of the feature [round] is redundantly specified for vowels in phonological metatheory, [e] and [o] must be regarded as equally similar to [ə]. Since there is no non-arbitrary way to decide whether the shwa should be united with [e] or with [o], it appears less objectionable to maintain that it is phonemically distinct than to unite it with either of these segments. Second, it seems clear from historical evidence (and sometimes from synchronic evidence, where [-ay], [-aw] in slow speech vary with [-e], [-o] in rapid speech) that this complementation is accidental rather than the result of phonetic conditioning.

Finally, it should be repeated that while these descriptions aim in principle at complete explicitness, I have not seriously attempted to attain that ideal in the description of morphology and have often fallen short of it in the description of phonology. If the use of an explicit model of language can be said to have one great advantage even to the user who fails it, that advantage perhaps lies in its heuristic value. I owe my awareness of many facts which might not otherwise have come to my attention to the effort to construct explicit derivations. Needless to say, it was impossible to follow up all of the many problems of synchronic analysis that were discovered in the search for evidence necessary to test the claims of the vowel deletion hypothesis. In some cases, while tentative or partial solutions have been proposed, a strongly motivated analysis will require a richer data base, and must be left to future work.

3. EXPLANATION OF THE DESCRIPTIVE FORMAT

To save unnecessary repetition, the format used for the presentation of descriptive material is outlined here. Some linguists may find the order of presentation disconcerting since, in accordance with the general conceptual scheme of generative grammar, the justification of lexical representations is made through the deductive application of rules to given underlying forms rather than through the prior establishment of contrast. I have generally included enough information, however, and have organized the material so that the reader preferring to do so could read the phonological description section-by-section in reverse order from low-level to higher-level P-rules to lexical representation without difficulty.

3.1. ABBREVIATIONS AND CONVENTIONS

Abbreviations of language names are: UJ: Uma Juman, Mk: Mukah, Bn: Bintulu, Mi: Miri, Kp: Kiput, LA: Long Anap, Bk: Bario Kelabit, PAN: Proto-Austronesian. The form of speech used at a particular long-house or kampung is called a 'language' unless specific reference is made to its membership in a cluster or chain of mutually intelligible forms of speech, L, in which case it is called a dialect of language L. Thus, Uma Juman is referred to both as a language and as a dialect of the Kayan language. The term 'language', then, is used in two senses, the first more concrete, the second more abstract. The term 'speech community' is often substituted for 'language' in the first sense. If not otherwise explained, symbols used in the linguistic descriptions are as follows: act: active, pass: passive, caus: causative, agen: agentive, by agency of, recip: reciprocal, rel: relative pronoun, loc: locative, [] (phonetic transcription), // (phonemic transcription; where no confusion could result, virgules are dropped), () (optionally included), + (morpheme boundary), # (word boundary), A → B (A is realized as B synchronically) A > B (A became B historically) A < B (A derives from B historically), / (in the environment of), 1/2 boundary between constituents 1 and 2, - (position of segment relative to environment), } (both elements embraced are included in the statement), V (vowel), C (consonant), Ø or 0, as explained (zero), : (length), '(C)V stress on the first vowel to the right, \tilde{V} (nasalization of a vowel), A ~ B ('A alternates with B' or 'A varies freely with B', as specified), * (historical reconstruction), ** (non-occurring form). The conventional spelling of place names is left unchanged.

4. GENERAL INFORMATION

The subgrouping relation and geographical location of each language is given. If the speech community is non-coastal the names of the nearest

upriver and downriver longhouses are reported (see frontispiece map). Where population figures are available these are also mentioned. Figures for the Baram District are taken from the preliminary census report of July, 1970.

Informants are identified by name, position, approximate age and sex. Additional languages in which some speaking fluency is claimed are listed, and multilingualism in the larger speech community is indicated when known. The approximate number of elicitation hours for each of the languages described is as follows:

Uma Juman (Kayan) : 20
 Mukah (Melanau) : 18
 Bintulu (North Sarawak isolate) : 21
 Miri (Lower Baram) : 18
 Kiput (Lower Baram) : 18
 Long Anap (Kenyah) : 22
 Bario (Kelabit) : 38

All significant published literature on the speech community described or on any other dialect of the same language is cited.

5. LINGUISTIC INFORMATION

The linguistic information proper is divided into six categories:

1. subsystems, 2. morphology, 3. lexical representation, 4. morpheme structure, 5. phonology and 6. vocabulary.

5.1. SUBSYSTEMS

Three linguistic subsystems are described: 1. personal and possessive pronouns, 2. demonstrative pronouns and 3. numeration/classifiers.

5.1.1. Personal and Possessive Pronouns

The full set (or sets) of personal and possessive pronouns is listed, together with the grammatical functions that these elements can represent. Usage is illustrated by examples in sentence context with pronouns underlined and keyed to the list of functions. For the sake of overall intelligibility, an effort is also made to provide word-by-word glosses for all sample sentences throughout each description. To make this clearer the singular pronouns of Bintllu are reproduced below along with grammatical functions and illustrative examples:

	Set A	Set B
sg.		
1	akəw	kəw
2	lkaw	nəw
3	lsa	ña

Members of Set A occur as

1. Actor (Active verb)
2. Patient/Goal
3. *lkaw* occurs optionally
in negative injunctions

Members of Set B occur as

1. Actor (Passive verb)
2. Possessives
3. *nəw* occurs optionally
in positive injunctions (imperatives)

Examples.

The function of each pronoun in order from left-to-right is indicated in parentheses. Subscripts a) and b) refer respectively to active and passive forms of the same sentence:

- 1a). *isa mə+bukut akəw* *he punched me* (A1, A2)
 he punch me
- b). *akəw də+bukut ña* *he punched me* (A2, B1)
 me punch he
2. *isa mə+gazaw likud kəw* *he scratched my back* (A1, B2)
 he scratch back my

In Sentence 1 the code (A1, A2) indicates that the first pronoun (*isa*) functions as the actor and the second (*akəw*) as the patient of the action. Similarly, in Sentence 2 the code (A2, B1) indicates that the first pronoun (*akəw*) functions as the patient and the second (*ña*) as the actor. In Sentence 3 the pronoun *isa* again represents the actor of an active verb, while *kəw* is possessive.

In all of the languages to be described the object pronoun is formally identical, not as in English with the actor of a passive verb, but rather with the actor of an active verb.

Pronouns are not marked for gender in any of the languages under consideration. The English glosses have usually been rendered as masculine except where a feminine gloss seems more appropriate in a particular semantic/cultural context.

It seems likely that Set A pronouns are psychologically primary in some sense, as speakers of all languages recorded invariably offered members of this set as free citation forms. No attempt has been made to segment pronouns, even where recurrent partials are plainly observable. Relative and interrogative pronouns are not systematically described.

5.1.2. Demonstrative Pronouns

For reasons that are not completely clear the demonstrative pronouns were particularly resistant to direct elicitation, especially where a distinction between 'in sight' and 'out of sight' or 'near addressee' is made in the forms meaning 'that' and 'there'. As a result, the meaning of certain deictic terms that turned up unsolicited in sentence context and were not noticed until after the informant work was completed sometimes had to be inferred from that part of the system which had been obtained more directly. Where information gaps are suspected in the systems described this suspicion has been noted.

5.1.3. Numeration/Classifiers

All seven languages make use of a decimal counting system. The cardinal numerals 1-10, 100 and 1,000 are listed, together with a random assortment of morphologically complex numbers up to six digits in length used to illustrate numeration. Multiplicative values are represented by placing the smaller number to the left, additive values by placing the smaller number to the right of any of the simple decimal values. Ordinal numerals are included when known.

If numeral classifiers are employed in counting objects the range of object types to which a classifier applies is indicated and illustrated by examples.

5.1.4. Kinship System

The kinship system of each language is described as completely as possible, with compositional definitions indicated by standard abbreviations. Thus, in Uma Juman FaFa, MoFa, FaMo, MoMo : huku indicates that huku is used for grandparents of either sex through either parent, and SpBr, SpSi, BrSp, SiSp : haŋu indicates that haŋu is used for the sibling of one's spouse or the spouse of one's sibling.

5.2. MORPHOLOGY

An effort is made to analyse each item into its constituent morphemes. A word that cannot be further analysed synchronically is called a root or stem. Roots are divided into full words and affixes. Affixes are always monosyllabic, and are not normally stressed. Full words bear stress, and can take one or more affixes.

With the exception of ablaut, affixes are subclassified as prefixes, infixes or suffixes, and are listed alphabetically within these categories. The first category described for each language is the uses of the simple (unaffixed) root. Reduplication is then discussed, followed

by prefixation, infixation and suffixation. Ablaut, which is regarded as a distinct morphological process, is described last.

The following convention has been adopted to facilitate the recognition of morphemes in phonemic transcription: any form which stands between word boundary symbols, morpheme boundary symbols or a word boundary symbol and a morpheme boundary symbol with no intervening boundary symbol is a morpheme. Hence Bintulu /#læβi?#/ 'lie down' is a morpheme, as are both pa- and læβi? in /#pa+læβi?#/ 'lay s.t. down'. This definition fails, however, when any morpheme becomes discontinuous as a result of infixation; the transcriptions /#timbak#/ 'shoot', /#t+ən+imbak#/ 'be shot' imply incorrectly that the latter item contains morphemes t-, -ən- and -imbak. For ease of recognition, therefore, infixes are always set off by hyphens (/#t-ən-imbak#/) and the above formal definition of morpheme is revised to read: any stretch of material which stands between hyphens, or between any immediate combination of word boundary and morpheme boundary symbols exclusive of hyphenated material is a morpheme. The use of a distinct boundary symbol for infixes makes no intended theoretical claim; it does, however, render more readily apparent the morphology of a form like Bintulu /#p-in-a+læβi?#/ (rather than /#p+in+a+læβi?#/) 'be laid down' or Bario Kelabit /#p-in-əŋ+abət#/ (rather than /#p+in+əŋ+abət#/) 'what was used to tie (s.t.)'.

When cited in isolation, affixes are set off by a hyphen marking their point of attachment to the root: pa-, -in-, -an. The symbol for word boundary is normally omitted if it can be supplied from other visual information (sentence onset or terminus, spacing). Where a language lacks overt tense/aspect distinctions the English translations of sentences that refer to non-future action have been rendered indifferently as past/completive or present/progressive. Future action is usually represented by a full word indicating intent.

5.2.1. Residual Difficulties

As a result of limited time in the field, and in many cases the accessibility of only one informant for a language, the morphological analysis has not always been exhaustive. For this reason a few words that are cited as roots may be morphologically complex. Similarly, there are some miscellaneous analytical indeterminacies for most languages - apparent affixes found with only one or two roots in the corpus. These are described in a special category on residual difficulties.

5.2.2. Sample Paradigms

Because this presentation of morphology takes the affix as its point of departure, paradigms are generally broken up and scattered through the exposition. To clarify how some relatively full paradigms look, sample roots are given in each of their attested morphologically complex shapes.

5.3. LEXICAL REPRESENTATION

The inventory of phonemes is stated in chart form. Consonants, vowels and diphthongs are listed separately. In one language (Kiput) phonemic triphthongs consisting of a syllable peak and a complex off-glide are also recognized, and form a fourth category. Although /ʔ/ and /h/ are treated as glides in their feature composition, in the inventory of phonemes they are listed in the traditional positions. In addition to the glides /ʔ/, /h/, /y/ and /w/ a mid-central glide /ǝ/ is recognized for some languages (as Kiput).

For purposes of these seven descriptions 'diphthong' refers only to word-final 'rising diphthongs' (vowel plus glide), as in Long Anap sapay 'shirt', ajaw 'harvest', isiw 'talk; what is said' or babuy 'wild pig'. Medial sequences of vowel plus glide or word-final 'falling diphthongs' (glide plus vowel), as in Long Anap kayu 'wood' are regarded as ordinary VC and CV sequences respectively. This distinction in the languages under consideration is supported by the evidence of historical change.

Where a language has contrastive length in the vowels long vowels are written as the corresponding short segment followed by colon. Where a language has contrastive length in the consonants long consonants are written as geminate clusters. To avoid possible confusion in the comparison of languages the geminate cluster analysis of long vowels has been rejected, since many languages which do not have contrastive vowel length nonetheless permit sequences of like vowels.

If a segment is especially rare or is found only in suspected loanwords, this fact is mentioned.

Unless stated otherwise the normal (unconditioned) phonetic values of consonant phonemes in all languages are as follows: /p/, /t/ and /k/ are voiceless, unaspirated labial, dental and velar stops respectively; /ʔ/ is the glottal stop. /b/, /d/ and /g/ are voiced labial, alveolar and velar stops; /c/ is a voiceless and /j/ a voiced palatal affricate. /m/, /n/, /ɲ/ and /ŋ/ are labial, alveolar, palatal and velar nasals. /f/ and /s/ are voiceless and /v/ and /z/ voiced labiodental and postdental fricatives; /h/ is voiceless onset or terminus

to an adjacent vowel. /l/ is an alveolar lateral and /r/ an alveolar tap; /w/ is a high back and /y/ a high front glide. All sonorants have the expected (unmarked) values for voicing.

Justification of the phoneme inventory and of the representation of some individual lexical items is given under 5.4.1. and 5.5.1. For ease of reference, phonetic values that deviate from the stated norms and phonetic values of consonant phonemes not indicated above are cited in square brackets after the appropriate symbol in the consonant chart rather than in the P-rules. Because of their typically greater allophony the phonetic values of vowels and diphthongs are described separately for each language.

5.4. MORPHEME STRUCTURE

Information relating to redundancies in the phonemic structure of morphemes is extracted and codified in several sets of statements. Two types of morpheme structure constraints are recognised: 'major class constraints' and 'minor class constraints'. Together these comprise what Stanley (1967) has called 'sequence structure constraints', the equivalent of Halle's (1959) 'morpheme structure rules'. There has been no attempt to investigate what Stanley (1967) termed 'segment structure constraints', (viz. constraints on the feature composition of phonemic segments).

5.4.1. Major Class Constraints

Major class constraints are constraints on the distribution of the phoneme categories 'consonant' and 'vowel'. These are most conveniently discussed by first describing permissible canonical shapes. Lacunae are then distinguished as accidental or structurally determined. Permissible shapes are stated separately for syllables and root morphemes.

5.4.1.1. *Canonical Shapes of Syllables*

For present purposes a syllable is regarded as the pulmonic pulse necessary to produce a syllable peak (peak of sonorance) plus any accompanying constrictions. Syllables are open if they terminate with a peak of sonorance, closed if they do not. All permissible syllable shapes are listed together with illustrative examples. Syllable boundary is marked by a raised dot.

5.4.1.2. *Canonical Shapes of Roots*

Every theoretically possible combination of consonant and vowel phonemes in root morphemes of up to three segments is noted. Canonical

shapes that are exemplified by attested forms are furnished with examples. To illustrate, the set of possible one-, two- and three-segment sequences in Bario Kelabit is cited below:

V		VVC	uat	<i>taproot</i>
C		VCV	abi	<i>all</i>
VV	io	VCC		
VC		CVV	iao	<i>sleek, glossy (of fur)</i>
CV	me	CVC	iam	<i>in, inside</i>
CC		CCV		
VVV		CCC		

As the principle object of this section is to distinguish gaps in attested canonical shapes that are accidental from gaps that are structurally significant, it is necessary in addition to examine longer sequences. Each longer canonical shape which is represented by at least one item in the corpus is noted and illustrated. Due to the rapid expansion of combinatorial possibilities in strings of more than three segments no attempt has been made to systematically list all theoretically possible longer sequences. Based on a consideration of attested canonical shapes a set of constraints on the phonemic structure of root morphemes is formulated. Thus, for Bario Kelabit we can state that:

1. Every root morpheme must contain at least one vowel
2. Consonant clusters do not occur within a morpheme (but are permitted initially across morpheme boundary)
3. No more than two vowels may occur in sequence
4. No root of more than two syllables begins with a vowel

Constraints 1, 3 and 4 hold for all seven languages. In addition, no more than two consonants may occur in sequence within a morpheme in any language.

Constraints 1-4 allow us to distinguish blanks that are accidental in the above list of canonical shapes from blanks that represent structural impossibilities. This will be clearer if we indicate in parentheses the morpheme structure constraint(s) that are violated by particular non-attested strings:

V		VVV	(3,4)
C	(1)	VCC	(2)
VC		CCV	(2)
CC	(1,2)	CCC	(1,2)

As can be seen, the sequences V and VC are not in violation of any established constraint. The lack of known forms manifesting these shapes, then, is taken to be an accidental gap, indicated by a blank.

Projected onto longer sequences, constraints 1-4 interpret the absence in the collected corpus of Kelabit roots conforming, for example, to the canonical shape CVCVCVV as fortuitous, but the absence of roots conforming, for example, to the canonical shape CVCCVC as a consequence of the fact that such shapes would fall outside the range of structural possibilities.

5.4.1.3. *Relative Frequency of Canonical Shapes*

Every attested canonical shape is listed. Based on a random sample of 100 lexical items, the approximate percentages of roots exhibiting these shapes are given to the right. Blanks can be interpreted to mean that the shape in question is not common.

5.4.2. *Minor Class Constraints*

Minor class constraints are constraints on the distribution of particular segments. As in the preceding section, constraints are stated by first illustrating permissible distributions. The distribution of consonants is described before discussing the distribution of vowels.

5.4.2.1. *Constraints on the Distribution of Particular Consonants*

Each consonant phoneme is indicated on a grid which permits its occurrence or non-occurrence in initial, intervocalic and final positions to be stated. A numbered list of roots illustrating all attested distributions follows. Numbers referring to these roots are entered in the appropriate place on the grid. Clusters are listed separately at the end. To illustrate with a slightly altered fragment of the description of Long Anap, the partial grid and list of roots

	initial	intervocalic	final
p	1	3,8	4
c	2 (in monosyllables)	6 (usually in loans)	-
d	5	1	-
n	8	7	3

1. padaŋ *monitor lizard*
2. cuk *order, command*
3. jipen *tooth*
4. kiəp kiəp *blink*

5. daləm *deep*
6. kacaŋ *peanut*
7. sanam *ant*
8. nupi *dream*

Attested clusters

mb	ləmbam	<i>flood</i>
nd	ndən	<i>pillow</i>
	lundu?	<i>sleep</i>
nj	njam	<i>skilled, clever</i>
	pinjam	<i>borrow</i>
ŋg	ŋgəŋ	<i>handspan</i>
	təŋgan	<i>board, plank</i>

expresses the following distributional facts; /p/ occurs initially (as in the word meaning 'monitor lizard'), intervocalically (as in the words for 'tooth' and 'dream') and finally (as in the word for 'blink'), but never pre- or postconsonantly within a root (or within the same iteration of a root in the case of reduplications); /c/ occurs initially in monosyllables and intervocalically, but never pre- or postconsonantly or finally; /d/ occurs initially, intervocalically and postconsonantly, but never preconsonantly or finally; /n/ occurs initially, intervocalically, preconsonantly and finally, but never postconsonantly. The complete grid together with the earlier statement of canonical shapes tells us among other things that:

1. Voiceless obstruents do not occur postconsonantly
2. /ʔ/ does not occur initially
3. Palatals and voiced stops do not occur in final position¹¹
4. Only nasals occur preconsonantly
5. Prenasalized stops occur initially in monosyllables and medially, but never initially in polysyllables or finally

It must be kept in mind that these constraints refer to phonemic segments, so that a constraint, for example, against initial glottal stop is found in all seven languages despite the fact that glottal stop is invariably inserted by rule in this position.

Two constraints on the distribution of particular consonants or classes of consonants are common to all seven languages:

1. /ʔ/ does not occur initially
2. Palatals do not occur in final position.

If a segment appears in a given environment only rarely or exclusively in suspected loanwords, or if the environment cannot be described without reference to canonical shape, these facts are stated. Thus, in Long Anap, while /c/ occurs fairly often initially, its occurrence in this position is restricted to monosyllables. In intervocalic position, on the other hand, /c/ is infrequent, appearing so far as is known only in the presumably onomatopoeic /aci/ 'sneeze' and in suspected Malay loans, as /kacaŋ/ 'peanut'.

Finally, it should be mentioned that the statement of constraints on consonant distribution which is undertaken here refers largely to positional distribution. Where clear associative or dissociative tendencies between particular consonants or consonant classes have been recognized these are noted (cf. 5.4.2.3.).

5.4.2.2. *Constraints on the Distribution of Particular Vowels*

Constraints on the distribution of particular vowels are simply expressed in a set of statements without accompanying evidence. Their general validity can easily be tested on the basis of lexical information that appears in other sections. All attested vowel sequences, however, are listed separately. To illustrate, the following constraints have been observed in Bario Kelabit:

1. All vocalic oppositions are neutralized as shwa in pre-penultimate syllables
2. Shwa does not occur in open final syllables, or before glottal stop, glides (/y/ and /w/) or vowels
3. /a/ and /ə/ are neutralized as /ə/ before voiced aspirates and /h/
4. /e/ and /o/ occur almost exclusively in open final syllables; rarely in closed final, or penultimate syllables

The following constraints on the distribution of particular vowels are common to all seven languages:

1. Within a root all vocalic oppositions are neutralized as /ə/ or /ə/ ~ /a/ in pre-penultimate syllables
2. Shwa does not occur in open final syllables or prevocally
3. The contrast of /a/ and /ə/ is neutralized (in some languages as /a/, in others as /ə/) before /h/
4. With rare exceptions, /ə/ and /o/ occur only in open final syllables

As noted earlier (5.3.), one means of justifying the phonemic representation of certain lexical items is through reference to morpheme structure. Thus, for example, the interpretation of the unstressed high vocoids [i] and [u] as semi-vowels /y/ and /w/ in Bario Kelabit words such as /ayək/ 'whisper' or /awan/ 'spouse' is based in part on the consideration that phonemic representations /aiək/ or /auan/ would violate the otherwise general constraint against sequences of more than two vowels within a morpheme, as well as the constraint on permissible vowels in pre-penultimate syllables.

There is in Bario Kelabit a P-rule neutralizing all vocalic oppositions as [ə] in pre-penultimate syllables, as with ['dara?] 'blood': [də'ra?ən] 'bleed', ['pupu?] 'washing': [pə'pu?ən] 'be washed'. To avoid this apparently unnecessary duplication of work a convention might be proposed which extends the domain of application of any morpheme structure constraint to morphologically complex words unless specifically stated otherwise. Stanley (1967:401-2) tentatively considers such a convention to cover cases of neutralization, proposing to account for certain alternations by the application of morpheme structure rules that retain their effect throughout phonological derivations. More recently Chomsky and Halle (1968) have offered a solution to this problem in terms of universal marking conventions. Stanley has observed that the convention he suggests will work only if the change in question does not violate a crucial ordering requirement when treated as a morpheme structure constraint. Thus, given the assumption that the morpheme structure constraints as a bloc precede the phonological rules, and given a sequence of P-rules 1, 2, 3 ... such that 2 is crucially ordered before 3, the decision to treat 3 as a morpheme structure constraint would conflict with the requirement that P-rule 2 apply first. It will become clear as we proceed that this requirement sometimes prevents us from adopting Stanley's suggestion. For this reason, even in cases where crucial ordering is not affected this approach is rejected. Because it would lead to an involvement in formalism that is not in keeping with the aims of this study, the approach outlined by Chomsky and Halle is also avoided. As a result, certain of the P-rules in effect recapitulate some morpheme structure constraints.¹²

5.4.2.3. Relative Frequency of Phonemes

Based on a random sample of 100 lexical items (i.e. that used in 5.4.1.3.), the relative list frequency of each phoneme is given for all positions (initial, intervocalic and final for consonants; penultimate and final syllables for vowels) in which it occurs. Since very little of the material in any language was elicited in discourse context, text frequency is not considered. Hyphen indicates the non-occurrence of a segment in a given position. Zero symbolises both lack of positional attestation for a segment in the sample used, and initial or final vowel or medial vowel sequence. This is illustrated in the following fragment from the description of Uma Juman:

p-	: 9	-p-	: 3	-p	: 3
ñ-	: 0	-ñ-	: 0	-ñ	: -
0-	: 17	-0-	: 6	-0	: 19

The above diagram indicates that nine of the 100 sample items in Uma Juman begin with p, three contain intervocalic p and three final p. Though it otherwise occurs in initial and intervocalic (but not final) position, ñ is not attested in the present sample. 17 of the items in the sample begin with, and 19 end with a vowel, and six contain a medial vowel sequence.

Dominant phonotactic characteristics, including any marked associative or dissociative tendencies are noted. Some of these that are general to the languages under consideration, as the positive association between identical vowels in successive syllables or the negative association between non-identical labials (as p...m, b...m, etc.) in successive syllables, were earlier noted by Chrétien (1965) for Proto-Austronesian.

5.5. PHONOLOGY

A set of partially ordered rules relating lexical representations at the level of the systematic phoneme to their systematic phonetic realizations (for qualifications, cf. Sect.2) is given for each language. The descriptions are generally based on the phonology of citation forms. Where phrase phonology is known and differs from that of citation forms this fact has been noted. Stress, which falls on the final syllable of citation forms but on the penultimate syllable of forms in context in most of the languages described, provides probably the most conspicuous example of such a difference.

5.5.1. Phonological Rules

As already mentioned, the statement of P-rules is made with a minimum of formality. When a rule applies to a single segment (as /ə/) the whole segment is written instead of the equivalent set of distinctive features. Similarly, if the class of segments affected or the environment of a rule is the class of true vowels or its complement (the true consonants, /l/, /r/, /ʔ/, /h/, /y/ and /w/), the symbols V and C are used respectively. Plausible alternatives to the chosen phonological analysis are discussed after the relevant P-rule.

In the course of various analyses the notion 'rule of grammar' inevitably came into question. If the collective segmental environments in which a phonological process takes place can be characterized as a natural class except for the non-participation of one segment, as with the breaking of high vowels before word-final /ŋ/ and /k/ (but not /g/) in Mukah, a single rule is assumed despite the impossibility of formulating such an asserted generalization in terms of current distinctive features. In some other cases, as with nasal substitution, a complex

of interdependent phonological processes has been treated as a unit even though a precise description of their concerted operation requires the recognition of more than one P-rule. For convenience of reference the phonological rules are summarized following their more detailed description. P-rules apply only within the (underlying) word, though a few rather loosely organized comments on phrase phonology are discussed for some languages under the headings 'Liaison' and 'Clitics'.

5.5.2. Residual Difficulties

Apart from complications of the type mentioned in sect. 2, various phonological problems remain for which a fully satisfactory solution has not been reached. These are stated, and alternative analyses considered in a special section on residual difficulties.

5.5.3. Sample Derivations

To clarify the interaction of the P-rules in particular lexical items some sample derivations are given. All pairs of crucially ordered rules are noted by number, and representative non-occurring forms which would result from the wrong order of application are given as justification for the ordering requirement.

5.5.4. Evidence of Contrast

For the benefit of those who might insist on evidence of contrast assembled in one place, a few minimal and sub-minimal pairs are cited. Special attention is directed to contrasts for which the likelihood of transcriptional error is relatively high.

5.6. VARIATION

All words recorded with more than one phonemic shape are cited together as examples of lexical variation. Where special circumstances require it, as with Uma Juman, this material may be accompanied by a fairly detailed discussion.

6. VOCABULARY OF ELICITED ROOT MORPHEMES AND MORPHOLOGICALLY COMPLEX WORDS

A complete vocabulary of elicited root morphemes and morphologically complex words is provided. When a word is known to be morphologically complex it is listed under the simple root, together with all other attested derivatives. As noted earlier, suspected loanwords are followed by (L), and exceptions to nearly general phonological rules

are marked with exception features.

Entries are alphabetized in accordance with the following order of symbols: a, b, c, d, ə, e, f, g, h, i, j, k, l, m, n, ñ, ŋ, o, p, ?, r, s, t, u, v, w, y, z. Idioms (i.e. lexically complex entries in which the meaning of the whole cannot be predicted from the meanings of the parts) are entered separately: Uma Juman həñap '*chicken*', tu? '*ghost*', but həñap tu? '*butterfly*'. Synonyms, antonyms and contrasting members of fairly well-defined semantic fields are cross-referenced.

The description of each language begins at 4.

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UMA JUMAN

4. GENERAL INFORMATION

Uma Juman (lit. '*house at the river junction*') is a Kayan longhouse on the Balui branch of the Rejang river opposite the mouth of the Besuar, a minor tributary which joins the main stream between 50 and 60 miles upriver from Belaga. The nearest settlements are Uma Daro' (9-10 miles upriver) and Long Liko (13-14 miles downriver), both Kayan. Population is unknown.

Henry Opang Luhah, an upper six science student at the Kolej Tun Datu Tuanku Haji Bujang, Miri, age about 18, served as informant. In addition to his native language the informant is fluent in English, Sarawak Malay and Iban and has, in common with most people at Uma Juman, some command of the Kenyah dialect of Uma Kulit, one of the last houses on the Balui, approximately 70 miles further upriver.

The speech community described here constitutes one of a number of closely related but widespread dialects of a language which is spoken in the upper reaches of most of the major river systems of central Borneo. Although to my knowledge nothing has ever appeared in print on the dialect of Uma Juman, Kayan as a whole is better represented, at least lexicographically, than the great majority of Bornean languages. The most important published materials are:

BARTH, J.P.J.

- 1910 *Boesangsch-Nederlandsch Woordenboek*. Batavia. (Represents a dialect spoken in the drainage of the Upper Kapuas which appears to differ very little lexically and phonologically from the dialect of Uma Juman).

BLUST, Robert A.

- 1974 'A Murik Vocabulary'. *Sarawak Museum Journal* 22/43 (NS): 153-89 (contains the Swadesh 200-item lexicostatistical test list for the dialects of Uma Juman in the Rejang and Long Atip in the Baram).

BROOKE LOW, H.

- 1896 'Kyan Vocabulary'. In: H. Ling Roth, ed. *The Natives of Sarawak and British North Borneo*. London, Truslove & Hanson.

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- 1849 'A Vocabulary of the Kayan Language of the Northwest of Borneo'. *Journal of the Indian Archipelago* 3:182-92 (the earliest published data on Kayan; reprinted in H. Ling Roth, 1896, *The Natives of Sarawak and British North Borneo*. London, Truslove & Hanson).

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- 1974 'An Outline of Kayan Grammar'. *Sarawak Museum Journal* 22/43(NS):43-91.

CUBIT, L.E.

- 1964 'Kayan Phonemics'. *Bijdragen tot de Taal-, Land- en Volkenkunde* 120:409-23.

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- 1925 'Die L-, R- und D-Laute in austronesischen Sprachen'. *Zeitschrift für Eingeborenen-Sprachen* 15:19-50, 116-38, 223-38, 273-319 (makes use of Barth's Busang dictionary).

DOUGLAS, R.S.

- 1911 'A Comparative Vocabulary of the Kayan, Kenyah and Kalabit Languages'. *Sarawak Museum Journal* 1/1:75-119 (includes about 750 words from an unidentified Kayan dialect spoken in the Baram District, Sarawak).

RAY, Sidney H.

- 1913 'The Languages of Borneo'. *Sarawak Museum Journal* 1/4:1-196 (four Sarawak Kayan dialects are represented by a comparative vocabulary of about 200 words).

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SOUTHWELL, Charles Hudson

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5. LINGUISTIC INFORMATION

The description is organised under the following headings: 1. sub-systems, 2. morphology, 3. lexical representation, 4. morpheme structure, 5. phonology, and 6. vocabulary.

5.1. SUBSYSTEMS

Three subsystems are described: 1. personal and possessive pronouns, 2. demonstrative pronouns and 3. numeration/classifiers.

5.1.1. Personal and Possessive Pronouns

There are two partially distinct sets of personal and two partially distinct sets of possessive pronouns, which we will call sets A and B and sets C and D respectively. Personal pronouns are as follows:

	Set A	Set B
sg.		
1	aku ^y	ak
2	ika?	im
3	hla?	na?
dual		
1 (incl.)	itu?	
(excl.)	kawa?	
2	kua?	
3	dahu?	
trial ¹³		
1 (incl.)	təlu?	
(excl.)	kalu?	
2	kəlu?	
3	dəhalu?	
plural		
1 (incl.)	itam	
(excl.)	kaml?	
2	ikam	
3	daha?	

Non-singular forms are identical with Set A, except that where a Set A pronoun has an initial vowel the corresponding set B pronoun lacks it.

Members of Set A occur as

1. Actor (Active verb)
2. Patient/Goal

Members of Set B occur as

1. Actor (Passive verb)¹⁴
2. im occurs optionally in positive and possibly also in negative injunctions

Examples:

- 1a). aku^y ŋ+bukut hla? I punched him (A1, A2)
 I punch him

- b). hia? ak η+bukut I punched him (A2, B1)
 him I punch
- 2a). hia? pək+lasu ata? anan¹⁵ she is heating the water (A1)
 she heat water the/that
- b). ata? anan ən na? pək+lasu she is heating the water (B1)
 water the/that agen. she heat
3. (im) pa+kan asu? kan+ən anih feed this (cooked) rice to the
 you feed dog rice this dog¹⁶ (B2)

In addition, non-singular members of both sets occur as the actor and patient of reciprocal verbs:

4. dahu? pə+haga? they (dual) are hitting e.o. (with s.t.)
 they hit e.o.

In passive sentences (such as 1b and 2b) the patient normally precedes the actor, but may instead follow the verb (thus ak η+bukut hia?, ən na? pək+lasu ata? anan). Both of these possibilities appear in the following pairs of active and passive sentences, where the order of constituents in the passive member can be either 1,2 or 2,1:

- 5a). akuy η+anit bavuy anan I skinned the pig (A1)
 I skin pig the/that
- b). bavuy¹ anan/ ak η²+anit (or 2,1) I skinned the pig (B1)
 pig the/that I skin
- 6a). ika? η+anit bavuy anan you skinned the pig (A1)
 you skin pig the/that
- b). bavuy¹ anan/im η²+anit (or 2,1) you skinned the pig (B1)
 pig the you skin
- 7a). hia? η+anit bavuy anan he skinned the pig (A1)
 he skin pig the
- b). bavuy¹ anan/ən na? η²+anit (or 2,1) he skinned the pig (B1)
 pig the agen he skin

Active sentences do not allow the corresponding permutation of constituents:

**bavuy anan akuy η+anit

Although the basis for this constraint is not yet clear, there seems to be a relatively straightforward explanation for the free constituent order of passive sentences. Given a sentence in which actor and patient pronouns are both selected from Set A, word-order is necessary to distinguish semantic roles: the leftmost pronoun is invariably the actor.

If a sentence has a Set B pronoun, however, it must be the actor. Given the fixed association of semantic role with pronoun selection for Set B pronouns, word-order is no longer a crucial factor in distinguishing semantic roles, and can be free.

As already noted briefly, surface passive sentences such as 5b which are in the order 2,1 and contain a 1st or 2nd p. sg. pronoun actor differ from their active counterparts only in choice of pronoun:

ak η+anit bavuy anan
akuy η+anit bavuy anan

Apart from intonational differences (not discussed in this description), a passive sentence such as 6b with second person sg. actor and constituents in the order 2,1, is homophonous with the corresponding singular imperative, except that in the latter the pronoun is optionally deletable:

im η+anit bavuy anan *you are skinning the pig*

8. (im) η+anit bavuy anan *skin the pig*

Unlike imperatives, a surface pronoun has not been observed in any negative injunction:¹⁷

9. asəm le-η-pate ŋipa? anan *don't kill that snake*
don't kill snake that

10. asəm kəriŋ atur na? *don't listen to his advice*
don't listen advice his

Reflexive constructions are formed with sədirɪ? '(one)self', an apparent Malay loanword:

11. hia? kəsiŋ hia? sədirɪ? *he is laughing at himself*
he laugh him self

Possessive pronouns are as follows:

	Set C	Set D
sg.		
1	kuy	-k
2	ka?	-m

Third person singular and non-singular forms are identical with Set B, except that Set D pronouns are separated from the possessed noun by a postclitic element -n.

Possessed roots that end in a vowel or in any consonant except glottal stop take a pronoun from Set C; roots that end in glottal stop take a pronoun from Set D:¹⁸

jəla tongue

jəla kuy my tongue
 jəla ka? your tongue
 jəla na? his tongue
 jəla tu? our (dual incl.) tongues
 etc.

mata? eye

mata?+k my eye
 mata?+m your eye
 mata?+n na? his eye
 mata?+n tu? our (dual incl.)
 eyes etc.

buk head hair

buk kuy my head hair
 buk ka? your head hair
 buk na? his head hair
 buk tu? our (dual incl.) head
 hair etc.

bulu? body hair

bulu?+k my body hair
 bulu?+m your body hair
 bulu?+n na? his body hair
 bulu?+n tu? our (dual incl.)
 body hair etc.

ləŋən arm

ləŋən kuy my arm
 ləŋən ka? your arm
 ləŋən na? his arm
 ləŋən tu? our (dual incl.) arms
 etc.

ipə? tooth

ipə?+k my tooth
 ipə?+m your tooth
 ipə?+n na? his tooth
 ipə?+n tu? our (dual incl.)
 teeth etc.

bua ñuh coconut

bua ñuh kuy my coconut
 bua ñuh ka? your coconut
 bua ñuh na? his coconut
 bua ñuh tu? our (dual incl.)
 coconuts etc.

ñupi? dream

ñupi?+k my dream
 ñupi?+m your dream
 ñupi?+n na? his dream
 ñupi?+n tu? our (dual incl.)
 dreams etc.

katəm wood plane

katəm kuy my wood plane
 katəm ka? your wood plane
 katəm na? his wood plane
 katəm tu? our (dual incl.) wood
 planes etc.

təna?i? intestines

təna?i?+k my intestines
 təna?i?+m your intestines
 təna?i?+n na? his intestines
 təna?i?+n tu? our (dual incl.)
 intestines etc.

One possessed root was recorded which ends in glottal stop, but takes its pronominal inflection from Set C:

ava? wound

ava? kuy my wound

ava? ka? your wound

ava? na? his wound

ava? tu? our (dual incl.) wounds

One word inexplicably takes the first person singular from Set D, but the remaining pronouns from Set C:

ate liver

ate+k my liver

ate ka? your liver

ate na? his liver

ate tu? our (dual incl.) livers etc.

Pronouns from Set D also occur suffixed to the root *anu?* 'which one?; thing mentioned' to designate absolute possession:

12. bup anu? aləŋ anu?+k? which book is mine?

book rel

bup anu? aləŋ anu?+m? which book is yours?

bup anu? aləŋ anu?+n na?? which book is his?

bup anu? aləŋ anu?+n tu?? which books are ours (dual incl.)?

Members of the same set appear after *dahi?* 'to (relational)', where they indicate goal:

13. daha? pək+jaji dahi?+k they (pl.) made a promise to me

they promise

daha? pək+jaji dahi?+m they (pl.) made a promise to you

daha? pək+jaji dahi?+n na? they (pl.) made a promise to him

daha? pək+jaji dahi?+n tu? they (pl.) made a promise to us
(dual incl.)

This paradigm, which has been partially inferred from attested forms *dahi?+k* and *dahi?+n kami?*, provides almost the only known example of Set D pronouns used as anything other than possessives.¹⁹ What might be involved in the use of these forms to mark the goal is still unclear.

5.1.2. Demonstrative Pronouns

The demonstrative pronouns involve three locative dimensions: 1. near speaker, 2. near hearer but not near speaker and 3. near neither speaker nor hearer. The forms and their glosses, with proximity to

participants in the conversation indicated by + and non-proximity by - are:

		near	
		speaker	hearer
an ^{ih}	<i>this: hlnih here</i>	+	±
an ^{an}	<i>that: tⁱⁿan there</i>	-	+
at ^{ih}	<i>that: hit^{ih} there</i>	-	-

The distinction between the distal demonstratives is determinable from the following sentences:

14. (im) at^{er} hit^{ih} surat an^{ih} *take this letter there*
 (you) take there letter this
15. as^{em} himuh tⁱⁿan *don't blow your nose there*
 don't blow the nose there

5.1.3. Numeration/Classifiers

The cardinal numerals 1-10, 100 and 1,000 are:

ji	<i>one</i>
dua?	<i>two</i>
t ^{el} u?	<i>three</i>
pat	<i>four</i>
lima?	<i>five</i>
n ^{em}	<i>six</i>
tusu	<i>seven</i>
saya?	<i>eight</i>
pitan	<i>nine</i>
pulu	<i>ten</i>
atu	<i>hundred</i>
ribu	<i>thousand</i>

Multiplicative values are indicated by placing the smaller number to the left, additive values by placing the smaller number to the right of any of the simple decimal values: ji atu '100', dua? pulu '20', pulu dua? '12', pulu n^{em} ribu saya? atu lima? pulu n^{em} '16,856'. **ji pulu and **pulu atu do not occur.

Ordinal numerals are evidently formed through the addition of a prefix k^{a-}, though only one example has been observed in the corpus: p^{ah}ari?+n k^a+t^{el}u? 'second (or third?) cousin'.

Numeral classifiers are not normally used, and when used are optional. The following were offered in response to direct elicitation:

batun (lit. *body of an animal*)

dua? b. bavuy *two pigs*

luŋ (lit. meaning unknown)

pat l. kayu *four trees*

lu?un (lit. *body of a human being; corpse*)

lima l. kəlunan *five persons*

təlu? l. anak *three children*

The informant was unable to suggest a classifier that could be used in the following phrases:

dua? da?un *two leaves*

təlu? nalaŋ *three mountains*

pat buŋa?	}	<i>four flowers</i>
pidan}		

5.1.4. Kinship System

The kinship terminology recorded for Uma Juman is as follows. Compositional definitions do not necessarily represent the full range of relationships designated by the classificatory label:

relative	:	<u>panak</u>
FaFa,MoFa	:	huku (l)aki?
FaMo,MoMo	:	huku duh
Fa	:	tama+n
Mo	:	hina+n
So	:	anak (l)aki?
Da	:	anak duh
ChCh	:	so
FaBr,MoBr	:	tama+n
FaSi,MoSi	:	hina+n
older Br	:	(pə)hari?+n (l)aki? (aləŋ) aya?
older Si	:	(pə)hari?+n duh (aləŋ) aya?
younger Br	:	(pə)hari?+n (l)aki (aləŋ) (du)?uk
younger Si	:	(pə)hari?+n duh (aləŋ) (du)?uk
FaBrCh,MoBrCh,FaSiCh,MoSiCh	:	(pə)hari?+n hiŋət
BrCh,SiCh	:	anak
SpFa	:	?

SpMo	:	ʔ ²⁰
Sp	:	hawa+n
SpBr, SpSi, BrSp, SiSp	:	haŋu
ChSp	:	anak həndun

other terms

- (pə)hariʔ+n kə+təluʔ *second cousin*
 (pə)hariʔ+n asuʔ *half-brother, half-sister*

As can be seen, certain kinship terms (Fa, Mo, sibling and their extensions, Sp) are obligatorily possessed. Rousseau (1974:94) also reports obligatory possession of some body parts in the Balui Kayan dialect of Uma Bawang. Although similar items (bulun 'body hair' next next to buluq 'feathers, fur'; perun 'gall, gall bladder' next to peruq 'gall (used only in curses)') have been observed by the present writer in Murik (1974:fn.20), where they appear to reflect earlier non-obligatorily possessed forms that have become obligatorily possessed as a result of semantic specialization or idiosyncratic semantic change in the root, obligatorily possessed body parts are apparently rare in Uma Juman. (cf. fn.30).

5.2. MORPHOLOGY

The morphology of Uma Juman can be described under the following headings:

The simple root

Apart from particles, pronouns and numerals, the simple root is usually a noun (kapit 'wing', urip 'life') or an adjective (həŋəm 'cold', ləmə 'soft, weak'). When verbal it generally appears in in-junctions, passive constructions and apparently in embedded clauses (cf. sentence 34)

16. (im) jat ue anih *pull this rattan*
 (you) pull rattan this
17. asəm taday haʔ huŋe *don't dive into the river*
 don't dive into river
- 18a). ikaʔ j-əm-at ue anan *you pulled the rattan*
 you pull rattan the
- b). ue ¹ānan/im ²jat (or 2,1) *you pulled the rattan*
 rattan the you pull
19. hiaʔ ŋ+taday haʔ huŋe *he dived into the river*
 he act dive into river

- 20a). akuy η+haga? asu? anan gəri kayu? *I hit the dog with a stick*
I act hit dog the with stick
- b). asu? ¹ānan/ak hāga?²/gəri kayu? (or 2,1) *I hit the dog with a stick*
dog the I hit with stick

It was noted above (5.1.1.) that a surface passive sentence which contains a preposed first or second person singular pronoun actor differs from the corresponding active sentence only in choice of pronoun, as in:

- ak η+anit bavuy anan *I skinned the pig*
 akuy η+anit bavuy anan *I skinned the pig*

This statement is true if the form of the verb is the same in active and passive constructions. In some cases, however, the active/passive distinction is signalled not only by pronoun selection or pronoun selection plus the agentive marker, but also by the form of the verb (18a-b, 20a-b and the following):²¹

- 21a). akuy η+təvək həñap *I cut the chicken's throat*
I act cut chicken
- b). həñāp¹ /ak t²əvək (or 2,1) *I cut the chicken's throat*
chicken I cut
- 22a). hia? η+təvəŋ kayu? *he felled the tree*
he act fell tree
- b). ka¹yū?/ən nā?² təvəŋ (or 2,1) *he felled the tree*
tree agen he fell
- 23a). akuy k-um-an kan+tən anan dəhaləm dih *I ate the rice yesterday*
I eat rice the yesterday
- b). kan+tən ¹ānan/ak k²ān+i/dəhaləm dih (or 2,1) *I ate the rice yesterday*
rice the I eat yesterday

It is not clear whether all roots can occur unaffixed in passive constructions or whether only certain roots have this characteristic.²² Moreover, in some sentences the simple root appears optionally in an active construction without signalling any evident difference of meaning:

24. hūŋe uk anan suhu? } *that small stream is rising*
 river small that η+suhu? }
 act rise
25. hia? hili? } səluer kuy *he seized my trousers*
 he η+hili? } trousers my
 act seize

Although these examples may give the impression that some simple and morphologically complex verbs are completely interchangeable, there seems to be a definite preference for the use of the simple root in passive constructions and the root prefixed with η - in active constructions. It is possible that the unaffixed root was formerly used as a passive and the root prefixed with η - as an active verb, but since the active/passive distinction was marked redundantly by pronoun choice, ən (see ən 'agentive'), word order or a combination of pronoun choice with either of the latter, these formal distinctions in the verb largely ceased to have grammatical meaning and the resulting variation was generalized to roots to which the grammatical distinction did not originally apply (as intransitives).²³

In at least one case where the shape of the verb differs in active and passive constructions there are two forms of the imperative, one corresponding to an active and the other to the equivalent passive sentence:²⁴

- 26a). ika? k-um-an dian *you ate the durian*
 you eat durian
- b). $\text{dian anan im kan+i}$ *you ate the durian*
 durian the you eat
- 27a). $(\text{im}) \text{ k-um-an dian anan}$ *eat the durian*
- b). $(\text{im}) \text{ kan+i dian anan}$ *eat the durian*

Reduplication

Reduplication is not put to morphological use in the material collected. No attempt was made to discover whether this is true of the language in general.

mə- (Attributive or Stative)

The prefix mə- is added to roots that are intrinsically nominal, changing them to adjectives or stative verbs. With some possible lexically idiosyncratic exceptions (e.g. gaŋ:mə+gaŋ) the meaning of this prefix is 'characterized by' or 'in a state of' the meaning of the root:

- asəp dirt : mə+asəp *dirty*
 pup dust : mə+pup *dusty*
 urip life : mə+urip *alive*
 $\text{aram organic decay, putrefaction}$: mə+aram *rotten*
 aduŋ fat, grease : mə+aduŋ *fat (adj.)*
 $\text{gaŋ k.o. dry wood used for firewood}$ ²⁵: mə+gaŋ *dry*

alit *healing* : mətalit *healed*
 all *pregnancy* : mətali *pregnant*
 uru? *grass* : məturu? *grassy*
 avuk *drunkenness* : mətavuk *drunk*

It is worth noting that in the corpus collected mə- occurs on monosyllabic roots and on disyllabic roots that begin with a vowel, but never on disyllabic roots that begin with a consonant.²⁶ This distributional peculiarity might be taken as evidence that the attributive prefix can be added to nominal roots of any canonical shape, but is deleted from consonant-initial disyllables by a later rule. Attempts to add the prefix to e.g. lasu 'hot', bahat 'heavy' or color terms (bəla 'red', nəmīt 'green', etc.) were rejected.

η

The prefix η- usually, though not always marks a verb that is transitive:

- tako *steal; theft* : η+tako *to steal*
28. laki? anan η+tako guluk kuy *that man stole my bolo knife*
 man that steal bolo knife my
- bian *split* : η+bian *to split*
29. haruk anan bian *the boat has split open (as from the heat of*
 boat the split *the sun)*
30. akuy η+bian kayu? anih *I split this stick*
 I split stick this
- habut *a hole through s.t.; having a hole or holes* : η+habut *perforate*
31. tariη anih habut *this cooking pot has a hole*
 pot this perforated
32. hia? η+habut lidiη anan *he perforated the wall*
 he perforate wall the
- təlise *comb* : η+təlise *to comb*
33. hia? η+təlise buk na? *she is combing her hair*
 she comb hair her
- suhu *request, command* : η+suhu *ask, order s.o. to do s.t.*
34. daha? η+suhu akuy du *they (pl.) told me to take a bath*
 they order I bathe

bah loincloth : η+bah put on or wear a loincloth

35. laki? aya? anan η+bah that old man is wearing a loincloth
man old that wear a loincloth

kelatin buoyancy : η+kelatin to float

36. kelatin haruk anan ja?ək that boat does not float well
buoyancy boat that bad

37. kayu? anan η+kelatin the wood is floating
wood the float

lisun smoke : η+lisun to smoke, smoulder

38. apuy anan η+lisun the fire is smouldering
fire the smoulder

As noted earlier (The simple root) many verbal roots prefixed with η- can occur in either active or passive constructions, and for some roots the prefix appears to be optional both in declarative sentences and in injunctions:

ata unripe : η+ata pick fruit before it is ripe

- 39a). kami? η+ata puti? anan we (pl. excl.) picked the
we pick before ripe banana the bananas before they were ripe

- b). puti? ¹anan/ən kami? η+ata (or 2,1) we (pl. excl.) picked the
bananas before they were ripe

40. duh anan hinəŋ } hinih that girl is looking this way
girl that η+hinəŋ } here

41. (Im) katun } na? tie it
(you) η+katun } it
tie

42. asəm hinəŋ } hinih don't look this way
don't η+hinəŋ } here
look

pə- (Reciprocal)

The prefix pə- normally indicates reciprocal action:

lura spittle, sputum : pə+lura spit at e.o.

43. dahu? pə+lura they (dual) are spitting at e.o.
they spit at e.o.

haga? *anything used to hit* : pə+haga? *hit e.o.*

44. *daha? pə+haga? they (pl.) are hitting e.o.*
they hit e.o.

ləkət *sticky, adhesive* : pə+ləkət *stick together (intr.)*

45. *surat dua? anan pə+ləkət those two sheets of paper are sticking*
letter two those stuck together^{together}

jat *pull* : pə+jat *pull e.o.*

46. (im) *jat ue anih pull this rattan*
(you) pull rattan this
pə+jat ue tug-of-war

tudək *beak; pecking* : pə+tudək *peck e.o.*

47. *manuk anan pə+tudək those birds are pecking e.o.*
bird those peck e.o.

katəl *itch, scratch* : pə+katəl *scratch e.o.*

48. *dahu? pə+katəl they (dual) are scratching e.o.*
añun coitus, copulation : pə+añun *copulate*

In one known case pə- designates the result of intransitive reciprocal action:

aplr either of the parts of two things joined
pə+apir stuck together, fused, as two bananas grown together

49. *puti? anan pə+apir those bananas are grown together*
banana those stuck together

and in two known cases a noun involving some kind of reciprocal relationship:

pə+tudək cockfight
pə+apir twin

pək- (Causative)

The prefix pək- generally signals causative action, though the meaning varies considerably, dependent upon the meaning of the root:

kəsiŋ *laugh* : pək+kəsiŋ *make s.o. laugh*

50. *laki? anan pək+kəsiŋ akuy that man is making me laugh*
man that make laugh me

- su far : pək+su separate, move apart
51. (im) pək+su haruk anan move those boats apart
(you) separate boat those
- ləkət sticky, adhesive : pək+ləkət stick two or more things together, attach
52. akuy pək+ləkət surat dua? anan I stuck those two sheets
I stick together paper two those of paper together?7
- asəp dirt : pək+asəp to soil
53. hia? pək+asəp basuŋ na? he soiled his shirt
he soil shirt his
- taŋi cry, weep : pək+taŋi make s.o. cry
54. hia? pək+taŋi harl?+n aki? na? aləŋ du?uk he made his younger
he make cry younger sibling male his rel small brother cry
- ava? wound : pək+ava? to wound, cut
55. asəm pək+ava? usu ka? don't cut your hand
don't cut hand your
- urip life : pək+urip save the life of a person or animal; spare
56. hia? aləŋ pək+urip akuy he is the one who saved my life
he rel save life me
- ja?ək bad : pək+ja?ək to wrong or slander a person
57. hia? pək+ja?ək akuy he slandered me
he slander me
- jaŋi promise : pək+jaŋi make a promise
58. hia? pək+jaŋi tama?+n na? he made a promise to his father
he promise father his
- dui drink : pək+dui offer s.t. to drink
59. hia? pək+dui dahu? burak he offered them (dual) rice
he offer to drink them rice wine wine to drink

As a result of the application of the phonological rules (#2), /pə/- and /pək/- fall together phonetically before most consonant-initial stems. Given the fairly distinct semantic/syntactic properties marking off causative from reciprocal verbs, however, no difficulty was encountered in assigning surface [pə]- sequences unambiguously to one or the other underlying form.

Nonetheless, in some cases the assignment of surface [pə]- sequences to underlying /pək/- is possible only by adopting a rather broad definition of the notion 'causative'. Thus, [pəva'gɪ?] 'to divide', [pəjə'jɪ:] 'to promise', [pəɪə'gɑŋ] 'to jump', [pərə'mē:] 'to celebrate, make merry' and similar items are assigned to underlying representations with /pək/- even though the surface semantics can be said to justify such representations only in the most marginal sense. The meaning of one item, [pəhə'duy] 'tend to someone who is ill' diverges so sharply from the meanings of its assumed constituents (/pək/ 'causative', /haduy/ 'work') as to be idiomatic. Native-speaker reaction, however, suggests that an analysis into two morphemes is justified, and this analysis is adopted here.

In most other cases (/pək+kəsɪŋ/, /pək+taŋi/, etc.) /pək/- clearly indicates cause, or non-interference with a natural process which is thereby allowed to run its course, as in /hia? pək+həŋəm kupi anan/ 'he let the coffee cool'.

In one construction a verb with /pək/- is used reflexively: /hia? ŋ+kəliəh pək+pərah hia? tua anan/ 'he always gets hurt when he plays' (= 'he just plays to hurt himself').

-əm-

The infix -əm- is inserted after a root-initial consonant if there is one. It usually, though not always marks a verb that is transitive. Transitive verbs with -əm- are apparently always active.

jahut sew, sewing : j-əm-ahut to sew

60. (im) jahut basuŋ anih sew this shirt
(you) sew shirt this

61. hia? j-əm-ahut basuŋ anan she is sewing the shirt
she sew shirt that

lura spittle, sputum : l-əm-ura to spit

62. hia? l-əm-ura he is spitting
he spit

lərat temper, tempering of metal : l-əm-ərat to temper metal

63. (im) lərat malat anih temper this parang
(you) temper parang this

64. hia? l-əm-ərat malat anan he tempered the parang
he temper parang the

asa *whet, whetting or sharpening* : əm+asa *to whet, sharpen*

65. hia? əm+asa ñu anih *he sharpened this knife*
 he sharpen knife this

sup *wash, washing* : s-əm-up *to wash*

66. hia? s-əm-up daven anan *she is washing the clothes*
 she wash clothes the

kəp *to beach, bring to shore* : k-əm-əp *to bring to shore*

67. dəhalu? k-əm-əp batan *they (trial) are bringing a log*
 they bring to shore log to shore

lidɪŋ *wall* : l-əm-ɪdɪŋ *make or put up a wall*

68. hia? l-əm-ɪdɪŋ lapo *he is putting walls in the temporary hut*
 he put walls in hut

iri *lying down* : əm+iri *lie down*

69. hia? əm+iri tinan *he is lying over there*
 he lie down there

ləduh *end-of-harvest celebration* : l-əm-əduh *celebrate the ləduh*

Certain features of the present analysis are in need of comment. As a result of the application of the phonological rules (#15), /mə/- and -/əm/- fall together as surface homophones both in monosyllables and in vowel-initial disyllables:

monosyllables

vowel-initial disyllables

- | | |
|--|---|
| a) /mə+pup/ → [mə'pup] <i>dusty</i> | a) /mə+asəp/ → [mə'səp] <i>dirty</i> |
| b) /k-əm-ar/ → [kə'kar] <i>to scratch up</i> | b) /əm+asa/ → [mə'sa:] <i>whet, sharpen</i> |

As noted earlier (sub /mə/-), a surface prefix [mə]- 'stative' does not occur in consonant-initial disyllables. Moreover, in this environment the infix -/əm/- is realized as [mə]- ~ -[əm]-:

/l-əm-ərat/ [mələ'rat] ~ [ləmə'rat] *to temper metal*

The proposed affixes /mə/-, -/əm/- thus never contrast formally in their surface realizations. The basis for distinguishing two affixes is largely the impressionistic semantics, where forms such as a) suggest a stative inflectional modification, while forms such as b) suggest an active inflectional modification.

There is, however, an inherent difficulty with this approach as the underlying distinctness of the affixes in particular cases must be

inferred entirely from the glosses offered, yet these may allow of more than one interpretation. In most cases this difficulty is minor: [mā'səp] 'dirty', as in [basuŋ nā? mā'səp] 'his shirt is dirty' is clearly stative, and [māsa:] 'whet, sharpen', as in [hiya? māsa mālat anān] 'he sharpened the parang' is clearly transitive and active. With forms such as [mālit] 'healed, healing' or [māñōr] 'adrift, drifting' on the other hand, it is less clear whether the affixed form signals a state or an action. Thus, [ʔava? anān mālit] 'the wound is healed/healing' could be stative, parallel to [doh anān māli] 'the woman is pregnant', or active, parallel to [lake? anan ləmūra/mālura] 'the man is spitting'.

There are several approaches one might take to such a problem, of which the most important would seem to be:

1) mark all questionable cases as /mə/- 'stative'
 2) mark all questionable cases as polysemous. Thus the sentence [ʔava? anān mālit] would be glossed 'the wound is healed/healing', implying a belief that both readings (state/action) are grammatically justified

3) mark most questionable cases as polysemous, but eliminate semantically implausible readings where these occur

Support for interpretation 1) is found in the fact that in unambiguous stative constructions the subject is invariably patient, whereas in unambiguous active constructions (as where the verb is a consonant-initial disyllable) the subject is invariably actor. Given this observation sentences such as [ʔava? anān mālit] 'the wound is healed' or [harok kuy māñōr] 'my boat is adrift' would be interpreted as stative constructions by analogy with the unambiguous cases. There is some historical support for this interpretation, since /mə/- generally derives from *ma- 'stative', and -/əm/- from *-um- 'actor focus'. However, the adoption of interpretation 1) would lead to an implausible result in at least one known example: [ʔata? haləm kire? māʔōh] 'the water was spilled from the kettle', where [māʔōh] seems clearly to be non-stative, despite a patient subject.

Interpretation 2) is perhaps the most conservative of the three, yet in the case of [māʔōh] it encounters the same difficulty just noted for interpretation 1).

Since the constraint against patient subjects in -/əm/- verbs evidently must be relaxed in any case to accommodate [māʔōh] (as /əm+aʔuh/), there seems to be no reason why forms such as [mālit] or [māñōr] cannot be regarded as convergent surface realizations of more than one underlying representation: /mə+alit/, /əm+alit/; /mə+añur/, /əm+añur/,

and underlying representations such as /mə+aʔuh/ 'spilled' (stative) ruled out as implausible on semantic grounds. Nonetheless, under this interpretation we are left with a distributional peculiarity: all known patient-initial -/əm/- verbs are vowel-initial.

Historically, what this distributional asymmetry suggests is the occurrence of an old non-stative verbal prefix homophonous with the stative prefix *mə- (cf. e.g. Ilocano yánud 'to float; throw into a current of water', maánud 'to drift, float'). The vowel of such an affix would have been subject to the general neutralization of vocalic oppositions (as /ə/) in prepenultimate syllables. By another well-motivated rule prevocalic /ə/ would then drop, giving rise to allomorphs [mə]- (before consonant-initial stems) and [m]- (before vowel-initial stems). The secondary prefix /mə/-, representing earlier *ma₁- 'stative' and *ma₂- 'active' then disappeared before consonant-initial stems, after which the consonant of the infix -/əm/- metathesized with the stem-initial consonant to produce [mə]- as an optional realization of the underlying infix. Note that metathesis of the infix apparently followed the loss of *mə- before consonant-initial roots, as these affixes did not merge phonemically in this environment (thus, there are no attested examples e.g. of -/əm/- 'statives').

On the basis of the preceding discussion we might posit a second synchronic prefix /mə₂- that occurs at least in /mə₂+aʔuh/ 'spill', and probably also in /mə₂+alit/ 'heal' /mə₂+añur/ 'drift', and /mə₂+uhav/ 'to yawn' (PAN *ma+Suab). The known synchronic evidence, however, seems insufficient to support such an analysis, and it is perhaps best for the present to treat these patient-initial verbs as containing atypical instances of -/əm/-.

Semantically it is not clear how -əm- and η- differ, or in particular cases how either of these differs from pək-. With one known exception (liruy 'torch' : l-əm-liruy 'shine a torch on, hunt at night using a torch') instruments or objects capable of instrumental use invariably take η- to form the corresponding verb:

- isah file : η+isah to file
 səp tweezers : η+səp pluck with tweezers
 sakul hoe : η+sakul to hoe
 təliise comb : η+təliise to comb
 kəliŋi mirror : η+kəliŋi use a mirror
 tugal dibble stick : η+tugal dibble
 ilik rice sieve : η+ilik to sieve
 katəm wood plane : η+katəm to plane
 jalaʔ casting net : η+jalaʔ fish with casting net
 pəsiʔ fishing line with hooks : η+pəsiʔ fish with line and hook
 kayuʔ tayun firewood : η+tayun burn firewood

In other instances, however, the factors governing choice of affix are still not predictable, as with *ləkət* 'sticky, adhesive' : *pək+ləkət* 'stick two or more things together' next to *kawi* 'bent' : *ŋ+kawi* 'to bend' or *jaji* 'promise' : *pək+jaji* 'to promise, make a promise' next to *para* 'a curse' : *ŋ+para* 'to curse'.

In one known case the difference between *ŋ-* and *pək-* appears to be between intransitive and transitive action:

ŋ+lisun 'to smoke, smoulder' : *pək+lisun* 'smoke out'

apuy anan ŋ+lisun the fire is smouldering

70. (im) *pək+lisun ləpo anih* smoke out this hut (as to drive
(you) smoke out hut this the mosquitos away)²⁸

With one known root *pək-* and *-əm-* are interchangeable:

luhu? cook fish or meat in a bamboo tube over the fire

71. *hia? pək+luhu?* } *masik* she is cooking fish in a bamboo tube
she l-əm-uhu? } *fish* over the fire
cook

In another the meanings appear to be indistinguishable:

72. *hia? j-əm-at ue* anan he is pulling the rattan
he pull rattan the

73. *kalu? pək+jat ti? giham* we (trial) pulled (our boat) through
we pull loc rapids the rapids²⁹

-n (Genitive)

The suffix *-n* links two nouns in a genitive relationship:

mata? eye : *do day* : *mata?+n do sun*

ata? water : *hiŋət bee* : *ata?+n hiŋət honey*

suhu? rise (of water) : *hunge river* : *suhu?+n hunge* rising of
the river

Its use is at least sometimes optional, as in

bulu? } *masik* fish scale
bulu?+n }

Certain examples reveal in addition that some nouns suffixed with *-n* can stand alone. In such cases the basic meaning of the root is modified to suggest a relationship to some other undefined noun:

ata? water : *ata?+n* juice, gravy

As was seen in the discussion of possessive pronouns, and in the discussion of kinship terms, *-n* also links a noun that ends in glottal

stop with any following non-first or second person singular possessive marker, and marks certain terms of relationship. Its use in these constructions is obligatory. Moreover, the genitive marker is required with some roots in isolation, chiefly terms of relationship, where it indicates obligatory possession (cp. ata?+n 'juice, gravy' = 'water of'):³⁰

hina?+n mother of³¹

tama?+n father of

hina?+k my mother

tama?+k my father

hina?+m your mother

tama?+m your father

hina?+n na? his mother

tama?+n na? his father

hina?+n tu? our (dual incl.)
mothers³² etc.

tama?+n tu? our (dual incl.)
fathers etc.

(but **hina?)

(but **tama?)

(pə)hari?+n sibling of

ara?+n name of

(pə)hari?+k my sibling

ara?+k my name

(pə)hari?+m your sibling

ara?+m your name

(pə)hari?+n na? his sibling

ara?+n na? his name

(pə)hari?+n tu? our (dual incl.)
siblings etc.

ara?+n tu? our (dual incl.)
names etc.

(but **(pə)hari?)

(but **ara?)

In one recorded sentence -n combines with anu? 'which one; thing mentioned' in the meaning '(an)other':

74. hia? saru? akuy ti? kelunan anu?+n he mistook me for another
he mistake me loc person another person

ən (Agentive)

The particle ən is preposed to the third person singular and all non-singular pronouns of Set B. Given the normal order of constituents (1,2) it redundantly marks the actor or agent³³ of a passive verb (5.1.1.: 2b, 7b, 5.2: 39 and the following):

- 75a). akuy η+bu masak anan I smelled the fish
I smell fish the

- b). masak¹ anan/ak η²+bu (or 2,1) I smelled the fish
masak anan/lm η+bu you smelled the fish
masak anan/ən na? η+bu he smelled the fish
masak anan/ən tu? η+bu we (dual incl.) smelled the fish
masak anan/ən kawa? η+bu we (dual excl.) smelled the fish
masak anan/ən kua? η+bu you (dual) smelled the fish
masak anan/ən dahu? η+bu they (dual) smelled the fish
masak anan/ən təlu? η+bu we (trial incl.) smelled the fish

masak anan/ən kalu? ŋ+bu *we (trial excl.) smelled the fish*
 masak anan/ən kəlu? ŋ+bu *you (trial) smelled the fish*
 masak anan/ən dəhəlu? ŋ+bu *they (trial) smelled the fish*
 masak anan/ən tam ŋ+bu *we (pl. incl.) smelled the fish*
 masak anan/ən kami? ŋ+bu *we (pl. excl.) smelled the fish*
 masak anan/ən kam ŋ+bu *you (pl.) smelled the fish*
 masak anan/ən daha? ŋ+bu *they (pl.) smelled the fish*

This particle also occurs before a nominal agent of a passive verb:

- 76a). həñap k-əm-ar pare anih *a chicken scratched up this rice*
chicken scratch up rice this
 b). pare ¹ānih/ən həñap² kar (or 2,1) *a chicken scratched up this rice*

When the function of agent is expressed by a noun, or a non- first or second- person singular pronoun, and the verb remains unchanged, a surface passive sentence with constituents in the order 2,1 differs from the corresponding active sentence only in taking the agentive marker (except in the 1st p. dual incl., 1st p. pl. incl. and 2nd p. pl. pronouns, whose Set A and Set B members are non-identical):

- 77a). tama?+k ŋ+isah malat *my father is filing a parang*
father my file parang
 b). ¹mālat/ən tamā²?+k ŋ+isah (or 2,1) *my father is filing a parang*
 78a). təlu? ŋ+kahəm ləpo *we (trial incl.) destroyed the hut*
we destroy hut
 b). ləp¹o/ən təl²u? ŋ+kāhəm (or 2,1) *we (trial incl.) destroyed the hut*
 79a). itam ŋ+anit payo anan *we (pl. incl.) skinned the deer*
we skin deer the
 b). payo ¹ānan/ən tam ²ŋ+anit (or 2,1) *we (pl. incl.) skinned the deer*

Despite their semantic distinctness, it is difficult to regard the formal similarity of ən and -n in obligatory possessed nouns as accidental. It is likely that these markers have a single historical origin (PAN *ni), with phonemic split conditioned by grammatical environment. Synchronically, however, any attempt to derive them from a single underlying form would require us to posit a rule of syllabification which applies solely to /n/ (agentive). Although the solution we have adopted violates an otherwise general constraint against schwa as the initial segment of a morpheme, it introduces no complications that would not also be present under the alternative solution (/n/ would also violate a general morpheme structure constraint, and from

a historical standpoint grammatically conditioned phonemic split must be recognized in either case). The choice is thus between accepting a single canonically irregular lexical entry (/ən/) as against positing a uniquely exemplified phonological rule (syllabification). In accordance with the general theoretical framework adopted we choose the former alternative.

5.2.1. Residual Difficulties

There are a number of forms in which the morphological analysis is still unclear, and it is doubtful that much progress will be made in understanding them until a richer data base is available. Some of these examples may be the product of incorrect analyses; others almost certainly result from borrowing and still others apparently involve real but minimally productive affixes whose functions are not yet well understood. The difficulties recognized are as follows:

bə-

A prefix with this shape appears in:

laqu *song* : bə+laqu *sing*

where it was evidently acquired through borrowing both words from Malay. An apparent prefix with the same shape occurs in:

bə+lari? *thunder*

bə+kilet *lightning*

Similarly, the variant shapes of $li\dot{g}et \sim b\dot{e}li\dot{g}et$ 'surefooted', as in:

80. $li\dot{g}et$ } *lan hia? pano he is very surefooted (in walking)*
 $b\dot{e}li\dot{g}et$ } *very he walk*
surefooted

may indicate that the second form is morphologically complex (for an alternative interpretation, however, cf. 5.6.).

bəl-

This prefix has been acquired in one Malay loanword:

bəl+ajar *learn* : ŋ+ajar *teach*

k- ~ ŋ-

An element $k- \sim \dot{\eta}-$ is found in one known item, which also presents special difficulties in the phonological analysis (see 5.5.2.):

ahit *sand* : k+ahit ~ ŋ+ahit *sandy*

le-

Several words can be analyzed so as to show an unexplained residual sequence le-:

- pəla rite in which beneficent spirits are invoked for the cure of illness : ŋ+pəla perform the pəla : lə+ŋ+pəla larger ceremonial complex in which the pəla is performed
- pate death; corpse : ŋ+pate die, dead : lə+ŋ+pate kill

In one case le- evidently indicates non-deliberate action:

- gak fruit that has fallen to the ground : lə+gak to fall

81. bua dian anan ləgak hida uma the durian fell under the
fruit durian the fall under house house (as for example,
through the floorboards)

next to, e.g.

82. hia? g-əm-ak batu? he dropped a stone
he drop stone

n-

A prefix n- is found in:

- ikər cough : n+ikər to cough

83. ikər na? ñawən lan his cough is very loud
cough his loud very

84. hia? lali? n+ikər he coughs a lot
he excessive cough

- uta vomit : n+uta to vomit

but is attested only in these two forms.

pə-

An affix having this phonemic shape ([p]- before vowels ~ [pə]- before consonants) is found in several items, where it is difficult for phonological and/or semantic reasons to identify it with the causative prefix. In the first two examples it appears to (redundantly) indicate completed action:

- asar move slightly : pə+asar moved slightly

85. (im) asar bərat anih move this mat a bit
(you) move a bit mat this

86. bərat anih aw pə+asar kəna? ən asu? a dog has (already) drag-
mat this already moved slightly affected by dog ged this mat a little

taday dive : pə+taday dive, to dive

87. (im) *taday ha? huŋe* dive into the river
(you) dive into river
88. *asəm lali? pə+taday* don't dive too much
don't excessive dive

laŋaŋ able to jump high or far : pə+laŋaŋ to jump

aŋəm extinguish, put out : pə+aŋəm go out, die, as a fire

89. *hia? laŋaŋ lan* he can jump well (high or far)
he able to jump very
90. *hia? pə+laŋaŋ* he is jumping
he jump

səp-

It is possible that there is a morphological relationship between:

itəŋ area cleared by cutting with a parang :

əm+itəŋ hack or cut with a parang

and

səp+itəŋ secondary forest

-ən-

A non-productive infix -ən- can be identified from:

ta?i? ~ ta?e faeces : təna?i? ~ təna?e intestines

A number of other non-productive affixes occur on the root meaning 'eat; food' as follows:

ma-

ma+kan to feed (humans)

91. *hia? ma+kan hapəŋ anan* she is feeding the baby
she feed baby the

pa-

pa+kan to feed (animals); fodder

92. *masik anih ən na? na pa+kan asu?* he used this fish to feed
fish this agen he use feed dog the dog

-um-

k-um-an eat³⁴

93. akuy k-um-an bua pini I'm eating a mango
I eat fruit mango

-ən

kan+ən cooked rice

-i

kan+i be eaten

94. kan+ən anan ən kam kan+i you (pl.) ate the rice
rice the agen you eat

pəŋ- plus infix root

pəŋ+k-um-an food (in general); diet

pəŋ- plus root plus -an

pəŋ+kan+an food (in general); diet

pəŋ+k-um-an } dahalu? ja?ək their (trial) diet is not good
pəŋ+kan+an } their bad
diet

In our present state of knowledge, it is probably best to regard all of the foregoing morphological analyses (5.2.1.) as part of the history of the language. Morpheme boundaries are, accordingly, not written in the lexical entries (6.).

In several other cases a form that must be listed as a lexical entry on the basis of the available synchronic evidence is known to be historically complex, and may contain a synchronically analysable affix, as with /məhəŋa?/ 'strong, strong-willed, hot-tempered' (evidently < *ma-'attributive' plus *seŋa 'breathe'), /ñlla/ < *(zZ)llaq 'lick', /pəhala/ < *salaq 'twist the ankle' or /səpərəm/ < *pəDem 'close the eyes'.

In a number of cases the clitic locative marker /ha?/ or /tɪ?/ has fused with a following root, and it is not entirely clear whether a synchronic segmentation is motivated: [ha'lem] < *sa lem 'in, inside', [hɪ'nɪh] < *sa inɪ 'here', [hɪ'tɪh] < *sa itɪ 'there (not near hearer)', [hɪ'nūh] < *sa inu 'where?', [hɪ'ran] *sa ijaN 'when?', [tɪ'nan] < *tɪ inan 'there (near hearer)'. In the absence of straightforward alternations (the meaning of /məhəŋa?/ cannot be determined from the meanings of its parts; /ñlla/ is said to be invariant; the demonstrative counter-

parts of /hinh/, /hitih/, /tinan/ contain initial /a/) all such cases are treated as monomorphemic.

It is possible that some other items that have been listed separately are in fact simple and morphologically complex shapes of the same morpheme. Thus [hu'ku:] 'grandparent' : and [mũ'ku:] 'old, of people' may contain the same root, as may [da'he?] 'to (relational)' and [da'hin] 'and, with', though the semantic justification for analysis of the latter item is tenuous. Similarly, [te] 'go' and [ne] 'come' would seem to be related, but only on the assumption that the relationship is semantically and phonologically idiosyncratic.

5.2.2. Sample Paradigms

The following paradigms illustrate the range of affixes that can be attached to a few particular roots:

ava? a wound
 mə+ava? wounded
 pek+ava? to wound
 pə+ava? wound e.o.

timək a shot, shooting
 ŋ+timək to shoot
 pə+timək shoot e.o.

lura spittle, sputum
 l-əm-ura to spit
 pə+lura spit at e.o.

ata? water
 ata?+n juice, gravy
 (i.e. water of)

5.3. LEXICAL REPRESENTATION

Lexical items in Uma Juman can be represented in terms of the following minimal inventory of symbols. Justification of the symbols used will be given in 5.5.1. and 5.5.4.

Consonants				Vowels		
p	t	k	ʔ	i	u	
b	d	j	g	e	ə	o
m	n	ñ	ŋ	a		
	s	h				
v	[β~v]	³⁵		Diphthongs		
	l			uy		
	r					
w	y			aw ³⁶		

5.4. MORPHEME STRUCTURE

Constraints on permissible phoneme sequences in morphemes can be divided into two types: major class constraints and minor class constraints.

5.4.1. Major Class Constraints

Major class constraints are limitations on the distribution of the categories 'consonant' and 'vowel'. These are discussed first in terms of the syllable, then in terms of root morphemes.

5.4.1.1. Canonical Shapes of Syllables

Possible phonemic syllable shapes (underlined) are as follows:

V i·li plank, board
 VC tu·an primary forest
 CV ba·ŋet ocean
 CVC hi·pun have, possess
 a·puv fire

5.4.1.2. Canonical Shapes of Roots

All theoretically possible combinations of the categories 'consonant' and 'vowel' within root morphemes of up to three phonemic segments are listed below. Where a canonical shape is exemplified by at least one known form, a representative example is cited to the right:

V	VVC	uaŋ	seed (of a fruit)
C	VCV	apu	hold, grasp
VV	VCC	ue	rattan
VC	CVV	aw	already
CV	CVC	te	go
CC	CCV	bən	lid, cover
VVV	CCC		

The following is a list of all attested canonical shapes involving longer sequences:

VCVC uləŋ thorn
 CVVC buaŋ the Malayan honey bear: *Ursus Malayanus*
 CVCV luho rubbish, trash
 CVCVC hikəl natural cockspur
 tutuk pounding
 CVCCV kərbo water buffalo (L)
 CVCVVC bəruan soul (of living person)
 CVCVCV təlise comb
 CVCCVC həŋguk hiccough
 ləkhən intestinal worm
 CVCVCVC kərataŋ k.o. large storage basket
 CVCVCVVC bələŋlan male (of pigs)

On the basis of this information it is possible to formulate a set of constraints on permissible combinations of vowels and consonants within Uma Juman root morphemes as follows:

1. Every root morpheme must contain at least one vowel.
2. No more than two V's or C's may occur in sequence.
3. Consonant sequences occur only medially.
4. No root morpheme of more than two syllables begins with a vowel.

Blanks in the above list of theoretically possible sequences can now be distinguished as structural impossibilities or accidental gaps. Non-occurring canonical shapes appear below, with the constraints that are violated cited in parentheses. Remaining blanks indicate accidental gaps:

V CC (1,3) VVV (2,4)	VCC (3) CCV (3) CCC (1,2,3)
--------------------------------	-----------------------------------

5.4.1.3. *Relative Frequency of Canonical Shapes*

Based on a sample of 100 roots selected at random the attested canonical shapes (5.4.1.2.) show the following frequency percentages:

canonical shape	frequency %
VV -----	
VC -----	
CV -----	3
VVC -----	2
VCV -----	2
CVV -----	
CVC -----	15
VCVC -----	13
CVVC -----	3
CVCV -----	14
CVCVC -----	44
CVCVVC -----	1
CVCVCV -----	
CVCCVC -----	1
CVCVCVC -----	2
CVCVCVVC -----	1
	100

5.4.2. Minor Class Constraints

Segmental constraints are limitations on the distribution of particular segments. For expository convenience consonant distribution and vowel distribution will be discussed separately.

5.4.2.1. Constraints on the Distribution of Particular Consonants

The recorded distribution of consonant phonemes (5.3.) in initial, intervocalic and final positions appears below, keyed by number to the illustrative lexical items that follow. To simplify the statement of environments attested clusters are cited separately at the end. Segments which are rare in any given position, or that are known to occur only in loanwords are marked as such:

	initial	intervocalic	final
p	1	10	20
t	2,15,21,23	6	8
k	3,16,19	9	1
ʔ	-	7,23	10,12
b	4	15	-
d	5	14,21	-
ʝ	6	16	-
g	7	17	-
m	8	2	7,17
n	9	3	9,25
ɲ	10	18	-
ŋ	11	5	3,11
s	12	19,25	-
h	13,17,20	1,4	5,13,14
v	24 (in 1 item)	13	21
l	14	8,11	19
r	25 (in 6 loans)	20	2,16,18
w	-	22	23
y	-	12	4

1. puhək *handspan*
2. tumir *heel*
3. kuniŋ *yellow*
4. bahuy *wind*
5. dəŋah *news*
6. jatu *fall*

7. gaʔam *molar*
8. malat *parang, machete*
9. bua nakan *small wild jackfruit*
10. ɲupiʔ *dream*
11. ŋalaŋ *mountain*
12. sayaʔ *eight*

- | | | | |
|-----------|--|--------------|---|
| 13. hlvih | <i>lower lip</i> | 20. arəpvhəp | <i>hope</i> |
| 14. ləduh | <i>end-of-harvest celebration</i> | 21. tadav | <i>dive</i> |
| 15. tubu | <i>rise (of the sun)</i> | 22. awa | <i>longhouse veranda</i> |
| 16. kajər | <i>solo dance</i> | 23. taʔaw | <i>right (side)</i> |
| 17. higəm | <i>hold, carry in the hand</i> | 24. va | <i>tree that has fallen
across a path or stream</i> |
| 18. anūr | <i>current; drift on the
current</i> | 25. rasun | <i>poison</i> |
| 19. kasəl | <i>dull, blunt</i> | | |

Attested consonant clusters

mb	həmbək	<i>selfish</i>	kh	ləkhən	<i>intestinal worm</i>
mp	həmput	<i>blowpipe</i>	rb	kərbo	<i>water buffalo (L)</i>
nd	anak hənduŋ	<i>child-in-law</i>	pt	səptlit	<i>spraying</i>
ŋg	hənguk	<i>hiccough</i> ³⁷	kj	təkjət	<i>startled</i>
ŋʔ	taŋʔap	<i>open</i>	tk	pətəkəl	<i>commit suicide</i>

In summary, the following constraints on the distribution of consonant phonemes can be stated:

1. Glides (/w/ and /y/) and glottal stop do not occur initially. /v/ occurs initially in a single item, which may be a transcriptional error; /r/ occurs initially in only six known items, all of which are apparent Malay loans.
2. Palatals, voiced stops and /s/ do not occur finally.
3. Within a morpheme consonant clusters occur only medially.
4. /ʔ/ does not occur between a high vowel and a following unlike vowel.

5.4.2.2. Constraints on the Distribution of Particular Vowels

Constraints on the distribution of vowel phonemes, together with attested vowel sequences are as follows:

1. With one exception (kuŋl 'large sweet mango'), regarded as a recent Malay loanword, all vocalic oppositions are neutralized as shwa in pre-penultimate syllables.
2. Within a root shwa occurs before /h/ only in prepenultimate position; it does not occur initially (except in ən 'agentive'), prevocally, after /a/, before /y/, or /w/, or in open final syllables; before /ʔ/ it occurs in one known form (lʔəʔ 'tooth').
3. Sequences of like vowels do not occur.
4. Within a morpheme /e/ and /o/ occur only in open final syllables.

Attested vowel sequences

ai	:	hai	<i>sword grass:Imperata cylindrica</i>
la	:	ñlan	<i>light in weight; quick</i>
iu	:	liu	<i>river channel</i>
ua	:	luan	<i>k.o. small edible fish</i>
ue	:	tuer	<i>stick driven into the mud to prevent a boat that has been pushed into the water from coming back to shore</i>
ul	:	uil	<i>lever</i>
ue	:	lue	<i>k.o. small yam</i>

5.4.2.3. Relative Frequency of Phonemes

The relative list frequency of consonant phonemes in each position appears below. Given the zero convention marking the non-occurrence of an initial, intervocalic or final consonant, initial and final consonants necessarily total 100. Absolute numerical values and percentages are thus identical. Due to a substantial number of monosyllables only partly compensated by multiple intervocalic consonants in trisyllables, the absolute number of intervocalic consonants is less than 100:

p-	:	9	-p-	:	3	-p	:	3
t-	:	19	-t-	:	6	-t	:	10
k-	:	12	-k-	:	9	-k	:	11
	:	-	-ʔ-	:	1	-ʔ	:	11
b-	:	11	-b-	:	1		:	-
d-	:	3	-d-	:	5		:	-
j-	:	3	-j-	:	1		:	-
g-	:	2	-g-	:	3		:	-
m-	:	3	-m-	:	1	-m	:	4
n-	:	1	-n-	:	7	-n	:	5
ñ-	:	∅	-ñ-	:	∅		:	-
ŋ-	:	∅	-ŋ-	:	4	-ŋ	:	24
s-	:	4	-s-	:	7		:	-
h-	:	9	-h-	:	3	-h	:	8
	:	-	-v-	:	4	-v	:	∅
l-	:	7	-l-	:	8	-l	:	1
r-	:	-	-r-	:	15	-r	:	3
w-	:	-	-w-	:	∅	-w	:	∅
y-	:	-	-y-	:	1	-y	:	1
∅-	:	<u>17</u>	-∅-	:	<u>6</u>	-∅	:	<u>19</u>
		100			85			100

Based on the above observations, the following general claims about the relative frequency of consonant segments in Uma Juman seem tentatively to be justifiable:

1. There is a marked preference for voiceless stops, especially /t/ to occur in C- position within root morphemes. Initial vowels are also highly favoured, and /b/- is much more common than any other voiced stop.
2. In intervocalic position preferences seem less distinctive, though liquids, particularly /r/ occur with relatively high frequency, and voiceless stops are considerably more common than voiced stops.
3. In final position there is a very strong preference, where a consonant occurs, for that consonant to be ŋ.

The relative frequency of vowel phonemes in each syllable (penultimate and ultimate) is as follows:

	penultimate	ultimate
a	44	36
ə	10	14
i	9	15
u	20	30
e	-	2
o	-	3

Based on the above observations the following general claims about the relative frequency of vowel segments in Uma Juman seem tentatively to be justifiable:

1. /a/ is the most frequent vowel in all positions; this domination is most marked in the penult.
2. /u/ is the second most frequent vowel in all positions, followed by /ə/ and /i/, which occur with approximately equal frequency.

The preferred canonical shape (disyllabic) and segment distribution of Uma Juman can be symbolized by the formula: taraŋ.

As noted earlier (fn.37), there appears to be an associative tendency between initial h and medial prenasalized stops. The basis of this association is not understood. There also appears to be a weak tendency for like vowels to occur in successive syllables.

The only dissociative tendency noted is one that appears to have been inherited from Proto-Austronesian:

1. Unlike labials (p...b, b...m, etc.) in successive syllables are disfavoured.

5.5. PHONOLOGY

The phonology of Uma Juman can be described in terms of a set of partially ordered rules relating lexical representations at the level of the systematic phoneme (but see Introduction, section 2) to their systematic phonetic realizations.

5.5.1. Phonological Rules

The phonological rules of Uma Juman are as follows:

1. (shwa deletion 1)

/ə/ → Ø / ___+V (a shwa that comes to be prevocalic as a result of affixation is deleted)

Examples

/mə+asəp/ → [mä'səp] *dirty*
 /mə+urip/ → [mü'rip] *alive, living*
 /pə+añun/ → [pa'ñün] *coitus, copulation*
 /pə+apir/ → [pa'pər] *stuck together, fused; twins*

It is possible to eliminate this rule by positing underlying prefixes that do not contain a vowel (/m/- 'attributive or stative', /p/- 'reciprocal'). If this interpretation is adopted, however, we would expect /p/- to delete (by Rule 2) in forms such as /p+lura/ 'spit at e.o.', /p+tuðək/ 'peck e.o.' or /p+jat uə/ 'tug-of-war' instead of producing the attested [pəlu'ra:] [pətu'dək] and [pə'jat wə:]. Similarly, the /m/- of an underlying form such as /m+gaŋ/ 'dry' would presumably assimilate to the following stop (by a generalization of Rule 18) instead of producing the attested [mä'gaŋ].

2. (consonant deletion)

A consonant is deleted if it is the first member of a cluster occurring across morpheme boundary. This rule deletes the second consonant of the causative prefix /pək/- before most consonant-initial stems.

Examples

/jaʔək/ *bad*
 /pək+jaʔək/ → [pəja'ʔək] *to wrong or slander a person*
 /duʔuk/ *small*
 /pək+duʔuk/ → [pədu'ʔok] *make s.t. smaller, reduce in size*
 /hatuŋ/ *swimming*
 /pək+hatuŋ/ → [pəha'toŋ] ~ [paha'toŋ] *make a person or animal swim (as by throwing him/it in the water)*

It appears to be optional if the root begins with /s/:

/su/

/pək+su/ → [pək'su:] ~ [pə'su:] *move (two or more things) apart*

Stop deletion does not occur before vowel-initial roots:

/ava?/ *wound*

/pək+ava?/ → [pəka'va?] *to wound*

/urip/ *life*

/pək+urip/ → [pəku'rip] *save the life (of a person or animal)*

By the same rule morpheme-final glottal stop is deleted before a possessive or genitive suffix:

/mata?/ → [mā'ta?] *eye*

/mata?+k/ → [mā'tak] *my eye*

/mata?+n do/ → ['mātan do:] *sun*

/bulu?/ → [bu'lo?] *body hair, feathers, scales*

/bulu?+m/ → [bu'lum] *your body hair*

/bulu?+n masik/ → ['bulun 'māsiək] *fish scale*

In an earlier section (5.4.2.1.) it was noted that consonant clusters occur only medially. This constraint on phonemic sequences within a morpheme might be invoked to account for the reduction of underlying final clusters across morpheme boundary, and part of rule 2 eliminated from the phonological component. Although the treatment of rule 2 as a morpheme structure constraint would work in the case at hand, since the precedence relation between rules 2 and 10 would remain unaffected whether rule 2 was treated as a P-rule or a morpheme structure constraint, this solution must be rejected on the more general grounds that the principle appealed to is violated in other language descriptions to follow, and can only be maintained in Uma Juman on an ad hoc basis. Alternatively, the present rule might be simplified in feature terms by elimination of underlying /?+C/ clusters if final glottal stop were added by rule rather than regarded as present in underlying representations. In the discussion of possessive pronouns (5.1.1.) it was observed that pronoun selection with a few exceptions can be predicted in phonological terms, members of Set C occurring after roots that end in a vowel or any consonant except glottal stop, and members of Set D occurring after roots that end in glottal stop. It seems clear that this statement of phonological environments could be made more natural if roots that end phonetically in a vowel were regarded as ending phonemically in glottal stop, and roots that end phonetically in glottal stop were regarded as ending phonemically in a

vowel. Phonological theory provides a means of expressing such relationships through the use of a variable notation. If this approach is adopted, however, it becomes necessary to posit underlying final glottal stop in lexical items that have phonetic final vowels from historical sources other than *-Vq, as /ateʔ/ ([ʔa'te:]) < *qaCey 'liver' or /atuʔ/ ([ʔa'tu:]) < *Ratus 'hundred' and we are confronted with diachronic complications of the type discussed in section 2 of the introduction.

3. (semivocalization)

$$\begin{bmatrix} -\text{cons} \\ +\text{high} \end{bmatrix} \rightarrow [-\text{voc}] / \# \text{ ______ } \begin{bmatrix} +\text{voc} \\ -\text{cons} \\ -\text{low} \end{bmatrix} \begin{array}{l} \text{(initial high vowels} \\ \text{become non-syllabic} \\ \text{before a non-low vowel)} \end{array}$$

Examples

/ue/ → [we:] rattan

/uil/ → [wel] lever

This rule does not apply before low vowels, nor if the sequence in question is non-initial:

/uaŋ/ → [ʔu'waŋ] seed; core of a tree

//lu/ [ll'yu:] river channel

/bua/ [bu'wa:] fruit

//lah/ [ll'yah] nit, egg of a louse

4. Vocalization

$$\begin{bmatrix} -\text{cons} \\ -\text{voc} \end{bmatrix} \rightarrow [+ \text{voc}] / \text{ ______ } \# \text{ in monosyllables}$$

Word-final glides vocalize in phonemic monosyllables. This rule is posited to account for the fact that words such as /duy/ 'drink', and /tuy/ 'permitted, allowed' are commonly pronounced as disyllables: [du'wi:], [tu'wi:], whereas the terminal glide of phonemic disyllables like /apuy/ 'fire' does not normally undergo a similar modification. (thus: [a'puy]).

5. (glide insertion)

$$\emptyset \rightarrow \begin{bmatrix} -\text{voc} \\ -\text{cons} \\ +\text{high} \\ \alpha\text{back} \end{bmatrix} / \begin{bmatrix} +\text{voc} \\ +\text{high} \\ \alpha\text{back} \end{bmatrix} \text{ ______ } \begin{bmatrix} +\text{voc} \\ -\text{cons} \end{bmatrix}$$

(between an underlying or derived high vowel and any following vowel a glide is inserted homorganic with the first phonemic segment)

Examples

/tuan/ → [tu'wan] *primary forest*
 /kəliah/ → [kəli'yah] *game*
 /duy/ → [du'wi:] *drink* (cf. rule 4)

6. (deletion of prepenultimate initial vowels)

V → ∅ / ____ (C)+(C)V(C)V(C) (a root-initial vowel which comes to be prepenultimate as a result of affixation is deleted)

Examples

/asa/ *whetting, sharpening*
 /əm+asa/ → [mā'sa:] *whet, sharpen*
 /iri/ *lying down*
 /əm+iri/ → [mī'ri:] *lie down*

7. (glottal onset)

∅ → ? / # ____ V (glottal stop is added before a vowel that follows word boundary. This rule applies to citation forms, but apparently not to non-initial words within the phrase)

Examples

/ah/ → [ʔah] *pen or corral for domesticated animals*
 /itam/ → [ʔi'tam] *we* (pl. incl.)
 /ulat/ → [ʔu'lat] *scar*

This proposed rule is likely to be the subject of some controversy. Cubit (1964) maintained that glottal stop is phonemic in initial position in at least some dialects of Kayan, but she provides no direct support for her statement. Southwell (to appear) supports Cubit, citing such minimal pairs as ah 'to refuse': 'ah 'a small fence, guard around fruit tree'. It is noteworthy, however, that with the exception of 'iuh 'knife' all words written by Southwell with initial glottal stop are monosyllabic. Moreover, some of these appear to be rapid-speech reductions of careful speech disyllables: cp. e.g. Long Atip [ʔaʔáh] (careful speech), [ʔah] (rapid speech) 'fence'. Rousseau (p.c.) also claims that glottal stop is phonemic in initial position in some Kayan communities, though again no specific data are provided. It is thus possible that the neutralization of glottal onset and smooth vocalic onset in Uma Juman is not representative of the entire Kayan dialect-complex (cf. also fn.44). Though little attention was paid to this fact in the field, it was noted that glottal stop was consistently

more prominent (probably longer) in some Uma Juman monosyllables than in others. Where comparative evidence is available these cases prove to be examples of original or underlying medial glottal stop that has become initial through reduction, as in aʔah → ah 'fence'.

8. (stress placement)

In citation forms the last vowel of a word receives stress. Stress is penultimate within the phrase.

Examples

/tiŋaŋ/ → [ti'ŋãŋ] *hornbill*
 /dara/ → [da'ra:] *long, of time*
 /bəlatup/ → [bəla'tup] *inflate*
 /kələsu/ → [kələ'su:] *steam*
 /mataʔ+n do/ → ['mātan do:] *sun*

9. (lenition of /b/)

/b/ → [v]/ V+ ____ V (/b/ becomes [v] in intervocalic position across morpheme boundary)

Examples

/bətun/ → [bə'ton] *swollen*
 /pək+bətun/ → [pəvə'ton] *cause s.t. to swell*
 /biti/ → [bi'ti:] *stand*
 /pək+biti/ → [pəvli'ti:] *make s.o. stand*
 /buluʔ/ → [bu'loʔ] *body hair, fur, feathers,*
 /pək+buluʔ/ → [pəvu'loʔ] *drop hair or feathers on s.t. (as when skinning an animal, plucking a chicken etc.)*

10. (shwa deletion 2)

Shwa deletes between single consonants or clusters of consonants which are themselves flanked by vowels, provided that the consonant preceding shwa is a plain stop (i.e. p, t, k, but not j).

Examples

/kəsiŋ/ → [kə'siŋ] *laugh, laughter*
 /pək+kəsiŋ/ → [pək'siŋ] *make s.o. laugh*
 /kəllah/ → [kəll'jah] *game*
 /pək+kəllah/ → [pəkll'jah] *play (recipr.)*
 /pəsət/ → [pə'sət] *grip*
 /pə+pəsət/ → [pəp'sət] *grip e.o.*
 /pərah/ → [pə'rah] *pain*
 /pək+pərah/ → [pəp'rah] *hurt, cause pain*

This rule appears to apply optionally if the consonant that precedes shwa is a nasal:

/lɛduh/ → [lɛ'doh] *post-harvest celebration*

/l-əm-ɛduh/ → [lɛm'doh] ~ [lɛm̃'doh] *celebrate the lɛduh*

/tɛmɛduh/ → [tɛm'doh] ~ [tɛm̃'doh] *rhinoceros*

If the consonant preceding shwa is neither a plain stop nor a nasal the rule does not apply:

/jɛlɛŋ/ *near*

/pɛk+jɛlɛŋ/ → [pɛjɛ'lɛŋ] *bring s.t. near*

/hɛmbuŋ/ *extension piece*

/pɛk+hɛmbuŋ/ → [pɛhɛm'boŋ] ~ [pɛhɛm̃'boŋ] *use s.t. as an extension piece*

/lɛkɛt/ *stick, adhere*

/pɛk+lɛkɛt/ → [pɛlɛ'kɛt] *stick or attach s.t.*

Because Rule 10 involves the same operation as Rule 1 it might be argued that there is an underlying relationship between the two deletion processes. If such a relationship exists, however, it cannot be stated naturally in terms of any of the conventions available in the standard theory of generative phonology (as by the use of the brace notation to collapse the two rule environments into a single general schema). Similarly, it seems unlikely that the two rules are functionally related, since the effect of Rule 1 is to block trilateral vowel sequences in phonetic representations, while Rule 10 works against other rules (as Rule 2) to produce surface consonant clusters from underlying CəC sequences.

Given these alternations and variant pronunciations such as [tɛm'doh] ~ [tɛm̃'doh] '*rhinoceros*' as justification for Rule 10, it is possible to interpret a handful of heterorganic consonant clusters in non-alternating forms as underlying sequences of consonant-shwa-consonant (where the first consonant is a stop), as in

/sɛpɛtɪt/ → [sɛp'tɪt] *spraying*

/tɛkɛjɛt/ → [tɛk'jɛt] *startled*

/pɛtɛkɛl/ → [pɛt'kɛl] *commit suicide*

Assuming this interpretation, three words which exhibit clusters of non-homorganic consonants remain: [kɛr'bo:] '*water buffalo*', apparently a recent loanword from Malay, [lɛk'hɛn] '*intestinal worm*' and [tɛŋ'ʔɛp] '*open*'. If [lɛk'hɛn] and [tɛŋ'ʔɛp] are written /lɛkɛhɛn/ and /tɛŋɛʔɛp/ respectively, the former would violate the previously mentioned morpheme structure constraint against non-prepenultimate shwa before /h/ and the latter would violate prepenultimate neutralization. The principal motivation for positing underlying trisyllables with a medial schwa that never

appears on the surface would be to exclude clusters of non-homorganic consonants from phonemic representations. Since forms which contain such clusters need to be recognized in any case, much of the force behind this argument is eliminated, and the items in question must be regarded as containing underlying clusters: /septit/ 'spraying', etc.

11. (lowering of high vowels)

$$V \rightarrow [-\text{high}] / \text{---} \begin{bmatrix} \text{+voc} \\ \text{+cons} \\ \text{-high} \end{bmatrix} \#$$

Underlying high vowels are lowered before word-final glottal stop, /h/, /l/ and /r/.

Examples

/lakɪʔ/ → [la'kəʔ] *male*
 /uruʔ/ → [ʔu'roʔ] *grass*
 /hɪvɪh/ → [hɪ'veh] *lower lip*
 /duh/ → [doh] *female*
 /uɪl/ → [wɛl] *lever*
 /bakul/ → [ba'koɪ] *basket*
 /tumɪr/ → [tu'mɛr] *heel*
 /atur/ → [ʔa'tor] *arrange, put in order*

The following exceptions to lowering were recorded:

/anɪh/ → [ʔa'nɪh] *this*
 /atɪh/ → [ʔa'tɪh] *that*
 /bagɪʔ/ → [ba'gɪʔ] *share, division*
 /beranɪʔ/ → [bera'nɪʔ] *fearless*
 /gunɪʔ/ → [gu'nɪʔ] *gunny sack*
 /hɪnɪh/ → [hɪ'nɪh] *here*
 /hɪtɪh/ → [hɪ'tɪh] *there*
 /ɪtuʔ/ → [ʔɪ'tuʔ] *we (dual incl.)*
 /ɪabuʔ/ → [ɪa'buʔ] *gourd*
 /ɪugɪʔ/ ~ /rugɪʔ/ → [ɪu'gɪʔ] ~ [ru'gɪʔ] *loss*
 /sədɪrɪʔ/ → [sədɪ'rɪʔ] *oneself*
 /tɪpuh/ → [tɪ'puh] *promise, agreement*

Of these bagɪʔ, beranɪʔ, gunɪʔ, ɪabuʔ, ɪugɪʔ ~ rugɪʔ and sɛdɪrɪʔ are apparent Malay loanwords.

12. (lowering of /u/)

$$/u/ \rightarrow [-\text{high}] / \text{---} \begin{bmatrix} \text{-voc} \\ \text{+cons} \\ \text{+high} \end{bmatrix} \#$$

/u/ is lowered before word-final velars.

Examples

- /təpuluk/ [təpu'luk] *heap, pile*
- /manuk/ [mā'nōk] *bird*
- /laʔuŋ/ [la'ʔoŋ] *back (anat.)*
- /usuŋ/ [ʔu'soŋ] *beak; upper lip*

Lowering does not occur in any of the segmental environments of Rules 11 or 12 if they do not precede word boundary:

- /puʔun/ → [pu'ʔun] *base, foundation; origin*
- /suhuʔ/ → [su'hoʔ] *rising, of the river*
- /kəliho/ → [kəll'ho:] *k.o. wild cow*
- /juluk/ → [ju'luk] *steep, of a roof*
- /piɾək/ → [pl'rək] *silver*
- /lukut/ → [lu'kut] *k.o. highly prized bead*
- /buŋa/ → [bu'ŋā:] *blossom of a non-fructifying plant*

13. (raising of /e/)

/e/ → [+high] _____

-voc
+cons
+high

/e/ is raised before word-final velars.

This is a minor rule, known to apply only to one morpheme:

- /ate/ → [ʔa'te:] *liver*
- /ate+k/ → [ʔa'tiək] *my liver* (cf. rule 14)

or possibly to two if /taʔe/ rather than its variant /taʔiʔ/ is used to derive

- /taʔe+k/ → [ta'ʔiək] *my faeces*

Although the material collected provided relatively few examples to test, Rule 13 presumably also applies to other possessible nouns that end in -e (cf. e.g. 5.5.2., derivation of /tənaʔe+k/ 'my intestines').

14. (breaking)

/i/ → [iə] / _____

-voc
+cons
+high

 #

/i/ is pronounced with a centralizing off-glide before word-final velars.

Examples

- /bəlatik/ → [bəla'tiək] *spring-set spear or arrow trap*
- /uniŋ/ → [ʔu'nĩŋ] *fine ashes*

/biʔik/ → [bi'ʔiək] *short (in length)*
 /utiŋ/ → [ʔu'tiŋ] *domesticated pig*
 /ʔupiʔ+k/ → [ñũ'piək] *my dream*

In view of the fact that /i/ and /u/ are both lowered before word-final /ʔ/, /h/, /l/ and /r/, and that /u/ is lowered in just those additional environments where /i/ is off-glided, it seems probable that Rules 12 and 14 are somehow related in Uma Juman. Given present phonological theory, however, such a relationship cannot be stated in any obvious way.

Because there is no reason to suppose that underlying sequences /iək/ or /iəŋ/ would not occur before word boundary, it is theoretically possible that Uma Juman would have a few minimal pairs distinguished only by stress (and perhaps minor differences in transitional glide). Thus, next to /siŋ/ → ['siŋ] 'cat' we might also find a word /siəŋ/ → [si'yəŋ] with some other meaning. The fact that no words of the latter type have yet been identified is doubtless accidental, and it is to be expected that further work on the language will reveal some breaking-dependent superficial stress contrasts.

15. (metathesis of the infix -əm-)

C-əm-

1 2 1,2 → 2,1

The consonant of the infix -əm- metathesizes with the first consonant of an infixed root. Metathesis is optional with polysyllables, but obligatory with monosyllables.

Examples

/jahut/ *sew, sewing*

/j-əm-ahut/ [jəmā'hut] → [mēja'hut] *to sew*

/lɛrat/ *tempering of metal*

/l-əm-ɛrat/ → [lɛmā'rat] ~ [māiā'rat] *to temper metal*

/sup/ *wash clothes, washing of clothes*

/s-əm-up/ → [mə'sup] *to wash clothes*

/kar/ *scratch up, scratching up*

/k-əm-ar/ → [mā'kar] *to scratch up*

In forms such as /əm+asa/ → [mā'sa:] /whet, sharpen', the interpretation of this affix as an underlying infix (prefixed to vowel-initial roots) necessitates a rule (Rule 6) which would not be needed if the same element were regarded as a CV- prefix, since the affixal vowel in /mə+asa/ would be dropped by Rule 1. In view of this observation and

the fact that monosyllabic roots are never infixes in phonetic representations it might be argued that the metathesis in question actually transforms an underlying prefix to a surface infix in polysyllabic roots that begin with a consonant. Although this interpretation apparently cannot be ruled out by the synchronic facts, there are both specific historical and universal arguments which render it unlikely as the original situation. Thus, where *-um- has been fossilized it is fossilized as an infix, not a prefix: UJ kuman (not **mukan) 'eat', and corresponding forms of this root with fossilized -um- throughout central and western Borneo. Similarly, infixes must be regarded as more highly marked than prefixes (if a language has infixes we can be virtually certain that it will also have prefixes, but not vice versa), and where differential markedness is involved the expected direction of metathesis would be from marked to unmarked. Since the synchronic facts apparently can be accounted for with almost equal facility by either analysis (underlying /mu/- or -/um/-), these arguments are taken to favour the latter alternative.

16. (lengthening)

V → V: / ____ #

Vowels are lengthened before word boundary.

Examples

/lɪko/ → [li'ko:] forehead
 /pəsa/ → [pə'sa:] fight (of animals)
 /ave/ → [ʔa've:] tusk
 /ləvi/ → [lə'vi:] evening

17. (partial devoicing of sonorants)

The exact form of this rule is uncertain. Especially in rapid speech the voicelessness of /h/, which can itself be viewed simply as voiceless onset to a following vowel, carries through shwa and results in partial devoicing of a succeeding consonantal sonorant (indicated below by gemination of the segment in question with subscript, below the onset).

Examples

/hɪɪɪ/ → [hɪ'ɪɪ:] look back
 /haɪah/ → [ha'ɪah] nest
 /həmər/ → [hə'mǣr] ~ [hə'ṃmǣr] pliant (as tobacco leaves)
 /həñã?/ → [hə'ñã?] ~ [hə'ṅñã?] salt

18. (lowering of shwa)

$$/ə/ \rightarrow [+low] / \text{---} \begin{bmatrix} -voc \\ -cons \\ -high \end{bmatrix} \#$$

Shwa is lowered to [a] before /ʔ/ and /h/.

This rule is required to account for the alternation in the simple and possessed shapes of /ipəʔ/ 'tooth':

/ipəʔ/ → [ʔi'paʔ] *tooth*
 /ipəʔ+k/ → [ʔi'pək] *my tooth*
 /ipəʔ+m/ → [ʔi'pəm] *your tooth*
 /ipəʔ+n naʔ/ → [ʔi'pən nāʔ] *his tooth*
 etc.

and for examples of the following kind:

/hatuŋ/ → [ha'toŋ] *swimming*
 /pək+hatuŋ/ → [pəha'toŋ] ~ [paha'toŋ] *make a person or animal swim (as by throwing him/it in the water)*

19. (nasal substitution)

This rule must be stated as a complex (multi-step) phonological process. Two steps are recognized here:

a) (assimilation)

$$[+nas] \rightarrow \begin{bmatrix} \text{aant} \\ \beta\text{cor} \end{bmatrix} / \text{---} \begin{bmatrix} -son \\ -del \text{ rel} \\ \text{aant} \\ \beta\text{cor} \end{bmatrix}$$

The nasal prefix /ŋ/ assimilates to the point of articulation of a following stop or fricative in roots of more than one syllable.

b) (replacement)

The initial obstruent of the root is replaced by the assimilated nasal.³⁸

Examples

/pugut/ → [pu'gut] *what is used to rub, anything used to rub*
 /ŋ+pugut/ → [mū'gut] *rub*
 /bagiʔ/ → [ba'giʔ] *share, division*
 /ŋ+bagiʔ/ → [mā'giʔ] *to share, divide*
 /tadav/ [ta'dav] *dive*
 /ŋ+tadav/ [nā'dav] *to dive*

- /kaluŋ/ → [ka'loŋ] *carving, design*
 /ŋ+kaluŋ/ [ŋã'loŋ] *carve, make designs*
 /suhuʔ/ → [su'hoʔ] *rising (of the river)*
 /ŋ+suhuʔ/ → [ñu'hoʔ] *rise (of the river)*
 /haduy/ → [ha'duy] *work*
 /ŋ+haduy/ → [ña'duy] *to work*

20. (shwa epenthesis)

When the prefix /ŋ/- comes to stand before a root-initial affricate, liquid or nasal, or before any root-initial consonant in a monosyllable, shwa is inserted between the members of the derived cluster.³⁹

Examples

- /jalaʔ/ *casting net*
 /ŋ+jalaʔ/ → [ŋãja'laʔ] *fish with a casting net*
 /lisun/ *smoke*
 /ŋ+lisun/ → [ŋãlɪ'sun] *smoulder*
 /ñupiʔ/ *dream*
 /ŋ+ñupiʔ/ → [ŋãñũ'peʔ] *to dream*
 /bu/ *odour*
 /ŋ+bu/ → [ŋã'bu:] *sniff, smell*
 /bah/ *loincloth*
 /ŋ+bah/ → [ŋã'bah] *wear a loincloth*

Before vowel-initial roots /ŋ/- is realized as a simple nasal:

- /ŋ+anit/ → [ŋã'nɪt] *to skin*
 /ŋ+isah/ → [ŋɪ'sah] *to file*

21. (nasalization)

A vowel is nasalized after a nasal consonant and this nasalization carries over to succeeding vowels until interrupted by an oral consonant other than /ʔ/, /h/, /y/, /w/ or /l/. It is not clear whether /r/ permits the carry-over of nasality.⁴⁰

Examples

- /himuh/ → [hi'mõh] *blow the nose*
 /həmpuʔ/ → [həm'puʔ] ~ [həmm'puʔ] *blowpipe*
 /ñipaʔ/ → [ñɪ'paʔ] *snake*
 /ŋ+katuŋ/ → [ŋã'toŋ] *tie*
 /ŋ+haʔuy/ → [ñã'ʔũy] *to scream*
 /ŋ+suhuʔ/ → [ñũ'hõʔ] *rise (of the river)*
 /ŋuyuʔ/ → [ŋũ'yõʔ] *provisions, food taken on a journey*

/ñiwaŋ/ → [ñĩ'wǎŋ] *thin, of people and animals*

/alit/ → [ʔa'ilit] *healing*

/əm+alit/ → [mǎ'ilit] *heal*

/ilik/ → [ʔi'ilit] *rice sieve*

/ŋ+ilik/ → [ŋĩ'ilit] *sift, strain*

If not nasalized by the process described above, the nasalization of vowels before a nasal consonant is negligible:

/lasaŋ/ → [la'saŋ] *bare (of ground); bald*

/kuraŋ/ → [ku'rən] *copper cooking pot*

/avin/ → [ʔa'vin] *because*

/suŋ/ → [soŋ] *mortar*

In summary, the major phonological processes of Uma Juman seem to be describable in terms of the following twenty-one rules. Crucial ordering requirements are given in a bloc following the P-rules. The interaction of the rules is illustrated, and the crucial ordering requirements justified in 5.5.3:

Summary of phonological rules

1. shwa deletion 1
2. consonant deletion
3. semivocalization
4. vocalization
5. glide insertion
6. deletion of prepenultimate initial vowels
7. glottal onset
8. stress placement
9. lenition of /b/
10. shwa deletion 2
11. lowering of high vowels
12. lowering of /u/
13. raising of /e/
14. breaking
15. metathesis of -/əm/-
16. lengthening
17. partial devoicing of sonorants
18. lowering of shwa
19. nasal substitution
 - a. assimilation
 - b. replacement
20. shwa epenthesis
21. nasalization

Crucial ordering requirements

Rule	must precede	Rule(s)
2		9, 11, 14, 18
3		5, 7, 14
4		5, 8, 16
6		7
8		14
13		14
15		18, 21
19a		19b
19		21
20		21

Several other phonological phenomena involving changes in non-segmental characteristics such as stress and juncture can also be mentioned here.

Liaison

Within a phrase /ʔ/ or /h/ at the end of a word is re-syllabified as the initial consonant of a following word that begins with an underlying vowel.

Examples

- /duh ayaʔ/ → [do 'hayaʔ] *old woman*
 /halah anak/ → ['hala 'hanak] *placenta*
 /dipah atih/ → ['dipa 'hatih] *far side*
 /haʔ uh/ → [ha 'ʔoh] *downriver (loc.)*

If the following word begins with a consonant, shwa is inserted between it and /h/:

- /himuh naʔ/ → ['himö hæ'näʔ] *his blowing of his nose*

Clitics

In rapid speech the generic locative marker /haʔ/ is never stressed, and becomes part of the same phonological word as a following root. This fact can be expressed by a general convention which replaces word boundary by morpheme boundary in the course of phonological derivations that involve clitic elements. The details of subsequent changes that affect this morpheme, however, are not yet completely clear. Apparently by a P-rule of low productivity which reflects morpheme structure constraint #1 all prepenultimate vowels fall together as shwa. Assuming that this rule is ordered after Rule 18 (which would convert a derivationally intermediate form such as [həʔ+udik] back to [haʔ+udik]), a second rule that contributes to the surface structure constraint against shwa before glottal stop deletes shwa, and the resulting cluster

is simplified by deletion of glottal stop. /haʔ/ was recorded only before vowel-initial roots.

Examples

- /udik/ *headwaters of a river*
 /haʔ udik/ → [ha 'ʔudlək] ~ ['hudlək] *upriver (loc.)*⁴¹
- /uh/ *lower course of a river*
 /haʔ uh/ → [ha 'ʔoh] (never **hoh) *downriver (loc.)*
- /uma/ *house*
 /haʔ uma/ [ha 'ʔuma:] *in the house*
- /ujuŋ/ *upper extremity*
 /haʔ ujuŋ/ → ['hujon] *above, on top*⁴²
- /awa/
 /haʔ awa/ → [ha 'ʔawa] ~ ['hawa:] *on the longhouse verandah*

5.5.2. Residual Difficulties

At least two major phonological problems remain for which only very tentative solutions can yet be proposed. In three pairs of words the shapes of the simple and affixed roots are seen to be related through metathesis:

- [hu'wav] *a yawn* : [mũ'hāv] *to yawn*
 [ha'it] *sand* : [ka'hit] ~ [ŋã'hĩt] *sandy*
 [ʔa'oh] *spill, spilling* : [mã'ʔõh] *to spill*

Without violating any established constraint on canonical shape or otherwise resorting to the use of some ad hoc descriptive device, each of the above roots can be assigned to either of just two underlying shapes: /huav/ or /uhav/, /hait/ or /ahit/ and /auh/⁴³ or /aʔuh/. If the first shape is chosen it appears to be impossible to regard the change in question as rule-governed. Thus, from underlying /h-əm-uav/ *to yawn* we would expect [həmu'wav] ~ [həŋmu'wav] without and [mẽhũ'wāv] with metathesis of the infix (5.5.1. Rule 15). The correct phonetic forms can be derived, however, by adopting the second alternative and positing a rule (ordered before Rules 5 and 7) which metathesizes a word-initial vowel with an immediately following /h/ or /ʔ/:

/uhav/	<i>a yawn</i>	/əm+uhav/	<i>to yawn</i>
huav		-----	(Met.)
huwav		-----	(5)
-----		m+uhav	(6)
hu'wav		m+u'hav	(8)
-----		m+ũ'hāv	(21)
[hu'wav]		[mũ'hāv]	

The above interpretation is supported indirectly by historical evidence, since an initial vowel followed by h (< *R and *S) regularly metathesized in the history of Uma Juman, as in *huat* < *ʔuR₂aC[] 'vein, vessel; tendon'. With so much to commend it the choice of vowel-initial shapes of these roots would seem to be beyond serious dispute. Nonetheless, this analysis is not without complications. In the word for 'yawn', for example, we must assume both a historical metathesis of the first C and V (*Suab > huav > uhav) and a synchronic metathesis reversing the original change in the simple root. Despite the initial impression of improbability that this explanation might leave, any attempt to account for the full range of facts will almost certainly require the assumption of two partially nullifying regular metatheses in the history of Uma Juman.

At an earlier period in the history of the Kayan dialects a constraint evidently developed against word-initial /h/ or /ʔ/, and items which would have violated this restriction were altered by metathesis: *Suab > huav > uhav 'yawn'.⁴⁴ Where metathesis resulted in a non-permitted cluster, as *Sasaq > hasa > ahsa 'whet, sharpen' pre-consonantal *h or *ʔ deleted. At some later period the constraint was apparently reformulated to operate against sequences of initial vowel followed by /h/ or /ʔ/, and a second metathesis occurred reversing the results of the first change in simple roots but not in the corresponding prefixed forms. In simple roots that had been unaffected by the first metathesis (as *uhat < *ʔuR₂aC 'vein, tendon', or *uhəŋ < *(q)uRəŋ 'horn, antler') this change led to restructuring. The entire hypothetical sequence is summarized below:

Stage 1 (pre-metathesized forms)

*huav yawn
 *hait sand
 *ʔauh spill
 *uhat vein, tendon
 *uhəŋ horn, antler

Stage 2 (results of first metathesis)

*uhav yawn	*əm+uhav to yawn
*ahit sand	*k+ahit ~ *ŋ+ahit sandy
*aʔuh spill	*əm+aʔuh to spill
*uhat vein, tendon	
*uhəŋ horn, antler	

Stage 3 (results of second metathesis)

[hu'wāv] <i>yawn</i>	[mū'hāv] <i>to yawn</i>
[ha'it] <i>sand</i>	[ka'hit] ~ [ŋǎ'hīt] <i>sandy</i>
[ʔa'oh] <i>spill</i>	[mǎ'ʔōh] <i>to spill</i>
[hu'wat] <i>vein, tendon</i>	
[hu'wəŋ] <i>horn, antler</i>	

To account for the phonological alternations in the roots meaning 'yawn', 'sand' and 'spill' it is necessary to assume that the affix found in the morphologically complex forms of these words was innovated after the first metathesis, an assumption which conflicts with known comparative evidence (PAN *ma+Suab 'yawn'), yet accounts for the Kayan facts better than any presently conceivable alternative. Thus, to derive present /əm+uhav/ from earlier *h-əm-uav or present /əm+aʔuh/ from earlier *ʔ-əm-auh we would be forced to recognize a heretofore undescribed and highly implausible type of metathesis whereby the segments affected permute across an intervening morpheme which remains unchanged.⁴⁵ These alternations become intelligible, however, on the assumption that the affix in question was added to roots that had already been restructured by metathesis: *əm+uhav; *aʔuh, *əm+aʔuh.

The foregoing interpretation is adopted as a provisional explanation of the facts, and a synchronic rule of metathesis ordered before Rules 5 and 7 is tentatively added to the P-rules of Uma Juman. It is worth noting in this connection that as a result of h-metathesis /uhav/ 'yawn' and /huav/ 'smoke vent' both appear as [hu'wāv].

A second residual difficulty involves the reversal of syllabicity of underlying high vowels in certain environments, as in

/kərawiŋ/ → [kəraw'yəŋ] *star*

While the phonetics of this word remain problematic in some particulars (both [kəraw'yəŋ] and [kərau'yəŋ] were heard), it seems clear that a phonemic representation /kərauyəŋ/ would violate the general constraint against permissible prepenultimate vowels. Since a few phonemic clusters of non-homorganic consonants are already recognized in medial position we might assume an underlying cluster in this word: /kərawyəŋ/ 'star'. A still poorly understood rule of semivocalization is independently required, however, in certain cases where an alternation is involved: [təǎ'ʔǎʔ] (/tənaʔiʔ/) 'intestines', [təǎ'ʔyək] (/tənaʔiʔ+k/) 'my intestines'. Given the independent need for such a rule it is possible to posit an underlying representation /kərawiŋ/ which violates no known constraint on lexical representations and allows us, with the rule of breaking (5.5.1. #14) to arrive at a phonetic representation [kəra'wiəŋ]. An attempt could be made to account for the observed semivocalization of /i/ in this item and the word for 'my intestines'

by ordering breaking (Rule 14) before semivocalization (Rule 3). To do so, however, would produce incorrect results in forms such as

- /uniŋ/ → [ʔu'nĩəŋ] (not *[ʔun'yəŋ]) *fine ashes*
 /kəsiŋ/ → [kə'siəŋ] (not *[kəs'yəŋ]) *laugh*
 /bəlatik/ → [bəla'tiək] (not *[bəlat'yək]) *spring-set spear trap*

The exact relationship between the phonemic and phonetic representations of these words, therefore, remains unexplained.⁴⁶

Finally, [p] and [v] were found to alternate in the partial paradigms:

- [pa'te:] *death; corpse* : [pəva'te:] *kill e.o.*

Since such an alternation does not occur in e.g.

- [pə'rah] *pain* : [pəp'rah] *cause pain*
 [pə'sət] *grip* : [pəp'sət] *grip e.o.*
 [pa'roŋ] *suitable, fitting* : [pəpa'roŋ] *get along, be well
 matched (of people)*

the explanation of this change is not yet clear. It is possible that [pəva'te:] provides evidence for a doublet ***bate* (cf. 5.6.).

5.5.3. To illustrate the interaction of the P-rules and the crucial ordering arguments relevant to determining their position in the sequence, some sample derivations are given below:

- | | |
|---|--|
| <p>1) /h-əm-ar/ <i>to blow</i></p> <p>h-ə'm-ar (8)
 m-ə'h-ar (15)
 m-a'h-ar (18)
 m-ã'h-ãr (21)</p> <p>[mä'hãr]</p> | <p>2) /pək+bətun/ <i>cause to swell</i></p> <p>pə+bətun (2)
 pə+bə'tun (8)
 pə+və'tun (9)
 pə+və'ton (12)</p> <p>[pəvə'ton]</p> |
| <p>3) /pək+həŋəm/ <i>to cool</i></p> <p>pə+həŋəm (2)
 pə+hə'ŋəm (8)
 pə+hə'ŋŋəm (17)
 pə+hə'ŋŋəm (18)
 pə+hə'ŋŋəm (21)</p> <p>[pəhə'ŋŋəm]</p> | <p>4) /pək+kəsiŋ/ <i>make s.o. laugh</i></p> <p>pə+kəsiŋ (2)
 pə+kə'siŋ (8)
 pə+k'siŋ (10)
 pə+k'siəŋ (14)</p> <p>[pək'siəŋ]</p> |
| <p>5) /ue/ <i>rattan</i></p> <p>we (3)
 we: (16)</p> <p>[we:]</p> | <p>6) /uaŋ/ <i>seed; core of a tree</i></p> <p>uwaŋ (5)
 ʔuwaŋ (7)
 ʔu'waŋ (8)</p> <p>[ʔu'waŋ]</p> |

- | | |
|----------------------------------|-----------------------------|
| 7) /ŋ+haʔuy/ <i>to scream</i> | 8) /mə+uruʔ/ <i>grassy</i> |
| ŋ+haʔuy (8) | m+uruʔ (1) |
| ñ+haʔuy (19a) | m+uʔruʔ (8) |
| +ñāʔuy (19b) | m+uʔroʔ (11) |
| +ñāʔũy (21) | [m+ũʔroʔ] (21) |
| [ñāʔũy] | [mũʔroʔ] |
| 9) /əm+asa/ <i>whet, sharpen</i> | 10) /j-əm-ahut/ <i>sew</i> |
| m+asa (6) | j-əm-aʔhut (8) |
| m+aʔsa (8) | m-əj-aʔhut (15) |
| m+aʔsa: (16) | m-əj-aʔhut (21) |
| m+ãʔsa: (21) | |
| [mãʔsa:] | [məj-aʔhut] |
| 11) /ŋ+ñupiʔ/ <i>to dream</i> | 12) /ate+k/ <i>my liver</i> |
| ŋ+ñuʔpiʔ (8) | ʔate+k (7) |
| ŋ+ñuʔpeʔ (11) | ʔaʔte+k (8) |
| ŋə+ñuʔpeʔ (20) | ʔaʔti+k (13) |
| ŋə+ñũʔpeʔ (21) | ʔaʔtiə+k (14) |
| [ŋəñũʔpeʔ] | [ʔaʔtiək] |

Justification of the crucial ordering requirements for Rules 1-21 is given below. The rule referred to by the number at the left must precede that referred to by the number to its right in order to prevent the derivation of non-occurring forms. Underlying representations are written between slant lines, actual realizations to the right of the arrow, and hypothetical non-occurring forms that would result from non-observance of the ordering requirement appear in parentheses to the right of the attested form:

- | | | |
|----|----|---|
| 2 | 9 | /pək+bətuŋ/ → [pəvəʔtoŋ] (**[pəbəʔtoŋ]) <i>cause to swell</i> |
| 2 | 11 | /buʔuʔ+m/ → [buʔium] (**[buʔiom]) <i>your body hair</i> |
| 2 | 14 | /ñupiʔ+k/ → [ñũʔpiək] (**[ñũʔpik]) <i>my dream</i> |
| 2 | 18 | /pək+hətuŋ/ → [pəhəʔtoŋ] ~ [pəhəʔtoŋ] (**[pəhəʔtoŋ]) ⁴⁷ <i>cause to swim</i> |
| | | /ipəʔ+k/ → [ʔiʔpək] (**[ʔiʔpak]) <i>my tooth</i> |
| 3 | 5 | /ue/ → [we:] (**[ʔuʔwe:]) <i>rattan</i> |
| | 7 | " " " " |
| | 14 | /unʔ/ → [ʔunʔiəŋ] (**[ʔunʔiəŋ]) <i>fine ashes</i> |
| 6 | 7 | /əm+asa/ → [mãʔsa:] (**[ʔəməʔsa:]) <i>whet, sharpen</i> |
| 8 | 14 | /kəsiŋ/ → [kəʔsiəŋ] (**[kəsiʔəŋ]) <i>laugh</i> |
| 13 | 14 | /ate+k/ → [ʔaʔtiək] (**[ʔaʔtik]) <i>my liver</i> |
| 15 | 18 | /h-əm-ar/ → [mãʔhār] (**[mãʔhār]) <i>to blow</i> |
| | 21 | /k-əm-ar/ → [mãʔkar] (**[məʔkar]) <i>to scratch up</i> |

19a	19b	/ŋ+haʔuy/ → [nã'ʔüy] (**[ŋã'ʔüy])	<i>to scream</i>
19	21	/ŋ+suhu/ → [ñũ'hũ:] (**[ñu'hu:])	<i>ask, request</i>
20	21	/ŋ+bah/ → [ŋã'bah] (**[ŋə'bah])	<i>wear a loincloth</i>

5.5.4. Evidence of Contrast

A few minimal and subminimal pairs are given below to demonstrate contrast in areas where transcriptional errors might be expected:

[ba]	<i>mouth</i>	:	[bah]	<i>loincloth</i>
[ʔa'ta:]	<i>raw, unripe</i>	:	[ʔa'taʔ]	<i>water</i>
[pəŋã'nãŋ]	<i>food (in general)</i>	:	[pəŋã'nãŋ]	<i>python</i>
[do:]	<i>daylight</i>	:	[du:]	<i>bathe</i>
[ta'nõ:]	<i>termite</i>	:	[ta'ŋĩ:]	<i>cry, weeping</i>

5.6. VARIATION

In 5.2.1. it was noted that a prefix /pə/-, distinct both from the causative and the reciprocal, is analyzable in a handful of forms. It is possible, however, that the synchronic morphological analysis which these items suggest is illusory, being simply a by-product of certain kinds of variation.

In a number of cases an initial consonant, or the entire initial syllable is apparently dropped in rapid speech: bæligət ~ lligət 'sure-footed', duʔuk ~ uk 'little, small', harəp ~ arəp 'hope', laklʔ ~ aklʔ 'male', pahar ~ har 'blow', pəhariʔ+n ~ hariʔ+n 'sibling', pəla ~ la 'rite in which beneficent spirits are invoked for the cure of illness', pəsət ~ sət 'squeeze', puah ~ uah 'unroll', taŋi ~ aŋi 'weep, cry'. Historically, it seems likely that items such as arəm 'extinguish, put out' (next to pə+arəm 'go out, die, as a fire') < *padəm 'extinguish' have been shortened phonemically by the rise of this kind of free or conditioned variation, with resulting reanalysis of the root-initial consonant as an affix. Pairs such as pahar ~ har, pəhariʔ+n ~ hariʔ+n, pəla ~ la, pəsət ~ sət and puah ~ uah appear to be in free variation, whereas the distribution of asar, pə+asar and arəm, pə+arəm is at least in part syntactically conditioned (pə- forms invariably occur in intransitive constructions with aw 'already', as in #86 and apuy anan aw pə+arəm 'the fire has already gone out', an environment in which the vowel-initial counterparts are evidently ruled out).

Variant pronunciations such as bæligət ~ lligət are assumed to be a product of careful speech/normal speech differences, and presumably affect many roots in addition to those for which multiple shapes were actually recorded. For this reason the variants are cited together rather than as separate, cross-referenced entries.

A similar approach is adopted for certain other cases of variation, where it is believed that the differing shapes result from a change in progress, or from acculturative differences between generations which affect the way that Malay loans are altered in the borrowing process. The roots affected are hæmut ~ hæput 'blowpipe', kuda (younger generation) ~ kuda? (older generation) 'horse' (Ml kuda), rame ~ lame 'noise and excitement of people enjoying themselves in a group', rug! ~ lugi? 'make no profit, take a loss', sænit ~ hænit 'urine, urinate', siba ~ hiba 'defecate', sibən ~ hibən 'sneeze'. All such variants are alphabetized under the more conservative pronunciation.

There is a chance that some other apparently rare affixes, as the n- in n+ikər 'to cough' also result from the rise of careful speech/normal speech variation with subsequent analogical wrong division. Thus, if lkər 'cough' is (or was) a rapid-speech variant of a careful speech form **tikər (not recorded), [nīkər] may be /ŋ+tikər/.

By contrast with the foregoing, certain instances of variation seem to involve true root variation, or 'doubleting'. In such cases the variation in question is presumably the result of a lexically idiosyncratic change in Uma Juman or some antecedent language. Unlike careful speech/normal speech variants, doublets may show non-syntactically conditioned semantic divergence.

All doublets are entered separately and cross-referenced: blaŋ 'split' : piaŋ 'share, divide', buku:t:puku 'punch', guŋ:kutiŋ 'scissors', hanih:hənih 'lean on', taʔe ~ taʔi? 'faeces, excrement', tənəʔe ~ tənəʔi? 'intestines', tɪsɪp ~ tusɪp 'mark left by sucking'. In one known case there is morphophonemic evidence for a doublet, but the variant root itself is unattested: pətə 'death', [pə'vətə] 'kill e.o.', where the reciprocal inflection suggests a root **bətə.

In some instances the observed variation is open to more than one interpretation. Thus, pəpəŋ ~ pəŋ may involve careful speech/normal speech variation, with loss of the initial syllable parallel to pəsət ~ sət 'squeeze', or doubleting with the simple and reduplicated root. It is here treated as a case of careful speech/normal speech variation, in accordance with the well-established pattern. Similarly, tubu ~ tuvu might be regarded as involving a change in progress, but would be the only example of intervocalic *b that has not completed the change to v. Since evidence for doublets *tumbuq, *tubuq is known from other Austronesian languages (as Malay), these variants are assumed to be true doublets, and are so described here.

The relationships between duri?, muri? and uri? 'stern of a boat' are unclear, and these variants are cited together.

6. VOCABULARY OF ELICITED ROOT MORPHEMES AND MORPHOLOGICALLY COMPLEX WORDS

A	
abit <i>small shelf under the paha?</i> (q.v.), <i>used to store cooking utensils.</i>	<i>of the wound is very long)</i> əm+alit <i>healed</i> ava? anan əm+alit <i>the wound is healed/</i> <i>healing</i>
adaŋ <i>fly, flight</i> ñlan lan adaŋ bilun anan <i>the</i> <i>flight of the airplane is very</i> <i>fast</i> əm+adaŋ <i>to fly</i>	alu? <i>pestle</i> (cf. suŋ)
adaŋ <i>deafness</i> adaŋ ka? anan magi? ja?ək <i>your</i> <i>deafness is very bad</i> mə+adaŋ <i>deaf</i>	anak <i>child</i> a. duh <i>daughter</i> a. hənduŋ <i>son-in-law, daughter-</i> <i>in-law</i> a. (l)aki? <i>son</i>
aduŋ <i>fat</i> (n.) mə+aduŋ <i>fat</i> (adj.)	anan <i>that</i> (near hearer) anlh [-lowering] <i>this</i>
ah <i>pen</i> (as for pigs)	anit <i>skin</i> ŋ+anit <i>to skin</i>
ahit <i>sand</i> k+ahit <i>sandy</i> ŋ+ahit <i>sandy</i>	anu? <i>which one?, thing mentioned</i> anu?+k <i>mine</i> anu?+m <i>yours</i> anu?+n na? <i>his</i>
ajaŋ <i>remnants, as of cloth</i> <i>after cutting</i>	añam <i>plait, weave</i> l m añam bərat mən akuy <i>weave</i> <i>a mat for me!</i> əm+añam <i>to plait, weave</i>
ajar (L) <i>learn</i> bə+l+ajar <i>to learn</i> ŋ+ajar <i>to teach</i>	añun <i>copulation</i> pə+añun <i>to copulate</i>
ak I	añur <i>current; send adrift on the</i> <i>current</i> l m añur kayu? anlh <i>send this</i> <i>stick adrift on the current</i> əm+añur <i>to drift</i> haruk kuy əm+añur <i>my boat is</i> <i>adrift/driftng</i>
akah <i>vines, creepers, exclusive</i> <i>of rattan</i> (cf. ue)	ap <i>mist, haze, fog</i>
akit <i>raft</i>	apəŋ <i>ear</i>
akuy I	apir <i>either of the halves of two</i> <i>things joined</i> pə+apir <i>stuck together, fused,</i> <i>as two bananas grown together;</i> <i>twins</i>
alan <i>path, way, road</i>	apu <i>hold, grasp</i>
aləŋ <i>relative marker, that,</i> <i>which</i>	
ali <i>pregnancy</i> mə+ali <i>pregnant</i>	
alit <i>healing</i> dara lan alit ava? anan <i>the</i> <i>wound is taking a very long</i> <i>time to heal (= the healing</i>	

- apuh *lime*
 apuy *fire*
 a?i *give*
 a?uh *spill, spilling*
 java lan a?uh ata? anan *spill-*
 ing the water was very wasteful
 əm+a?uh *to leak, spill out*
 from a container
 ata? haləm kiri? əm+a?uh *the*
 water was spilled from the
 kettle
 aram *putrefaction, rottenness*
 (cf. butuŋ)
 aram masik anan bu ja?ək *this*
 rotten fish smells bad (= the
 rottenness of this fish smells
 bad)
 mə+aram *rotten, putrid*
 ara? *glowing coal* (cf. lusuŋ)
 ara?+n *name*
 arək (L) *Malay-introduced rice*
 wine (cf. burak)
 arəm *extinguish, put out*
 apuy anan ən na? arəm *he put*
 out the fire
 əm+arəm *to extinguish*
 hia? əm+arəm apuy *he ex-*
 tinguished the fire
 pə+arəm *go out*
 apuy anan aw pə+arəm *the fire*
 has already gone out
 aru *long, of things* (cf. dara)
 asa *sharpen* (cf. ña?ət)
 əm-asa *to whet, sharpen*
 asar *move a bit, move slightly*
 asar bərat anih *move this mat*
 a bit
 pə+asar *moved slightly*
 asəm *don't*
 asəp *dirt, grime*
 mə+asəp *dirty*
 pək+asəp *make s.t. or s.o. dirty*
 hia? pək+asəp basuŋ na? *he*
 soiled his shirt
 aslŋ *spinning top*
 asu?₁ *dog*
 ŋ+asu? *to hunt using dogs*
 asu?₂ (= asu?₁? cf. pəhari?+n)
 ata₁ *milk from the breast*
 ata₂ *raw, unripe*
 ŋ+ata *pick fruit before it is*
 ripe
 ata? *water*
 a. batu? *ice*
 ata?+n *juice, gravy*
 ata?+n hiŋət *honey*
 atər *convey, take to a place*
 im atər hitih surat anih *take*
 this letter there
 ate *liver*
 atih [-lowering] *yonder; that*
 (far from both speaker and
 hearer)
 atu *hundred*
 atur *order, command; advice,*
 arrangement
 atur na? ja?ək *his advice is*
 bad
 ŋ+atur *to order, advise, arrange*
 ava? *wound*
 ava? anan mə+allit *the wound*
 has healed
 mə+ava? *wounded*
 pə+ava? *to wound e.o.*
 pək+ava? *to cut, wound, injure*
 ave *boar's tusk*
 avin *because*
 avuk *drunkenness*
 ja?ək lan avuk na? *his drunken-*
 ness is a problem (= is bad)
 mə+avuk *drunk*

avu? *hearth; heavy or compacted ashes* (cf. uniq)

aw *already; still, yet*

awa *verandah of longhouse*

aya? *big, large; great; old*

ayep *sirih leaf (chewed with betel nut - cf. gahet)*

B

ba *mouth*

baduk (see bua) *k.o. large jackfruit* (cf. nakan)

bagi? [-lowering] (L) *divide; share, division*

pek+bagi? *to divide*

Im pek+bagi? *masuk anan divide that fish!*

bah *loincloth*

q+bah *put on a loincloth, wear a loincloth*

baha *husked rice* (cf. kanen, pare)

bahat *heavy*

bahi? *riverbank*

bahuy *wind*

bakah *rectangular basketry cage for chickens or birds* (cf. kevatuq)

baklr *spear with barbless metal head* (cf. selaqap, tuduk)

bakul (L) *non-native basket, market basket*

balo *sago palm* (cf. buluq)

balun *material, clothing* (cf. daven)

baqet *sea, ocean*

bara *announce, inform, tell*

baran *k.o. basketry cap used to cover a carrying basket* (cf. ben)

barl *lose one's voice, as after prolonged shouting*

baro *beginning to clear, of a storm*

basa *wet*

q+basa *to wet, dampen*

basuq *shirt*

batanq *log*

batuq *body*

batu? *stone*

bavah *heavy, hard, of rain*

usan bavah *its raining hard, its pouring; a downpour*

bavuy *wild pig* (cf. utiq)

bawan₁ (L) *onion*

bawan₂ *pond, small body of standing water* (cf. takuq)

baya? *crocodile*

bayar *pay*

bekal *overgrown with weeds, of an uncultivated field*

bekilet *lightning*

bela *red*

belar![?] *thunder* (cf. uven)

belatlk *spring-set spear trap used esp. for monkeys*

belatup *to inflate, as a balloon*

belaqlan *male, of pigs*

belaql (see bua) *rambutan*

beliget ~ liget *surefooted, steady on one's feet* (cf. gadu?)

beluhun *waterfall*

ben *lid, cover* (cf. baran)

beni *seed for planting* (cf. uan₂)

benq *lungs*

beran![?] [-lowering] (L) *brave, courageous*

- bəraŋ *broad (usually used of planks)*
- bərat *mat*
- bəri *burst, of an overfilled container (cf. buri; turu)*
- bəruan *soul (of a living person - cf. tu?)*
- bəruk *large yellow-brown short-tailed monkey*
- bəsuh *satiated, having a full stomach (cf. pənu)*
- bətamən *door*
- bətuŋ *swell, swollen*
 pək+bətuŋ *make s.t. swell*
 kəpəh avə? anan pək+bətuŋ tudək *the bandage on that wound is making the leg swell*
- blaŋ *split (cf. plaŋ)*
 ŋ+biaŋ *to split*
- bih *at*
 b. hule *at or on the left*
 b. la?uŋ *behind*
 b. nəŋ *in front*
- bila *graveyard, cemetery*
- bilun₁ (L) *aeroplane*
- bilun₂ *the mousedeer: Tragulus kanchil (cf. payo, təla?u)*
- bi?ik *short in length (cf. liva)*
- biti *stand*
 pək+biti *make s.o. stand up*
 hia? pək+biti nām uk anan *he made the child stand up*
- bo *high; tall*
- bu *a smell, odour*
 ŋ+bu *to smell (tr.)*
- bua *fruit*
 b. baduk *k.o. large jackfruit*
 b. bələtɪ *rambutan*
 b. dian *durian*
- b. hlvo *k.o. fruit similar to but smaller than the rambutan*
- b. iso *k.o. small, sweet green fruit w/large black seed*
- b. kuini (L) *k.o. large, sweet mango*
- b. məduŋ *papaya*
- b. nakan *k.o. small jackfruit*
- b. nūh *coconut*
- b. pini *k.o. small sweet mango*
- b. tupəŋ *breadfruit*
- b. uru? san *pineapple*
- buaŋ *the Malayan honey bear: Ursus malayanus*
- buat *irritated, in a bad mood*
- buk *head hair (cf. bulu?)*
- bukar *sheath for a parang*
- bukuŋ *knee*
- bukut (cf. pukut) *punch, a punch*
 ŋ+bukut *to punch*
 pək+bukut *fight one another using the fists*
- bulan *moon*
- bulu *bamboo*
- buluŋ *sago flour (cf. balo)*
- bulu? *body hair (cf. buk)*
 b. usuŋ *moustache*
 pək+bulu? *drop hair on, let hair drop on*
 asəm pək+bulu? kanən anan *don't drop hair on the food (as when skinning a pig)*
- buna (L) *decorative flowers, flowers kept around the house (cf. pidaŋ)*
- bup (L) *book*
- burak *native rice wine, alcohol (cf. arək)*
- buri *leak or spill out of a hole in the side or bottom of a container (cf. bəri, turu)*

η+buri *make a hole to allow
s.t. to pour out*
hia? η+buri baha haləm guni?
*he made a hole to let the rice
pour from the gunny sack*
buruη *sell all at once, whole-
sale*
busaη *riverine island*
buta? *blind*
butit *abdomen, stomach*
butuη *rotten, as of spoiled
meat (cf. aram)*
buvu? *conical bamboo basketry
fish trap*

D

dageη (L) *trade*
daha *blood*
pək+daha *make s.t. bleed*
asəm pək+daha ava? usu ka?
*don't make the wound on your
hand bleed (as by picking at
a scab) or don't let the wound
on your hand bleed (i.e. do
s.t. about it)*
daha? *they, them (plural)*
dahin *and, with*
dahi? *to (relational) (cf. mən)*
dahun *advice*
dahu? *they, them (dual)*
dano *muddy water or soft muddy
area in the jungle*
da?an *branch of a tree*
da?un *a leaf (cf. itun)*
dara *long, of time (cf. aru)*
daveη *cloth; clothes; belongings
(cf. baiun)*
dawe (L) *wire*

daya? *swarming of fish in the
river during the breeding season*
dəhaləm dih *yesterday (= just
yesterday?)*
jəmarl anih ən na? taηap
dəhaləm dih *he opened the cup-
board yesterday*
dəhalu? *they, them (trial)*
dəkət *small tadpole-like fish
that clings by oral suction to
stones in the river (cf. ləkət)*
dəl *push s.t., as a stick, into
a hole; put s.t. in the mouth*
dəηah *news*
dəpa? *fathom*
dian₁ *candle*
dian₂ (see bua) *a fruit, the
durian*
dih *just, only*
dipah *either of the sides of a
river, etc.*
dipah atih *far side*
do *day, daylight*
do anih hanit *it's a sunny (hot)
day*
do anih usan *it's raining*
do anih uven *it's thundering*
du *bath, bathe (cf. mayo, sup)*
hia? η+suhu akuy du *he told me
to take a bath*
duan *talk, speak*
dua? *two*
duh *female*
duman *year*
du?uk ~ uk *little, small; young;
narrow; few*
pək+du?uk *to reduce in size,
make smaller*
hia? pək+du?uk asiη na? *he re-
duced the size of his spinning
top (as by carving it with a
knife)*

duri? ~ muri? ~ uri? *stern of a boat, place where the steersman stands*

duy *drink*

pək+duy *treat s.o. to a drink, offer s.t. to drink*

duyan *disinterested, showing no interest*

a

an *agentive marker*

G

gadu? *unsteady on one's feet (cf. bəlġət)*

gahət *betel nut (cf. ayəp)*

gak *fruit which has fallen from a tree; drop*

lə+gak *fall from a height (as fruit)*

g-əm-ak *to drop*

galaŋ *bracelet, anklet*

gaŋ *dry wood used for firewood*
mə+gaŋ *dry*

gaʔam (see lpəʔ) *molar*

gəri *with (instrumental) (cf. pəkə)*

gġham *rapids*

guhaŋ *empty*

guluk *k.o. curved knife or bolo*

guni? [-lowering] (L) *gunny sack*

gutġ (cf. kutġ) (L) *scissors*

H

habut *perforation; perforated*

tarġ anġ habut *this cooking pot has a hole*

ŋ+habut *to pierce, make a hole in s.t.*

haduy *work*

ŋ+haduy *to work*

pək+haduy *to tend to s.o. who is ill*

haga? *hit*

ŋ+haga? *to hit*

pə+haga? *hit one another*

hal *sword grass: Imperata cylindrica*

halah *nest; hive*

h. anak *placenta*

h. hiŋət *beehive*

h. manuk *bird's nest*

haləŋ *join parallel pieces of wood with a crosspiece; put across (as a board across a ditch)*

haləm *in, inside*

haləŋ *earthworm*

haman *clever (cf. jam)*

hamuk *mosquito*

hanġh (cf. hənġh) *lean against*

kayu? ak hanġh ti? lidġ I
leaned a stick against the wall
ŋ+hanġh *to lean against, lean s.t. against*

akuy ŋ+hanġh ti? jġhi? I *leaned against a housepost*

akuy ŋ+hanġh kayu? ti? lidġ I
leaned a stick against the wall

hanġt *strong or bright, of the sun; hot tasting, as chili peppers*

haŋu *brother-in-law, sister-in-law*

hapəŋ *baby, infant*

hapo *k.o. leaf used in roofing, roof*

ha? *at, on*

haʔġh *shy, ashamed*

haʔġt *put s.t. on a hook*

- ha?uy *a scream*
 η+ha?uy *to scream*
- harəp ~ arəp (L) *hope*
 haru *push*
 η+haru *to push*
 pə+haru *to push one another*
- haruk *boat*
 hatek *leech*
 hatəŋ *k.o. tame pigeon*
 hatin *taut, of a rope (cf. ləkuh)*
 hatuŋ *swim, swimming also used in the special sense of swimming across the river, of wild pigs at certain times of the year*
 daha? na hatuŋ *they are chasing the pigs which are swimming across the river*
 η+hatuŋ *to swim*
 pək+hatuŋ *make s.o. or s.t. swim*
 hia? pək+hatuŋ asu? *he made the dog swim (as by throwing it in the water)*
- havət *burn, as fields for planting*
 η+havət *to burn over farmland*
- havur *cover s.t. (usually with earth) in order to conceal it*
 im havur malat anih *cover this parang*
- hawa?+n *spouse*
 hawat *flying fox, large fruit bat (cf. pədan)*
 hələn *stuffed cotton pillow*
 həmbək₁ *mute; mentally defective person, idiot*
 həmbək₂ *selfish (= həmbək₁ ?)*
 həmbuŋ *piece used to extend the length of another, extension piece*
- kayu? anih ak na həmbuŋ *I'm using this piece of wood as an extension piece*
 pək+həmbuŋ *to join two things together so as to extend their length*
 həməŋ *soft, pliant, as tobacco leaves*
 pək+həməŋ *make s.t. soft or pliant*
 hia? pək+həməŋ da?un luku? *he made the tobacco leaf soft, pliant*
 həmpuŋ ~ həpuŋ *blowpipe*
 hənđuŋ (cf. anak) *son-in-law, daughter-in-law*
 hənən *choke, as when drinking water or other liquid too quickly*
 hənih (cf. hanih) *lean against*
 hənəp *chicken*
 hənəp tu? *butterfly (= spirit chicken)*
 hənəa? *salt*
 hənəa? *breath*
 j-əm-at h. *breathe*
 hənəm *cold*
 pək+hənəm *to cool, let s.t. cool off*
 hia? pək+hənəm kupi anan *he let the coffee cool*
 hənɡuk *hiccough*
 hərəuŋ *sip*
 η+hərəuŋ *to sip*
 hi *who?, whose?*
 hilaŋ *push grass or bushes aside when making a trail through the forest*
 hia?₁ *he/she, him/her, it*
 hia?₂ *marker of condition; if*
 hilda *under, beneath*
 hidək *sob*

- higem *hold; carry in the hand*
 ŋ+higem *to hold*
 pek+higem *to touch, hold*
 asem pek+higem baha anan *don't touch (= play with) the rice (could be said to a child)*
- higet (cf. pəhari?+n) *cousin*
- hikai *natural cockspar (cf. tajl)*
- hikəp *to catch (fish, shrimp, etc.) with a dipnet*
 dəhalu? te hikəp *they are going fishing with dipnets*
- hile *seize*
 ŋ+hile *to seize, take s.t. from s.o.*
- hili *turn the head, look back*
 ŋ+hili *to turn the head, look back*
 pə+hili *look back at one another*
- himah *suffocate*
- hina?+n *mother, aunt (ref.)*
 hina?+i (?) *mother (voc.)*
- hineŋ *see*
 ŋ+hineŋ *to see*
- hinih [-lowering] *here*
- hinu? *where?*
- hiŋət *bee*
- hipun *have, possess when?*
- hiran *dusk, twilight*
- hirəp *dusk, twilight*
- hisir *finger-ring*
- hitih [-lowering] *there*
- hivih *lower lip (cf. usuŋ)*
- hivo (see bua) *k.o. fruit similar to, but smaller than the rambutan*
- huat *vein, vessel; tendon*
- huav *smoke vent, hole in the longhouse roof to let smoke out*
- huəŋ *horn, antler*
- huku *grandparent*
 h. (l)akl? *grandfather*
 h. duh *grandmother*
- hule₁ *left (side)*
- hule₂ *revenge (n.)*
 hia? te na hule na? kah anan *he will take his revenge*
- huluk *spoon, ladle*
- huŋe *river*
- hurup (L) *letter of the alphabet*
- I
- iah *marker of a tag question*
 ika? kah ŋ+pulu bavuy anih lah? *You're the one who speared this pig, aren't you?*
 səŋ im asa kah malat anih lah? *You are going to sharpen this parang, aren't you?*
- ijam *borrowed*
 pə+ijam *to borrow*
- ikam *you (plural)*
- ika? *you (sg.)*
- ikər *cough (n.)*
 ikər na? n̄awən lan *his cough is very loud*
 n+ikər *to cough*
 hia? lali? n+ikər *he is coughing a lot*
- ikuh *tail*
- ili₁ *choice*
 basuŋ anih kah ili na? *he chose this shirt (= this is the shirt that was his choice)*
 əm+ili *to choose, select*
- ili₂ *plank*
- ilik *strainer, sifter; rice sieve*
 ŋ+ilik *to strain, sift*

iluh *a passage in the river,
usually through rapids (cf.
liu)*

ŋ+iluh *to clear stones from a
river in order to provide pass-
age for a boat*

im *you (sg.)*

iŋit *condition of being cross-
eyed*

iŋit na? ja?ək lan *he has badly
crossed eyes*

mə+iŋit *cross-eyed*

ipə? *tooth*

i. ga?am *molar tooth*

ipət *quickly*

im suhu ne hinih ipət hia? *tell
him to come here quickly*

mə+ipət *fast, quick*

iri₁ *lie down*

əm+iri *to lie down*

iri₂ *slice, a slice*

ləba? lan iri anit bavuy *there
are many slices of pig skin (or
meat)*

əm+iri *to slice*

isah *file, rasp*

ŋ+isah *to file*

isak *to roast, as fish (cf.
luhu?, lutu)*

iso (see bua) *small sweet green
fruit with a large black seed*

itam *we, us (plural incl.)*

itəŋ *cutting, manner of cutting;
mark left by cutting; area
cleared by cutting with a parang
(cf. səpitəŋ)*

sayu lan itəŋ maɪat anih *this
parang cuts very well*

əm+itəŋ *to hack or cut with a
parang*

itun *leaves (taken collectively)
foliage (cf. da?un)*

itu? [-lowering] *we (dual incl.)*

J

jahut *sew*

j-əm-ahut *to sew*

jaji (L) *a promise (cf. tipuh)*

hiran jaji na? səŋ uli *when
did he promise to return home?
(= when was his promise that he
will return home?)*

pək+jaji *to promise*

dahu? pək+jaji dahi?+n kami? *they (dl.) made a promise to us*

jaka? *at, during*

jaku? (L) *tobacco (cf. luku?)*

jala? (L) *casting net*

ŋ+jala? *to fish with a casting
net*

jam *know, clever (cf. haman)*

jan *no, not (cf. jinun)*

japan *just now, a moment ago*

ja?a *jaw*

ja?ək *bad*

pək+ja?ək *to vilify, slander,
say s.t. bad about s.o.*

hia? pək+ja?ək akuy *he said
s.t. bad about me*

jaran *wide-spaced, as of trees
planted at intervals or teeth
separated by gaps*

jat *pull, draw, drag*

j-əm-at *to pull, draw, drag*

hia? j-əm-at ue anih *he is
pulling the rattan*

pə+jat ue *tug-of-war*

pək+jat *pull a boat through the
rapids*

kalu? pək+jat ti? giham *we (pl.)
pulled our boat through the
rapids*

jatu *to fall*

java *wasteful*

jəla <i>tongue</i>	ŋ+kaluŋ <i>to carve wood, make designs, write</i>
jələŋ <i>near</i>	hia? ŋ+kaluŋ bətamən <i>he is carving a door</i>
pək+jələŋ <i>to bring together</i>	
jəle <i>corn, maize; swollen gums</i>	kalu? <i>we (trial excl.)</i>
jəmari (L) <i>cupboard</i>	kamah <i>palm of the hand (cf. usu)</i>
jəmi? <i>rice-stubble, rice-straw</i>	kami? <i>we, us (plural excl.)</i>
jət <i>belt</i>	kanən <i>cooked rice; food (cf. baha, pare)</i>
ji <i>one</i>	kani <i>eat (cf. kuman, makan, pakan)</i>
jihi? <i>housepost</i>	kapal <i>thick, of planks, etc., having thick flesh around the seeds, of fruits (cf. kusal)</i>
j. mubuŋ <i>ridgepole</i>	kapit <i>wing</i>
jlnun <i>no, not (cf. jan)</i>	kapuk <i>cotton; kapok</i>
juluk <i>steep (of a roof)</i>	ka?it ₁ <i>to hook s.t. on s.t. else, as a walking stick on a wall</i>
juman <i>river junction, place where a tributary stream flows into a river</i>	ka?it ₂ <i>stubborn</i>
K	
ka <i>a bird, the crow</i>	kar <i>scratch up</i>
kah <i>particle of emphasis (possibly a topicaliser)</i>	pare ən həŋap kar <i>the chicken scratched up the rice</i>
kahəm <i>collapse, as an old house or fieldhut; capsized</i>	k-əm-ar <i>to scratch up, as a fowl scratching up the ground</i>
haruk anan kahəm <i>the boat capsized</i>	həŋap k-əm-ar pare anih <i>the chicken scratched up this rice</i>
ŋ+kahəm <i>to destroy</i>	kasa <i>foot (cf. tudək)</i>
hia? ŋ+kahəm ləpo <i>he destroyed the hut</i>	kasaŋ (L) <i>bean</i>
kajər <i>native solo dance</i>	kasəl <i>blunt, dull</i>
ŋ+kajər <i>to dance the kajər</i>	katəl <i>itch, itchy</i>
kaka <i>hunt</i>	akuy katəl <i>I feel itchy</i>
te kaka <i>go hunting</i>	ŋ+katəl <i>to scratch an itch</i>
kali? <i>digging stick; place of digging</i>	pə+katəl <i>scratch each other</i>
kali? hi aləŋ tinan <i>whose digging (place of digging) is that?</i>	dahu? pə+katəl <i>they are scratching e.o.</i>
ŋ+kali? <i>to dig</i>	katəm <i>wood plane</i>
kaluŋ <i>a design, carving, writing</i>	katlɾ (L) <i>bed</i>
	katuŋ <i>anything used to tie</i>
	ŋ+katuŋ <i>to tie</i>

kawa? we (dual excl.)

kawi bent

ŋ+kawi to bend

kawit boat hook; hook used in weaving to pull the thread

kayo post-harvest ceremony for the ritual purification of weapons

ŋ+kayo to fight in war, hunt heads

kayu? wood; stick; tree

k. tayun firewood

kə- prefix of ordinal numerals

kə-təlu? third (?)

kəjəp blink, blinking

kəjəp na? mə+ipət his blinking is fast

ŋ+kəjəp to blink

kələdi (L) k.o. large yam (cf. lue)

kələtiŋ buoyancy

ŋ+kələtiŋ to float

kələbit shield

kələsu steam

kələv tortoise (cf. kəravaŋ)

kəliah game, toy

ŋ+kəliah to play

pə+kəliah to play together, as children

kəliho k.o. wild cow

kəliŋi mirror

ŋ+kəliŋi to look at o.s. in the mirror

kəlunan person, human being

kəlu? you (trial)

kəlu?uŋ mountain ridge (cf. galaŋ, ujet, ulur)

kəlut diluted, not concentrated

kəna? affected by

kəp go ashore, bring ashore

bataŋ ən dəhalu? kəp they brought the log ashore

k-əm-əp to bring ashore

dəhalu? k-əm-əp bataŋ they brought the log ashore

kəpah a bandage, dressing for a wound

kəra? neck

kərataŋ storage basket for cooking utensils

kəravaŋ freshwater turtle (cf. kələv)

kərawiŋ star

kərbo (L) water buffalo, carabao

kəre moment, point in time

kəre anih now

kəriŋ hear, listen

ŋ+kəriŋ to listen

kəruki kneeling

sayu lan kəruki na? he kneels well (= his kneeling is very good)

ŋ+kəruki to kneel

kəsəm diving, submerging; setting

kəsəm na? dara lan he stays submerged for a long time (= his submerging is very long)

ŋ+kəsəm to dive; to set, of the sun (cf. tubu)

akuy ŋ+kəsəm hida haruk I dived under the boat

mata?+n do ŋ+kəsəm direction of the setting sun

kəsəp greedy

kəsliŋ laugh

pək+kəsliŋ to make s.o. laugh

kət thing

kətah succeed after great effort in doing s.t. difficult (cf. lahut)

- kətinun (L) *cucumber*
 ketuŋ *porcupine*
 kavatuŋ *round basketry cage or coop for chickens (cf. bakah)*
 kirip *large hornbill feathers used to decorate the sunuŋ*
 kiri? *kettle*
 kua? *you (dual)*
 kuda ~ kuda? *horse*
 kuhuŋ *head*
 kuŋni (see bua) *k.o. large sweet mango*
 kul *bark of a tree*
 kulih *clouded leopard*
 kuman *eat (cf. kanl, makaŋ, pakan)*
 kuniŋ *yellow*
 kuŋit (L) *turmeric*
 kuŋ *shell*
 k. si *snail shell*
 kurən *k.o. copper cooking pot formerly in use (cf. tariŋ)*
 kuri *how much/how many*
 kuri laŋah anih *how much does this cost? (= how much is the price of this?)*
 kusal *having thin flesh around the seeds, of fruits (cf. kapal)*
 kutiŋ (cf. gutiŋ) (L) *scissors*
 kutu? *louse*
- L
- labu? [-lowering] (L) *gourd*
 ladaŋ *temporary shed where people eat or rest when working on a swidden farm (cf. ləpo, luvuŋ, uma)*
 laŋah *temporary floor of saplings used in a field hut*
 laŋaŋ *able to jump high or far*
 laŋaŋ lan hia? *he can jump (high or far)*
 pək+laŋaŋ *to jump*
 hia? pək+laŋaŋ *he is jumping*
 lagi *able to climb well*
 lagu (L) *song*
 bə+lagu *to sing*
 lah *receding, of water*
 aya? lan lah huŋe anan *the river has receded considerably (= the receding of the river is very great)*
 l-əm-ah *to recede, of water*
 lahut *to give up on an undertaking when the going becomes too difficult, as returning home when it proves impossible to cross a rapids (cf. katah)*
 laki? ~ aki? *male*
 hari?+n aki? ~ h. laki? *brother*
 l. uk *young man, bachelor*
 l. aya? *old man*
 lall? *too much, excessive*
 lalir *buttress root (cf. pakat)*
 lan *much, very, extremely (cf. magi?)*
 lana *pus*
 ŋ+lana *to suppurate*
 lani *smooth (cf. lini)*
 laŋa? *blowpipe dart*
 laŋət *cloud*
 laŋit *sky*
 laŋo *housefly*
 la?e *tired, exhausted*
 la?uk *do s.t. behind s.o.'s back (lit. and fig.)*

- laʔuŋ *back* (anat.)
 laʔuŋ kamah *back of the hand*
- lasaŋ *bare, of a field without grass; bald*
- lasəŋ *piece of wood or other object used to facilitate pulling s.t. that has become stuck while being pulled*
- lasu *warm, hot*
 pək+lasu *to heat*
- lataŋ *cleared area around a house*
- late (L) *chain*
- lavaʔ *to fail to happen, of s.t. expected*
- lavat *cautious, careful*
- lavo *rat*
- lavu *to shoot rapids in a boat*
- lawa *proud, arrogant*
- lawaʔ *dip net*
- lawat *cross a river*
- layaŋ *broad, extensive*
- ləbuʔ *many*
- ləbo *to have passed through some difficulty and reached easy going, as in passing through a rapids, going over the peak of a mountain, etc.*
- ləduh *end-of-harvest celebration*
 l-əm-əduh *to celebrate the*
 ləduh
- ləgah (L) *price, cost*
- ləkət *stick, adhere to* (cf. dəkət)
- ləkhən *intestinal worm*
- ləkuh *slack, of a rope* (cf. hatiŋ)
- ləma *weak, soft*
- ləñəp *flooded, covered by water*
- ləŋən *arm*
- ləpo *hut, building other than a longhouse* (cf. ladaŋ, luvuŋ, uma)
 l. lumaʔ *field hut, shelter for workers on swidden farm*
 l. uk *storage house for paddy, belongings, etc.*
- lərat *to temper metal, as with a newly made parang*
 lərat malat anih *temper this parang*
 l-əm-ərat *to temper*
 hiaʔ l-əm-ərat paraŋ *he tempered the parang*
- ləva *fetch water*
- ləvi *evening*
- lə *strong*
- liah *nit, egg of a louse*
- lidəm *dark*
- lidiŋ *wall of a house*
 l-əm-idiŋ *to put up walls in a house*
 hiaʔ l-əm-idiŋ uma *he is putting walls in the house*
- liko *forehead*
- lim *all*
- limaʔ *five*
- lini *fine, as fine sand* (cf. lani)
- liruy
 l-əm-iruy *to shine a torch on s.t. or s.o.; to hunt at night, using a torch*
- lisat₁ *to leave a trail of trampled grass, as when walking through a field*
- lisat₂ *to rub off, as chalk from a blackboard*
- lisun *smoke*
 pək+lusun *to smoke out*

liu *small channel in a river, as when an island divides the river into a mainstream and a narrow second stream (cf. luh)*

liva *short in height; low (cf. bi?ik)*

lu *needle*

luaŋ *k.o. small food fish, about 3" long*

lue *k.o. small yam (cf. kəladi)*

luho *rubbish, garbage, trash*

luhu? *cook meat or fish in a bamboo tube over the fire (cf. isak, lutu)*

l-əm-uhu? *to cook meat or fish in a bamboo tube over the fire*

pək+luhu? *to cook meat or fish in a bamboo tube over the fire*

luku? (L) *tobacco (cf. jaku?)*
da?un luku? *tobacco leaf*

lukut *k.o. highly prized bead*

luma? *swidden farm, cultivated field*

luno *harvest*

lu? *put, place*

lu?i *rheumatic pains*

lu?uŋ *human body; corpse*

lu?ut (see sak) *overripe*

lura *spittle, saliva*

l-əm-ura *to spit*

pə+lura *to spit at e.o.*

lurək *foam, soapsuds*

lusəŋ *charcoal (cf. ara?)*

lutu *meat or fish packed in sago, wrapped in leaves and roasted over the fire (cf. isak, luhu?)*

luvaŋ *hole*

luvuŋ *temporary longhouse used while constructing a new one (cf. ladaŋ, ləpo, uma)*

M

magi? *too, excessive, very (cf. lan)*

mahiŋ *hard*

makan *to feed people (cf. kani, kuman, pakan)*

malat *parang, machete*

maləm *night; spend the night*

manuk *bird*

marin *new*

masuk *fish*

mata? *eye*

mata?+n do *sun*

mayo *wash off (plates etc.) with water (cf. du, sup)*

mədam *feverish, sick*

məduŋ (see bua) *papaya*

məgi *say*

məhəŋa? *strong; strong-willed, hot-tempered*

məlu? *sit; stay behind*

mən *for (benefactive), to (relational) (cf. dahi?)*

məraŋ *k.o. tall tree with yellowish wood used to make boats*

mi *sweet*

mi həŋa? *salty*

mijah (L) *table*

mubuŋ (see jihi?) *ridgepole*

muku *old, of people (cf. una?)*

mu? *breast*

N

na *make, do, use, build*

- tua? uma tulun ɲatur dəhalu?
na uma *the headman directed them in building the house*
- na apuy *to cook*
- na kanən *to cook rice*
- na luku? *to smoke (tobacco)*
- na taŋuh *to cook anything besides rice*
- nah *particle of emphasis*
- nakan (see bua) *small jackfruit*
(cf. baduk)
- na? *he/she, him/her, it*
- nasip (L) *luck, fate*
sayu nasip *good luck*
- nəm *six*
- nəŋ *face*
- ne *come*
- nun *what?*
- nunu? *how?*
- ñam₁ *beautiful, handsome*
duh ñam *a beautiful girl*
laki? ñam *a handsome man*
- ñam₂ *youth, young people (probably = ñam₁ in the sense of jeunesse dorée)*
ñam uk *child*
- ña?ət *sharp* (cf. asa, ukul)
- ñatu *k.o. tree with leaf similar to the breadfruit*
- ñawən *loud, noisy*
- ñəmit *green; pale*
- ñian *light in weight; quick, fast*
- ñilla *to lick*
- ñipa? *snake*
ñ. pəŋanən *python*
- ñipi *thin, of things* (cf. ñlwan)
- ñivun *any palm of the genus Ocosperma*
- ñiwan *thin, of people and animals*
(cf. ñipi)
- ñu *knife*
- ñuh (see bua) *coconut tree*
- ñupi? *dream*
ɲ+ñupi? *to dream*
- ɲaja *to step on*
- ɲalaŋ *mountain* (cf. kəlu?un, ujet, ulur)
- ɲar *gills of a fish*
- ɲurut *to whimper constantly, asking for things (of a child)*
- ɲuyu? *provisions, food taken on a journey*

P

- paha? *shelf above the hearth where firewood is stored* (cf. abit)
- pahar ~ har *blow*
ɲ+pahar *to blow*
- pahu? *grasshopper*
- pakan *to feed animals; fodder*
(cf. kanl, kuman, makan)
- pakat *root* (cf. lalir)
- pake (L) *with (instrumental - cf. geri)*
- panak *relative; consanguineal or affinal kinsman*
- pano *walk*
- panu? *fight, argue, of people*
- pa?ət *bite, a bite*
ɲ+pa?ət *to bite*
- pa?i *bitter*

- para *a curse*
 η+para *to curse*
- paraŋ *monitor lizard*
- pare *rice in the field; rice-plant* (cf. baha, kanən)
- paruŋ *match, agree with*
 η+paruŋ *right, proper, fitting*
 pə+paruŋ *be compatible, get along well together*
- parut *grater*
- pat *four*
- pate *death; corpse, carcass*
 pate tama?+n na? anan təkjəl tua *his father's death was entirely unexpected*
 η+pate *die, dead*
 lə+η+pate *kill*
 pə+pate *kill one another*
 dahu? pə+pate *they are killing each other*
- payan *finished*
- payo *the sambhur deer: Cervus equinus* (cf. bilun₂, təla?u)
- pədan *small insectivorous bat* (cf. hawat)
- pəgiŋ *frequent*
- pəhala *twist the ankle*
- pəhari?+n ~ hari?+n *sibling*
 p. asu? *half-brother, half-sister*
 p. higət *cousin*
- pəkale *to learn*
- pəla ~ la *rite in which beneficent spirits are invoked for the cure of illness; payment made to rectify offence to someone*
 η+pəla *to perform the pəla*
 lə-η-pəla *larger ceremonial complex in which the pəla is performed*
- pənu *full* (cf. bəsuħ)
- pənanan *diet, intake of food* (cf. pənuman)
- pənanən (see ñipa?) *python*
- pənuman *diet, intake of food* (cf. pənanan)
- pəpəŋ ~ pəŋ *gather, collect*
 η+pəpəŋ *to gather, collect*
 im pəŋ kayu? anan *gather the sticks together*
- pərah *pain, painful*
 kuhuŋ kuy pərah *I have a headache, (= my head hurts)*
 pək+pərah *to hurt*
 hia? η+kəliħ pək+pərah hia? tua anan *he always gets hurt when he plays (= he just plays to hurt himself)*
- pəru? *gall (bladder)*
- pəsa *fight one another, of animals*
- pəsət ~ sət *squeeze; grip*
 pəsət na? ləma *his grip is weak*
 η+pəsət *to squeeze*
- pəsi? *line and hooks for fishing*
 η+pəsi? *to fish with line and hooks*
- pətkəl *commit suicide*
- piaŋ *a share* (cf. biaŋ)
 η+piaŋ *to share*
- pidan *wild flowers, any flower not commonly cultivated or grown around the house* (cf. buŋa)
- pikir (L) *think*
- pini (cf. bua) *k.o. small sweet mango*
- pirək (L) *silver*
- pitan *nine*
- pitəm *black*

puah ~ uah *unroll, unfurl, as a mat, cloth, etc.*
 η+puah *to unroll, to unfold*
 hia? η+puah berat *she unrolled the mat*
 berat ən na? uah *she unrolled the mat*

pugut *anything used for rubbing*
 η+pugut *to rub*

puhək *handspan*

puhut *massage; way of massaging*
 puhut na? sayu lan *his massage (way of massaging) is very good*
 η+puhut *to massage*

pujap *count*
 η+pujap *to count*

pukut (cf. bukut) *punch*
 pukut na? məhəŋa? *his punch is strong*

pulu₁ *stab, spear*
 η+pulu *to stab, spear*

pulu₂ *ten*

pulut *adhesive substance, as the sap of the breadfruit; rubber*

pup *dust*
 mə+pup *dusty*

pu?un *base, foundation; origin, beginning*
 p. kayu? *base of a tree*

pusər *ball of thread wound round and round*

pusu *heart*

putaŋ *walking stick*

puti *white*

puti? *banana*

rame ~ lame (L) *noise and excitement of people enjoying themselves in a group*

pək+rame *to celebrate, make merry*

rasun (L) *store-bought poison*
 (cf. tasəm)

ribu (L) *thousand*

rigit (L) *money*

rugi? ~ lugi? [-lowering] (L)
make no profit, take a loss in business

S

sak *ripe*
 s. lu?ut *overripe*

sakul (L) *hoe*
 η+sakul *to hoe, dig with a hoe*

san *ladder*

sapl (L) *cow*

sapur (L) *to mix, add to*

saru? *misperceive, as in mistaking one person for another*

saya? *eight*

sayu *good*

sədia? (L) *ready*

sədri? [-lowering] (L) *oneself*

səkulah (L) *school*

səlaŋap *spear with multi-barbed head* (cf. bakir, tuduk)

səluər (L) *trousers*

səm *sour*

sən *push to the side, push out of the way*

səŋ *will* (fut.)

səŋlit ~ həŋlit *urine, urinate*

səp *bamboo tweezers*

R

rajin (L) *industrious*

- səpərəm *close the eyes*
 im səpərəm mata?+m *close your eyes*
 η+səpərəm *to close the eyes; blink*
 dəhalu? η+səpərəm *they closed their eyes*
- səpitəŋ *secondary forest (may be morphologically complex; cf. itəŋ, tuan)*
 η+səpitəŋ *to farm secondary forest*
- səptit *squirt, squirting, spray, spraying*
 su lan səptit ata? anan *the water is squirting/spraying very far (= the squirting/spraying of the water is very far)*
 η+səptit *to squirt or spray*
- si *snail*
- siba ~ hiba *defecate*
- sibən ~ hibən *sneeze*
- simuh ~ himuh *blow the nose*
 η+simuh *to blow the nose*
- siŋ *cat*
- si?+n *meat, flesh*
- sit *vulva, vagina*
- so₁ *grandchild*
- so₂ *throw (cf. təvaləŋ)*
 s-əm-o *to throw*
- su *far*
 pək+su *to separate, place apart*
- suba?₁ *k.o. red cloth*
- suba?₂ (L) *to try*
- suhu *request, order*
 suhu na? magi? pəgiŋ *his requests were very frequent*
 η+suhu *to ask or order s.o. to do s.t.*
- suhu? *to rise, of the river*
 η+suhu? *to rise, of the river*
 suŋe uk anan suhu?/η+suhu? *that small stream is rising*
 aya? lan suhu?+n huŋe anan *the river has risen considerably (= the rising of the river is very great)*
- sukat *measure the length, width, height or thickness of s.t.*
 η+sukat *to measure*
 hia? sukat/η+sukat bətamən anih *he is measuring this door*
- sunuŋ *costume of clouded leopard or other skin worn to dance the kajər*
- suŋ *mortar (cf. alu?)*
- sup *wash (cf. du, mayo)*
 sup daven anan *wash those clothes*
 s-əm-up *to wash, as clothes*
- surat *letter, paper*

T

- tadav *dive*
 im tadav ha? huŋe *dive into the river!*
 η+tadav *to dive*
 hia? η+tadav ha? huŋe *he dived into the river*
 pətadav *to dive*
 asem lali? pətadav *don't dive too much!*
- tagəŋ *firm, secure, as slats in a bridge*
- tahən (L) *durable, lasting*
- tahəp *k.o. fruit similar to the breadfruit*
- tajl (L) *metal cockspur (cf. hikəl)*
- takep *cut*
 im na aya? takep kayu? anan *widen (= make big) the cut on the wood*

- η+takəp *to cut two pieces of wood so that they fit together, as in constructing a house*
 takər *anything used for climbing*
 η+takər *to climb up*
 tako *thing stolen, stealing, theft*
 rigit anih kah tako na? *this is the money that he stole (= this money was his theft)*
 η+tako *to steal*
 kəlunan η+tako *thief*
 takuŋ *lake (cf. bawan₂)*
 takut *fear; afraid*
 tali? *rope, string*
 tama?+n *father, uncle*
 tana *earth, soil*
 tanəm *bury*
 im tanəm pate asu? anih *bury this dog (= bury the dead body of this dog)*
 η+tanəm *to bury; to become submerged*
 hia? η+tanəm pate asu? anan *he buried the dog*
 batu? anih η+tanəm *this stone is submerged (or covered, as by mud)*
 tane *termite, white ant*
 taŋi ~ aŋi *weep, cry; a cry*
 η+taŋi *to weep, cry*
 pək+taŋi *to make s.o. cry*
 taŋ?ap *open*
 η+taŋ?ap *to open (a door, etc.)*
 taŋuh *any side-dish eaten with rice, as fish, meat or vegetables*
 tapan *winnowing basket*
 η+tapan *to winnow*
 tapu? *to cover the sharp edge or point of s.t. to prevent it from accidentally injuring someone*
 η+tapu? *incur an injury from s.t. sharp*
 ta?aw *right (side)*
 ta?ən *set s.t., as a trap*
 buvu? ən na? ta?ən *he set the*
 buvu? *fish trap*
 η+ta?ən *to set s.t. up, as a trap*
 hia? η+ta?ən buvu? *he set the*
 buvu? *fish trap*
 ta?e (cf. ta?i?) *faeces, excrement*
 ta?i? (cf. ta?e) *faeces, excrement*
 tariŋ *cooking pot (cf. kurən)*
 tasəm *native vegetable poison used for blowpipe dart (cf. rasun)*
 tasu *floor*
 tatar *a push with the leg*
 tatar na? magi? məhəŋa? *his leg-push is very strong*
 η+tatar *to push s.t. using the leg*
 hia? η+tatar haruk *he pushed-off the boat with his leg*
 tavah *antidote, as for poison, medicine*
 tavah burak *yeast*
 tavo *weeding*
 tavo luma? anan jan payan aw *the weeding of the field is not finished yet*
 η+tavo *to weed*
 tayo *area that is planted by dibbling*
 tayo na? kah aləŋ ha? bih ləpo *it is the area that he planted that is near the hut*
 η+tayo *to plant seeds by dropping them in holes made with a dibble stick*
 tayun (see kayu?) *firewood*
 η+tayun *to burn firewood*

- təba? *man's traditional inverted-bowl-style haircut*
 η+təba? *to cut the hair in the traditional style*
- təbək *dripping (cf. turu)*
 təbək ata? anan bavaḥ lan
there is a bad leak (= the dripping of the water is very heavy)
- təgu *time, period; during*
- təkjət (L) *unexpected, startling*
- təlan *liquid, gravy; rice porridge*
- təla?u *the barking deer: Cervulus muntjac (cf. bilun₂, payo)*
- təlawə? *spider*
- təliŋa? *lobe of the ear (generally pierced and distended)*
- təlise *comb*
 η+təlise *to comb*
- təluḥ *egg*
- təlu?₁ *three*
- təlu?₂ *we (trial incl.)*
- təlusuŋ kayu? *k.o. wood-boring insect*
- təmbaga? (L) *copper*
- təməduḥ *rhinoceros*
- təna?e (cf. təna?i?) *intestines*
- təna?i? (cf. təna?e) *intestines*
- təŋaran *make a social visit, visit people to chat*
- təpilap *deflected, as a parang blade that fails to cut hard wood when one swings it*
- təpuluk *a heap, pile*
 η+təpuluk *to heap, pile*
- təpulu? *k.o. headcloth or turban*
- təpuruŋ *run*
 η+təpuruŋ *to run*
- hia? təpuruŋ/η+təpuruŋ *ne hini he is running here*
- tərəhək *a snore*
 η+tərəhək *to snore*
- təsək *taste; what is tasted*
 təsək na? kah anan *that is the thing that he tasted*
 η+təsək *to taste*
- təso *jump down*
- tətəp *fixed, definite, certain*
- təvaləŋ *throw (cf. so₂)*
 η+təvaləŋ *to throw*
- təva? *a clearing in the forest*
 η+təva? *to make a clearing in the forest by felling trees*
- təva?əŋ *necklace*
- təvək *cut the throat, of a chicken, etc.*
- akuy η+təvək həŋap *I cut the chicken's throat*
- təvəŋ *fell trees*
 kayu? ən na? təvəŋ *he felled the tree*
 η+təvəŋ *to fell trees*
 hia? η+təvəŋ kayu? *he felled the tree*
- təvukuŋ *knot*
- təvu? *sugarcane*
- te *go*
 hia? η+suhu akuy te səkulah *he told me to go to school*
- tibaŋ *weigh*
- tiləm (L) *mattress*
- timah *impatient*
- timək (L) *shoot, shooting*
 timək na? ja?ək *his shooting (aim) is bad*
 η+timək *to shoot*
 pə+timək *to shoot e.o.*

- tinar *there (near hearer)*
 tiŋaŋ *a bird, the hornbill*
 tipuh [-lowering] *promise, agreement (cf. jaji)*
 ti? *on, against; for*
 akuy ŋ+hənih ti? lidiŋ *I'm leaning against the wall*
 hia? saru? akuy ti? kəlunan anu?+n *he mistook me for another person*
 tiro *mourn*
 tisip (cf. tusip) *place of sucking, as the mark on an ice-cream cone on which one has been sucking*
 ŋ+tisip *to suck (of a baby at the breast, a child sucking on a popsickle, etc.)*
 tua *just, only, merely*
 tuan *primary forest (cf. səpitəŋ)*
 tua? uma (M1 tua rumah) *headman*
 tubu (cf. tuvu) *to grow (intr.); thing grown; rising, of the sun (cf. kəsəm)*
 aw tubu nah pare *the paddy is already growing (i.e. has germinated)*
 ŋ+tubu *to grow (tr.)*
 hia? ŋ+tubu pulut *he grows rubber (trees)*
 mata?+n do tubu *direction of the rising sun*
 tudek₁ *beak of a bird (cf. usuŋ)*
 ŋ+tudək *to peck with the beak, of birds when eating or fighting*
 pə+tudək *peck e.o.; cockfight*
 tudək₂ *leg, entire leg inclusive of the foot (cf. kasa)*
 tudu *sleep*
 tuduk *spear with single-barbed head (cf. bakir, səlaŋap)*
 tuər *stick driven in the mud to keep a boat that has been*
 pushed into the water from coming back to shore
 ŋ+tuər *to drive a tuər into the mud*
 tugal *dibble stick*
 tugul *prop, support (as a stick used to hold up an old house, or the cover of the huav)*
 tukər (L) *to change*
 tuku *a boil*
 tulaŋ *bone*
 tular *animal*
 tulun (L) *to help*
 tumir *heel*
 tumu? *plant resin, dammar*
 tupəŋ (see bua) *breadfruit*
 tu? *ghost, spirit (cf. bəruan)*
 turin *k.o. small river fish*
 turu *to leak, of the roof (cf. bəri, buri, tabək)*
 tusip (cf. tisip) *place of sucking, mark left by sucking*
 tusu *seven*
 tusu? *sucking*
 tusu? na? magi? dara *his sucking is prolonged (e.g. of a baby that sucks for a long time)*
 ŋ+tusu? *to suck*
 tuto *straight*
 tutuk *knock, pound, beat; what is pounded*
 tutuk na? kah anan *that is the thing that he pounded*
 ŋ+tutuk *to knock, pound, beat*
 tutuŋ *burn*
 ŋ+tutuŋ *to burn*
 tuvu (cf. tubu) *to grow (intr.)*
 tuy *allow, permit*
 jan tuy *taboo*

U

- uaŋ₁ *core of a tree*
 uaŋ₂ (= uaŋ₁?) *seed of a fruit*
 (cf. bəni)
 udik *upper course of a river*
 ha? udik *upriver (loc.)*
 ue *rattan (cf. akah)*
 uh *lower course of a river*
 ha? uh *down river (loc.)*
 uhav *yawn*
 əm-uhav *to yawn*
 uil *lever*
 uit *plate*
 ujət *peak of a hill or a mountain*
 (cf. kəlu?uŋ, ŋalaŋ, ulur)
 ujuŋ *top part*
 ha? ujuŋ uma *on top of the house*
 ukul₁ *worn-down, of the blade of an old parang*
 (cf. ña?ət)
 ukul₂ *rib of a basket, slender piece of wood placed inside a basket to give support to its sides*
 ulat *scar*
 uləŋ *thorn*
 ulər *maggot; caterpillar*
 uli *return home*
 hia? səŋ te uli jaka? təgu anih
he will be returning home at this time
 uluh *crotch*
 luvaŋ uluh *anus*
 ulur *mountain ridge* (cf. kəlu?uŋ, ŋalaŋ, ujət)
 uma *house, longhouse* (cf. ladaŋ, ləpo, luvuŋ)
 una? *old, of things* (cf. muku)
- uniŋ *fine ashes, as cigarette ashes or ashes blown into the air from burning fields* (cf. avu?)
 uraŋ *shrimp*
 uriŋ *shin*
 urip *life*
 əm+urip *living, alive*
 pək+urip *to save or spare the life of s.t.*
 uruŋ *nose*
 uru? *grass*
 mə+uru? *grassy*
 mə+uru? lan luma? anan *that field is very grassy*
 uru? san (cf. bua) *pineapple*
 usan *rain*
 usu *hand* (cf. kamah)
 usuk *chest* (anat.)
 usuŋ (see bulu?) *upper lip; beak of a bird* (cf. hivih, tudək)
 uta *vomit*
 n+uta *to vomit*
 utək *brain*
 uti? *penis*
 utiŋ *domesticated pig* (cf. bavuy)
 uvən *to thunder, rumble* (cf. bəları?)

V

- va *tree that has fallen across a path or river*
 hiku?+n *elbow*
 luŋ *numeral classifier (for trees)*

N O T E S

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2. Briefly, the vowel deletion hypothesis expresses a claim that the first of like vowels, or unlike vowels one of which was shwa, was deleted following a voiced obstruent and preceding the reflex of Proto-Austronesian *S (probably a sibilant at the time of vowel deletion) in a language ('Proto-North Sarawak') ancestral to all of the languages of northern Sarawak, Brunei and Sabah which show an aberrant reflex of PAN *b, *d, *D, *j or *g in certain lexical items. The resulting clusters (*S clusters) were simplified in various ways in each of the daughter languages. Thus, PAN *buSuk > PNS *bSuk > Bintulu buk, Miri fuk, Kiput suəq, Long Anap puk, Bario Kelabit əb^huk (northern Sarawak),

Bisaya Bukit (Brunei), Timugon Murut (Sabah) abuk '*hair of the head*', next to PAN *bulu > PNS *bulu > buləw ~ vuləw, buluh, buləw, bulu, buluh, bulu, bulu '*body hair, fur, downy feathers, floss*' in the same languages. Although the Bintulu implosives have more than one source (Blust 1973), it is assumed that a Kelabit voiced aspirate invariably implies a Proto-North Sarawak *S cluster. On this assumption a number of lexical items that had earlier been reconstructed as disyllabic have been extended through the addition of a syllable with *S (as *m-uDi → *m-uDeSi '*rear, behind; to follow*').

3. Using current distinctive feature theory it is impossible to formulate a single rule to describe these facts, and the breaking e.g. of high vowels before /ŋ/ must be treated counterintuitively as unrelated to the similar phenomenon before /k/. It is conceivable, of course, that the exclusion of /g/ from the environment of such a proposed rule is phonetically or phonologically well-motivated in some still poorly understood way, and that the underlying unity and generality of the process in question can be expressed formally in a revised phonological theory which takes this possibility into account. Thus, /ŋ/ and /k/ might be characterized in contrast to /g/ as unmarked for the feature [voice]. As mentioned above, theoretical revisions presumably necessary to the solution of such problems are regarded as beyond the scope of the present investigation.

4. For convenience, however, the term '*morphophonemic*' is occasionally used to describe a situation involving phonological alternations. As will be seen, in a few cases it has not been possible to describe an alternation as the product of a P-rule operating on a plausible underlying representation. Under these circumstances the alternation is stated as an idiosyncratic property of the morpheme affected.

5. This phenomenon, common to many Indonesian languages, is evidently a complex process involving assimilation and deletion. Details are discussed in section 5.5.1. of the individual languages.

6. Though there probably are strong phonetic reasons why nasal substitution does not occur in liquid-initial roots, it is somewhat less clear why epenthesis does not operate on all roots regardless of the initial consonant. A possible explanation of this fact is that epenthesis is disfavoured when avoidable because it would lengthen words phonetically beyond the preferred disyllabic canonical shape. It should be noted in this connection that nasal substitution apparently

never occurs in monosyllables even when the initial consonant is one that is regularly substituted in roots of two or more syllables. The prefix in such cases is invariably [ŋə̃]-, as in Uma Juman [bu:] 'odor' : [ŋə̃'bu:] 'sniff, smell'.

7. Initial [v] was recorded only in [va:] 'tree that has fallen across a path or river'. It is possible that this is a transcriptional error.

8. A variant həput was also recorded.

9. Although the distributional relationship of [d] and [r] is similar to that of [b] and [v], the former segments do not alternate in prefixed roots: [dɑ'ha:] 'blood' : [pəda'ha:] 'cause to bleed', [du'ʔok] 'small' : [pədu'ʔok] 'reduce (s.t.) in size'.

10. Vennemann (1972) has called this type of change - where a historical rule is reflected by its mirror-image as a result of restructuring - 'rule inversion'.

11. In general all morpheme structure constraints that can be stated in terms of a given environment are cited together and referred to collectively by number. This convention is adopted for convenience of reference, and is not intended to imply that the distinct constraints so labelled can be formally united.

12. As Stanley himself (p.402) and at least one other recent writer (Kisseberth, 1970) have noted, this result is not necessarily undesirable, reflecting as it does the commonplace fact about natural languages that constraints which hold across morpheme boundary are frequently identical to those which hold within a morpheme.

13. Although they are formally distinct, and members of the first group were almost certainly true trials at an earlier period (təluʔ is homophonous with the number 'three'), informant reaction suggests that the trial and plural pronouns now overlap in actual usage. Thus, while the plurals must refer to more than three persons, the trials may refer to just three or to more than three persons. It is possible that the four-way number distinction in the pronouns is in the process of change to a three-way distinction through a generalization of the trials to cover any number over three.

14. Note that in Kayan (unlike the other languages that will be described) active-passive distinctions are not always formally marked in

the verb. Where no overt morphological marking appears in the verb, the underlying distinctness of active and passive predicates is signalled by pronoun selection alone for first and second person singular actors, by pronoun selection plus the agentive marker ən for third person singular actors, and by the agentive marker with or without pronominal differences (dependent on canonical shape) for all non-singular actors (cf. e.g. ex. 75). Hence sentence 1a) and the actor-initial variant of sentence 1b) (ak ŋ+bukut hla?), glossed identically, differ only in the set membership of the actor pronoun.

15. Anan *'the, that'* is omitted in normal informal speech; anih *'this'* apparently cannot be omitted without a change of meaning.

16. That the direct and indirect object can occur in either order is clear from:

(im) a?i ñu anih mən hla? *give this knife to him*
 (you) *give knife this to him*

17. Clayre and Cubit (1974:65), in their discussion of the Baram Kayan dialects of Uma Pu and Uma Peliau report dehortative constructions of the type meng im tudu *'don't you sleep!'*. Given the limited size of the present corpus and the variable appearance of surface pronouns with positive injunctions, it is possible that the absence of an overt pronoun in negative injunctions is an accidental gap. Alternatively, this may be a variable feature of Kayan dialectology.

18. One of the most conspicuous and problematic features of Kayan historical phonology is the addition of an apparent alpha-switching rule that interchanged original -V and -V?. In the earlier state of affairs the distributional complementation of Sets C and D could be stated far more naturally: possessed roots that ended in a consonant were inflected from Set C; those that ended in a vowel from Set D.

19. na? *'it'* in 5.2. sentence 41 apparently must also be assigned to Set D. Its relationship to the other pronouns is not yet well understood.

20. Not recorded. If analogous to most Sarawak kinship systems these terms would be tama+n hənduŋ and hina+n hənduŋ respectively (cf. anak hənduŋ *'ChSp'*).

21. Clayre and Cubit (1974:85) maintain that there is '*no grammatical form to indicate passive in Kayan*'. They use the terms '*Actor sentence type*' and '*Action sentence type*' (55-6) to describe what are here called active and passive sentences respectively, but do not draw attention to a difference of verb form in the two types of construction. It is possible, due to the limited scope of my corpus, that I have perceived grammatical patterning where there is only free variation, or that the Baram and Rejang dialect clusters actually differ in this respect. The Baram Kayan material of Clayre and Cubit clearly differs from that described here in reflecting a reported preference for '*Action sentence types*' (our '*passives*') in the order 2,1.

22. While sentences 18b, 20b, 21b, 22b and various other passive constructions make use of the simple (unaffixed) root, the verb in 23b contains a suffix -i which, as we will see (5.2.1.) is known only in this word.

23. As can be seen in sentences 28-31 under η-, however, the contrast of the simple root and the root prefixed with η- is sometimes used to distinguish a state from a transitive action.

24. The apparently free interchangeability of the unaffixed root and the root prefixed with η- in injunctions such as sentence 41 could have originated in the same way, but is now obscured by the general loss of contrast between simple and morphologically complex words of this type. If so, the evident preference for the use of the simple root in injunctions would perhaps suggest a preference for injunctions formed from passive declaratives at an earlier stage in the history of the language.

25. Southwell (to appear) cites this as gang 1. *dry branch*', 2. '*dryness*' in Baram Kayan.

26. For a possible explanation of this fact see note 6.

27. Cp. sentence 45.

28. /η+taŋi/ '*to cry*': /pək+taŋi/ '*make s.o. cry*' can probably be viewed in the same way. The semantic distinctions between these three affixes (η-, pək- and -əm-) are further blurred in sentence 70, since smoke is in effect the instrument with which mosquitoes are driven away.

29. Apparently because the meaning is disambiguated by context, /pək+jat/ occurs without a surface object in this sentence.

30. To these we can perhaps add [hi'kun] 'elbow' and [sin] 'flesh', which comparative data reveal to be morphologically complex. Possessive paradigms were not recorded for these roots, however, and the tentative underlying representations /hiku+n/, /si+n/ (rather than /hikun/, /sin/) are based on historical expectation.

31. Historically, this interpretation assumes that forms such as ata?+n 'juice, gravy' and hina?+n 'mother of' derive from constructions that contained the genitive particle *ni. There is, however, a possible alternative to this analysis. Although Uma Juman generally preserves the Proto-Austronesian +n/n̄ distinction, it seems clear from the Set B, C and D pronouns that the 3rd sg. possessive suffix *-n̄a reflects *n̄ as n. It is thus noteworthy that with one irrelevant exception to be noted (ara?+n 'name of'), those Uma Juman roots that are obligatorily possessed originally ended in a vowel. Given this distributional limitation, -n could represent an earlier 3rd sg. Set D pronoun which filled out the pattern of singular postclitics: -k, -m, (-n). If so, the present Set D 3rd sg. pronoun must represent two historical layers of suffixation: a fossilized clitic -n, overlaid by a pronoun originally drawn from Set C. Under this interpretation the similar clitic preceding non-singular Set D pronouns apparently must be explained as an analogical extension, though the basis for analogy remains unclear.

32. A form [hi'nē:] was also recorded with the meaning 'our (incl.) mother', but both the gloss and phonemic representation are unclear. It is possible that this form is vocative, and that the underlying representation is /hina+i/; if so, a P-rule will be required for just this item to convert /a+i/ to [ē]. A form [ta'mē:] was not recorded.

33. The term 'agent' is used with the meaning 'actor of a passive verb'.

34. The fossilized prefix pa- in /pa+kan/ is probably identical historically with pək-, and the fossilized infix -um- in /k-um-an/ is presumably identical historically with -əm-.

35. /v/ was recorded as [β] ~ [v] in word-final position; intervocalically only [v] was heard.

36. Known only in aw 'already', and ta?aw 'right (side)'.

37. In the corpus collected all medial nasal clusters that do not occur in known loanwords (as *təmbaga?* 'copper') appear in h-initial roots (cf. above and *həmbuŋ* 'extension piece').
38. This step might be further broken down into a second assimilation whereby the root-initial obstruent assimilates regressively to the nasal prefix, and a subsequent deletion of either member of the resulting nasal sequence.
39. Clayre and Cubit (1974:78) point out that some b-, p- and d-initial disyllables in Baram Kayan take a phonetic prefix *nge-*, as *basung* 'coat' : *nge-basung* 'wear a coat', (next to *basa* 'wet' : *masa* 'dampen'), *puti* 'white' : *nge-puti* 'whiten, make white' (next to *panah* 'hot' : *manah* 'to heat') and *danau* 'mud' : *nge-danau* 'be muddy'. By contrast, all stop-initial words of more than one syllable that were recorded in Uma Juman undergo nasal substitution.
40. Because of its exceptionally short duration the nasalization of prepenultimate shwa is difficult to determine by a simple auditory check. Furthermore, it is unclear whether nasalization in this environment (if it occurs) carries over to succeeding syllable peaks, as in /ŋ+tɛlɪsɛ/ 'to comb' or /ŋ+lɪsʊn/ 'to smoke, smoulder'.
41. There is some residual uncertainty concerning the placement of stress in reduced clitic phrases.
42. It is not known whether ['humã:] or [ha 'ʔuɔŋ] occur.
43. Given this phonemic shape, we would have no way to account for the appearance of [ʔ] or [mã'ʔõh]. If, on the other hand, /ʔauh/ is adopted as the underlying representation, this word would contain the only example of initial /ʔ/ in the language. As will be seen, neither interpretation allows us to derive the correct surface forms using only the P-rules proposed in 5.5.1. and metathesis of the affixal consonant with the first consonant of the root.
44. To account for the alternation in [ʔaoh]:[mã'ʔõh] it is assumed that the glottal stop was phonemic in initial position at the time of the first metathesis. There is a weak possibility that this was not the case and that non-phonemic initial glottal stop metathesized with a following vowel.

45. Assuming earlier morphologically complex shapes *mə+huav and *mə+ʔauh, it would be necessary to conclude - again implausibly - that the first metathesis affected sequences of hV and ʔV not only where they would have violated the presumed constraint, but in all of their occurrences.

46. In view of the fact that all three words are phonemic trisyllables, it appears likely that the semivocalization of /u/ in /kuɫni/ → [kwi'ni:] '*large sweet mango*' is ultimately explainable as an instance of the same change.

47. Without a variant [paha'toŋ].