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IRREGULAR VERBS IN MÊNTU LAND DAYAK (BUKAR-SADONG, ULU SEKAJAM):
SOME REMARKS ON VERB MORPHOLOGY

Christopher Court

Mêntu Land Dayak is one member of the Bukar-Sadong Land Dayak complex of dialects of the Upper Sadong River area, Serian District, First Division, Sarawak, and in the upper Sekajam River area, Sanggau District, Kalimantan Barat. It belongs to the hinterland North-west sub-group of the Bornean group within the Indonesian language family. It has been influenced by foreign languages, most notably Malay and Iban, and their influence is to be seen predominantly in the lexicon in the form of loan-words, loan-idioms and so on. It is distinguished from these two languages by the extreme irregularity of its verb morphology, which is such that, just as with an Indo-European language, it is necessary to learn the 'principal parts' of every verb, although this statement should be qualified by saying that the 'principal' parts are the only parts of the verb, and that in any case there are only two or three of them. It is its irregularity or unpredictability alone which makes Bukar-Sadong verb morphology remarkable. This paper, unless it is explicitly stated otherwise, is to be understood in synchronic terms. Thus an affix is only considered to be such if it is still detachable, still an affix in the consciousness of the speakers.

Verbs can be divided into two broad morphological categories: non-inflecting and inflecting. Examples of non-inflecting verbs are such words as buhuuq 'to go away', buqąs 'to sleep', guleeq 'to lie down', jalar 'to walk', kirąja 'to work', kinąbur 'to kill' (derived from kąbur 'dead'). They do not change to make a passive or imperative form, nor do they take a nasal prefix (see below).

Inflecting verbs take the nasal prefix corresponding to Malay mąng- when not passive or imperative, and lose this prefix in the passive or
imperative. The form with this prefix will be referred to as the prenasalized form. Native speakers consider the prenasalized form of the verb, which is used in the Subject - Verb - Object sentence, to be the natural or 'unmarked' form of the verb. When asked for items of vocabulary as isolated words they will invariably give the prenasalized form of the verb, if it has one, i.e., if it is an inflecting verb. But in an obvious sense the passive/imperative form is 'basic' since (with the exception of one group of irregular verbs - see below) it lacks the nasal prefix and is, to all intents and purposes, the root of the verb. From the point of view of description, the relation between the two forms is so irregular that both parts have to be stated independently. However it is marginally easier to begin description from the passive/imperative form of such verbs.

The basic rule of adding the nasal prefix to the root is that if the root begins with a stop or fricative, this stop or fricative, whether voiceless or voiced, will be replaced by the homorganic nasal consonant. Comparing it with the Malay mēng-, the mē- part of the prefix is dropped as it were, and all that remains is ng (or m, n, ny as the case may be). Examples are pulaas + mulaas 'to stroke', bukut + mukut 'to hit', tijuq + niujuq 'to point to', dāngah + nāngah 'to catch', chuchul + nyuchul 'to burn' jugātn + nyugātn 'to give'. If the stem begins with l or r the prefix takes the form ngi-, for example lupet + ngilupet 'to fold', rampās + ngirampās 'to snatch'.

If this were the whole story Mēntu verb morphology would be just as regular as Malay. But if the verb root begins with a voiceless stop, it may be retained along with the nasal, e.g., ṭuqātn + mпуqātn 'to know', tikātn + ntiŋkātn 'to press', chiyum + nchiyum 'to kiss', kapukng + ngkapukng 'to surround'. (The voiced stop is never retained, if only because all inflecting verbs have disyllabic roots and there is a phonological rule that a voiced stop cannot exist after a nasal except in final syllables). To complicate matters further, a verb whose prenasalized form consists of a nasal with a following stop may have a passive/imperative form not consisting of the root minus the nasal, but produced by the addition of the further prefix ni-: e.g. mpuriq + nimpuriq 'to treat with medicine', ntagātn + nintagātn 'to pinch'. For the last group of words, the prenasalized form has to be regarded as basic, or underlyin the passive/imperative.

In some very common verbs the root or passive/imperative form and the prenasalized form are not homorganic, e.g. tāŋkāt + māŋkāt 'to get up', tinān + minān 'to use, wear', tundah + ngundah 'to do, make', gagaw + magaw 'to look for', daduq + maduq 'to dry by the fire'. If
IRREGULAR VERBS IN MĘNTU LAND DAYAK

the root begins with n- the prenasalized form usually begins with ng-
e.g. námñah + nangñah 'to hang up', namok + nangomok 'to pierce',
nanggood + nganggood 'to carry on the shoulder', numpaaq + ngumpaaq
'to chew'. There are exceptions however; naqam + maqam 'to eat',
naqam + maqam 'to lose'.

Three further factors introducing irregularity are inflexion, vowel
alternation and nasal harmony.

Inflexion concerns the inflex -in-, as it occurs in the passive/
imperative form of the verbs which are subject to prenasalization. In
many cases the bare root representing the passive/imperative form of
the verb will have an infixed by-form. For instance, mokut 'to hit'
has the passive/imperative form bukut or binukut. Similarly mäkuq 'to
congeal' has bąkuq or binąkuq. Sometimes the infixed form is rare or
odd-sounding, sometimes it is the only possible form for the passive/
imperative.

The vowel alternation is between a in the simple form and æ in the pre-
nasalized form. It is obligatory for those verbs which show it. Compare,
for instance tàrîh + ntàrîh 'to make string', tàkiq + ntàkiq 'to def-
mect', kàpiñg + ngàpiñg 'to hear', which show vowel alternation,
with tabur + nabur 'to scatter', najah + ngajah 'to follow', tandah +
nánda 'to leave alone'; námñah + ngändañah 'to hang up', tâmbak + ngàmbak
'to play (an instrument)', which do not show such alternation. In many
cases of a : æ alternation in the verb there is an associated noun with
the æ vocalism: e.g. for the above verbs tàrîh 'string', tàkiq 'faeces',
kàpiñg 'ear', but verbs without such alternation may also have asso-
ciated nouns with æ vocalism: e.g. àmbak 'gong stick' going with tâmbak
+ ngàmbak above.

Nasal harmony concerns the prenasalized form of the verb. If this
form begins with a simple nasal consonant and the intervocalic consonant
is w, y, h, q or zero, then the vowel of the last syllable may 'har-
monize', i.e. be nasalized, or it may not: e.g. from siwa [si'wa:] 'to
rent' we get nỳiwa [nỳi'wa:] 'to rent', while from juwa [dzu'wa:] 'to
sell' we get nỳuwa [nỳu'wa:] 'to sell'. Again, jiqit [dji'qit] 'to sew'
gives nỳiqit [nỳi'qit], while suqakng [su'qakŋ] 'to dam with stones'
gives nỳuqakng [nỳu'qakŋ]. (The nasalization of the vowel in the first
syllable in these forms is necessitated by the preceding nasal consonant,
hence not phonemic and not noted in this spelling.)

Such are the forms of irregularity in the Męntu Land Dayak verb.
The writer has not counted to see how many Męntu Land Dayak verbs are
regular in the sense of perfect predictability of the prenasalized form,
given the passive/imperative or non-prefixed form. Regular verbs are
probably a majority but they do not include many of the commonest verbs
in the language.
NOTES

Author's Note: Unfortunately publication of the present paper has been held up for six years. The paper should be read in the light of that circumstance.

1. The name Mënlu [mɛn'tu:] distinguishes three villages of common origin on the Kedup [kɛdʊp] branch of the upper Sadong river, viz. Mënlu Mawang [məwakŋ], Mentu Tapuh [ta'piʔ] and Mentu Pondok [pu'ndɔk]. These villages were the seat of a social-anthropological study by W. Geddes, who produced two books (1954, 1957) and an ethnographic film about them. The present writer worked on this language in Sydney between March 1962 and May 1963 with Raphael Nyandoh anak Kadir of the Sarawak Museum as informant, from February to June 1964 in Sarawak with Robert Na-en anak Jerman also of the Sarawak Museum as chief informant, and again in Sarawak in May 1970 and August-September 1971 with both Nyandoh and Na-en as informants. The writer's original work in Sydney was carried out under the auspices of the Department of Anthropology of the University of Sydney, as was the first field trip to Sarawak. This and the subsequent trips were greatly assisted by the Sarawak Museum. The writer would at this point like to thank Professor W. Geddes, Dr. A. Capell, The Sydney University, The Sarawak Museum, Father Houben, St. Theresa's Mission, Nyandoh and Na-en for making the study possible, and his colleague Mr. Alex Jones for distilling a portable dictionary from his voluminous dictionary file.

Although statements in this paper are limited to Mënlu Land Dayak, they are true with little or no adjustment of the entire Bukar-Sadong speech area, in the Serian district of Sarawak, as well as of mutually intelligible dialects on the upper Sekajam River in West Kalimantan, such as the Bipaus [bipwus] dialect spoken in Balai Karangan and surrounding villages.
IRREGULAR VERBS IN MËNTU LAND DAYAK

The Bukar-Sadong 'dialect' (or dialect complex) has a certain importance in that the Missions have devised a script for it and Dayaks who have been to school use it for correspondence among themselves, there are a few Mission and Government publications in the language and there are daily broadcasts in it from Radio Malaysia, Sarawak.

A former misconception of the author's is to be noted here. During his original work on Mëntu Land Dayak, the author's informants never used the term 'Bukar-Sadong', and the author first encountered the term in Scott 1964, where a somewhat different member of the same dialect complex is described. The author assumed that 'Bukar-Sadong' referred only to the dialect described by Scott and not to the complex as a whole. This misconception is to be found in everything written before the author's second field trip to Sarawak in May 1970: e.g. Court 1967a, b, c, 1970a.

2. This statement is not to be understood as implying any rigorous classification or separation of genetic, typological and geographical affinities. The complete classification of the languages of Borneo is a task for the future. However in 1969 Donald M. Topping made a lexicostatistical survey of the Land Dayak area of Sarawak, and in 1969-70 A.B. Hudson collected word-lists in the First Division of Sarawak and elsewhere, based on the Swadesh 200-word list and his own specific Borneo list (see Hudson 1964). Topping's work has been written up and a summary published (see references below) but the present writer has not as yet seen any of Hudson's results.

3. The spelling used in this article is that used in Court and Na-en. It accounts for all the phonemic distinctions in the dialect but uses digraphs and diacritics on ordinary letters in order to depart as little as possible from the spellings which have been used by the Missions in the area and by the Government in what little literature exists in the dialect - a catechism, the story of Daniel, some pamphlets explaining how to vote etc. The phonemic inventory is as follows: /p, b, t, d, ch [tʃ], j [dʒ], k, g, m, n, ny [n], ng [ŋ], s, l, r, w, y, h, q [ʔ], i, a, e, o, u, ə [v], ø [i]/. Phonemically long vowels are indicated by doubling the vowel letter, and phonemic nasalization of vowels is indicated by an attached comma: ø, ø, l etc. A lengthy account of the phonology is to be found in the writer's The Phonological Structure, a less formal one in Court and Na-en. See also The Phonological Structure and Court 1967a for other brief accounts.
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1 Uma Juman
2 Mukah
3 Bintulu
4 Miri
5 Kiput
6 Long Anap
7 Bario
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.

I. 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. 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 Baro dialect of Kelabit, and parallel discrepancies in other languages of the area for which limited published data were available. 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 Barlo (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/ ([ŋ]) 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. 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] a whisper: ['ŋŋ̂əyək] to whisper, 
[ʔurat] a wound: ['ŋŋ̂ərat] to wound, 
[ʔate:] death: ['ŋŋ̂əte:] kill, 
[ʔənʊk] clothing: ['ŋŋ̂ənʊk] to dress, put on clothing, 

b) ['linuŋ] thought: [ŋŋ̂o'linuŋ] think, 
[ɬulʊn] what is rolled up; anything rolled up: [ŋŋ̂o'ɬulʊn] roll up, 
[ɬudap] sleep; to sleep: [ŋŋ̂o'ɬudap] put s.o. (as a child) to sleep, 
[ɬəŋŋ̂] slipped off (of a bracelet, shirt, skin of snake, etc.): [ŋŋ̂o'ɬəŋŋ̂] remove anything that encircles.

In each of these pairs of words the first member is related to the second through the prefixation of an element [ŋ]- or [ŋŋ̂]- 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 [ŋŋ̂]- 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 /ŋə+linuŋ/ 'think', /ŋə+ɬulʊn/ '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) ['buwan'] odor: ['mūwān'] sniff, smell,
['kattep'] mark left by a bite: ['nattāp'] to bite,
['pa?id'] what is used to wipe; anything used to wipe:
['diyu?'] bath; bathe (o.s.): ['nTyū?'] bath the 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+buan/ 'sniff, smell', /ŋə+katēp/ '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. In liquid-initial roots this means of cluster avoidance is not available and consonant sequences are separated by shwa epenthesis. 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+ayak/ 'to whisper', /ŋ+urat/ 'to wound', /ŋ+linuh/ 'think', /ŋ+lulun/ 'roll up', /ŋ+buan/ 'sniff, smell', /ŋ+katēp/ '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 -/kl/ ([?]), but not before -/ŋ/ ([?]), where both /k/ and /ŋ/ 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/, /?/, /i/ and /r/. A few words nonetheless exhibit a high vowel before final /h/ or /?/ ([?a'nih] 'this', [ba'gi?] 'share, division', [sosed'ri?] 'oneself', [?i'tu?] 'we (dual incl.)', [la'bu?] '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: /anih/ [-lowering], etc. Where an etymology is known (as with bagi (Skt.) 'divide', PAN (B) *s(ae)ŋ(0ŋ)ri '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:

<table>
<thead>
<tr>
<th>systematic phonemic (SP)</th>
<th>/i/</th>
<th>/u/</th>
</tr>
</thead>
<tbody>
<tr>
<td>autonomous phonemic (AP)</td>
<td>/e/ [e]&lt;*i</td>
<td>/o/ [o]&lt;*u</td>
</tr>
<tr>
<td></td>
<td>/i/ [i]&lt;*i(L)</td>
<td>/u/ [u]&lt;*u(L)</td>
</tr>
</tbody>
</table>

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'tu?] '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:

<table>
<thead>
<tr>
<th></th>
<th>initial</th>
<th>intervocalic</th>
<th>postconsonantal</th>
<th>final</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>[b]</strong></td>
<td>58</td>
<td>14</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td><strong>[v]</strong></td>
<td>1</td>
<td>34</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

In addition to their partial complementation, these segments alternate in forms such as [bo'ton] 'swollen': [po'veton] 'cause s.t. to swell', [bi'ti:] 'stand': [po'veti:] 'make s.o. stand', [bu'lo?] 'body hair, fur, feathers': [po'vu'lo?] '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. /kəlambit/ to [kələ'bit] 'shield', /timbaŋ/ to [təlbaŋ] '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', /həmbak/ [-CR] 'selfish', /həmbuŋ/ [-CR] 'extension piece', /həmput/ [-CR] 'blowpipe', /həŋguk/ [-CR] 'hiccup', 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 /ləmbu?/ [-lowering] and /rəmbu/, 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:

<table>
<thead>
<tr>
<th></th>
<th>initial</th>
<th>intervocalic</th>
<th>postconsonantal</th>
<th>final</th>
</tr>
</thead>
<tbody>
<tr>
<td>[d]</td>
<td>22</td>
<td>25</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[r]</td>
<td>3</td>
<td>68</td>
<td>0</td>
<td>33</td>
</tr>
</tbody>
</table>

Of the three r-initial items, one ([rl'g'it] 'money') is clearly a Malay loan, and there are strong reasons to believe that the other two ([ra'sun] 'poison' and [rl'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/. 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 [?a'ra:n] (/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', [?a'rap] ~ [ha'rap] < *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', /\(arap/\) ~ /\(harap/\) 'hope'), which permits a natural historical statement \((\#d, \#r > r)\) but forces us to recognize an unnatural P-rule (/\(r/\) \(\rightarrow [d]\) in initial and post-consonantal positions). 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 ([\(pl'le\]) 'choice': [\(ml'le\]) 'choose', [\(ta'pa\]) 'man's traditional haircut': [\(nə'pa\]) 'cut the hair in the traditional style', [\(su'rat\]) 'letter': [\(nə'ra\)] 'write', [\(sa'Qlt\)] 'urine', [\(nə'Qlt\)] 'urate' 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: [\(a'ni\)] 'skin, hide': [\(nə'ni\)] 'to skin', [\(i'i\)'sun] 'smoke': [\(nəli'sun\)] 'to smoke (intr.)', [\(pa'at\)] 'bite': [\(mə'at\)] 'to bite', [\(ba'sa\)] 'wet': [\(mə'sa\)] 'dampen', [\(təli'se\)] 'comb': [\(nəli'se\)] 'to comb', [\(kəli'Q\)] 'mirror': [\(nəli'Q\)] 'look at o.s. in a mirror', [\(hə'du\)] 'work': [\(nə'du\)] 'to work', [\(hə'ga\)] '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 [\(η\)], [\(nə\)] and homorganic nasal substitution can be explained on the assumption of a single underlying prefix /\(η/\) 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 /\(n/\) to /\(h/\) in e.g. /\(nə+haduy/\) ~ [\(nə'duy\)] 'to work' or /\(nə+haga/\) \(\rightarrow [nə'ga\] 'hit with s.t.' results in the palatal nasal [\(n\)]. This fact might be taken as evidence that [\(h]\) is an underlying palatal, but if we assume underlying forms /\(nə+haduy/\) 'to work' or /\(nə+saga/\) '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+haduyl/ 'to work', /ŋ+hagaʔ/ '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 Kipu[t] [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 *[a]. 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 longhouse 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), or 0, as explained (zero), : (length), ' (primary stress on the first vowel to the right), ̃ (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 Bintulu are reproduced below along with grammatical functions and illustrative examples:

<table>
<thead>
<tr>
<th>sg.</th>
<th>Set A</th>
<th>Set B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>akaw</td>
<td>kaw</td>
</tr>
<tr>
<td>2</td>
<td>ikaw</td>
<td>new</td>
</tr>
<tr>
<td>3</td>
<td>isa</td>
<td>na</td>
</tr>
</tbody>
</table>
Members of Set A occur as
1. Actor (Active verb)
2. Patient/Goal
3. ikaw occurs optionally in negative injunctions

Members of Set B occur as
1. Actor (Passive verb)
2. Possessives
3. naw 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 ma+bukut akaw he punched me (A1, A2)

   he punch me

   2. is a ma+gazaw ikud kaw 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 (akaw) as the patient of the action. Similarly, in Sentence 2 the code (A2, B1) indicates that the first pronoun (akaw) 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 kaw 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 : ḫaṇu indicates that ḫaṇu 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
SKETCHES OF THE MORPHOLOGY AND PHONOLOGY OF BORNEAN LANGUAGES

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 /#ləbi?#/ 'lie down' is a morpheme, as are both pa- and ləbi? in /#pa+ləbi?#/ 'lay s.t. down'. This definition fails, however, when any morpheme becomes discontinuous as a result of infixation; the transcriptions /#timbak#/ 'shoot', /#t+an+imbak#/ 'be shot' imply incorrectly that the latter item contains morphemes t-, -an- and -imbak. For ease of recognition, therefore, infixes are always set off by hyphens (/#t-an-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+ləbi?#/ (rather than /#p+in+a+ləbi?#/) 'be laid down' or Bario Kelabit /#p-in-an+abat#/ (rather than /#p+in+an+abat#/) '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 /ʒ/ 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 sapəy 'shirt', ajəw 'harvest', isiw 'talk; what is said' or babųy '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/, /ŋ/ 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 allo­
phony the phonetic values of vowels and diphthongs are described sep­
arately 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. Per­
missible 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:

\[
\begin{align*}
&V \\
&C \\
&VV \text{ knife} \\
&VC \\
&CV \text{ go; and, with} \\
&CC \\
&VVV
\end{align*}
\]

\[
\begin{align*}
&VVC \text{ uat taproot} \\
&VCV \text{ abi all} \\
&VCC \\
&CVV \text{ lao sleek, glossy (of fur)} \\
&CVC \text{ lam in, inside} \\
&CCV \\
&CCC
\end{align*}
\]

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:

\[
\begin{align*}
&V \\
&C \text{(1)} \\
&VC \\
&CC \text{(1,2)} \\
&VVV \text{(3,4)} \\
&VCC \text{(2)} \\
&CCV \text{(2)} \\
&CCC \text{(1,2)}
\end{align*}
\]

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 CVCCCVW as fortuitous, but the absence of roots conforming, for example, to the canonical shape CVCCCV 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

<table>
<thead>
<tr>
<th>initial</th>
<th>intervocalic</th>
<th>final</th>
</tr>
</thead>
<tbody>
<tr>
<td>p</td>
<td>1</td>
<td>3,8</td>
</tr>
<tr>
<td>c</td>
<td>2 (in monosyllables)</td>
<td>6 (usually in loans)</td>
</tr>
<tr>
<td>d</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>n</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>

1. padaŋ  monitor lizard
2. cuk     order, command
3. jipan   tooth
4. kicap kicap  blink
5. dalam   deep
6. kacaŋ   peanut
7. sanam   ant
8. nupi    dream
Attested clusters

mb lambam flood
nd ndan pillow
lundu? sleep
nj njam skilled, clever
pinjam borrow
ng ngaŋ handspan
taŋan board, plank

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

1. Voiceless obstruents do not occur postconsonantally
2. /ʔ/ does not occur initially
3. Palatals and voiced stops do not occur in final position
4. Only nasals occur preconsonantally
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 onomatopoetic /aci/ 'sneeze' and in suspected Malay loans, as /kaçaŋ/ '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 /e/ are neutralized as /a/ 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 /a/ or /a/ ~ /a/ in pre-penultimate syllables
2. Shwa does not occur in open final syllables or prevocally
3. The contrast of /a/ and /a/ is neutralized (in some languages as /a/, in others as /a/) before /h/
4. With rare exceptions, /e/ 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 /ayak/ 'whisper' or /awan/ 'spouse' is based in part on the consideration that phonemic representations /aiək/ or /a赞同 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 Ke la bit a P-rule neutralizing all vocalic oppositions as [ə] in pre-penultimate syllables, as with ['dəra?] 'blood': [də'raʔən] 'bleed', ['pəpuʔ] 'washing': [pa'puʔən] '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:

<table>
<thead>
<tr>
<th>phoneme</th>
<th>frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>p-</td>
<td>9</td>
</tr>
<tr>
<td>-p-</td>
<td>3</td>
</tr>
<tr>
<td>-p</td>
<td>3</td>
</tr>
<tr>
<td>n-</td>
<td>0</td>
</tr>
<tr>
<td>-n-</td>
<td>0</td>
</tr>
<tr>
<td>-n</td>
<td>-</td>
</tr>
<tr>
<td>ø-</td>
<td>17</td>
</tr>
<tr>
<td>-ø-</td>
<td>6</td>
</tr>
<tr>
<td>-ø</td>
<td>19</td>
</tr>
</tbody>
</table>
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 \( p\ldots m, b\ldots m \), 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 /a/) 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/, /y/, /n/, /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 /q/ 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, e, f, g, h, i, j, k, l, m, n, ñ, ò, o, p, q, 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 hañap 'chicken', tu? 'ghost', but hañap tu? 'butterfly'. Synonyms, antonyms and contrasting members of fairly well-defined semantic fields are cross-referenced.

The description of each language begins at 4.
GENERAL REFERENCES

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DYEN, Isidore


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1970 'How Concrete is Phonology?' Language 46/1:58-76.

KIPARSKY, Paul


KISSEBERTH, Charles W.

STANLEY, Richard
1967 'Redundancy Rules in Phonology'. Language 43/2:393-436.

VENNEMANN, Theo
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 Luhat, 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.


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

CLAYRE, B. and L. CUBIT

CUBIT, L.E.

DEMPWOLFF, Otto

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).

ROUSSEAU, J.

SOUTHWELL, Charles Hudson

5. LINGUISTIC INFORMATION

The description is organised under the following headings: 1. subsystems, 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:

<table>
<thead>
<tr>
<th></th>
<th>Set A</th>
<th>Set B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>sg.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>akuy</td>
<td>ak</td>
</tr>
<tr>
<td>2</td>
<td>ika?</td>
<td>im</td>
</tr>
<tr>
<td>3</td>
<td>hla?</td>
<td>na?</td>
</tr>
<tr>
<td><strong>dual</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (incl.)</td>
<td>itu?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(excl.) kawa?</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>kua?</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>dahu?</td>
<td></td>
</tr>
<tr>
<td><strong>trial</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (incl.)</td>
<td>telu?</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>(excl.) kalu?</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>kolu?</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>dehaliu?</td>
<td></td>
</tr>
<tr>
<td><strong>plural</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (incl.)</td>
<td>itam</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(excl.) kaml?</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>ikam</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>daha?</td>
<td></td>
</tr>
</tbody>
</table>

Members of Set A occur as
1. Actor (Active verb)
2. Patient/Goal

Members of Set B occur as
1. Actor (Passive verb)
2. im occurs optionally in positive and possibly also in negative injunctions

**Examples:**

la). **aku y q+bukut hla?** I punched him (A1, A2)

I punch him
b). hia? ak ə+bukut I punched him (A2, B1)
   him I punch

2a). hia? pak+lasu atə? anan¹⁵ she is heating the water (A1)
   she heat water the/that
b). atə? anan an na? pak+lasu she is heating the water (B1)
   water the/that agen. she heat

3. (im) pa+kan asu? kan+ə 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? pa+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 pre­
cedes the actor, but may instead follow the verb (thus ak ə+bukut hia?,
ən na? pak+lasu atə? 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 ə+anit bavuy anan I skinned the pig (A1)
   I skin pig the/that
b). bavuy anan/ ak ə+anit (or 2,1) I skinned the pig (B1)
   pig the/that I skin

6a). ika? ə+anit bavuy anan you skinned the pig (A1)
   you skin pig the/that
b). bavuy anan/im ə+anit (or 2,1) you skinned the pig (B1)
   pig the you skin

7a). hia? ə+anit bavuy anan he skinned the pig (A1)
   he skin pig the
b). bavuy anan/ən na? ə+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 ə+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 dis­
tinguish 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:

\[
\begin{align*}
\text{ak } & \eta+\text{ant} \text{ bavuy anan} \\
\text{akuy } & \eta+\text{ant} \text{ bavuy anan}
\end{align*}
\]

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:

\[
\begin{align*}
\text{1m } & \eta+\text{ant} \text{ bavuy anan} \text{ you are skinning the pig} \\
8. \text{(im) } & \eta+\text{ant} \text{ bavuy anan} \text{ skin the pig}
\end{align*}
\]

Unlike imperatives, a surface pronoun has not been observed in any negative injunction: \(^{17}\)

\[
\begin{align*}
9. \text{asam } & \text{i-}\eta-\text{pate } \text{hipa? anan} \text{ don't kill that snake} \\
& \text{don't kill snake that}
\end{align*}
\]

\[
\begin{align*}
10. \text{asam } & \text{kariq} \text{ atur } \text{na? don't listen to his advice} \\
& \text{don't listen advice his}
\end{align*}
\]

Reflexive constructions are formed with \text{sdiri}? '(one)self', an apparent Malay loanword:

\[
\begin{align*}
11. \text{hia? kesiq hia? } & \text{sdiri}? \text{ he is laughing at himself} \\
& \text{he laugh him self}
\end{align*}
\]

Possessive pronouns are as follows:

\[
\begin{array}{ll}
\text{Set C} & \text{Set D} \\
\text{sg.} & \\
1 & \text{kuy} & -k \\
2 & \text{ka?} & -m \\
\end{array}
\]

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:  

<table>
<thead>
<tr>
<th>Root</th>
<th>Possessive Form</th>
<th>Pronominal Inflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>jelə</td>
<td>jelə kuy</td>
<td>jelə ka?</td>
</tr>
<tr>
<td>tongue</td>
<td>my tongue</td>
<td>your tongue</td>
</tr>
<tr>
<td>mata?</td>
<td>mata?+k</td>
<td>mata?+m</td>
</tr>
<tr>
<td>eye</td>
<td>my eye</td>
<td>your eye</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Root</th>
<th>Possessive Form</th>
<th>Pronominal Inflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>buk</td>
<td>buk kuy</td>
<td>buk ka?</td>
</tr>
<tr>
<td>head hair</td>
<td>my head hair</td>
<td>your head hair</td>
</tr>
<tr>
<td>bulu?</td>
<td>bulu?+k</td>
<td>bulu?+m</td>
</tr>
<tr>
<td>body hair</td>
<td>my body hair</td>
<td>your body hair</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Root</th>
<th>Possessive Form</th>
<th>Pronominal Inflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>løøøn</td>
<td>løøøn kuy</td>
<td>løøøn ka?</td>
</tr>
<tr>
<td>arm</td>
<td>my arm</td>
<td>your arm</td>
</tr>
<tr>
<td>ipa?</td>
<td>ipa?+k</td>
<td>ipa?+m</td>
</tr>
<tr>
<td>tooth</td>
<td>my tooth</td>
<td>your tooth</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Root</th>
<th>Possessive Form</th>
<th>Pronominal Inflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>bua ŋuh</td>
<td>bua ŋuh kuy</td>
<td>bua ŋuh ka?</td>
</tr>
<tr>
<td>coconut</td>
<td>my coconut</td>
<td>your coconut</td>
</tr>
<tr>
<td>ŋupi?</td>
<td>ŋupi?+k</td>
<td>ŋupi?+m</td>
</tr>
<tr>
<td>dream</td>
<td>my dream</td>
<td>your dream</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Root</th>
<th>Possessive Form</th>
<th>Pronominal Inflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>katam</td>
<td>katam kuy</td>
<td>katam ka?</td>
</tr>
<tr>
<td>wood plane</td>
<td>my wood plane</td>
<td>your wood plane</td>
</tr>
<tr>
<td>intestines</td>
<td>my intestines</td>
<td>your intestines</td>
</tr>
</tbody>
</table>

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? alaŋ anu?+k? which book is mine?
    book rel
    bup anu? alaŋ anu?+m? which book is yours?
    bup anu? alaŋ anu?+n na?? which book is his?
    bup anu? alaŋ 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? pæk+jaji dahi?+k they (pl.) made a promise to me
    they promise
    daha? pæk+jaji dahi?+m they (pl.) made a promise to you
    daha? pæk+jaji dahi?+n na? they (pl.) made a promise to him
    daha? pæk+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. 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:

<table>
<thead>
<tr>
<th></th>
<th>near speaker</th>
<th>hearer</th>
</tr>
</thead>
<tbody>
<tr>
<td>anih</td>
<td>this: hñih</td>
<td>here</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>anan</td>
<td>that: tinan</td>
<td>there</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>atih</td>
<td>that: hitih</td>
<td>there</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

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

14. (im) ater hitih surat anih take this letter there
(you) take there letter this

15. asam 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 one
- dua? two
- talu? three
- pat four
- lima? five
- nam six
- tusu seven
- saya? eight
- pitan nine
- pulu ten
- atu hundred
- ribu thousand

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 nam ribu saya? atu lima? pulu nam '16,856'. **ji
pulu and **pulu atu do not occur.

Ordinal numerals are evidently formed through the addition of a
prefix kā-, though only one example has been observed in the corpus:
pahari?+n kā+talu? '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
- **lun** (lit. meaning unknown)
- pat l. kayu four trees
- **lu?un** (lit. body of a human being; corpse)
- lima l. kalunan five persons
- tælu? 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
- tælu? na?añ three mountains
- pat buña? four flowers

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:

<table>
<thead>
<tr>
<th>relative</th>
<th>panak</th>
</tr>
</thead>
<tbody>
<tr>
<td>FaFa,MoFa</td>
<td>huku (l)aki?</td>
</tr>
<tr>
<td>FaMo,MoMo</td>
<td>huku duh</td>
</tr>
<tr>
<td>Fa</td>
<td>tama+n</td>
</tr>
<tr>
<td>Mo</td>
<td>hina+n</td>
</tr>
<tr>
<td>So</td>
<td>anak (l)aki?</td>
</tr>
<tr>
<td>Da</td>
<td>anak duh</td>
</tr>
<tr>
<td>ChCh</td>
<td>so</td>
</tr>
<tr>
<td>FaBr,MoBr</td>
<td>tama+n</td>
</tr>
<tr>
<td>FaSi,MoSi</td>
<td>hina+n</td>
</tr>
<tr>
<td>older Br</td>
<td>(pə)hari?+n (l)aki? (alañ) aya?</td>
</tr>
<tr>
<td>older S1</td>
<td>(pə)hari?+n duh (alañ) aya?</td>
</tr>
<tr>
<td>younger Br</td>
<td>(pə)hari?+n (l)aki (alañ) (du)?uk</td>
</tr>
<tr>
<td>younger S1</td>
<td>(pə)hari?+n duh (alañ) (du)?uk</td>
</tr>
<tr>
<td>FaBrCh,MoBrCh,FaSiCh,MoSiCh</td>
<td>(pə)hari?+n hīgat</td>
</tr>
<tr>
<td>BrCh,SiCh</td>
<td>anak</td>
</tr>
<tr>
<td>SpFa</td>
<td>?</td>
</tr>
</tbody>
</table>
SKETCHES OF THE MORPHOLOGY AND PHONOLOGY OF BORNEAN LANGUAGES

SpMo : ʔ20
Sp : hawa+n
SpBr,SpSi,BrSp,S1Sp : hantu
ChSp : anak hantu

other terms

(pa)hariʔ+n ke+taiu? second cousin
(pa)hariʔ+n asu? 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 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 (hanto 'cold', ioma 'soft, weak'). When verbal it generally appears in conjunctions, passive constructions and apparently in embedded clauses (cf. sentence 34)

16. (im) jat ue anih pull this rattan
(you) pull rattan this

17. asam today ha? hune don't dive into the river
don't dive into river

18a). ika? j-əm-at ue anan you pulled the rattan
you pull rattan the

b). ue ʔanən/Im ʔjat (or 2,1) you pulled the rattan
rattan the you pull

19. hia? n+today ha? hune he dived into the river
he act dive into river
20a). akuy ƞ+haga? asu? anan gǝrl kayu? I hit the dog with a stick
   I act hit dog the with stick

b). asu? 1an an/ak haga?/gǝrl 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 ƞ+anit bǝvuy anan I skinned the pig
akuy ƞ+anit bǝvuy 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 ƞ+tevek hǝnǝp I cut the chicken's throat
   I act cut chicken

b). hǝnǝp /ak tevek (or 2,1) I cut the chicken's throat
   chicken I cut

22a). hia? ƞ+tevek kayu? he felled the tree
   he act fell tree

b). kayuʔ/en nǝʔ tevek (or 2,1) he felled the tree
tree agen he fell

23a). akuy k-um-ǝn kan+ǝn anan dǝhalǝm dih I ate the rice yesterday
   I eat rice the yesterday

b). kan+ǝn 1an an/ak kǝn+i/dǝhalǝm 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. hune uk anan suhu? that small stream is rising
    river small that ƞ+suhu? 
    act rise

25. hia? hiliʔ? saluǝr kuy he seized my trousers
    he ƞ+hiliʔ? 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 ŋ- in active constructions. It is possible that the unaffixed root was formerly used as a passive and the root prefixed with ŋ- as an active verb, but since the active/passive distinction was marked redundantly by pronoun choice, an (see an '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 \( \text{you ate the durian} \)
\( \text{you eat durian} \)

b). dian anan im kan+i \( \text{you ate the durian} \)
\( \text{durian the you eat} \)

27a). (im) k-um-an dian anan \( \text{eat the durian} \)

b). (im) kan+i dian anan \( \text{eat the durian} \)

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.

mø- (Attributive or Stative)

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

- asøp (adj.) dirt: mø+asøp dirty
- pup (adj.) dust: mø+pup dusty
- urüp (adj.) life: mø+urüp alive
- aram (adj.) organic decay, putrefaction: mø+aram rotten
- aduŋ (adj.) fat, grease: mø+aduŋ fat (adj.)
- gaŋ (adj.) k.o. dry wood used for firewood 25: mø+gaŋ dry
alit healing : mə+alit healed
ali pregnancy : mə+ali pregnant
uru? grass : mə+uru? grassy
avuk drunkenness : mə+avuk 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. 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 (bala 'red', ḳemit 'green', etc.) were rejected.

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

tako steal; theft : ŋ+tako to steal

28. laki? anan ŋ+tako guluk kuy that man stole my bolo knife 
man that steal bolo knife my 
bian split : ŋ+bian to split

29. haruk anan bian the boat has split open (as from the heat of 
boat the split

30. akuy ŋ+bian kayu? anih I split this stick
I split stick this

habut a hole through s.t.; having a hole or holes : ŋ+habut perforate

31. tarln anih habut this cooking pot has a hole
pot this perforated

32. hia? ŋ+habut lidin anan he perforated the wall
he perforate wall the

talise comb : ŋ+talise to comb

33. hia? ŋ+talise buk na? she is combing her hair
she comb hair her

suhu request, command : ŋ+suhu ask, order s.o. to do s.t.

34. daha? ŋ+suhu akuy du they (pl.) told me to take a bath
they order I bathe
bah | loincloth : n+bah | put on or wear a loincloth

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

kalatin | buoyancy : n+kalatin to float

36. kalatin haruk anan ja?ok that boat does not float well
     buoyancy boat that bad

37. kayu? anan n+kalatin the wood is floating
     wood the float

lisun | smoke : n+lisun to smoke, smoulder

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

As noted earlier (The simple root) many verbal roots prefixed with n- 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 : n+ata | pick fruit before it is ripe

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

b). puti? anan/øn kam? n+ata (or 2,1) we (pl. excl.) picked the
     bananas before they were ripe

40. duh anan hinaŋ hiniŋ that girl is looking this way
     girl that n+hinaŋ here

41. (Im) katunŋ na? tie it
     (you) n+katunŋ it
     tie

42. asam hinaŋ hiniŋ don't look this way
     don't n+hinaŋ here
     look

pa- (Reciprocal)

The prefix pa- normally indicates reciprocal action:

lura | spittle, sputum : pa+lura spit at e.o.

43. dahu? pa+lura they (dual) are spitting at e.o.
     they spit at e.o.
haga? anything used to hit : pe+haga? hit e.o.

44. daha? pe+haga? they (pl.) are hitting e.o.

lökët sticky, adhesive : pe+lökët stick together (intr.)

45. surat dua? anan pe+lökët those two sheets of paper are sticking 

letter two those stuck together

jat pull : pe+jat pull e.o.

46. (im) jat ue anih pull this rattan 

(you) pull rattan this

pe+jat ue tug-of-war

tudëk beak; pecking : pe+tudëk peck e.o.

47. manuk anan pe+tudëk those birds are pecking e.o.

bird those peck e.o.

katël itch, scratch : pe+katël scratch e.o.

48. datu? pe+katël they (dual) are scratching e.o.

añun coitus, copulation : pe+añun copulate

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

pir either of the parts of two things joined

pe+pir stuck together, fused, as two bananas grown together

49. puti? anan pe+pir those bananas are grown together

banana those stuck together

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

pe+tudëk cockfight

pe+pir twin

pek- (Causative)

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

kësin laugh : pek+kësin make s.o. laugh

50. laki? anan pek+kësin akuy that man is making me laugh

man that make laugh me
su far : pek+su separate, move apart

51. (im) pek+su haruk anan move those boats apart
    (you) separate boat those

laket sticky, adhesive : pek+laket stick two or more things together, attach

52. akuy pek+laket surat dua? anan I stuck those two sheets
    I stick together paper two those of paper together?

asap dirt : pek+asap to soil

53. hia? pek+asap basug na? he soiled his shirt
    he soil shirt his

tanl cry, weep : pek+tanl make s.o. cry

54. hia? pek+tanl harl?+n aki? na? alan du?uk he made his younger
    he make cry younger sibling male his rel small brother cry

ava? wound : pek+ava? to wound, cut

55. asem pek+ava? usu ka? don’t cut your hand
    don’t cut hand your

urip life : pek+urip save the life of a person or animal; spare

56. hia? alan pek+urip akuy he is the one who saved my life
    he rel save life me

ja?ak bad : pek+ja?ak to wrong or slander a person

57. hia? pek+ja?ak akuy he slandered me
    he slander me

ja?l promise : pek+ja?l make a promise

58. hia? pek+ja?l tama?+n na? he made a promise to his father
    he promise father his

dul drink : pek+dul offer s.t. to drink

59. hia? pek+dul 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), /pe/- and /pek/- 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 [pe]- sequences unambiguously to one or the other underlying form.
Nonetheless, in some cases the assignment of surface [pə]- sequences to underlying /pak/- is possible only by adopting a rather broad definition of the notion 'causative'. Thus, [pəva'gi?] 'to divide', [pəja'ji:] 'to promise', [pəla'gaŋ] 'to jump', [pəra'me:] 'to celebrate, make merry' and similar items are assigned to underlying representations with /pak/- even though the surface semantics can be said to justify such representations only in the most marginal sense. The meaning of one item, [pəha'duy] 'tend to someone who is ill' diverges so sharply from the meanings of its assumed constituents (/pak/ '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 (/pak+kəsiŋ/, /pak+təŋ/, etc.) /pak/- clearly indicates cause, or non-interference with a natural process which is thereby allowed to run its course, as in /hia? pək+həŋəm kəpəl anan/ 'he let the coffee cool'.

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

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 this shirt
     she sew shirt that

lura spittle, spu tum : l-əm-ura to spit

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

la rat temper, tempering of metal : l-əm-arat to temper metal

63. (im) la rat malat anih temper this parang
     (you) temper parang this

64. hia? l-əm-arat malat anan he tempered this parang
     he temper parang the
asa whet, whetting or sharpening: am+asa to whet, sharpen

65. hia? am+asa ʔu anih he sharpened this knife
he sharpened this

sup wash, washing: s-em-up to wash

66. hia? s-em-up davan anan she is washing the clothes
she wash clothes the

kap to beach, bring to shore: k-em-up to bring to shore

67. dahalu? k-em-ap bataŋ they (trial) are bringing a log
to bring to shore log

lidin wall: l-em-lidin make or put up a wall

68. hia? l-em-lidin lapo he is putting walls in the temporary hut
he put walls in hut

liri lying down: em+liri lie down

69. hia? em+liri tinan he is lying over there
he lie down there

ləduh end-of-harvest celebration: l-em-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), /ma/-
and-/am/- fall together as surface homophones both in monosyllables
and in vowel-initial disyllables:

monosyllables  

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

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

/l-em-ərat/ [məle'rat] ~[ləmə'rat] to temper metal

The proposed affixes /mə/-, -/am/- 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'sap] 'dirty', as in [basuŋ nā? māsap] 'his shirt is dirty' is
clearly stative, and [māsa:] 'wet, sharpen', as in [hiya? māsa māla
anān] 'he sharpened the parang' is clearly transitive and active. With
forms such as [mālit] 'healed, healing' or [mānōr] '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? anān ʔamūra/ʔalūra] '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 /mē/- '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 unam-
biguous 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 [həroku mānōr] '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 /mē/- generally
derives from *mē- 'stative', and */am/- from *-um- 'actor focus'.
However, the adoption of interpretation 1) would lead to an implausible
result in at least one known example: [ʔata? ʔaləm kiiʔ? māʔoh] 'the
water was spilled from the kettle', where [māʔoh] 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 [māʔoh] it encounters the same difficulty just noted
for interpretation 1).

Since the constraint against patient subjects in */am/- verbs evi-
dently must be relaxed in any case to accommodate [māʔoh] (as /am+aʔuh/),
there seems to be no reason why forms such as [mālit] or [mānōr] cannot
be regarded as convergent surface realizations of more than one under-
lying representation: /mə+alit/, /əm+alit/; /mə+aŋur/, /əm+aŋur/,
and underlying representations such as /ma+a?uh/ 'spilled' (stative) ruled out as implausible on semantic grounds. Nonetheless, under this interpretation we are left with a distributional peculiarity: all known patient-initial -/am/- 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 *ma- (cf. e.g. Ilocano yánud 'to float; throw into a current of water', mañud 'to drift, float'). The vowel of such an affix would have been subject to the general neutralization of vocalic oppositions (as /a/) in prepentultimate syllables. By another well-motivated rule prevocalic /a/ would then drop, giving rise to allomorphs [ma]- (before consonant-initial stems) and [m]- (before vowel-initial stems). The secondary prefix /ma/-, representing earlier *ma₁- 'stative' and *ma₂- 'active' then disappeared before consonant-initial stems, after which the consonant of the infix -/am/- metathesized with the stem-initial consonant to produce [ma]- as an optional realization of the underlying infix. Note that metathesis of the infix apparently followed the loss of *ma- before consonant-initial roots, as these affixes did not merge phonemically in this environment (thus, there are no attested examples e.g. of -/am/- 'statives').

On the basis of the preceding discussion we might posit a second synchronic prefix /me₂/- that occurs at least in /me₂+a?uh/ 'spill', and probably also in /me₂+allit/ 'heal' /me₂+añur/ 'drift', and /me₂+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 -/am/-.

Semantically it is not clear how -am- and η- differ, or in particular cases how either of these differs from pak-. With one known exception (liruy 'torch': l-am-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
- sap tweezers : η+sap pluck with tweezers
- sakul hoe : η+sakul to hoe
- tallise comb : η+tallise to comb
- kalinji mirror : η+kalinji use a mirror
- tugal dibble stick : η+tugal dibble
- liki rice sieve : η+liki to sieve
- katam wood plane : η+katam to plane
- pasi? fishing line with hooks : η+pasi? fish with line and hook
- kayu? tayun firewood : η+tayun burn firewood
In other instances, however, the factors governing choice of affix are still not predictable, as with lakat 'sticky, adhesive': pak+lakat 'stick two or more things together' next to kawi 'bent': ø+kawi 'to bend' or jaji 'promise': pak+jaji 'to promise, make a promise' next to para 'a curse': ø+para 'to curse'.

In one known case the difference between ø- and pak- appears to be between intransitive and transitive action:

ø+lisun 'to smoke, smoulder': pak+lisun 'smoke out'

apuy anan ø+lisun the fire is smouldering
70. (im) pak+lisun lapo anih smoke out this hut (as to drive (you) smoke out hut this the mosquitos away)28

With one known root pak- and -øm- are interchangeable:

luhu? cook fish or meat in a bamboo tube over the fire
71. hia? pak+luhu? masik she is cooking fish in a bamboo tube
    she 1-øm-uhu? fish over the fire
cook

In another the meanings appear to be indistinguishable:

72. hia? j-øm-at ve anan he is pulling the rattan
    he pull rattan the
73. kalu? pak+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 øm
ata? water : higøt bee : ata?+n higøt honey
suhu? rise (of water) : huøe river : suhu?+n huøe 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 con-
structions is obligatory. Moreover, the genitive marker is required with
some roots in isolation, chiefly terms of relationship, where it indi-
cates obligatory possession (cp. ata?+n 'juice, gravy' = 'water of'): 30

hina?+n mother of 31

hina?+k my mother
hina?+m your mother
hina?+n na? his mother
hina?+n tu? our (dual incl.) mothers 32 etc.

(but ** hina?)

(pə)hari?+n sibling of
(pə)hari?+k my sibling
(pə)hari?+m your sibling
(pə)hari?+n na? his sibling
(pə)hari?+n tu? our (dual incl.) sibl ings etc.

(but **(pə)hari?)

ara?+n name of
ara?+k my name
ara?+m your name
ara?+n na? his name
ara?+n tu? our (dual incl.) names etc.

(but **ara?)

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

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

an (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 agent 33 of a passive verb (5.1.1.: 2b, 7b, 5.2: 39 and the following):

75a). akuy ə+bu masik anan I smelt the fish
I smell fish the

b). masik anan/ak ə+bu (or 2,1) I smelt the fish
masik anan/im ə+bu you smelt the fish
masik anan/ən na? ə+bu he smelt the fish
masik anan/ən tu? ə+bu we (dual incl.) smelt the fish
masik anan/ən kawa? ə+bu we (dual excl.) smelt the fish
masik anan/ən dahu? ə+bu you (dual) smelt the fish
masik anan/ən təiu? ə+bu they (dual) smelt the fish
masik anan/ən təiu? ə+bu we (trial incl.) smelt the fish
masik anan/ən kəlu? ŋ+bu ə (trial excl.) smelled the fish
masik anan/ən kəlu? ŋ+bu ə (trial) smelled the fish
masik anan/ən dehəlu? ŋ+bu ə they (trial) smelled the fish
masik anan/ən tam ŋ+bu ə (pl. incl.) smelled the fish
masik anan/ən kam ŋ+bu ə (pl. excl.) smelled the fish
masik anan/ən dəhə? ŋ+bu ə they (pl.) smelled the fish

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

76a). ɡənəp k-əm-ər ɡənəhən a chicken scratched up this rice
    chicken scratch up rice this

b). ɡənbən ɡənəhən ɡənəp (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). təmaʔ+ŋə ɡənəsah məlat my father is filing a parang
    father my file parang
b). məlat/ən təmaʔ+ŋə ɡənəsah (or 2,1) my father is filing a parang

78a). təluʔ ɡənəkahəm ləpo ə (trial incl.) destroyed the hut
    we destroy hut
b). ləpo/ən təluʔ ɡənəkahəm (or 2,1) we (trial incl.) destroyed the hut

79a). ɡəntəm ɡənəniʔ we (pl. incl.) skinned the deer
    we skin deer the
b). ɡənəniʔ ɡəntəm (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 *n), with phonemic split conditioned by grammatical environment. Synchronously, 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:

be-

A prefix with this shape appears in:

lagu song : be+lagu sing

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

be+lari? thunder
be+kilat lightning

Similarly, the variant shapes of ligat\textsuperscript{1}b\textsuperscript{1}ligat 'surefooted', as in:

80. ligat lan his? pano he is very surefooted (in walking)
b\textsuperscript{1}ligat very he walk surefooted

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

be\textsuperscript{1}l-

This prefix has been acquired in one Malay loanword:

be\textsuperscript{1}l+ajar learn : g+ajar teach

k\textsuperscript{1} ~ g\textsuperscript{1}

An element k\textsuperscript{1} ~ g\textsuperscript{1} is found in one known item, which also presents special difficulties in the phonological analysis (see 5.5.2.).

ahit sand : k+ahit ~ g+ahit sandy
Several words can be analyzed so as to show an unexplained residual sequence la-:

*pala* rite in which beneficent spirits are invoked for the cure of illness: *n+pala* perform the *pala*: *la+n+pala* larger ceremonial complex in which the *pala* is performed

*pate* death; corpse: *n+pate* die, dead: *la+n+pate* kill

In one case *la-* evidently indicates non-deliberate action:

*gak* fruit that has fallen to the ground: *la+gak* to fall

81. bua dian anan *la+gak* hida uma the durian fell under the fruit durian the fall under house next to, e.g.

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

n-

A prefix *n-* is found in:

*ikar* cough: *n+ikar* to cough

83. *ikar* na? ḥawan lan his cough is very loud
cough his loud very

84. hia? lali? *n+ikar* he coughed a lot
    he excessive cough

*uta* vomit: *n+uta* to vomit

but is attested only in these two forms.

pe-

An affix having this phonemic shape ([p]- before vowels ~ [pe]- 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: *pe+asar* moved slightly

85. (im) *asar* beraat aniḥ move this mat a bit
    (you) move a bit mat this

86. beraat aniḥ aw *pe+asar* kena? en asu? a dog has (already) drag-
    mat this already moved slightly affected by dog ged this mat a little
**taday** dive : **pa+taday** dive, to dive

87. (im) **taday ha? hagne** dive into the river
(you) **taday dive into river**

88. **asam lali? pa+taday** don't dive too much
**don't excessive dive**

**lagan** able to jump high or far : **pa+lagan** to jump

**aram** extinguish, put out : **pataram** go out, die, as a fire

89. **hi? lagan lan** he can jump well (high or far)
**he able to jump very**

90. **hi? pa+lagan** he is jumping
**he jump**

**sep**-

It is possible that there is a morphological relationship between:

**itam** area cleared by cutting with a parang : **am+itam** hack or cut with a parang

and

**sep+itam** secondary forest

**-an**

A non-productive infix **-an**- can be identified from:


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

**ma**-

**ma+kan** to feed (humans)

91. **hi? ma+kan hapan anan** she is feeding the baby
**she feed baby the**

**pa**-

**pa+kan** to feed (animals); fodder

92. **masik ani? an na? na pa+kan asu?** he used this fish to feed
**fish this age he use feed dog the dog**
-um-

k-um-an  eat

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

-en

kan+en  cooked rice

-I

kan+l  be eaten

94. kan+en anan on kam kan+l you (pl.) ate the rice
    rice the agent you eat

pan- plus infixed root

pan+k-um-an  food (in general); diet

pan- plus root plus -en

pan+k-kan+an  food (in general); diet

pan+k-um-an dahalu? ja?ak their (trial) diet is not good
pan+k-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 /mohena/ 'strong, strong-willed, hot-tempered' (evidently < *ma-
'attributive' plus *seña 'breathe'), /nilla/ < *(zZ)ilaq 'lick', /pohala/
< *salaq 'twist the ankle' or /separem/ < *peDem 'close the eye'.

In a number of cases the clitic locative marker /haʔ/ or /tlʔ/ has fused with a following root, and it is not entirely clear whether a synchronic segmentation is motivated: [ha'lam] < *sa lem 'in, inside',
[hl'ni] < *sa lni 'here', [hl'ti] < *sa lti 'there (not near hearer)',
[hl'n] < *sa lnu 'where?', [hl'ren] *sa ljaN 'when?', [tl'nan] < *tl
inan 'there (near hearer)'. In the absence of straightforward alternations (the meaning of /mohena/ cannot be determined from the meanings of its parts; /nilla/ is said to be invariant; the demonstrative counter-
parts of /hinih/, /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 [mū'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:

<table>
<thead>
<tr>
<th>Root</th>
<th>Affix</th>
<th>Example</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ava?</td>
<td></td>
<td></td>
<td>a wound</td>
</tr>
<tr>
<td>ma+ava?</td>
<td></td>
<td>wounded</td>
<td></td>
</tr>
<tr>
<td>pek+ava?</td>
<td></td>
<td>to wound</td>
<td></td>
</tr>
<tr>
<td>pa+ava?</td>
<td></td>
<td>wound e.o.</td>
<td></td>
</tr>
<tr>
<td>lura</td>
<td></td>
<td>spittle, sputum</td>
<td></td>
</tr>
<tr>
<td>l-um-ura</td>
<td></td>
<td>to spit</td>
<td></td>
</tr>
<tr>
<td>pa+lura</td>
<td></td>
<td>spit at e.o.</td>
<td></td>
</tr>
<tr>
<td>tilmak</td>
<td></td>
<td>a shot, shooting</td>
<td></td>
</tr>
<tr>
<td>ƞ+timak</td>
<td></td>
<td>to shoot</td>
<td></td>
</tr>
<tr>
<td>p+timak</td>
<td></td>
<td>shoot e.o.</td>
<td></td>
</tr>
<tr>
<td>ata?</td>
<td></td>
<td>water</td>
<td></td>
</tr>
<tr>
<td>ata?+n</td>
<td></td>
<td>juice, gravy</td>
<td>(i.e. water of)</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Consonants</th>
<th>Vowels</th>
<th>Diphthongs</th>
</tr>
</thead>
<tbody>
<tr>
<td>p t k ?</td>
<td>i u</td>
<td></td>
</tr>
<tr>
<td>b d j g</td>
<td>e a o</td>
<td></td>
</tr>
<tr>
<td>m n ŋ βγ</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>s h</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n[ŋwv]35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>uy</td>
<td></td>
</tr>
<tr>
<td>w y</td>
<td></td>
<td>aw36</td>
</tr>
</tbody>
</table>

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:

\[ \begin{align*}
V & \quad l \cdot l \quad \text{plank, board} \\
VC & \quad t \cdot u \cdot a \quad \text{primary forest} \\
CV & \quad b \cdot a \cdot g \quad \text{ocean} \\
CVC & \quad h \cdot u \cdot p \quad \text{have, possess} \\
& \quad a \cdot p \quad \text{fire}
\end{align*} \]

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:

\[ \begin{align*}
V & \quad VVC \quad \text{seed (of a fruit)} \\
C & \quad VCV \quad \text{hold, grasp} \\
VV & \quad VCC \\
VC & \quad CVV \quad \text{fruit} \\
CV & \quad CVC \quad \text{lid, cover} \\
CC & \quad CCV \\
VVV & \quad CCC
\end{align*} \]

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

\[ \begin{align*}
VVC & \quad u \cdot e \quad \text{thorn} \\
CVVC & \quad b \cdot a \quad \text{the Malayan honey bear: Ursus Malayanus} \\
CVCV & \quad l \cdot u \quad \text{rubbish, trash} \\
CVCVC & \quad h \cdot i \cdot k \quad \text{natural cockspur} \\
& \quad t \cdot u \cdot t \quad \text{pounding} \\
CVCCV & \quad k \cdot a \cdot r \quad \text{water buffalo (L)} \\
CVCCVC & \quad b \cdot a \cdot r \quad \text{soul (of living person)} \\
CVCVCV & \quad t \cdot e \cdot i \quad \text{comb} \\
CVCVCVC & \quad h \cdot a \cdot g \quad \text{hiccough} \\
& \quad l \cdot a \cdot k \quad \text{intestinal worm} \\
CVCVCVC & \quad k \cdot a \cdot r \quad \text{k.o. large storage basket} \\
CVCVCVCV & \quad b \cdot a \cdot e \quad \text{male (of pigs)}
\end{align*} \]
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:

<table>
<thead>
<tr>
<th>V</th>
<th>VCC (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CCV (3)</td>
</tr>
<tr>
<td>CC (1,3)</td>
<td>CCC (1,2,3)</td>
</tr>
<tr>
<td>VVV (2,4)</td>
<td></td>
</tr>
</tbody>
</table>

### 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:

<table>
<thead>
<tr>
<th>canonical shape</th>
<th>frequency %</th>
</tr>
</thead>
<tbody>
<tr>
<td>VV --------------</td>
<td>--------------</td>
</tr>
<tr>
<td>VC --------------</td>
<td>--------------</td>
</tr>
<tr>
<td>CV --------------</td>
<td>3</td>
</tr>
<tr>
<td>VVC --------------</td>
<td>2</td>
</tr>
<tr>
<td>VCV --------------</td>
<td>2</td>
</tr>
<tr>
<td>CVV --------------</td>
<td>--------------</td>
</tr>
<tr>
<td>CVC --------------</td>
<td>15</td>
</tr>
<tr>
<td>VCVC --------------</td>
<td>13</td>
</tr>
<tr>
<td>CVVC --------------</td>
<td>3</td>
</tr>
<tr>
<td>CVCV --------------</td>
<td>14</td>
</tr>
<tr>
<td>CVCVC --------------</td>
<td>44</td>
</tr>
<tr>
<td>CVCVCV --------------</td>
<td>1</td>
</tr>
<tr>
<td>CVCVCVC --------------</td>
<td>--------------</td>
</tr>
<tr>
<td>CVCVCVCVC --------------</td>
<td>--------------</td>
</tr>
<tr>
<td>CVCVVCVVC --------------</td>
<td>100</td>
</tr>
</tbody>
</table>
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:

<table>
<thead>
<tr>
<th>initial</th>
<th>intervocalic</th>
<th>final</th>
</tr>
</thead>
<tbody>
<tr>
<td>p</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>t</td>
<td>2,15,21,23</td>
<td>6</td>
</tr>
<tr>
<td>k</td>
<td>3,16,19</td>
<td>9</td>
</tr>
<tr>
<td>?</td>
<td></td>
<td>7,23</td>
</tr>
<tr>
<td>b</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>d</td>
<td>5</td>
<td>14,21</td>
</tr>
<tr>
<td>j</td>
<td>6</td>
<td>16</td>
</tr>
<tr>
<td>s</td>
<td>7</td>
<td>17</td>
</tr>
<tr>
<td>m</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>n</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>h</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>v</td>
<td>24 (in 1 item)</td>
<td>13</td>
</tr>
<tr>
<td>l</td>
<td>14</td>
<td>8,11</td>
</tr>
<tr>
<td>r</td>
<td>25 (in 6 loans)</td>
<td>20</td>
</tr>
<tr>
<td>w</td>
<td>-</td>
<td>22</td>
</tr>
<tr>
<td>y</td>
<td>-</td>
<td>12</td>
</tr>
</tbody>
</table>

1. puhak handspan
2. tumir heel
3. kuning yellow
4. bahuy wind
5. doñah news
6. jatu fall
7. ga?am molar
8. malat parang, machete
9. bua nakan small wild jackfruit
10. ñupi? dream
11. qalaj mountain
12. saya? eight
13. hlvlhl lower lip  
14. laduh end-of-harvest celebration  
15. tubu rise (of the sun)  
16. kajar solo dance  
17. higam hold, carry in the hand  
18. anür current; drift on the current  
19. kasal dull, blunt  

20. arapw Harap hope  
21. tadaw dive  
22. awa longhouse veranda  
23. ta?aw right (side)  
24. va tree that has fallen across a path or stream  
25. rasun poison

Attested consonant clusters

mb hambak selfish  
mp hampit blowpipe  
nd anak handug child-in-law  
ŋ disaster hinguk hicough  
ŋ? tąŋ?ap open  

kh lakhān intestinal worm  
rb kerbo water buffalo (L)  
pt saptit spraying  
kj takjat startled  
tk patkal commit suicide

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 (kuli? '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 an 'agentive'), prevocalically, after /a/, before /y/, or /w/, or in open final syllables; before /ʔ/ it occurs in one known form (_ipsa? '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  sword grass: Imperata cylindrica
ia : ēian light in weight; quick
iu : liu river channel
ua : luan k.o. small edible fish
ue : tuer stick driven into the mud to prevent a boat that has been pushed into the water from coming back to shore
ui : uil lever
ue : lue k.o. small yam

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:

<table>
<thead>
<tr>
<th>Phoneme</th>
<th>Frequency</th>
<th>Intervocalic Frequency</th>
<th>Total Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>p-</td>
<td>9</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>t-</td>
<td>19</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>k-</td>
<td>12</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>b-</td>
<td>11</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>d-</td>
<td>3</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>j-</td>
<td>3</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>g-</td>
<td>2</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>m-</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>n-</td>
<td>1</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>ŋ-</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>ŋ̄-</td>
<td>0</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>s-</td>
<td>4</td>
<td>7</td>
<td>-</td>
</tr>
<tr>
<td>h-</td>
<td>9</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>-</td>
<td>4</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>l-</td>
<td>7</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>r-</td>
<td>-</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>w-</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>y-</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>ø-</td>
<td>17</td>
<td>6</td>
<td>19</td>
</tr>
</tbody>
</table>

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 η.

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

<table>
<thead>
<tr>
<th></th>
<th>penultimate</th>
<th>ultimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>44</td>
<td>36</td>
</tr>
<tr>
<td>e</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>i</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>u</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>e</td>
<td>–</td>
<td>2</td>
</tr>
<tr>
<td>o</td>
<td>–</td>
<td>3</td>
</tr>
</tbody>
</table>

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 /a/ 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)

\[ /\varepsilon/ \rightarrow \emptyset /\_\_+V \] (a shwa that comes to be prevocalic as a result of affixation is deleted)

Examples

/ma+asap/ \rightarrow \[ m\'s\_\_ap \] dirty
/m\_\_urip/ \rightarrow \[ m\_\_\_rip \] alive, living
/p\_\_a\_\_ün/ \rightarrow \[ p\_\_\_n\_\_n \] coitus, copulation
/p\_\_a\_\_pir/ \rightarrow \[ p\_\_p\_\_r \] stuck together, fused; twine

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/ 'epit at e.o.', /p+tud\_ak/ 'pok e.o.' or /p+jat\_e/ 'tug-of-war' instead of producing the attested \[ p\_\_u\_\_ra:]\ [p\_\_\_u\_\_\_d\_\_k] and \[ p\_\_\_e\_\_\_jat\_e:\.\] Similarly, the /m/- of an underlying form such as /m+g\_a\_n/ 'dry' would presumably assimilate to the following stop (by a generalization of Rule 18) instead of producing the attested \[ m\_\_\_g\_\_a\_n\].

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 /p\_\_k/- before most consonant-initial stems.

Examples

/ja\_\_\_k/ bad
/p\_\_k+j\_a\_\_\_k/ \rightarrow \[ p\_\_\_a\_\_\_j\_\_\_k \] to wrong or slander a person
/du\_\_\_k/ small
/p\_\_k+du\_\_\_\_k/ \rightarrow \[ p\_\_\_\_d\_\_u\_\_\_k \] make e.t. smaller, reduce in size
/hatuŋ/ swimming
/p\_\_k+hatuŋ/ \rightarrow \[ p\_\_\_ha\_\_\_t\_uŋ \] make a person or animal
\[ p\_\_\_ha\_\_\_\_t\_o\_\_ŋ \] swim (as by throwing him/it in the water)
It appears to be optional if the root begins with /s/:

/su/
/pak+su/ → [pak'su:] ~ [pa'su:] move (two or more things) apart

Stop deletion does not occur before vowel-initial roots:

/ava?/ wound
/pak+ava?/ → [paka'va?] to wound

/urlip/ life
/pak+urlip/ → [paku'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'lu'um] your body hair
/bulu?+n masik/ → ['bulun 'māslak] 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 */ate/ (/?a'te:]) < */qaCey 'liver' or */atu/ (/?a'tu:]) < */Ratu 'hundred' and we are confronted with diachronic complications of the type discussed in section 2 of the introduction.

3. (semivocalization)

\[
\begin{array}{c}
\text{-cons} \\
\text{+high}
\end{array} + [-\text{voc}] / \# \quad \begin{array}{c}
\text{+voc} \\
\text{-cons} \\
\text{-low}
\end{array}
\]

(initial high vowels become non-syllabic before a non-low vowel)

Examples

/ue/ → [we:] rattan
/uil/ → [we?] lever

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

/uaŋ/ → [u'waŋ] seed; core of a tree
/llu/ [ll'yu:] river channel
/bua/ [bu'wa:] fruit
/liah/ [ll'yah] nit, egg of a louse

4. Vocalization

\[
\begin{array}{c}
\text{-cons} \\
\text{-voc}
\end{array} \rightarrow [+\text{voc}] / \# \quad \text{in monosyllables}
\]

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)

\[
\begin{array}{c}
\text{-voc} \\
\text{-cons} \\
\text{+high}
\end{array} + \begin{array}{c}
\text{+voc} \\
\text{+high} \\
\text{+voc}
\end{array}
\]

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

/\(tu'an/ \rightarrow [tu'\ wan] \) primary forest
/\(kali\ ah/ \rightarrow [kali'yah] \) game
/\(duy/ \rightarrow [du'\ wi:] \) drink (cf. rule 4)

6. (deletion of prepenultimate initial vowels)

\(V \rightarrow \emptyset / (C)+(C)V(C)V(C)\) (a root-initial vowel which comes
to be prepenultimate as a result of affixation is deleted)

Examples

/\(asa/ \) whetting, sharpening
/\(am+asa/ \rightarrow [m\tilde{a}'\; sa:] \) whet, sharpen
/\(iri/ \) lying down
/\(am+iri/ \rightarrow [m\tilde{r}'\; ri:] \) lie down

7. (glottal onset)

\(\emptyset \rightarrow \emptyset/ \emptyset \) (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

/\(ah/ \rightarrow [\tilde{a}h] \) pen or corral for domesticated animals
/\(itam/ \rightarrow [\tilde{t}i'am] \) we (pl. incl.)
/\(ulat/ \rightarrow [\tilde{u}'\; lat] \) scar

This proposed rule is likely to be the subject of some controversy.
Cubit (1964) maintained that glottal stop is phonemic in initial pos-
tion 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 syllables: cp. e.g. Long Atip
[\(\tilde{a}q'a\tilde{a}\)] (careful speech), [\(\tilde{a}h\)] (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 vo-
calic 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/ → [tiŋaŋ] hombill
/dara/ → [da-ra:] long, of time
/belaːtuŋ/ → [be-la:tup] inflate
/kelo'suː̂/ → [kelo'su:] steam
/mataʔ+n do/ → ['mətə doː] sun

9. (lenition of /b/)

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

**Examples**

/bətuŋ/ → [bə'tuŋ] swollen
/pək+bu'tuŋ/ → [pəwe'tuŋ] cause s.t. to swell
/bi'tiː/ → [bi'tiː] stand
/pək+bi'tiː/ → [pəvə'tiː] make s.o. stand
/buluʔ/ → [bu'luʔ] body hair, fur, feathers,
/pək+bułuʔ/ → [pəvuluʔ] 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
/kəliːʔah/ → [kəliː'yah] game
/pə+kalıːʔah/ → [pəkəliː'yah] play (recip.)
/pəset/ → [pə'set] grip
/pə+pəset/ → [pəp'set] 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:

/la'duh/ + [le'doh] post-harvest celebration
/la'-m-eduh/ + [la'm'doh] celebrate the laduh
/temaduh/ + [tem'doh] rhinoceros

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

/ja'en/ near
/pæk+jalən/ + [pajə'len] bring s.t. near
/həmbuŋ/ extension piece
/pæk+həmbuŋ/ + [pahəm'boŋ] use s.t. as an extension piece
/le'kat/ stick, adhere
/pæk+le'kat/ + [palə'kat] 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 triliteral vowel sequences in phonetic representations, while Rule 10 works against other rules (as Rule 2) to produce surface consonant clusters from underlying CaC sequences.

Given these alternations and variant pronunciations such as [tem'doh] + [temə'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

/səpə'tit/ + [səp'tit] spraying
/tək'jet/ + [tək'jet] startled
/pətəkəl/ + [pət'kəl] commit suicide

Assuming this interpretation, three words which exhibit clusters of non-homorganic consonants remain: [kər'bo:] 'water buffalo', apparently a recent loanword from Malay, [lək'hən] 'intestinal worm' and [taŋ'tæp] 'open'. If [lək'hən] and [taŋ'tæp] are written /ləkəhən/ and /taŋətæp/ 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: /sɛptɪl/ 'spraying', etc.

11. (lowering of high vowels)

\[
V + [-\text{high}] / \quad \begin{array}{c}
\text{avoc} \\
\text{acons} \\
-\text{high}
\end{array} \quad \#
\]

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

Examples

/la'kɪ?/ → [la'ke?] male
/uruʔ/ + [ʔu'roʔ] grass
/hlɪʔ/ + [hl'veh] lower lip
/duh/ + [doh] female
/uɪl/ + [woʔ] lever
/ba'kʊl/ + [ba'kɔl] basket
/tumɪʔ/ + [tu'mɛr] heel
/ɑstʊr/ + [ɑ'tɔr] arrange, put in order

The following exceptions to lowering were recorded:

/anɪʔ/ → [ʔa'nɪʔ] this
/ɑtɪʔ/ + [ʔa'tɪh] that
/ba'gɪʔ/ + [ba'gɪʔ] share, division
/bɛɾanɪʔ/ → [bɛɾa'nɪʔ] fearless
/gu'nɪʔ/ → [gu'nɪʔ] gunny sack
/hlɪʔ/ + [hl'ɛnɪʔ] here
/hɪtɪʔ/ → [hɪtɪʔ] there
/iτuʔ/ → [ʔi'tuʔ] we (dual incl.)
/lɑbʊʔ/ + [lɑ'buʔ] gourd
/lugɪʔ/ → /ru'ɡɪʔ/ → [lu'ɡɪʔ] → [ru'ɡɪʔ] loss
/sədɪrɪʔ/ + [sədɪ'ɾɪʔ] oneself
/tɪpʊh/ + [tɪ'pʊh] promise, agreement

Of these bagɪʔ, bɛɾanɪʔ, gu'nɪʔ, lɑbʊʔ, lugɪʔ → rugɪʔ and sədɪrɪʔ are apparent Malay loanwords.

12. (lowering of /u/)

/u/ → [-\text{high}] / \quad \begin{array}{c}
-\text{voc} \\
+\text{cons} \\
+\text{high}
\end{array} \quad \#

/u/ is lowered before word-final velars.
Examples

/tapuluk/ [têpu'lok] heap, pile
/manuk/ [mã'nôk] bird
/ta?un?/ [la?'oŋ] back (anat.)
/usun?/ [u'son] 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:

/pu?un?/ + [pu'?un] base, foundation; origin
/suhu?/ + [su'ho?] rising, of the river
/këlliho/ + [kelli'ho:] k.o. wild cow
/juluk/ + [ju'lok] steep, of a roof
/pirak/ + [pî'raw] silver
/Iukut/ + [Iu'kut] k.o. highly prized bead
/buŋa/ + [bu'ŋa:] blossom of a non-fructifying plant

13. (raising of /e/)

/el/ + [+high] ___ [+cons] [+high]

/el/ is raised before word-final velars.

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

/ate/ + [a'te:] liver
/ate+k/ + [a'tiak] my liver (cf. rule 14)

or possibly to two if /ta?e/ rather than its variant /ta?!/? is used to derive

/ta?e+k/ + [ta'ïak] my faeces

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

14. (breaking)

/i/ + [i?] [+cons] 

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

Examples

/bela'tik/ + [bela'tiak] spring-set spear or arrow trap
/unin?/ + [u'nTöŋ] fine ashes
/biʔiʔk/ → [biʔiʔ øk] short (in length)
/utij/ → [uʔtijø] domesticated pig
/nupiʔ+k/ → [ŋuʔ pik] my dream

In view of the fact that /i/ and /u/ are both lowered before word-final /ʔ/, /h/, /i/ 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 /iøk/ or /iøŋ/ 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/ + [ˈsiŋø] 'cat' we might also find a word /siŋø/ + [siˈyoŋ] 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/ [jəməˈhut] → [məjəˈhut] to sew
/lørat/ tempering of metal
/l-əm-ørat/ → [ləməˈørat] → [mələˈørat] to temper metal
/sup/ wash clothes, washing of clothes
/s-əm-up/ → [məˈsup] to wash clothes
/kar/ scratch up, scratching up
/k-əm-ar/ → [məˈkar] to scratch up

In forms such as /əm+asa/ → [məˈsaː] /wet, 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 infixed 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)

\[ V + V: / \quad \# \]

Vowels are lengthened before word boundary.

*Examples*

/\i\iko/ \+ [\i\i\'ko:] forehead
/p\eta\a/ \+ [p\eta\s\a:] fight (of animals)
/s\a\ve/ \+ [s\a\ve:] tusk
/l\e\vi/ \+ [l\e\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*

/\h\i\i\i/ \+ [\h\i\i\i:] look back
/ha\a\i\ah/ \+ [ha\a\i\ah] nest
/\h\a\m\a\r/ \+ [ha\m\a\r] \[ha\m\a\r] pliant (as tobacco leaves)
/\h\a\n\a?/ \+ [ha\n\a?] \[ha\n\a?] salt
18. (lowering of shwa)

\[ /a/ \rightarrow [+\text{low}] / \quad \quad -\text{cons} \quad \# \]

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 /ipaʔ/ 'tooth':

\[ /ipaʔ/ \rightarrow [ʔiʔpaʔ] \text{ tooth} \]
\[ /ipaʔ+k/ \rightarrow [ʔiʔpæk] \text{ my tooth} \]
\[ /ipaʔ+m/ \rightarrow [ʔiʔpam] \text{ your tooth} \]
\[ /ipaʔ+n naʔ/ \rightarrow [ʔiʔpan naʔ] \text{ his tooth} \]

and for examples of the following kind:

\[ /hataʔ/ \rightarrow [həʔtoʔ] \text{ swimming} \]
\[ /pæk+htaʔ/ \rightarrow [pæʔaʔtoʔ] \sim [pæʔaʔtoʔ] \text{ make a person or animal swim (as by throwing him/it in the water)} \]

19. (nasal substitution)

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

a) (assimilation)

\[ [+\text{nas}] \rightarrow [\text{ant}] / \quad \quad -\text{son} \quad \text{-del rel} \]
\[ \text{ant} \quad \beta\text{cor} \]

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

\[ /pugut/ \rightarrow [pu'gut] \text{ what is used to rub, anything used to rub} \]
\[ /ŋ+pugut/ \rightarrow [mũ'gut] \text{ rub} \]
\[ /ba\text{giʔ}/ \rightarrow [ba'gíʔ] \text{ share, division} \]
\[ /ŋ+ba\text{giʔ}/ \rightarrow [mã'gíʔ] \text{ to share, divide} \]
\[ /ta\text{dav}/ \rightarrow [ta'dav] \text{ dive} \]
\[ /ŋ+ta\text{dav}/ \rightarrow [nã'dav] \text{ to dive} \]
/kalun/ [ka'loŋ] carving, design
/ŋ+kalun/ [ŋā'loŋ] carve, make designs
/suhu?/ [su'ho?] rising (of the river)
/ŋ+suhu?/ [ŋū'ho?] rise (of the river)
/haduy/ [ha'duy] work
/ŋ+haduy/ [ŋa'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

/jala?/ casing net
/ŋ+jala?/ [ŋa'ja'la?] fish with a casing net
/lsun/ smoke
/ŋ+lsun/ [ŋal'sun] smoulder
/ŋupi/ dream
/ŋ+ŋupi?/ [ŋaŋū'pe?] to dream
/bu/ odour
/ŋ+bu/ [ŋa'bu:] sniff, smell
/bah/ loincloth
/ŋ+bah/ [ŋa'bah] wear a loincloth

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

/ŋ+anit/ [ŋa'nīt] to skin
/ŋ+isah/ [ŋī'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'mōh] blow the nose
/hamput/ [ham'put] ~ [hamm'put] blowpipe
/ŋipa?/ [ŋī'pa?] snake
/ŋ+katun/ [ŋa'toŋ] tie
/ŋ+ha?uy/ [ŋa'?ūy] to scream
/ŋ+suhu?/ [ŋū'ho?] rise (of the river)
/ŋuyu?/ [ŋū'yō?] provisions, food taken on a journey
/nįwəŋ/ → [n̥i'wəŋ] thin, of people and animals
/əlіt/ → [ʔa'ılt] healing
/əm+əlіt/ → [mā'ılt] heal

/iliŋ/ → [ʔi'ılk] rice sieve
/ŋ+iliŋ/ → [ŋti'ıl̥k] sift, strain

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

/ləsan̥/ → [lə'san̥] bare (of ground); bald
/kuren̥/ → [ku'ren̥] copper cooking pot
/əvin̥/ → [ʔa'ven̥] because
/səŋ/ → [soŋ̊] 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

<table>
<thead>
<tr>
<th>Rule</th>
<th>must precede</th>
<th>Rule(s)</th>
</tr>
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<td>2</td>
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<td>20</td>
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</tbody>
</table>

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 ayəʔ/ + [do 'hayaʔ] old woman
/halañak/ + ['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/ + [himō ha'nāʔ] 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 [haʔ+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

\[ /udik/ \text{ headwaters of a river} \]
\[ /haʔ? udik/ \rightarrow [\text{ha }'\text{udlək}] \sim [\text{hulək}] \text{ upriver (loc.)} \]
\[ /uh/ \text{ lower course of a river} \]
\[ /haʔ? uh/ \rightarrow [\text{ha }'\text{oʔ}] \text{ (never **oh)} \text{ downriver (loc.)} \]
\[ /uma/ \text{ house} \]
\[ /haʔ? uma/ \rightarrow [\text{ha }'\text{uma:}] \text{ in the house} \]
\[ /ujuŋ/ \text{ upper extremity} \]
\[ /haʔ? ujuŋ/ \rightarrow [\text{hujon}] \text{ above, on top} \]
\[ /awa/ \]
\[ /haʔ? awa/ \rightarrow [\text{ha }'\text{awa}] \sim [\text{hawa:}] \text{ on the longhouse verandah} \]

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:

\[ [\text{hu }'\text{wav}] \text{ a yawn} : [\text{mū}'\text{hāv}] \text{ to yawn} \]
\[ [\text{ha }'\text{it}] \text{ sand} : [\text{ka }'\text{hit}] \sim [\text{ŋā}'\text{hit}] \text{ sandy} \]
\[ [?a'oh] \text{ spill, spilling} : [\text{mā}'\text{oʔ}] \text{ to spill} \]

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/\textsuperscript{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] \sim [həmu'wāv] without and [māhū'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/:
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 \(<*？uR_aC[]\)'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 (\(*S_uab > huav > uhav\)) 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: \(*S_uab > huav > uhav 'yawn'\). Where metathesis resulted in a non-permitted cluster, as \(*Sasaq > hasa > ahsa 'whet, sharpen'\) preconsonantal \(*h\) 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 < *?uR_2aC 'vein, tendon', or *uħan < *(q)uRən '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  
\*uħan horn, antler

**Stage 2 (results of first metathesis)**

\*uhav yawn  
\*ahit sand  
\*aʔuh spill  
\*uhat vein, tendon  
\*uħan horn, antler  

\*am+uhav to yawn  
\*k+ahit ~ \*ŋ+ahit sandy  
\*am+aʔuh to spill
Stage 3 (results of second metathesis)

\[
\begin{align*}
[\text{hu'waw}] & \quad \text{yawn} \\
[\text{ha'it}] & \quad \text{sand} \\
[?\text{a'oh}] & \quad \text{spill} \\
[\text{hu'wat}] & \quad \text{vein, tendon} \\
[\text{hu'wao}] & \quad \text{horn, antler}
\end{align*}
\]

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+Saab 'yawn'), yet accounts for the Kayan facts better than any presently conceivable alternative. Thus, to derive present /\text{am+u'hav}/ from earlier *\text{h-am-u'av} or present /\text{am+a?uh}/ from earlier *\text{?-am-a'uh} 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: *\text{am+u'hav}; *\text{a?uh}, *\text{am+a'uh}.

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 /\text{u'hav}/ 'yawn' and /\text{hu'av}/ 'smoke vent' both appear as [\text{hu'waw}].

A second residual difficulty involves the reversal of syllabic

of underlying high vowels in certain environments, as in

/\text{kǝrawiŋ}/ \text{→ [kǝraw'yǝŋ]} \text{star}

While the phonetics of this word remain problematic in some particulars (both [kǝraw'yǝŋ] and [kǝraw'yǝŋ] were heard), it seems clear that a phonemic representation /kǝrawyǝŋ/ 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: /kǝrawyǝŋ/ 'star'. A still poorly understood rule of semivocalization is independently required, however, in certain cases where an alternation is involved: [tǝnǝ'?ǝ?] (/tǝnaʔiʔ/) 'intestines', [tǝnǝ'?ǝyǝk] (/tǝnaʔiʔ+k/) 'my intestines'. Given the independent need for such a rule it is possible to posit an underlying representation /kǝrawiŋ/ 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 [kǝrawiŋ]. An attempt could be made to account for the observed semivocalization of /1/ 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'nʃəŋ] (not **[ʔun'yəŋ])  fine ashes
/kəsiŋ/ + [kə'siəŋ] (not **[kəs'yəŋ])  laugh
/bəlatik/ + [bəla'tiæk] (not **[bəlat'yæk])  spring-set spear trap

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

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

[pæte:] death; corpse :  [pəva'te:] kill e.o.

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

[pə'ræh]  pain :  [pəp'ræh]  cause pain
[pə'sæt]  grip :  [pəp'sæt]  grip e.o.
[pə'roŋ]  suitable, fitting :  [pəpə'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:

1) /həm-ar/  to blow

<table>
<thead>
<tr>
<th>Form</th>
<th>(   )</th>
</tr>
</thead>
<tbody>
<tr>
<td>həm-ar</td>
<td>(8)</td>
</tr>
<tr>
<td>məh-ar</td>
<td>(15)</td>
</tr>
<tr>
<td>məh-ar</td>
<td>(18)</td>
</tr>
<tr>
<td>məh-ar</td>
<td>(21)</td>
</tr>
<tr>
<td>[məhər]</td>
<td></td>
</tr>
</tbody>
</table>

2) /pək+ba'niŋ/  cause to swell

<table>
<thead>
<tr>
<th>Form</th>
<th>(   )</th>
</tr>
</thead>
<tbody>
<tr>
<td>pək+ba'niŋ</td>
<td>(2)</td>
</tr>
<tr>
<td>pək+ba'niŋ</td>
<td>(8)</td>
</tr>
<tr>
<td>pək+va'niŋ</td>
<td>(9)</td>
</tr>
<tr>
<td>pək+va'niŋ</td>
<td>(12)</td>
</tr>
<tr>
<td>[pəvə'niŋ]</td>
<td></td>
</tr>
</tbody>
</table>

3) /pək+ha'ŋəm/  to cool

<table>
<thead>
<tr>
<th>Form</th>
<th>(   )</th>
</tr>
</thead>
<tbody>
<tr>
<td>pək+ha'ŋəm</td>
<td>(2)</td>
</tr>
<tr>
<td>pək+ha'ŋəm</td>
<td>(8)</td>
</tr>
<tr>
<td>pək+ha'ŋəm</td>
<td>(17)</td>
</tr>
<tr>
<td>pək+ha'ŋəm</td>
<td>(18)</td>
</tr>
<tr>
<td>pək+ha'ŋəm</td>
<td>(21)</td>
</tr>
<tr>
<td>[pəkə'ŋəm]</td>
<td></td>
</tr>
</tbody>
</table>

4) /pək+kəsiŋ/  make s.o. laugh

<table>
<thead>
<tr>
<th>Form</th>
<th>(   )</th>
</tr>
</thead>
<tbody>
<tr>
<td>pək+kəsiŋ</td>
<td>(2)</td>
</tr>
<tr>
<td>pək+kəsiŋ</td>
<td>(8)</td>
</tr>
<tr>
<td>pək+kəsiŋ</td>
<td>(10)</td>
</tr>
<tr>
<td>pək+kəsiŋ</td>
<td>(14)</td>
</tr>
<tr>
<td>[pəkəsiŋ]</td>
<td></td>
</tr>
</tbody>
</table>

5) /we/  rattan

<table>
<thead>
<tr>
<th>Form</th>
<th>(   )</th>
</tr>
</thead>
<tbody>
<tr>
<td>we</td>
<td>(3)</td>
</tr>
<tr>
<td>we:</td>
<td>(16)</td>
</tr>
<tr>
<td>[we:]</td>
<td></td>
</tr>
</tbody>
</table>

6) /uəŋ/  seed; core of a tree

<table>
<thead>
<tr>
<th>Form</th>
<th>(   )</th>
</tr>
</thead>
<tbody>
<tr>
<td>uəŋ</td>
<td>(5)</td>
</tr>
<tr>
<td>?uəŋ</td>
<td>(7)</td>
</tr>
<tr>
<td>?u'əŋ</td>
<td>(8)</td>
</tr>
<tr>
<td>[?u'əŋ]</td>
<td></td>
</tr>
<tr>
<td>Rule</td>
<td>Content</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>7)</td>
<td>/ŋ+haʔuy/ to scream</td>
</tr>
<tr>
<td></td>
<td>η+haʔuy (8)</td>
</tr>
<tr>
<td></td>
<td>ŋ+haʔuy (19a)</td>
</tr>
<tr>
<td></td>
<td>+ŋaʔuy (19b)</td>
</tr>
<tr>
<td></td>
<td>+ŋäʔuy (21)</td>
</tr>
<tr>
<td></td>
<td>[ŋäʔuy]</td>
</tr>
<tr>
<td>9)</td>
<td>/əm+asa/ what, sharpen</td>
</tr>
<tr>
<td></td>
<td>m+asa (6)</td>
</tr>
<tr>
<td></td>
<td>m+a’sa (8)</td>
</tr>
<tr>
<td></td>
<td>m+a’sa: (16)</td>
</tr>
<tr>
<td></td>
<td>m+a’sa: (21)</td>
</tr>
<tr>
<td></td>
<td>[mā’sa:]</td>
</tr>
<tr>
<td>11)</td>
<td>/ŋ+nupiʔ/ to dream</td>
</tr>
<tr>
<td></td>
<td>η+nū’piʔ (8)</td>
</tr>
<tr>
<td></td>
<td>η+nū’peʔ (11)</td>
</tr>
<tr>
<td></td>
<td>nə+nū’peʔ (20)</td>
</tr>
<tr>
<td></td>
<td>nē+nū’peʔ (21)</td>
</tr>
<tr>
<td></td>
<td>[ŋēnū’peʔ?]</td>
</tr>
</tbody>
</table>

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+bətun\+/ → [pəva’ton] (**[pəbə’ton]**) cause to swell
2 11 /buluʔ+m\+/ → [bu’lum] (**[bu’lom]**) your body hair
2 14 /nupiʔ+k\+/ → [nū’piək] (**[nū’piək]**) my dream
2 18 /pək+hatuʔ\+/ → [pəha’ton] → [pəha’ton] (**[pəhə’ton]**) cause to swim
   /ipəʔ+k\+/ → [ʔi’pək] (**[ʔi’pək]**) my tooth
3 5 /uə/+ [we:] (**[ʔu’we:]** rattan
7 " " " "
14 /unin\+ → [ʔu’ninəŋ] (**[ʔun’inəŋ]**) fine ashes
6 7 /əm\+asa/+ → [mā’sa:] (**[ʔama’sa:]**) what, sharpen
8 14 /kasliŋ → [kə’sləŋ] (**[kəsli’əŋ]**) laugh
13 14 /ate+k\+/ → [ʔa’tiək] (**[ʔa’tiək]**) my liver
15 18 /h-əm-ar/+ → [mā’hər] (**[mā’hər]**) to blow
21 /k-əm-ar/+ → [mā’kər] (**[mə’kər]**) to scratch up
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] mouth : [bah] loincloth
- [ʔa'ta:] raw, unripe : [ʔa'ta?] water
- [paŋa'nən] food (in general) : [paŋa'nən] python
- [do:] daylight : [du:] bathe
- [ta'nə:] termite : [ta'nɪ:] cry, weeping

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: bəlīgət ~ līgət 'sure-footed', duʔuk ~ uk 'little, small', haɾəp ~ arəp 'hope', lakʔ ~ aklʔ 'male', pahər ~ haɾ 'blow', pahəɾʔ+n ~ haɾʔ+n 'sibling', pala ~ la 'rite in which beneficent spirits are invoked for the cure of illness', pəsət ~ sət 'squeeze', puah ~ uah 'unroll', təŋi ~ 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') < *padem '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 pahər ~ haɾ, pahəɾʔ+n ~ haɾʔ+n, pala ~ la, pəsət ~ sət and puah ~ uah appear to be in free variation, whereas the distribution of asər, pə+asər and arəm, pə+arəm is at least in part syntactically conditioned (pə- forms invariably occur in intransitive constructions with aʔ 'already', as in #86 and apuy anan aʔ pə+arəm 'the fire has already gone out', an environment in which the vowel-initial counterparts are evidently ruled out).

Variant pronunciations such as bəlīgət ~ līgət 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 hampuṭ ~ hapuṭ 'blowpipe', kuda (younger generation) ~ kuda? (older generation) 'horse' (Ml kuda), rame ~ lame 'noise and excitement of people enjoying themselves in a group', rugli? ~ lugli? 'make no profit, take a loss', sengit ~ hengit 'urine, urinate', sibā ~ hiba 'defecate', sībān ~ hibān '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+tikār 'to cough' also result from the rise of careful speech/normal speech variation with subsequent analogical wrong division. Thus, if tikār 'cough' is (or was) a rapid-speech variant of a careful speech form **tikār (not recorded), [nṭikār] may be /n+tikār/.

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: blān 'split' : pīn 'share, divide', bukt: pukut 'punch', gūṭiṅ: kūṭiṅ 'scissors', hāniṅ: hāniṅ 'lean on', tāi? ~ tāi? 'faeces, excrement', tēnā?e ~ tēnā?i? 'intestines', tīsīp ~ tusīp 'mark left by sucking'. In one known case there is morphophonemic evidence for a doublet, but the variant root itself is unattested: pate 'death', [pəvate] 'kill e.o.', where the reciprocal inflection suggests a root **bate.

In some instances the observed variation is open to more than one interpretation. Thus, pəpən ~ pən may involve careful speech/normal speech variation, with loss of the initial syllable parallel to pəset ~ sət 'squeeze', or doubling 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? 'stem of a boat' are unclear, and these variants are cited together.
6. VOCABULARY OF ELICITED ROOT MORPHEMES AND MORPHOLOGICALLY COMPLEX WORDS

A

abit small shelf under the paha? (q.v.), used to store cooking utensils.

adan fly, flight

ñlan lan adan blun anan the flight of the airplane is very fast

em+adan to fly

adañ deafness

adañ ka? anan magi? ja?ak your deafness is very bad

mat+adañ deaf

aduñ fat (n.)

mat+aduñ fat (adj.)

ah pen (as for pigs)

ahit sand

k+ahit sandy

η+ahit sandy

ajañ remnants, as of cloth after cutting

ajar (L) learn

bel+ajar to learn

η+ajar to teach

ak I

akah vines, creepers, exclusive of rattan (cf. ue)

akit raft

akuy I

alan path, way, road

alañ relative marker, that, which

ali pregnancy

mat+ali pregnant

alit healing

dara lan alit ava? anan the wound is taking a very long time to heal (= the healing

of the wound is very long)

em+alit healed ava? anan

em+alit the wound is healed/healing

alu? peistle (cf. suñ)

anak child

a. duh daughter

a. handuñ son-in-law, daughter-in-law

a. (I)akñ son

anan that (near hearer)

anlh [-lowering] this

anlit skin

η+anlit to skin

anu? which one?, thing mentioned

anu?+k mine

anu?+m yours

anu?+n na? his

añam plait, weave

lm añam barat man akuy weave a mat for me!

em+añam to plait, weave

añun copulation

pa+añun to copulate

añur current; send adrift on the current

lm añur kayu? añlh send this stick adrift on the current

em+añur to drift

haruk kuy em+añur my boat is adrift/drifting

ap mist, haze, fog

apən ear

apir either of the halves of two things joined

pa+apir stuck together, fused, as two bananas grown together; twine

apu hold, grasp
apuh lime
apuy fire
aʔi give
aʔuh spill, spilling
java lan aʔuh ataʔ anan spill- ing the water was very wasteful
atataʔ to leak, spill out
from a container
ataʔ halak kiriʔ em+aʔuh the water was spilled from the kettle
aram putrefaction, rottenness
(cf. butuŋ)
aram masink anan bu jak this rotten fish smells bad (= the rottenness of this fish smells bad)
mataram rotten, putrid
araʔ glowing coal (cf. lusøŋ)
araʔ+n name
arøk (L) Malay-introduced rice
twine (cf. burøk)
arøm extinguish, put out
apuy anan an naʔ arøm he put out the fire
em+arøm to extinguish
hiaʔ em+arøm apuy he ex-
tinguished the fire
pe+arøm go out
apuy anan aw pe+arøm the fire has already gone out
aru long, of things (cf. dara)
asa sharpen (cf. naʔat)
em-asã to whet, sharpen
asar move a bit, move slightly
asar barat aŋiŋ move this mat a bit
pe+asar moved slightly
asœm don't
asœp dirt, grime
me+asœp dirty
pek+asœp make s.t. or s.o. dirty
hiaʔ pek+asœp basuŋ naʔ he soiled his shirt
asln spinning top
asuʔ1 dog
ŋ+asuʔ to hunt using dogs
asuʔ2 (= asuʔ1 cf. pøhariʔ+n)
atã1 milk from the breast
atã2 raw, unripe
ŋ+atã pick fruit before it is ripe
atã water
a. batuʔ ice
atã+n juice, gravy
atã+n hµet honey
aãr convey, take to a place
im aãr hitih surat aŋiŋ take
this letter there
ate liver
atih [-lowering] yonder; that
(far from both speaker and hearer)
atu hundred
atur order, command; advice,
arrangement
atur naʔ jaʔaŋ his advice is
bad
ŋ+atur to order, advise, arrange
avaʔ wound
avaʔ anan me+allt the wound
has healed
me+avaʔ wounded
pe+avaʔ to wound e.o.
pek+avaʔ to cut, wound, injure
ave boar’s tusk
avin because
avuk drunkenness
jaʔaŋ lan avuk naʔ his drunken-
ness is a problem (= is bad)
me+avuk drunk
avu? hearth; heavy or compacted ashes (cf. unīŋ)

aw already; still, yet

awa verandah of longhouse

aya? big, large; great; old

ayaŋ sirih leaf (chewed with betel nut - cf. gahat)

B

ba mouth

baduk (see bua) k.o. large jockfruit (cf. nakan)

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

pak+bagi? to divide

im pak+bagi? masik anan divide that fish!

bah loincloth

ŋ+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. kavatun)

bakir spear with barbless metal head (cf. selangap, tuduk)

bakul (L) non-native basket, market basket

balo eago palm (cf. buluŋ)

balun material, clothing (cf. daven)

banet sea, ocean

bara announce, inform, tell

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

bari lose one's voice, as after prolonged shouting

bara beginning to clear, of a storm

basa wet

ŋ+basa to wet, dampen

basuŋ shirt

batan log

batuŋ body

batu? stone

bavah heavy, hard, of rain

usan bavah its raining hard, its pouring; a downpour

bavuy wild pig (cf. utiŋ)

bawঐ (L) onion

bawঐ Pond, small body of standing water (cf. takun)

baya? crocodilе

bayer pay

bekał overgrown with weeds, of an uncultivated field

bekałet lightning

beia red

belal? thunder (cf. uvan)

belałik spring-set spear trap used esp. for monkeys

belatup to inflate, as a balloon

belonjan male, of pigs

belat (see bua) rambutan

baligat ʚliget surefooted, steady on one's feet (cf. gadu?)

beluhuŋ waterfall

ben lid, cover (cf. baran)

beni seed for planting (cf. uŋ2)

ben lungs

beran? [-lowering] (L) brave, courageous
beran broad (usually used of planks)
berat mat
beri burst, of an overfilled container (cf. buri, turu)
beruan soul (of a living person - cf. tu?)
beruk large yellow-brown short-tailed monkey
besuh satiated, having a full stomach (cf. penu)
betaman door
betunj swell, swollen
pek+betunj make s.t. swell
kapah ava? anan pek+betunj tudek the bandage on that wound is making the leg swell
blang split (cf. plan)
ŋ+blang to split
bih at
b. hule at or on the left
b. la?un behind
b. nəŋ in front
bila graveyard, cemetery
bilunj (L) aeroplane
bilunj the mouse-deer: Tragulus kanchil (cf. payo, telsu?)
bi?ik short in length (cf. llva)
biti stand
pek+biti make s.o. stand up
hia? pek+biti nam 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. belut! rambutan
b. dian durian
b. hivo 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. ɲuh coconut
b. pini k.o. small sweet mango
b. tupəŋ breadfruit
b. uru? san pineapple
bung 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
pek+bukut fight one another using the fists
bulan moon
bulu bamboo
bulunj sago flour (cf. balo)
bulu? body hair (cf. buk)
b. usun moustache
pek+bulu? drop hair on, let hair drop on
asəm pek+bulu? kanən anan don't drop hair on the food (as when skinning a pig)
buga (L) decorative flowers, flowers kept around the house (cf. plang)
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. berl, turu)
ŋ+burĩ make a hole to allow s.t. to pour out
hia? ŋ+burĩ bahã halãm guni? he made a hole to let the rice pour from the gunny sack
buruŋ sell all at once, wholesale
busaŋ riverine island
butaŋ blind
butit abdomen, stomach
butuŋ rotten, as of spoiled meat (cf. aram)
buvuŋ conical bamboo basketry fish trap
daya? swarming of fish in the river during the breeding season
dahalãm dih yesterday (= just yesterday?)
jamaŋ aniñ en na? taŋ?ap dahalãm dih he opened the cupboard yesterday
dahalu? they, them (trial)
dakat small tadpole-like fish that clings by oral suction to stones in the river (cf. lekat)
del push s.t., as a stick, into a hole; put s.t. in the mouth
danah news
depaŋ fathom
dian candle
dian2 (see bua) a fruit, the durian
dih just, only
diaŋ either of the sides of a river, etc.
dipah atiŋ far side
doo day, daylight
do aniñ hanit it's a sunny (hot) day
do aniñ usan it's raining
do aniñ uven it's thundering
du bath, bathe (cf. mayo, sup)
hia? ŋ+suhu akuy du he told me to take a bath
duan talk, speak
duaŋ two
duh female
duman year
du?uk uk little, small; young; narrow; few
pak+dũu?uk to reduce in size, make smaller
hia? pak+dũu? uk asingu na? he reduced the size of his spinning top (as by carving it with a knife)
duri ? ~ muri ? ~ uru? stern of a boat, place where the steersman stands

duy drink

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

duyan disinterested, showing no interest

\( \alpha \) an agentive marker

\( \gamma \) gadu? unsteady on one's feet (cf. bellget)

gahat betel nut (cf. ayap)

gak fruit which has fallen from a tree, drop

la+gak fall from a height (as fruit)

g-em-ak to drop

galau bracelet, anklet

gan dry wood used for firewood

me+gan dry

gama (see lpa?) molar

gori with (instrumental) (cf. pake)

gham rapide

guhan empty

guluk k.o. curved knife or bolo

gu?l? [-lowering] (L) gunny sack

gutin (cf. kutin) (L) scissors

\( \eta \) haduy work

\( \eta+\text{haduy} \) to work

pak+haduy to tend to s.o. who is ill

haga? hit

\( \eta+haga? \) to hit

pa+haga? hit one another

hal sword grass: Imperata cylindrica

halau nest; hive

h. anak placenta

h. higat beehive

h. manuk bird's nest

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

halem in, inside

haleq earthworm

haman clever (cf. jam)

hamuk mosquito

hanih (cf. hanih) lean against

kayu? ak hanih ti? lidi\( \gamma \) I leaned a stick against the wall

\( \eta+\text{hanih} \) to lean against, lean s.t. against

akuy \( \eta+\text{hanih} \) ti? jih? I leaned against a housepost

akuy \( \eta+\text{hanih} \) kayu? ti? lidi\( \gamma \) I leaned a stick against the wall

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

hanu brother-in-law, sister-in-law

hapen baby, infant

hapo k.o. leaf used in roofing, roof

he? at, on

ha?lh shy, ashamed

ha?lit put s.t. on a hook
ha?uy a scream
ŋ+ha?uy to scream
haarap + arap (L) hope
haru push
ŋ+haru to push
pa+haru to push one another
haruk boat
hatok leech
hatan k.o. tame pigeon
hatin taut, of a rope (cf. lakah)
hatun swim, swimming also used in the special sense of swimming across the river, of wild pigs at certain times of the year
da?ah na hatun they are chasing the pigs which are swimming across the river
ŋ+hatun to swim
pak+hatun make s.o. or s.t. swim
hia? pak+hatun asu? he made the dog swim (as by throwing it in the water)
havat burn, as fields for planting
ŋ+havat to burn over farmland
havur cover s.t. (usually with earth) in order to conceal it
im havur maliat anih cover this parang
hawa?+n spouse
hawat flying fox, large fruit bat (cf. pedan)
healan stuffed cotton pillow
hambak1 mute; mentally defective person, idiot
hambak2 selfish (= hambak1 ?)
hambun piece used to extend the length of another, extension piece

kayu? anih ak na hambun I'm using this piece of wood as an extension piece
pak+hambun to join two things together so as to extend their length
hamar soft, pliant, as tobacco leaves
pak+hamar make s.t. soft or pliant
hia? pak+hamar da?un luku? he made the tobacco leaf soft, pliant
hamput + haput blowpipe
hanu (cf. anak) son-in-law, daughter-in-law
hanen choke, as when drinking water or other liquid too quickly
hanih (cf. hanih) lean against
hanap chicken
hanap tu? butterfly (= spirit chicken)
hana? salt
hana? breath
j-am-at h. breathe
haenem cold
pak+haenem to cool, let s.t. cool off
hia? pak+haenem kupi anan he let the coffee cool
hanguk hicough
harut sip
ŋ+harut to sip
hi who?, whose?
hia? push grass or bushes aside when making a trail through the forest
hia1 he/she, him/her, it
hia2 marker of condition; if
hida under, beneath
hidok sob
higam hold; carry in the hand
ŋ+higam to hold
pak+higam to touch, hold
asam pak+higam bha na anan don’t touch (= play with) the rice
(coULD be said to a child)
higet (cf. pahari?+n) cousin
hikai natural cockspur (cf. tejl)
hikap to catch (fish, shrimp, etc.) with a dipnet
dəhalu? te hikap they are going fishing with dipnets
hile seize
ŋ+hile to seize, take s.t.
from s.o.
hi Ii turn the head, look back
ŋ+hi Ii to turn the head, look back
pa+hii Ii look back at one another
himah suffocate
hina?+n mother, aunt (ref.)
hina?+i (?) mother (voc.)
hineh see
ŋ+hineh to see
hinih [-lowering] here
hini? where?
hinot bee
hipun have, possess when?
hiran dusk, twilight
hirap dusk, twilight
hisir finger-ring
hitih [-lowering] there
hivih lower lip (cf. usun)
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
huaŋ horn, antler
huku grandparent
h. (1)i? grandfather
h. duh grandmother
hule? left (side)
hule? revenge (n.)
hia? te na hule na? kah anan
he will take his revenge
huluk spoon, ladle
hune river
hurup (L) letter of the alphabet

lah marker of a tag question
lka? kah ŋ+ulu bevuy anih lah?
You’re the one who speared this pig, aren’t you?
sen im asa kah malat anih lah?
You are going to sharpen this parang, aren’t you?

i jam borrowed
pa+i jam to borrow
lkam you (plural)
lka? you (sg.)
lker cough (n.)
lkər na? nəwən lan his cough is very loud
n+lker to cough
hia? laii? n+lker he is coughing a lot

lkuh tail

III1 choice
basuŋ anih kah III na? he chose
this shirt (= this is the shirt that was his choice)
äm+III to choose, select

III2 plank
IIlk strainer, sifter; rice sieve
ŋ+iIIlk to strain, sift
iluh a passage in the river, usually through rapids (cf. ilu)
η+iluh to clear stones from a river in order to provide passage for a boat
im you (sg.)
η+ilt condition of being cross-eyed
η+ILT na? jat lan he has badly crossed eyes
me+ilt cross-eyed
ipe? tooth
i. ga?em molar tooth
ipat quickly
im suhu ne hinh ipat hia? tell him to come here quickly
me+ipat fast, quick
iri1 lie down
em+iri to lie down
iri2 slice, a slice
laba? lan iri anit bavuy there are many slices of pig skin (or meat)
em+iri to slice
isah file, rasp
η+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, we (plural incl.)
iten cutting, manner of cutting; mark left by cutting; area cleared by cutting with a parang (cf. sapiten)
sayu lan ilen malat anih this parang cuts very well
em+iten to hack or cut with a parang
itun leaves (taken collectively) foliage (cf. da?un)
itu? [-lowering] we (dual incl.)
jala tongue

jeląŋ near
  pək+jeląŋ to bring together
jelę corn, maize; swollen gums
jemari (L) cupboard
jamit? rice-stubble, rice-straw
jet belt
ji one
jhī? housepost
  j. mubun ridgepole
jīnun no, not (cf. jen)
juluk steep (of a roof)
juman river junction, place where
  a tributary stream flows into
  a river

K

ka a bird, the crow
kah particle of emphasis (possibly a topicaliser)
kaham collapse, as an old house
  or field hut; capsized
  haruk anan kaham the boat
capsized
ŋ+kaham to destroy
  hia? ŋ+kaham lapo he destroyed
  the hut
kajęr native solo dance
  ŋ+kajęr to dance the kajęr
kaka hunt
  te kaka go hunting
kalę? digging stick; place of
digging
  kali? hi alan tinan whose
digging (place of digging) is
  that?
ŋ+kali? to dig
kaluŋ a design, carving, writing
  ŋ+kaluŋ to carve wood, make
designs, write
  hia? ŋ+kaluŋ bataman he is
carving a door
kaluŋ we (trial excl.)
kamah palm of the hand (cf. usu)
kami? we, us (plural excl.)
kanaŋ cooked rice; food (cf.
baha, pare)
kani eat (cf. kuman, makan,
pakan)
kapal thick, of planks, etc.,
having thick flesh around the
  seeds, of fruits (cf. kusal)
kapit wing
kapuk cotton; kapok
ka?it1 to hook s.t. on s.t. else,
as a walking stick on a wall
ka?it2 stubborn
kar scratch up
  pare an haŋap kar the chicken
  scratched up the rice
  k-əm-ar to scratch up, as a
  fowl scratching up the ground
  haŋap k-əm-ar pare anih the
  chicken scratched up this rice
kasa foot (cf. tudak)
kasaŋ (L) bean
kasal blunt, dull
katal itch, itchy
  akuy katal I feel itchy
  ŋ+katal to scratch an itch
  pə+katal scratch each other
  dahu? pə+katal they are scratch
  ing e.o.
katam wood plane
katir (L) bed
katun anything used to tie
  ŋ+katun to tie
kawa? we (dual excl.)
kawi bent
η+kawi to bend
kawit boat hook; hook used in weaving to pull the thread
kayo post-harvest ceremony for the ritual purification of weapons
η+kayo to fight in war, hunt heads
kayu? wood; stick; tree
k. tayun firewood
ke- prefix of ordinal numerals
ke-telu? third (?)
kejep blink, blinking
kejep na? metipat his blinking is fast
η+kejep to blink
keladi (L) k.o. large yam (cf. lue)
kelatiŋ buoyancy
η+kelatiŋ to float
kelabit shield
kelasu steam
kelav tortoise (cf. kəravāŋ)
kéliŋ game, toy
η+kéliŋ to play
pa+kéliŋ to play together, as children
kéliho k.o. wild cow
keliŋi mirror
η+keliŋi to look at o.o. in the mirror
kelunan person, human being
kelu? you (trial)
keluʔuŋ mountain ridge (cf. nalaŋ, ujat, ulur)
kelut diluted, not concentrated
kena? affected by
kap go ashore, bring ashore
bataŋ en dahalu? kap they brought the log ashore
k-əm-ap to bring ashore
dahalu? k-əm-ap bataŋ they brought the log ashore
kapah a bandage, dressing for a wound
kera? neck
kərataŋ storage basket for cooking utensils
kəravāŋ freshwater turtle (cf. kalav)
kərawiŋ star
kərbo (L) water buffalo, carabao
kere moment, point in time
kere anh now
kəriŋ hear, listen
η+kəriŋ to listen
kərukl kneeling
sayul an kərukl na? he kneels well (= his kneeling is very good)
η+kərukl to kneel
kəsəm diving, submerging; setting
kəsəm na? dara lan he stays submerged for a long time (= his submerging is very long)
η+kəsəm to dive; to set, of the sun (cf. tubu)
akuŋ η+kəsəm hida haruk I dived under the boat
mataʔon do η+kəsəm direction of the setting sun
kəsap greedy
kesiŋ laugh
paŋ+kəsiŋ to make s.o. laugh
keː thing
kataŋ succeed after great effort in doing s.t. difficult (cf. lahut)
katlnun (L) cucumber
kattr porcupine
kavatun round basketry cage or coop for chickens (cf. bakah)
klrip large hornbill feathers used to decorate the sunuŋ
klrl? kettle
kua? you (dual)
kuda ~ kuda? horse
kuhun head
kuini (see bua) k.o. large sweet mango
kull bark of a tree
kulih clouded leopard
kuman eat (cf. kanı, makaŋ, pakan)
kunin yellow
kuñlt (L) turmeric
kuŋ shell
k. si snail shell
kuren k.o. copper cooking pot formerly in use (cf. tarin)
kurl how much/how many
kurl lagah anih how much does this cost? (= how much is the price of this?)
kusal having thin flesh around the seeds, of fruits (cf. kapal)
kutln (cf. gutin) (L) scissors
kutu? louse

lagah temporary floor of saplings used in a field hut
lagan able to jump high or far
lagan lan hia? he can jump (high or far)
pak+lagan to jump
hia? pak+lagan he is jumping
lagi able to climb well
lagu (L) song
batelagu to sing
lah receding, of water
aya? lan lah hunu anan the river has receded considerably (= the receding of the river is very great)
l-om-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. ketah)
laki? ~ aki? male
hari?+n aki? ~ h. laki? brother
l. uk young man, bachelor
l. aya? old man
lal? too much, excessive
lalir buttress root (cf. pakat)
lan much, very, extremely (cf. magi?)
lanu pus
ŋ+lanu to suppurate
lani smooth (cf. lini)
lana? blowpipe dart
lanet cloud
lanit sky
lano housefly
la?e tired, exhausted
la?uk do s.t. behind s.o's back (lit. and fig.)
laʔun back (anat.)
laʔun kamah back of the hand
lasan bare, of a field without grass; bald
lasor piece of wood or other object used to facilitate pull-ing s.t. that has become stuck while being pulled
lasu warm, hot
pek+lasu to heat
latar 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
lawaʔ proud, arrogant
lawaʔ dip net
lawat cross a river
layan 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.
lədəhu end-of-harvest celebration
l-em-ədəhu to celebrate the lədəhu
ləgah (L) price, cost
ləkat stick, adhere to (cf. dekət)
ləkən intestinal worm
ləkənu slack, of a rope (cf. hatɨŋ)
ləma weak, soft
lənəp flooded, covered by water
lənən arm
ləpo hut, building other than a longhouse (cf. ladaŋ, luvun, 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 malanɨ temper this parang
l-em-ərat to temper
hiaʔ l-em-ərat paran he tempered the parang
ləva fetch water
ləvəl evening
le strong
ləah nit, egg of a louse
lədəm dark
lədən wall of a house
l-em-ədən to put up walls in a house
hiaʔ l-em-ədən uma he is putting walls in the house
ləko forehead
ləm all
ləmaʔ five
ləni fine, as fine sand (cf. lani)
ləruy
l-em-əruy to shine a torch on s.t. or s.o.; to hunt at night, using a torch
ləsən1 to leave a trail of trampled grass, as when walking through a field
ləsən2 to rub off, as chalk from a blackboard
ləsun smoke
pek+ləsun to smoke out
small channel in a river, as when an island divides the river into a mainstream and a narrow second stream (cf. lluh)
short in height; low (cf. bl?lk)
needle
k.o. small food fish, about 3’ long
k.o. small yam (cf. k?lad)
rubbish, garbage, trash
cook meat or fish in a bamboo tube over the fire (cf. isak, lulu)
to cook meat or fish in a bamboo tube over the fire
pitted
? tobacco (cf. jaku?)
tobacco leaf
k.o. highly prized bead
swidden farm, cultivated field
harvest
put, place
rheumatic pains
human body, corpse
(see sak) overripe
spittle, saliva
to spit
spit at e.o.
foam, soapuds
charcoal (cf. ara?)
meat or fish packed in sago, wrapped in leaves and roasted over the fire (cf. isak, luhu?)
hole
temporary longhouse used while constructing a new one (cf. lada, lapo, uma)

too, excessive, very (cf. lan)
hard
to feed people (cf. kani, kuman, pakan)
machete
night; spend the night
bird
new
fish
eye
do
wash off (plates etc.) with water (cf. du, sup)
feverish, sick
(see bua) papaya
say
strong; strong-willed, hot-tempered
sit; stay behind
for (benefactive), to (relational) (cf. dahl?)
tall tree with yellowish wood used to make boats
sweet
salty
(?) table
ridgepole
old, of people (cf. una?)
breast
make, do, use, build
tu? uma tulun näatur dehalu?
na uma the headman directed them in building the house
na apuy to cook
na kanan to cook rice
na luku? to smoke (tobacco)
na tahu 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
näm six
nän face
ne come
nunu what?
nunu? how?
ña?äm1 beautiful, handsome
duh nä?äm a beautiful girl
laki? nä?äm a handsome man
ña?äm2 youth, young people (probably = nä?äm1 in the sense of jeunesse dorée)
näm uk child
ña?ät sharp (cf. asa, ukul)
ña?at k.o. tree with leaf similar to the breadfruit
ña?awan loud, noisy
ña?amit green; pale
ña?än light in weight; quick, fast
ña?lla to lick
ña?ipa? snake
ña. päñanan python
ña?ipä thin, of things (cf. nä?iwaŋ)
ña?iwaŋ any palm of the genus Oncoesperma
ña?iwaŋ thin, of people and animals (cf. nä?ipä)
ña knife
ña?uh (see bua) coconut tree
ña?u? dream
ña?u? to dream
ña?aja to step on
ña?alan mountain (cf. kela?uŋ, ujat, ulur)
ña?ar gills of a fish
ña?urut to whimper constantly, asking for things (of a child)
ña?u?y provisions, food taken on a journey

paha? shelf above the hearth
where firewood is stored (cf. abit)
paha? pahar blow
ña+pahar to blow
põahu? grasshopper
pakan to feed animals; fodder (cf. kañä, kuman, makan)
pakat root (cf. lañir)
pake (L) with (instrumental - cf. geri)
pañak relative; consanguineal or affinal kinemam
päno walk
pañu? fight, argue, of people
pañät bite, a bite
ña+päñät to bite
ña?ät bitter
para a curse
  ṅ+para to curse
paraŋ monitor lizard
pare rice in the field; rice-plant (cf. baha, kanan)
paruŋ match, agree with
  ṅ+paruŋ right, proper, fitting
pa+paruŋ be compatible; get along well together
paruŋ greater
pat four
pate death; corpse, carcass
  pate tamaʔ+naʔ anan tokjaʔ tua his father's death was entirely unexpected
  ṅ+pate die, dead
lə+ḥ+pate kill
pa+pate kill one another
dahuʔ pa+pate they are killing each other
payan finished
payo the sambhar deer: Cervus equinus (cf. bilunʔ, talaʔu)
pedan small insectivorous bat (cf. hawat)
pəg real frequent
pahala twist the ankle
pahariʔ+n ə haririʔ+n sibling
  p. asuʔ half-brother, half-sister
  p. higat cousin
pakale to learn
pala ʷ la rite in which beneficent spirits are invoked for the cure of illness; payment made to rectify offence to someone
  ṅ+pala to perform the pala
lə-ŋ-pala larger ceremonial complex in which the pala is performed
pənu full (cf. bəsuʔ)
pənənən diet, intake of food (cf. pənuʔan)
pənənən (see ĕpiʔ?) python
pənuʔan diet, intake of food (cf. pənənən)
pəpəŋ ʷ pəŋ gather, collect
  ṅ+pəpəŋ to gather; collect
impəŋ kayuʔ anan gather the sticks together
parah pain, painful
kuhun kuy parah I have a headache, (= my head hurts)
pək+pərah to hurt
hiaʔ ṅ+kaɬiʔah pək+pərah hiaʔ tua anan he always gets hurt when he plays (= he just plays to hurt himself)
pəruʔ gail (bladder)
pəsa fight one another, of animals
pəsət ʷ sət squeeze; grip
pəsət naʔ ləma his grip is weak
  ṅ+pəsət to squeeze
pəsiʔ line and hooks for fishing
  ṅ+pəsiʔ to fish with line and hooks
pətkəl commit suicide
pian a share (cf. bian)
  ṅ+pian to share
pidaŋ 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
pitaŋ gray
puah ~ uah unroll, unfurl, as a mat, cloth, etc.
η+puah to unroll, to unfold
hia? η+puah berat she unrolled the mat
berat an na? uah she unrolled the mat
pugut anything used for rubbing
η+pugut to rub
puhok 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? mehanga? 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
me+pup dusty
pu?un base, foundation; origin, beginning
p. kayu? base of a tree
puser ball of thread wound round and round
pusu heart
putan walking stick
puti white
puti? banana
rame ~ lame (L) noise and excitement of people enjoying themselves in a group
pak+rame to celebrate, make merry
rasun (L) store-bought poison (cf. tasam)
ribu (L) thousand
rigit (L) money
rugil? ~ lugi? [-lowering] (L) make no profit, take a loss in business
sak ripe
s. lu?ut overripe
sakul (L) hoe
η+sakul to hoe, dig with a hoe
san ladder
sap1 (L) cow
sapur (L) to mix, add to
saru? misperceive, as in mistaking one person for another
saya? eight
sayu good
sada? (L) ready
sadiri? [-lowering] (L) oneself
sakulah (L) school
salaŋap spear with multi-barbed head (cf. bakir, tuduk)
saluar (L) trousers
sam sour
san push to the side, push out of the way
sæŋ will (fut.)
sæŋit ~ hæŋit urine, urinate
sap bamboo tweezers
sapa rem close the eyes
im sapa rem mata?+m close your eyes
η+sapa rem to close the eyes; blink
dehal u? η+sapa rem they closed their eyes

sapatit  secondary forest (may be morphologically complex; cf. itan, tuan)
η+sapatit to farm secondary forest

saptit squirt, squirting, spray, spraying
su lan saptit ata? anan the water is squirting/spraying very far (= the squirting/spraying of the water is very far)
η+saptit to squirt or spray

si snail
siba ν hiba defecate
siban ν hiben sneeze
simuh ν himuh blow the nose
η+simuh to blow the nose

sina cat
si+n meat, flesh
sit vulva, vagina
so1 grandchild
so2 throw (cf. tavalan)
s-em-o to throw

su far
pak+su to separate, place apart

suba?1 k.o. red cloth
suba?2 (L) to try

suhu request, order
suhu na? magi? pahin 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
sune uk anan suhu?/η+suhu? that small stream is rising
aya? lan suhu?n huge 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 bataman anih he is measuring this door

sunug costume of clouded leopard or other skin worn to dance the kajar

suŋ mortar (cf. alu?)

tadav dive
im tadav ha? huge dive into the river!
η+tadav to dive
hia? η+tadav ha? huge he dived into the river
pa+tadav to dive
asam qali? pa+tadav don’t dive too much!

tagan firm, secure, aa slats in a bridge

tahen (L) durable, lasting

tahep k.o. fruit similar to the breadfruit

tajil (L) metal cockspur (cf. hikal)

takens cut
im na aya? takes kayu? anan widen (= make big) the cut on the wood
η+takep to cut two pieces of wood so that they fit together, as in constructing a house

taker anything used for climbing

η+takep to climb up

tako thing stolen, stealing, theft

toŋ aniŋ kah tako na? this is the money that he stole (= this money was his theft)

η+tako to steal

ta kalunan η+tako thief

takuŋ lake (cf. bawan)

takut fear; afraid

tali? rope, string

tama?+n father, uncle

tana earth, soil

tanam bury

im tanam pate asu? aniŋ bury this dog (= bury the dead body of this dog)

η+tanam to bury; to become submerged

hia? η+tanam pate asu? anan he buried the dog

batu? aniŋ η+tanam this stone is submerged (or covered, as by mud)

tane termite, white ant

tanji ~ aŋi weep, cry; a cry

η+tanji to weep, cry

η+pən aŋi to make s.o. cry

tanap open

η+tanap to open (a door, etc.)

tanuh 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

taʔaw right (side)

taʔan set s.t., as a trap

η+takar to climb up

buvu? an na? taʔan he set the buvu? fish trap

η+taʔan to set s.t. up, as a trap

hia? η+takar buvu? he set the buvu? fish trap

η+tah (cf. taʔi?) faeces, excrement

taʔi? (cf. taʔe) faeces, excrement

tariŋ cooking pot (cf. kurən)

tasam native vegetable poison used for blowpipe dart (cf. rasun)

tasu floor

tatar a push with the leg

tatar na? magi? mahara? 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

tavəh antidote, as for poison, medicine

tavəh 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 alaŋ ha? bəh la po 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

tayuŋ (see kayu?) firewood

η+taŋuŋ to burn firewood
ta白糖 man's traditional inverted-bowl-style haircut
η+白糖 to cut the hair in the traditional style

白糖 dripping (cf. turu)
白糖 ata? anan bavah lan there is a bad leak (= the dripping of the water is very heavy)

白糖 time, period; during
白糖 (L) unexpected, startling
白糖 liquid, gravy; rice porridge
白糖 the barking deer: Cervulus muntjac (cf. bilun2, payo)
白糖 spider
白糖 lobe of the ear (generally pierced and distended)
白糖 comb
白糖 to comb
白糖 egg
白糖 three
白糖 we (trial incl.)
白糖 k.o. wood-boring insect
白糖 rhinoceros
白糖 (cf. tana??) intestines
白糖 (cf. tana?) intestines
白糖 make a social visit, visit people to chat
白糖 deflected, as a parang blade that fails to cut hard wood when one swings it
白糖 a heap, pile
白糖 to heap, pile
白糖 k.o. headcloth or turban
白糖 run
白糖 to run
白糖 he is running here
白糖 a snore
白糖 to snore
白糖 taste; what is tasted
白糖 na? kah anan that is the thing that he tasted
白糖 to taste
白糖 jump down
白糖 fixed, definite, certain
白糖 throw (cf. so2)
白糖 to throw
白糖 a clearing in the forest
白糖 to make a clearing in the forest by felling trees
白糖 necklace
白糖 cut the throat, of a chicken, etc.
白糖 I cut the chicken's throat
白糖 fell trees
白糖 he felled the tree
白糖 to fell trees
白糖 he felled the tree
白糖 knot
白糖 sugarcane
白糖 go
白糖 he told me to go to school
白糖 weigh
白糖 mattress
白糖 impatient
白糖 shoot, shooting
白糖 his shooting (aim) is bad
白糖 to shoot
白糖 to shoot e.o.
tinan there (near hearer)
tiangan a bird, the hornbill
tipuh [-lowering] promise, agreement (cf. jaji)
ti? on, against; for
akuy ti hanih ti? lidin I'm leaning against the wall
hia? saru? akuy ti? kalunan
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
ny+ tisip to suck (of a baby at the breast, a child sucking on a popsicle, etc.)
tua just, only, merely
tuan primary forest (cf. sapitun)
tua? uma (M1 tua rumah) headman
tubu (cf. tuvu) to grow (intr.); thing grown; rising, of the sun (cf. kasam)
aw tubu nah pare the paddy is already growing (i.e. has germinated)
nny+tubu to grow (tr.)
hia? nny+tubu pulut he grows rubber (trees)
mata?+n do tubu direction of the rising sun
tudak1 beak of a bird (cf. usun)
nny+tudak to peck with the beak, of birds when eating or fighting
peta+ tudak peck e.o.; cockfight
tudak2 leg, entire leg inclusive of the foot (cf. kasa)
tudu sleep
tuduk spear with single-barbed head (cf. bakir, salanap)
tuwar stick driven in the mud to keep a boat that has been pushed into the water from coming back to shore
ny+tuwar to drive a tuwar 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)
tukar (L) to change
tuku a boil
tula bone
tular animal
tulan (L) to help
tumir heel
tumu? plant resin, dammar
tupan (see bua) breadfruit
yu ghost, spirit (cf. baruan)
turin k.o. small river fish
turu to leak, of the roof (cf. beri, buri, tabek)
tusip (cf. tisip) place of sucking, mark left by sucking
tusu seven
tusu? sucking
ny+ tusu? na? magi? dara his sucking is prolonged (e.g. of a baby that sucks for a long time)
nny+ tusu? to suck
tuto straight
tutuk knock, pound, beat; what is pounded
ny+tutuk na? kah anan that is the thing that he pounded
ny+tutuk to knock, pound, beat
tulan burn
ny+tulan to burn
tuvu (cf. tubu) to grow (intr.)
tuy allow, permit
jantuy taboo
una\textsubscript{1} core of a tree
una\textsubscript{2} (= una\textsubscript{1}\?) seed of a fruit (cf. bani)
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
\textit{am-uhav} to yawn
uil lever
uit plate
ujat peak of a hill or a mountain (cf. k\textsubscript{e}lu\textsubscript{u}, qal\textsubscript{a}, ulur)
ujun top part
ha? ujun uma on top of the house
ukul\textsubscript{1} worn-down, of the blade of an old parang (cf. n\textsubscript{a}t\textsubscript{e}t)
ukul\textsubscript{2} rib of a basket, slender piece of wood placed inside a basket to give support to its sides
ulat scar
ulen thorn
ular maggot; caterpillar
uli return home
hia? san te uli jak\textsubscript{a} anih he will be returning home at this time
uluh croctoh
lu\textsubscript{u}na\textsubscript{u} uluh anus
ular mountain ridge (cf. k\textsubscript{e}lu\textsubscript{u}, qal\textsubscript{a}, ujat)
uma house, longhouse (cf. lada\textsubscript{a}, lapo, luvun)
una? old, of things (cf. muku)

una\textsubscript{n} fine ashes, as cigarette ashes or ashes blown into the air from burning fields (cf. avu?)
ura\textsubscript{n} shrimp
ura\textsubscript{n} shin
urip life
am+urip living, alive
pak+urip to save or spare the life of s.t.
urun nose
uru? grass
ma+uru? grassy
ma+uru? lan luma? anan that field is very grassy
uru? san (cf. bua) pineapple
usan rain
usu hand (cf. kamah)
usuk chest (anat.)
usun (see bulu?) upper lip; beak of a bird (cf. hivih, tudak)
uta vomit
n+uta to vomit
utak brain
uti? penis
utin domesticated pig (cf. bavuy)
uvan to thunder, rumble (cf. b\textsubscript{e}l\textsubscript{a}ri?)

va tree that has fallen across a path or river
hiku\textsubscript{n} elbow
lu\textsubscript{n} numeral classifier (for trees)
NOTES

1. Thanks are due to many persons for encouragement, information and personal help, and to several institutions for material support without which my work in Sarawak would have been impossible. I am particularly grateful to George W. Grace, then my dissertation advisor in Hawaii, whose genuine interest in the project and persistent questioning over a period of years kept me constantly alert to alternative explanations of the data, and contributed considerably to whatever value the results may have. Much appreciation goes also to Benedict Sandin and Lucas Chin of the Sarawak Museum for official sponsorship of my fieldwork by the museum, and to William Hsu, then principal of the Kolej Tun Datu Tuanku Kaji Bujang, Miri, and William Ng, then principal of the Marudi Government Secondary School, Marudi, for making arrangements for me to work with students at those institutions. The project was funded under NSF grant GS-3206. My wife and I will always remember Haji Abdullah bin Yusoff, his wife Fatimah and their children, who became a second family to us during our stay in Miri. Finally, I owe a blanket debt of gratitude to all the many native peoples of Sarawak who helped to teach me something of their languages and of themselves.

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 Sük, Miri Sük, Kiput suSq, Long Anap puk, Barlo Kelabit aSbuk (northern Sarawak),

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Bisaya Bukit (Brunei), Timugon Murut (Sabah) abuk 'hair of the head', next to PAN *bulu > PNS *bulu > bulaw ~ vulaw, buluh, bulaw, 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-ud - *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 /η/ 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, /η/ 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 [ŋə]-, as in Uma Juman [bu:] 'odor': [ŋə'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 haput 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: [da'ha:] 'blood': [pada'ha:] 'cause to bleed', [du'ok] 'small': [pado'ok] '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 (təlu? 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 an 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 η+bukut hla?), glossed identically, differ only in the set membership of the actor pronoun.

15. Anan 'the, that' is omitted in normal informal speech; aniŋ '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:

\[(\text{im}) \ a?i \ h\ u \ aniŋ \ m\ an \ h\ ia? \ give \ this \ knife \ to \ him\]
\[(\text{you}) \ give \ knife \ this \ to \ him\]

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 'tu du '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 -Y. 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. naŋ '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 handuŋ and hina+n handuŋ respectively (cf. anak handuŋ '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. 'dry-ness' in Baram Kayan.

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

27. Cp. sentence 45.

28. /η+taŋ/ 'to cry': /pək+taŋ/ '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/ň distinction, it seems clear from the Set B, C and D pronouns that the 3rd sg. possessive suffix *-ňa reflects *ň 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 [e]. 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 pāk-, and the fossilized infix -um- in /k-um-an/ is presumably identical historically with -əm-.

35. /v/ was recorded as [ʃ] ~ [v] in word-final position; intervocally 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 tambaga? 'copper') appear in h-initial roots (cf. above and hambúŋ '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+telise/ 'to comb' or /ŋ+lisun/ 'to smoke, smoulder'.

41. There is some residual uncertainty concerning the placement of stress in reduced clitic phrases.

42. It is not known whether ['humā:] or [ha 'ʔujoŋ] occur.

43. Given this phonemic shape, we would have no way to account for the appearance of [ʔ] or [māʔoŋ]. 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 [ʔoŋ]:[māʔoŋ] 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 *me+huav and *me+?auh, it would be necessary to conclude - again implausibly - that the first metathesis affected sequences of hV and ?V 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 /kuin/ → [kwi'ni:] 'large sweet mango' is ultimately explainable as an instance of the same change.

47. Without a variant [paha'ton].
'KOLANO' IN THE TONDANO LANGUAGE

F.S. WATUSEKE

In Tondano we still hear from the old people about the existence of the word kolano, a word not used any more by the younger generation, who consider terms like this only a joke. This term kolano means 'king, monarch, rajah' in the Tondano language (Watuseke, ms). In Minahasa history, where we have no kings or monarchs, we use the word for a king in the neighbouring regions, especially the kings of Bolaang Mongondow, Sangi or Ternate. We usually only hear this term in tales and stories, in which such a king is commonly depicted as a barbarous, tyrannical figure. Sometimes, too, we find it in riddles, e.g. "Em baé ni kolano n de1' si tetéboan. Sapa itu? Em burénga," i.e. 'A house of a king, it has no windows. What is it? An egg' (Watuseke 1972:332, No. 20).

Further we also have the following occurrences: eng kolanona, lit. 'the king of it', i.e. 'the only bar in a window, which we still can find in some old houses'; also, 'the only ceiling beam that supports the ridge-pole (also in traditional houses)'.

In the Kakas dialect of the Tondano language, there is a shrub named kolano, i.e. 'the jarak pagar tree' (Jatropha curcas L.)

We also know this word as an obsolescent term, in other Minahasa languages for instance in Tonséa', Tombulu', Tontémboan and Tonsawang, all with the meaning of 'king, monarch, rajah'. In Ratahan and Ponoasakan we also have this term (Mededeelingen, p.421). In Tontémboan we find the following: "kolano 'monarch, king' (Tern. kolano, Jav. kělană), compare also the title dano or danu, at Batjan given to grandsons of the Sultan" (De Clercq 1890:268a quoted in Schwarz 1908:165).

In Bolaang Mongondow Dunnebier writes: "kolano 'monarch, king'; djou koţano 'Sir King'; this title is used too by some notable oldsters,
especially relatives, toward the monarch, but otherwise is little used
any more, except in tales. More usual is: ompoe datoé 'Sir Monarch',
etc." (Dunnebier 1951: 184). In Gorontalo we know the term kolano in
the form of galana with the meaning of "leader" (Bastiaans 1939: 67).

In the Sangi language: "kuâno 'rajah, king', an old word, little
used any more ...., at Talaud it is still in use" (Steller and Aebersold
1959: 234).

In Tontémboan this word is compared with the Ternatan (also Sangirese)
kolano, while in Bolaang Mongondow this word seems clearly to have been
adopted via the Ternate language, witness the expression djou kolano
'Sir King'.

Besides in Ternate, this word is also still to be found on Halmahera
Island and in its environs, and in the Northern part of Irian (= New
Guinea). In the Buli language we also have this word: "kolano, from
the Ternate 'king, monarch, sir'; djou kolâno 'Sir King, the principal';
loboré ni kolâno 'the king of our fingers, middle finger'" (Maan 1940:
49-50).

This term kolano we also find in the Tidore and West-Makian language.
In the Tobeló language it is koano, in the Pagu language kolan (Cowan
1957: 88).

In North-West Irian (= North-West New Guinea) as well, we find it in
a somewhat corrupted form, as in the Numfor language and in the Biak-
dialects korano, in Windesi koranu. It is one of the many titles of
the Irian family chiefs (J.L. and F.J.F. van Hasselt 1947: 126). In the
Waropen language it is korano, koranu, a title for a notable, village
head (Held 1942: 37) and in some districts on the North-East of West
Irian in Armopa and environs koranu is a village head (Koentjaraningrat,

When we inspect the area where this word occurs, it spreads over a
territory from North Sulawesi (Celebes) in the West, Sangi and Talaud
Islands in the North and as far as North-West Irian in the East. Now
this area indicates a territory that lay within the sphere of influence
of the Sultans of Ternate and Tidore in the past. This spread, too, is
proof that this term kolano was adopted from Ternate by all these above-
mentioned languages and dialects.

In all sources concerning the languages and dialects in North Sulawesi
and in Halmahera that we have consulted here, we are told that this
word kolano comes from Ternate. In Batjan and in Buli, there also
occurs another word, i.e. dano 'a title of nobility', that also comes
from Ternate and is cognate with the word kolano. Now, this area does
not indicate an area of cognate languages or related language groups,
in which case we could conclude that this word is indigenous to those
regions. On the contrary it indicates more an area of specific political influence in history, namely that of Ternate and of Tidore.

Compare the area of the kingdom of Ternate and of Tidore in the 17th century (Vlekke 1965:156, Vermaseren n.d.:82-3 and Muhammad Yamin n.d.:17-18) and the area of the linguistic groups in North Sulawesi and the Moluccas (Esser 1938:9b). These two areas do not coincide with each other.

If it were an original term in these regions, here we would limit ourselves to the language of the Austronesian family, and presume that the occurrence of this term in the North Halmahera language group is a result of adoption from neighbouring languages; then this term should still be found in other Austronesian languages in South Sulawesi and in the languages farther west. Yet this is not so. There exists indeed in the Western languages a word kelana (Malay, Sundanese) or kśiśānā (Javanese), that in all these languages means 'wanderer, knight errant', but all are adopted from the Sanskrit.

Sutan Mohammad Zain writes in his Bahasa-Indonesian Dictionary:

"kelana, 1. wanderer, knight errant; ...
2. title of nobility of Bugis origin in Riau;
   Engku Kelana, son of the Raja Muda in Riau, who
   will succeed his father." (Sutan Mohammad Zain n.d.:419)

In the Malay States we have seen, as St. Moh. Zain writes, that besides having the meaning of a "wanderer, a knight errant", it is also a royal title. Now the very relation of a wanderer, a knight errant and a royal title betray to us the origin of the Ternate kolano, the term for a monarch, king, that has the original meaning of a wanderer (Sutan Moh. Zain n.d.:419).

Let us look at what L.-C. Damais writes:

In the word list from Ternate drawn up by J. Fortgens, 
Woordenlijst van het Ternatesch, we can find indeed the
word kolano with the meaning of "king", related to the Malay
kelana. This latter word designates the Indonesian
equivalent of "the knights errant" of the European Middle
Ages, sometimes in a pejorative sense. In Javanese
theater, the kśiśānā is always a stranger from across the
sea (sabrang), with a violent and semimagical character ......

We do not have the means to investigate here whether there is an etymological relationship between the Ternatan word
kolano and the West Indonesian kśiśānā, but it is quite possible. In this case the Javanese word would be a
borrowing from Ternate, that eventually was used in epic
literature (especially the Pańji cycle), and in the theater, for any non-Javanese prince. But we must not forget that
the word is attested to as early as in the Ramayana, in the
Bharatayudha, which is dated accurately to 6-IX-1157 A.D..
If it is indeed a borrowing, it must have been a very early
one. (Damais 1957:669).
Damais says that he cannot definitely state whether there exists an etymological relationship between the Ternatan word kolano and the Javanese kēlānā, though it is very possible. He feels that it is a Javanese borrowing from the Ternatan (Damais also related this case to me personally when I visited him in Jakarta at the beginning of 1959, after he had asked me about the existence of the word kolano in the Minahasan languages). But now I personally feel it is just the other way around. The very pronunciation of the Javanese kēlānā leads me to conclude the opposite, as does the one-sided spread of the word in North-East Indonesia. The fact is that the Javanese kēlānā 'a stranger, who originates from beyond the sea', betrays that this was adopted by Ternatan from the Javanese and not the reverse.

We have seen above that it has also the same meaning of "wanderer, knight errant" and in addition has the meaning of "a royal title of Buginese origin in Riau". This same relation of "knight, wanderer" and "king, monarch" confirms my suspicion. Concerning the genesis of the little kingdoms in Indonesia B.H.M. Vlekke gives two types, in one of which a Malayan tradesman from Sumatra, Malaya or Java appears in less civilised islands; he is slyer and more clever than the aboriginal people: "He gathers supporters and slaves and organizes a guard sometimes consisting of criminals. Such a person becomes a "king", from the outer world" (Vlekke 1965:73).

About the Moluccas Vlekke writes as follows. Until the 12th century the Moluccas were unknown in history. The inhabitants did not know the market value of the spices that grew abundantly there. Chinese and Arabs first came in the 15th century. Indonesians from the Western islands became intermediaries and shipped spices to the trade centre. Some of the traders from other islands settled along the coasts, and, the primitive inhabitants withdrew into the interior after some disagreeable encounters with the shrewd and hard-fisted newcomers. In the new settlements, the richest merchant automatically became the leader, and, after a while, such a leader took the title of raja or king. Before the twelfth century no political organizations worthy of that name existed on the Moluccas, and it is probable that the rise of the first local government was closely connected with the extension of Javanese shipping to the islands, for from the beginning of Moluccan history the rules of Ternate, the first principality to be mentioned in this part of the archipelago, seem to have recognized the overlordship of the kings of Java, if only in name for business' sake (Vlekke 1965:52-3).

From the above we see that there is a relation between a "wanderer, knight errant" and a "king", so that the Javanese kēlānā with the meaning of "a wanderer, knight errant" has changed into the meaning of "king" in the Ternatan word kolano. In the Malay States, e.g. in Riau (to the East of Sumatra), it indicates a monarch of Bugis origin (also again a stranger, "wanderer") who obtained the title of kelana, as did his
son-successor (Sutan Mohammad Zain, n.d.:419). We have just seen that, at the coming into existence of kingdoms, it was not always a figure elected to be a chieftain who became king, but in regions less behind the times, sometimes "a stranger from the other side of the sea" became a chieftain and later on was recognized as a king. Such a king existed in Ternate. Vlekke, as quoted above, mentioned that a rich tradesman from among the newcomers, who could quite possibly have been of Javanese origin, made himself king. And this chieftain was a kelana 'wanderer, knight errant', or in his Javanese Kōlanā, and, after he had made himself king, the term was taken over as kolano in the Ternatan language. So a word meaning "wanderer" was identified with the meaning of "king", or indicates a new function of this wanderer in a new country, i.e. a king.

We also have a similar situation in the Malayan regions. There kelana means 'wanderer, knight errant, adventurer', and in addition this term is used as a title of nobility of a king of Buginese origin.

With the rise of the Ternatan kingdom (later on Sultanate), this term also spread to the territories mentioned above, that had come under Ternate's sphere of influence in the past. The word in question in the Minahasan language group, to which the Tondano language belongs, is now becoming obsolete, and now we use more the term Raja, borrowed from Malay and in turn from Sanskrit.

The coming into existence of the term kolano in the North-East part of Indonesia, we may say, coincides with the introduction and adoption of the institution of king or rajah in these parts of Indonesia.
The Minahasa language group comprises the languages of Tondano, Tombulu', Tonséa', Tontémboan and Tonsawang.

The other languages spoken in the Minahasa region such as Bantik, Ratahan and Ponošakan, are not grouped in the mentioned Minahasa language group, but the languages of Bantik and Ratahan (formerly called Bénten'an) form dialects of the Sangi language, and the Ponošakan language forms a dialect of the Bolaang Mongondow language. As known all these languages, namely the Minahasa languages, the Sangi and Talad languages and the Bolaang Mongondow language belong to the Philippine language group, this according to the Dutch linguist N. Adriani (Adriani and Kruijt, 1914). In 1914 Adriani made the first classification of all the languages on the Islands of Celebes (Sulawesi). S.J. Esser followed this classification with some modifications, namely he reduced the total to only 8 language groups comprising the languages of Sulawesi, on his linguistic map of Indonesia (Esser 1938). Another classification was made by Dyen (Dyen 1965) according to the lexicostatistical method but this is very incomplete concerning the languages of Sulawesi. Of the languages of the Northern part of Sulawesi he has treated only three languages namely Tontémboan (the only language in the Minahasa group in his classification), Gorontalo and Suwawa. The languages of Gorontalo and Suwawa he classified in the Philippine language group, but he could not classify Tontémboan in that group.

There are people who call Tonsawang in passing Tombatu, according to its capital or to the newly created administrative subdistrict (1920), but the first name Tonsawang is usually in use. In their history and anthropology the people of Bantik, Ratahan, Ponošakan and Tonsawang are not of the same origin as the speakers of the first-mentioned four languages and they are to be considered as later immigrants. That the
people of Tonsawang speak a highly cognate language is proof that these people have taken their language from the other Minahasa languages, especially from that of Tontémboan.
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