KELEY-I PHONOLOGY AND MORPHOPHONEMICS

LOU HOHULIN and MICHAEL KENSTOWICZ

Keley-i is a Malayo-Polynesian language spoken by approximately 5,000 people on Central Luzon in the Philippines between the Ibaloi and Ifugao territories. Although culturally Keley-i speakers are Ifugao, their language shares features of both adjacent families and has recently been placed in a separate group called Kallahan by Reid (1975). This study is based on the fieldwork of the first author and her husband who visited the Keley-i area many times between 1965 and 1974.

There are 23 phonemes in Keley-i, 18 consonants and five vowels.

p	t	c	k	ʔ		i		u
b	d	ǰ	g			e		o
	s	š		h			a	
m	n		ng					
w	l	y						

The palatal obstruents are inordinately rare, having arisen from palatalisations of dentals by y or occurring in borrowings from neighbouring languages where these sounds are as common as the stop consonants.[1] Aside from borrowed words like ʔiskul *'school'* and ʔistet *'States'*, s is a variant of t before i, as can be seen by the following forms where the infix -in- has been placed inside roots beginning with t: takang *'to open the mouth'*, s-in-ekang; tugun *'to advise'*, s-in-ugun. The remaining consonants have relatively free distribution except for n, which assimilates to the point of articulation of a following consonant, and ʔ. The glottal stop alternates with Ø in two situations. First, stems ending in a vowel take an inserted ʔ before pause and before a vowel. Thus, gesi *'to carve'* appears as gesiʔ at the end of a phrase

and as gesi?-an when the suffix -an has been appended to the stem.
Although /gesi?/ could be viewed as the underlying form and a rule
deleting ? before words beginning with a consonant invoked, the fact
that u glides to w before a vowel² militates against this approach: cf.
bayu 'to pound rice' which appears as bayu? before pause but as bayw-an
before a vowel. If /bayu?/ were the underlying form, an otherwise un-
necessary and unnatural rule deleting ? in the context u__V would be
required. On the other hand, if the underlying forms are /bayu/ and
/gesi/, all that is required is to order the rule gliding prevocalic
u before the rule that inserts ? between two vowels. The other ?-∅
alternation occurs with the affixes /in/ and /um/ which can appear
either prefixed or infixed. Their underlying shape emerges when they
are infixed, while when prefixed a glottal stop is inserted since no
Keley-i word begins with a vowel phonetically: cf. the forms of dilag
'to light' d-in-ilag, d-um-ilag, ?in-dilag, ?um-dilag. It should be
noted that all roots which begin with a glottal stop must be assumed
to have that sound present in their underlying forms, since the glottal
stop is not lost, even when preceded by a consonant-final prefix: cf.
?inum 'to drink', man-?inum. The contexts in which the glottal stop is
inserted in Keley-i are summarised in the following rule.

$$\emptyset \rightarrow ?/ \left\{ \begin{array}{l} \#\_\_V \\ V\_\_V \\ V\_\_pause \end{array} \right\}$$

Turning to the vowels, e is always lax while i and u are lax only
before syllable-final velars. Aside from a few words like to?on 'year',
o is limited to borrowings.

As in other languages of the Philippines, much of the morphology of
the verb in Keley-i is connected with the highlighting or bringing into
focus of a particular NP in the sentence. The syntactic aspects of
this Philippine phenomenon have been treated by a number of writers,
most recently by Schachter (1976). Since we are concerned with the
phonology and morphology of the Keley-i verb, only a brief description
of the syntactic facts will be presented here.

In every sentence a particular NP is highlighted or made the 'topic'.
It will usually correspond to a NP marked by the definite article in
English. Non-focused NPs in the sentence are usually indefinite.
Pronouns occur in a focus and a non-focus set (also oblique) while
nouns are marked by a binary system of particles.

	pronoun sets			particles	
	focus	non-focus		focus	non-focus
1sg.	?ak	ku	personal	hi	nan hi
2sg.	ka	mu	non-personal	hu/∅	ni
3sg.	∅	tu	locative	di/∅	di
1du.	?ita	ta			
1pl.excl.	kami	mi			
1pl.incl.	itsu	tayu			
2pl.	kayu	yu			
3pl.	?ida	da			

The verb is marked by a portmanteau morpheme expressing tense and
'agreement' with the highlighted NP in terms of its syntactic function
in the sentence. Thus, compare the two sentences below.

(a) b-imm-edbed hi Juan ni pa?ul.
     'John has bound some cane.'

(b) b-in-edbed nan Juan (hu) pa?ul.
     'John has bound the cane.'

In (a) the subject *'John'* is in focus, while the object *'cane'* (pa?ul)
is not. This is marked by the appropriate particles. The past tense
on the verb bedbed *'to bind'* is marked by the infix -imm- since it is
the subject of the sentence that is highlighted. On the other hand,
in (b) pa?ul is in focus and *'John'* is not. This necessitates a differ-
ent agreement marker on the verb. In this case the past tense is
marked by -in-, used to signal object focus. It should be noted that
the word order in Keley-i is fixed: Verb-Subject-Object. Transposition
of the subject and object in either (a) or (b) leads to an ungrammatical
sentence. Keley-i seems to differ in this respect from some other
Philippine languages where the word order is apparently more free.

    In addition to subject and object focus, Keley-i has what we will
call (c) accessory focus (used for instrumentals), (d) referent focus
(used when the action of the verb is directed to an object located in
a particular region of time or space), and (e) beneficial focus.
Examples of the past tense of bedbed in each of these foci follow.

(c) ?im-bedbed nan Juan ?etan ?ikat ni pa?ul.
                            that string
     'John has bound the cane with that string.'

(d) b-in-edbed-an nan Juan hu heli tu.
                           leg his
     'John has bound (it, e.g. the wound) on his leg.'

(e)   ʔim-bedbed-an nan Juan hi Pablo ni paʔul.
      'John has bound some cane for Paul.'

It should be pointed out that a Keley-i sentence frequently has only
two NPs per clause and for this reason some of the above sentences,
while perfectly grammatical, are a bit unnatural. When there are more
than two NPs in a clause, the focus NP must appear in one of the first
two NP slots. The subject must appear immediately after the verb, even
if it is not in focus. The position of the object, referent, accessory,
and beneficial NPs is dependent on which of these NPs is in focus.
This constraint accounts for the fact that the object paʔul occupies
the third NP slot in (c) and (e).

   Most of the morphophonemic alternations in Keley-i occur in the verb
inflection. In each of the five simple foci enumerated above, a verb
appears in an imperative form and three tense forms: past, present,
and future. The basic opposition is between past and non-past or more
accurately between perfective (completed action) and imperfective
(incompleted action). The imperfective is broken down into present
(action begun) vs. future (action not yet begun). As we shall see,
these two basic oppositions are reflected in various ways in the
morphology. The overwhelming majority of verb roots are disyllabic,
occurring in two canonical forms: CVCV(C) or CVCCV(C). Examples of
the latter type are ʔagtu *'to carry on the head'* and duntuk *'to punch'*.

subject focus	fut.	man-ʔagtu	ʔum-duntuk
	past	nan-ʔagtu	d-imm-untuk
	pres.	ka-man-ʔagtu	ka-ʔum-duntuk
object focus	fut.	ʔagtu-ʔen	duntuk-en
	past	ʔ-in-agtu	d-in-untuk
	pres.	ka-ʔagtu-ʔa	d-in-untuk
accessory focus	fut.	ʔi-ʔʔagtu	ʔi-dduntuk
	past	ʔin-ʔagtu	ʔin-duntuk
	pres.	ke-ʔi-ʔʔagtu	ke-ʔi-dduntuk
referent focus	fut.	ʔagtu-ʔan	duntuk-an
	past	ʔ-in-agtu-ʔan	d-in-utuk-an
	pres.	ka-ʔagtu-ʔi	ka-duntuk-i
beneficial focus	fut.	ʔi-ʔʔagtu-ʔan	ʔi-dduntuk-an
	past	ʔin-ʔagtu-ʔan	ʔin-duntuk-an
	pres.	ke-ʔi-ʔʔagtu-ʔi	ke-ʔi-dduntuk-i

Inspection of these paradigms reveals that, by and large, the present
and future are differentiated from the past in the same way and that

the present is differentiated from the future by the prefix ka-. Al-
though further analysis of the inflectional morphemes is possible (e.g.
the beneficial seems to combine the prefixes of the accessory with the
suffixes of the referent focus) we will ignore this here. Two morpho-
phonemic rules are operative in these paradigms. First, the a of the
present morpheme ka- is raised to e when followed by an i. The vowel
e also triggers this change (cf. ke-bedbed-an 'bind' obj. f. pres.).
Other prefixes of the shape Ca- do not exhibit this behaviour and so
this raising rule is limited to just this one morpheme. Second, note
that the root-initial consonants are geminated after the prefix ?i-.
This rule, like a number of other consonant gemination rules in Keley-i,
is limited to the present and future forms of the verb and thus supports
the opposition between perfective and imperfective. For example, the
imperative in the accessory focus is also marked by ?i-: cf. ?i-galgal
'chew!' vs. ?i-ggalgal acces. future; ?i-bedbed 'bind!' vs. ?i-bbedbed
acces. future. Also, in stative forms the prefix ?i- appears in all
tenses. Here we find gemination only in the present and future, as
seen below.

stative	fut.	me-?i-ggalgal-an	me-?i-bbedbed-an
	past	ne-?i-galgal-an	ne-?i-bedbed-an
	pres.	ke-?i-ggalgal-an	ke-?i-bbedbed-an

We thus require a rule geminating the root initial consonant after the
prefix ?i- in the imperfective aspect.

   We now turn to roots of the shape CVCV(C), which are much more
susceptible to morphophonemic change. The simplest types are those
whose first root vowel is high. For example, pili 'to choose' and
duyag 'to pour' are inflected as follows.

	subj. f.	obj. f.	acces. f.	ref. f.	ben. f.
fut.	?um-pilli	pilli-?en	?i-ppili	pilli-?an	?i-ppili-?an
past	p-imm-ili	p-in-ili	?im-pili	p-in-ili-?an	?im-pili-?an
pres.	ka-?um-pilli	ke-pilli-?a	ke-?ippili	ke-pilli-?i	ke-?i-ppili-?i
fut.	?um-duyyag	duyyag-en	?i-dduyag	duyyag-an	?i-dduyag-an
past	d-imm-uyag	d-in-uyag	?in-duyag	d-in-uyag-an	?in-duyag-an
pres.	ka-?um-duyyag	ka-duyyag-a	ke-?i-dduyag	ka-duyyag-i	ke-?i-dduyag-i

Note first that the nasal of the prefix ?um- is constant, while the
nasal in ?in- agrees in point of articulation with the first consonant
of the root. We shall return to this nasal assimilation rule later and
justify the assumption that the underlying nasal in ?in- is dental.

Secondly, we observe that the medial root consonant is geminated in
the non-past of the subject, object, and referent foci, but not in the
accessory or beneficial. Since in the latter two cases the initial
root consonant is doubled because of the presence of the prefix ?i-,
one might imagine that there is an incompatibility between a stem-
initial and medial geminate. However, there are other contexts where
both kinds of gemination occur, as in the following stative paradigm
of bitu *'to put'*.

    fut.   me-?i-bbittu-?an
    past   ne-?i-bitw-an
    pres.   ke-?i-bbittu-?an
    imper.   ?i-bitu

We thus require the following provisional statement of the medial gem-
ination rule: double the medial consonant of a CVCV(C) root in the
imperfective except in the accessory and beneficial focus.

    We now turn to CVCV(C) roots whose first vowel is e. hepung *'to
break a stick'* is inflected as follows.

	subj. f.	obj. f.	acces. f.	ref. f.	ben. f.
fut.	?um-hehpung	hehpung-en	?i-hhehpung	hehpung-an	?i-hhehpung-an
past	h-imm-epung	h-im-pung	?in-hepung	himpung-an	?in-hepung-an
pres.	ka-?um-hehpung	ke-hehpung-a	ke-?i-hhehpung	ke-hehpung-i	ke-?i-hhehpung-i

Let us discuss the past tense forms first. Like many other Philippine
languages, Keley-i has preserved the rule deleting the pepet vowel
from the first syllable of a root so long as an initial cluster or a
medial three-consonant cluster does not arise. Thus, past tense object
and referent forms like h-im-pung and h-im-pung-an from /h-in-epung(-an)/
result from loss of the e followed by the nasal assimilation rule. The
rule does not apply in the subject past h-imm-epung because the e is
preceded by a cluster nor, for the same reason, in the accessory and
beneficial past where the prefix ?in- creates a cluster with the root-
initial consonant. Forms like b-in-edbed *'bind'* object past show that
a following cluster also inhibits the rule. We thus formulate the
following rule of syncope, where the + stands for the stem boundary.

    $e \rightarrow \emptyset \ / \ V+C\_\_CV$

Turning now to the present and future forms, note that a copy of the
root-initial consonant is placed after the e. This process is presum-
ably related to the fact that the present and future is formed by
reduplication of the first root syllable in other Philippine languages.
Compare the following paradigm for sulat *'read'* in Tagalog.

        fut.   susulat
        past   s-um-ulat
        pres.   s-um-usulat

We thus assume that the root shape hehpung derives from hehepung via
the syncope rule. This in turn suggests that perhaps the medial gem-
ination process is the reflex of an historical reduplication of the
second root syllable. All we need assume is that upon reduplication
of a root such as pili to *pilili, the medial vowel was reduced to
pepet (*pileli) - a type of reduplication found in many American Indian
languages. Synchronically, however, there is no evidence that the
shape pilli arises from anything but a rule like medial gemination.
We thus have the following three stem modification rules, each restric-
ted to the present and future tenses.

        reduplication: $C_i eCV(C) \rightarrow C_i eC_i eCV(C)$

        medial gem.: $\emptyset \rightarrow C_i$ / $C[i,u,a]C_i\_\_V(C)$

        initial gem.: $\emptyset \rightarrow C_i$ / $?i-\_\_C_i$

Initial gemination may combine with either reduplication or with medial
gemination (except in the accessory and beneficial), while reduplication
and medial gemination are mutually exclusive. A form such as ?i-hhehpung
is derived as follows.

                        /?i-hepung/
        reduplication   ?i-hehepung
        initial gem.   ?i-hhehepung
        syncope   ?i-hhehpung

    CaCV(C) roots are more complex, as a glance at the inflection of
gabut *'to cut grass'* shows.

	subj. f.	object f.	acces. f.
fut.	mang-gebbut	gebbut-en	?i-ggabut
past	nang-gabut	g-in-ebut/g-im-but	?ing-gabut
pres.	ka-mang-gebbut	ka-gebbut-a	ke-?i-ggabut

	ref. f.	ben. f.
fut.	gebbut-an	?i-ggabut-an
past	g-in-ebut-an/g-im-but-an	?ing-gabut-an
pres.	ka-gebbus-i	ke-?i-ggabus-i

In the imperfective there is a change of the a root vowel to e whenever
the medial gemination rule has applied. This change does not occur
before any other consonant clusters - only those that result from medial

gemination (cf. ?agtu 'to head carry'). This alternation lends a
modest degree of support to the contention that medial gemination is
the reflex of an historical reduplication with reduction to pepet,
since if gebbut is derived from *gabebut, the rule fronting a to e
before i and e could account for this otherwise strange alternation.
Synchronically, however, it is clear that this rule is no longer pro-
ductive, as it affects only the present morpheme ka-. We thus require
another special stem modification rule that will switch a to e when
followed by a geminate that has arisen from the medial gemination rule.

   Turning now to the past tense forms, note that a has changed to e
in g-in-ebut and g-in-ebut-an. This is the result of a rule in Keley-i
that raises the first vowel of a CaCV(C) root to e when that vowel is
in the context VC__CV. The rule does not apply when the a is preceded
by a consonant cluster (?ing-gabut, ?i-ggabut) nor when followed by a
consonant cluster (?-in-agtu 'head carry'). The alternative pronunci-
ations g-im-but and g-im-but-an occur in more colloquial speech and can
be viewed as arising in one of two different ways. First, it is possible
that the e-syncope rule is being generalised to apply to a as well.
Alternatively, it is possible that the a is first raised to e and then
deleted in the colloquial style by the e-syncope rule. At this point
there is no way to decide between these two alternative analyses.

   Non-high vowels in the second root syllable are also subject to
morphophonemic change, but again only when they are in the context
VC__CV. In this context a and e delete. The following imperative and
past tense referent focus forms illustrate this aspect of Keley-i verbal
morphophonemics.

gaget	gags-i	*'hurry!'*
?ayag	?ayg-i	*'call him!'*
dilag	d-in-ilg-an	*'lighted'*
giked	g-in-ikd-an	*'prepared rice field'*

This behaviour differs from that displayed by a and e in the first root
syllable in two respects. First, there are no examples in which a
shifts to e and does not delete. Second, there are cases where a and
e fail to delete from the second root syllable even though in the con-
text VC__CV (see below); on the other hand, there are no examples where
e fails to syncopate from the first root syllable when in the context
VC__CV. These facts lead us to believe that there is a separate syncope
rule (syncope II) operating in the second root syllable that deletes
both a and e.

   [a,e] – ∅ / VC__C+V

Interesting problems arise when we consider referent past roots where both the first and the second vowel are non-high, for both are then in the context for morphophonemic change. In general what we find is that only one of the two syllables is affected – never both. In CeCeC and CeCaC roots, it is always the first root vowel that is deleted.

?edep	?-in-dep-an	'extinguished'
degeh	d-ing-geh-an	'was sick'
dengel	d-ing-ngel-an	'heard'
hegep	h-ing-gep-an	'entered'
depap	d-im-pap-an	'wrestled'
?ekal	?-ing-kal-an	'removed'
getad	g-in-tad-an	'beat gongs'

This may be described by simply ordering the first syncope rule before the second. When the former is applied, a consonant cluster is created, preventing application of the second syncope rule, as shown by the following derivation.

/d-in-epap-an/

d-in-pap-an	syncope I
inapplicable	syncope II
d-im-pap-an	nasal assimilation

In CaCeC and CaCaC roots two patterns occur. Usually the second root vowel is deleted and the first remains as a. When the second root vowel exceptionally fails to delete, the first a will raise to e but never deletes.

gaget	g-in-agt-an	'hurried'
?ameh	?-in-amh-an	'was jealous'
takew	s-in-ekew-an	'stole'
gatel	g-in-etel-an	'itched'
gawat	g-in-awt-an	'borrowed'
tapang	s-in-apng-an	'attracted'
hagad	h-in-egad-an	'swept'
gahal	g-in-ehal-an	'scooped'

This behaviour can also be described by simply ordering syncope II before the rule that raises a to e in the first root syllable. Deletion of the second root vowel creates a consonant cluster that prevents raising of the first root vowel. When syncope II exceptionally fails to apply, the a of the first syllable is now in the context VC__CV, and so raising does occur. The following derivations show how these rules work.

/g-in-aget-an/	/g-in-atel-an/	
inapplicable	inapplicable	syncope I
g-in-agt-an	inapplicable	syncope II
inapplicable	g-in-etel-an	raising

Note that if the one-step option of simply deleting a in g-im-but
from /g-in-abut/ is selected by generalising syncope I to apply to e
and to a (in the colloquial style), then we must order this rule before
syncope II when the first root vowel is e, but after syncope II when
the first root vowel is a. On the other hand, if the two-step method
of raising to e and then reapplication of syncope I is adopted, we
again have the same rules applying in different orders: syncope I would
occur before raising in the formal style and after raising in the
colloquial. Although phonological rules normally apply in the same
order for all derivations, Keley-i seems to be a language in which
different orderings occur rather often. The nasal assimilation process
presents a similar problem.

Keley-i contrasts nasal at three points of articulation: labial,
dental and velar. When standing before a consonant, n assimilates in
point of articulation, while m does not. There are no good examples
in which the behaviour of the velar nasal ng can be assessed. It does
not unambiguously appear in any prefix or infix and there are no stems
of the shape ngeCVC, where, upon deletion of the e, the assimilatory
nature of ng could be determined.

The prefix and infix (?)um- illustrates the constant non-alternating
nature of m.[3]

teled	?um-tetled	*'sting'*	?eba	?um-?e?ba	*'carry on back'*
dengel	?um-dedngel	*'hear'*	petut	p-um-tut	*'dam'*
kebed	?um-kekbed	*'scratch'*	bedad	b-um-dad	*'untie'*
gelid	?um-geglid	*'move'*			

The infix -in- assimilates the point of articulation of a following
consonant when inserted into a root of the shape CeCVC, since here
syncope I operates.

tepen	s-im-pen	*'measure'*	hemek	h-im-mek	*'pity'*
kebet	k-im-bet	*'scratch'*	tewik	s-in-wik	*'prick'*
petut	p-in-tut	*'dam'*	peyuh	p-in-yuh	*'bless'*
bedad	b-in-dad	*'untie'*	behat	b-in-hat	*'cut rattan'*
tekuk	s-ing-kuk	*'shout'*	de?ek	d-in-?ek	*'accuse'*
penel	p-in-nel	*'hold'*			

Since all Keley-i roots begin with a consonant, prefixes such as
the accessory past ʔin- and the intransitive nan- never occur before a
vowel, so their underlying final consonant can never be directly
observed. But since they exhibit exactly the same range of variants
as the nasal in the infix -in-, which is unambiguously a dental, they
may be safely assumed to also end in a dental nasal morphophonemically.

pehal	ʔim-pehal	*'crack bamboo'*			
behat	ʔim-behat	*'cut rattan'*	ʔala	ʔin-ʔala	*'get'*
tewik	ʔin-tewik	*'prick'*	bayu	nam-bayu	*'pound rice'*
dengel	ʔin-dengel	*'hear'*	degeh	nan-degeh	*'hurt'*
keleng	ʔing-keleng	*'sacrifice'*	gubat	nang-gubat	*'fight'*
gitek	ʔing-gitek	*'cut'*	hiʔgut	nan-hiʔgut	*'knot'*
heged	ʔin-heged	*'wait'*	ʔawit	nan-ʔawit	*'get'*

We thus formulate the following rule of nasal assimilation, ordered
after syncope.

$$n \rightarrow \begin{bmatrix} \alpha \text{ point of} \\ \text{articulation} \end{bmatrix} \Big/ \underline{} \begin{bmatrix} + \text{ cons} \\ \alpha \text{ point of} \\ \text{articulation} \end{bmatrix}$$

Since the oral and laryngeal glides are [-cons] they will not trigger
assimilation and the underlying dental nasal of ʔin- and nan- will
show up before these sounds.

There is another set of prefixes in Keley-i that invoke a deletion
of the root-initial consonant. These prefixes mark the contrastive
identification of the agent of the verb and when the subject is pro-
nominal, the oblique set is used and the pronoun appears before the
verb. Compare ʔum-beyyu ʔak ni pagey *'I'll pound some rice'* and
hiʔg-ak mem-eyyu ni pagey *'I'll be the one to pound some rice'*. In
this set of prefixes, the perfective is marked by nen- and the imper-
fective by men-: cf. the various forms of gubat *'fight'*: meng-ubbat,
neng-ubat, ke-meng-ubbat. Taking the past tense prefix as the para-
digmatic example, note that in the following data it exhibits the same
range of alternation as ʔin- and man-.

bayu	nem-eyu	*'pound rice'*
patey	nem-etey	*'kill'*
duntuk	nen-untuk	*'hit'*
gubat	neng-ubat	*'fight'*
hulat	nen-ulat	*'cover'*

Assuming that the underlying form of the contrastive identification
prefix is nen-, it is clear that nasal assimilation must precede the

rule deleting the root-initial consonant after this type of prefix.
But this leads to an ordering paradox. Nasal assimilation precedes
root-initial consonant deletion. But the latter rule must precede
syncope, as the following forms show.

pedug	nem-dug	*'chase'*
beka	nem-ka	*'dig'*
kebet	neng-bet	*'pick up'*

For it is only by the deletion of the root-initial consonant that the
VC__CV environment for syncope is created. A form like nem-dug would
be derived as follows.

/nen-pedug/
nem-pedug	nasal assimilation
nem-edug	root-initial consonant deletion
nem-dug	syncope

Note that in the above data the final nasal of the prefix agrees in
point of articulation with the deleted root-initial consonant. In the
following forms, on the other hand, the nasal agrees with the medial
consonant.

teba	nem-ba	*'kill pig'*	depu	nem-pu	*'possessed by spirit'*
tepen	nem-pen	*'measure'*	dengel	neng-ngel	*'hear'*
temel	nem-mel	*'plant sprouts'*	hemek	nem-mek	*'pity'*
teled	nen-led	*'sting'*	hepaw	nem-paw	*'possess'*

What accounts for this difference? Clearly it is the fact that the
root-initial consonant in these stems is one before which no assimilation
of the prefixal nasal occurs and upon the deletion of the e, nasal assim-
ilation applies to assimilate the final n of nen- to the medial consonant
of the root. But this implies that nasal assimilation follows syncope,
completing the ordering paradox. On this analysis, a form such as
nem-ba would be derived as follows.

/nen-teba/
vacuous	nasal assimilation
nen-eba	root-initial deletion
nen-ba	syncope
nem-ba	nasal assimilation

The Keley-i ordering paradox crucially depends of course on the
identity of the nasal assimilation that occurs in the prefix nen- and
that which occurs after the syncope rule. So far they have been exactly
identical. There is, however, one factor which calls this identification

into (serious?) question. This is the fact that the nasal in nen-
assimilates to a root-initial glottal stop, while the other prefixes
ʔin-, nan-, etc. as well as the nasal-consonant clusters resulting
from syncope do not.

ʔala	ʔin-ʔala	*'get'*
ʔawit	nan-ʔawit	*'get'*
ʔinum	neng-inum	*'drink'*
ʔeba	neng-ba	*'carry on back'*
deʔek	nen-ʔek	*'accuse'*

We thus require a modification in the rule of assimilation for nen- so
that its final nasal will assimilate to a root-initial glottal stop.
But no such assimilation occurs for ʔin- and nan-. Is this difference
enough to justify the conclusion that there are two separate nasal
assimilation rules in Keley-i? If so, then the ordering paradox is
resolved.

The question of whether two phenomena are part of the same rule or
not is of course one of the most difficult issues facing contemporary
phonological theory. Until a theoretical clarification of this issue
occurs, the Keley-i nasal assimilation problem remains open.

N O T E S

1. For example, Keley-i išu *'we* (incl.)' corresponds to Kalanguya
itayu. As we shall see, a is raised to e in certain positions in
Keley-i and may then drop out, giving *ityu. Also, the frozen form
iyeja *'it is here'* can be related, at least historically, to deya *'here'*
from earlier *iye-dya.

2. Gliding of u to w before a vowel does not take place if a cluster
of three consonants would arise. Hence, no gliding occurs when ʔagtu
is followed by a vowel. Instead, the rule inserting a glottal stop
between vowels applies.

3. This morpheme is infixed in subordinate clauses and prefixed in
main clauses.

BIBLIOGRAPHY

REID, Lawrence A.

    1975   'The Pronominal System of Proto-Cordilleran, Philippines'. *Working Papers in Linguistics, University of Hawaii* 6/6: 1-12.

SCHACHTER, Paul

    1976   'The Subject in Philippine Languages: Topic, Actor, Actor-topic, or None of the Above?'. In: Charles N. Li, ed. *Subject and Topic*, 491-518. New York: Academic Press.