

AUSTRONESIAN AND MON-KHMER COMPONENTS IN THE PROTO CHAMIC VOWEL SYSTEM

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1. INTRODUCTION¹

The Austronesian speakers who arrived on the coast of the Southeast Asian mainland spoke a basically disyllabic language with a relatively modest vowel inventory. The morphemes were typically disyllabic, more specifically, CVCV(C), and there were four basic vowels: *-a, *-i, *-u, *-e (= [-ə]) and three final diphthongs: *-ay, *-ui, and *-aw; the four vowels occurred in both syllables of the disyllabic forms while the diphthongs were restricted to the final syllable.

Under the influence of what was apparently more than casual contact with Mon-Khmer (MK) languages, this pre-Chamic Austronesian (An) language adopted the main-syllable stress of the neighbouring MK languages, a change that had consequences both for the morpheme structure and for the vowel inventories of Proto Chamic (PC). By the time of PC, the formerly disyllabic Austronesian roots had become iambic (in the sense of Donegan 1993); that is, the formerly disyllabic morphemes came to have an unstressed initial syllable followed by a stressed main syllable. This iambic PC stress pattern is certainly reflected in the contrasts between the vowel inventories of the pre-syllable and the main syllable. Unlike in the Austronesian disyllables where there was a balanced four-way vowel contrast in both syllables,² in PC the vowel inventories are anything but symmetrical: in the unstressed PC pretonic syllable, the four-way Austronesian vowel distinction has been reduced to a three-way distinction while in the stressed main syllable the same four-way distinction, has been expanded to 18 or so distinct vowels, not counting length contrasts.³

Some of these new main-syllable vowels developed out of splits of inherited Austronesian vowels, but the bulk of the forms with new vowels are found in pre-Chamic borrowings from MK. Thus, the main vowels of PC include two readily discernible historical layers: those vowels inherited from Austronesian, which form the core of the basic vowel system, and

¹ A large number of people provided me with wide-ranging assistance in the preparation of this paper. Especial thanks are due to Mark Durie, David Solnit, Bob Blust, Jerry Edmondson, Karen Mistry and Elzbieta Thurgood. The paper is based on work supported by the National Science Foundation under Grant No. SBR-95121101.

² However, it appears that this four-way Austronesian vowel distinction was already on its way to becoming a three-way distinction in parts of Western Malayo-Polynesian.

³ It needs to be pointed out, however, that some of the expansion of the vowel inventory is due to borrowing from MK.

those vowels which primarily reflect MK influence and overwhelmingly occur in pre-Chamic MK borrowings.

While distinguishable, the two layers are not completely distinct: sometimes the phonology of the MK borrowings matched the phonology of the Austronesian lexicon, making the borrowed form indistinguishable on purely phonological grounds from inherited Austronesian forms; undoubtedly, sometimes the phonology of the MK borrowings was restructured by the pre-Chamic speakers to match the phonology of the Austronesian lexicon, again making the forms blend phonologically with the inherited Austronesian forms; but, in a way that is at times strikingly obvious, sometimes new phonological contrasts accompanied the MK borrowings.

Among forms carrying new phonological contrasts, the overwhelming majority of the words are identifiable as MK loans into pre-Chamic, while the bulk of the remaining forms are potentially of MK origin as they lack etymologies, Austronesian or otherwise. However, although overwhelming preponderance of forms containing new vowels are MK borrowings or possible MK borrowings, sprinkled in among the MK forms, there are also usually one or two words with straightforward, well-attested Austronesian etymologies. Two things appear to have happened in such words. First, the MK contact led to the development and phonemicisation of a vowel distinction already present in the phonetics of the Austronesian forms. Second, the development of the new sound in an Austronesian form would have significantly lessened the need to restructure the incoming MK loan words containing this vowel.

1.1 THE LITERATURE

The literature on Chamic vowels contains considerable discussion of the correspondences between An and PC (e.g. Blood 1962, Pittman 1959 and Thomas 1963), as well as a more limited discussion of the reflexes between PC and the modern Chamic languages (primarily Lee 1966, but also Burnham 1976 and others). However, two more recent developments make it possible to clarify, expand upon, and, in some cases, revise this earlier work. First, there has been a greatly expanded awareness of precisely which forms are MK borrowings; the use of Headley (1976) augmented by preliminary reconstructions of two branches of Mon-Khmer found in Vietnam (H. Blood 1968; Smith 1972) not only has allowed the recognition of a large number of MK loans but also—in conjunction with other revisions—has made it possible to work out a rough chronology for many of the loans, classifying them as either pre-Chamic or post-PC loans. Second, the database has expanded enormously, leading to numerous revisions in the individual lexical items and some modification in the overall schema, although much of Lee's outline is still quite workable today. In addition, of course, other recent literature in Chamic studies has also contributed to our understanding of PC vowels and their correspondences (e.g., Ni 1988a, 1988b, 1990a, 1990b; Haudricourt 1984; Benedict 1984; Blust 1969, 1980a, 1980b, 1981, 1983–84, 1986, 1989).

The only work to set out main vowel correspondences of PC was Lee (1966). Since then expanded knowledge of various Chamic languages makes the time appropriate for revisions. One source of revision is the realisation that some 10% of Lee's reconstructed forms are MK borrowings, many of them not even pre-Chamic borrowings but post-PC borrowings and thus are not legitimate input to PC reconstruction. The removal of these post-PC borrowings from the database eliminates certain of Lee's marginally attested vowel correspondence

patterns completely while simplifying others. A second development leading to the modification of Lee's protoforms is a reanalysis of his treatment of nasalised vowels. Lee often reconstructed nasalised vowels to account for the failure of certain Roglai word-final nasals to denasalise. However, the elimination of late borrowings from the database allows an alternative treatment of the Roglai patterns, which in turn makes it clear that the Roglai changes are internal to Roglai and, thus, no longer reconstructable to PC. Finally, as the result of modifications in the treatment of numerous individual words, it has been possible to reconstruct *ɔ̃ where Lee reconstructs both *ɔ̃ and *o. This treatment reassigns the various *ɔ̃ reflexes largely to *ə, but occasionally elsewhere. As a general consequence of the accumulation of numerous minor revisions, this paper provides new reconstructions of the PC main vowel reconstructions, modifying Lee (1966).

As has already become obvious, this discussion of PC main-syllable vowels divides the relevant discussion into four time periods: the Austronesian period predating contact with MK languages; the pre-Chamic period, in which early contact occurred but which predates what we reconstruct as PC; the stretch of time during which what we reconstruct as PC Chamic was spoken; and the period following the break-up of PC.

1.2 PC VOWEL LENGTH

As will become clear later, vowel length in PC involves the interaction of the Austronesian inherited vowels with the MK vocalic contributions to PC. Here it is enough to make several comments on the distribution of vowel-length contrasts. In PC, vowel length occurs only for specified vowels and then only in certain contexts. As Lee (1966:117) noted, the "length contrast seems to be fairly certain for *a, *u, and *ɔ̃, but (as is true of the daughter languages) is limited to certain environments". The questions in the reconstruction of length revolve around determining precisely those finals before which length occurs and those before which it does not occur. The PC *a occurs both long and short before final -ʔ, -ŋ, -k, -l, -r, and marginally before -t (see Table 26). The PC *ɔ̃ occurs both long and short before final -ʔ, -ŋ, and -k (see Tables 36–40). The PC *u occurs both long and short before final -ʔ and -ŋ (see Tables 11 and 13–16).

Other residual evidence of vowel length seems to exist in various daughter languages but it is not (yet?) possible to reconstruct it. For instance, the length distinctions in Rade suggest that there may have once been a distinction between -a:m and -am; however, if so, it has been totally obscured elsewhere by subsequent developments throughout Chamic.

TABLE 1: CONSTRAINTS ON THE OCCURRENCE OF PC VOWEL LENGTH

*-ǎ- versus *-a:-	/__?; /__ŋ; /__k; /__l; /__r; /__n; /__t (marginal)
*-ǒ- versus *-ɔ̃:-	/__?; /__ŋ; /__k
*-ǔ- versus *-u:-	/__?; /__ŋ

Notes on tables:

- a) An in these tables refers to an Austronesian reconstruction that at least predates Chamic; many of these forms, of course, do not reconstruct all the way back to Austronesian. Two levels of borrowed entities are distinguished: borrowings

predating PC are marked by †^* with the † indicating that the form was borrowed and the $*$ indicating that nonetheless it reconstructs back to PC. Borrowings postdating PC are simply marked by † . Most likely all the $*\text{ə}$ forms should be prefaced in one of these ways.

- b) Apparent irregularities in the correspondences are indicated by a hyphen followed by a consonant indicating precisely what is irregular: -v = irregular vowel, -c = irregular consonant, -f = irregular final, -vr = irregular vowel register, -t = irregular tone, -ⁿ = irregular nasalisation, -l = irregular length, -iv = irregular initial and vowel, -ivf = irregular initial, vowel, and final, -r = irregular correspondence for /r/, -vǵ = the initial vowel is irregular, and so on.
- c) The symbol (m) indicates metathesis.
- d) 'Bahnar (AC)' refers to the Bahnar forms cited in Aymonier and Cabaton (1906).

2. THE PC MAIN-SYLLABLE VOWELS INHERITED FROM AUSTRONESIAN

The pre-contact Austronesian language that was to become Chamic had a vowel system consisting of four main vowels, occurring in either syllable, and three diphthongs, occurring only in the second syllable (see Table 2).

TABLE 2: An MAIN VOWEL REFLEXES IN PC

An second-syllable vowels			PC main-syllable vowels	
$*i$	$*u$		$*-j-$	$*-u-$
			$*-əi$	$*-əu$
$*e$ [ə]		→	$*ă$	
$*a$			$*a$	
$*ay$	$*uy$		$*-ay$	$*-ui$
$*aw$			$*-au$	

The reflexes of these Austronesian vowels in PC are straightforward for the most part, with the subsequent PC reflexes set out in the tables below. In certain cases, particular developments are discussed in more detail. The essence of the An > PC changes, however, is relatively simple. The two high Austronesian vowels underwent splits, diphthongising in final position, but remaining $-i-$ and $-u-$ in closed syllables; these developments are also further conditioned in minor ways by an apparent interaction with stress placement (see discussion at §2.1 below). Austronesian shwa became $*ă$ before certain finals but merged with $*a$ before others; this led to a length distinction between PC short $*ă$ and PC long $*a$ before the finals where $*ă$ was maintained (see Table 3 and further discussion in §2.5).

The original An shwa is realised as PC short $*ă$ (Table 3); note that the PC words reconstructed with shwa are not inherited from An, but instead are borrowed from MK! The realisation of An shwa as PC $*ă$, by introducing a contrast with PC $*a$, introduced a vowel-length distinction into PC.

TABLE 3: An *e [= ə] > PC *-ǎ- REFLEXES

An	PC	Rade	Jarai	Roglai	Chru	Haroi	WCham	PR Cham	
*ajeng	*ǎ-	<i>hədǎŋ</i>	<i>hədǎŋ</i>	<i>hadak</i>	<i>hədaŋ</i>	---	<i>tǎŋ</i>	<i>haʔǎŋ</i> ; <i>ʔaŋ</i>	char- coal
<i>taŋek</i>	*ǎ-	<i>kənǎʔ</i>	<i>tənǎʔ</i>	<i>tanǎʔ</i>	<i>tənǎʔ</i>	<i>cənǎʔ</i>	<i>tanəʔ</i>	<i>tanǎʔ</i>	cook
<i>lemak</i>	*ǎ-	<i>emǎʔ</i>	<i>rəmaʔ</i> -l	<i>lumǎʔ</i>	<i>ləmaʔ</i>	<i>ləmǎʔ</i>	<i>laməʔ</i>	<i>limǎʔ</i> ; <i>lamǎʔ</i>	fat; grease
*le(m)- <i>beng</i>	*ǎ-	<i>bǎŋ</i>	<i>bǎŋ</i>	<i>bak</i>	<i>baŋ</i>	<i>bǎŋ</i>	---	<i>bǎŋ</i>	hole; door
*gatel	*ǎ-	<i>kətǎl</i>	<i>kətal</i>	<i>katan</i>	<i>kətal</i>	<i>kətǎl</i>	<i>katǎl</i>	<i>katǎl</i>	itchy
<i>hiket</i>	*ǎ-	---	<i>ʔakǎʔ</i> ; <i>kǎʔ</i>	<i>ikaʔ</i>	<i>akaʔ</i>	<i>ʔakǎʔ</i>	<i>kǎk</i>	<i>ikǎʔ</i> ; <i>kǎʔ</i>	to tie
<i>qulej</i>	*ǎ-	<i>hluǎt</i> (m)	<i>hlǎt</i> ; <i>hluǎt</i> (m)	<i>hulaʔ</i>	<i>həlaʔ</i>	---	<i>hlǎʔ</i>	<i>halǎʔ</i>	worm; caterpillar

Note: Forms in the Austronesian column without an asterisk are from Blust; however, such forms are only claimed to predate PC. Austronesian forms with an asterisk are from a myriad of other sources.

The new length distinction occurred before the final consonants *-ʔ, -ŋ, -k, -l, -r, and, more marginally, before -t, causing a distinction between short PC *ǎ (< largely from An *e [ə]) and long PC *a (< largely from An *a). In other environments, An *e [= *ə] merged at some point with PC *a, although with further research it still may be possible to extend the reconstruction of the PC vowel-length difference to additional environments. For example, the reflexes of An *-em in PC are almost always *-ǎm, but nonetheless it has not been possible as yet to reconstruct a distinction between *-am and *-ǎm. Perhaps later research will allow a vowel-length distinction to be teased out in this context, but this has not been done yet.

The next historical stage involves the break-up of PC into its daughter languages. The various PC vowel reflexes are relatively clear, making it possible to represent the changes fairly adequately in various tables (cf. Table 4). There are, of course, little oddities such as sporadic metathesis scattered throughout Chamic and instances here and there of unaccounted-for nasalisation (neither of which will be discussed here), but although interesting in themselves, these oddities are a very minor part of the vowel reflex patterns.

TABLE 4: REFLEXES OF PC INHERITED MAIN-SYLLABLE VOWELS

An	PC	Rade	Jarai	Roglai	Tsat	Chru	Haroi	WCham	PR Cham
*i	*-əi	-ei	-əi	-əi	-ai	-əi	-ǎi; -ii	-ay	-ǎy
	*i-	-i-	-i-	-i-	-i-	-i-	-e-; -eiʔ; -i-	-i-	-i-
*u	*-əu	-ǎu	-əu	-əu	-au; -(i)ə	-əu	-ǎu; -ǎu	-au	-ǎw

An	PC	Rade	Jarai	Roglai	Tsat	Chru	Haroi	WCham	PR Cham
	*u-	-u-	-u-	-u-	-u-	-u-	-o-; -ou-; -u-	-u-	-u-
*e	*a-	-a	-a	-a	-a	-a	-a; -ia	-a	-a
*uy	*ui-	-ui	-ui	-ui	-ui	-ui	-oi; -ui	-ui	-uy
*ay-	*ay-	-ie	-ai	-ai	-a:i ²	-ai	-ai; -iai	-ai	-ay
*aw	*au-	-au	-au	-au	-au	-au	-a:u; -iau	-au	-aw
*a-	*a	a	a	a	a	a	a; ia	a	a

Note: Vowel length is not shown in this table and will be discussed later. The former existence of vowel registers in Haroi accounts for the dual Haroi reflexes for each PC vowel.

In this paper, only two of the more notable PC vowel reflex patterns are given further discussion. In Western Cham and Phan Rang Cham, PC *a and *ǎ have an interesting set of conditioned reflexes, which are discussed below in some detail (§2.5).

The other PC vowel reflexes of particular interest are found in Haroi, which has what Huffman (1976) termed 'restructured register'. These Haroi changes will not be discussed in any detail here, but they have been discussed elsewhere in the literature by others (Lee 1977; Burnham 1976) and by myself (Thurgood 1996, 1997). These fascinating vowel splits were the focus of some early work by Lee (1977) and by Burnham (1976), who both correctly deduced that the vowel splits correlated with the earlier presence of vowel registers. Some of the details of the conditioning factors still remain to be figured out.

2.1 REFLEXES OF PC *-j- AND *-j

In the stage from An to PC, the reflexes of the Austronesian high vowel *j split: in open stressed syllables, it became PC *-əj (the PC reflexes of which are reflected in Table 5), while in closed syllables (and, apparently, in unstressed open syllables), it remained *-j- (the PC reflexes of which are reflected in Table 6).

TABLE 5: REFLEXES OF PC *-əj < An *-j

An	PC	Rade	Jarai	Roglai	Tsat	Chru	Haroi	WCham	PR Cham
-j	*əj	-ɛj; -uɛ (m)	-əj	-əj; -uəj (m)	-aj	-əj	-i:j; -ǔj	-ay	-ǔy
								[m = metathesis]	

The fact the split was conditioned both by the openness of the syllable and by the presence of stress becomes much more obvious when the data in Table 7 is examined.

TABLE 6: REFLEXES OF PC *-j- < An *-j-

An	PC	Rade	Jarai	Roglai	Chru	Haroi	WCham	PR Cham
---	*j-	-ih	-ih	-ih	-ih	-ih; -ǐh; -th; -ǔh; -ɛh	-ih	-ǐh; -ih

An	PC	Rade	Jarai	Roglai	Chru	Haroi	WCham	PR Cham
---	*i-	-ĩm	-ĩm; -im	-ip	-im	-ĩm; -em	-ĩm	-ĩm
---	*i-	-ĩp	-ip	-iu?	-iu?	-ip	-iu?	-ĩw?
---	*j-	-ĩ?	-ĩ?	-i?	-i?	-ĩ?; -ei?	-ĩ?	-ĩ?
---	*j-	-ĩt	-i?; -it	-i?	-i?	-i?; -ei?	-i?	-i?
---	*j-	-ĩl	-ĩl	-in	-il	-ĩl; -el	-ĩl	-ĩl
---	*j-	-ĩr	-ĩr	-i	-i	-ei	-i	-i
---	*j-	-ĩn	-in; -ĩn	-in; -it	-in	-ĩn; -ěn	-ĩn	-ĩn
---	*j-	-ĩŋ	-ĩŋ	-iŋ	-iŋ	-iŋ	-əŋ	-ĩŋ

The Austronesian open syllable *-i reflexes do not unexceptionally go to PC *əi. In a handful of ‘grammatical’ morphemes, the open-syllable *i displays a unique pattern of reflexes (see Table 7), albeit a pattern that matches the reflex pattern for *-i except for the Rade and the Haroi reflexes. In effect, except for the split Rade reflexes and the Haroi reflexes, the reflex pattern is the pattern for closed syllable *-i-.

TABLE 7: PC OPEN SYLLABLES WITH *-i IN UNSTRESSED SYLLABLES

The pattern:

Malay	PC	Rade	Jarai	Roglai	Chru	Haroi	WCham	PR Cham
---	*-i	-ei	-i	-i	-i	-i; -ei	-i	-i

The examples:

An	PC	Rade	Jarai	Roglai	Chru	Haroi	WCham	PR Cham	
<i>di</i>	*-i	<i>ti</i>	---	---	<i>tə-</i>	---	---	<i>ti</i>	at
<i>sini</i>	*-i	<i>tineĩ</i>	---	<i>tinĩ</i>	<i>ni</i>	<i>ni</i>	<i>ni</i>	---	here
<i>ini; ni</i>	*-i	<i>tineĩ</i>	<i>?anai</i>	<i>kunĩ</i>	<i>ni</i>	<i>?ani</i>	<i>ni; nu ??</i>	<i>ni</i>	this
---	*-j	---	---	---	---	<i>tĩ?-v</i>	---	---	particle
<i>kami</i>	*-i	<i>həmeĩ</i>	<i>gəməĩ</i>	<i>labu?</i>	---	<i>kəmei;</i>	---	<i>kami</i>	we (exc.)
			-iv	<i>kamĩn?</i>		<i>kəme -v</i>			

The pattern immediately in Table 7 is quite exceptional, as the overwhelmingly dominant pattern for the word final *-i is for it to become *əi in PC. Although there are several borrowed forms with similar reflexes, the forms in Table 7 are inherited forms, not borrowings. The set itself consists of several demonstratives, a particle, and a pronoun. A careful look at the syntax and semantics of these forms shows they all have something in common: they are all ‘grammatical’ forms and, more crucially, they are all typically unstressed, not stressed. Thus, the lack of stress in these forms seems to be the reason that these words have not patterned with the stressed An *-i > PC *əi forms.

Actually, a more careful study of the variation in the Rade and the Haroi reflexes suggests, not that these forms were unstressed in every context, but rather that in some contexts the forms were stressed and in some they were unstressed, with either the stressed form or the unstressed form ultimately winning out on a case-by-case basis.

A small number of PC **-j* finals came from other sources. Two forms appear inherited from Austronesian (see Table 8).

TABLE 8: TWO OTHER INHERITED FORMS WITH PC OPEN SYLLABLE **-j*

An	PC	Rade	Jarai	Roglai	Chru	Haroi	WCham	PR Cham	
<i>sisir</i>	<i>*-j</i>	<i>kəsi</i>	<i>təsi</i>	<i>kasi</i>	<i>təsi</i>	<i>cəsei</i>	<i>tasi</i>	<i>tathi</i>	a comb
<i>pagi</i>	<i>*-j</i>	<i>məgi</i>	<i>pəgi</i>	<i>pagi</i>	<i>pəgi</i>	<i>pəkht</i>	<i>pəke</i>	<i>pəke</i>	tomorrow
		-v					-v	-v	

Headley (1976) identifies ‘comb’ as a borrowing from MK, but, if it is, its presence in Malay as *sisir* suggests that if it was borrowed, it was borrowed into An before PC; thus, the reflex still needs to be explained. In this case, the explanation lies in the final **-ir*. Paralleling Austronesian forms involving final **-ur* (§2.2), the change from An **-j* > PC **əj* occurred before the change An **-ir* > PC **-j*; as a consequence, the **-j* did not undergo the change from **-j* > **əj*.

However, with the form *pagi*, which shows up in Malay as *pagi*, there is no explanation for the unexpected PC final **-j*.

The remaining forms with a PC final **-j* all appear to be loans (Table 9). In some cases, Headley has identified it as a loan; in other cases, various other irregularities suggest it is a loan.

TABLE 9: APPARENT BORROWINGS WITH PC OPEN SYLLABLE **-j*

An	PC	Rade	Jarai	Roglai	Chru	Haroi	WCham	PR Cham	
---	<i>*-j</i>	<i>ei</i>	<i>rəʔi</i>	<i>laʔi</i>	---	<i>lə--i</i>	<i>laʔi</i>	<i>lii</i>	basket, winnowing
		(Headley (#1.5) identifies this as a MK loan.)							
---	<i>*-j</i>	<i>εa</i>	<i>həni</i>	<i>ia</i>	<i>həni</i>	<i>həni</i>	<i>ea</i>	<i>hani</i>	bee;
		<i>hənuε (m)</i>		<i>hunī</i>			<i>hani</i>		honey
		(cf. Vietnamese <i>ongmật</i>)							
---	<i>*-j</i>	---	<i>kli-j</i>	---	---	<i>cəlei</i>	---	<i>tali</i>	flat (of large rocks)
---	<i>*-j</i>	<i>ki</i>	<i>təki</i>	<i>tuki</i>	<i>təki</i>	<i>cəke</i>	<i>take</i>	<i>take</i>	horn; antler
		-v				-v	-v		
		(Headley (#1.34) identifies this as a MK loan; it also looks like a PLB form.)							
---	<i>*-j</i>	<i>kətrəi</i>	---	<i>katri</i>	<i>kətrəi</i>	<i>kətrəi</i>	<i>katray</i>	---	scissors
					-f	-vf			

(Headley (#1.5) identifies this as a MK loan. Another source suggests *kələkati* ‘areca-nut scissors’ from Tamil.)

Little question exists whether most, if not all, the above forms are loans. However, with at least several of the forms, there is some question about the relative chronology of the loan. Certainly, ‘horn; antler’ and ‘scissors’ look like loans that postdate the break-up of PC.

2.2 REFLEXES OF PC*-u, *-ǔ-, AND *-u:-

In the stage from An to PC, the reflexes of the An high vowel *u split: in open stressed syllables, it became PC *-əu (the PC reflexes of which are reflected in Table 10), while in closed syllables, it remained *-u- (the PC reflexes of which are reflected in Table 11).

TABLE 10: REFLEXES OF PC *-əu < An *-u

An	PC	Rade	Jarai	Roglai	Tsat	Chru	Haroi	WCham	PR Cham
-u	*-əu	-ǎu	-əu	-əu	-au; -(i)ə	-əu	-ǎu; -ǎu	-au	-ǎw

In closed syllables, An *-u- become PC *-u- (the PC reflexes of which are reflected in Table 11).

TABLE 11: REFLEXES OF PC *-u- < An *-u-

An	PC	Rade	Jarai	Roglai	Tsat	Chru	Haroi	WCham	PR Cham
---	*u-	-uh	-uh	-uh	-u ⁵⁵	-uh	-ǔh; -uh; -ǔh; -oh	-uh	-ǔh
-us	*u-	-uih	-uih	-uh	-u ⁵⁵	-u:h	-ih; -oh	-uh	-ǔh
---	*u-	-ǔn	-ǔn	-ut; -un	-un	-un	-ǔn; -ǔn	-ǔn	-ǔn
---	*u-	-ǔm	-um; -ǔm	-up	---	-um	-ǔm; -ǔm	-um	-ǔm
---	*ǔ-	-ǔŋ	-uŋ; -ǔŋ	-uk; -uŋ	-uŋ	-uŋ	-ǔŋ; -ǔŋ; -oŋ	-uŋ	-ǔŋ
---	*u:-	-uŋ	-oŋ; -uŋ	-u:k	-uŋ	-ɔ:ŋ; -o:ŋ	-uŋ; -oŋ; -o:ŋ	-oŋ	-oŋ
---	*ǔ-	-ǔʔ	-ǔʔ	-uʔ	---	-uʔ	-ǔʔ; -ǔʔ; -ǔʔ	-ǔʔ	-ǔʔ
---	*u:-	-ǔʔ	-ǔʔ	-uʔ	---	-u:ʔ	-uʔ; -uʔ; -ǔuʔ; -oʔ	-uʔ; -oʔ	-uʔ; -oʔ

In addition to forms borrowed from MK, a small number of PC *-u finals are inherited from Austronesian (see Table 12).

TABLE 12: PC OPEN SYLLABLES FROM An *-ur FINALS

The pattern:

An	PC	Rade	Jarai	Roglai	Chru	Haroi	WCham	PR Cham
*-ur	*u	-u	-u	-u	-u	-o:u	-u	-u

The examples:

Malay	PC	Rade	Jarai	Roglai	Chru	Haroi	WCham	PR Cham	
ekor	*u-	ku	?aku	iku	aku	?ako:u	hla ku	---	tail
nyor	*u-	---	---	laʔu	laʔu	laʔu	laʔu	liu	coconut palm
kujur	*u-	kju	təju -i	---	---	kəsu	---	---	spear; lance

Malay	PC	Rade	Jarai	Roglai	Chru	Haroi	WCham	PR Cham	
<i>telur</i> (egg)	* <i>u-</i>	---	---	---	<i>klu</i>	---	---	<i>klu</i>	scrotum (animal)

The pattern immediately above is interesting, as it reconstructs as PC **u*, rather than the expected PC **əu*. Quite obviously, in pre-Chamic word-final **u* became **əu*, and then the loss of final **r* in **ur* rhymes produced a set of new inherited word-final **u* finals. In addition, of course, there are a number of other word-final PC **u* forms, but probably these are mostly early loans.

It is significant that the developments in Acehnese closely parallel the developments in mainland Chamic languages. That is, although the normal Acehnese reflex for word-final **u* is *-èe*, the word for 'tail' is *iku*, suggesting that the Acehnese forms paralleled the mainland Chamic forms in development. Although the evidence will not be given in this paper, work in progress substantiates the long-held belief that Acehnese is simply another Chamic language, albeit one that left the mainland at an early date.

In addition to the reflexes already discussed, **u* also has a limited vowel length distinction: **u* is found both long and short before final *-ʔ* (Tables 13 and 14) and final *-ŋ* (Tables 15 and 16). What is clear, however, is that at least some of the forms containing both the long and the short vowels are from Austronesian sources; it is also equally obvious that some of the forms in both categories come from MK sources.

One might suggest that, among the Austronesian descended forms, the short forms descend from **uk*, while the long ones descend from **ut*, as the single form in Rade, *mənūt* 'banyan' with its final *-t* suggests, but without further data this is of course speculation. Similarly, the form *ribut* 'storm' ends in *-t* in Malay. However, at present, all this is essentially nothing more than unsubstantiated speculation.

TABLE 13: SHORT *-u-* BEFORE FINAL *-ʔ*

PC	Rade	Jarai	Roglai	Chru	PR Cham	
* <i>-ūʔ</i>	<i>-ūʔ</i>	<i>-ūʔ</i>	<i>-uʔ</i>	<i>-uʔ</i>	<i>-ūʔ</i>	
* <i>ʔaṅūʔ</i>	<i>aṅūʔ</i>	<i>ʔaṅuʔ</i> <i>-vɿ</i>	<i>aṅūʔ</i>	---	<i>ṅuʔ</i>	beads
* <i>ṅūʔ</i>	<i>ṅūʔ</i>	<i>ṅūʔ</i>	<i>ṅūʔ</i>	<i>ṅuʔia</i>	<i>ṅūk-f</i>	dive; submerge
* <i>mabūʔ</i>	---	---	<i>babuʔ</i>	<i>məbuʔ</i>	---	drunk
* <i>manūʔ</i>	<i>mənūʔ</i>	<i>mənūʔ</i>	<i>manūʔ</i>	<i>mənūʔⁿ</i>	<i>mīnūʔ</i>	fowl; chicken
* <i>ʔadūʔ</i>	<i>adūʔ</i>	<i>ʔadūʔ</i>	<i>aduʔ</i>	<i>aduʔ</i>	<i>aʔūʔ; tūʔ</i>	room
* <i>bitūʔ</i>	<i>mətūʔ</i>	<i>pətuʔ</i>	<i>pituʔ</i>	<i>pətuʔ-f</i>	<i>pitūʔ; patūʔ;</i> <i>patūʔ</i>	star

TABLE 14: LONG -u- BEFORE FINAL -ʔ

PC	Rade	Jarai	Roglai	Chru	PR Cham	
*-uʔ	-ũʔ	-ũʔ	-uʔ	-uʔ	-uʔ; -oʔ	
*kaʔuʔ	---	kəʔũʔ	---	---	---	barkcloth
*guʔ	gũʔ	---	---	---	kuʔ	below, lower
*juʔ	jũʔ	jũʔ	juʔ	juʔ	çuʔ	black
*yuʔ	---	yũʔ	---	---	---	descend
		'west'				
*taguʔ	kəgũʔ	təguʔ	tagu:k-f	təguʔ	takoʔ	get up
*tuʔ	tũʔə	tũʔ	tuʔ	---	toʔ	to receive
*ribuʔ	ebũʔ	rəbũʔ	rubuʔ	rəbuʔ	ripuʔ; rapuʔ	storm
*kaʔuʔ	---	kəʔũʔ	---	kəʔũʔ ⁻ⁿ	---	worried; sad
*puʔ	pũʔ	---	puʔ	poʔ	---	carry in arms

Among the short vowels, there are several words with good Austronesian etymologies (apparently, for example, 'flour', 'mortar', and 'nose') as well as established MK borrowings. In contrast, at least preliminarily all the long vowels appear to be restricted to MK borrowings.

TABLE 15: SHORT -u- BEFORE FINAL -ŋ

PC	Rade	Jarai	Roglai	Chru	PR Cham	
---	-ũŋ	-ũŋ; -uŋ	-uk; -uŋ	-uŋ	-ũŋ; -uŋ	
*rabũŋ	ebũŋ	reɓũŋ	rubuk	rəbuŋ	ripuŋ; rapũŋ	bamboo shoot
*bũŋ	bũŋ	buŋ	---	buŋ	puŋ	basket, large
*tapũŋ	kəpũŋ	təpũŋ	tupuk	təpuŋ	tapũŋ	flour
*risũŋ	esũŋ	rəsũŋ	risuk	ləsuŋ -i	lithũŋ	mortar
*ʔidũŋ	adũŋ	ʔadũŋ	idūk	aduŋ	iʔũŋ	nose
*ʔanũŋ	anũŋ	ʔanuŋ	---	---	anũŋ	package
*salũŋ	---	hlũŋ	saluk	---	---	pit, trench
*kadũŋ	---	kəduŋ	---	kəduŋ	---	pocket; bag
*katũŋ	kətũŋ	kətuŋ	katuk	kətuŋ	---	pull
*tũŋ	---	---	tuk	tuŋ	tũŋ	stomach
*dũŋ	dũŋ	---	duk	---	---	wrap up
*phũŋ	phũŋ	phuŋ	phuŋ -f	---	---	leper; leprosy
*gulũŋ	---	gluŋ	paguluk;	pərləŋ -v	kalũŋ	to roll
			taguluk			

(probably borrowed from Malay; see p.84 of Shorto)

* (li)hũŋ tɛi huŋ-l huŋ lahɔŋ -f ləhɔŋ -v --- papaya

(Mon-Khmer; Headley, #1.46)

TABLE 16: LONG *-u-* BEFORE FINAL *-ŋ*

PC	Rade	Jarai	Roglai	Chru	PR Cham	
---	<i>-uŋ</i>	<i>-oŋ; -uŋ</i>	<i>-u:k</i>	<i>-ɔ:ŋ; -o:ŋ</i>	<i>-oŋ</i>	
* <i>ʔamu:ŋ</i> ?	<i>amuŋ</i>	---	<i>amu:k</i>	<i>amu:ŋ - v;</i> <i>tərmung</i>	---	bunch; ear; stalk
* <i>caku:ŋ</i>	<i>kəkuŋ</i>	<i>cəkuŋ</i>	<i>caku:k</i>	<i>səko:ŋ</i>	<i>cakoŋ; takoŋ</i>	carry
* <i>ɗu:ŋ</i>	<i>ɗuŋ</i>	---	<i>ɗu:k</i>	<i>ɗo:ŋ</i>	---	float
* <i>ʔu:ŋ</i>	<i>uŋ</i>	<i>ʔoŋ</i>	---	---	---	male; husband
* <i>ʔamu:ŋ</i>	<i>amuŋ</i>	---	<i>mū:k -f</i>	<i>mɔ:ŋ</i>	---	snout
* <i>pu:ŋ</i>	---	---	---	<i>apo:ŋ</i>	---	straw (rice)
* <i>bru:ŋ</i>	<i>bruŋ</i>	<i>broŋ</i>	---	---	---	streaked; striped

All the examples of long *-u-* before *-ŋ* appear to be from MK, but this remains speculation until more work has been done.

2.3 REFLEXES OF PC **-ay* AND **-au*

The reflexes of PC **-ay* and **-au* are straightforward and well-attested. The only particularly interesting reflex is in Tsat, where the final **-y* strengthens to a glottal stop.

TABLE 17: REFLEXES OF PC **-ay* AND **-au*

An	PC	Rade	Jarai	Roglai	Tsat	Chru	Haroi	WCham	PR Cham
<i>-ay</i>	* <i>ay</i>	<i>-ie;</i> <i>-ai</i> (loans)	<i>-ai</i>	<i>-ai</i>	<i>-a:iʔ;</i> <i>-a:i</i> (loans)	<i>-ai</i>	<i>-ai;</i> <i>-iai</i>	<i>-ai</i>	<i>-ay</i>
---	* <i>au</i>	<i>-au</i>	<i>-au</i>	<i>-au</i>	<i>-a:u;</i> <i>-au</i>	<i>-au;</i> <i>-a:u</i>	<i>-a:u;</i> <i>-iau</i>	<i>-au</i>	<i>-aw</i> (length is with apparent loans)

The other interesting dimension to the reflexes of these two vowels is that they are, in effect, the long counterparts to the word-final PC **-ɔi* and **-əu*, which developed word-finally from An **-i* and **-u*, respectively.

2.4 REFLEXES OF PC **-ui*

The reflexes of PC **-ui* are straightforward.

TABLE 18: REFLEXES OF PC **-ui*

An	PC	Rade	Jarai	Roglai	Tsat	Chru	Haroi	WCham	PR Cham
<i>-uy</i>	* <i>ui-</i>	<i>-ui</i>	<i>-ui</i>	<i>-ui</i>	<i>-ui</i>	<i>-ui</i>	<i>-ui;</i> <i>-oi</i>	<i>-ui</i>	<i>-uy</i>

2.5 REFLEXES OF PC *a, *-ǎ-, AND *-a:-

Although sometimes subject to minor variation conditioned by the syllable-final consonant, the reflexes of PC *a in open syllables, and *-ǎ- and *-a:- in closed syllables are quite regular in PC.

TABLE 19: REFLEXES OF PC *-a, *ǎ, and *a:-

An	PC	Rade	Jarai	Roglai	Tsat	Chru	Haroi	WCham	PR Cham
---	*-a	-a	-a	-a	-a	-a	-ia; -a	-a	-a
-ah	*a-	-ah	-ah	-ah	-a ⁵⁵	-ah	-ah; -iah	-ah; -ih	-ah; -ih
-as	*a-	-aih	-aih	-a	-a	-a:h	-ah; -iah	-ah	-ǎh
---	*a-	-am; -ǎm	-am; -ǎm	-ap; -am	---	-am	-iam; -ǎm; -am	-ǎm	-ǎm
---	*a-	-ǎp	-ǎp	-a [?] ; -ǎ [?]	---	-a [?] ; -ǎu [?]	-au [?]	-au [?]	-ǎ [?]
---	*ǎ-	-ǎŋ	-ǎŋ	-ak	---	-aŋ	-ǎŋ	-ǎŋ	-ǎŋ
---	*a:-	-aŋ	-aŋ	-a:k	---	-a.ŋ	-a:ŋ; -aŋ	-aŋ; -iŋ	-aŋ; -ǎŋ (occasional)
---	*ǎ-	-ǎ [?]	-ǎ [?]	-a [?]	---	-a [?]	-ǎ [?] ; -ia [?]	-ǎ [?] ; -ɔ [?]	-ǎ [?] ; -ɨ [?]
---	*a:-	-ǎ [?]	-ǎ [?]	-a [?]	---	-a [?]	-a [?]	-a [?]	-a [?]
---	*ǎ-	-ǎk; -ǎ [?]	-ǎk; -ǎ [?]	-ak; -a [?]	---	-a [?]	-ǎ [?]	-a [?]	-a [?] ; -ak
---	*a:-	-ak	-ak	-a [?]	---	-a [?]	-a [?]	-a [?] ; -i [?]	-a [?] ; -ɨ [?]
---	*ǎ-	-ǎr	-ǎr	-a	---	-ar	-al; ---	-ǎr	-ǎr
---	*a:-	-ar	-ar	-a	---	-a:r	-al; ---	ar	-ǎr; -ar
---	*ǎ-	-ǎl	-al	-an	---	-al	-ǎl	-ǎl	-ǎl
---	*a:-	-al	-al	-an	---	-a:l	-al	-al	-al
---	*ǎ-	-ǎn	-ǎn	-an; -at	---	-an	-ǎn	-ǎn; -in	-ǎn
---	*a:-	-an	-an	-a:n; -a:t	-a:n	-a:n	-ian; -an	-an; -in; -in	-an; -in; -in
---	*ǎ-	-ǎt	-ǎt; -ǎ [?]	-a [?]	---	-a [?]	-ǎ [?]	-ǎ [?]	-ǎ [?]
---	*a:-	-at	-at; (marginal)	-a [?]	---	-a [?]	-at; -a [?]	-a [?]	-a [?]
---	*ac	-ač	-ǎi [?]	-a:i [?]	-ai [?]	-a:i [?]	-ai [?] ; -iai [?]	-ai [?]	-ay [?]

The marginally attested pattern noted above refers to the contrast between long and short *-a- before a final *-t. More evidence may strengthen this correspondence, or, conversely, eliminate it.

The PC *a occurs both long and short before final -ɔ, -ŋ, -k, -l, -r, and marginally before -t (see Table 26). It is widely suggested in the literature that the length distinction in PC correlates with certain Acehnese vowel distinctions; a careful examination of the two fully substantiates that claim for these vowels.

TABLE 20: LONG AND SHORT -a- BEFORE FINAL -ʔ

PC	Rade	Jarai	Roglai	Chru	PR Cham	
*-ǎʔ	-ǎʔ	-ǎʔ	-aʔ	-aʔ	-ǎʔ; -ɿʔ	
*hunǎʔ	---	---	hunǎʔ	hǎnaʔ	hanɿʔ	asthma
*bǎʔ	bǎʔ	bǎʔ	baʔ	baʔ	pǎʔ	carry on back (borrowing?)
*tǎʔ	---	tǎʔ	taʔ	taʔ	---	chop; cut
*tanǎʔ	kǎnǎʔ	tǎnǎʔ	tanǎʔ	tǎnaʔ	tanɿʔ	cook
*lamǎʔ	emǎʔ	rǎmaʔ	lumǎʔ	lǎmaʔ	limɿʔ; lamɿʔ	fat, oil, grease
(Bahnaric rǎmǎ, lǎmǎ)						
*paghǎʔ	---	pǎkhǎʔ	pakǎʔ-v	khaʔ	khǎʔ	forbid
*ŋǎʔ	ŋǎʔ	ŋǎʔ	ŋǎʔ	ŋaʔ	ŋǎʔ cf. ŋǎʔ	make, do
*urǎʔ	arǎʔ	?arǎʔ	---	araʔni	urǎʔ; arǎʔ	now
*tisǎʔ	kǎsǎʔ	tǎsǎʔ	tisaʔ	tǎsaʔ	tathǎʔ	ripe; cooked
*tapǎʔ	kǎpǎʔ	tǎpaʔ	tupaʔ	tǎpaʔ	tapǎʔ	straight; honest
*mǎʔ	mǎʔ	mǎʔ	mǎʔ	maʔ	mǎʔ	take; get
*ikǎʔ	---	?akǎʔ; kǎʔ	ikaʔ	akaʔ	ikǎʔ; kǎʔ	to tie
*surǎʔ	hrǎʔ	hrǎʔ	suraʔ	sraʔ	harǎʔ	write; book
*-aʔ	-ǎʔ	-ǎʔ	-aʔ	-aʔ	-aʔ	
*tanaʔ	---	tǎnǎʔ	---	---	---	faggot; bamboo strip
*paʔ	pǎʔ	pǎʔ	paʔ	paʔ	paʔ	four
*jaʔ	djǎʔ	?jǎʔ	djaʔ	---	---	hold; carry
*blaʔ	---	---	blaʔ	blaʔ	blaʔ	open eyes
*palaʔ	plǎʔ	plǎʔ	palaʔ	plaʔ-v1	palaʔ	wide palm; sole

TABLE 21: LONG AND SHORT -a- BEFORE FINAL -ŋ

PC	Rade	Jarai	Roglai	Chru	PR Cham	
*-ǎŋ	-ǎŋ	-ǎŋ	-ak	-aŋ	-ǎŋ	
*glǎŋ	dlǎŋ	---	---	---	klǎŋ	look at
*lawǎŋ	---	---	---	rǎwaŋ	rawǎŋ -i	visit
*hadǎŋ	hǎdǎŋ	hǎdǎŋ	hadak	hǎdaŋ	haʔǎŋ	charcoal
*khǎŋ	khǎŋ	khǎŋ	khak	khaŋ	khǎŋ	hard; stiff
(Vietnamese ?)						
*bǎŋ	bǎŋ	bǎŋ	bak	baŋ	bǎŋ	hole; door
*hǎŋ	hǎŋ	hǎŋ	hak	haŋ	hǎŋ	hot; spicy

(Mon-Khmer; Headley, #1.35 & Shorto)

PC	Rade	Jarai	Roglai	Chru	PR Cham	
*wǎŋ	wǎŋ	---	wak	wəŋ	wǎŋ	sickle
*pǎŋ	---	pǎŋ	---	---	---	wall, make
*lanǎŋ	enǎŋ	rənǎŋ	lanak -f	lənəŋ	lanĩŋ	earthworm
*-a:ŋ	-aŋ	-aŋ	-a:k	-a:ŋ	-aŋ; -ǎŋ	
*plǎŋ	plǎŋ	---	plak	pla:ŋ-l	---	lemon grass
*dra:ŋ			dra:k	dra:ŋ		rhinoceros
						hornbill
*kra:ŋ	----	kra:k	kəra:ŋ -v ¹		---	clam;
shellfish						
*raba:ŋ/n	kəban	---	raba:k	rəba:ŋ	ripaŋ;	bridge
-if	-f				rapaŋ	
(Mon-Khmer; Headley, #1.10)						
*pina:ŋ	mənəŋ	pənəŋ	pinǎŋ-l	pənə:ŋ	paniŋ	betel; betel-nut
*cana:ŋ	---	cənəŋ	canǎŋ	chənə:ŋ	taniŋ	bed
*d'a:ŋ	d'aŋ	d'aŋ	d'a:c	d'a:ŋ	daŋ	(lie) on back
*ha:ŋ	haŋ εa	haŋ	ha:k	---	---	bank; shore
*kala:ŋ	tlaŋ	klaŋ	kala:k	kəla:ŋ	---	hawk; kite
(Mon-Khmer; Headley, #1.38)						
*tula:ŋ	klaŋ	təlaŋ	tula:k	təla:ŋ	talaŋ	bone
*ka:ŋ	kaŋ	kaŋ	ka:k	təlka:ŋ; kaŋ	kaŋ	chin; jaw
(Mon-Khmer; Headley, #1.12)						
*cad'a:ŋ;	kəd'aŋ	cəd'aŋ	cad'a:k	chədə:ŋ;	radǎŋ	crack open
*rad'a:ŋ				sədə:ŋ	-m	
*pagha:ŋ	bhaŋ-i	pəkhaŋ	pakha:k			dry over fire
*rala:ŋ;	hlaŋ	hlaŋ	rala:k	rəla:ŋ	---	grass, thatch
*kala:ŋ						
*ja:ŋ	---	---	ja:k	ja:ŋ	---	to guard;
(Sanskrit; Coope)						gate(way)
*luba:ŋ	---	---	luba:k	ləba:ŋ	lipaŋ;	hole; pit
					lapaŋ	
*sa:ŋ	saŋ	saŋ	sa:k	sa:ŋ	thaŋ	house
*pisa:ŋ	---	---	pisa:k	pəsa:ŋ	pathaŋ	husband
(Sanskrit)						
*ura:ŋ	arǎŋ-l	?arǎŋ	ura:k	ara:ŋ	uraŋ	person
*huda:ŋ	hədaŋ	hədaŋ	huda:k	həda:ŋ	hatǎŋ; taŋ	shrimp; lobster
*ya:ŋ	yaŋ	yaŋ	ya:k	ya:ŋ	yaŋ	spirit; god
*la:ŋ	laŋ	laŋ	la:k	la:ŋ	laŋ	spread out
*luwa:ŋ	ewaŋ	rəwaŋ	luwa:k	ləwa:ŋ	liwaŋ	thin; lean
*caba:ŋ	kəbaŋ	---	jabha:k	chəba:ŋ	cabaŋ	branch; fork
*kata:ŋ	kətaŋ	kətaŋ	---	kədə:ŋ-l	---	strong; well

PC	Rade	Jarai	Roglai	Chru	PR Cham
* <i>*piŋan</i>	<i>məŋan</i>	---	---	---	<i>paŋin-</i> dish

(Hindi < Persian; Coope)

TABLE 22: LONG AND SHORT -a- BEFORE FINAL -k

PC	Rade	Jarai	Roglai	Chru	PR Cham	
*- <i>āk</i>	- <i>āk</i> ; - <i>ǎʔ</i>	- <i>āk</i> ; - <i>ǎʔ</i>	- <i>ak</i> ; - <i>aʔ</i>	- <i>aʔ</i>	- <i>aʔ</i> ; - <i>ak</i>	
* <i>tagāk</i>	<i>kəgǎʔ</i>	<i>təgǎʔ</i>	<i>tagak</i>	<i>təgak</i> -f	---	bush knife
* <i>?alāk</i> -f (Arabic)	---	---	<i>alak</i>	<i>alak</i> -f	<i>alāk</i>	wine; liquor
* <i>taglāk</i>	<i>kədlāk</i>	<i>təglāk</i>	---	<i>tərglaʔ</i>	---	choke
* <i>gatāk</i>	<i>kətāk</i>	<i>kətāk</i>	<i>kataʔ</i>	<i>kətaʔ</i>	<i>katǎʔ</i>	sap; resin
* <i>parāk</i>	<i>prāk</i>	<i>prāk</i>	<i>pariaʔ</i>	<i>priaʔ</i>	<i>paryǎʔ</i> ; <i>pirak</i> (white)	silver; money
* <i>?alāk</i>	<i>alǎʔ</i>	<i>?alǎʔ</i>	---	---	---	yolk
*- <i>a:k</i>	- <i>ak</i>	- <i>ak</i>	- <i>aʔ</i>	- <i>aʔ</i>	- <i>aʔ</i> ; - <i>iʔ</i>	
* <i>rata:k</i>	<i>etak</i>	<i>rətaʔ</i>	<i>rataʔ</i>	<i>rətaʔ</i>	<i>riʔaʔ</i> ; <i>rataʔ</i>	bean; pea
* <i>paʔa:k</i>	<i>pǎl-ak</i>	<i>pəʔǎʔ</i>	<i>paʔaʔ</i>	<i>pəʔaʔ</i>	<i>paaʔ</i>	armpit
* <i>?ana:k</i>	<i>anak</i>	<i>?anǎʔ</i> -l	<i>anǎʔ</i>	<i>anaʔ</i>	<i>anǎʔ</i>	child
* <i>?a:k</i>	<i>ak</i>	<i>?aʔ</i>	<i>aʔ</i>	<i>chim aʔ</i>	<i>aʔ</i>	a crow
(Mon-Khmer)						
* <i>mañā:k</i>	---	---	<i>mañāⁿʔ</i>	---	<i>miñiʔ</i>	oil
(from Cham? Shorto p.87)						
* <i>?amra:k</i>	<i>amrak</i>	---	<i>amraʔ</i>	<i>amrǎiʔ</i> - ⁿ	<i>mraʔ</i> ; <i>amraʔ</i>	peacock
(Mon-Khmer; Headley, #1.47)						
* <i>ha:k</i>	<i>hak</i>	<i>hak</i>	<i>haʔ</i>			split
* <i>?awak</i>	<i>awak</i>	---	---	<i>awaʔ</i>	<i>awaʔ</i>	spoon; ladle
(Mon-Khmer; Headley, #1.61)						
* <i>ja:k</i>	<i>jak</i>	<i>jak</i>	<i>jaʔ</i>	---	<i>çaʔ</i>	invite

TABLE 23: LONG AND SHORT -a- BEFORE FINAL -l

PC	Rade	Jarai	Roglai	Chru	PR Cham	
*- <i>āl</i>	- <i>āl</i>	- <i>al</i>	- <i>an</i>	- <i>al</i>	- <i>āl</i>	
* <i>taŋāl</i>	<i>kəŋāl</i>	---	---	---	<i>taŋəh</i> -fv	deaf
* <i>patāl</i>	---	---	---	<i>pətal</i>	<i>patār</i>	pillow
* <i>gatāl</i>	<i>kətāl</i>	<i>kətal</i>	<i>katan</i>	<i>kətal</i>	<i>katāl</i>	itchy
* <i>sapāl</i>	<i>pāl</i>	<i>həpal</i>	<i>sapan</i>	<i>spal</i>	<i>hapāl</i>	arm (fore-)
* <i>dāl</i>	---	<i>dāl</i>	---	---	---	to wedge

PC	Rade	Jarai	Roglai	Chru	PR Cham	
* <i>mǎl</i>	---	<i>mal</i>	<i>mān</i>	<i>mal</i>	<i>mǎl</i>	beam
* <i>sanǎl</i>	<i>anal-</i>	<i>hənal</i>	<i>sanān</i>	---	---	pillow
* <i>-a:l</i>	<i>-al</i>	<i>-al</i>	<i>-an</i>	<i>-a:l</i>	<i>-al</i>	
* <i>pra:l -v</i>	<i>pral</i>	<i>prǎn</i>	<i>pran</i>	<i>pra:n</i>	<i>prǎn</i>	strong; well
* <i>*ja:l</i>	<i>jal</i>	<i>jal</i>	<i>jan</i>	<i>ja:l</i>	<i>çǎl -l</i>	net, casting
(Indo-European; Headley, #2.6; Sanskrit <i>jaala</i>)						
* <i>kapa:l</i>	<i>kəpal</i>	<i>kəpal</i>	<i>kapan</i>	<i>kəpa:l</i>	<i>kapal</i>	thick
* <i>ka:l</i>	<i>kal</i>	<i>kal</i>	---	<i>kal -l</i>	---	to lock; bolt
* <i>ba:l</i>	---	<i>bal</i>	<i>ban</i>	<i>ba:l</i>	<i>pal</i>	mend; patch
* <i>bana:l</i>	<i>mənal</i>	<i>bənal</i>	<i>banān</i>	---	---	rag
* <i>kata:l</i>	---	---	<i>katan</i>	<i>kəta:l</i>	<i>katal</i>	thunder; lightning

TABLE 24: LONG AND SHORT -a- BEFORE FINAL -r

PC	Rade	Jarai	Roglai	Chru	PR Cham	
* <i>-ǎr</i>	<i>-ǎr</i>	<i>-ǎr</i>	<i>-a</i>	<i>-ar</i>	<i>-ǎr</i>	
* <i>*asǎr</i>	<i>asǎr</i>	---	---	---	<i>athǎr</i>	seed
(Sanskrit <i>saara</i>)						
* <i>padǎr</i>	---	<i>pədǎr;</i> <i>pədər</i>	<i>pada</i>	<i>pədar</i>	---	spin; turn
* <i>padǎr</i>	---	---	<i>padǎ</i>	<i>pədǎr</i>	---	tell, send
* <i>-a:r</i>	<i>-ar</i>	<i>-ar</i>	<i>-a</i>	<i>-a:r</i>	<i>-ǎr; -ar</i>	
* <i>baʔa:r</i>	<i>məar</i>	---	<i>baʔa</i>	<i>bəʔa:r</i>	<i>piar</i>	paper
* <i>ba:r</i>	---	---	<i>ba</i>	---	<i>bǎr</i>	coiled
* <i>da:r</i>	<i>dar</i>	<i>dar</i>	---	---	---	encircle
* <i>*usa:r</i>	---	<i>*asǎr;</i> <i>*asǎr</i>	<i>usa</i>	<i>asa:r</i>	<i>athǎr</i>	flesh, meat
* <i>cha:r</i>	<i>čhar</i>	---	<i>cha</i>	<i>sa:r</i>	<i>char</i>	gong
* <i>wa:r</i>	<i>war</i>	<i>war</i>	<i>wa</i>	<i>wa:r</i>	<i>wal -f</i>	stable; pen

TABLE 25: LONG AND SHORT -a- BEFORE FINAL -n

PC	Rade	Jarai	Roglai	Chru	PR Cham	
* <i>-an</i>	<i>-ǎn</i>	<i>-ǎn</i>	<i>-an; -at</i>	<i>-an</i>	<i>-ǎn</i>	
* <i>*apǎn</i>	---	---	<i>apat</i>	<i>apan</i>	<i>apǎn; pǎn</i>	hold; take
* <i>ŋǎn</i>	<i>ŋǎn</i>	<i>ŋǎn</i>	---	---	---	money
* <i>*aŋǎn</i>	---	---	---	<i>aŋan</i>	<i>aŋǎn;</i> <i>ŋǎn</i>	name
(Sanskrit ?)						
* <i>*anǎn</i>	<i>anǎn</i>	<i>*anǎn</i>	<i>anān</i>	---	---	name
* <i>*klǎn</i>	<i>tlǎn</i>	<i>klǎn</i>	<i>tlat</i>	<i>klan</i>	<i>klǎn</i>	boa; python

(Mon-Khmer; Headley, #1.50)

PC	Rade	Jarai	Roglai	Chru	PR Cham	
* <i>*khǎn</i>	---	<i>khǎn</i>	<i>khat</i>	<i>khan</i>	<i>khǎn</i>	cloth
(Vietnamese <i>khǎn</i> 'towel; handkerchief')						
* <i>*gǎn</i>	<i>gǎn</i>	<i>gǎn</i>	<i>gat</i>	---	<i>ḡǎn</i>	cross; pass over; go past
* <i>-a:n</i>	<i>-an</i>	<i>-an</i>	<i>-a:n; -a:t</i>	<i>-a:n</i>	<i>-an; -in; -in</i>	
* <i>lama:n</i>	<i>eman</i>	<i>rəman</i>	<i>lumān</i>	<i>ləma:n</i>	<i>limin</i>	elephant
* <i>taŋa:n</i>	<i>kəŋan</i>	<i>təŋan</i>	<i>taŋān</i>	<i>təŋa:n</i>	<i>taŋin</i>	hand
* <i>*papa:n</i>	---	---	---	<i>pəpa:n</i>	<i>papan</i>	board; plank
(probably borrowed)						
* <i>dha:n</i>	<i>adhan</i>	<i>than; dhan</i>	<i>tha:t</i>	<i>tha:n</i>	<i>than</i>	branch
* <i>lupa:n</i>	<i>epan</i>	<i>rəpan</i>	<i>lupa:t</i>	<i>ləpa:n</i>	<i>lipan;</i> <i>lapan</i>	centipede
* <i>?ika:n</i>	<i>kan</i>	<i>?akan</i>	<i>ika:t</i>	<i>aka:n</i>	<i>ikan</i>	fish
* <i>riŋa:n</i>	<i>eŋan</i>	<i>rəŋan</i>	<i>riŋa:t</i>	<i>ləya:n</i>	<i>liŋan;</i> <i>laŋan</i>	ladder
* <i>bula:n</i>	<i>mŋan</i>	<i>blan</i>	<i>ia bila:t</i>	<i>ea bla:n</i>	<i>pilan</i>	moon; month
* <i>_na:n</i>	<i>təinan-i</i>	<i>pənan</i>	<i>ina:t;</i> <i>rina:t</i>	---	---	pineapple
* <i>hujā:n</i>	<i>həjan</i>	<i>həjan</i>	<i>hujat</i>	<i>həja:n</i>	<i>haçan</i>	rain
* <i>jala:n</i>	<i>elan</i>	<i>jəlan</i>	<i>jala:t</i>	<i>jəla:n</i>	<i>çalan</i>	road; path
* <i>bha:n</i> ⁻ⁿ	---	<i>phan</i>	<i>pha:t</i>	<i>phā:n</i> ⁻ⁿ	<i>phan</i>	sneeze

TABLE 26: LONG AND SHORT *-a-* BEFORE FINAL *-t*

PC	Rade	Jarai	Roglai	Chru	PR Cham	
* <i>-ăt</i>	<i>-ăt</i>	<i>-ăt; -ă?</i>	<i>-a?</i>	<i>-a?</i>	<i>-ă?</i>	
* <i>sukăt</i>	<i>kăt</i>	<i>həkət-v</i>	<i>suka?</i>	<i>ska?</i>	---	stopper
* <i>pisăt</i>	<i>məsăt</i>	---	<i>pisa?</i>	<i>pəsa?</i>	<i>pathă?</i>	navel; centre
* <i>buŋăt</i>	<i>məŋăt</i>	<i>bəŋă?</i> ; <i>bəŋăt</i>	<i>buŋă?</i>	<i>bəŋa?</i>	<i>piŋŭ?</i>	soul, spirit; shadow
* <i>?urăt</i>	<i>aruăt</i> (m)	<i>?ara?</i> -v	<i>ura?</i>	<i>ara?</i>	<i>ură?</i>	vein, tendon
* <i>hulăt</i>	<i>hluăt</i> (m)	<i>hlăt;</i> <i>hluăt</i> (m)	<i>hula?</i>	<i>həla?</i>	<i>hală?</i>	worm
* <i>kawăt;</i> * <i>kuat</i>	<i>kəwăt</i>	<i>kuăt</i>	---	<i>kuat -f</i>	---	wire
* <i>talabăt</i>	---	---	<i>talabat</i>	<i>təlbət</i>	---	worship
(borrowing?)			-f	-f		
* <i>-a:t</i>	<i>-at</i>	<i>-at; -a?</i>	<i>-a?</i>	<i>-a?</i>	<i>-a?</i>	
* <i>pha:t</i>	<i>məŋat</i>	<i>phă?</i>	<i>paŋă?</i>	<i>pha?</i>	<i>pha?</i>	chisel
* <i>jaha:t</i>	<i>jhat</i>	<i>sat</i>	---	<i>jəha?;</i> <i>jəhua</i>	<i>çha?</i>	bad; wicked

PC	Rade	Jarai	Roglai	Chru	PR Cham
* <i>la:t</i>	<i>lat</i>	<i>lat; laʔ</i>	<i>laʔ</i>	---	<i>klet</i> flat
(Mon-Khmer; Headley, #1.25)					-ivf
* <i>laba:t</i>	<i>ebat</i>	---	<i>lubaʔ</i>	---	<i>lipaʔ; lapaʔ</i> walk, go

In Table 27, which shows PC forms with **a* following a nasal consonant, the corresponding Western Cham and Phan Rang vowels are /-i-/ or, more rarely, /i/ as the result of the nasalisation. For three forms ('flower', 'striped' (which may be the same root as 'flower'), and 'soul, spirit; shadow'), the reflex is /-u-/, a reflex conditioned both by the word-final position after /ŋ/ and by the fact that the initial **b*- gives the whole word second register.

TABLE 27: NASALISED **a* IN W. CHAM AND PHAN RANG CHAM

PC	WCham	PR Cham	
* <i>tiŋa</i>	---	<i>tañi</i>	ask
* <i>tə(ri)ŋa</i>	(<i>tanih</i>)	<i>taŋi</i>	ear
* <i>mamah</i>	<i>mamih</i>	<i>mimiŋ</i>	chew
* <i>tanah</i>	<i>tanih</i>	<i>tañh</i>	earth, soil
* <i>tama</i>	<i>tami</i>	<i>tami</i>	enter
* <i>ʔama</i>	<i>mi</i>	<i>ami</i>	father
* <i>huma</i>	<i>hami</i>	---	field, dry
* <i>lima</i>	<i>lami</i>	<i>limi; lami</i>	five
* <i>ʔina</i>	<i>ni</i>	<i>ini</i>	mother; major; big
* <i>/ʔamāh</i>	<i>miŋ</i>	<i>mñh</i>	gold
* <i>lamāh</i>	<i>ramih</i>	<i>ramñh -i</i>	rhinoceros
* <i>laŋa -v</i>	<i>laŋi</i>	<i>liŋi; laŋi</i>	sesame
* <i>panah</i>	<i>panih</i>	<i>pañh</i>	shoot (bow); a bow
* <i>mañam -l</i>	<i>mañim</i>	<i>miñim</i>	weave; twill
* <i>pina:ŋ</i>	<i>pañiŋ</i>	<i>pañiŋ</i>	betel (areca palm); betel nut
* <i>ʔana:k</i>	<i>niʔ</i>	<i>aniʔ</i>	child
* <i>lama:n</i>	<i>lamin</i>	<i>limin</i>	elephant
* <i>cana:ŋ</i>	<i>caniŋ</i> (wooden bed)	<i>taniŋ</i>	furniture; bed
* <i>taŋa:n</i>	<i>taŋəŋ -v</i>	<i>taŋñ</i>	hand
* <i>mañā:k</i>	<i>mañiʔ</i>	<i>miñiʔ</i>	oil
* <i>makrāh</i>	<i>krih</i>	---	middle, half
* <i>krām -lvⁿ</i>	<i>krim -v</i>	<i>krim -v</i>	bamboo
* <i>krāh</i>	<i>krih; kih</i>	<i>krih</i>	middle; half
* <i>gunam</i>	---	<i>kanām</i>	cloud
* <i>nam</i>	<i>nām</i>	<i>nām</i>	six
* <i>anān</i>	<i>nəŋ</i>	<i>nān</i>	that (third p.)

PC	WCham	PR Cham	
*buŋa	paŋur-f	piŋu	flower
*buŋa	---	piŋu	striped
*buŋăt	paŋũ?	piŋũ?	shadow, shade; soul, spirit

The type of nasalisation is itself of interest, being perseverative rather than anticipatory, a type of nasalisation reminiscent of the nasalisation in Malay and in other Austronesian languages.

3. THE PC MAIN VOWELS BORROWED FROM MK

The main vowels reconstructed for PC, including early pre-Chamic MK borrowings reconstructable to the PC level, are presented in Table 28 below. The MK borrowings are in bold.

TABLE 28: MAIN VOWELS BORROWED FROM MK (IN BOLDFACE)

PC main-syllable vowels			
* ia	*-j-, *-i	*-u	* ua
* iãu		*-ũ-, *-u:-	* uai
* iau			* uai
	*-əi, *-əu,		
* ε	*ə	*-ɔ	
		*-ɔ-, *-ɔ:-	
PC main-syllable vowels			
	*-a		
	*-ã-, *-a:-		
	*-ay	*-ui	
	*-au		

In Table 28, the PC vowels that came with MK borrowings are represented in bold type. This statement, however, requires some qualification. First, the *-i in open syllables originates from two sources, one involving borrowed MK forms, the other involving forms inherited from Austronesian. It is important to recall that forms with *-i in a final open syllable inherited from An became *əi in PC. Thus, MK borrowings with *-i in a final open syllable that postdate this change introduced a number of new forms with *-i in final open syllables. Further, a small number of Austronesian 'grammatical' forms apparently did not undergo the change from *-i to *əi in unstressed contexts (see discussion in §2.1). Second, the *ε is quite marginally attested; further research may eliminate it completely. And, third, the vowel-length distinction with -u- seems to have come about through the influence of MK borrowings containing long -u-.

3.1 REFLEXES OF PC *e

There are only a small number of PC forms that reconstruct with *e and their etymological status is not completely clear.

TABLE 29: REFLEXES OF PC *e

An	PC	Rade	Jarai	Roglai	Tsat	Chru	Haroi	WCham	PR Cham
---	*ε-	-eh	-eh	-eh	-e	-eh	-ih; -ĩh; -iěh; -eh	-eh	-eh
---	*ε-	-ě	-e	-e	-e	-ε	-i; -ε	-ε	-ε
---	*ε-	-al	---	-en	---	-εl; -ε:l	---	---	---

The majority are borrowings, but there is one obvious non-borrowing among them, the form *labeh ‘more, surplus’, which is obviously related to Malay *lebih* ‘more’.

3.2 REFLEXES OF PC shwa

PC shwa only occurs in borrowed forms; the An *e [ə] became, not shwa, but PC *ǎ.

TABLE 30: REFLEXES OF PC *ə

An	PC	Rade	Jarai	Roglai	Tsat	Chru	Haroi	WCham	PR Cham
---	*ə-	-ĩʔ	-ĩʔ	-əʔ	-əʔ	-əʔ	-ǎʔ; -əʔ	-əʔ	-əʔ; -ĩʔ
---	*ə-	-ih	-əh; -ih	-əh	---	-əh	-ĩh; -ǎh; -ǎh	-əh	-ǎh; -əh
---	*ə-	-ǎk	-ik; -iʔ	-əʔ	-əʔ	-əʔ	-ĩʔ; -ǎ-	-əʔ	-ǎʔ
---	*ə-	-ǎm	-ǎm	-əp	-an	-əm	-a-; -ǎa-	-ǎm	-ǎm
---	*ə-	-ǎŋ	-ǎŋ	-ək	-aŋ	-əŋ	-ĩŋ; -iŋ	-əŋ	-aŋ; -ĩŋ
---	*ə-	-ǎn	-ǎn	-ət	---	-ən	-ǎn; * -ǎn	-ěn	-ǎn
---	*ə-	-ǎʔ	-ǎʔ	-əʔ	---	-əuʔ	---	-auʔ	-ǎwʔ
---	*ə-	-ər	-ər; -ǎr	-ə	-an	-ər	-ul; -ol	-ǎr	-ǎr

All of the forms with the above vowel reflex patterns (Table 30) and with clear etymologies (Table 31) are borrowings. There are, of course, numerous forms without clear etymologies.

TABLE 31: SOURCES OF PC *ə

PC	P-Mnong	P-North Bahnaric	Bahnaric (AC)	
*nrən -if;	---	---	---	numb
*drən -if	---	---	---	
*laʔən	*ʔlik	---	---	cold

PC	P-Mnong	P-North Bahnaric	Bahnaric (AC)	
* <i>grəm</i> -vf	---	---	<i>grâm</i>	thunder
	(Mon-Khmer; Headley, #1.66)			
* <i>chər</i>	---	---	---	plant with stick
* <i>ch-an-ər</i>	---	---	---	dibble stick
* <i>bə?</i>	---	---	---	to fence, dam
* <i>b-an-ə?</i>	---	---	<i>bənot</i>	a dam, fence
* <i>pəŋ</i>	* <i>pəŋ</i>	---	---	to nail, hammer
* <i>jəŋ</i> -vf	* <i>jeŋ</i>	---	---	become
* <i>yəh</i>	* <i>yəh</i>	---	---	particle
* <i>*kləp</i>	* <i>təp</i>	---	---	stab; poke
* <i>*pər</i>	* <i>pār</i>	* <i>pār</i>	<i>apār; pār</i>	to fly
	(Mon-Khmer; Headley, #1.27; Vietnamese <i>bay</i> from * <i>bal</i>)			
* <i>brəm</i>	* <i>kām</i>	---	<i>brəm; mrəm</i>	arrow
* <i>gər</i>	---	---	<i>gər</i>	handle (knife)
* <i>gəŋ</i>	---	---	<i>gaŋ; gǎŋ</i>	pole; post
* <i>*sagər</i>	---	* <i>hagâr</i>	<i>həgər; çər</i>	drum
	(Mon-Khmer; Headley, #1.22)			
* <i>sidəm</i>	---	---	<i>hudum; hadam</i>	ant
* <i>təl</i>	---	---	<i>tâl; tol</i>	arrive; until

Although all the above forms are borrowings, it is not clear were all of them have come from. As the table makes clear, some have etymological connections to the Mnong branch of MK or to the Bahnaric branch. The first three forms are post-PC borrowings into various Chamic languages, as noted by the use of the symbol †, but only one has a clear MK etymology. The next four forms also appear to be MK borrowings, as evidenced by the MK instrumental infix *-an-*; although it is possible to factor out this prefix on the basis of the forms in PC, it is far more likely that the forms were borrowed with the infixes already in place. The next eleven forms all have counterparts in Proto Mnong (Blood 1968), Proto North-Bahnaric (Smith 1972), or in Bahnaric itself (Aymonier and Cabaton 1906). None of the PC *ə forms appear to have Austronesian etymologies.⁴

3.3 REFLEXES OF PC **ja*, **iâu*, AND **iau*

Three diphthongs have been borrowed from MK into PC: **ja*, †*iâu*, and **iau*. The reflexes are conditioned by co-occurrence with different finals, but are nonetheless quite regular.

⁴ Most likely all the *ə forms should be prefaced with the symbol †, indicating a borrowing, with those borrowed from MK into pre-Chamic being indicated by *† and those borrowed after the break-up of PC being indicated simply with †.

TABLE 32: REFLEXES OF PC *ia

PC	Rade	Jarai	Roglai	Tsat	Chru	Haroi	WCham	PR Cham
*-ia	-ia	-ia	-ia	-ia	-ia	---; -ěa; -eă	-ea	-ya
*ia-	-iă?	-iă?	-ia?	-ia?	-ia?	---; -ěa?	-i?/? -ea?	-yă?
*ia-	-ier; -ea	-εr; -ia	-ia	-ia	-ia; -iər; -ier	---; -εa; -ea	-ia; -ea	-ier; -ier
*ia-	-ia-	---	---	---	-iă:u?	-cau?	-eau?	-yaw?
*ia-	-iă?; -iet	-iă?; -εt	-ia?	-ia?	-ia?	-ia?; -εt -v	-i?/? -ea?	-?/?; -yă?
*ia-	-iăm;-iam -iam	-iap	-ia?	-ia:m	---	---; -eam	---; -eam	-yam
*ia-	-ieŋ	-εŋ	-iaŋ; -iak (-yak)	-iaŋ	-iaŋ	---; -eaŋ	-iaŋ	-ieŋ
*ia-	-iă?	-iă?	-ia?	-ia?	-ia?	---; -ěa?	-i?/?; -ea?	-yă?
*?iar	εa	?ia	ia	?ia ³³	ia	?εa; ?ea	ea	ýa; water ier (fresh)

Of all the words containing the diphthong *-ia-* only ‘water’ (last item in Table 32) appears to be a Austronesian word. The overwhelming majority of all the above forms are borrowings, although **chiyap* ‘wing’ (last item in Table 33) may, despite its initial, be an inherited form at the PC level.

TABLE 33: REFLEXES OF THE PC CONFIGURATION *iya-

PC	Rade	Jarai	Roglai	Tsat	Chru	Haroi	WCham	PR Cham
*iya-	-ia-	-ia-	-ia-	---	-əya- /l___; -ia:-	---; -aya- /r___	-ea-; /r___ -ya-	-aya
*chiyap	siap	---	---	---	siău? _n	cau? -v	cheau?	thyaw? wing

This last ‘vowel’ is obviously not a unitary vowel, but rather a specific configuration that appears to behave uniquely. In some cases, this particular configuration has coalesced into **ia*.

TABLE 34: REFLEXES OF PC *iău

An	PC	Rade	Jarai	Roglai	Tsat	Chru	Haroi	WCham	PR Cham
---	*iău-	-iău; -au	-εu; -iεau;	-iău	-a:?	-iău	-iau; -εau;	-iu	-iw

An	PC	Rade	Jarai	Roglai	Tsat	Chru	Haroi	WCham	PR Cham
			- <i>iau</i>				- <i>eau</i>		
---	* <i>iau-</i>	- <i>ieo</i>	---	- <i>iāu</i>	- <i>iau</i>	- <i>iau</i>	- <i>iau</i> ; - <i>εau</i>	- <i>iau</i>	- <i>iew</i>

The above patterns occur only in borrowings. The first pattern **iāu* is even further restricted; it occurs only in words borrowed after the break-up of PC, as the * before the form indicates.

3.4 REFLEXES OF PC **ua* AND **uai*

The overwhelming majority of the words in PC containing the above vowels are borrowings, but there are at least two forms that are inherited: **buat* ‘to do’ and **dua* ‘two’, both identical to the forms in Malay (see Table 35).

TABLE 35: REFLEXES OF PC **ua* AND **uai*

An	PC	Rade	Jarai	Roglai	Tsat	Chru	Haroi	WCham	PR Cham
--	* <i>ua</i>	- <i>ua</i>	- <i>ua</i>	- <i>ua</i>	---	- <i>ua</i>	- <i>ua</i> ; - <i>oa</i>	- <i>ɔa</i>	- <i>wa</i>
---	* <i>ua-</i>	- <i>uah</i>	- <i>uah</i>	- <i>uah</i>	- <i>ua</i> ⁵⁵	- <i>uah</i>	- <i>uah</i> ; - <i>oah</i>	- <i>ɔah</i>	- <i>wăh</i>
---	* <i>ua-</i>	- <i>ăt</i> ; - <i>uot</i>	- <i>uă?</i> ; - <i>ɔt</i>	- <i>uă?</i>	- <i>ua?</i>	- <i>ua?</i>	---; - <i>ôa?</i>	---	---
---	* <i>ua-</i>	- <i>uom</i>	- <i>ɔm</i>	- <i>o:p</i>	- <i>uam</i>	- <i>ɔ:m</i>	- <i>uɔm</i> ; - <i>ɔm</i>	- <i>ɔm</i>	- <i>ɔm</i>
---	* <i>ua-</i>	- <i>uon</i>	- <i>ɔn</i>	- <i>uat</i> ; - <i>uan</i>	- <i>uan</i>	- <i>uan</i> ; - <i>uəp</i>	- <i>uan</i> ; - <i>ɔn</i>	- <i>uan</i>	- <i>ôn</i>
---	* <i>ua-</i>	- <i>uă?</i>	- <i>uă?</i>	- <i>ua?</i>	- <i>uă?</i>	- <i>uă?</i> ; - <i>əwă?</i>	- <i>uă?</i> ; - <i>oa?</i>	- <i>ɔa?</i> ; - <i>ui?</i>	- <i>wă?</i>
---	* <i>ua</i>	- <i>uor</i> ; - <i>ua</i>	- <i>ua</i>	- <i>uā</i>	- <i>ua</i>	- <i>ua</i>	- <i>oa</i>	- <i>ur</i> ; - <i>ɔa</i>	- <i>u</i>
---	* <i>ua-</i>	- <i>ul</i>	- <i>ul</i>	- <i>uan</i> ; - <i>uəp</i>	---	- <i>ual</i> ; - <i>uəl</i>	- <i>ul</i>	- <i>ual</i>	- <i>ôl</i>
---	* <i>uac</i>	- <i>uě?</i>	- <i>uă?</i>	- <i>ue?</i> ; - <i>uai?</i>	- <i>oi?</i>	- <i>uai?</i>	- <i>oa?</i> ; - <i>uɔ?</i>	- <i>uai?</i>	- <i>ɔy?</i>
---	* <i>uəi-</i>	- <i>ui</i>	- <i>ui</i>	- <i>uəi</i>	- <i>oi</i>	- <i>uəi</i>	- <i>ui</i> ; ---	- <i>uai</i>	- <i>oy</i>
---	* <i>uc</i>	- <i>uč</i>	- <i>ui?</i> ; - <i>uc</i>	- <i>ui?</i>	---	- <i>ui?</i>	- <i>ui?</i> ; - <i>ô?</i>	- <i>ui?</i>	- <i>ÿy?</i>
---	* <i>uai-</i>	- <i>ue</i>	- <i>uai</i>	- <i>uai</i>	- <i>uai</i>	- <i>uai</i>	- <i>uai</i> ; - <i>oai</i>	- <i>uai</i>	- <i>oy</i>

As with a number of the correspondences examined so far, it is sometimes quite difficult to distinguish between conditioned variation and irregularities due to borrowing.

3.5 REFLEXES OF PC *-ɔ, *-ɔ̃-, AND *-ɔ:-

The majority of the *-ɔ, *-ɔ̃- and *-ɔ:- vowels entered PC through borrowing, but there are nonetheless a minority that appear to have come not through borrowing but from Austronesian forms with *u. In particular, *ramo:ŋ ‘tiger’, *lamɔ or *ramɔ ‘cow’, *trɔŋ ‘eggplant’, and *dɔ:k ‘sit; stay; live’ seem to have some claim to some sort of pre-Chamic Austronesian etymology; the etymology for *dɔ:k is particularly strong.

TABLE 36: REFLEXES OF * ɔ, * ɔ̃-, AND * ɔ:-

An	PC	Rade	Jarai	Roglai	Tsat	Chru	Haroi	WCham	PR Cham
---	*-ɔ	-o	-o	-o	-o	-ɔ	-ɔ	-ɔ	-ɔ
---	*-ɔ-	-ɔh	-ɔh	-oh	---	-ɔh	-vɰ; -ũh; -õh; -ɔh	-ɔh	-ɔh; -õh
---	*-ɔ̃-	-ɔ̃ŋ	-ɔ̃ŋ; -õŋ	-ok	---	-ɔ̃ŋ	-ɔ̃ŋ	-ɔ̃ŋ	-ɔ̃ŋ
---	*-ɔ:-	-oŋ	-ɔ̃ŋ; -oŋ	-oŋ; -o:k	-(u)oŋ	-ɔ:-ŋ	-uŋ; -uŋ; -ɔ̃ŋ	-ɔ̃ŋ	-ɔ̃ŋ
---	*-ɔ̃-	-ɔ̃?	-ɔ̃?	-o?	-o?	-ɔ̃?	-ɔ̃? -ũ?	-ɔ̃?	-ɔ̃?
---	*-ɔ:-	-ɔ̃?;	-ɔ̃? -ɔ̃k; -ɔ̃?	-o?	-o?	-ɔ̃?	-ɔ̃?;	-ɔ̃?	-ɔ̃?
---	*-ɔ:-	-ok	-ɔ̃?	-o?	-o?	-ɔ̃?	-v?; -ɔ̃?	-ɔ̃?	-ɔ̃?

Not only was PC *ɔ largely borrowed, but in certain environments the vowel was borrowed with a length distinction. The PC *ɔ occurs both long and short before final -ʔ, final-ŋ, and final -k (Tables 37, 38, and 39, respectively).

TABLE 37: *ɔ BEFORE FINAL -ʔ

PC	Rade	Jarai	Roglai	Chru	PR Cham	
*-ɔ̃ʔ	-ɔ̃ʔ	-ɔ̃ʔ	-oʔ	-ɔ̃ʔ	-ɔ̃ʔ	
*ʔakɔ̃ʔ	kɔ̃ʔ	ʔakɔ̃ʔ	akoʔ	akɔ̃ʔ	akɔ̃ʔ	head
*gɔ̃ʔ	gɔ̃ʔ; go	gɔ̃ʔ	goʔ	gɔ̃ʔ	kɔ̃ʔ	kettle; pot
*chɔ̃ʔ	---	sɔ̃ʔ	choʔ	sɔ̃ʔ	---	scoop out
*hɔ̃ʔ	kəhɔ̃ʔ	hɔ̃ʔ	---	---	---	sweat; bleed

PC	Rade	Jarai	Roglai	Chru	PR Cham	
* <i>ŋɔʔ</i>	---	<i>ŋɔʔ</i>	---	<i>gah ŋɔʔ</i> (east)	---	above; upgrade
* <i>ɔʔ</i>	---	<i>ʔɔʔ</i> ; <i>ʔɔʔ</i>	---	<i>ɔʔ</i> (choke)	---	vomit
* <i>srɔʔ</i>	<i>hrɔʔ</i>	---	---	<i>srɔʔ</i>	---	subside
* <i>-ɔʔ</i>	<i>-ɔʔ</i> ; <i>-ɔʔ</i>	<i>-ɔʔ</i>	<i>-oʔ</i>	<i>-ɔʔ</i>	<i>-ɔʔ</i>	
* <i>kasɔʔ</i>	<i>kəsɔʔ</i>	<i>kəsɔʔ</i>	<i>kuliʔ</i> <i>soʔ</i>	<i>kəlsɔʔ</i>	<i>thɔʔ</i> (placenta)	lungs
* <i>kɔʔ</i>	<i>kɔʔ</i>	<i>koʔ</i> -l	<i>koʔ</i>	<i>kɔʔ</i>	<i>kɔʔ</i> ; <i>akɔʔ</i>	white
* <i>mɔʔ</i>	<i>mɔʔ</i>	---	<i>mɔʔ</i>	---	---	wife (mid-)
* <i>ɓɔʔ</i>	<i>ɓɔʔ</i> <i>məta</i>	<i>ɓɔʔ</i> ; <i>bɔʔ</i>	<i>ɓoʔ</i> <i>mata</i>	<i>ɓɔʔ</i> <i>məta</i>	<i>ɓɔʔ</i>	face cf. nose

TABLE 38: **ɔ* BEFORE FINAL *-ŋ*

PC	Rade	Jarai	Roglai	Chru	PR Cham	
* <i>-ɔŋ</i>	<i>-ɔŋ</i>	<i>-ɔŋ</i> ; <i>-ɔŋ</i>	<i>-ok</i>	<i>-ɔŋ</i>	<i>-ɔŋ</i>	
* <i>prɔŋ</i>	<i>prɔŋ</i>	<i>prɔŋ</i>	<i>prok</i>	<i>prɔŋ</i>	<i>prɔŋ</i>	big
* <i>trɔŋ</i>	<i>trɔŋ</i>	<i>trɔŋ</i>	<i>trok</i>	<i>trɔŋ</i>	<i>trɔŋ</i>	eggplant
* <i>salɔŋ</i>	<i>hlɔŋ</i>	<i>hlɔŋ</i>	---	---	<i>klɔŋ</i>	forever
* <i>dhɔŋ</i>	<i>dhɔŋ</i>	<i>thɔŋ</i>	<i>thok</i>	<i>thɔŋ</i>	<i>thɔŋ</i>	knife
* <i>yɔŋ</i>	<i>yɔŋ</i>	<i>yɔŋ</i>	<i>yok</i>	---	---	lift; take off
* <i>cadɔŋ</i>	---	---	<i>cadok</i>	<i>chədɔŋ</i>	<i>cadɔŋ</i> -l	flat basket
* <i>anrɔŋ</i>	---	---	<i>anroʔ</i> -f	---	<i>arɔʔ</i>	toad
* <i>rɔŋ</i>	<i>rɔŋ</i>	<i>rɔŋ</i>	<i>tula:k</i> <i>turoc</i>	<i>grɔŋ</i> -iʔ	<i>rɔŋ</i> -l	a back
* <i>-ɔŋ</i>	<i>-oŋ</i>	<i>-ɔŋ</i> ; <i>-oŋ</i>	<i>-oŋ</i> ; <i>-o:k</i>	<i>-ɔŋ</i>	<i>-ɔŋ</i>	
* <i>atɔŋ</i>	<i>toŋ</i>	---	<i>ato:k</i>	<i>atɔŋ</i>	<i>atɔŋ</i>	beat (gong)
* <i>lɔŋ</i>	<i>loŋ</i>	---	---	<i>pərlɔŋ</i>	---	try, test, prove
* <i>khɔŋ</i>	<i>khɔŋ</i> (end of rain)	<i>khɔŋ</i>	<i>kho:k</i>	<i>khɔŋ</i> (dry, sunny)	<i>khɔŋ</i>	dry (weather?)
* <i>rɔŋ</i>	<i>roŋ</i>	<i>roŋ</i>	---	---	<i>rɔŋ</i>	nourish
* <i>glɔŋ</i>	<i>dloŋ</i>	<i>dloŋ</i>	<i>dlo:k</i>	<i>glɔŋ</i>	<i>klɔŋ</i>	tall; big; high
* <i>bumɔŋ</i>	<i>moŋ</i> (banana stalk)	---	<i>bumo:k</i>	---	---	banana
* <i>kadɔŋ</i>	---	---	<i>kadɔ:k</i>	---	---	blossom get stuck
* <i>kɔŋ</i>	<i>koŋ</i>	<i>kɔŋ</i>	<i>ko:k</i>	<i>kɔŋ</i>	<i>kɔŋ</i>	bracelet

PC	Rade	Jarai	Roglai	Chru	PR Cham	
* <i>*krɔːŋ</i>	<i>kronŋ</i>	<i>krɔŋ</i>	<i>kro:k</i>	<i>ia krɔːŋ</i>	<i>krɔŋ</i>	river
* <i>*bɔːŋ</i>	<i>boŋ</i>	<i>bɔŋ</i>	<i>bo:k</i>	<i>bɔːŋ</i>	<i>pɔŋ</i>	coffin
* <i>*hɔːŋ -f</i>	<i>hoŋ</i>	<i>hoŋ</i>	<i>hoŋ -f</i>	<i>hɔːŋ</i>	---	wasp
* <i>*jɔːŋ</i>	<i>joŋ</i>	<i>jɔŋ</i>	<i>jo:k</i>	<i>jɔːŋ</i>	<i>açɔŋ</i>	axe
* <i>*lamɔːŋ</i>	<i>emoŋ</i>	<i>rəmoŋ</i>	<i>lumōŋ</i>	<i>rəmoːŋ</i>	<i>rimɔŋ -i</i> ;	tiger
* <i>*ramɔːŋ</i>				-r	<i>ramɔŋ -i</i>	
* <i>*ʔanrɔːŋ</i>	<i>enoŋ</i>	<i>ʔanɔŋ</i>	<i>anro:k</i>	<i>anɔːŋ</i>	<i>anɔŋ</i>	carry (on a pole)
			-v ¹			

With the forms in Table 38, the MK influence is particularly clear. Four of the forms have already been analysed as post-Chamic borrowings (*), another four are pre-Chamic borrowings (**), and the remainder, while not yet established as borrowings, certainly lack obvious Austronesian etymologies.

TABLE 39: *ɔ BEFORE FINAL -k

PC	Rade	Jarai	Roglai	Chru	PR Cham	
*-ɔk	-ɔk	-ɔk; -ɔk; -ɔʔ	-oʔ	-ɔʔ	-ɔʔ	
* <i>tulɔk</i>	---	<i>təlɔʔ</i>	---	---	---	disk-like
* <i>pɔk</i>	<i>pɔk</i>	<i>pɔk</i>	<i>poʔ</i>	---	---	to open
* <i>hɔk</i>	<i>hɔk</i>	<i>hɔk</i>	---	<i>hɔʔ</i>	<i>hɔʔ</i>	pour out; spill
*-ɔ:k	-ok	-ɔʔ	-oʔ	-ɔʔ	-ɔʔ	
* <i>dɔ:k</i>	<i>dok</i>	<i>dɔʔ</i>	<i>doʔ</i>	<i>dɔʔ</i>	<i>ɬɔʔ</i>	sit; live; stay
* <i>lɔ:k</i>	<i>lok</i>	<i>lok</i>	<i>loʔ</i> ; <i>caloʔ</i>	<i>lɔ:h</i> ; <i>lɔʔ</i>	<i>lɔʔ</i>	to peel
* <i>sɔ:k</i>	---	---	---	<i>sɔʔ</i>	---	strike; pound
* <i>kutɔ:k</i>	<i>kətuop</i>	---	<i>kuto:k</i>	<i>kətɔ:k</i>	---	grasshopper
* <i>kutɔ:p</i>	-vf		-f	-f		
* <i>prɔ:k</i>	<i>prok</i>	<i>prɔʔ</i>	---	<i>prɔʔ</i>	<i>prɔʔ</i>	squirrel

TABLE 40: PC *ɔ APPARENTLY FROM AUSTRONESIAN SOURCES

PC	Rade	Jarai	Roglai	Chru	PR Cham	
* <i>dɔ:k</i>	<i>dok</i>	<i>dɔʔ</i>	<i>doʔ</i>	<i>dɔʔ</i>	<i>ɬoʔ</i>	sit; live; stay
* <i>lamɔ</i> ;	<i>emo</i>	<i>rəmo</i>	<i>lamo</i> ⁻ⁿ	<i>ləmo</i>	<i>limo</i> ;	cow; ox
* <i>ramɔ</i>					<i>lamo</i>	
* <i>bɔh</i>	<i>boh</i>	<i>bɔh</i>	<i>boh</i>	<i>boh</i>	<i>poh</i>	fruit; egg; classifier

One of the forms containing **-ɔ:k* (**dɔ:k* 'sit; stay; live') is definitely an Austronesian word. The **ɔ* itself also occurs in two more forms apparently inherited from Austronesian sources: **bɔh* 'fruit; egg; classifier for small round objects' and possibly **ramɔ*/**lamɔ* 'cow; ox; cattle', although I suspect the latter may be a widespread borrowing instead. However, the remaining forms do not seem to have obvious Austronesian etymologies. Instead, it appears that the overwhelming majority of these forms are borrowings, most of them from MK sources. Certainly, the following are MK forms (see Headley 1976, 1991): 'wasp,' 'axe,' 'bracelet,' 'coffin, casket,' 'grasshopper,' 'river,' and 'squirrel.' Those that were borrowed after the break-up of PC are marked with †. In addition, several more of the forms above, while not identifiable as MK borrowings, nonetheless appear to be borrowings from some source, on the basis of extreme irregularities in patterning (e.g. 'tiger' and possibly 'cow; ox'); the form for 'grasshopper', were it not already identified as a MK borrowing, would still look like a borrowing because of the extreme irregularity of its correspondences. Finally, some other forms look suspiciously non-Austronesian due to their phonetics: the **b-* initial in 'face', the **sr-* cluster in 'subside', the *-nr-* cluster in 'toad', the **d-* in 'flat basket' and 'get stuck'.

4. THE MAIN VOWELS SUMMARISED

It goes without saying that everywhere the details remain to be filled in and clarified. For instance, much can be learned about the first-syllable vowels from a more sophisticated examination of the written records. Similarly, a better understanding of borrowings will contribute to a better understanding of the systemic interactions between the Austronesian and the MK heritage.

Nonetheless, the outlines of the history of PC vowels seem clear. The PC vowel system consists of a core of elements inherited from Austronesian, supplemented and enriched by MK borrowings. In addition, the subsequent reflexes of PC vowels in the various daughter languages is also quite straightforward, with our improvement upon the foundation laid by Lee (1966) and others made possible by an expanded understanding recognition of which forms were borrowings and by a greatly expanded database.

From these patterns we can learn something both about the nature of the earlier cultural contact and about the influence of language contact on vowel systems. The intensity of the early contact between MK speakers and the pre- PC speakers is attested to by the richness of the borrowed component of PC. The effects of language contact are attested to by the restructuring of the original Austronesian disyllables into the iambic morphemes of PC and by the incorporation of a number of new vowel distinctions into the linguistic system.

REFERENCES

- Aymonier, Étienne François and Antoine Cabaton, 1906, *Dictionnaire cham-français*. PEFEO 7. Paris: Leroux.
- Benedict, Paul K., 1984, Austro-Tai parallel: a tonal Cham colony on Hainan. *Computational Analyses of Asian and African Languages* 22:83–86.
- Blood, Doris Walker, 1962, Reflexes of Proto-Malayo-Polynesian in Cham. *Anthropological Linguistics* 4/9:11–20.
- Blood, Henry F., 1968, A reconstruction of Proto-Muong. SIL/University of North Dakota.
- Blust, Robert A., 1969, Some new Proto-Austronesian trisyllables. *Oceanic Linguistics* 8/2:85–104.
- 1980a, Austronesian etymologies. *Oceanic Linguistics* 19/1–2:1–181.
- 1980b, More on the origins of glottalic consonants. *Lingua* 52:125–156.
- 1981, The reconstruction of Proto-Malayo-Javanic: an appreciation. *Bijdragen tot de Taal-, Land-, en Volkenkunde* 137/4:456–469.
- 1983–84, Austronesian etymologies—II. *Oceanic Linguistics* 22-23/1 & 2:29–149.
- 1986, Austronesian etymologies—III. *Oceanic Linguistics* 25/1-2:1–123.
- 1989, Austronesian etymologies—IV. *Oceanic Linguistics* 28/2:111–180.
- Brennan, Hugh, 1992, Peminjaman leksikal dalam Bahasa Melayu. *Jurnal Dewan Bahasa* 36/6:552–565.
- Burnham, E. C., 1976, The place of Haroi in the Chamic languages. MA thesis, University of Texas at Arlington.
- Coope, A. E., 1986, *Macmillan's Malay—English English—Malay dictionary*. Singapore: Macmillan.
- Donegan, Patricia, 1993, Rhythm and vocalic drift in Munda and Mon-Khmer. *Linguistics of the Tibeto-Burman Area* 16/1:1–43.
- Haudricourt, André-G., 1984, Tones of some languages in Hainan. *Minzu Yuwen* 4:17–25.
- Headley Robert K., 1976, Some sources of Chamic vocabulary. In Jenner et al., eds 1976, Part 1:453–476.
- 1991, The phonology of Kompong Thom Cham. In Jeremy H. C. S. Davidson, ed. *Austroasiatic studies: essays in honour of H.L. Shorto*, 105–121. University of London, School of Oriental and African Studies.
- Huffman, Franklin E., 1976, The register problem in fifteen Mon-Khmer languages. In Jenner et al., eds 1976, Part 1:575–590.
- Jenner, Philip N., Laurence C. Thompson, and Stanley Starosta, eds *Austroasiatic Studies*. Special publication of Oceanic Linguistics No.13. Honolulu, Hawaii: University of Hawaii Press.
- Lee, Ernest Wilson, 1966, Proto-Chamic phonologic word and vocabulary. PhD dissertation, Indiana University.
- 1977, Devoicing, aspiration, and vowel split in Haroi: evidence for register (contrastive tongue-root position). In Thomas et al., eds, 1977:87–104.
- Ni Dabai, 1988a, The genealogical affiliation of the language of the Hui people in Sanya Hainan. *Minzu Yuwen* 2:18–25.
- 1988b, The Kam-Tai of China and the Hui of Hainan. *Bulletin of the Central Institute of Minorities* 3:54–65.
- 1990a, The origins of the tones of the Kam-Tai languages. MS.
- 1990b, The Sanya (=Utsat) language of Hainan island: a living specimen of a linguistic typological shift. MS.
- Pittman, Richard S., 1959, Jarai as a member of the Malayo-Polynesian family of languages. *Asian Culture* 1/4:59–67.
- Shorto, Harry L., 1975, Achinese and mainland Austronesian. *Bulletin of the School of Oriental and African Studies* 38:81–102.
- Smith, Kenneth D., 1972, A phonological reconstruction of Proto-North-Bahnaric (Language data, Asian-Pacific series, No.2). Santa Ana, CA: SIL.
- Thomas, David, Ernest W. Lee and Nguyen Dang Liem, eds, 1977, *Papers in South East Asian Linguistics No.4: Chamic Studies*. PL, A–48.

- Thomas, Dorothy M.**, 1963, Proto-Malayo-Polynesian reflexes in Rade, Jarai, and Chru. *Studies in Linguistics* 17:59–75.
- Thurgood, Graham**, 1996, Language contact and the directionality of internal drift: the development of tones and registers in Chamic. *Language* 71/1:1–31.
- 1997, Restructured register in Haroi: reconstructing its historical origins. In A.S. Abramson, ed., *Southeast Asian linguistic studies in honour of Vichin Panupong*, 283–295. Bangkok: Chulalongkorn University Press.