

Cua (Kor) historical phonology and classification*

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Abstract

The Cua language of the Central Vietnam Highlands has been little studied, and is barely known beyond a few unpublished wordlists. Recently the author acquired an extensive manuscript lexicon (Maier & Burton 1981), and also made some brief field recordings. With the help of this data the phonological history of Cua is reconstructed, with reference to a preliminary reconstruction of proto-Bahnaric. Additionally, the question of classification is discussed; it was treated as Eastern North Bahnaric by Smith (1973) and Central Bahnaric by Sidwell (2002). The present study argues that Cua reflects a distinct Eastern branch which has been influenced by contact with North Bahnaric (in addition to Vietnamese and Chamic).

Introduction

Cua, also known as Kol, Kor or Traw, is something of an enigma among the Bahnaric languages of the Vietnam Central Highlands. It embodies a rather idiosyncratic combination of phonological developments that have served to obscure its history and classification. The language is not well studied (not being easily accessible), yet the data available does permit some useful analyses, especially the manuscript rhyming dictionary of Maier & Burton (1981). In this paper I present the results of internal and comparative reconstruction of Cua historical phonology, framed in terms of its apparent development from Proto-Bahnaric (PB)¹ (the latter modelled here more or less as it was discussed in Sidwell 2002 and 2003).

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¹ Abbreviations used in this paper: PB: Proto-Bahnaric, NB: North Bahnaric, WB: West Bahnaric, CB: Central Bahnaric, MK: Mon-Khmer, SIL: Summer Institute of Linguistics.

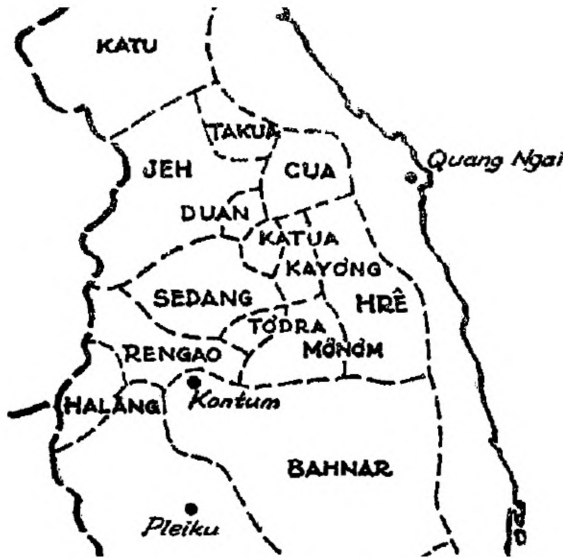


Figure 1. Map showing location of languages of the Vietnam Central Highlands
(fragment of SIL map dated March 1966)

According to Maier & Burton (1981: 2):

Cua is a member of the Bahnaric branch of the Mon-Khmer family of languages. The majority of the Cua people, who number 10,000-15,000, live in the mountain area of Tra Bong district in Quang Ngai province, central Vietnam. The Cua people call themselves “Kool,” their term for ‘montagnard’ in general, this name being modified to “Cua” by the Vietnamese. The Cua people who live in the Tra Bong valley are called Kool Dong, “Valley Cua,” and the Cua who live in the mountains are called Kool Doot or Kool Taal “High Cua.”

The language is not extensively documented by Western scholars, and one is largely restricted to using manuscript materials. Sources readily available in English (via the Summer Institute of Linguistics [SIL] in Dallas and Bangkok) are:

- Phillips (1959), a manuscript lexicon of 187 words in four dialects
- Burton (1969), a discussion of clause structure,
- Maier (1969), an analysis of phonemes,
- Maier & Đình Van Cau (1976) a Cua-Vietnamese-English thesaurus in the form of a computer printout,
- Maier & Burton (1971), a manuscript lexicon of 281 words of a lowland Cua dialect
- Smith (1973), a discussion of classification,
- Maier & Burton (1981), a manuscript rhyming dictionary of somewhat more than 3000 items, annotated to the effect that it is based on a 1966 manuscript

In addition there are some minor literacy and bible translation notes at the David Thomas Library (SIL) in Bangkok, and this writer has collected some short wordlists in the field.

Cua Phonology

Maier (1969) offers a phonemic description of Cua. The analysis is of the straightforwardly structuralist type typical of the day, and is very useful, although perhaps not quite exhaustive. The set of phonemes, tabled according to their place in the word-structure, are found to be as follows (transcribed into IPA from Maier’s typewriter based notation):

Phonemes of Cua (based on Maier 1969):

Initials					Finals				
p	t	c	k	ʔ	p	t	c	k	ʔ
ph	th		kh		wʔ		jʔ		
b	d	ʃ	g						
β	dʰ								
m	n	ɲ	ŋ		m	n		ŋ	
w	r, l, hl	j			w	l	j		
s				h	lh	jh			h

Vowels:

i:	i:	u:	i	ɪ	i	u	ia	ua
e:	ə:	o:	e		ə	o	ea	oa
ɛ:	a:	ɔ:	ɛ	a	ʌ			

The template for the phonological word is rather strict; it consists minimally of a main syllable C₁(C₂)V(C₃) and an optional presyllable C₄v. Concerning the main syllable onset, C₁ can be any of the “initials” listed above, while the optional medial C₂, is restricted to *r, l, j* and *w*, plus nasals

after initial *h* and *ʔ*, unless we accept sequences *hm, hn, hn, hn, ʔm, ʔn, ʔn, ʔn* as unitary phonemes. Maier entertains either analysis, tending to the latter (although not indicating this in her table of phonemes). Main syllable codas (C_3) show the same places and manners of articulation but without a general voicing or aspiration contrast. Final postglottalized glides occur, as do an aspirated lateral and yod (“complex finals”). In fact the dictionary of Maier & Burton (1981) also lists a number of forms with postglottalized final nasals, although these appear largely to reflect Vietnamese loans with *săc* tone. There are no tones or registers mentioned in any descriptions, and I have not heard any.² The main vowel (V) is any of the table above, although there are various distributional restrictions that give rise to remarkable asymmetries, which will be discussed in detail below. The presyllable vowel (*v*) appears to be entirely prosodic, having no distinctive timbre, and is consistently written *a* in the dictionary of Maier & Burton.

The Cua phonemes can be compared with the PB phoneme inventory as follows:

Phonemes of Proto-Bahnaric (based on Sidwell 2002, 2003):

Initials					Finals				
p	t	c	k	ʔ	p	t	c	k	ʔ
b	d	ʃ	g						
ɸ	ɗ								
m	n	ɲ	ŋ		m	n	ɲ	ŋ	
w	l, r	j			w	l, r	j		
	s			h		s			h

Vowels:

i:	ĩ:	u:		i	ĩ	u	ia	ua
e:	ə:	o:		e	ə	o		
ɛ:	a:	ɔ:		ɛ	a	ɔ		

Historical Development of Cua Phonemes

Initials

At first glance the only difference between the Cua and PB initials is in the aspirated stop series and voiceless lateral. It is often a vexing question whether to treat aspirates in MK languages as sequences of stop + /h/ or unitary phonemes. In languages such as Khmer, Koho and others it is obvious that

²I recorded the elicitation of some basic word lists (with the assistance of a young Bahnar fellow who prefers not to be named), and these recordings provide no indication of voice registers.

prevocalic aspirates (as opposed to preconsonantal aspirates)³ can be split by infixes, confirming their analytical structure, and this is the approach I have taken with PB. But in the available Cua data examples of productive morphology of this type are lacking. Also, as Maier (1969) points out, examples such as *khwal* ‘curly’, *khwal* ‘hoe’, although infrequent, suggest aspirates occupying a single C₁ slot before a medial C₂. It appears that a general reduction in morphological productivity, plus increasing borrowing from Vietnamese (whose initial sequences such as *xw-* are borrowed as *khw-*) may have conditioned a reanalysis of these initials in Cua.

The other initial which is missing in PB is the voiceless lateral /hl/. Effectively Cua has two voiceless laminal fricatives (/hl, s/), differing only in their manner of articulation. Comparative data demonstrates that /hl/ is the direct reflex of PB *s and *sl, part of a larger chain shift in which PB *c shifted to /s/, and the resultant empty /c/ slot was filled mainly by loans from Vietnamese and Chamic. Examples:

Gloss	Cua	NB ⁴	CB	WB	PB
‘hair’	hlo:k	*sək (Jeh suk)	*sək (Bahnar sək)	*sək (Jru' sok)	*s-
‘divide/share’	ʔahlɔ:k	*səŋ (Halang səŋ)	*ʔəsəŋ (Bahnar ʔəsəŋ)	*səŋ (Brao səŋ) ⁴	*s-
‘honey(bee)’	hlut	*sut (Halang sut)	*su(:)t (Bahnar su:t)	*sut (Jru' su:t)	*s-
‘leaf’	hla:	*hla: (Jeh la:)	*hla: (Bahnar hla:)	*sla: (Jru' hla:)	*sl-
‘dog’	sɔ:	*cɔ: (Jeh cɔ:)	*cɔ: (Bahnar sɔ:)	*cɔ: (Jru' cɔ:)	*c-
‘bird’	se:p	*cem (Jeh cim)	*ce:m (Bahnar se:m)	*ce:m (Jru' ce:m)	
‘to eat’	sa:	*ca: (Jeh ca:)	*ca: (Bahnar sa:)	*ca: (Jru' ca:)	*c-

³As is well known, Khmer preconsonantal stops are phonetically aspirated before nasals and liquids.

⁴NB reconstructions & data are from Sidwell (ms.), a manuscript monograph widely circulated for comments in 2002 and still available upon request from the author; WB reconstructions & data are from Sidwell & Jacq (2003), and CB reconstructions & data are from a ms. of Sidwell, which is still in preparation. Much of this same data can be viewed freely online at the author’s project website: www.sealang.net/monkhmer.

⁴Brao *səŋ* ‘to pay’ may be borrowed from/influenced by Khmer *səŋ* ‘give back, payback, restore, compensate’.

Examples of /c/ entering Cua via loans:

Cua <i>cih</i> ‘write’	Proto-Chamic ⁵ * <i>cih</i> ‘write, draw’, Wr.Cham <i>cih</i>
Cua <i>cowah</i> ‘sand’	Proto-Chamic * <i>cuah</i> ‘write, draw’, Wr.Cham <i>cuah</i>
Cua <i>ce:</i> ‘tea’	Vietnamese <i>chè</i>
Cua <i>cam</i> ‘squat’	Vietnamese <i>chôm</i>

These shifts among the laminals resemble, but are quite independent of, the merger of *c- > /s-/ which occurred in Bahnar, Tampuan and South Bahnaric (together “South Central Bahnaric”). While the latter was a simple merger of *c- and *s-, Cua has kept the reflexes of these proto-phonemes distinct.

Both Cua and Proto-Bahnaric show imploded stops /ɓ, ɗ/ in their inventories, but these series are not related. In fact like most Bahnaric language, Cua has merged the imploded stops with the plain voiced series, and the presently imploded stops of Cua have other sources: principally borrowing, and also by assimilation of glottal + nasal sequences. Etymological imploded stops appear to continue unchanged only in Bahnar. Examples:

Cua	Remarks
ba:l ‘two’	< *ɓa:r PB (cf. Bahnar ɓa:r)
tabak ‘sprouts’	< *təɓaŋ " (cf. Bahnar ɓa:r ‘bamboo shoots’)
da:k ‘water’	< *ɗa:k " (cf. Bahnar ɗa:k)
do:p ‘ripe’	< *ɗu:m " (cf. Bahnar ɗu:m)
tabak ‘hang, suspend’	< tabak Proto-Chamic
beŋ? ‘candy, sugar’	< <i>bánh</i> Vietnamese (with sac tone realized as post-glottalization)
ɗəŋ ‘hammer’	< <i>đông</i> Vietnamese
ɗwat ‘protective hat’	< ɗuan Proto-Chamic (via Bahnar ɗwan ?) ⁶
ɗəw ‘just, recent’	< ?na:w PB? (cf. Bahnar ?na:w ‘new, recent’)
kadiap ~ ka?niap ‘close (eyes)’	doublet

Other than the above-mentioned changes, Cua initial consonants continue their PB values essentially unchanged, showing no signs of devoicing or other general restructurings often found in MK languages.

Finals

The history of the word final consonants is characterized by several types of changes that, taken together, have profoundly affected the phonetic

⁵Chamic data and reconstructions used here are from Thurgood (1999).

⁶A cognate is also attested in Vietic, but lacks the diphthonged vowel, e.g. Vietnamese *nón* ‘conical hat’.

character of Cua vis-à-vis other Bahnaric languages.⁷ These can be summarised as follows:

- lateralization of *-s
- hardening of nasals to oral stops
- emergence of post-glottalized finals
- loss of laminal versus velar opposition

Perhaps the single most striking aspect of Cua phonology is the hardening of final nasals. Smith (1973) identified the phonological environment for this process as any syllable not having an initial nasal or laryngeal, such that the great majority of final nasals hardened. He formulated the rule in the following figure:⁸

$$\text{PNB} \quad * \left[\begin{array}{c} \left\{ \begin{array}{c} N \\ h \\ q \\ C_1 \end{array} \right\} \end{array} \right] \text{ V N} \longrightarrow \text{ENB} \left[\begin{array}{c} \left\{ \begin{array}{c} N \\ h \\ q \\ C_1 \end{array} \right\} \end{array} \right] \text{ V} \left[\begin{array}{c} N \\ P \end{array} \right]$$

Figure 2. Rule for hardening of nasal finals in Cua and Katua by Smith (1973:115)

The above rule does not appear to remain active, and probably belongs to a much older stage of the languages; an examination of the corpus finds numerous exceptions among borrowings, expressive formations and other more recent lexical innovations/acquisitions. Indicative examples of the operation of the rule, and some exceptions, follow:

Type	Cua	Remarks
*-m > -p	klə:p ‘liver’	< *klə:m PB
*-n > -t	pɔ:t ‘four’	< *puan PB
*-ŋ > -c	pɛc ‘to shoot’	< *paŋ PB
*-ŋ > -k	hrɛ:k ‘100’	< *hriaŋ PB
no change (prevocalic /n/)	kanim ‘urinate’	< *kʔno:m PB
no change (prevocalic /ŋ/)	ŋi:m ‘sweet’	< *ʔŋa:m PB

⁷All but the first of these changes also occur viously in NB languages, but it is Cua that shows the whole suite.

⁸The rule also applies (apparently) to the language Kotua, and on the basis of this shared feature Smith proposed the sub-grouping East-North-Bahnaric. However, Kotua, although lacking registers, shows the characteristic vowel restructuring of NB languages, indicating that it should more probably be sub-grouped with Hrê-Sedang.

no change (prevocalic /h/)	thə:m ‘eight’	< *tha:m PB
exception (loan)	wəŋ ‘hammock’	< <i>võng</i> Vietnamese
exception (loan)	si:n ‘request permission’	< <i>xin</i> Vietnamese
exception (loan)	kuŋ ‘also’	< <i>cũng</i> Vietnamese
exception (loan)	phanam ‘starving’	< <i>pha ngan</i> Vietnamese

Not surprisingly, given similar parallels in Vietnamese and various other languages of the area (especially Jeh and Halang), the final laminals *-c and *-ŋ underwent various neutralizations. Historical *-ŋ and *-ŋ have merged, with */ŋ/ the unmarked reflex, and /ŋ/ commonly recorded after front vowels (although most are simply noted with /ŋ/ in Maier & Burton’s 1981 dictionary). Historical *-c tends to merge with *-t after back/central vowels, and with *-k after front vowels (by dissimilation) and there are numerous examples of alternates attesting this in the data. In various cases it is evident that laminal nasals shifted articulation before hardening to stops. Some examples:

Type	Cua	Remarks
*-ŋ > -c ~ -k	je:c ~ je:k ‘to become’	cf. Bahnar ji:ŋ
*-ŋ > -ŋ > -k	ple:k ‘sky’	cf. Bahnar pleŋ
*-ŋ > -c ~ -t	ta:c ~ ta:t ‘to weave’	< *ta:ŋ PB
*-c > -t	ramu:t ‘ant’	< *smo:c PB
-c ~ -k	pale:c ~ pale:k ‘to pledge’	

Interestingly, Cua has a contrast between two final laminals, /lh/ and /jh/, quite unlike other Bahnaric languages, which usually only have one (typically a sound that has a wide allophonic range: [s ~ ʃ ~ ç ~ jh]). In this case finals /lh/ and /jh/ appear to reflect a split, either a phonologically conditioned split of PB final *-s, or a general shift of *-s to /-lh/, with /-jh/ subsequently introduced by borrowings. Examples:

Cua	Remarks
pə:lh ‘calf of leg’	*puas PB
ro:lh ‘elephant’	*ruas “
bəlh ‘snake’	*bəs “
wəlh ‘measure’	*was “
barəjh ‘type of mountain rice’	*bras Proto-Chamic
ta:jh ‘to call’	*tas ‘loud noise’, cf. Wr.Khmer <i>kantas</i> ‘sneeze’
kawəjh ‘beckon with hand’	Wr.Khmer <i>vas</i> ‘gesticulate’, Vietnamese <i>vây</i> ‘to wave’

The voiced final lateral /-l/ reflects a merger of *-r and *-l to /-l/ (realized as /-r/ in the Kool Taal dialect). Examples:

Cua	Remarks
jami:l ‘ribs’	cf. jəmi:r Bahnar
pʌl ‘to fly’	cf. pər Bahnar
gʌl ‘drum’	cf. səgər Bahnar
phɔ:l ‘soul, spirit’	cf. pəhŋɔ:l Bahnar
kʌl ‘chop wood’	cf. kal Bahnar ‘chop large trees’

The post-glottalized finals - somewhat infrequent in the corpus at around 1% only - appear to reflect various complex origins, including: vowel breaking, metathesis, and borrowing. The following examples are indicative:

Cua	Remarks
baraw? ‘work’	cf. *bruā? Proto-Chamic (with metathesis)
kwaj? ‘gather, amass’	cf. kuai? Chru, N.Roglai (Highland Chamic only)
luj? ‘last born (child)’	cf. *taluc Proto-Chamic, e.g. N.Roglai talui?
ja:w? ~ ?ja:w? ‘to count’	cf. jɔ? Bahnar (with vowel breaking)
ka: gaj? ‘kind of fish’	< cá gay Vietnamese
səw? ‘bad, ugly’	< xấu Vietnamese

However, there are also a few examples of /-jʔ/ that are puzzling. For example, the first two examples below, sə:jʔ and ?nɔ:jʔ, have apparent cognates with finals that do not look like obvious sources of [jʔ]. Such examples will require further investigation. In two further examples below, ‘one’ and ‘before’, the finals may have a straightforward explanation. Various Bahnaric languages have a special form for ‘one’ used with classifiers, e.g. the regular term in Bahnar for counting is /mo:jʔ/, but when followed by a classifier /?məjʔ/ is used. The latter is the regular MK etymon for ‘one’ in which the main vowel is reduced, and the final is postglottalized, perhaps as a prosodic juncture. The ‘before, first, ahead’ form may be contaminated by analogy with ‘one’.

Cua	Remarks
sə:jʔ ‘till, cultivate, prune’	cf. Wr.Khmer bhjuər furrow, Stieng cuər ‘to plow’
?nɔ:jʔ ‘more, another’	cf. Bahnar ?naaw ‘new, recent’, Tampuon naaw? ‘again, further’
muj? ~ muj ‘one’	cf. Bahnar ?məjʔ ‘one used with classifiers’
?adrɔ:jʔ ‘before, ahead’	cf. Bahnar hədrɔ:j ‘before, first’

The general problem of accounting for the /-jʔ / final in Bahnaric languages, especially in cases where it contrasts with /-c/ (since we would anticipate decomposition of /-c/ as the first source of /-jʔ/), remains unresolved. It may be that a *-jʔ : *-c distinction must be reconstructed for Proto-Bahnaric,

although presently the lack of regular correspondences makes the problem difficult to investigate.

Vocalism

Cua vocalism is exceedingly interesting from the perspective of reconstructing PB vowels. On the surface the Cua vowel inventory looks like what one finds in a more or less typical conservative or "unrestructured" (to use the framework of Huffman 1985) Mon-Khmer language. However, the specific distributions of various vowels tell a very different story, one of a web of conditioned shifts, splits and mergers that is unique to Cua.

There are two main stories in the history of Cua vowels. One is the story of the central vowels raising in timbre, and other is the diphthongs merging and re-emerging from the front and back monophthongs. Both of these complicated changes correlate fairly neatly with the manners and places of articulation of the immediately adjacent consonants.

Raising of Central Vowels

Maier (1969:19) writes:

Glancing at the occurrences of *u* and *o*, one could wonder whether they are allophones of the same phoneme. The higher *u* may be preceded by nasal consonants but *o* never is; however, with several other consonants they do contrast in minimal environments.

Maier is apparently referring to both the long and short pairs /i:/, i/ and /ə:/, ə/. Out of the complete corpus of more than 3000 entries, there are about 60 examples of /i:/, 150 of /i/, 120 of /ə:/ and 120 of /ə/. Among these we find the following distributions in the etymologically Bahnaric vocabulary:

- /ə:/, ə/ occur after all initials except nasals (specifically in the prevocalic position),
- /i:/ occurs only after nasal and a couple of examples after /r/,
- /i/ occurs after all consonants, approximately half of these after nasals.

Beginning with /i:/, the distribution is quite strongly restricted. The couple of examples of /ri:/ are the adverbial **ri:t ri:t** 'carefully' and derivative **hri:t** 'careful, small', plus the temporal **tamri:** 'day after tomorrow'. The latter is transparently derived from **bar** 'two' (cf. Nyaheun **mbra:** 'day after tomorrow'), which immediately gives a clue to the source of /i:/ in Cua. But first, some background on the question of /i:/ in Bahnaric generally.

According to sub-grouping, we generally find that:

- WB languages have a phoneme /i:/, often realised as a diphthong [iə], which is well distributed and reasonably frequent;
- NB languages lack a long high central vowel, due to restructuring associated with the emergence of registers;
- CB languages have infrequent high central vowels, usually in loans or transparently allophones of other vowels.

In Sidwell (2002) I reconstructed a PB *i:, on the basis of the correspondence of WB *i: to CB and NB *i:, contrasting with PB *i:. Examples:

	PB	WB	CB	NB
‘banana’	*pri:t	*pri:t (Jru’ priət)	*pri:t (Bahnar pri:t)	*pri:t (Jeh priət)
‘weep/cry’	*ni:m	*ni:m (Jru’ niəm)	*ni:m (Alak ni:m)	*ni:m (Kayong niem)
‘rain’	*ʔmi:	*ʔmi: (Jru’ ʔmiə)	*ʔmi: (Alak bi:)	*ʔmi: (Halang ʔmja)
‘bone’	*ktsi:ŋ	*k[r]ʔti:ŋ (Jru’ ktiəŋ)	*kti:ŋ (Bahnar kəti:ŋ)	*ksi:ŋ (Jeh kəsjaŋ)
‘frog’	*ki:t	*ki:t (Jru’ ŋkiət)	*ki:t (Bahnar ki:t)	*ki:t (Jeh kiət)
‘sick’	*ji:ʔ	*ji:ʔ (Jru’ jiʔ)	*ji: (Stieng ji:)	*ji:ʔ (Jeh jiʔ)
‘dig’	*ci:r	--	*si:r (Bahnar si:r)	*ci:l (Jeh ci:l)

External comparisons, such as Mon **prət** ‘banana’ and Khmu’ **kmaʔ** ‘rain’ indicate that this PB *i: goes back to PMK *a:. It is also clear that the raising of /a:/ to /i:/ was an ongoing tendency within Bahnaric, for example, within WB examples of *i: derive from PB *a:, and there is a further tendency to raise /a:/ to /ə:/ specifically within Jru’ (before labials). Examples:

	PB	WB	CB	NB
‘wind’	*kəja:l	*kəji:l (Jru’ kəjiəl)	*kəja:l (Bahnar kja:l)	*kəja:l (Jeh kəja:l)
‘maggot’	*sra:j	*sri:j (Jru’ sriəj)	*hra:j (Bahnar hra:j)	*hra:j (Sedang hre)
‘tiger’	*kla:	*kli: (Jru’ kliə)	*kla: (Bahnar kla:)	*kla: (Sedang klə)
‘sweet’	*ʔŋa:m	*ʔŋa:m (Jru’ ʔŋə:m)	*ʔŋa:m (Bahnar ʔŋa:m)	*ʔŋa:m (Jeh ʔŋa:m)
‘blood’	*pha:m	*pha:m (Jru’ phə:m)	*pha:m (Bahnar pha:m)	*pəha:m (Jeh pəha:m)
‘crab’	*kta:m	*kʔta:m (Jru’ ktə:m)	*kta:m (Bahnar kta:m)	*kta:m (Jeh kəta:m)

As Maier noted above, Cua /i:/ is effectively in complementary distribution with /ə:/, given their distribution after nasals. However, it is also apparent that Cua /a:/ is similarly restricted; out of some 420 words with /a:/ in the corpus I count only 15 with prevocalic nasals, and among them are various obvious loans, such as **phanam** ‘starve to death’ < Vietnamese *pha ngan*, **jam nam** ‘fuzzy, rough’ < Vietnamese *nhám* ‘rough’. Thus the most straightforward hypothesis is that historical *a: and *ə: both raised and merged to /i:/, filling the vowel space that was emptied by the earlier merger of *i: and *ə: to *i: - apparently generally - beyond WB. Examples:

Cua	PB	WB	CB	NB
saŋi:j ‘far’	*cŋa:j	*cŋa:j (Jru’ hŋa:j)	*cŋa:j (Alak caŋa:j)	*sŋŋa:j (Jeh ŋiŋŋa:j)
ʔami: ‘younger aunt’	*ma:	--	*ma: (Bahnar ma:)	*ma: (Jeh ma:)
kaʔŋi:l ‘blinded’	*k[ʔ]ŋa:l	--	--	*kŋa:l (Halang kəŋa:l)
ŋi:t ‘to let cool off’	(*ŋa:c)	--	Bahnar ŋa:c ‘to cool’	--
ʔami:j ‘daughter- in-law’	*[]ma:j	*kma:j (Jru’ kma:j) ‘widow’	--	*ma:j (Jeh ma:j) ‘d-in-law’
hmi:t ‘miss, remember’	(*mə:t)	*mət (Jru’ mΛ:t) ‘to love’	--	--
kaʔŋi:t sΛk ‘put up above’	(*[]ʔŋə:ŋ)	--	Bahnar ʔŋə:ŋ ‘pull oneself up’	Rengao həŋe:n ‘lean upright (against)’
ʔaŋi:k ‘to look upwards’	(*ŋə:k)	--	Bahnar ŋə:k ‘to bend head back’	--

Unlike /i:/, Cua /i/ occurs after all types of initials. None-the-less, we still find that, parallel to /ə:/, the short /ə/ also does not occur after initial nasals. Additionally, of 430 words with a short /a/, I count only 17 with prevocalic nasals. The working hypothesis therefore, foreshadowed to some extent in Sidwell (2002), is that while both PB *a and *ə raised and merged to /i/, PB *ɨ was not previously lost from the pre-Cua system by merger(s).⁹ Consequently

⁹This is not to say that all examples of PB *ɨ were transmitted to Cua without change, since some other conditioned shifts/mergers have occurred; e.g. Cua **suʔ** ‘to return’ < PB ***ciʔ** (with backing of vowel by dissimilation of initial).

this is why we count as many as 150 examples of words with /i/ in the corpus, since the directly inherited words with /i/ will have been joined by those resulting from the raising of *a and *ə after nasals.

Elsewhere in Bahnaric, especially in South Central and NB, it is evident that PB *i was most often lowered, and in some cases backed or fronted under the influence of final consonants. This had the effect that, beyond WB, only Alak and Taliang/Kasseng show evidence of the PB *i/*ə contrast.¹⁰ Unfortunately, the extent of available data for either of these languages is such that I have not found any relevant examples involving PB *ə after a nasal, and we have a conundrum for the present: did PB *ə raise after nasals in Cua, paralleling the development of *ə:, or were there simply no examples of such a sequence in the proto-language? More research is required. Examples:

Cua	PB	WB	CB	NB
hñij ‘day’	*tñaj	*tñaj (Jru’ tñaj)	*tañaj (Alak tañaj)	--
sanim ‘year’	*cnam	--	*cnam (Bahnar sənam)	*hnam (Jeh hnam)
panil ‘wing’	*pnar	*pnar (Jru’ pnar)	*pnar (Bahnar pənar)	*pnar (Jeh mənal)
panih ‘portion, half’	*p[ʔ]nah	--	*pʔnah (Bahnar məʔnah)	*ʔnah (Halang ʔnah)
kʌʔ gɨl ‘head’	*gɨl	--	(Bahnar kəl, Alak gʷu)	*gəl (Rengao gəl)
dik ‘stand up’	*dik	*dik (Jru’ dik ‘to climb’)	*dik (Alak duk ‘rise, stand’)	*dək (Jeh dək ‘go up’)
rabiʔ ‘at night’	(*[]biʔ)	*trbiʔ ~ *ʔmbiʔ (Jru’ hbiʔ)	(Alak m̥bɣʔ)	--
hnim ‘to bang against, knock’	*tim	*tim ‘hit’, *trnim ‘hammer, mallet’ (Jru’ hnəm)	--	--

¹⁰One reviewer suggested that the *i correspondence may instead reflect PB *ə, due its limited distribution.

Diphthongs

The development of Cua diphthongs involves various splits and mergers, conditioned by place of articulation of finals. These changes are no longer productive, and subsequently numerous structural exceptions have been introduced by the intrusion of loans, mainly from Katuic, Chamic and Vietnamese.

Within the history of the Bahnaric languages there is a complicated relationship between the diphthongs **ia* and **ua*, and the low monophthongs **e:* and **ɔ:* (discussed to some extent in Sidwell 2003). In my reconstruction of PB, **ua* was restricted to syllables with apical or laminal finals, while **ia* could only occur with labial, apical or velar finals. Neither could occur in open syllables (zero coda). By contrast, **e:* and **ɔ:* were effectively unrestricted in their distributions, with the one exception that **e:* did not occur before laminals. It is also noteworthy that **e:* was markedly infrequent in closed syllables, possibly reflecting various diphthongizations in the development of Proto-Bahnaric from PMK. We can represent the distributions of these proto-vowels as follows (where shaded areas indicate licit combinations and the lighter shading of the more suspect distributions):

	-p	-m	-w	-t	-n	-r	-l	-s	-c	-ŋ	-j	-k	-ŋ	-h	-ʔ	-ø
ia																
u																
a																
<i>e:</i>																
<i>ɔ:</i>																

Analysing the etymologically Bahnaric vocabulary within Cua, some regular patterns emerge:

1) **ua* and **ɔ:* merged to /ɔ/ before apicals and laminals, creating a temporary gap in the paradigm (e.g. the few examples of /-uat/, /-uac/ in Maier & Burton's dictionary are predominantly loans). Some new cases of /ua/ emerged from the diphthongization of **u:* before velars.

2) Most cases of **ia* continued without change into Cua, although before **-r* and **-l*, **ia* merged with **i:* to /i/. **ia* also variously merged with **e:* to /e:/, and in an apparent chain shift some examples if **i:* then diphthonged to /ia/.

Examples:

Sound change	Cua	Proto-Bahnaric
PB *ua > Cua ɔ: /_ C[+ apical, + laminal]	pɔ:lh ‘calf of leg’ pɔ:t ‘four’ paŋɔ:t ‘hungry’ hlɔ:ŋ ‘tail’ ʃɔ:ŋ ‘deer’ rɔ:ŋ ‘fly’ rɔ:t ‘buy’ kɔ:t ‘child’	*puas *puat *paŋuat *suaj *juaj *ruaj *ruat *kuan
PB *u: > Cua ua /_ C[+ velar]	guak ‘ladder’ suak ‘axe’	*gu:ŋ *cu:ŋ
Sound change	Cua	Proto-Bahnaric
New uaC[+ velar] < borrowing	kuak ‘to dig’ < Viet. <i>cuốc</i>	
PB *ia, *i: > Cua i: /_ r, l	ʔi:l ‘chicken’ pari:l ‘hail’ khi:l ‘wind’ si:l ‘dig’ ti:l ‘seed’	*ʔiar *prial *kja:l *ci:r *ti:l
PB *ia > Cua e: /_ C[+ velar]	hre:k ‘100’	*hriang
PB *ia > Cua ia	rapiat ‘tongue’ kanih ‘finger nail’ siap ‘raise animals’ kadiap ‘onion’	*lpiat *krnih *ciam *kdiam
PB *i: > Cua ia /_ C[+ velar]	jiak ‘rice field’ cpiak ‘civet’	*ji:k ‘to hoe’ *spi:k ‘civet’

The innovative diphthongs /ea/ and /oa/ are infrequent in the corpus; I count only 30 examples of /ea/ and 13 of /oa/. Significantly, six examples of /oa/ are written by Maier & Burton with alternates, e.g.: *joa?* ~ *jowa?* ‘to tread’, and paralleling this, several examples of /ea/ have Bahnaric etymologies suggesting disyllables:

Cua	Remarks
dea ‘thatch’	< PB *[g/d]ajaa (cf. Bahnar gaja:, Halang daja:)
kea ‘ginger’	< PB *kajaa (cf. Alak kaja:, Stieng ca:)

These facts suggest that the notation of diphthongs /ea/ and /oa/ may record forms with medial glides, with or without an epenthetic schwa.

Also, there are several examples involving words with prevocalic /r/ that are unambiguously from an earlier /ia/. This environment is a typical trigger for reanalysis of diphthongs in Bahnaric languages, e.g. Chrau **rəwəj** ‘fly’ < *ruaj, rəjəŋ ‘100’ < *riaŋ. Cua examples:

Cua	Remarks
reah ‘root’ ʔareak ‘crab’	< PB *riah (cf. Srê rias) < PChamic *ʔariaŋ ‘crab’

Other Vowel Changes

There is one further aspect of the vocalism to discuss; Cua has the contrasting pair of /ɪ, i/ among the short high front vowels. The contrast is real, but restricted to before glottal stops only. Tentatively we can explain this as the reanalysis of a PB length contrast which has been otherwise lost from the system, such that /ɪ/ likely reflects an historically short *i, while /i/ reflects a long *i:

There is a structural correspondence between syllables with a short vowel and glottal final in Cua, Bahnar and various other languages, and an open syllable in South Bahnaric, e.g. Cua **jiʔ** ‘sick’ versus Stieng **ji:** ‘sick’. For some etyma South Bahnaric have a short closed syllable, and for others they have an open syllable. This suggests a Proto-Bahnaric contrast of length before glottal stop, reflected in Cua as a vowel quality difference. The following examples are suggestive although not conclusive:

Cua	Bahnar	SB	Alak	PB
jiʔ ‘sick’ karaʔ ‘old’ baʔ ‘father’	jiʔ kraʔ baʔ	ji: (Stieng) kra: (Srê) ba: (Stieng)	ɕjiʔ karaʔ --	*ji:ʔ *kra:ʔ *ba:ʔ
suʔ ‘to return’ diʔ ‘all, finished’	-- diʔ ‘all’	seʔ (Stieng) --	cuʔ --	*ciʔ (*diʔ)

Summary & Conclusions

While the analyses and results presented in this - rather preliminary - paper are far from complete, they have identified many features of the historical-phonological evolution of Cua, and surely provide a solid basis for further work. On the face of it Cua shows a peculiar suit of connected conditioned sound changes that are readily explained as direct developments from Proto-Bahnaric. It would therefore seem reasonable to suggest that Cua represents a (fourth) primary branch of Bahnaric on its own, which (contra Sidwell 2002), I suggest be called “East Bahnaric”.

The reconstructed development of PB phonemes discussed here is tabled as follows:

Initials				Finals		
*p-	>	p-		*-p	>	-p
*b-, *ɓ-	>	b-		*-m	>	-m/-p
*m-	>	m-		*-w	>	-w
*w-	>	w-		*-t	>	-t
*t-	>	t-		*-n	>	-n/-t
*d-, *ɗ-	>	d-		*-r, -l	>	-l
*n-	>	n-		*-c	>	-n/-t/-k
*r-	>	r-		*-s	>	-lh
*l-	>	l-		*-ɲ-	>	-ŋ/-k
*s-	>	hl-		*-k	>	-k
*c-	>	s-		*h-	>	-h
*j-	>	j-		*ʔ-	>	-ʔ
*ɲ-	>	ɲ-				
*j-	>	j-				
*k-	>	k-				
*g-	>	g-				
*ŋ-	>	ŋ-				
*h-	>	h-				
*ʔ-	>	ʔ-				

Vowels					
*i:	>	i:/e:/ia/i	*i:	>	i:/ia/e:
			*ə:	>	ə:/i:
			*a:	>	a:/i:
*ia	>	ia/ja/i:			*u
					>
					ua/ɔ:/
*i	>	i/ɬ	*i	>	i/u/ʌ
			*ə	>	ə/i
			*a	>	a/i
					a
					>
					wa/u:

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