THE PHONOLOGY OF
KOMPONG THOM CHAM

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0. *Introduction*

Cham is a member of the Chamic Group of Austronesian. Other Chamic languages include Chru, Haroi, Jarai, Radé, and Roglai. It is classified into two major dialects: Eastern Cham (spoken by about 30,000 people in the Socialist Republic of Vietnam in the vicinity of Phan Rang) and Western Cham (spoken by about 150,000 people in Vietnam in the vicinity of Châu Đốc and in Tây Ninh Province, and in Cambodia along the Mekong River and its tributaries). This study describes the synchronic and diachronic phonology of the Western Cham dialect spoken in Kompong Thom Province, Cambodia,[1] (KTC). This dialect differs somewhat from the Western Cham dialect of Châu Đốc (CHD) described by Friberg and Hor (1977); it differs substantially from the Eastern Cham of Vietnam (CVN).

The Western Chams apparently represent the descendants of immigrants who left Vietnam after the collapse of the Cham Kingdom in the sixteenth century. The majority of Western Chams are Muslims and use an adoptation of the Arabic script—via Malaysia—to write Cham. Recently, a Latin script has been devised to write Eastern and Western Cham.

1. *The Word*

The native Cham word—which may differ significantly in pattern from borrowed words—has the following syllabic patterns:

MONOSYLLABLES: $(C_3V_2)'C_1(C_2)V_1F$

CV	/la/	['la:]	'leaf'
CVF	/săw/	['sau̯]	'dog'
CVCV	/taho/	['tho:]	'large jar'
	/patɔ/	[pə'tɔ:]	'teach'
CVCVF	/kanɔŋ/	[kə'nɔ:ŋ]	'be angry'

POLYSYLLABLES: $''C_4V_3C_3V_2F_2'C_1V_1F_1$

CVCVCV	/marasa/	[''maɣɔ'sa:]	'maybe'
CVCVCVF	/panatăŋ/	[''panɔ'tàŋ]	'animal'
CVCVFCVF	/patanrăuʔ/	[''patɔn'ɣău̯ʔ]	'make heavy'

In the patterns above: C = any consonant, V = a vocalic nucleus, ' marks primary stress of the following syllable, '' marks secondary stress of a following syllable, and F = any final consonant. Borrowed words from Khmer, Vietnamese, Arabic, Malay, Sanskrit, or European sources may show varied syllabic patterns. In some cases, there has been a reshaping of a foreign word into a Cham syllabic pattern. More recent borrowings are less likely to be reshaped than older ones.

/šɔřga/ [šɔřga] 'heaven' (Skt. *svarga*)
/fim/ [fi:m] 'film' (ultimately from French or English 'film')

2. Register
Western Cham is a two-register language. The effects of register are seen most obviously on the vocalic nucleus. The High Register (HR) vowels are higher (in terms of tongue height), rather 'breathy' in voice quality, and associated with low pitch. Low Register (LR) vowels are lower in tongue height, often with lower on-glides, rather 'clear' in voice quality, and associated with higher pitch. Friberg and Hor (1977: 18-19), following Gregerson (1976), suggest that the physiological basis for register is the advancement or retraction of the tongue root. They describe First Register (with the tongue root retracted, called Low Register in this paper) vowels as generally lower and tense and Second Register (with tongue root advanced, called High Register in this paper) vowels as generally higher and lax with associated lower pitch and slightly breathy quality.

The High Register developed in syllables which originally, in an earlier stage of Cham,[2] began with voiced consonants. In the dialect of Western Cham described by Friberg and Hor (1977), the High versus Low Register opposition was noted only following stops. Low register vowel nuclei followed originally voiceless stops and high register vowel nuclei followed originally voiced stops. The remaining consonants seemed to be associated with the high register. In the Kompong Thom dialect, original clusters of /h/ + /w, l, y, r, m, n, ŋ/[3] have lost the /h/[4] and have vowel nuclei associated with the low register. In some cases, the original Proto-Chamic (PC) cluster had initial /s/ which must have become /h/ before the Cham Empire broke up, e.g.:

*humã 'field' > /mɨ/ [mˀɨ] cf. CHD *hamɯ* and CVN *hmu* or *həmu*)
*hanãʔ 'asthma' > /nɨʔ/ [nˀɨʔ] (cf. CHD *hanɯc* and CVN *hanɯ*')

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2. Since the traditional Cham script distinguishes between voiced and voiceless stops and it was adopted prior to the eighth century A.D., it is believed that the voiced-voiceless distinction was present in Cham at that time.
3. /h/ + /ñ/ has not been found.
4. In careful speech, the /h/ may be pronounced, but it has been lost in the everyday spoken language.

*sana 'roast' > /na/ [na:] (cf. CHD *hana* and CVN *hna*)
*hureʔ 'vine' > /rĕʔ/ [ɣɛʔ] (cf. CHD *hrĕk* and CVN *harĕ'*)
*surăʔ 'writing' > /răʔ/ [ɣaʔ] (cf. CHD *hrak* and CVN *hraʔ* or *sraʔ*)
*sula 'leaf' > /la/ [la:] (cf. CHD *hla* and CVN *hala*)
*haway or huway 'rattan' > /wăy/ [waɪ̯] (cf. CHD *haway* or CVN *hawĕy*)

The contrast between the reflexes of *w, *l, *y, *r, *m, *n, *ŋ and *h(V) + *w, *l, *y, *r, *m, *n, *ŋ can be seen in pairs like the following.

/ni/ [nᵊiꞏ:] 'bee' < *hunĩ
/nì/ [nɪ̵:] 'this' < *ʔunĩ

/mĭt/ [miᵛt] 'hear' < *hmɔ̃t
/mɪ̀t/ [mɪ̵t] 'always' < *(mit)†

/wăʔ/ [u̯aʔ] 'eat' < *huaʔ
/wằʔ/ [u̯à] 'pull down' < *(wăʔ)

/yăw/ [i̯au̯] 'like' < *(hyəu̯)
/yằw/ [i̯àu̯] 'yoke' < *yəu̯

/răʔ/ [ɣaʔ] 'writing' < *surăʔ
/rằʔ/ [ɣàʔ] 'vein' < *ʔurăt

3. Consonants
The following consonants occur in KTC:

	BILABIAL	DENTAL	PALATAL	VELAR	GLOTTAL
STOPS	p	t	c	k	ʔ
	b	d	j		
NASALS	m	n	ñ	ŋ	
SONANTS	w	l	y	r	
		s			h

/ř, f, š, z/ also occur in borrowed words.

The consonant phonemes of KTC are described in detail below.
/p t c k/ are voiceless, unaspirated bilabial, dental, palatal, and velar stops respectively. They are unreleased in final position. When followed by / /, they are lenis.

/palăy/ 'village' [pɔ̆'lăɪ̯]
/cìp/ 'Thursday' [čìp]
/taraʔ/ 'sow rice' [tɔ̆'ɣꞏʔ]
/matăh/ 'raw' [mɔ̆'tah]
/cĭm/ 'bird' [čim]
/tacuiʔ/ 'spit' [tɔ̆'čuɪ̯ʔ]
/kapal/ 'thick' [kɔ̆'paꞏl]

/paha/ 'thigh' [pha:]
/tăʔ/ 'chop trees' [taʔ]
/tahăw/ 'know' [thau̯]
/ŋăt/ 'be careful' [ŋat]
/cakăw/ 'cut with scissors' [čɔ̆'kau̯]
/kĕʔ/ 'to bite' [kɛʔ]
/take/ 'horn, antler' [tɔ̆'ke:]

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†Asterisked entries in parentheses ( ) are tentative reconstructions (Ed.).

/palăk/ 'muddy' [pɔ̆'lãk]   /tɔʔ/ 'bottom' [tɔ˙:ʔ]
/tɔ̃ʔ/ 'be at' [tɔ̆˖:ʔ]   /ku/ 'Cambodian' [ku˙:]
/kù/ 'kind of taro' [kŭ˖:]   /tahu/ 'dry' [thu˙:]
/tahù/ 'bat' [thŭ˖:]   /pà/ 'lead' [pà:]
/parà/ 'shoulder' [pɔ̆'ɣà:]   /tapà/ 'bland' [tɔ̆'pà:]
/toàh/ 'search for' [toàh]   /tarăp/ 'of' [tɔ̆'ɣăp]
/patằr/ 'remind' [pɔ̆'tằɯ]   /kìŋ/ 'oven' [kì:ŋ]
/karà̃ʔ/ 'rough' [kɔ̆'ɣà:ʔ]   /carù/ 'medicine' [čɔ̆'ɣŭ˖:]

Modern KTC initial /p t c k/ are reflexes of Proto-Chamic *p, *t, *c, *k and *b, *d, *j, *g. The four voiced PC stops conditioned following high register vowel nuclei.

*patəw 'stone' > /patăw/   *tupaʔ 'straight' > /tapẵʔ/
*tubəw 'sugarcane' > /tapằw/   *durəy 'thorn' > /trùay/
*pagi 'tomorrow' > /pakè/   *bala 'tusk' > /plà/
*ʔadəy 'younger sibling' > /tằy/ *tiān 'abdomen' > /tean/
*cim 'bird' > /cĭm/   *keʔ 'bite' > /kɛ̆ʔ/
*jū̃ʔ 'black' > /cù̃ʔ/   *groh 'to bark' > /krɔ̃h/

The clusters *dl- and *tl become /kl-/.

*tlaw 'three' > /klăw/   *dleh 'tired' > /klɛ̃h/

Voiceless stops are retained in words borrowed from Khmer.

Khm. /phəŋ/ 'inch' > /phɔ̃ŋ/
Khm. /ckiel/ 'gouge' > /cakial/
Khm. /kmaoc/ 'ghost' > /kamot/
Khm. /tnaot/ 'sugar palm' > /tanot/
Khm. /taə/ 'only' > /taə/.

Some words which contained voiced stops in Middle Khmer were apparently borrowed before these stops were devoiced in Khmer and then subsequently devoiced in KTC. The vowel nuclei in KTC that follow originally voiced Khmer stops are those asociated with the high register.

Khm. /peil/ (*bel*) 'time' > /pèl/
Khm. /koum/ (*gōm*) 'lamp' > /kòm/
Khm. /toap/ (*dāpa*) 'army' > /tɔ̀p/
Khm. /tup/ (*da'pa*) 'stop' > /tɔ̀p/

There are several problems with the reflexes of the final PC stops. Generally, KTC has /-ʔ/ as the reflex for *-p *-t *-c *-k and *-ʔ. Final *-p

becomes /-uʔ/;[5] final *-t becomes /-ʔ/; final *-c becomes /-iʔ/ or /-ʔ/ after front vowels, and final *-k and *-ʔ become /-ʔ/. Examples of the normal reflexes are given below.

*găp 'each other' > /kău̥ʔ/	*lăp 'fold' > /lău̥ʔ/
*ʔasăp 'smoke' > /său̥ʔ/	*hadip 'alive' > /tìuʔ/
*chiāp 'wing' > /ceauʔ/	*ʔdiəp 'sticky rice' > /diauʔ/

There are numerous examples of final /-p/ in all phonetic environments in KTC. Many of these words are clearly borrowings, but others are not identifiable as such.

/kacău̥p/ 'solid' cf. Chru *koʲjăp*, S. Roglai *kojap*, and Rade *kjăp*.
/kŭmsup/ 'dawn' cf. CHD *masup* and N. Roglai *môsup*.
/radăp/ 'accustomed' cf. Chru *loʲdăp* and S. Roglai *lodap*.
/pakɔ̆p/ 'compare' cf. Chru *poʲgăp*.
/pàp/ 'evil' cf. Khm. /baap/ (< Skt. *pāpa*).
/tanàp/ 'low' cf. Old Khm. *dnāp* 'lowland' < *dāpa* 'low'
/lɔp/ 'erase' cf. Khm. /lup/ (*luʹpa*).
/ɛp/ 'accompany' cf. Khm. /ʔaep/ (*ʹēpa*) 'take shelter'
/rùp/ 'body' cf. Skt. *rūpa*.

*haget 'what' > /kèʔ/	*tuʔūt 'knee' > /taʔŭʔ/
'jhīt 'sew' > /chìʔ/	*laŋīt 'sky' > /laŋìʔ/

Lee (1965) has two reconstructions of PC words with final *-t that have kept /-t/ in Cham.

*capăt 'squeeze' > /capĕt/	*kawăt 'wire' > /kawĕt/

There are other words with final /-t/ for which reconstructions are not available, but which have cognates in the other Cham dialects.

/klŭt/ 'stuck, jammed' cf. CHD *glŭt* and CVN klŭt (< *glut*)
/cahĕt/ 'jump rope' cf. CHD *chhĕt*
/thĭt/ 'cured, recovered' cf. CHD and CVN *dhĭt*
/mĭt/ 'hear' cf. CHD and CVN *hamĭt*
/ŋằt/ 'be careful' cf. CHD *ngăt*
/padŭt/ 'compare' cf. CHD *paɗŭt*
/pawɛt/ 'cut in half' cf. CHD *pawet*
/sit/ 'small' cf. CHD *sit*

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5. The Chamic languages are in the process of losing final /-p/. This process has almost reached completion in Cham, Chru, Roglai, and Haroi. Compare the following chart:

	'fold'	'smoke'	'tie'	'hide'	'full'
CHAM	lău̥ʔ	său̥ʔ	căuʔ	tḁ̆ʔ	pàu̥ʔ
CHRU	lŏŭ	asăŭ	că	(pŏ)dŏŭ	—
SOUTH ROGLAI	lou'	sao	ca'	dou	—
NORTH ROGLAI	—	asaʔ	ica'	dɔʔ	bă'
HAROI	—	asauʔ	cauʔ	—	—
JARAI	lăp	asăp	čă	dŏp	bŏ
RADE	lăp	săp	čăp	dăp	bŏ

There are also a fair number of words with final /-t/ in KTC for which no cognates have been found: /păt/ 'of', /prĕt/ 'run fast', /cawĕt/ 'erratically', /cŭt/ 'small bamboo', /mĭt/ 'run', /padĭt/ 'make up a story', /padĕt/ 'make a fingerprint', /prĭt/ 'to set limits', /srɔt/ 'collapse', /wĕt/ 'shake the head', /yĭt/ 'keep on doing'. Of interest is the fact that, in all of these words, /-t/ is preceded by a short vowel and in most of them the vowel is a front vowel. Borrowed words with final /-t/ are numerous: /ahăt/ 'Sunday' (Malay *ahat, ahad*), /pĕt/ 'hospital' (Khm. /pɛɛt/), /bɔt/ 'turn' (Khm. /bat/, /carĭt/ 'cricket' (Khm. /caŋrət/), /makĕt/ 'female' (Malay *mĕgat*?). There may be some modifications of the vowel: /pĕt/ 'surround' (Khm. /poat/ *ba'ta*), /tĕt/ 'kick with the toe' (Khm. /toat/ *da'ta*). Final /-c/ in Khmer loans becomes /-t/ in KTC: /khut/ 'broken' (Khm. /khooc/), /kamot/ 'ghost' (Khm. /kmaoc/).

*būc 'pull up' > /pùiʔ/   *duac 'run' > /duaiʔ/
*pruec 'intestine' > /proiʔ/   *sāc 'shake out' > /saiʔ/
*hūc 'whistle' > /huiʔ/   *huac 'afraid' > /huaiʔ/
*ʔamrec 'pepper' > /mrɛʔ/

*brŭk 'rotten' > /prŭʔ/   *pirăk 'silver' > /preaʔ/[6]
*bruãʔ 'work' > /prŭʔ/   *mañak 'oil' > /mañɨʔ/
*katŭk 'flatus ventrus' > /katuʔ/   *pituʔ 'star' > /patŭʔ/
*pāʔ 'four' > /paʔ/   *ŋõʔ 'upgrade' > /ŋɔ̃ʔ/
*huaʔ 'eat rice' > /hoaʔ/   *tasĩʔ 'sea' > /tasiʔ/

Usually, following a nasalised vowel in PC and in borrowed words, /-k/ and /-ʔ/ become /-k/:

*ñũʔ 'dive' > /ñŭk/ ·   *tulõk 'disk shape' > /talɔk/
*masãk 'brave' > /masăk/

but, in some cases, no evidence of a nasalised vowel has been found:

*kutok 'grasshopper' > /katɔk/   *jăk 'clever' > /căk/.

KTC also retains final stops intact in borrowings from Khmer.

Khm. /sroop/ 'absorb' > /srop/
Khm. /aep/ 'move' > /ɛp/
Khm. /book/ 'hump' > /bok/
Khm. /lout/ 'jump' > /lòt/

/b d j/ are voiced, fortis, optionally preglottalised, bilabial, dental, and *palatal stops. The preglottalisation is especially noticeable in* /j/ which appears to vary between [ʔj] and [ʔi̯]. These stops do not occur in final position.

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6. There may have been metathesis here: *pirăk (I am unsure of the length here, it may have been *pirāk which would explain the Cham form better) > *priak > Cham /preaʔ/.

/beah/ 'until' [ʔbeah]   /dɛ̆h/ 'sputter' [ʔdɛh]
/bĭŋ/ 'eat' [ʔbɨŋ]   /labăh/ 'miserable' [lɔ̆'ʔbah]
/kadəŋ/ 'bell' [kɔ̆'ʔdəˀŋ]   /jău?/ 'must' [ʔjau̯ʔ]
/pajuan/ 'move' [pɔ̆'ʔjuan]

The KTC preglottalised series reflects preglottalised consonant in PC:

*ʔbɔ̆ŋ 'eat' > /bĭŋ/   *caʔbuay 'mouth' > /cabuay/
*ʔduac 'run' > /duaiʔ/   *ʔdiʔ 'climb' > /diʔ/
*ʔjɔ̆uʔ 'must' /jauʔ/   *ʔjŭh 'firewood' > /jŭh/

Preglottalised stops are retained in words borrowed from Khmer:

Khm. /book/ 'hump' > /bok/
Khm. /sɑmbaəm/ 'great' > /sabəm/
Khm. /dael/ 'which' > /del/

/m n ñ ŋ/ are bilabial, dental, palatal, and velar nasals respectively. All but /ñ/ have been found in final position.

/mĭt/ 'hear' [miˀt]   /mɨ̆t/ 'always' [mɨ̆ˀt]
/mɔ̆h/ 'place' [mɔˀh]   /mɔ̆h/ 'hate' [mɔ̆h]
/păm/ 'kind of pancake' [pam]
/ni/ 'bee' [nˀiˀ:]]   /nɨ̀/ 'this' [nɨˀ:]
/kɔn/ 'group' [kɔ:n]   /narɨŋ/ 'bow' [nɔ̆ɤɨ:ŋ]
/ŋǎn/ 'noun' [ŋàn]   /ñom/ 'dye' [ño:m]
/mañum/ 'drink' [mɔ̆'ñu:m]

The PC nasals *m, *n, *ñ, and *ŋ are retained unchanged in KTC.

*mata 'eye' > /mata/   *malăm 'night' > /malàm/
*tamã 'enter' > /tamɨ̀/   *ñu 'he' > /ñù/
*mañak 'oil' > /mañɨ̆ʔ/   *nãw 'go' > /nàw/
*ʔinã 'main' > /nɨ̀/   *jalān 'road' > /calàn/
*ŋã̆ʔ 'do' > /ŋǎ̆ʔ/   *laŋã 'sesame' > /laŋɨ̀/
*sāŋ 'house' > /saŋ/

The nasals are also retained in words borrowed from other languages.

Khm. /mei/ 'chief' > /mè/   Khm. /maak/ 'type' > /màk/
Khm. /ñien/ 'addicted' > /ñian/ Khm. /aeŋ/ 'self' > /eŋ/
Mal. *hina* (ult. from Skt. *hīna*) 'inferior' > /hina/ 'difficult'
Mal. *saman* (ult. from Ar. *zaman*) 'era' > /samăn/ or /zamăn/.

/w/ is a bilabial semi-vowel. It occurs in C¹ and F positions, and, in rare occasions, in C² position; and it is associated with high register nuclei. Original *hVw- clusters have become /w/ following by low register nuclei.

/wǎ̆ʔ/ 'pull down' [u̯à̆ʔ]   /yăw/ 'like' [i̯au̯]
/lawǎy/ 'stir' [lɔ̆'u̯ài̯]   /iw/ 'left (side)' [ʔi:u̯]

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In at least one case, the diphthong /oa/ which is a reflex of PC *ua and which seems regularly to become /wa/ in Eastern Cham, formed a cluster with /w/ as C^2. This forms alternates with the expected /oa/ form.

/hoaʔ/ and /wăʔ/ (< *hwăʔ < PC *huaʔ) 'eat rice'

/w/ is a reflex of PC *w. In borrowings from Khmer, /v/ is reflected by KTC /w/ in all positions.

*wār 'stable' > /wàr/	*patəw 'stone' > /patăw/
*lawa or jawa 'soul' > /ñawà/	*ʔiāw 'left (side) > /iw/
*haway (or) huway 'rattan' > /wăy/	
Khm. /viel/ 'field' > /wàl/	Vn. *chiều* 'mat' > /ciaw/
Khm. /sievphiv/ 'book' > /saphăw/ or /saphăw/	

/l/ is a lateral sonant. It occurs in C_1, C_2, C_3, and F positions.

/laʔu/ 'coconut' [lŏ'ʔu:]	/blăy/ 'buy' [ʔblai̯]
/lanŭŋ/ 'eel' [lŏ'nuŋ]	/tăl/ 'until' [tal]

/l/ is a reflex of PC *l; the clusters *h(V)l- and *s(V)l- are reflected in KTC by /l/ followed by a low register nucleus. /l/ in borrowed words is retained.

*lu 'much, many' > /lò/	*leʔ 'fall' > /lὲ/
*glo 'brain' > /klɔ̀/	*tulāŋ 'bone' > /talàŋ/
*lupān 'centipede' > /lapan/	*jāl 'net' > /càl/
*kapāl 'thick' > /kapal/	*tăl 'until' > /tal/
*hVlɔ̌ʔ 'rice dust' > /lɔ̌ʔ/	*hVluaʔ 'sharp' > /luaʔ/
*hulun 'slave' > /lĭn/	*sula 'leaf' > /la/
Khm. /lout/ 'jump' > /lòt/	Khm. /peil/ 'time' > /pèl/

Khm. poolih/ (ult. from French, *police*) > /plìh/ 'police'

French *chaland* 'ferry' > /chalaŋ/

Skt. *dhūli* 'dust' /thŭ̃l/

Khm. /rɔbuah/ (spoken: /ləbuah/) 'wounded' > /labuaih/

/r/ has two allophones. In all positions but F it is a voiced velar fricative [ɣ] which sometimes seems to approach a voiced stop [g]. In C_2 position preceding high central vowels, /r/ shows a tendency to be lost; in F position, it is a voiced, high-mid, unrounded semi-vowel [ɯ], while in C_3 position, there is some alternation between /r/ and /l/.

/rŭh/ 'shake out' [ɣuh]	/prằy/ 'give' ['pɔ̌ɣài̯]
/krɨm/ 'bamboo' ['kɔ̌ɣɨ:m] or [kɨ:m]	/păr/ 'to fly' [paɯ]
/ranɨŋ/ or /lanɨŋ/ 'wide' [ɣɔ̌'nɨ:ŋ] or [lɔ̌nɨ:ŋ]	

/r/ in all positions is a reflex of PC *r, which in F position following a high back rounded vowel or a diphthong is lost in KTC. /r/ in borrowed words has several treatments. In most borrowings from Sanskrit and Khmer, it has the same allophonic distribution as it has in native Cham words, but in some Sanskrit and Arabic loans, /r/ is a flap [ř].

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*ruah 'choose' > /roah/   *ʔariaŋ 'crab' > /riaŋ/
*krãm 'bamboo' > /krɨm/   *ʔusar 'seed' > /săr/
*cur 'lime' > /cu/   *biēr 'dwarf' > /pìa/
*kuar 'gather up' > /kua/
Skt rūpa 'body' /rup/
Skt. nagara 'fortress' > /lakãr/ 'country'
Skt. naraka 'hell' > /nãrka/   Skt svarga 'heaven' > /šɔřga/
Malay murtabat or martabat (ult. from Arabic) 'grade, step' >
    /mŭřtabăt/ 'knowledge'
Khm. /riep/ 'level' > /ràp/   Khm. /sroop/ 'absorb' > /srop/

/y/ is a palatal semi-vowel. In C_1 position preceding a vowel it may have considerable friction, approaching [ǰ].

/yăw/ 'like' [i̯au̯] /yằw/ 'yoke' [i̯àu̯]
/hatằy/ 'after' [hɔ̃'tài̯]   /kayăw/ 'tree' [kɔ̃'i̯au̯]

/y/ in all positions reflects PC *y. The cluster *hVy- gives /y/ followed by low register vowel nuclei.

*yɔ̃w 'yoke' > /yằw/   *hayɔ̃w 'like' > /yăw/
*hayuak 'harvest' > /yoaʔ/   *tuãy 'stranger' > /tuay/

/y/ in borrowed words remains /y/.

Khm. /claəy/ 'answer' > /chləy/
Mal. dunia (ult. from Arabic) 'world' > /tùnya/

/s/ is a voiceless dental spirant. It occurs in C_1, C_3, and C_2 positions. It occurs in F position only in some recently borrowed words.

/sit/ 'small' [si:t]   /sabo/ 'colour' [sɔ̃'ʔbo:]
/pasĕh/ 'castrate' [pɔ̃'seh]   /kumŭs/ 'dictionary' [kumus]

/s/ is a reflex of PC *s. Final s in early borrowings is usually reflected by /-ih/; final PC *s has become /-h/.

*suəy 'slow' > /suay/   *ʔusar 'seed' > /săr/
*srũh 'nest' > /srũh/   *brās 'husked rice' > /prằh/
*tikus (or *tukus 'rat' /takŭh/ *kakăs 'scale' > /kakăh/

Khm. /saak/ 'attempt' > /sak/   Skt. doṣa 'fault' > /tùih/

Skt. mānuṣa 'man' > /manuih/
Khm. /cbah/ < (cbās) 'clear' > /cabaih/
Khm. /cumnuah/ < (jamnuas) 'substitute' > /camnùaih/

PC *s in C_3 position may be lost before stops or retained before other consonants. In the latter case, *s sometimes becomes *h which in turn is lost after causing a change in the register of the following syllable.

*sagor 'drum' > /kằr/   *sara 'salt' > /sra/
*sidor (or) *sidər 'remember' > /tằr/
*sidOm (or) *sudOm 'ant' > /tɔ̃m/
*samũ (or) *sumũ 'flat' > /samu/
*surằʔ 'writing' > *harằʔ > /rằʔ/
*sula 'leaf' > *hala > /la/   *sana 'roast' > *hana > /na/

/h/ is a voiceless glottal spirant. It occurs in all positions.

/hoa?/ 'pull tight' [hoə̆]   /pahiʔ/ 'bitter' [phi:ʔ]
/hawa/ 'dissatisfied' [hɔ̃'u̯a:]   /plằh/ 'split' [plàh]

/h/ in all positions reflects PC *h. Final PC *h and *s have merged, and are reflected by /-h/. In borrowed words, /h/ remained /h/. Arabic ḥ merged with Cham /h/.

*hã 'yes' > /hɨ/   *hia 'cry' > /hea/
*hūc 'whistle' > /huiʔ/   *bahrəw 'new' > /phằw/
*hadūm 'how many' > /hatòm/   *ʔabih 'all' > /pĭh/
Mal. *hakĕm* 'judge' (ult. from Ar. *ḥakīm*) < /hakĕm/
Khm. /cneah/ (<*jhnah*) 'win' > /canɨ̆

/f š z/ appear to be limited to borrowed words especially those from Arabic through Malay. /f/ is a voiceless bilabial spirant; /š/ is a voiceless palatal spirant, and /z/ is a voiced dental spirant. In casual speech, /š/ and /z/ usually become /s/.

/šɔ̌rga/ 'heaven' < Skt. *svarga*   /fằl/ 'memorise' < Ar. *fal*
/išrằt/ (or) /isrằt/ 'show' < Mal. *isharat* (ult. from Ar.) 'signal'
/izĭn/ 'permission' ≤ Mal. *idzin* (or) *izin* (ult. from Ar.)

There seem to be two kinds of initial consonant clusters in KTC. One may be represented as /C₁C₂/ and consists of two consonants in close juncture without any intervening vowel. C₂ in these clusters is limited to /l r h/. The following examples have been noted in this corpus:

	SECOND MEMBER		
	l	*r*	*h*
p	X	X	X
t			X
c			X
k			X
n		(X)	

The second type of cluster may be represented as /C₁aC₂/. In clusters of this type, there is an intervening short vowel. Some of these show considerable variation. One speaker, in slow, careful speech may pronounce a cluster with the short vowel, e.g., [tə̆hun] 'year', while the

same speaker in more casual, rapid speech may pronounce the same cluster without any perceptible intervening vowel, e.g. [thun]. The C_2 in these clusters can be /p t c k ʔ j m n ñ ŋ w l y r s h/. As described in the second type above, there has been some simplification of PC clusters of *hVC- and *sVC-. In at least one case, the historical treatment of clusters differs. PC *tl- and *dl- > CHD /kl-/ but *tVl- > KTC /tal-/, *tlaw 'three' > /klăw/, *tulāŋ 'bone' /talaŋ/.

Cham also has consonant clusters in polysyllabic words. In these, the common pattern is CVCCV(F) , as in:

/cakla/ 'lightning' [čə̆'kla:]
/paplăy/ 'to sell' [pə̆'plài̯]
/kanrăm/ 'trap' [kə̆n'ɣam]
/masrŭh/ 'war' [mə̆s'ɣuh]
/taplɛt/ 'scraped off' [tə̆'plɛt]

Another pattern has a short vowel between the two middle consonants. The third syllable receives the main stress while the first receives secondary stress.

/marasa/ 'maybe' [ˈˈmaɣə̆'sa:]
/masatăh/ 'from a distance' [ˈˈmasə̆'tah]
/palahiɯʔ/ 'to destroy' [ˈˈpalə̆'hiɯʔ]

Finally, there is the pattern CVCVFCVF as in:

/patanrău̯ʔ/ 'make heavy' [ˈˈpatə̆n'ɣau̯ʔ]

4. Vowels
KTC has the following vowels:

	FRONT	CENTRAL	BACK
HIGH	i ĭ	ɨ ɨ̆	u ŭ
MID-HIGH	e		
MID		ə ə̆	o ŏ
MID-LOW	ɛ ɛ̆		
LOW		a ă	ɔ ɔ̆

GLIDES: /ia, iɯ, ea, au, ua, oa/

All vowels that precede /-h/ are short, but they are still marked with the breve (˘) in this article. First or low register vowels are generally lower than their second or high register counterparts and may have on-glides. The vowels are now described in detail:

/i ĭ/ are high front vowels. First register /i/ is [ʔiˑ:]

/nì/ 'this' [nìˑ:]   /ni/ 'bee' [nᵊiˑ:]
/lĭn/ 'I' [liˑn]   /padiʔ/ 'hurt' [pə̆ʔdi:ʔ]

KTC /i/ and /ĩ/ are reflexes of PC *i, *ĩ, *ī, and *ĩ̄.

*cĭm 'bird' > /cĭm/   *ʔabĩh 'all' > /pĩh/
*jhīt 'sew' > /chìʔ/   *gīŋ 'stove' > /kìŋ/
*ʔaŋĩn 'wind' > /ŋĭn/   *laŋī̃ʔ; 'sky' > /laŋiʔ/
*phī̃ʔ 'bitter' > /phiʔ/

KTC /i/ and /ĩ/ may reflect /i/ and /ə/ in borrowed words.

Pali *bhikkhu* > Khm. /phiʔkhoʔ/ > /phìʔ/ 'Buddhist monk'
French *police* > Khm. /pooliih/ > /plĩh/ 'police'
Khm. /kən/ > /kĭn/ 'to mill rice'
Skt. *sākṣin* > Malay *saksi* > /săksi/ 'witness'

/e/ is a long mid-high front vowel; no short /e/ has been found in the present material except preceding /-h/.

/mè/ 'chief' [mè:]   /pèl/ 'time' [pè:l]
/ʔeŋ/ 'self' [ʔe:ŋ] /sĕh/ 'student' [sĕh]
/take/ 'horn, antler' [tɔ̆'ke:]

KTC /e/ is a reflex of PC *ī.

*pagi 'tomorrow' > /pakè/   *tuki 'horn, antler' > /take/

It also occurs in words borrowed from Khmer in which it is a reflex of /ei/ and /ae/.

Khm. /peil/ 'time' > /pèl/   Khm. /mei/ 'chief' > /mè/
Khm. /ʔaeŋ/ 'self' > /ʔeŋ/   Khm. /dael/ 'have ever' > /del/

/ɛ ɛ̃/ are mid-low front vowels; first register /ɛ/ is [ae] in open syllables.

/lɛ̃ʔ/ 'fall into' [lɛ̃ʔ]   /cɛ̆h/ 'insert' [cɛ̆h]
/sarɛ/ 'debt' [sɔ̆'ɣaɛ]

PC *ĕ and *ē and *ẽ are reflected by KTC /ɛ̃/ and /ɛ/.

*kɛ̆ʔ 'bite' > /kɛ̆ʔ/   *ʔĕh 'excrement' > /ʔɛ̃h/
*bube 'goat' > /papɛ̆/   *srẽ 'debt' > /sarɛ/

/ɨ ɨ̃/ are high central unrounded vowels; first register /ɨ/ is [ʔɨ̈:] in open syllables.

/bɨ̃ŋ/ 'eat' [ʔbɨŋ]   /mɨ/ 'field' [mᵊɨ̈:]
/mɨ̃ʔ/ 'get' [mɨʔ] /nɨ/ 'chief, main' [nɨ̈:]

KTC /ɨ/ and /ɨ̃/ are reflexes of PC *ã and *ā̃ and *ɔ̃ and *ɔ̃̄.

*tanã̃ʔ 'cook' > /tanɨ̃ʔ/   *lanã̃ŋ 'worm' > /lanɨ̃ŋ/
*limã̃ 'five' > /lamɨ/   *lumã̃n 'elephant' > /lamɨn/

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*lumiã? 'prepare' > /lamiɯ?/ or /ramiɯ?/
*hã 'yes' > /hɨ/   *?bɔ̆ŋ 'eat' > /bɨŋ/
*čɔ̆? 'mountain' > /cɨ̌?/   *dəŋ 'stand' > /tɨŋ/

KTC /ɨ/ may reflect /a/ in ancient borrowings.

Khm. /cneah/ (*jhnah*) > /canɨ̆h/ 'win'

The word /ɨnŋău?/ 'verb?' is probably a loan from Malay.

/ə ɔ̆/ are mid-central unrounded vowels. The perceived difference
between first register /ɨ/ and second register /ɔ̆/ is often very slight.

/yə/ *final emphatic particle* [i̯ə:]   /pəŋ/ 'blown away' [pə:ŋ]
/pə̌?/ 'small dam' [pə̌?]   /pə?/ '(banana) sheath' [pə:?]
/calɔ̆ŋ/ 'very tall' [cɔ̌'ləŋ]

KTC /ə/ and /ɔ̆/ are reflexes of PC *ɔ̄ and *ə. They also derive from
Khmer /əə/ and /aə/ in borrowed words.

*pɔ̆ŋ 'to nail, pound' > /pɔ̌ŋ/   *wɔ̆? 'instead' > /wɔ̌?/
*pɔ̆h 'open' > /pɔ̆h/   *(...)tə? 'tremble' > /catə?/
Khm. /claəy/ 'answer' > /cləy/
Khm. /sambaəm/ 'important' > /sabəm/
Khm. /prɔhəən/ or /pəhəən/ 'arrogant, insolent' > /phə̌n/

There is one instance of KTC /ə/ from Khmer /aə/.

Khm. /tae/ 'only' > /təə/ (cf. p.108 above).

/a ă/ are low central unrounded vowels. /a/ in unstressed presyllables
represents a very short mid-central vowel [ə̆]; when it occurs before /m/ in
presyllables, it is backed and rounded to [ɔ̆].

/saŋ/ 'house' > [sa:ŋ]   /năn/ 'that' [nàn]
/tằy/ 'younger sibling' [tài]   /kapằ?/ 'walk' [kɔ̆'pà:?]

KTC /a/ and /ă/ are reflexes of PC *a and *ă. PC *ɔ̄ preceding *r and *l is
also reflected by /ă/.

*blă̆h 'split' > /plằh/   *hăŋ 'spicy' > /hăŋ/
*dalăm 'deep' > /talằm/   *katăl 'itchy' > /katăl/
*pha 'thigh' > /pha/   *tulāŋ 'bone' > /talaŋ/
*pā? 'four' > /pa?/   *hujān 'rain' > /càn/
*?ulā 'snake' > /là/   *gɔ̆r 'handle' > /kằr/
*tɔ̆l 'until' > /tăl/

KTC /a/ may reflect /a/ in borrowed words as well as /ie/ in some
borrowings from Khmer.

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Pali *akkhara* > /akhǎr/ 'letter'
Pali *kappāsa* > Khm. /kapbaah/ > /kapǎh/ 'cotton'
Malay *akal* (ult. from Arabic) > /akǎl/ 'intelligence'
Skt. *rājakāra* > Khm. /rieccakaa/ > /racaka/ 'government'
Khm. /riep/ (*rāpa*) > /ràp/ 'level'

/u ŭ/ are high back rounded vowels; first register /u/ and /ŭ/ have lower on-glides [ᵘu] or [ʊ].

/hu/ 'have' [hᵘu]   /kŭŋ/ 'who' [kʊŋ]
/ñù/ 'he, she, it' [ñù:]   /cǎrŭh/ 'fall down' [cɔ̌'γù˖h]

KTC /u/ and /ŭ/ are reflexes of PC *ū and *ŭ and PC *ũ̄ and *ṳ̃.

*tŭh 'pour' > /tŭh/   *pitŭʔ 'star' > /patŭʔ/
*tupŭŋ 'flour' > /tapŭŋ/   *thŭn 'year' > /thŭn/
*manṳ̃ʔ 'chicken' > /manŭʔ/   srŭ̃h 'nest' > /srŭh/
*ñṳ̄s 'blow nose' > /ñuh/   *jū̃ʔ 'black' > /cùʔ/
*cūr 'lime' > /cu/   *jaʔbū 'dry' > /cabu/
*jamṳ̄k 'mosquito' > /camùʔ/   *ñṳ̃ 'he, she, it' > /ñù/

KTC /u/ and /ŭ/ reflect /u/ in borrowed words.

Skt. *dhūli* > Khm. /thuulii/ > /thŭ̀l/ 'dust'
Malay *dunia* (ult. from Arabic) > /tù̃nya/ 'world'
Khm. /puun/ (*būna*) > /pùn/ 'to mound up'
Skt. *guru* > Khm. /kruu/ > /krù/ 'sorcerer'
Malay *kubur* (ult. from Arabic) > /kupùř/ 'tomb'

/o ŏ/ are mid-high back rounded vowels.

/ʔo/ <u>final negative particle</u> [ʔo:]   /pahoŋ/ 'group' [pho:ŋ]
/pŏh/ 'fruit' [pŏ˖h]   /lò/ 'very' [lò˖:]

KTC /o/ and /ŏ/ are reflexes of PC *ū, *ŭ and *ũ̄. In loanwords, KTC /o/ may also reflect Khmer /oo/, /ou/, and /ao/.

*ʔbuh 'see' > /bŏh/   *hŭ̃ŋ 'papaya' > /lahŏŋ/
*hadūm 'how long' > /hatòm/   *lū 'many' > /lò/
*tagū̃ʔ 'arise' > /takŏʔ/   *plūm 'leech' > /plom/
*tū̃ʔ 'receive' > /toʔ/
Khm. /tnaot/ 'sugar palm' > /tanot/   Khm. /sroop/ 'absorb' > /srop/
Khm. /youŋ/ 'two' > /yòŋ/   Khm. /lout/ 'jump' > lòt/

/ɔ ɔ̌/ are mid-low back rounded vowels.

/lamɔ/ 'cow' [lǎ'mɔ:]   /tɔ̌ʔ/ 'to be located at' [tɔ̀:ʔ]
/tɔ̌p/ 'hit with the flat of the fist' [tɔp]

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/kɔ̆h/ 'knock' [kɔh]

KTC /ɔ/ and /ɔ̃/ are reflexes of PC *o, *ŏ, *õ, and *ɔ̃.

*ʔakŏʔ 'head' > /kɔ̆ʔ/	*grŏh 'to bark' > /krɔ̆h/
*patō 'teach' > /patɔ/	*rōŋ 'nourish' > /rɔ̆ŋ/
*lōk 'to peel' > /lɔʔ/	*ŋŏ̃ʔ 'on' > /ŋɔ̃ʔ/
*hŏ̃ŋ 'wasp' > /hɔŋ/	

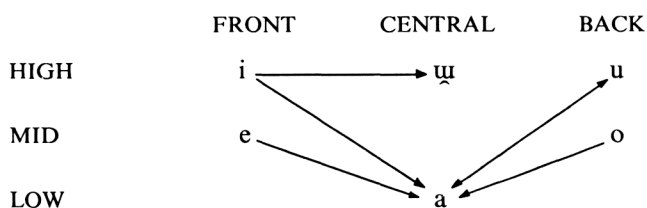Lee's (1965) *O sporadically becomes KTC /ɔ̃/.

*ʔbrOm 'arrow' > /brɔ̃m/
*sudOm (or) *sidOm 'ant' > /tɔ̆m/

Khmer /oa/ and /ɔə/ become /ɔ̃/ in KTC; /oa/ becomes /ɛ̃/ before /-t/.

Khm. /toap/ 'army' > /tɔ̆p/   Khm. /crɔək/ 'pickle' > /crɔ̆k/

There is abundant evidence in KTC for a split in the PC high and low vowels: *i > /i/ and /e/, *u > /u/ and /o/, and *a > /a/ and /ɨ/. The conditioning factor for the split of *a is apparently nasalisation: *a > /a/, while *ã > /ɨ/. The conditioning factor for the split of the high vowels has not been discovered. Lee (1977: 89-92) relates similar vowel splits in Haroi to: (1) the voicing feature of a preceding obstruent, and (2) the height feature of a preceding vocoid. Both reflexes of *i and *u have been found in apparently identical environments in KTC. It is always possible that the /e/ and /o/ reflexes, which are statistically much rarer than the /i/ and /u/ reflexes, are limited to borrowings from other dialects or from related languages, but so far, in most cases, no sources have been found.

The following glides occur:

	FRONT	CENTRAL	BACK
HIGH	i	ɯ̤	u
MID	e		o
LOW		a	

/sia/ 'near' [siə]
/lahiɯʔ/ 'lose' [lɔ̆'hiɯʔ]
/cèaŋ/ 'craftsman' [cèaŋ]
/kua/ 'embrace']kuə]
/tŏa/ 'two' [tŏə]

/hapian/ 'when' [hɔ̆'piən]
/seam/ 'good' [seam]
/yuan/ 'Vietnamese' [i̯ùən]
/ròah/ 'seek' [ɤòəh]
/săuʔ/ 'smoke' [sau̯ʔ]

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KTC /ia/ is a reflex of PC * iē, *ia, and *io. It also occurs in borrowings from Khmer and Vietnamese.

*biēr 'dwarf' > /pìa/   *palia 'hail' > /plia/
*pioh 'keep' > /mapiah/
Kh. /ckiel/ 'scrape' > /cakial/   Vn. *chiều* 'sleeping mat' > /ciaw/
Khm. /ñien/ 'addicted' > /ñian/

KTC /iɯ/ occurs only before /-ʔ/ where it is a reflex of PC *iãʔ.

*lumiã 'put away' > /lamiɯʔ/   *lahiãʔ 'lose' > /lahiɯʔ/
*maʔiãʔ 'urinate' > /maʔiɯʔ/

KTC /ea/ is a reflex of PC *iã/

*hiā 'cry' > /hea/   *tiān 'abdomen' > /tean/
*liah 'lick' > /leah/   *biāk 'true' > /pèaʔ/
*paʔdiāʔ 'hot' /padeaʔ/

KTC /ua/ is a reflex of PC *uə and *uɔ̃. It also occurs in loanwords from Khmer.

*ruəy 'fly' > /ruay/†   *luən 'to swallow' > /lùan/
*suəy 'slow' > /suay/   *kamuɔ̃n 'nephew' > /kamuan/
Khm. /phuay/ 'blanket' > /phuay/   Khm. /sua/ 'ask' > /sua/
Kh. /tɔtual/ 'accept' > /tatùal/

KTC /oa/ is a reflex of PC *ua and *uã.

*dua 'two' > /tòa/   *cuah 'sand' > /coah/
*ʔdua 'carry on the head' > /doa/   *juaʔ 'step on' > /còaʔ/
*caŋuã 'basket' > /caŋoa/

KTC /ău̯ʔ/ is a reflex of PC *-ăp and *ɔ̃u̯ʔ.[7] (See also the treatment of PC final *-p above p. 109).

*căp 'tie' > /cău̯ʔ/   *ʔanăp 'in front' > /tanău̯ʔ/
*trɔ̃uʔ 'heavy' > /trău̯ʔ/   *hău̯ʔ 'sweat' > /hău̯ʔ/

Presyllable Vowels
Lee (1965), mainly on the basis of evidence from Roglai, reconstructed three presyllable vowels: *i, *u, and *a. In KTC these have all merged to /a/, which is [ə]. When the presyllable began with *ʔ-, *h-, and sometimes *s-, the presyllable has been lost in KTC.

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† cf. VN *ruồi* 'housefly, fly' (Ed.).
7. Although I suspect that *ɔ̃u̯ʔ derives ultimately from *ăp.

*ˀinã 'female animal' > /nɨ/   *bilān 'season' > /plàn/
*dilah 'tongue' > /talăh/   *ˀunī 'this' > /nì/
*sula 'leaf' > /la/   *limã? 'five' > /lamɨ/
*kubaw 'water buffalo' > /kapàw/   *ˀadhɔ̄y 'forehead' > /thǎy/
*hawǎy 'rattan' > /wǎy/   *patɔ̄w 'stone' > /patǎw/

There may also be some evidence of the presyllable vowel in cases of
metathesis.

*buŋa 'flower' > /paŋù/   *pirǎk 'silver' > *priaˀ > /preaˀ/
*durəy 'thorn' > /trùay/   *manī 'bathe' > *mnǎy > /manǎy/

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