

# THE CONTRIBUTION OF CAT GIA ROGLAI TO CHAMIC

ERNEST W. LEE

## 1. INTRODUCTION

Northern Roglai (NR) *buŋã* and Cat Gia Roglai (CGR) *puwiŋ* both meaning 'flower' and NR *srã:ʔ* and CGR *t<sup>h</sup>uŋʔ* both meaning 'crossbow' might not be considered as cognates for doing lexicostatistic studies and would certainly not suggest that the two Roglai languages are closely related. The word Roglai itself probably comes from Proto Chamic (PC) *\*ʔura:ŋ* 'person' + *\*dlai* 'forest'. In NR *\*ʔura:ŋ* is reduced to *ra:k* 'classifier for people' and to the prefix *ra-* [aa] 'they, he, she' which is widely used in narrative discourse where the referent is clear from the context. The Northern Roglai people refer to themselves as Radlai [aadlai]. The Cat Gia Roglai people also refer to themselves as Radlai [radlai]. Given the origin of the word Roglai, it would be possible for the term to refer to any language where the people were considered to be people of the forest. The words *buŋã* and *puwiŋ* as well as *srã:ʔ* and *t<sup>h</sup>uŋʔ* are definitely cognate and NR and CGR are closely related languages. The purpose of this paper is to show some of the contribution that Cat Gia Roglai can make to the understanding of the Chamic languages.

Sections 2–8 focus on various phonological developments in CGR and their significance to the wider Chamic picture. Special attention is given to nasalisation in §4 since there is more to say about it and it potentially has significance for Acehnese as well as the mainland Chamic languages of Southeast Asia. In §10, I show how CGR *puwiŋ* developed from Proto Chamic (PC) *\*buŋa* and how *t<sup>h</sup>uŋʔ* developed from PC *\*srã:p* (Lee 1966, Burnham 1976). Finally, in §11, I summarise the various CGR features shared with specific Chamic languages.

The CGR data on which this study is made is very sketchy and some of it not completely reliable phonetically. It comes from about two hours of contact with a CGR village in 1974 working under the auspices of the Summer Institute of Linguistics. Without my background in Northern Roglai, it would not have been possible for me to get even that amount of useful data in the short time available.

### 1.1 DEMOGRAPHIC BACKGROUND

Cat Gia Roglai is not a large language group. To the best of my knowledge in 1974 it was spoken in only two hamlets in Ninh Thuan province in Vietnam. The information given to me at that time was that there were 1,187 people in Ap [hamlet] Cat Gia and 888 in Ap Binh Nghia-Cham, both located in Xa [village] Cat Hai north of Phan Rang. I have arbitrarily

referred to the language as Cat Gia Roglai because the information I got was from that particular hamlet. The people of both hamlets were in regular contact with Vietnamese speakers and the Cham-speaking people of Ninh Thuan province. It is not certain how much contact they may have had with some of the other Roglai-speaking people, but was apparently less than with Cham speakers. It is unlikely that they would have had any significant recent contact with Northern Roglai. The dress of the CGR people was more similar to that of the Cham than to that of the majority of the Montagnard people, but this was also true of some of the people traditionally called Southern Roglai. I have not included CGR as a Southern Roglai dialect since it appears to be somewhat distinct as well as geographically isolated.

## 1.2 CAT GIA ROGLAI AS A ROGLAI LANGUAGE

As noted above, the CGR people refer to themselves as Radlai. Certainly in their minds and in the minds of the neighbouring Chams and Vietnamese they are Roglai.

CGR shares a number of features with Cham so that in many respects it looks more like Cham than Northern Roglai. I am less familiar with Southern Roglai, but superficially CGR appears to share more with Cham than any of the other Roglai dialects do, even though probably most Southern Roglai dialects are in regular contact with Cham. Contact between Northern Roglai and Cham, on the other hand, is virtually nil.

One problem with the data is frequent variation between what was probably good CGR and what is quite evidently Cham. Because of their regular contact with the more prestigious Cham and the informants being bilingual in Cham, they very likely did intersperse some Cham pronunciations and lexical items. A second problem is that I undoubtedly missed or misrepresented some things because I was listening and writing through a NR grid. One particular variation (inconsistency in hearing) was in recording reflexes of voiced stops which I noted variously as voiced, voiced aspirated, voiceless, and voiceless aspirated (see §2.1). In spite of these problems, however, there is sufficient consistency in the data to be able to make a number of valid observations about CGR.

One phonological innovation which CGR shares with all other dialects of Roglai, but not with Cham or any of the other Chamic languages is the denasalisation of final nasal consonants to oral stops (except where the preceding vowel is nasalised) as: CGR *lapat* 'eight' and *tʰalapat* 'nine', with the *[l]apat* from PC *\*lapan* which is reflected variously in Chamic as a component of 'eight' and 'nine'; *brəp* from PC *\*brOm* 'arrow'; *ʔbək* 'eat' from PC *\*ʔbəh*. The CGR examples all represent what has happened following short protovowels. The same was undoubtedly true following long vowels where the final stops have subsequently been lost in CGR (see §3.1).

NR and CGR appear to share some features not shared by Cham or the other Roglai dialects. I have already mentioned that both groups refer to themselves as Radlai with the *dl* cluster and an *a* in the pretonic syllable. The term Roglai has most likely come into Vietnamese and other languages from Cham, where it would be pronounced [rəglai]. To my knowledge, of the Lowland Chamic languages, only NR and CGR have the cluster [dl]. The others all have [gl]. NR and CGR also share a common form *kamīn* 'we (exclusive)' which reflects the final nasal vowel *\*ɨ̃* with nasal accretion as described in §4.1.3.

Lexically CGR shares the word for 'cooked rice' with NR. NR has *bu* and CGR has *p<sup>h</sup>u* alternating with *bu* in my data. The other mainland Chamic languages use reflexes of PC \**l\_səi* for 'cooked rice' whereas reflexes of \**buɾ* are used for 'rice soup', although from my data I am not certain of the distinction between Haroi *lasôi* and *p<sup>h</sup>u* since I have both listed as meaning 'cooked rice'. (Acehnese also has *bu* for cooked rice.)

With further study, details of comparison of CGR with NR and Southern Roglai could be amplified, but the denasalisation of the final nasal consonants is probably the most significant identifying feature of all that is called Roglai. Otherwise, as already noted, there are many features of CGR which are more like Cham than NR and perhaps Southern Roglai dialects as well. See §11.

## 2. DEVELOPMENT OF WORDS WITH SYLLABLE-INITIAL VOICED STOPS

Initial voiced stops have played an extremely important role in the development of the Chamic languages. Thurgood (1995) pulls together the various developments in Chamic and discusses their significance.

CGR, very much unlike NR, seems to be moving in the same direction as the other Chamic languages where register and/or tone have developed from syllables and words beginning with original voiced stops. I treat this subject first since it involves such a large number of words and affects varying aspects of the discussion throughout the rest of this paper, especially with respect to how the syllable-initial stops as transcribed are to be interpreted.

### 2.1 THE CGR EVIDENCE

As already noted, the reflexes of PC voiced stops in CGR are variously transcribed in my data as voiced, voiced aspirated, voiceless, and voiceless aspirated. The reason for this is probably also varied. I have already mentioned that I was listening through a NR grid. Sometimes I may have written a voiced stop simply because that was what I was expecting, but clearly that does not account for all the variations, particularly when NR as a matter of fact does have all four possibilities, but contrastively. That is, NR contrasts the sets: *p*, *ph*, *b*, *bh*; *t*, *th*, *d*, *dh*; *c*, *ch*, *j*, *jh*; and *k*, *kh*, *g*, *gh*. (The aspiration of NR is quite strong and the aspirated series are interpreted as consonant sequences because of the possibility of infixation in a few words.) My own suspicion is that the aspiration which I was recording for CGR in syllables reflecting voiced stops may have been weaker and perhaps actually a breathiness that I was hearing. It is also possible that the difference between voiced and voiceless that I was recording was also a syllable-level feature that I was not cued into. The one environment in which I recorded less variation was in pretonic syllables where I did not record any aspiration. I suspect that CGR is well advanced in the development of a register system which my NR ear simply was not attuned to and which I did not have time to develop in the short session I had available with linguistically unsophisticated speakers. In examples (1)–(10) I list a number of the words as I recorded them, but elsewhere I list them with an underlined voiceless symbol (*p*, *t*, *c*, *k*) which should probably be read as representing some kind of register feature.

	CGR	NR	
(1)	<i>at<sup>h</sup>ɔi/ad<sup>h</sup>ɔi</i>	<i>adɔi</i>	younger sibling
(2)	<i>b<sup>h</sup>a?</i>	<i>ba?</i>	full
(3)	<i>cala:</i>	<i>jalat</i>	road
(4)	<i>dilah</i>	<i>dilāh</i>	tongue
(5)	<i>hap<sup>h</sup>au</i>	<i>habəu</i>	ashes
(6)	<i>?iduj</i>	<i>?idūc</i>	nose
(7)	<i>payah</i>	<i>barah</i>	to swell
(8)	<i>tanau/danau</i>	<i>danau</i>	pond
(9)	<i>t<sup>h</sup>lai/d<sup>h</sup>lai</i>	<i>dlai</i>	forest
(10)	<i>t<sup>h</sup>ua</i>	<i>dua</i>	two

## 2.2 SIGNIFICANCE FOR CHAMIC

The apparent developments in CGR of words with original syllable-initial voiced stops would tend to support Thurgood's (1995) thesis that the various developments from proto voiced stops are due to external influence (although in this case the influence is probably not external to Chamic, but is that of Cham itself on CGR). It is not yet clear whether the system of CGR is more like the current status of Eastern or Western Cham, but CGR is not in direct contact with any Mon-Khmer language, so that any external influence would be expected to show the influence of ECham (Eastern Cham) in which many CGR speakers would be bilingual.

Which of the Chamic languages CGR has parallels with in respect to reflexes of words with syllable-initial voiced stops will depend on what the actual manifestation is in current CGR. If voicing has been lost and aspiration predominates, then it is quite parallel to Haroi, which has reanalysed them as aspirated stops (Lee 1977). It should be noted that the pretonic reflexes of voiced stops in CGR are without aspiration and the same is true in Haroi. Haroi does have an occasional allophonic aspiration of voiceless stops in pretonic position, but is unrelated to the source of the stop (Mundhenk and Goschnick 1977:5ff.). It would also be parallel to Utsat, which has voiceless aspirated stops reflecting original voiced stops in the tonic syllable (e.g. Maddieson and Pang 1993).

## 3. LOSS OF FINAL STOPS FOLLOWING LONG VOWELS: VOWEL LENGTH IN OPEN SYLLABLES

Vowel-length contrast is a feature which is very widespread throughout Southeast Asia. All of the mainland Chamic languages have long and short vowels although the distribution varies somewhat. Rade and Jorai contrast vowel length in all environments except in open syllables and before the laryngeals glottal stop and *h*; Haroi contrasts vowel length in all environments except in open syllables (Mundhenk and Goschnick 1977); Eastern Cham contrasts vowel length in all environments except open syllables and before *h*. NR is the most restricted, contrasting vowel length only before stops including glottal stop. (The national language Vietnamese contrasts vowel length only in closed syllables and that only for central vowels.)



## 3.1 THE CGR EVIDENCE

For the most part I did not attempt to mark vowel length for CGR except preceding final glottal stop. Consistently where NR has long vowels before oral stops, the final stop was dropped in CGR. Not realising the significance of what was happening, I did not pay attention to the length of the resultant vowel until it became clear that *t<sup>h</sup>a* 'one' (NR *sa*) was minimally contrastive with *t<sup>h</sup>a:* 'house' (NR *sa:k*). Although I do not have clear evidence that all the long vowels of the words which lost the final stop were retained as long in CGR, there is little reason to doubt that they were. It is possible that CGR contrasts vowel length only in open syllables and before glottal stop, but I could have missed it in other environments where I was not attuned to hearing length contrast.

Words which lose the final stop are listed in examples (11)–(27) along with the NR cognates, and the PC forms are also listed if they have been reconstructed. Clearly long and clearly short vowels in PC are marked as such. Vowels in PC are not marked as long or short when it is uncertain which to reconstruct or when vowel duration is neutral (as in pretonic syllables). It should be noted that most of the words not marked for length are of Austronesian origin but that no contrastive length is reconstructed for them in Proto Austronesian. The CGR forms given below are all marked as long, even though this quality has not been confirmed.

	CGR	NR	PC	
(11)	<i>pula:</i>	<i>bila:t</i>	<i>*bila:n</i>	moon
(12)	<i>cala:</i>	<i>jala:t</i>	<i>*jala:n</i>	road
(13)	<i>tlo:</i>	<i>dlok</i>	<i>*dlo:ŋ</i>	tall, long
(14)	<i>ʔdə:</i>	<i>ʔdə:p</i>	-----	to say (ECham <i>ʔdo:m</i> )
(15)	<i>ʔdu:</i>	<i>ʔdu:c</i>	<i>*ʔdo:ŋ</i>	to float
(16)	<i>hatu:</i>	<i>hadu:p</i>	<i>*hadom</i>	how many (ECham <i>tò:m</i> )
(17)	<i>huça:</i>	<i>hujat</i>	<i>*huja:n</i>	rain
(18)	<i>ʔika:</i>	<i>ʔika:t</i>	<i>*ʔika:n</i>	fish
(19)	<i>krɔ:</i>	<i>krɔ:k</i>	<i>*krɔ:ŋ</i>	river
(20)	<i>lupa:</i>	<i>luba:k</i>	<i>*luba:ŋ</i>	hole
(21)	<i>pit<sup>h</sup>a:</i>	<i>pisa:k</i>	-----	husband (reference in NR) (from <i>*pu</i> 'lord' + <i>*sa:ŋ</i> 'house')
(22)	<i>t<sup>h</sup>a:</i>	<i>sa:k</i>	<i>*sa:ŋ</i>	house
(23)	<i>t<sup>h</sup>ia:</i>	<i>sia:p</i>	<i>*sia:m</i>	good
(24)	<i>tia:</i>	<i>-tia:t</i>	<i>*tia:n</i>	abdomen (NR in <i>matia:t</i> 'pregnant')
(25)	<i>tola:</i>	<i>tula:k</i>	<i>*tula:ŋ</i>	bone
(26)	<i>ʔu:</i>	<i>ʔu:k</i>	<i>*ʔo:ŋ</i>	husband (address in NR)
(27)	<i>wa:</i>	<i>ra:c</i>	-----	classifier for people

Words which have final glottal stop following a long vowel, but do not lose the glottal stop, include:

	CGR	NR	PC	
(28)	<i>ʔayu:ʔ</i>	<i>ʔayu:ʔ</i>	<i>*ʔayup</i>	to blow
(29)	<i>pa:ʔ</i>	<i>pa:ʔ</i>	<i>*pa:ʔ</i>	four
(30)	<i>ʔbu:ʔ</i>	<i>ʔbu:ʔ</i>	<i>*ʔbuk</i>	hair

Words with short vowel plus oral stop which retain the final stop include:

	CGR	NR	PC	
(31)	<i>gulap</i>	<i>gulap</i>	<i>*gulǎm</i>	to carry on shoulder
(32)	<i>ʔbək</i>	<i>ʔbək</i>	<i>*ʔbǎŋ</i>	to eat
(33)	<i>phut</i>	<i>phut</i>	<i>*phŭn</i>	trunk/stalk

### 3.2 SIGNIFICANCE FOR CHAMIC

First, it is possible that CGR is the only Chamic language with a straightforward long/short vowel contrast in open syllables. Fuller (1977) gives a couple of examples with long vowels in open syllables, but the description is sketchy and it is unclear whether there is any glottalisation involved. I do not recognise Roglai cognates for the examples given. There are also examples with long vowel plus glottal stop for which I do recognise cognates. The Chru primer (anon. 1970) has numerous word-final vowels marked with a grave accent, but these vowels are phonemically long and followed by glottal stop. Most of these are cognate with NR and ECham words ending with a long vowel plus glottal stop.

Second, the development in CGR supports my earlier analysis of NR in two respects. Although no acoustic studies have been done, I was aware that usually the NR final stops following long vowels were somewhat lenis. The lenis feature of final [k] following a long vowel was such that Fr Corentin Savary, who spoke Roglai fluently, responded to it as being more similar to his French /r/ than to a [k] although he clearly perceived /k/ following a short vowel as [k]. I even wondered if NR was in the process of beginning to lose these final lenis stops, but I fully expected that the glottal stop was replacing them since I also thought I perceived some accompanying glottal stricture.

I had also analysed word-final vowels in NR as short even though there was no contrast with long vowels. In other languages, analysts had taken the open-syllable vowels to be long. This made a difference in how words were analysed in teaching literacy since in Roglai it made the open-syllable vowel short like the unmarked vowels before stops. Tests done with native speakers tended to support their perception of the open-syllable vowels as being short rather than long even though actually neutralised in the position. The loss of the final consonants in CGR with resulting long open syllables contrasting with short open syllables shows that in CGR the already existing open syllables were short.

## 4. NASALISATION AND EFFECTS OF NASALISATION

### 4.1 THE CGR EVIDENCE

Nasalisation of vowels, whether restricted to the vowels or a feature of syllables or words, either occurs or has left its marks in most of the Chamic languages. CGR is no exception. I recorded nasalisation in only a small percentage of the words, but in a much

larger number there is clear evidence of nasalisation. I suspect that, for many of these, nasalisation may still be a significant feature even though I did not perceive or record it. For the words where I did record nasalisation with the vowel, only one was in an environment with no nasal consonant, namely *səp* 'language', which is *săp* in ECham and *sanăp* in NR. It is conceivable that the CGR could be analysed as *səm*<sup>?</sup> rather than *səp*. In any case it leaves some unexplained details since both ECham and CGR would be expected to have initial aspirated *t* instead of *s*.

What is of interest here is what has happened in CGR to syllables where vowel nasalisation can be reconstructed at least for Lowland Chamic (LC). As Durie (1990:108) has noted, I reconstructed nasalisation for Proto Chamic in cases where I had only the evidence of Roglai. In many cases to do so was probably assuming too much. Unfortunately the reconstructions did not include Haroi or Chru, which would have provided some of the evidence for deciding one way or the other. It is also unfortunate that Jorai, which I did use, has considerable nasalisation, but that this nasalisation was not recorded in materials available at the time. In the data below I have included the ECham cognates, many of which also attest nasalisation, and in a few instances the Chru cognate is also given.

#### 4.1.1 RAISING OF LOW CENTRAL NASALISED VOWEL TO HIGH CENTRAL ARTICULATION

One development from nasalisation in CGR is the raising of the low central nasalised vowel to a high central vowel. The examples (34)–(40) are all between nasal consonants or between a nasal consonant and a final *h* or glottal stop because in other environments there are always further developments which are discussed below. There are also other developments before *h* and glottal stop (see §4.1.3).

	CGR	NR	ECham	
(34)	<i>lamin</i>	<i>lumăn</i>	<i>limin</i>	elephant
(35)	<i>mă<sup>?</sup></i>	<i>mă<sup>?</sup></i>	<i>mi<sup>?</sup></i>	to get
(36)	<i>mih</i>	<i>măh</i>	<i>mih</i>	gold
(37)	<i>mim</i>	<i>măm</i>	<i>măm</i>	to nurse
(38)	<i>panih</i>	<i>panăh</i>	<i>panah</i>	shoot
(39)	<i>piniŋ</i>	<i>pinănŋ</i>	<i>paniŋ</i>	betel nut
(40)	<i>tanih</i>	<i>tanăh</i>	<i>tanih</i>	land

Exceptions are *nam* 'six' and *ŋă<sup>?</sup>* 'to do' (cf. NR *năm* and *ŋă<sup>?</sup>*). ECham *năm* and *ŋa<sup>?</sup>* do not have the expected reflex of a nasalised vowel. In *panah* 'to shoot' ECham also has *a*, the expected reflex of the low central oral vowel rather than the expected *i*, and Chru has an oral vowel rather than the expected nasal vowel, whereas NR has *ă* and both Western Cham and CGR have *i*, the expected reflex of \**ă* for those two languages. The reflexes of 'to suck' are varied throughout Chamic with the following vowels occurring between two *m*'s: *i*, *ε*, *a*, *i*.

## 4.1.2 LOSS OF LOW CENTRAL NASALISED VOWEL ADJACENT TO HIGH CENTRAL VOCOID

If the nasalised low central vowel  $\tilde{a}$  is adjacent to a high front vocoid (preceding and/or following), the low central vowel is lost. Examples (41)–(44) are the only ones I have which do not also have a further accompanying change. It is possible that the word for ‘right’ in CGR is nasalised, but if the word for ‘left’ had been nasalised, I believe I would have noted that.

	CGR	NR	ECham	
(41)	$\text{?iu}$	$\text{?iãu}$	$\text{?iu}$	left
(42)	$\text{hənu?}$	$\text{hanuã?}$	$\text{hnũ?}$	right
(43)	$\text{hun}$	$\text{huan}$	-----	mist
(44)	$\text{t}^{\text{h}}\text{eũ:?}$	$\text{chiã:?}$	$\text{siaw?}$	wing (cf. Chru $\text{siã:u?}$ )

It would appear that examples (41)–(44) actually have two changes (raising of  $\tilde{a}$  and subsequent loss) which are phonetically conditioned and ordered. Raising of the nasalised vowel from a low central articulation to a high central articulation adjacent to a high front or high back vocoid gives two adjacent vowels which are very similar. The high central vowel, then, was assimilated by the high front or high back. (It should be noted, however, that the national language Vietnamese does have sequences of high central vocoid followed by a high back or high front vocoid.) The loss of nasalisation would have followed the raising of the vowel, but order of the loss of the high central vocoid and nasalisation could have been in either order or simultaneous.

Thus the ordering for CGR in the case of  $\text{iu}$  ‘left’ could be any one of the following:

- (45)  $\text{?iãu} \rightarrow \text{?ĩu} \rightarrow \text{?iũ} \rightarrow \text{?iu}$   
 (46)  $\text{?iãu} \rightarrow \text{?ĩu} \rightarrow \text{?iu} \rightarrow \text{?iu}$  -  
 (47)  $\text{?iãu} \rightarrow \text{?ĩu} \rightarrow \text{?iu}$

In the example of ‘mist’ (43), the NR is not nasalised, but it is assumed that with the shift of earlier  $*-l$  (attested for ‘mist’ in other Roglai dialects) to  $n$  in CGR, nasalisation of the vowel also developed and the  $\tilde{a}$  subsequently was raised and lost following  $u$ . In NR the vowel preceding an original  $*-l$  does not nasalise ( $\text{?uan}$  ‘stuck in the throat’ from earlier  $*\text{?ual}$  along with  $\text{?uãn}$  ‘very’ provide the only minimal contrast of oral versus nasal before a nasal consonant in NR.)

The shift of  $*i$  to  $e$  in  $\text{t}^{\text{h}}\text{eũ:?}$ , the CGR reflex of ‘wing’ (44), is not explained. It could possibly be related to the preceding voiceless consonant or may have been lowered because of the influence of the earlier low central vowel although it is not lowered in ECham. The ECham form  $\text{siaw?}$ , however, does not reflect a nasalised vowel although the Chru form  $\text{siã:u?}$  is nasalised.

Exceptions recorded where one would have expected loss of  $\tilde{a}$  but where it was retained are:  $\text{mahãu}$  ‘thirsty’ (NR also  $\text{mahãu}$ ), onomatopoeic  $\text{miãu}$  ‘cat’ (NR also  $\text{miãu}$ ),  $\text{mãi}$  ‘to come’ (NR also  $\text{mãi}$ ),  $\text{nãu}$  ‘to go’ (NR also  $\text{nãu}$ ). Apart from ECham  $\text{mahu}$  ‘thirsty’, there is no loss in the cognate words in ECham either. The following words in CGR do not reflect the loss following a nasal consonant, but the NR forms have oral vowels, not nasal:  $\text{cānu}$  ‘pond’ (NR  $\text{danau}$ ), and  $\text{caŋua}$  ‘winnowing basket’ (NR  $\text{caŋua}$ ).

## 4.1.3 ACCRETION OF EPENTHETIC VELAR NASAL CONSONANT FOLLOWING NASAL VOWEL

The other significant development is the addition of an epenthetic velar nasal consonant following the nucleus of the syllable. This has been observed for open syllables and with final *h* and glottal stop. Examples (48)–(49) provide the only examples available of the accretion of the nasal with no observed change in the quality of the vowel itself. (The words are aligned in (48)–(58) to make the like features stand out.)

	CGR	NR	ECham	Chru	
(48)	<i>huŋ</i>	<i>hmũ</i>	<i>hu</i>	<i>hũ</i>	to have
(49)	<i>nuŋ</i>	<i>nũ</i>	<i>nu</i>	<i>nũ</i>	he, she, it

Sets (50)–(55) are all examples of the shift of a syllable-final low central vowel to high central vowel plus the accretion of a velar nasal consonant following the vowel.

	CGR	NR	ECham	
(50)	<i>ʔamiŋ</i>	<i>ʔamã</i>	<i>ʔami</i>	father
(51)	<i>puwiŋ</i>	<i>buŋã</i>	<i>piŋu</i>	flower
(52)	<i>hmiŋ</i>	<i>humã</i>	<i>hmu</i>	rice paddy
(53)	<i>hiŋ</i>	<i>hã</i>	<i>hi</i>	you (sing.) (low form in ECham)
(54)	<i>lamiŋ</i>	<i>limã</i>	<i>limi</i>	five
(55)	<i>tamiŋ</i>	<i>tamã</i>	<i>tami</i>	enter

Original oral vowels following a nasal consonant do not acquire the velar nasal: *hana* ‘to parch’ (NR *hana*), *tano* ‘male (animal)’ (NR *tano*). There were no exceptions in the data available. (The ECham forms for (51)–(52) have *u* instead of *i* as in the other reflexes because these two forms reflect metathesis of pretonic *u* and onset nasal plus application of the same rule as described for CGR in §4.1.2 above.)

Sets (56)–(58) are examples of the accretion of a velar nasal consonant preceding glottal stop and *h*, with the latter being manifested as a voiceless velar nasal, but written here as *ŋh*. (See example (61) in §4.1.4 for one further example preceding glottal stop.)

	CGR	NR	ECham	
(56)	<i>ʔaniŋʔ</i>	<i>ʔanã:ʔ</i>	<i>ʔaniʔ</i>	child
(57)	<i>lumiŋʔ</i>	<i>lumãʔ</i>	<i>limiʔ</i>	fat
(58)	<i>lumiŋh</i>	<i>lumãh</i>	-----	rhinoceros

Exceptions: The reflex of ‘rhinoceros’ is the only example I have of the acquired voiceless velar nasal, whereas there are three counterexamples (36, 38, 40 above). There are also a couple of exceptions before glottal stop: *laŋi:ʔ* (NR *laŋi:ʔ*) ‘sky’, *ŋaʔ* ‘to do’ (NR *ŋãʔ*); for the latter see above in §4.1.1.

Undoubtedly with further study other examples of the accretion of a velar nasal before both *h* and glottal stop would be found. The question arises as to why the CGR data had as many exceptions to the accretion rule as there were. I have already mentioned the high degree of contact between the CGR speaking people and the ECham people. This suggests two possibilities: (1) heavy influence of ECham has caused some of the forms to be borrowed from Cham, or (2) I was getting Cham words instead of CGR. I would like to suggest the

strong possibility of the latter. ECham no longer retains nasalisation as a part of its basic phonemic system. With this information it is reasonable to assume that just as the NR are looked down on by neighbouring language groups because they have strange sounds made through the nose, the CGR speakers also may be looked down on because of *their* strange nasal sounds. Because of the heavy friction through the nostrils, the final voiceless velar nasal sounds especially strange, so that the CGR people could be abandoning it in favour of the Cham cognates or simply avoiding it in situations where they might be looked down on. Most of my data came from two speakers and I do know that the word *lumiñh* ‘rhinoceros’ came from the second speaker whereas the three words with *ih* came from the first speaker. Forms like *ʔaniñʔ* ‘child’, however, which sounds less strange, were used by both speakers.

4.1.4 LOSS OF LOW CENTRAL NASAL VOWEL AND ACCRETION OF VELAR NASAL CONSONANT

Examples (59)–(61) show the loss of the original low central nasalised vowel *ã* after raising to a high central vowel plus the accretion of the velar nasal. Beginning with (59) some sets of examples have the reconstruction for Proto Lowland Cham (PLC).

	CGR	NR	PLC	
(59)	<i>cañiñ</i>	<i>riñiã</i>	<i>*ta(ri)ñã</i>	ear (cf. ECham <i>tañi</i> )
(60)	<i>juñ</i>	<i>jrãu</i>	<i>*jrãu</i>	medicine
(61)	<i>t<sup>h</sup>uñʔ</i>	<i>srã:ʔ</i>	<i>*srã:p</i>	crossbow (cf. Chru <i>srã:uʔ</i> )

Only NR retains a reflex of the Proto Austronesian liquid in the word for ‘ear’ (59), but most of the Chamic languages show the metathesis of the *\*i* with the following *ñ*. It is this metathesis that CGR and ECham reflect with the remaining *i* in the tonic syllable. In the other two examples (60 and 61) it is likely that in CGR *r* is lost before *u*. I suspect that, as in NR, the *r* in clusters in CGR is a high unrounded central vocoid and that the vocoid-loss rule (see §4.1.2) is applied to it even though the origin is different.

The Chru evidence for ‘crossbow’ (61) is provided to corroborate the source of the CGR *uʔ* from PLC *\*-p*, for which see §9.1 below.

4.1.5 EVIDENCE OF EFFECTS OF NASAL CONSONANT ACCRETION IN PROCESS

There is some evidence that some of the processes described above have left CGR with unusual reflexes.

One bit of evidence is that the word given for tiger was *ramo* without the expected final *ñ* of PLC *\*lumõ:ñ/rumõ:ñ*. The form *ramo* would appear to be a back formation with the velar nasal dropped and thus giving evidence of a period when nasal accretion was still an active process in variation with its absence.

Another bit of evidence is the word for ‘hand’, which has replaced the final alveolar nasal *n* with the velar nasal *ñ* as in:

	CGR	NR	PLC
(62)	<i>tagiñ</i>	<i>tagãñ</i>	<i>*tagã:n</i>

This would appear to reflect a shift from final *n* to *ŋ* during the time when the open-syllable high central nasalised vowel was acquiring a final *ŋ*. Presumably what happened was that during the process, *n* alternated with its absence and then parallel to the other words acquiring *ŋ* it also acquired an *ŋ*.

#### 4.2 SIGNIFICANCE FOR CHAMIC

Although, as Durie has noted (1990:108), nasalisation is somewhat unstable both in Chamic and in Acehnese dialects, there is a thread of consistency which makes it clear that it has been around for a long time.

Of the mainland Chamic languages, only Rade neither has nasalisation nor, to my knowledge, evidence of having had it. I see no reason to believe, however, that Rade did not have nasal vowels even though no trace of it remains. Durie himself (1990:108ff.) indicates that there is some evidence for contrastive nasalisation in Proto Aceh-Chamic (PAC). Furthermore, instability of nasalisation is not a feature unique to Chamic and Acehnese (see Mattisoff 1975:279ff.) and instability of nasalisation is not the only unstable feature of Chamic.

I have not done a systematic study, but it is safe to say that there are a number of features of Chamic which are not stable. For nasalisation Durie cites, for example, the fact that Cham (ECham) has *panah* 'to shoot' rather than the expected *\*panih* if reflecting a PC nasal vowel, and as I have noted above Chru has *pənah* rather than the expected *\*pənih*. On the other hand, WCham and CGR both have the expected *pənih*, and NR is *panāh*. (Since Acehnese reflects an earlier oral vowel (Proto Acehnese *\*panah* instead of *\*panōh*), Durie suggests reconstructing Proto Aceh-Chamic *\*panah* with an oral vowel which was subsequently nasalised in Acehnese after vowel lowering. Durie did not have access to the WCham data.) If we look at various phonological diachronic developments in Chamic, it is almost impossible, if not altogether impossible, to find any single change that does not have several exceptions. I suggest that many of these incomplete changes or exceptions to change are the result of dialect influence. For example, the reasonably consistent change of final nasal consonants to oral stops following oral vowels in all of the languages and/or dialects known as Roglai has some exceptions. NR has *ʔidūk* reflecting PC *\*ʔidūŋ* 'nose', and CGR has *ʔiduŋ* instead of the expected *\*ʔiduk*. And at least some dialects of Southern Roglai have *prɔŋ* 'big' from PC *\*prɔŋ*, where one would expect *\*prɔk* in all forms of Roglai. Because of their geographical spread, with all Roglai dialects except NR being in direct contact with either Chru or ECham, which retain the final nasals, this type of incomplete change is not unexpected.

Having said this, it may be also be safe to say that nasalisation in Chamic is less stable than most other features. What I do not know, and would find helpful to know, is the extent of nasalisation as a feature of neighbouring Mon-Khmer languages. I am aware that it is not a feature of Koho, the only Mon-Khmer language adjacent to NR, and I am unaware of its being a feature of any other non-Chamic language contiguous to the Chamic languages, but that does not rule out the possibility of earlier contact with a language with contrastive nasalisation. It is the speakers of Koho who considered NR to be strange because of the nasal vowels. I also suspect, as I noted above, that the synchronic absence of nasalisation in

ECham has had some influence on the feelings of CGR speakers concerning nasalisation in their language.

4.2.1 PARALLEL DEVELOPMENTS IN CGR AND ECHAM

There is a considerable amount of parallel between the effects of nasalisation in CGR and Cham. I include only ECham here because I have not had a close look at WCham, although I am aware that WCham does share the same evidences of previous nasalisation. Both of the developments described in §4.1.1 and §4.1.2 are shared by CGR and ECham. These are the raising of the low central nasalised vowel to a high central vowel, and the subsequent loss of that vowel adjacent to other high vocoids. Two of the examples from above are repeated here as (63) and (64). In (63) only the raising of the vowel occurs in both ECham and CGR whereas in (64) both languages share both the raising and the subsequent loss.

	CGR	ECham	NR	PLC	
(63)	<i>lamin</i>	<i>limin</i>	<i>lumān</i>	<i>*lumān</i>	elephant
(64)	<i>hənu?</i>	<i>hnũ?</i>	<i>hanuā?</i>	<i>*hanuā?</i>	right

Although it is possible that Cham and CGR could have independently developed the raising of *ã* to a high central vowel and the subsequent loss of the high vowel contiguous to another high vocoid, it is highly unlikely that the developments were independent, given the proximity of CGR to ECham and the regular contact between the two.

ECham does not share with CGR the accretion of the nasal consonant in open syllables nor before *h* and glottal stop as described in §4.1.3. On the other hand, CGR has one instance of alveolar nasal accretion which is shared with NR, namely *kamīn* ‘we (exclusive)’ for which Burnham (1976) has reconstructed PLC *\*kamī* (see §1.2). This is the only instance I know of an accretion of a nasal consonant in NR. The accretion of *n* rather than *ŋ* is likely because of the shared features of the high front vowel and *n* (there are no other instances in the CGR data of nasal accretion following a high front vowel).

Chru has a development that is similar to the raising of the low central nasal vowel, but involves the raising of the mid central nasal vowel [ɔ̃] to a high central nasal vowel [ɨ̃] (Fuller 1977:83). It is written in Chru as a mid central vowel with a tilde indicating nasalisation.

4.2.2 PARALLEL DEVELOPMENTS IN CGR AND ACEHNESE

CGR and Acehnese share the raising of the low central nasal vowel and the accretion of a velar nasal in open syllables. In CGR and ECham, the vowel is raised to a high central position, whereas in Acehnese it is raised only to a mid central position. In the examples I cite the PAc (Proto Acehnese) as reconstructed by Durie (1990).

Example (65) illustrates the raising of the vowel in CGR and PAc and (66–67) illustrate both the raising of the vowel and the accretion of a velar nasal in the two languages.

	CGR	PAc	
(65)	<i>tanih</i>	<i>tanãh</i>	earth
(66)	<i>lamiŋ</i>	<i>limãŋ</i>	five
(67)	<i>tamiŋ</i>	<i>tamãŋ</i>	to enter



Durie (1990:111) raises the question as to whether Acehnese shares any features with particular Chamic subgroups. Acehnese shares the raising of the low central nasal vocoid [ã] with both Cham (ECham and WCham) and with CGR, although the Acehnese vowel does not rise as high as the vowel of either CGR or Cham. It shares the accretion of the velar nasal consonant [ŋ] only with CGR. The crucial question is whether the shared features of vowel raising and velar nasal accretion are historically common to Cham, CGR, and Acehnese or whether they are independent developments.

Shift of height and/or perception of height of nasal vowels is well attested. Wright (1975:382) summarises his investigation of perception:

...vowel nasalisation is accompanied by an auditory lowering of the vowel, except for the vowels [æ] which rises, [ɑ] which changes very little in quality and [ɔ] which also rises. Although it was originally proposed that such auditory effects would be a function of changes in the frequency of the first formant, this correlation was not observed for the high and back vowels. Rather, perception of vowel height in these areas appears to depend on other, poorly understood parameters of vowel quality, a conclusion also reached by Ladefoged. We may conclude that Ohala's claim is feasible: the auditory facts of vowel perception can provide an explanation for the diachronic tendency to lower that was hypothesised, at least for high and mid vowels...

Acehnese (but not Cham or CGR) lowers the high front and back nasalised vowels (Durie 1990:107ff.), conforming to the perceptual results of Wright's study. Of the three low vowels in Wright's study, two of the nasalised ones are perceived as raised, but the one vowel which is raised in Acehnese and in Cham and CGR is the very one which Wright notes as being perceived with only little change.

Ruhlen (1975:339) notes concerning natural systems of oral and nasal vowels:

...although OV's and NV's are often described as having the same absolute vowel height, we may hypothesise that where positional differences do exist there is a universal tendency for high and mid NV's to be lower than their oral partners, while low NV's tend to be higher than their corresponding OV's. Like long vowels, then, NV's tend to be centralised with respect to the OV's though this does not imply, of course, that they are centralised for the same physiological reason.

Although Wright's perceptual studies and Ruhlen's natural system account for some change in height, they do not account for the extent of the lowering of Acehnese high nasal vowels to a low-mid position bypassing the Acehnese high-mid position, unless there were two stages of lowering or the lowering predates the development of the mid-high vowels from high vowels (see Durie 1990:104). Nor do they account for the extent of the raising of the CGR and Cham low central nasal vowel to a high position bypassing the CGR and Cham mid central vowel. Ruhlen's hypothesis does, however, fit well with the raising of the Acehnese low central nasal vowel to a low-mid position. The lowering of the Acehnese vowels is not relevant here since no lowering has been observed in Chamic elsewhere; only the raising of the low central ã is relevant.

Raising of low nasal vowels is not uncommon and could therefore easily have been independent developments in Acehnese on the one hand and Cham and CGR on the other. Nonetheless, it is a feature that is shared and could be historically connected. Since virtually all phonological innovations are natural changes, I don't think we should dismiss the

possibility of an historical connection lightly, but should keep in mind that the degree of raising in Acehnese was much less than in Cham and CGR, which may militate against their being historically connected.

The second feature, that is the accretion of a velar nasal consonant in open syllables, is shared only by Acehnese and CGR although, as noted above in §4.1.3, CGR also has some nasal accretion before *h* and glottal stop. (Acehnese also has at least one instance of an accretion of an alveolar nasal in *jameun* 'formerly' (from Durie 1985). No PC form has been reconstructed, but NR has *jumã* 'formerly'.) The alternation between nasal vowel and  $\eta$  is not uncommon either. Ohala (1975:297) in his list of predictions and explanations of nasal sound patterns observes, "The alternation of  $[\eta] \approx \tilde{v}$  should be more common than the alternation of other nasals with  $\tilde{v}$ ". By alternation, I assume that Ohala means that  $[\eta]$  can be perceived as, and/or replace, a nasal vowel and vice versa. This being the case, it would not be surprising for a language to have velar nasal accretion following a nasal vowel, with or without loss of nasalisation of the vowel. The question which I am not prepared to answer, but which needs answering, is whether any other language(s) in the area also share(s) the feature of nasal accretion, particularly any Austro-Asiatic language(s). If only CGR and Acehnese share the feature it would seem more likely to have some historical connection.

Whether Acehnese shares developments with specific mainland Chamic languages is a crucial issue, as Durie has correctly noted. If it does not share developments with specific languages, then the separation of Acehnese could predate the break-up of the Chamic group on the mainland of Southeast Asia. If, however, it does share developments with specific languages, then the separation of Acehnese probably does not predate the break-up of the mainland Chamic group. In that case whether one uses the term Achino-Chamic or Chamo-Acehic or Aceh-Chamic seems to me to become a moot question. It would in such a case probably be best simply to broaden the term Chamic to include Acehnese. The exclusion of Acehnese from Chamic appears to have been based more on historical facts concerning the migration(s) (e.g. Cowan 1988) of the Acehnese people to Aceh and the significant differences of Acehnese from mainland Chamic, even though the migration(s) undoubtedly did not precede the fifteenth century AD. Admittedly, Acehnese speakers outnumber all of the speakers of mainland Chamic languages, but this is because of rapid expansion of the Acehnese at the same time some of the other languages may have been becoming depleted. The contribution of CGR toward answering this question is only a small step. As Durie has also noted, a lot of work still needs to be done utilising more accurate data and including older Cham materials, evidence from Utsat of Hainan, and evidence from neighbouring Austro-Asiatic languages. Unfortunately the CGR data itself is scanty and not very accurate, but it does indicate what a wider base can provide.

## 5. MERGER OF PRETONIC ALVEOLAR AND ALVEOPALATAL STOPS AS ALVEOPALATALS

### 5.1 THE CGR EVIDENCE

This does not seem to be a consistent change in CGR, but there are a number of words where pretonic *\*d-* and *\*t-* have merged with *\*j-* and *\*c-*. In the data available there are twice as many exceptions as words which follow the pattern. I suggest that the merger of the alveolar and alveopalatal stops is either a shift in process or an interrupted or reversed shift

resulting from ECham pressure. As already mentioned, it is also possible that I was getting words adjusted toward Cham for my benefit. Examples (68)–(72) all have the expected change although I recorded a variant of ‘pond’ (72) without the change.

	CGR	NR	PLC	
(68)	<i>cəkuh</i>	<i>tukuh</i>	* <i>tukuh</i>	rat
(69)	<i>caŋiŋ</i>	<i>riŋiã</i>	* <i>ta(ri)ŋã</i>	ear
(70)	<i>cakəi</i>	<i>digəi</i>	* <i>digəi</i>	tooth
(71)	<i>cayah</i>	<i>darah</i>	* <i>darah</i>	blood
(72)	<i>canau/tanau</i>	<i>danau</i>	* <i>danau</i>	pond

Exceptions noted are:

	CGR	Roglai	PLC	
(73)	<i>tagiŋ</i>	<i>taŋãn</i>	* <i>taŋãn</i>	hand
(74)	<i>takoi</i>	<i>takuai</i>	* <i>takuai</i>	neck
(75)	<i>talai</i>	<i>taləi</i>	* <i>taləi</i>	rope
(76)	<i>tami</i>	<i>tamã</i>	* <i>tamã</i>	enter
(77)	<i>tanih</i>	<i>tanãh</i>	* <i>tanãh</i>	earth
(78)	<i>tola:</i>	<i>tula:k</i>	* <i>tula:ŋ</i>	bone
(79)	<i>təha</i>	<i>tuha</i>	* <i>tuha</i>	old
(80)	<i>təke</i>	<i>tukri</i>	* <i>tuki</i>	horn (of animal)
(81)	<i>tut<sup>h</sup>au</i>	<i>tisəu</i>	* <i>tisəu</i>	breast
(82)	<i>tata</i>	<i>dada</i>	* <i>dada</i>	chest
(83)	<i>tilah</i>	<i>dilah</i>	* <i>dilah</i>	tongue

The following exception shows an unusual *k*-reflecting \**t*-:

	CGR	Roglai	PLC	
(84)	<i>kapai</i>	<i>tarapai</i>	* <i>ta(ra)pai</i>	rabbit

## 5.2 SIGNIFICANCE FOR CHAMIC

It is granted that there has been a steady loss of pretonic syllables and reduction of pretonic consonants in Chamic. The merger of the alveolar and alveopalatal stops in the pretonic syllables in CGR is shared with Haroi where it is very regular. Examples (68)–(72) above are repeated here as (85)–(89) with the Haroi reflexes substituted for the NR reflexes and PC for PLC.

	CGR	Haroi	PC	
(85)	<i>cəkuh</i>	<i>cakəh</i>	* <i>tukuh</i>	rat
(86)	<i>caŋiŋ</i>	<i>caŋea</i>	* <i>ta(ri)ŋa</i>	ear
(87)	<i>cayah</i>	<i>cariah</i>	* <i>darah</i>	blood
(88)	<i>cakəi</i>	<i>cakhi:i</i>	* <i>digəi</i>	tooth
(89)	<i>canau/tanau</i>	<i>caniau</i>	* <i>danau</i>	lake

The set of exceptions (73)–(83) above also all have *c-* in Haroi except that there is no reflex of PC *\*tanah* ‘earth’ given for Haroi. The unusual exception in CGR for ‘rabbit’ (84) is also shared by Haroi (90):

	CGR	Haroi	PC	
(90)	<i>kapai</i>	<i>kapai</i>	<i>*ta(ra)pai</i>	rabbit

The sharing, albeit not thoroughgoing in the CGR data, of the merger of the pretonic alveolar and alveopalatal stops as alveopalatal stops, along with the sharing of the unusual reflexes of PC *\*ta(ra)pai* ‘rabbit’, suggest a possible close affinity of CGR and Haroi. Compare Burnham (1976:57ff.) who concluded that Haroi is to be considered as a separate branch of Chamic, that is as neither Highland Chamic nor Lowland Chamic.

The merger of the alveolar and velar pretonic stops in CGR and Haroi differs from the development in Rade where the voiced alveolar and alveopalatal stops fell together with *\*l-* and *\*r-* in the pretonic syllable as glottal stop plus *e*, but the voiceless counterparts fell together with *\*k-* as *k-* (Lee 1966). Examples (85)–(89) are repeated here as (90)–(94) with the Rade reflexes added.

	CGR	Haroi	Rade	PC	
(91)	<i>cəkuh</i>	<i>cakɔh</i>	<i>kkuh</i>	<i>*tukuh</i>	rat
(92)	<i>caŋiŋ</i>	<i>caŋɛa</i>	<i>kŋa</i>	<i>*ta(ri)ŋa</i>	ear
(93)	<i>caɣah</i>	<i>cariah</i>	<i>ʔerah</i>	<i>*darah</i>	blood
(94)	<i>cakəi</i>	<i>cakhi:i</i>	<i>ʔegei</i>	<i>*digəi</i>	tooth
(95)	<i>canau/tanau</i>	<i>caniau</i>	<i>ʔenau</i>	<i>*danau</i>	pond

Durie (1990:106) has reconstructed for Proto Acehnese at least two instances of pretonic *c-* where PC has *\*t-*, but in both instances the onset of the tonic syllable is also *\*c-*, so that it could be assimilation or possibly loss of pretonic syllable with subsequent reduplication.

	PAceh	PC	
(96)	<i>*(cɛ)cɛt</i>	<i>*ticẽ?</i>	great-grandchild
(97)	<i>*cucɔ</i>	<i>*ticɔ</i>	grandchild

## 6. SHIFT OF ONSET *\*s-* TO *t<sup>h</sup>*

### 6.1 THE CGR EVIDENCE

There is a regular shift of *\*s-* to *t<sup>h</sup>* in the onset of the tonic syllable and one instance in the pretonic syllable in CGR.

	CGR	NR	PC	
(98)	<i>ʔat<sup>h</sup>au</i>	<i>ʔasəu</i>	<i>*ʔasəu</i>	dog
(99)	<i>ʔat<sup>h</sup>aʔ</i>	<i>ʔasaʔ</i>	<i>*ʔasap</i>	smoke
(100)	<i>lut<sup>h</sup>a</i>	<i>rusa</i>	<i>*rusa</i>	deer
(101)	<i>pit<sup>h</sup>a</i>	<i>pisa:k</i>	-----	husband
(102)	<i>tat<sup>h</sup>i:ʔ</i>	<i>tasi:ʔ</i>	<i>*tasi:ʔ</i>	ocean
(103)	<i>t<sup>h</sup>a</i>	<i>sa</i>	<i>*sa</i>	one

	CGR	NR	PC	
(104)	<i>t<sup>h</sup>a:</i>	<i>sa:k</i>	<i>*sa:ŋ</i>	house
(105)	<i>t<sup>h</sup>a<sup>?</sup>ai</i>	<i>sa<sup>?</sup>ai</i>	<i>*sa<sup>?</sup>ai</i>	elder sibling
(106)	<i>t<sup>h</sup>εũ:?</i>	<i>c<sup>h</sup>ǎ:?</i>	<i>*siap</i>	wing (cf. Chru <i>siã:u?</i> )
(107)	<i>t<sup>h</sup>ia</i>	<i>sia:p</i>	<i>*sia:m</i>	good
(108)	<i>tut<sup>h</sup>au</i>	<i>tisəu</i>	<i>*tisəu</i>	breast
(109)	<i>t<sup>h</sup>uŋ?</i>	<i>srã:?</i>	<i>*srã:p</i>	crossbow (cf. Chru <i>srã:u?</i> )

Of the three exceptions noted (110–112) only (112) is in the tonic syllable:

	CGR	NR	PC	
(110)	<i>hak<sup>h</sup>ən</i>	<i>sagə</i>	<i>*sagor</i>	drum
(111)	<i>saya</i>	<i>sara</i>	<i>*sara</i>	salt
(112)	<i>săp</i>	<i>sanăp</i>	<i>*săp</i>	speech, language

It was already noted above (§4.1) that ECham also has an initial *s* in *săp* where an aspirated *t* would have been expected from PC *\*s*. It should be noted that there was only one pretonic instance of *\*s*- becoming *t<sup>h</sup>*- in CGR whereas there are two where it does not. Further data might give a better pattern, but in both of these exceptions (111–112) CGR also agrees with ECham. For the one CGR word *t<sup>h</sup>a<sup>?</sup>ai* ‘elder sibling’ where the pretonic *\*s*- does become *th*-, ECham retains an *s*-. The normal reflex of PC pretonic *\*s*- in Cham is a simple *h*- as in *hakăl* ‘drum’ (grave accent represents low pitch) so that the reflexes with *s*- for both *sara* ‘salt’ and *sa<sup>?</sup>ai* ‘elder sibling’ in ECham are unexpected.

## 6.2 SIGNIFICANCE FOR CHAMIC

To my knowledge only ECham and CGR share the shift of PC *\*s*- to *t<sup>h</sup>*- and that only in the tonic syllable. I therefore suggest that the shift in CGR is probably because of the contact between the CGR and ECham.

It should also be noted, however, that the two pretonic exceptions noted for CGR and which agree with ECham are also exceptions in Haroi. Like CGR and ECham Haroi has *sara* ‘salt’ instead of expected *\*hara*, but *ca<sup>?</sup>ăi* ‘older sibling’ instead of expected *\*a<sup>?</sup>ăi*.

## 7. SHIFT OF -ŋ- AND -r- TO -ɣ- AFTER PRETONIC *a* AND TO -w- AFTER PRETONIC *u*

As with many of the other patterns observed in CGR, this one is not consistent, but happened with sufficient frequency to produce an observable pattern. A larger corpus would, of course, be very helpful.

### 7.1 THE CGR EVIDENCE

#### 7.1.1 SHIFT OF -n- AND -r- TO -ɣ- AFTER PRETONIC *a*

There are several examples of this pattern. One problem is that for a couple of the words, I recorded -g- where I suspect it probably should have been -ɣ-. One word I recorded both

ways. In the examples I give them as I recorded them. Northern Roglai does not have the cognate word for 'corn' so I have listed a Southern Roglai form in the NR column.

	CGR	NR	PC	
(113)	<i>ʔagin</i>	<i>ʔanān</i>	<i>*ʔanan</i>	name (cf. ECham <i>ʔaŋan</i> )
(114)	<i>ʔayin/ʔayin</i>	<i>ʔaŋin</i>	<i>*ʔaŋin</i>	wind
(115)	<i>tayəi</i>	<i>təŋəi</i> (SR)	----	corn (cf. Chru <i>təŋəi</i> )
(116)	<i>tagiŋ</i>	<i>taŋān</i>	<i>*taŋ:n</i>	hand (PLC <i>*taŋā:n</i> )
(117)	<i>payə</i>	<i>bara</i>	<i>*bara</i>	shoulder
(118)	<i>mayiah</i>	<i>mariah</i>	<i>*mariah</i>	red
(119)	<i>saya</i>	<i>sara</i>	<i>*sara</i>	salt
(120)	<i>tayah</i>	<i>darah</i>	<i>*darah</i>	blood

The *i* in CGR *ʔagin* 'name' is not accounted for since one would have expected *i* from *\*ā*. ECham, however, also has an *i* in *taŋin* 'hand' where *i* would be expected from PLC *\*ā*. The velar consonant in the tonic onset parallels the Cham *ŋ*, but I do not know whether SR or Chru also have a velar nasal or not. NR, Haroi, Jorai, and Rade all have *n*.

No exceptions to the shift of *-r-* were observed, but a few exceptions were observed for *-ŋ-*:

	CGR	NR	PLC	
(121)	<i>caŋiŋ</i>	<i>riŋiā</i>	<i>*ta(ri)ŋā</i>	ear
(122)	<i>caŋua</i>	<i>caŋua</i>	<i>*caŋua</i>	winnowing basket
(123)	<i>laŋi:ʔ</i>	<i>laŋi:ʔ</i>	<i>*laŋi:ʔ</i>	sky

### 7.1.2 SHIFT OF *-n-* AND *-r-* TO *-w-* AFTER PRETONIC *u*

In the data available there is only one clear example of each.

	CGR	NR	PC	
(124)	<i>puwiŋ</i>	<i>buŋā</i>	<i>*buŋā</i>	flower
(125)	<i>huwəi</i>	<i>hurəi</i>	<i>*hurəi</i>	day

There is one additional word which I take to be a result of the same change, namely *wa* 'classifier for people' from PC *\*ʔuraŋ* 'person'. Unfortunately I did not get the word for person, but NR has *ʔura:k* 'person' and *ra:k* 'classifier for people'. I would expect CGR to have *\*ʔuwa:*.

A possible counter example noted was *tayui* 'thorn', but this probably derives from an intermediate *\*daruəi* from *\*durəi* with metathesis (as in NR *daruəi*) and subsequent loss of the ə in CGR. This then follows the expected pattern for the development of *\*-r-* following *\*a*.

## 7.2 SIGNIFICANCE FOR CHAMIC

The change of *-ŋ-* and *-r-* to *-w-* in CGR is to my knowledge without precedent in Chamic, as is also the change of *-ŋ-* to *-ɣ-*. The shift of *-r-* to the velar fricative *-ɣ-* is not

without precedent. It also happened in WCham and even the NR has moved in that direction. What I have written as *r* in NR represents a high central non-syllabic vocoid [i] in tonic syllables (*bara* [baia] 'shoulder') sometimes with an *r*-like timbre. PC *\*r-* in pretonic syllables is further weakened in NR and manifested by a lengthening (with two pulses) of the pretonic vowel with no glottal stricture (*radlai* [aadlai] 'Roglai').

I believe that there is probably an historical connection between the NR and the CGR reflexes of PC *\*r-*. As far as articulation is concerned, the non-syllabic [i] is very close to a voiced velar fricative. The tongue placement is very close and the primary difference seems to be degree of stricture. Whether there is any historical connection between WCham and CGR *ɣ-* as reflexes of PC *\*r-* is less clear, but, I suggest, should not be ruled out at this stage of our knowledge.

## 8. SHIFT OF FINAL *\*-r* TO *-n*

### 8.1 THE CGR EVIDENCE

A number of words were observed where word final *\*-r* has become *-n* in CGR. These are:

	CGR	NR	PC	
(126)	<i>hakən</i>	<i>sagə</i>	<i>*sagOr</i>	drum
(127)	<i>kan</i>	<i>gə</i>	<i>*gǎr</i>	handle
(128)	<i>pən</i>	<i>pə</i>	<i>*pOr</i>	to fly
(129)	<i>piən</i>	<i>bhia</i>	<i>*biər</i>	short, dwarf
(130)	<i>ʔut<sup>h</sup>an</i>	<i>ʔusa</i>	<i>*ʔusǎr</i>	seed, flesh
(131)	<i>wan</i>	<i>wa</i>	<i>*war</i>	pen, cage

The only possible exception noted was CGR *pu* 'cooked rice', but the cognate forms for other Lowland Chamic languages and Haroi also lack any overt reflex of a final *\*-r*. NR regularly loses *\*-r*, so all of the NR reflexes in sets (126)–(131) as well as *bu* 'cooked rice' end with a vowel.

### 8.2 SIGNIFICANCE FOR CHAMIC

The shift of final *\*-r* to *-n* in CGR is to my knowledge unique in Chamic. It is highly unlikely, however, that the shift from *\*-r* to *-n* represents a single change. It is probably safe to assume that *\*-r* changed first to an intermediate *\*-l* which in turn changed to *-n*. If this assumption is true, CGR shares the first change with Haroi in which PC *\*-r* is reflected by *-l*.

	CGR	Haroi	PC	
(132)	<i>hakən</i>	<i>ʔakhu:l</i>	<i>*sagOr</i>	drum
(133)	<i>kan</i>	<i>khu:l</i>	<i>*gǎr</i>	handle

	CGR	Haroi	PC	
(134)	<i>pən</i>	<i>pɔ:l</i>	<i>*pOr</i>	to fly
(135)	<i>ʔut<sup>h</sup>an</i>	<i>ʔasal</i>	<i>*ʔusǎr</i>	seed, flesh
(136)	<i>wan</i>	<i>wa:l</i>	<i>*war</i>	pen, cage

Whether this shared feature of Haroi and CGR are part of a shared history remains to be determined. Both the alternation of *r* with *l* and of *l* with *n* are historically common (see Ohala 1975:296 for *l* and *n*). The alternation of *r* and *l* is common in Chamic in onset position and NR shares with CGR the reflection of final PC *\*-l* as *-n* although there is only one instance in the CGR data available:

	CGR	NR	PC	
(137)	<i>kapan</i>	<i>kapan</i>	<i>*kapa:l</i>	thick

## 9. SHIFT OF FINAL PC *\*-p* TO *-u*?

### 9.1 THE CGR EVIDENCE

	CGR	NR	PC	
(138)	<i>ʔayu:ʔ</i>	<i>ʔayu:ʔ</i>	<i>*ʔayup</i>	to blow
(139)	<i>hutiuq/hətiʔ</i>	<i>hadiuʔ</i>	<i>*hadip</i>	to live
(140)	<i>ʔjauʔ</i>	<i>ʔjəʔ</i>	<i>*ʔjəp</i>	correct
(141)	<i>patia:uʔ</i> (to hunt)	<i>tia:ʔ</i>	<i>*tiə:p</i>	to pursue
(142)	<i>theũ:ʔ</i>	<i>chiã:ʔ</i>	<i>*siap</i>	wing
(143)	<i>ya:uʔ</i>	<i>ya:ʔ</i>	<i>*ya:p</i>	to count

In all of the examples (138)–(143) both CGR and NR lose the final *\*-p* but differ in what happens. CGR retains both the labial feature and the stop feature with the *-uʔ* with the exception of the variant in (139) where the labial feature is lost following *i*. In (138) there is only one *u* before the glottal stop, the *u* from the *\*-p* having merged with the nucleus. NR normally retains only the stop feature but has one exception (139) where the labial feature is also retained following the *i* in *hadiuʔ*.

The only exceptions noted for CGR in the data available were:

	CGR	NR	PC	
(144)	<i>ʔasa:ʔ</i>	<i>ʔasa:ʔ</i>	<i>*ʔasǎp</i>	smoke
(145)	<i>pəʔ</i>	<i>baʔ</i>	<i>*bǎp</i>	full

### 9.2 SIGNIFICANCE FOR CHAMIC

The development of *\*-p* in CGR is shared by both ECham, Chru, and Haroi. I have evidence for only a few of the Chru reflexes. For all the examples above (138–143) for which I have evidence, ECham and Haroi have replaced the *\*-p* with a labial semivowel and glottal stop except for Haroi *ʔathip* ‘alive’ which retains the *-p* of *\*hadip*. For the two



exceptions given above for CGR (144–145), the Haroi reflexes have the expected change, but ECham agrees with CGR for both as shown in (146–147):

	CGR	ECham	Haroi	PC	
(146)	<i>ʔat<sup>h</sup>a:ʔ</i>	<i>ʔat<sup>h</sup>ǣʔ</i>	<i>ʔasauʔ</i>	<i>*ʔasǎp</i>	smoke
(147)	<i>paʔ</i>	<i>pǎʔ</i>	<i>phiauʔ</i>	<i>*bǎp</i>	full

It should be noted concerning these two exceptions they are the only two for which a short ǣ is reconstructed for PC. Whether this is significant remains to be seen.

#### 10. *puwiŋ* ‘FLOWER’ AND *t<sup>h</sup>uŋʔ* ‘CROSSBOW’ AS REFLEXES OF PC

I began with CGR and NR reflexes of PC *\*buŋa* ‘flower’ and PC *\*srǎ:p* ‘crossbow’, noting that although CGR and NR are closely related, these two sets of words would make them appear to be quite different. Apart from the change of *\*-p* to glottal stop in the word for crossbow, the NR reflexes of these two words are structurally unchanged. The CGR reflexes, however, are radically restructured.

CGR *puwiŋ* ‘flower’ manifests four and possibly five changes:

- 1) Change of initial voiced consonant *\*b* to a voiceless or partially voiceless sound (symbolised by *p* with other possible changes within the word as part of a Mon-Khmer type register system (see §2)).
- 2) Change of *\*-ŋ-* to *w* following *\*u* (see §7.1.2).
- 3) Change of *\*-ǣ* to *ĩ* (see §4.1.1).
- 4) Accretion of *ŋ* following *ĩ* (see §4.1.3).
- 5) Possible loss of nasalisation of *ĩ*. Although I did not record *i* as being nasalised, it may have been.

The third and fourth changes dealing with nasalisation as stated above are ordered, and if the fifth change applies it must follow the third and fourth changes. It is possible, however, that nasal accretion preceded the raising of the vowel. Otherwise the order of the changes does not seem relevant. Of the original phonemes of *\*buŋǣ*, only the *\*u* of the pretonic syllable appears unchanged, but even it may have acquired some change of quality as part of a developing register system.

CGR *t<sup>h</sup>uŋʔ* ‘crossbow’ manifests six and possibly seven changes:

- 1) Change of initial *\*s-* to *t<sup>h</sup>-* (see §6.1).
- 2) Change of final *\*-p* to *-uʔ* (see §9.1).
- 3) Raising of *\*-ǣ-* to intermediate *\*ĩ* (see §4.1.1).
- 4) Loss of *ĩ* preceding *-u* resulting in *ũ:* (see §4.1.2).
- 5) Accretion of nasal consonant following *ũ:* resulting in final nasal consonant followed by glottal stop (see §4.1.3).

- 6) Possible loss of nasalisation of  $\tilde{u}$ .
- 7) Loss of  $r$  as second member of cluster before  $u$  (see discussion under §4.1.4).

Again, as they are stated, changes (3)–(6) dealing with nasalisation are ordered, and if (6) applies it must follow (2)–(5). Changes (3)–(5) could, however, be reordered if stated differently.

## 11. SUMMARY OF CGR INNOVATIONS SHARED WITH OTHER CHAMIC LANGUAGES

Throughout the paper, I have indicated features shared with various of the Chamic languages and with Acehnese. Here I list the features shared with each of the languages included which will enable us to see something of the relationship of CGR to the others.

### Northern Roglai (See also Roglai)

- 1) Share [dl] as opposed to [gl] shared by other Lowland Chamic languages (§1.2).
- 2) Accretion of final alveolar nasal consonant in *kamīn* ‘we (exclusive)’ (§1.2; §4.2.1).
- 3) Lexical items: reflexes of *\*bu:r* mean ‘cooked rice’ (also shared with Acehnese (§1.2)).
- 4) NR may be in the process of losing final stops after long vowels with possible long/short contrast in open syllables as in CGR (§3.2).
- 5) NR  $r$  becomes high central unrounded non-syllabic vocoid (except in pretonic syllable). This is probably related to the CGR shift to voiced velar fricative (§7.2). As a second member of a cluster, both tend to lose the *\*r* preceding a high vocoid, suggesting that *\*r* first became a high non-syllabic vocoid (§4.1.4).

### Roglai (Southern and Northern)

- 1) Denasalisation of final nasal consonants and becoming voiceless stops (§1.2).

### ECham (some shared also with WCham)

- 1) Development of register system connected with original initial stops (§2.2).
- 2) Raising of low central nasal vowel to high central position (§4.1.1).
- 3) Loss of high central nasal vowel adjacent to high front or back vocoid (§4.2).
- 4) Shift of initial *\*s-* to  $t^h$  (§6.2). Share most exceptions as well (§6.2).
- 5) Final *\*-p* becomes final high central non-syllabic vocoid combined with glottal stop (§9.2). (This feature is also shared with Haroi.)

**WCham**

- 1) Change of *\*r-* to voiced velar fricative (§7.2).
- 2) See also ECham although not all features shared.

**Haroi**

- 1) Development of register system connected with original initial stops. CGR in development stage and Haroi has already restructured vowel system with accompanying loss of register system (§2.2).
- 2) Merger of initial alveolar and palatal stops although sporadic in CGR (§5.2).
- 3) Shared initial *k-* in word for 'rabbit' (§5.2).
- 4) Final *\*-r* becomes *-l* although in CGR the resulting *-l* along with already existing *-l* became a final *-n* (§8.2).
- 5) Final *\*-p* becomes final high central non-syllabic vocoid combined with glottal stop (§9.2). (This feature is also shared with ECham.)

**Acehnese**

- 1) Raising of low central nasal vowel: CGR to high position, Acehnese to mid-low position (§4.2).
- 2) Accretion of velar nasal consonant following nasal vowel in open syllables (§4.2).
- 3) Possibly shift of *\*t* to *c* (see also for Haroi above), but doubtful (§5.2).

Looking only at the above list, the features shared by CGR with NR, ECham, and Haroi are the highest and roughly equal in number. The number of features shared with some of the other languages may turn out to be as many when we have the information organised. The nature of some of the features shared with ECham and Haroi, however, seem to indicate that there may be a closer affinity of Haroi with other Lowland Chamic languages than Burnham (1976) recognised. Southern Roglai and also Chru should have a lot in common with CGR that is not available here. I would expect that features shared specifically with Rade or Jorai, however, are somewhat unlikely.

Concerning the relationship of CGR with NR and ECham, I expect that the features shared by CGR and NR are more likely held over from earlier common history and that some of the features shared with Cham are from more recent close contact.

CGR shares two nasal related innovations with Acehnese but the significance of these remains to be seen.

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