

## THE VALUE OF $\bar{I}$ , $I$ , $\bar{U}$ AND $U$ IN MIDDLE KHMER

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This is the fourth of a series of studies on the vowel and consonant systems of Middle Khmer, tentatively assigned to the period from the 14th to the 18th centuries. The first paper in the series<sup>1</sup> reported the results of an analysis of eighteen short metrical texts and showed how these can be placed in quasi-chronological sequence on the basis of their rhymes. This was followed by a description of the changing distribution of final  $-ra$  and  $-la$ <sup>2</sup> and by an examination of the graphemes  $au$  and  $ai$ ,<sup>3</sup> both using the same corpus of 5,164 rhymes as had been developed for the first paper. We turn now to investigate the graphemes  $\bar{I}$ ,  $i$ ,  $\bar{U}$ , and  $u$  as these are found in the same material. Future studies will treat vowels occurring before the final palatals, the development of modern  $/oe/$ , and the grapheme  $e$  in the same body of texts. A sketch of the vocalism, including information on the Middle Khmer system, has been given elsewhere.<sup>4</sup>

The analytical procedure followed here is essentially the same as before. The entire corpus is first sifted, all rhymes involving orthographic  $\bar{I}$ ,  $i$ ,  $\bar{U}$ , and  $u$  being separated out. The rhymes in question are then typed and weighed from the point of view of their relevance to the problem of determining their value during the Middle Khmer period. The modern value of the four graphemes is taken as a known quantity, and the modern regularized orthography is preferred over that originally used in the seventeen undated  $cp\bar{a}'pa$  texts. The members of each rhyming pair are compared and inferences are drawn from their orthographic shape, from their modern value, from the pre-modern pronunciation of loanwords present, and from known systematic changes in the vocalism. These inferences are finally tested against the collected rhymes.

While many of the rhymes used have been invalidated by later phono-

logical changes, it is assumed that all of the rhymes indicated by the meter of each text were, with very few exceptions, valid at the time of composition.

In isolating the evidential from the nonevidential portion of the assembled data, it is necessary to draw a distinction between 'perfect' and 'imperfect' rhymes. Perfect T rhymes are those in which both members of a rhyming pair show graphic T in their relevant syllables. Perfect i, ū, and u rhymes are similarly those in which both members have the same orthographic vowel. Imperfect rhymes are those in which only one member of a rhyme contains graphic T, i, ū or u, which rhymes with some other orthographic form. Exceptions are made in the case of certain allographs, to be mentioned as they are introduced. The reason for this distinction, as well as examples of both classes of rhyme, will be given shortly. In our group of texts perfect rhymes account for 62.4% of all T, i, ū and u rhymes, imperfect rhymes accounting for the remaining 37.6%.

Table 1 shows that the total corpus contains 366 perfect and imperfect T rhymes and 299 perfect and imperfect i rhymes. The T rhymes have an average frequency of 6.45% and individual frequencies which rise and fall erratically between a peak of 13.82% and a low of 0.79%. Maxima are registered for the *Cpā'pa sṛt*, the '*Ariyasatthā*', and the *Ker(tī) kāla*, minima for the *Kūna cau lpæka* (A) and the *Bākya cā'sa*. The i rhymes show an average frequency of 5.64% and individual frequencies which, while roughly mirroring the profile of T rhymes, range narrowly between 8.3% and 4.00%.

Table 2 shows that the corpus contains 217 perfect and imperfect ū rhymes and 243 perfect and imperfect u rhymes. The ū rhymes have an average frequency of 4.23% and individual frequencies which, though less extreme than those of T rhymes, rise and fall at random between a peak of 7.57% and a low of 2.08%. Maxima are registered for the *Cpā'pa dūnmāna kūna*, the '*Ariyasatthā*', and the *Kūna cau lpæka* (A), minima for the *Hai mahājana* (I), the *Krama*, and the *IMA*. The i rhymes have an average frequency of 4.72% and individual frequencies ranging from a high of 10.07% down to zero. Maxima are registered for the *Prusa*, the *Bākya cā'sa*, and the *Hai mahājana* (I), minima for the *Krama*, the *Vidhūrapandita*, and the *Kūna cau*.

At issue in this paper, therefore, are 1,124 rhymes representing 21.8% of the total corpus. It remains to be seen how many of these are usable in our investigation.

TABLE 1  
GENERAL FREQUENCIES OF Ī AND i RHYMES

	total rhymes	ī rhymes		i rhymes	
<i>Ker(ṭi) kāla</i>	105	11	10.48%	7	6.66%
<i>Kūna cau</i>	328	22	6.71%	14	4.26%
<i>Rājaneti</i>	214	20	9.35%	13	6.07%
<i>Krama</i>	154	6	3.90%	7	4.54%
<i>Hai mahājana (I)</i>	337	29	8.61%	20	5.93%
<i>IMA 38</i>	493	39	7.91%	28	5.67%
<i>Kūna cau lpæka (A)</i>	297	9	3.03%	14	4.71%
<i>Vidhūrapandita</i>	225	14	6.22%	9	4.00%
<i>Pantām pītā</i>	295	9	3.05%	19	6.44%
<i>Kūna cau lpæka (B)</i>	127	1	0.79%	6	4.72%
<i>Trāneti</i>	380	22	5.79%	19	5.00%
<i>Dūnmāna khḷwṇa</i>	175	11	6.29%	10	5.71%
<i>Bākya cā'sa</i>	97	1	1.03%	4	4.12%
<i>Hai mahājana (II)</i>	324	23	7.10%	20	6.17%
<i>Pantām 'ū buka</i>	291	10	3.44%	14	4.81%
<i>Dūnmāna kūna</i>	251	22	8.76%	21	8.36%
<i>Srṭ</i>	579	80	13.82%	42	7.25%
<i>Prusa</i>	298	16	5.37%	19	6.37%
<i>'Ariyasatthā</i>	194	21	10.82%	12	6.18%
	5,164	366	6.45%	298	5.63%

TABLE 2  
GENERAL FREQUENCIES OF  $\bar{u}$  AND  $u$  RHYMES

	total rhymes	$\bar{u}$ rhymes	$u$ rhymes
<i>Ker(tti) kāla</i>	105	6 5.71%	5 4.76%
<i>Kūna cau</i>	328	10 3.05%	6 1.83%
<i>Rājaneti</i>	214	8 3.74%	10 4.67%
<i>Krama</i>	154	4 2.60%	0
<i>Hai mahājana (I)</i>	337	7 2.08%	22 6.53%
<i>IMA 38</i>	493	14 2.84%	13 2.64%
<i>Kūna cau lpoka (A)</i>	297	19 6.40%	16 5.39%
<i>Vidhūrapandita</i>	225	7 3.11%	3 1.33%
<i>Pantām pitā</i>	295	18 6.10%	15 5.08%
<i>Kūna cau lpoka (B)</i>	127	4 3.15%	5 3.94%
<i>Trīneti</i>	380	15 3.95%	15 3.95%
<i>Dūnmāna khḷwā</i>	175	5 2.86%	11 6.29%
<i>Bākya cā'sa</i>	97	3 3.10%	7 7.22%
<i>Hai mahājana (II)</i>	324	10 3.09%	20 6.17%
<i>Pantām 'ū buka</i>	291	18 6.19%	15 5.15%
<i>Dūnmāna kūna</i>	251	19 7.57%	11 4.38%
<i>Sṛī</i>	579	25 4.32%	29 5.01%
<i>Prusa</i>	298	12 4.03%	30 10.07%
<i>'Ariyasatthā</i>	194	13 6.70%	10 5.15%
	5,164	217 4.23%	243 4.72%

In Table 3 we see that perfect T rhymes number 313 and perfect i rhymes number 127. The T rhymes, with an average frequency of 5.52%, have individual frequencies ranging from 11.9% to 0.8%. Maxima are registered for the *Srī*, the *'Ariyasatthā* and the *Ker(tī) kāla*, as before, while minima are registered for the *Kūna cau lpōka* (B), the *Bākya cā'sa*, and the *Kūna cau lpōka* (B). The i rhymes, with an average frequency of 2.47%, have individual frequencies ranging from only 5.2% to 0.8%. The highest are registered for the *Dūnmāna kūna*, the *Pantām pitā*, and the *'Ariyasatthā*, the lowest for the IMA, the *Bākya cā'sa*, and the *Vidhūrapandita*. In the case of neither T rhymes nor i rhymes do we have reason to assume any correlation between these frequencies and the relative age of the texts.

TABLE 3  
PERFECT Ī AND i RHYMES

	total rhymes	ī rhymes	i rhymes
<i>Ker(tī) kāla</i>	105	9 8.6%	2 1.9%
<i>Kūna cau</i>	328	21 6.4%	5 1.5%
<i>Rājaneti</i>	214	16 7.5%	6 2.8%
<i>Krama</i>	154	6 3.9%	0
<i>Hai mahājana</i> (I)	337	21 6.2%	8 2.4%
IMA 38	493	35 7.1%	4 0.8%
<i>Kūna cau lpōka</i> (A)	297	9 3.0%	10 3.4%
<i>Vidhūrapandita</i>	225	13 5.7%	3 1.3%
<i>Pantām pitā</i>	295	9 3.1%	13 4.4%
<i>Kūna cau lpōka</i> (B)	127	1 0.8%	4 3.1%
<i>Trīneti</i>	380	19 5.0%	7 1.8%
<i>Dūnmāna khḷwṇa</i>	175	9 5.1%	4 2.3%
<i>Bākya cā'sa</i>	97	1 1.0%	1 1.0%
<i>Hai mahājana</i> (II)	324	15 4.6%	10 3.1%
<i>Pantām 'ū buka</i>	291	9 3.1%	10 3.4%
<i>Dūnmāna kūna</i>	251	19 7.6%	13 5.2%
<i>Srī</i>	579	69 11.9%	11 1.9%
<i>Prusa</i>	298	12 4.0%	9 3.0%
<i>'Ariyasatthā</i>	194	20 10.3%	7 3.6%
	5,164	313 5.52%	127 2.47%

In Table 4 we see that perfect  $\bar{u}$  rhymes number 138 while perfect  $u$  rhymes number 124. The  $\bar{u}$  rhymes show an average frequency of 2.71% and individual frequencies ranging from 5.7% to 0.8%. Maxima are seen for the *Ker(tti) kāla*, the *Kūna cau lpōka* (A) and *Pantām pitā*, and the *Pantām 'ū buka*, minima for the *Dūnmāna kūna*, the *Bākya cā'sa*, and the *Hai mahājana* (I and II). The  $u$  rhymes show an average frequency of 2.32% and individual frequencies ranging from 4.7% down to 0.6%. Peaks are registered for the *Rājaneti* and *Prusa*, the *Pantām pitā* and the *Kūna cau lpōka* (A), lows for the *IMA*, the *Dūnmāna khlwna*, and the *Kūna cau*. In neither case, again, can any correlation be discerned between these frequencies and the age of the texts.

TABLE 4  
PERFECT  $\bar{u}$  AND  $u$  RHYMES

	total rhymes	$\bar{u}$ rhymes	$u$ rhymes
<i>Ker(tti) kāla</i>	105	6 5.7%	2 1.9%
<i>Kūna cau</i>	328	10 3.0%	4 1.2%
<i>Rājaneti</i>	214	7 3.3%	10 4.7%
<i>Krama</i>	154	4 2.6%	0
<i>Hai mahājana</i> (I)	337	4 1.2%	9 2.7%
<i>IMA 38</i>	493	12 2.4%	3 0.6%
<i>Kūna cau lpōka</i> (A)	297	13 4.4%	12 4.0%
<i>Vidhūrapandita</i>	225	5 2.2%	0
<i>Pantām pitā</i>	295	13 4.4%	12 4.1%
<i>Kūna cau lpōka</i> (B)	127	2 1.6%	2 1.6%
<i>Trīneti</i>	380	13 3.4%	6 1.6%
<i>Dūnmāna khlwna</i>	175	3 1.7%	2 1.1%
<i>Bākya cā'sa</i>	97	1 1.0%	2 2.1%
<i>Hai mahājana</i> (II)	324	4 1.2%	7 2.2%
<i>Pantām 'ū buka</i>	291	12 4.1%	12 4.1%
<i>Dūnmāna kūna</i>	251	2 0.8%	5 2.0%
<i>Srī</i>	579	12 2.1%	17 2.9%
<i>Prusa</i>	298	8 2.7%	14 4.7%
<i>'Ariyasatthā</i>	194	7 3.6%	5 2.6%
	5,164	138 2.71%	124 2.32%

Perfect rhymes thus number 702 and account for 62.4% of all T, i, ū, and u rhymes in the corpus.

We address ourselves now to the question of what these perfect rhymes have to contribute to a solution of the problem under consideration. Since the phonological value of T, i, ū, and u is unknown in Middle Khmer but known in modern Khmer, it can be said that the perfect rhymes in our eighteen texts are divisible into three types according as their members have High Register (HR) or Low Register (LR) reflexes in the modern language.

In one of these types, both members of the rhyme presuppose HR reflexes, e.g. jT /cii/ : gambT /kumpii/ (R 33fe);<sup>5</sup> dharanT /thoaronii/ : rddhT /rýttthii/ (HMI 75bc); gamnita /kumnit/ : gita /kit/ (KC 68de); 'āditya /qaatit/ : jita /cit/ (HMII 66d/67b); gūra /kuur/ : dadūra /ttuur/ (KK 3bc), grū /kruu/ : 'abhirū(ha) /qaphiruu/ (A 32ab); buka /puk/ : duka /tuk/ (KC 29de); guṇa /kun/ : muna /mun/ (T 67ab).

In a second type, both members of the rhyme presuppose LR reflexes, e.g. ktT /kdəej/ : krakrT /krakrəej/ (KC 20ef); pT /bəej/ : sratT /sradəej/ (P 9lab); phtita /pdət/ : citta /cət/ (R 32ce); tamrih /tamrəh/ : trih /trəh/ (T 19de); kūna /kòon/ : p'ūna /pqòon/ (KK 14bc); 'āsrūva /qaasròow/ : kūva /kòow/ (S 176c/177a); 'usa /qoh/ : khusa /khoh/ (HMI 40ab); cuka /cok/ : sukha /sok/ (PP 54g/55c).

In the third type of rhyme one member is reflected by a HR form, the other by a LR form, e.g. dhūiT /thuulii/ : tT /dəej/ (KK 18bc); sālT /saaləej/ : kutumbT(ka) /kdompii/ (V 50ab); tica /təc/ : dranica /tronic/ (KC 4g/5c); gita /kit/ : citta /cət/ (S 215a); madhūra /mathuur/ : cūla /còol/ (R 48g/49c); trūva /tròow/ : byū(ha) /pjuu/ (KCLA 8g/9c); sam'uya /samqoj/ : ruya /ruj/ (KC 20ab); manussa /mnuh/ : prusa /proh/ (P 3ab).

In considering these examples we note at once the close apparent correspondence between the four graphemes and their HR realizations: T /ii/ [i:], i /i/ [ɪ], ū /uu/ [u:], u /u/ [ʊ]. On the other hand, we cannot fail to recognize that the same graphemes have LR realizations and that these differ appreciably from their HR counterparts. We are warranted in assuming from their orthographic representation that the HR nuclei have undergone little or no change from their pre-modern shapes. We are warranted in assuming from the difference between the HR nuclei and their LR counterparts that the latter have developed from their premodern forms by several types of lowering: i /əej/ [ɣ:j], i /ə/ [ə'], ū /oo(w)/ [o:ʷy:w], u /o/ [oʷ]. Both of these assumptions accord well with what we know of the development of the modern vocalism.<sup>6</sup> Briefly, the register of each nucleus is governed by its former environment, originally voiced initials yielding HR nuclei, originally

voiceless initials yielding LR nuclei. The circumstance that the former environment is, with very few exceptions, shown by the conservative writing system is an incidental convenience. The main point here is that by knowing the register of a nucleus we can reconstruct its pre-modern equivalence: HR /ii, i, uu, u/ and LR /əej, ə, ɔo(w), o/ are alike from pre-modern /ii, i, uu, u/. In this light, the meaning of the perfect rhymes given above becomes clearer. While the HR : HR rhymes undergo no change, the LR : LR rhymes appear as *krakrT* /krəkrii/, *pT* /?bii/ : *sratT* /srɔ?dii/; *phtita* /p?dit/ : *citta* /cit/, *tamrih* /tomrih/ : *triḥ* /trih/; *kūna* /kuun/ : *p'ūna* /pquun/, *'āsrūva* /qaasruuw/ : *kūva* /kuuw/; and *'usa* /quh/ : *khusa* /khuh/, *cuka* /cuk/ : *sukha* /suk/. The discrepant HR : LR rhymes, moreover, are now heard as they were at the time of composition: *dhūT* /thuulii/ : *tT* /?dii/, *sāT* /saalii/ : *kuṭumbT(ka)* /k?dumbii/; *tica* /tic/ : *dranica* /tronic/, *gita* /kit/ : *citta* /cit/; *madhūra* /madhuur/ : *cūla* /cuul/, *trūva* /truuw/ : *byū(ha)* /bjuu/; *saṃ'uya* /sɔmquj/ : *ruya* /ruj/, *manussa* /mnuh/ : *prusa* /pruh/. In and by themselves, however, our perfect rhymes tell us nothing regarding the pre-modern value of the graphemes in question. Were it not for (a) the fact that we are concerned with rhymes, (b) our assumption that these were almost entirely valid at the time of composition, and (c) their orthographical form, we should be on very infirm ground indeed. What we have been doing up to this point, it may be said, is comparable to weighing English rhymes (*soot* : *moot*, *cough* : *rough*) which are spelled similarly but are pronounced differently in modern English and may or may not have rhymed in Middle English. In short, we need other evidence. We must consequently look to imperfect rhymes and see what confirmation or what new conclusions can be had from them.

The four tables given hereafter show that imperfect rhymes number 422, a figure representing 37.5% of our working corpus, and have an average frequency of 2.0%.

Table 5 shows that imperfect T rhymes number 53 and have an average frequency of only 0.9%. Of these 33 (62.3%) are rhymes in which one member has orthographic T and the other has ai in the relevant syllable. Of the remainder 6 (11.3%) are T : e rhymes and 5 (9.4%) are T : ɿ rhymes, while in 9 others (17%) T rhymes with some other graphic vowel. It should be noted in particular that the individual frequencies for the eighteen texts rise and fall unpredictably between a maximum of 2.5% and a minimum of 0.3%, and show no pattern of increase or decrease correlatable with the age of the texts.



TABLE 5  
IMPERFECT T RHYMES

	total rhymes	a i	e	ī	other	total
<i>Ker(tī) kālā</i>	105	0	1	1	0	2 1.9%
<i>Kūna cau</i>	328	0	1	0	0	1 0.3%
<i>Rājāneti</i>	214	1	1	1	1	4 1.9%
<i>Krama</i>	154	0	0	0	0	0
<i>Hai mahājana</i> (I)	337	7	0	0	1	8 2.4%
<i>IMA 38</i>	493	2	1	0	1	4 0.8%
<i>Kūna cau lṛæka</i> (A)	297	0	0	0	0	0
<i>Vidhūrapandita</i>	225	1	0	0	0	1 0.4%
<i>Pantām pitā</i>	295	0	0	0	0	0
<i>Kūna cau lṛæka</i> (B)	127	0	0	0	0	0
<i>Trīneti</i>	380	0	0	2	1	3 0.8%
<i>Dūnmāna khḷwṇa</i>	175	2	0	0	0	2 1.1%
<i>Bākya cā'sa</i>	97	0	0	0	0	0
<i>Hai mahājana</i> (II)	324	8	0	0	0	8 2.5%
<i>Pantām 'ū buka</i>	291	0	0	0	1	1 0.3%
<i>Dūnmāna kūna</i>	251	3	0	0	0	3 1.2%
<i>Srī</i>	579	7	0	0	4	11 1.9%
<i>Prusa</i>	298	1	2	1	0	4 1.3%
<i>'Ariyasatthā</i>	194	1	0	0	0	1 0.5%
	5,164	33	6	5	9	53 0.9%

In 'The Value of au and ai in Middle Khmer' 25 T : ai rhymes were listed in full and discussed. These may be exemplified here by smāratT /smaardəej/ : thlai /tlaj/ (HMI 66bc), khcT /kcəej/ : nai /nəej/ (DKh 4bc), metrT /méetrəej/ : kansai /kansaj/ (DKn 86ab), and ptT /pdəej/ : tadai /daatəej/ (S 22ab).<sup>7</sup> To these we may now add eight rhymes between T and āya, an allograph of ai:

HMI	45cb	smāratT /smaardəej/	:	sañsāya /sañsaj/	<sup>7</sup>
	45cd	smāratT /smaardəej/	:	vināya /winəej/	
V	51b/50d	ktT /kdəej/	:	jalasrāya /culosraj/	
HMII	79d/80b	pāramT /baarəməej/	:	bhāya /phəej/	
DKn	46ab	metrT /méetrəej/	:	prāsraja /praasraj/	
S	61c/62a	sri /srəej/	:	hardāya /hrýtəej/	
	62ba	sratT /sradəej/	:	hardāya /hrýtəej/	
A	41c/40g	ktT /kdəej/	:	-ālāya /-aalaj/	

It has already been shown that the T member of the 25 T : ai rhymes was in every case reflected by a modern LR syllable in /-əej/. This observation finds unqualified confirmation in the eight T : āya rhymes just cited. On the other hand, in the case of the T : ai rhymes previously reported it was found that 17 out of the 25 ai members were reflected by modern HR forms in /-əej/ while eight corresponded to modern LR forms in /-aj/. The eight āya members of the rhymes just given are similarly ambivalent, corresponding to four HR and four LR syllables in the modern language. It can therefore be said that, of the 33 ai ~ āya members in question here 21 or 63.6% reflect the HR while 12 or 36.4% reflect the LR. The inequality of these percentages is not enough to justify assumption of any clearly defined pattern. Hence we can only repeat what was said earlier. It is clear that if ai (and āya) had originally represented [aj] these various rhymes would not have been possible. Moreover, from the fact that we find ai and āya members which presuppose different registers in rhyme with T members presupposing only the LR we can only suppose that the LR reflex of Middle Khmer /ii/ (T) had developed before registrational contrast was fully established for Middle Khmer /əej/ (ai ~ āya). In all 33 cases, therefore, T must have had its modern LR value of /-əej/ while ai and āya must have had their pre-modern value of /-əej/. The eight rhymes just given might hence be rewritten as follows in pre-modern as well as modern terms:

smāratT /smaarʔdii > smaardəej/	sañsāya /sañsej > sañsaj/	<sup>8</sup>
smāratT /smaarʔdii > smaardəej/	vināya /winəej > winəej/	
ktT /kʔdii > kdəej/	jalasrāya /ʔulosrej > culosraj/	
pāramT /ʔbaarəmi > baarəməej/	bhāya /bhəej phəej/	

metrT /meetrii > méetrèej/	prāsrāya /praasrēj > praasraj/
srT /srii > srèej/	hardāya /hrytēj > hrýtéj/
sraT /srəʔdii > srədèej/	hardāya /hrytēj > hrýtéj/
ktT /kʔdii > kdèej/	-ālāya /-aalēj > -aalaj/

These examples are enough to show that rhymes of the type in question could have been possible only during a limited period in the transition from the vocalism of Old Khmer to that of the modern language.

Leaving T : āya (ai) rhymes and going on to the remaining imperfect T rhymes in the corpus, we find that Table 5 registers six rhymes in which orthographic T is paired with e. Upon examining these we are struck by the fact that the T members of five are reflected by modern HR forms:

KK	15/16b	bTra /piir/	:	ker(ti) /kèer/ <sup>7</sup>
KC	6ed	bTra /piir/	:	ker(ti) /kèer/
R	23ab	jhnānTsa /cnfi niih/	:	cacesa /ccèeh/
P	19ab	ralTna /rliiŋ/	:	dheña /théēŋ/
	25ba	ralTna /rliiŋ/	:	dheña /théēŋ/

Regarding the e member of these rhymes, we are reminded in the first place that modern HR /ée/ is often articulated as [ɛ:] while modern LR /èe/ is often [ɛ:]. It seems unlikely that the authors of the *Ker(tti)* *kāla* and the *Kūna cau* ever intended rhyme between /ii/ and [ɛ:] [ɛ:]. We are reminded in the second place that *ker(ti) fame, glory* is a modification of Sanskrit *kṛti*, in conformity with a fairly common correspondence.<sup>9</sup> In the two cases above we can only suppose that it was still [ki:r] at the time of composition. In the late *Cpā'pa prusa*, on the other hand, the twofold occurrence of *ralTna* : *dheña* is good evidence that *dheña* was already being pronounced [thɛ:ŋ] instead of pre-modern [dhe:ŋ] and consequently that Middle Khmer /ee/ (e) had by the date of this text already split into its present registral shapes. As for the form *cacesa* in the above rhymes, we must assume either that the rhyme in which it occurs was never valid or, as is more probable, that the contemporary orthography must have been \**cacTsa*. The sixth and last of our T : e rhymes is also the most instructive. This is:

IMA	105a/104c	ktT /kdèej/	:	leya /laaej/ <sup>7</sup>
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in which both members are reflected by modern LR forms. The latter member has the Middle Khmer orthography of modern *ləya*. Rewriting the rhyme in pre-modern as well as modern terms makes it clear that it could have been valid only during a limited period, namely after registral contrast had been established for original /ii/ but before contrast had been established for original /ee/:

ktT /kʔdii > kdèej/	:	ləya /ləej > laaej/ <sup>8</sup>
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Table 5 also shows five T : ʔ rhymes. In reality only three of these have long ʔ in the member rhyming with T. These are:

KK	4cb	krápT /krápəej/	:	bhlʔ /plýy/ <sup>7</sup>
T	36ec	metrT /méetrəej/	:	banlʔ /punlýy/
	44ec	metrT /méetrəej/	:	banlʔ /punlýy/

It would be rash to draw conclusions from so few examples, which are consequently reserved for a forthcoming study on ʔ and i. Of the two remaining rhymes, one has orthographic long T pronounced [ɿ], in rhyme with short i, and hence reassignable to i:

P	lab	brahmagTti /prummokit/	:	briddha /prýt/ <sup>7</sup>
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This conforms with the modern standard language, in which contrast is easily lost between HR /i/ and HR /ý/. The other rhyme is

R	34ab	jañjTna /cunciŋ/	:	tĩña /dýŋ/ <sup>7</sup>
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where the first term (*balance, scales*) is from Old Khmer janjyañ /jənjŋə/<sup>10</sup> while the second (*to know*) is from Old Khmer tyañ /tiəŋ ~ ʔdiəŋ/ and Middle Khmer (e.g., IMA 16b) tyĩña /ʔdiŋ > ʔdýŋ/. Notwithstanding the modern orthography given above, it seems clear that the two rhymed when the *Rājanetī* was composed.

Table 5 shows, finally, nine rhymes in which T is paired with other orthographic vowels. These are:

R	12ba	sTla /səl/	:	khjila /kcil/ <sup>7</sup>
HMI	87ab	hTña /hliŋ/	:	bhlleña /plíeŋ/
IMA	28ab	byira /piir/	:	ramila /rmil/
T	5de	mantrT /muntrəej/	:	bi- /pi-/
PUB	2ed	'vT /qawəej/	:	həya /haaej/
S	193a	ptT /pdəej/	:	ñāya /ŋíeŋ/
	199a	ptT /pdəej/	:	ñāya /ŋíeŋ/
	202a	ptT /pdəej/	:	ñāya /ŋíeŋ/
	204a	ptT /pdəej/	:	ñāya /ŋíeŋ/

The first of these shows in its prior member the same long T pronounced [ɿ] as has already been seen in the case of brahmagTti : briddha, and is hence to be reassigned to short i. The second rhyme with bhlleña (= phlleña /plíeŋ/) *rain* is acoustically admissible, and will be treated in a future study on orthographic iə. In the third, the form byira corresponds to modern bTra. The latter member of this and the fourth rhyme shows short i /i/, which apparently varied freely in these forms with /ii/.<sup>11</sup> The fifth rhyme conforms exactly with the ktT : leya cited above from IMA 38 and confirms the inferences made from its occurrence. From its development,

'vT /wii > wəej/ : həya /həej > haaej/,<sup>8</sup>

one can see that the new LR reflex of Middle Khmer /ii/ appeared before the LR reflex of /əə/. The four identical rhymes from the Cpā'pa sṛṭ occupy optional positions in the metrical scheme. While it is possible that their constituents may not have been meant to rhyme, it is probable that they were so intended. By the time of this late text the prior member had certainly developed from /pʔdii/ to /pdəej/. The change /ŋaaj > ŋéəej > ŋfiəj/ is established but not yet dated in relation to other changes. The important thing here, however, is that the syllable nucleus before final /j/ typically undergoes in modern standard Khmer a shift of stress and length from [i:ə] to [ie:] and even [je:] which would make it more than ordinarily congruent with /pdəej/. We can therefore suppose that the rhyme in question was as admissible as the ĥTña : bhliəña mentioned above.

We turn now to imperfect i rhymes. Table 6 shows, first of all, a preponderance (84 items = 49.1%) of rhymes in which one member of the pair has graphic iya. These are somewhat awkward to classify inasmuch as iya, while written with short i, is an allograph of long T. As such it occurs paired either with itself or with T in all but four cases. Like T, iya is reflected by modern forms of both registers. The bulk of the rhymes in which it occurs are hence divisible into three types according as their members show HR or LR reflexes. As before, in one type both members presuppose HR reflexes, e.g. 'indriya /qəntrii/ : byādhT /pjfiəthii/ (KC 50ba) and muhñni /muhñii/ : medriya /méetrii/ (IMA 126ce). In a second type, both members presuppose LR reflexes, e.g. lokiya /lóokəej/ : pT /bəej/ (K 9c/9g) and lokiya /lóokəej/ : 'apriya /qaprəej/ (K 9ce). In the third type of rhyme one member is reflected by a HR form, the other by a LR form, e.g. 'indriya /qəntrii/ : ptT /pdəej/ (KK 21cb) and 'apriya /qaprəej/ : lajjT /lacci/ (KC 19g/20c). It can be seen from this much that rhymes of this type are to be reassigned to perfect T rhymes. Like the latter, they tell us nothing of the pre-modern value of T or i. It is nonetheless of interest to note that the ratio of the three types of rhyme just described is decidedly uneven. In 59 cases (70.2%) both members correspond to modern HR forms. In the remaining eighteen cases (21.4%) the two members have different registers.

It was mentioned above that there are four exceptions to this pattern. In these graphic iya is in rhyme with graphic ai and its āya allograph. The rhymes in question are:

HMI	25bc	-tirthiya /-dèerthəej/	:	bhāya /phəj/ <sup>7</sup>
IMA	25cb	-dhivatiya /-thipdəej/	:	didaiya /tiitəj/

TABLE 6  
IMPERFECT i RHYMES

	total rhymes	iya	e	ä	†	other	total	
<i>Ker(ti) kūla</i>	105	2	2	0	1	0	5	4.8%
<i>Kūna cau</i>	328	7	0	2	0	0	9	2.7%
<i>Rājaneti</i>	214	3	0	0	3	1	7	3.3%
<i>Krama</i>	154	6	1	0	0	0	7	4.5%
<i>Hai mahājana (I)</i>	337	5	2	1	2	2	12	3.6%
<i>IMA 38</i>	493	15	7	2	0	1	25	5.1%
<i>Kūna cau lṛṣka (A)</i>	297	2	0	2	0	0	4	1.3%
<i>Vidhūrapandita</i>	225	4	1	0	1	0	6	2.7%
<i>Pantām pitā</i>	295	2	2	2	0	0	6	2.0%
<i>Kūna cau lṛṣka (B)</i>	127	0	1	0	1	0	2	1.6%
<i>Trāneti</i>	380	9	1	1	0	0	11	2.9%
<i>Dūnmāna khḷwṇa</i>	175	5	1	0	0	0	6	3.4%
<i>Bākya cā'sa</i>	97	0	0	0	3	0	3	3.1%
<i>Hai mahājana (II)</i>	324	0	8	2	0	0	10	3.1%
<i>Pantām 'ū buka</i>	291	2	0	2	0	0	4	1.4%
<i>Dūnmāna kūna</i>	251	3	3	0	2	0	8	3.2%
<i>Srī</i>	579	12	6	11	0	2	31	5.4%
<i>Prusa</i>	298	3	3	3	1	0	10	3.4%
<i>'Ariyasatthā</i>	194	4	1	0	0	0	5	2.6%
	5,164	84	39	28	14	6	171	3.2%

DKh	20ab	lokiya /lóokèəj/	:	ksāya /ksaj/
DKn	75c/76a	lokiya /lóokèəj/	:	'ai /qaj/

These four are to be reassigned to the imperfect ai (āya) : T which have been treated elsewhere.<sup>12</sup>

The next largest group on Table 6 consists of 39 i : e rhymes, representing 22.7% of all imperfect I rhymes. These are of sufficient interest to warrant being listed in full:

KK	16cb	sarila /sarəl/	:	ker(ti) /kèer/ <sup>7</sup>
	20ab	rih /rih/	:	ceh /cèh/
K	5ba	khjila /kcil/	:	sarasera /sɑarsèer/
HMI	55ab	kicca /kəc/	:	bhleca /pléec/
	73d/74b	jamnih /cumnih/	:	radeh /rtéh/
IMA	3d/4b	-gitta /-kit/	:	sarbvejña /sarpéec/
	18ab	tica /təc/	:	bejña /péec/
	39ba	rih /rih/	:	nēh /néh/
	57ab	kica /kəc/	:	sreca /sréec/
	119fe	miña /mip/	:	pambeña /bampéep/
	140ab	sammiña /samlèeŋ/	:	phsiña /psèeŋ/
	150ab	viña /wip/	:	beña /péep/
V	46bc	miña /mip/	:	ceña /cèep/
PP	21ec	tamrih /tamrèh/	:	camneh /camnèh/
	21ef	tamrih /tamrèh/	:	neh /néh/
KCLB	35ba	tamrih /tamrèh/	:	ceh /cèh/
T	79fe	pantica /bantèc/	:	greca /kréec/
DKh	5ba	diña /tip/	:	ceña /cèep/
HMI	8ab	tica /təc/	:	bhleca /pléec/
	10d/11b	tica /təc/	:	geca /kéec/
	11dc	banlica /punlic/	:	pambhleca /bampiléec/
	51d/52b	viña /wip/	:	jreña /créep/
	57d/58b	viña /wip/	:	ceña /cèep/
	58cb	viña /wip/	:	ceña /cèep/
	60d/61b	viña /wip/	:	'amneña /qamnéep/
	78cb	lica /lic/	:	steca /sdac/ (sic)
DKn	71c/72a	viña /wip/	:	'amneña /qamnéep/
	72ba	viña /wip/	:	'amneña /qamnéep/
	91a/90c	rih /rih/	:	neh /néh/
S	49a	kicca /kəc/	:	beca(na) /péec/
	77ab	viña /wip/	:	mneña /mnéep/
	162c/163a	viña /wip/	:	pambeña /bampéep/
	163ba	viña /wip/	:	pambeña /bampéep/
	164a	tih /tèh/	:	ceh /cèh/
	221ba	kicca /kəc/	:	beca(na) /péec/

P	12bc	miña /mĩɲ/	:	ceña /cèɲ/
	16b/15d	viña /wiɲ/	:	ceña /cèɲ/
	16bc	viña /wiɲ/	:	ceña /cèɲ/
A	19ab	pantica /bantəc/	:	bhleca /pléec/

One can see at a glance that these rhymes fall into two main groups. They comprise, in addition to a residue of three rhymes, eight rhymes (20.5%) in which the *i* and *e* members occur before the visarga (/~h/) and 28 rhymes (71.8%) in which the *i* and *e* members occur before a palatal final, in 12 cases /-c/, in 16 cases /-ɲ/. This majority includes the defective rhyme cited above from IMA 38 *brahmagitta* (now *brahmagTti*) : *sarbvejña* (now *sarbejña*), about which there is little that can be said. For the rest it is enough to mention that in modern standard Khmer the palatal stop and nasal have, when final, the effect not only of typically inducing a palatal glide before their main articulation but also of definitely muddling the quality and the quantity of the preceding syllable nucleus. In impressionistic terms the vowels of *miña* (formerly *meña*) and *ceña* are indistinguishable; length contrast between them is lost, while both are centralized and lowered to a degree difficult to define without acoustic analysis. Thus the pronunciation of *steca* (formerly *stā<sup>1</sup>ca*) recommended by the semi-official *Vacanānukrama khmēra* is /sdac/ [sʔdaʋč], as above.<sup>13</sup> There is no reason not to attribute these same phenomena to Middle Khmer, since they offer the simplest justification for the rhymes in question.

The eight rhymes with visarga can be explained in terms of divergent development. The form *rih* (formerly *reh*) occurs three times, and changed from Middle Khmer /reh/ to early modern HR /réh/ [rih], after which its orthography was adjusted. The form *ceh* and its derivative *camneh* account for another three occurrences, and change from Middle Khmer /ceh/ and /cəmneh/ to modern LR /cèh/ [čeh] and /camnèh/ [čəmneh]. Hence the rhyme *rih* : *ceh* (KK 20ab) would have sounded as [reh : čeh] at the time of composition. The form *neh* (formerly *neh* or *nēh*) also occurs three times; this changed from Middle Khmer /neh/ to modern HR /néh/ [nih], without modification of the orthography. The rhyme *rih* : *neh* (IMA 39ba, DKn 91a/90c) would therefore have sounded as [reh : neh] at the time of composition. The form *tamrih* (formerly *tamreh*) also occurs three times, and underwent the same change as *rih*. Hence *tamrih* : *neh* (PP 21ef), *tamrih* : *ceh* (KCLB 35 ba), and *tamrih* : *camneh* (PP 21ec) would all have been in rhyme at the time of composition. The form *jamnih* /jəmnih > cumnih/ has undergone no change in its main syllable, and can still rhyme with *radeh* /rdeh > rtéh/ [r<sup>ɔ</sup>tih] *cart*. The form *tih* apparently changed from Middle Khmer /tih/ to early modern



LR /tèh/, whence modern /tèh/; presumably it could have rhymed with *ceh* (S 164a) only before the development of the modern standard language.

Our three-item residue consists of two rhymes with liquid finals, *sarila* /saril > sarəl/ : *ker(ti)* /kir > kèer/ (KK 16cb)<sup>8</sup> and *khjila* /kʲii > kcil/ : *sarasea* /sərsir > sarsèer/ (K 5ba),<sup>14</sup> and one rhyme which appears to have undergone little but orthographical change: *samliṇa* (now *samteṇa voice*) and *phsiṇa* (now *phseṇa to be different*) at IMA 140ab, which seem to have rhymed as /somleən/ : /pseən/ and hence to be reassignable to e.

The next largest group on Table 6 consists of 29 rhymes in which i is paired with an ā or a type graphic vowel other than ai ~ äya. These represent 16.9% of all imperfect i rhymes, and fall into several classes. One of these comprises seven rhymes (six from the late *Cpā'pa sṛṭ*, the other from the still later *Cpā'pa prusa*) with palatal finals, exemplified by *miṇa* /mip/ : *samṭā'ṇa* /samlap/ (S 141c/142a) and *tica* /tèc/ : *tā'ca* /dac/ (P 32ba). These may be grouped with i : e rhymes with palatal finals, already discussed, and on identical grounds. One is tempted to dismiss the remaining rhymes as simply defective, but closer examination suggests that this may not be the case with the majority. Indeed, some of these rhymes may constitute the best evidence available for the early bifurcation of Middle Khmer /i/ into HR /i/ and LR /ə/ [e' ~ e'']. In particular, four rhymes (including one duplication) consist of loans from Sanskrit or Pāli, the a member of which may have been given its Indic (= learned) value of [ə] instead of its Khmer value of [ɔ:],<sup>15</sup> though the actual pronunciation in Cambodia may well have been [a^] - that is to say, a low central vowel raised toward [ʌ]. These are:

IMA	8dc	<i>sthita</i> /sthit > sthèt/ <sup>8</sup> <i>bodhisatva</i> /boodhiset > póothisat/
T	63de	<i>citta</i> /cit > cèt/ <i>praṇipāṭa(na)</i> /prənipet > pranèbat/
HMII	17ab	<i>'ānita</i> /qaanit > qaanèt/ <i>satva</i> /set > sat/
HMII	62ab	<i>'ānita</i> /qaanit > qaanèt/ <i>satva</i> /set > sat/

More will be said regarding this type of change in a separate study of the low vowels of Middle Khmer. For the moment, let it be noted that two other rhymes containing Indic loans cannot be justified on the same basis as the four just given, inasmuch as their i members never descended to the emergent LR: *bita* /bit > pit/ : *rata(na)* /rət > rat >

roet/ (KC 57ab) and gita /git > kit/ : -ksatra /-kset > -ksat/ (HMI 29d/30b). With these may be grouped gita /git > kit/ : mā<sup>1</sup>ta /mat > moet/ (S 75c/76a), which does not so far as is known contain an Indic loan. Regarding these three it seems best to withhold judgment. On the other hand, in the following eight cases (including two duplications) the rhyme may have pivoted on a raised variety of /a/ in imitation of, or at least set off by, the learned pronunciations just seen:

KC	10ab	citta /cit > cèt/ pā <sup>1</sup> ta /ʔbat > bat/
IMA	123de	'issa /qih > qèh > qah/ (now 'a sa) hnāssa /nah/ (now nā <sup>1</sup> sa)
KCLA	56ab	pañhina /ʔboṅhin > boṅhèn/ khjā <sup>1</sup> na /kʃan > kcoən/
PP	56ab	pañhina /ʔboṅhin > boṅhèn/ khjā <sup>1</sup> na /kʃan > kcoən/
PUB	56ab	pañhina /ʔboṅhin > boṅhèn/ khjā <sup>1</sup> na /kʃan > kcoən/
S	76ba	citta /cit > cèt/ mā <sup>1</sup> ta /mat > moet/
S	169c/170a	citta /cit > cèt/ sñā <sup>1</sup> ta /sqat/
P	56cd	cina /cin > cèn/ dā <sup>1</sup> na /dan > toən/

In two rhymes modern editions of our texts show the orthographic form 'a<sup>1</sup>ta /qat > qat/ *to withstand*, which the original manuscripts must have represented as 'ita /qit > qèt/:

S	67c/68a	citta /cit > cèt/ 'ita /qit > qèt/
P	62ab	jita /ʃit > cit/ 'ita /qit > qèt/

This change is well attested, being already met with in the form 'issa (now 'a<sup>1</sup>sa) just cited from IMA 123d; it is also seen in the free variation in the modern language between 'ita /qèt/ and 'a<sup>1</sup>ta /qat/ *to lack, be missing*.<sup>16</sup> Even this variation, however, cannot justify the 'ita /qit > qèt/ : khnāta /knaat/ found first in the *Kūna cau lpœka* (A) (24ed) and again in the *Pantām pitā* and the *Pantām 'ū buka* (also 24ed). These three occurrences, together with sina /sin > sèn/ : da<sup>1</sup>na /don > tun/ (S 79c/80a), must be regarded as defective.

The next group of imperfect i rhymes comprises 14 cases in which orthographic i is paired with ɨ, representing HR /y/ [w<sup>v</sup>] and LR /ỳ/ [ɣ<sup>v</sup> ~ e] in modern standard Khmer. These appear to pose no problems.

Contrast is easily lost between their modern realizations on both registers, and there is no reason to assume contrast was formerly greater than today. The modern orthography in fact tolerates a number of alternant forms such as *kritya* /krèt/ and *kritya* /krýt/ while the dictionary of Guesdon, published just as the modern orthography was being promulgated, records hundreds of alternants such as *niña* /niŋ/ and *niña* /nýŋ/ with. This small group of rhymes may therefore be exemplified by *gita* /git > kit/ : *ñañita* /ŋgyt > ŋgyt/ (HMI 22ab, P 22ba), *smita* /smit > smèt/ : *samṛiddhi* /sòmryt > samrýt/ (V 49ba), and *sucarita* /sucarit > socarèt/ : *brīddha* /pryt > prýt/ (KK 1ba).

Lastly, Table 6 shows a residue of six imperfect rhymes in which *i* is paired with 'other' orthographic vowels. Three of these include the anomalous form *sṭla* /səl/, previously discussed and reassigned to short *i*: *khjila* /kʲil > kcil/ : *sṭla* /sil > səl/ (R 12 ab), *'ampila* /qəmʔbil > qambəl/ : *sṭla* /sil > səl/ (HMI 77b/76d), and *babila* /ppil/ : *sṭla* /sil > səl/ (HMI 77cd). A fourth, *pica* /ʔbic > bəc/ : *cuca* /cuc > coc/ (S 208a), is probably referable to the muddling attendant upon palatal finals, also previously discussed. The other two may well have been defective: *'isa* /qih > qah/ (now *'a'sa*) : *dosa* /dooh > tóoh/ (IMA 47a) and *citta* /cit > cèt/ : *chuta* /chut > chot/ (S 216a).

Table 7 shows that imperfect *ū* rhymes number 79 and have an average frequency of 1.5%. Of these 35 (44.3%) are rhymes in which orthographic *ū* is paired with *w*, while 33 (41.7%) have *ū* paired with *au*. Of the remainder six (7.6%) have *ū* paired with *o*, while five (6.3%) make up a small residue in which *ū* is paired with other orthographic vowels. It is worthy of note that imperfect *ū* rhymes are not found in the first, second, and fourth of our texts, that they are of minimal frequency in the third, fifth, sixth, eighth, and eleventh texts, and that they reach a peak frequency of 6.8% only in the fairly late *Dūnmāna kūna*. However, apart from this striking maximum, the rise and fall of frequencies for the other texts follows no recognizable pattern, and the most that can be said is that imperfect *ū* rhymes are less common in the early texts than in the later texts.

The 35 *ū* : *w* rhymes are reflected in the modern language by ten HR: HR rhymes, sixteen LR : LR rhymes, and nine HR : LR rhymes. These are exemplified by

KCLA	9ce	byū(ha) /pjuu/ <sup>7</sup>	gwra /kúuər/
DKn	21	kūna /kdon/	sñwna /sŋùuən/
HMII	48d/49b	tpūña /tbòŋ/	lwña /lúuəŋ/

TABLE 7  
IMPERFECT  $\bar{u}$  RHYMES

	total rhymes	w	au	o	other	total
<i>Ker(tī) kāla</i>	105	0	0	0	0	0
<i>Kūna cau</i>	328	0	0	0	0	0
<i>Rājaneti</i>	214	0	0	1	0	1 0.5%
<i>Krama</i>	154	0	0	0	0	0
<i>Hai mahājana (I)</i>	337	0	2	1	0	3 0.9%
<i>IMA 38</i>	493	2	0	0	0	2 0.4%
<i>Kūna cau lpōka (A)</i>	297	3	2	0	1	6 2.0%
<i>Vidhūrapandita</i>	225	0	0	1	1	2 0.8%
<i>Pantām pitā</i>	295	3	2	0	0	5 1.7%
<i>Kūna cau lpōka (B)</i>	127	0	2	0	0	2 1.6%
<i>Trīneti</i>	380	0	2	0	0	2 0.5%
<i>Dūnmāna khlwna</i>	175	0	1	0	1	2 1.1%
<i>Bākya cā'sa</i>	97	0	1	0	1	2 2.1%
<i>Hai mahājana (II)</i>	324	3	2	1	0	6 1.9%
<i>Pantām 'ū buka</i>	291	3	2	0	1	6 2.1%
<i>Dūnmāna kūna</i>	251	10	6	1	0	17 6.8%
<i>Srī</i>	579	8	4	1	0	13 2.2%
<i>Prusa</i>	298	3	1	0	0	4 1.3%
<i>'Ariyasatthā</i>	194	0	6	0	0	6 3.1%
	5,164	35	33	6	5	79 1.5%

In weighing the significance of these rhymes it is worth noting in the first place that the seventy lexical items they include show a decidedly limited range of finals: on the one hand, 38 items with /-n/ and four with /-ŋ/, on the other hand, 23 items with /-r/ and five with zero final. It is well known that in modern Khmer a final dental nasal or liquid may induce before itself a neutral phonetic glide: *jūna* /cuun/ [č̥u:ᵀn], *kūna* /kòon/ [ko:ᵀn]. It may be mentioned in the second place that the distribution of these seventy items according to their modern register is uneven. HR ū /uu/ and w /úuə/ account for 29 items (41.4%): two in *IMA* 38, six in the *Kūna cau lpəka* (A), four in the *Hai mahājana* (II), four in the *Ḍūnmāna kūna*, and one in the *Saṭ*. LR ū /òo/ and w /ùuə/ thus account for 41 items (58.6%), but are clustered in the later texts: two in *IMA* 38 and two in the *Hai mahājana* (II) but sixteen in the *Ḍūnmāna kūna*, fifteen in the *Saṭ*, and six in the *Prusa*. Although it can be assumed that this concentration of LR forms (23 ū, 17 w items) is fortuitous, it would appear to constitute particularly cogent proof that, as late as the time of the *Cpā'pa prusa*, Middle Khmer /uu/ (ū) had not yet bifurcated into modern HR /uu/ and LR /òo(w)/ or, perhaps it should be said, had not yet developed fixed registral contrast. Rhymes on the order of *dhūra* /dhuur > thuur/ : *gwra* /guuər > kúuər/ (KCLA 9 fe) are not difficult to justify once we accept the possibility of [dhu:ᵀr]. On the other hand, while a rhyme foreshadowing LR ū /òo/ from an early text such as *trṭsūra* (Sanskrit *triśūla*) *triisuur* > *trèəjsòor* : *gumnwra* /gumnuuər > kumnúuər/ (*IMA* 26d/27b) may not surprise us, a similar rhyme from a late text such as *p'ūna* /pqun > pqòon/ : *khlwna* /kluuən > klùuən/ (*ḌKn* 56c/57a, P 45ab) is difficult to accept as normal, albeit imperfect, unless we see LR /òo/ as not yet fully established.

However, this reminds us of our next largest group of imperfect ū rhymes, namely the 33 in which ū is paired with au. These have already been listed in full and discussed in sufficient detail in an earlier paper,<sup>17</sup> where it was shown that most of the au items in question presuppose modern HR /əw/ while most of the ū items presuppose modern LR -ūva /òow/ [ɣ:w]. It was also shown that this type of rhyme increases in frequency, from earlier to later texts, with the diphthongization and lowering of -ūva from [w:w] to [ɣ:w] as the emergent LR became fixed. This observation would seem to modify somewhat, or at least place in better perspective, what has just been said regarding ū : w rhymes.

The next largest group of imperfect ū rhymes comprises six ū : o rhymes, as follows:

R 16de grū /kruu/ : bola /póol/<sup>18</sup>

HMI 74ab	dūka /tuuk/	:	goka /kóok/
V 5bc	drūña /truu /	:	camkoña /camkaaŋ/
HMII 16cb	sañtūka /sandòok/	:	thoka /thaaok/
DKn 33	kūna /kòon/	:	lamdona /lumtòon/
S 185c/186a	cambūka /campuuk/	:	soka /saaok/

The first thing we observe in these rhymes is that two of the  $\bar{u}$  members (*sañtūka* and *kūna*) are on the LR and three of the  $\bar{o}$  members (*camkoña*, *thoka*, and *soka*) are on the LR. This observation does not appear to be helpful, however. These rhymes are to be compared with the  $\bar{T} : e$  rhymes already discussed. In particular we are reminded that, like the modern registral reflexes of Middle Khmer /ee/, those of /oo/ may differ considerably in tongue-height, HR /óo/ being often articulated as [o:], LR /òo/ being often [ɔ:]. Moreover, in the orthographical forms *sammlīña* : *phsiña* (now *samteña* : *phseña*), already cited from IMA 38, we have a good indication that Middle Khmer /ee/ was heard as a lower-high [ɪ:] at the opening of the 18th century notwithstanding the fact that both of the forms in question were to develop LR nuclei in the modern language. This qualifies what was argued earlier on the basis of the repeated rhyme *rañña* : *dheña*. The vowel of *dheña* may well have been [ɪ:] but not, after all, because it was evolving into the HR reflex of /ee/. It may have originally been on this level. In the case of  $\bar{T} : e$  rhymes general conclusions, even of a provisional kind, were ruled out by what was found regarding the form *ker(ti)*, which significantly reduced the number of rhymes remaining. In the case of the present  $\bar{u} : \bar{o}$  rhymes we may have sufficient reason to postulate that Middle Khmer /oo/ was characteristically articulated on the lower-high level as [o:]. Particularly if the thesis is accepted that registral contrast for Middle Khmer /uu/ was not fully established by the time of the *Cpā'pa phusa*, we are unable to force a justification of three of the six rhymes listed above by juggling the registral and preregistril forms of the orthographic vowels. Specifically, *drūña* /druuŋ > truun/ : *camkoña* /camkoon > camkaaŋ/, *sañtūka* /sɔn?duuk > sandòok/ : *thoka* /thook > thaaok/, and *cambūka* /cambuuk > campuuk/ : *soka* /sook > saaok/ are plausible only if we interpret the pre-modern /oo/ as [o:]; and if we admit this, we provide the rationale for all six rhymes including *grū* /gruu > kruu/ : *bola* /bool > póol/, *dūka* /duuk > tuuk/ : *goka* /gook > kóok/, and *kūna* /kuun (> kòon)/ : *lamdona* /lomdoon > lumtòon/. All six rhymes, in other words, paired [u:] with [o:].

Our five-item residue comprises three  $\bar{u} : a$  (a') rhymes and two  $\bar{u} : u$  rhymes, as follows:

KCLA	23fe	tūña /tòŋ/	:	daña /tòŋ/
DKh	25d/26b	kūna /kòon/	:	la'na /lun/
PUB	47ef	mūla /muul/	:	ya'la /jul/
V	39ba	pradūsta /pratuuh/	:	khusa /khoh/
B	1lab	yūra /juur/	:	dur- /tur-/

Although it was mentioned above that LR /òo/ is often [ɔ:] in modern standard Khmer, we cannot assume that the first of these rhymes sounded originally as [tɔ:ŋ] : [dɔ:ŋ]. To do so would be to contradict our assumption that registrational contrast for Middle Khmer /uu/ was not fully established as late as the time of the *Cpā'pa prusa*, an assumption which has proved useful thus far. Modern *daña*, *ya'la*,<sup>19</sup> and probably also *la'na* belong to an important group of lexical items which have *o* in Old Khmer but undergo lowering (e.g. *phon* /phooŋ/ > *phaña*/phooŋ/ *in company with, together*), and should hence be reassigned to the ū : o rhymes previously discussed. The original rhymes were almost certainly *tūña* /tuuŋ/ : *doña* /doon/ [dɔ:ŋ], *kūna* /kuun/ : *lona* /loon/ [lɔ:n], and *mūla* /muul/ : *yola* /jool/ [jɔ:l]. In the case of *pradūsta* : *khusa* the two syllable nuclei have the same phonetic length but likewise show different degrees of openness. Despite its phonemic form, *pradūsta* /pratuuh/ *to fault* reverts to a short vowel (Sanskrit *praduṣṭa*) under the influence of its final /-h/, while *khusa* /khuk > khoh/ had not yet manifested the LR. The rhyme was therefore [prəduh] : [khoh]. In the last rhyme *yūra* /juur/ *to be long in time* is paired with the first syllable of *durjana*<sup>20</sup> /turjun/ *wicked person*. The vowel of this syllable, with the gradual loss of final /-r/, had probably undergone compensatory lengthening by the time of the *Bākya cā'sa*, though it is difficult to say whether the /-r/ had entirely disappeared. With this reservation, the rhyme sounded as [ju:(r)] : [du:(r) > tu:].

We turn now to imperfect u rhymes, the types and distribution of which are laid out in Table 8.

The first and largest group of imperfect u rhymes comprises 98 items (82.3% of all such rhymes) in which u is paired with shortened a. This is the one type of rhyme which cannot be satisfactorily analyzed from the date provided by the modern orthography. There was considerable vacillation between u and a in Middle Khmer times while original /ɔ/ [ɔ̃] after voiced initials was being raised to modern [ə] in the formation of the HR.<sup>21</sup> As a result, continuity with the Old Khmer orthographic form of the items in question here was lost. As often as not the modern regularized orthography has fixed upon one symbol or the other in a wholly arbitrary manner. Pending closer examination of the manuscripts, therefore, we shall describe the data on hand without drawing any firm conclusions.

TABLE 8  
IMPERFECT u RHYMES

	total rhymes	ā	o	other	total
<i>Ker(tī) kāla</i>	105	3	0	0	3 2.9%
<i>Kūna cau</i>	328	2	0	0	2 0.6%
<i>Rājaneti</i>	214	0	0	0	0
<i>Krama</i>	154	0	0	0	0
<i>Hai mahājana</i> (I)	337	11	2	0	13 3.9%
<i>IMA 38</i>	493	10	0	0	10 2.0%
<i>Kūna cau lpøka</i> (A)	297	4	0	0	4 1.3%
<i>Vidhūrapandita</i>	225	1	1	1	3 1.3%
<i>Paṇtām pitā</i>	295	3	0	0	3 1.0%
<i>Kūna cau lpøka</i> (B)	127	3	0	0	3 2.4%
<i>Trīneti</i>	380	9	0	0	9 2.4%
<i>Dūnmāna khlwna</i>	175	6	3	0	9 5.1%
<i>Bākya cā'sa</i>	97	4	0	1	5 5.2%
<i>Hai mahājana</i> (II)	324	11	1	1	13 4.0%
<i>Paṇtām 'ū buka</i>	291	3	0	0	3 1.0%
<i>Dūnmāna kūna</i>	251	4	1	1	6 2.4%
<i>Srī</i>	579	8	2	2	12 2.1%
<i>Prusa</i>	298	11	4	1	16 5.4%
<i>'Ariyasatthā</i>	194	5	0	0	5 2.6%
	5,164	98	14	7	119 2.4%



What is not shown on Table 8 is the frequency of u : a rhymes for each text. This averages 2.0% precisely. Individual averages below this point are far from what we should expect were the orthography unadjusted. They run, quite erratically, from the eighth text (the *Vidhūrapandita*, 0.4%) to the second (0.6%) and on to the fifteenth and ninth (both 1.0%), the seventh (1.3%), seventeenth (1.4%), and the sixteenth (1.6%). Above this same point averages start from the thirteenth text (the *Bākya cā'sa*, 4.1%) and drop to the eighteenth (3.7%), the fourteenth and twelfth (both 3.4%), the fifth (3.3%), the first (2.9%), the nineteenth (2.6%), and the eleventh and tenth (both 2.4%); the IMA stands right at 2.0%. The random nature of these frequencies clearly rules out any correlation with the date of the texts.

As before, it is convenient to classify u : a rhymes according to the register of their modern reflexes. In this way we obtain four groups, as follows:

HR : HR rhymes number 30, and are exemplified by the following:

HMI	68ba	rum /rum/ <sup>8</sup> dham /dhom > thum/
IMA	143ab	guna /gun > kun/ lana /lon > lun/
KCLA	49g/50c	muna /mun/ bandha /bon > pun/
V	68ba	jum /jum > cum/ dham /dhom > thum/
T	12ba	manussa /mnuh/ yasa /joh > juh/
DKh	27b/26d	buka /buk > puk/ naraka /nərok > naruk/
HMII	5ab	guna /gun > kun/ dama <sup>1</sup> na /domnon > tumnon/
P	11bc	lupa /lup/ gra <sup>1</sup> pa /grəp > krup/
A	24de	buta /but > put/ rama <sup>1</sup> ta /rmot > rmut/

While one naturally supposes that these rhymes were devised after the /ɔ > u/ shift and were meant to sound as [ɔ] : [u], it is not altogether certain that this was the case. For in the next group of rhymes we meet evidence that [ɔ] and [ɔ] could rhyme.

HR : LR rhymes number 8, as follows:

HMI	92ba	buka /buk > puk/ 'ākra <sup>1</sup> ka /qaakrək > qaakrak/
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IMA	87a/96c	ñuṇa /ṇuṇ/ paṇa /ʔbɔṇ > baṇ/
IMA	87ab	nuṇa /ṇuṇ/ camṇaṇa /cɔmɔṇ > camṇaṇ/
IMA	94a/93c	ghluṇa /gluṇ > klūṇ/ thlaṇa /tloṇ > tloṇ/
IMA	94ab	ghluṇa /gluṇ > klūṇ/ 'aṅga /qɔṇ > qaṇ/
IMA	97c/98a	mukha /muk/ 'ākṛaka /qaakrɔk > qaakrak/
B	2cd	ghmum /gmum > kmum/ samṇam /sɔmṇɔm > sɔmṇam/
P	2lbc	buṇa /buṇ > puṇ/ 'aṅga /qɔṇ > qaṇ/

This small group of forms is puzzling, but may contain invaluable indices. Four out of the eight rhymes in question come from IMA 38, and are therefore given here in the original orthography. The rhyme /muk/ (Sanskrit mukha *face, front*): /qaakrɔk/, providing it is not defective, suggests that [ɔ] and [ɔ̃] were in rhyme at the time of composition – possibly because the /ɔ > u/ shift was well under way by 1702 A.D. If this possibility is disallowed, we have two alternatives. On the one hand, we can assume that our eight u members were originally a forms representing Middle Khmer short /ɔ/, raised to [ɔ̃] and respelled accordingly before the date of composition. On the other hand, we can suppose that the relevant vowel of the a members for some reason passed through an intermediate [ɔ̃] before being lowered to /a/ [ɐ] for the emergent LR. Of these two possibilities the first is simple and in keeping with what is already known of Middle Khmer while the second is quite unlikely. Both, however, would disqualify /muk/ : /qaakrɔk/, which should not be done without firmer evidence.

LR : HR rhymes number 37, and are exemplified by the following:

KK	35ab	tula /ʔduɭ > doɭ/ ya'la /jɔɭ > juɭ/
KC	14fe	knuṇa /knuṇ > knoṇ/ mama'ṇa /mmɔṇ > mmuṇ/
HMI	76dc	parisuddha /ʔbɔrisut > barèsot/ samba'ta /sɔmbɔt > sampuɭ/
IMA	143ed	suṇa /suṇ > soṇ/ 'aṅga /qɔṇ > qaṇ/
KCLA	40fe	phlum /plum > plom/ pragam /prɔgɔm > prakum/

KCLB	8d/9b	kantura /kənʔdul > kandel/ ya <sup>1</sup> la /jɔl > jul/
T	69ab	khusa /khuh > khoh/ ra <sup>1</sup> sa /rɔh > ruh/
DKh	16ab	cuka /cuk > cok/ la <sup>1</sup> la <sup>1</sup> ka /llɔk > lluk/
HMI	55ab	punya /ʔbun > bon/ ja <sup>1</sup> na /jɔn > cun/
DKn	64c/65a	sukha /suk > sok/ lāmaka /laamɔk > lfiəmuk/
S	192a/191c	chuta /chut > chot/ ma <sup>1</sup> ta /mɔt > mut/
P	51cb	prusa /pruh > proh/ yasa /jɔh > juh/
A	35de	suña /suŋ > soŋ/ la <sup>1</sup> na /lɔŋ > luŋ/

These rhymes are simply an amplification of the HR : HR rhymes already given, inasmuch as they occur in texts composed before Middle Khmer /u/ split into modern HR /u/ and LR /o/. The qualification previously expressed applies here as well.

LR : LR rhymes number 22, and are illustrated by the following:<sup>22</sup>

KK	6ba	kum /kum > kom/ pārambha /ʔbaarɔm > baaram/
HMI	1ba	prusa /pruh > proh/ sappurasa /sɔpʔburch > sapborah/
IMA	98ba	sukkha /suk > sok/ 'ākṛaka /qaakrɔk > qaakrak/
T	62ed	pamruña /ʔbɔmrɔŋ > bamrɔŋ/ phca <sup>1</sup> na /pɔŋ > pɔŋ/
DKh	51ba	prusa /pruh > proh/ rapa <sup>1</sup> sa /rʔbɔh > rbah/
DKn	43ab	suña /suŋ > soŋ/ 'aṅga /qɔŋ > qɔŋ/
S	192ab	chuta /chut > chot/ 'a <sup>1</sup> ta /qɔt > qat/
A	5de	cuña /cuŋ > coŋ/ ca <sup>1</sup> na /cɔŋ > cɔŋ/

These are to be added to the eight HR : LR rhymes given above. The presence of /suk/ (Sanskrit sukha) and /pruh/ (Sanskrit puruṣa) tends to legitimate the /muk/ : /qaakrɔk/ cited previously as a clue that [o] and [ɔ] rhymed at this period. Indeed, it seems more certain than

before that the a members of these 30 rhymes did not have [ə] in the relevant syllable.

The next largest group of imperfect u rhymes given on Table 8 comprises 14 rhymes in which u is paired with o. It is worth noting that the u members of these rhymes are divided, in modern terms, between six HR and eight LR items while the o members are divided between seven HR and seven LR items. HR : HR rhymes are four in number, LR : LR rhymes, five, and rhymes of mixed register five. The rhymes are:

HMI	84ab	manussa /mnuh/ <sup>8</sup> smoh /smoh > smaoh/
HMI	95cd	khusa /khuh > khoh/ smoh /smoh > smaoh/
V	52ab	luh /luh/ noh /noh > nõh/
DKh	30ba	cuh /cuh > coh/ noh /noh > nõh/
DKh	32d/33b	dhiuh /dluh > tluh/ noh /noh > noh/
DKh	33cb	khduh /kduh > ktuh/ noh /noh > nõh/
HMII	51ba	dhiuh /dluh > tluh/ coh /coh > caoh/
DKn	49ba	cuh /cuh > coh/ smoh /smoh > smaoh/
S	199c/200a	susa /suh > soh/ kra'oh /kroqoh > kraqaoh/
S	200ba	susa /suh > soh/ kra'oh /kroqoh > kraqaoh/
P	22b/21d	juh /j̃uh > cuh/ noh /noh > nõh/
P	26d/27b	'usa /quh > qoh/ joh /j̃oh > cõh
P	27cb	khusa /khuh > khoh/ joh /j̃oh > cõh/
P	57b/56d	cuh /cuh > coh/ khnoh /knoh > knaoh/

It cannot escape notice that all 28 members of these rhymes have final /-h/. In the case of the u members this latter is represented by visarga in eight items, by final -sa in six items; in the case of all 14 o members it is represented by visarga, the shortening effect of which permits rhyme with u. It seems clear in this light that we have

here an extension of the ū : o rhymes previously discussed with the difference that, while the o items were meant to be articulated on the higher-mid level or higher, [o ~ ɔ], as before, the u items were articulated on the lower higher level: manussa /mnuh/ [m<sup>ə</sup>nəh], luḥ /luh/ [ləh], khusa /khuh/ [khəh], cuḥ /cuh/ [čəh]. It may be worth observing that nine of the above rhymes are probably still valid: four of the rhymes with modern /nóh/ and the five rhymes in which /-oh/ [-o<sup>h</sup>] is paired with /-aoh/ [-əh]. The five rhymes which are no longer valid are, on the one hand, /mnuh/ [m<sup>ə</sup>nəh] : /smaoh/ [sməh] and /tluh/ [t<sup>h</sup>ləh] : /caoh/ [čəh] and, on the other, /coh/ [čəh] : /nóh/ [nəh], /qoh/ [ʔə<sup>h</sup>] : /cóh/ [čəh], and /khoh/ [kho<sup>h</sup>] : /cóh/ [čəh].

The last group of imperfect u rhymes shown in Table 8 comprises seven rhymes in which u is paired with other graphic vowels. These are:

V	39ab	khusa /khuh > khoh/ <sup>8</sup> pradūsta /prəduuh > pratuuh/
B	11ba	dur- /dur- > tur-/ yūra /juur/
HMII	80ab	lupa /lup/ īā <sup>1</sup> pa /rap/
DKn	39	'aṅguya /qəŋguj > qəŋkuj/ kantəya /kəntəej > kantaəej/
S	208a	cuca /cuc > coc/ pica /ʔbic > bəc/
S	216a	chuta /chut > chot/ citta /cit > cèt/
P	34ab	trum /trum > trom/ tām /ʔdam > dam/

The first two of these have already been discussed under imperfect ū rhymes, while cuca : pica is adequately explained by the palatal finals treated under imperfect i rhymes. The remaining four rhymes must be regarded as defective, and are probably the work of a careless copyist.

The main conclusions to which the present study leads may be re-stated as follows:

1. Imperfect T : āya rhymes demonstrate prosodic congruence between LR /əej/ (T) and preregistrā /ej/ (āya) and at the same time show that the registrā differentiation of Middle Khmer /ii/ (T) antedated that of Middle Khmer /ej/ (āya ~ ai).

2. Registrā differentiation of Middle Khmer /əə/ (e > ə) was established after that for Middle Khmer /ii/ (T), and was not fixed as late as 1702 A.D.

3. It is probable that registral contrast between modern HR /*é*e/ and LR /*è*e/ (e) had appeared by the date of the *Cpā'pa prusa*.

4. It is probable that Middle Khmer /aa/ (*ā*) had bifurcated into HR /*é*ee , *i*ie/ and LR /aa/ by the time of the *Cpā'pa sṛṭ*, if not much earlier.

5. As recently as the time of the *Cpā'pa prusa* the registral reflexes of Middle Khmer /uu/ (*ū*) were not fixed.

6. The preregistral articulatory level of /ee/ and /oo/ (e, o) may have been characteristically lower-high [ɪ:] and [o:], or may have ranged between lower-high and higher-mid, [ɪ: ~ e:] and [o: ~ u:].

N O T E S

1. Philip N. Jenner, 'The Relative Dating of Some Khmer *Cpā'pa*,' to appear in *Austroasiatic Studies*, edited by Philip N. Jenner, Laurence C. Thompson, and Stanley Starosta. Oceanic Linguistics Special Publications, No. 13 (Honolulu: The University Press of Hawaii, 1976). The texts in question comprise 17 undated works of the *cpā'pa* /*cbap*/ genre plus No. 38 of the *Inscriptions modernes d'Angkor* (IMA 38), known as the *Grande inscription d'Angkor Vat* (K. 301) and dated śaka 1623 (= A.D. 1702 or 1701). The *cpā'pa* are homiletic works of surpassing interest from the linguistic as well as the cultural and literary points of view; IMA 38 is a devotional text no less interesting, included to provide one reference point in the chronological sequence. The titles of the *cpā'pa* are given on the accompanying tables. For the benefit of readers who have not seen my earlier papers it must be explained that there are two distinct texts known as the *Cpā'pa hai mahājana* and that the *Cpā'pa kuna cau lpæka* is a composite work, its first part consisting of a version of the *Pantām pitā* (itself a prototype of the *Pantām 'ū buka*), its second part consisting of a version of the *Bākya cā'sā*.

2. Philip N. Jenner, 'The Final Liquids of Middle Khmer,' to appear in a forthcoming issue of *Zeitschrift für Phonetik*.

3. Philip N. Jenner, 'The Value of *au* and *ai* in Middle Khmer,' to appear in *South-East Asian Linguistic Studies*, edited by Nguyen Dang Liem. Pacific Linguistics, Series C - No. 31 (Canberra: The Australian National University, 1974).

4. Philip N. Jenner, 'The Development of the Registers in Standard Khmer,' in *South-East Asian Linguistic Studies*, 47-60.

5. Glosses are not furnished for the forms cited, inasmuch as we are concerned with a phonological problem. The examples are given first in an Indianist transliteration and again, between slants, in phonemic transcription. In the notation of modern standard Khmer the acute (') marks HR, the grave (`) marks LR, for 14 otherwise ambivalent nuclei.

6. See 'The Development of the Registers...'

7. All forms save those cited from IMA 38 are given in the modern regularized orthography. Unless otherwise indicated, all phonemic transcriptions represent the modern realization, for the reason already given.

8. The transliterations continue to show the modern orthography, but the first phonemic form represents Middle Khmer while the second represents modern Khmer. The symbols /ʔb, ʔd/ are used for the unitary imploded voiced labial and dental stops of Middle Khmer, which contrast with exploded /b, d/. This contrast is lost in modern Khmer, and /b, d/ are to be construed as implosive.

9. The parentheses in *ker(ti)*, now /kèer/, correspond to the *daṇḍa-ghāta*, a diacritic 'canceling' final written syllables. The Sanskrit form alone warrants our assuming that the earliest Khmer pronunciation of this item was [ki:r]. Perhaps under the influence of the orthographic -rt- sequence, this must have begun to be altered to [kɪr] by the date of the *Cpā'pa ker(ti) kāla*. For this text we can postulate /kiir/, rhyming as here with /piir/, and also /kir/ or even /kil/, rhyming with /saril/ (KK 16cb). Both pronunciations were possible during the early Middle Khmer period but with the progressive loss of final /-r/, with intolerance of short nuclei in open syllables, and with the development of the registers the original nucleus had to be lowered. In open syllables Middle Khmer /ii/ appears to have first dropped to higher-mid front [e:] and then to have undergone the typical centralization seen in such syllables as pT /ʔbii > bèej/; in syllables closed by final /-r/, however, this change was arrested before centralization set in. That the same change could occur when the original vowel was short is shown by modern *sira* /sèer/ *head*, < Pāli *sira*, and its alternants *sira(sa)* /sèer/ (< Sanskrit *śiras*) and *sirsa* ~ *sir(sa)* /sèer/ (< older Sanskrit *śTrsa*), for which see VK II: 1352b, 1353a, 1353b. Note finally that the VK (I: 39b) sanctions *kir(ti)* /kèer/ as a variant of *ker(ti)* and attributes both to a nonexistent Sanskrit \*kirti.



10. See Saveros Pou and Philip N. Jenner, 'Some Chinese Loanwords in Khmer,' in *JOS*, XI (1973).1: 45, item 148.

11. At least it can be noted that *ramila* /rmil/ *to glance at* is an /r-/ derivative of an allomorph of *mēla* /mēl/ *to look at* and may have had a long as well as a short vowel. The syllable bi- in the next rhyme is the initial of *bicāraṇā* (Sanskrit and Pāli *vicāraṇa*) *investigation* and like other loans with the same prefix is commonly articulated [pi?] or even [pi:] rather than [pɪ?].

12. See 'The Value of au and ai in Middle Khmer.'

13. VK, II: 1437b.

14. For the disparate liquid finals see 'The Final Liquids of Middle Khmer.'

15. W.A. Allen, *Phonetics in Ancient India* (London: Oxford University Press, 1961), 57-61, notably 58 and note 4.

16. VK, II: 1591b, 1772a; Joseph Guesdon, *Dictionnaire cambodgien-français* (Paris: Plon, 1930), I: 10a, 51a.

17. See 'The Value of au and ai in Middle Khmer,' especially Table 4, which includes two rhymes in -ova and -o from IMA 38 which are not taken into account here.

18. Rhymes of this type have been discussed in 'The Final Liquids of Middle Khmer.'

19. The form *yola* /jool/ occurs in IMA 12, dated in correspondence with 1628 A.D.; see Saveros Lewitz, 'Inscriptions modernes d'Angkor 10, 11, 12, 13, 14, 15, 16a, 16b, et 16c,' in BEFE0, LIX (1972): 221-49, in particular 226. Most of the forty-odd Middle Khmer inscriptions which use the word at all have the orthographic form *yala*, with the length of the syllable nucleus unmodified by a diacritic. However, in IMA 38, the only metrical text in this corpus, the same form is consistently in rhyme with short syllables, e.g. 'akusala /qakosal/ (97a/96c), tala /dal/ (97ab), saṃṇala /samnal/ (110c/109g), mandala /mundul/ (129ec), kravala /krawal/ (129ef). It is not without interest that modern editions of the earlier *Kūna cau lṛəka* and *Paṇṭām pītā* have *cūla* /còol/ *to approach, enter* where the *Paṇṭām* 'ū *buka* has *ya'la* /jul/

to see. In view of what has been said, we are led to assume that *ya'la* is the original, and is roughly contemporary with IMA 12.

20. This form with short *u* is given in two of my editions of the *Bākya cā'sa* while that of the Institut Bouddhique gives *dūrjana*. The VK admits only the former.

21. See 'The Development of the Registers...'

22. Table 8 specifies 98 items whereas only 97 have been accounted for here. One defective rhyme has been omitted.

23. In my transcription, the nongeminate /o/ of /smoh/ [smoh] represents a short allophone of Middle Khmer /oo/ before visarga as opposed to final -sa, while the /ao/ of modern /smaoh/ [smoh] represents a short allophone of /aao/ in the same environment.