

NOTES ON THE NUMERALS AND NUMERAL COEFFICIENTS IN OLD, MIDDLE AND MODERN KHMER

Four states of the Khmer language are discussed below, those respectively of the inscriptions of the 7th to 12th centuries (Old Khmer); the 17th century inscriptions (Middle Khmer); the poetry of the *Ream Ker*¹⁾ and present-day spoken Khmer (Modern Khmer). Ideally they would have been treated in this order. The material for the earlier stages is, however, not abundant; the Khmer inscriptions consist chiefly of short accounts of donations to religious foundations, information about boundaries and lists of personnel. It seemed preferable therefore to give as a starting point the fuller statement which is possible on modern Khmer. The other sections then follow in the above order.

As far as has been possible the same plan has been followed for all parts. Thus *x* represents a numeral, *c* a numeral coefficient and *X* the 'numeral construct' or close sequence of both members, *x* and *c*. For Old Khmer a straightforward transliteration is used, with the symbol ' representing the vowel-base. The transcription used for both Middle and Modern Khmer is that evolved by Professor Henderson²⁾ with the addition of unpronounced symbols given in parentheses. Word for word translations in parentheses follow the free translations of examples unless both translations are the same.

1. MODERN KHMER

1.1. Numerals

1.1.1. *Catalysis*.³ Numerals may be catalysed by their occurrence immediately after the word *tì:*, 'place'⁴⁾ *tì:* mùəy, *tì:* pì:(r), etc. are in fact the ordinal numbers, 1st, 2nd, etc. Numerals are catalysed as words by their needing in any context only one stress, e.g. *pram-'by*, '(five-three)

¹⁾ Cambodian version of the Ramayana. This was included for interest since it is thought to be based on very early versions. As far as the numeration is concerned, however, it resembles Modern Khmer more closely than Middle. The published version, *Ream Ker*, Fascicules I-X and LXXV-LXXX, Phnom Penh, Éditions de la Bibliothèque Royale, 1937, was consulted.

²⁾ 'The Main Features of Cambodian Pronunciation', *BSOAS*, xiv, 1, 1952. For typographical reasons, however, the grave accent that indicates the second register has been transferred in the short diphthong *wə* from the *w* to the *ə*, viz. *wə* and has had to be omitted from the vowel *v* and from the vowel *u* in a number of words scattered through the paper. Since this later vowel is restricted to second register syllables, little confusion should arise.

³⁾ The terms 'catalysis and 'catalyse' are used in the sense of 'proof' and 'prove' with reference to the assigning of words to word categories.

⁴⁾ Two other words, *ponma:n*, 'how many' and *cra:n* 'many' are thus also catalysed as numerals.

eight', hoksɿp-'pì:(r) 'sixty-two' are thus compound words, x.

The multiplied terms, 100, 1,000, etc. are also thus catalysed as one word, e.g. pram-mùəy-'rò:y, 'six hundred', pram-buən-'pðən, 'nine thousand'. When further numerals follows a multiplied term the whole number is a series of words, e.g. pram-'rò:y cɿtsɿp buən, 'five hundred and seventy-four'. Such a sequence may be uttered with rise in pitch on the last syllable of the first word and pause before the second; this could not happen in the middle of a Khmer word.

1.1.2. *Lexicon*. All numbers are composed from the following terms: 1–5 mùəy, pì:(r), bɿy, buən, pram (plus irregular prampwul); 10 dɔp and-'teen', dɔndɔp; 20 mphuɿy.

The Thai loan-words, 30–100, sa:msɿp, saesɿp, ha:sɿp, hoksɿp, cɿtsɿp, paetsɿp, kausɿp, rò:y and 1 000, pðən, 10 000, mɿ:n, 100 000, saen, million, lì:ən.

Sanskrit loan-words, ten million kaot(i) and so:n(y) zero.

1.1.3 *Internal grammatical characteristics*. In the composition of the numbers, 1–99, sequences of the terms are to be added together beginning with 6 (6, pram-mùəy, 8, pram-bɿy, 18, dɔp-pram-bɿy, 24, mphuɿy-pram, 56, ha:sɿp-pram-mùəy. prampwul is the spoken form of the written pram-pì:(r), which is sometimes read as pram-pì:. pram-dɔndɔp, pram-bɿy-dɔndɔp, 15, 18, etc., are alternative forms of dɔp-pram, dɔp-pram-bɿy.

From 100 onwards, the Thai and Sanskrit loan-words are multiplied by a preceding number to form the hundreds and thousands, e.g. 1 500, mùəy-pðən, pram-rò:y. Subsequent numbers are added, e.g. 20 601, pì:(r)-mɿ:n pram-mùəy-rò:y mùəy. A multiplying mùəy has in the spoken language the alternative form mə, e.g. mərò:y, məpðən.

1.1.4. *Written figures and their arrangement*. The Khmer script includes 10 symbols, 1–9 plus zero; these are arranged in the same way as in the West to represent, from right to left, units, tens, hundreds, thousands, etc.

1.2. Numeral coefficients

1.2.1. *Catalysis*. Numeral coefficients are catalysed by their occurrence immediately after the numeral in close juncture, e.g.

mənùs (s) buən nēək	four men	(men ⁵) four persons)
bɿy thɿay	three days	
'ɔŋkɔ:(r) pram cì:əl	five baskets of husked rice	(husked-rice five baskets)

nēək, thɿay, cì:əl are catalysed as *c*.

1.2.2. *Lexicon*. A representative selection of modern numeral coefficients are presented in the paragraphs, a)–g), below according to their

⁵) Plural forms are given in the literal translations where suitable, since they facilitate quick reading and are no less implicit than the singular in the Khmer.

lexical characteristics.

a) Reference to persons, e.g.

ko:n bvy nēak	three children	(children three persons)
sdac bvy prēah- 'ōŋ(k)	three kings	(three kings eminent-bodies)
lō:k-sōŋ(kh) bvy 'ōŋ(k)	three monks	(monks three bodies)

In colloquial speech these numeral coefficients are not always present; ko:n bvy and sdac bvy may equally well be heard.

b) Reference to shapes, e.g.

ba:rvy pi:(r) daəm	two cigarettes	(cigarettes two trunks)
smau mūəy səsay	one blade of grass	(grass one sinew)
thnam pi:(r) krēəp	two pills	(medicine two seeds)
sko:(r) dāp phaen	ten lumps of sugar	(sugar ten discs)
krāda:s pi:(r) sōnlyk	two sheets of paper	(paper two leaves)
'vt(th) mūəy dom	one brick	(brick one piece)

Where the noun represents an uncountable substance, like grass, the coefficient is essential but otherwise, as with cigarettes, it may be absent.

c) Reference to quantities, e.g.

tu:k-tae mūəy pē:ŋ	one cup of tea	(water-tea one cup)
sko:(r) bvy ni:əl	three pounds of sugar	(sugar three pounds)
dvy dāp pyi:əm	ten fathoms of land	(land ten fathoms)
səmpwət pi:(r) tbo:ŋ	ten yards of material	(material two five-yard-lengths)

The coefficient is essential here.

d) Reference to manner of presentation of a commodity or manner of growing, e.g.

satra mūəy khsae	a fascicle of manuscript pages	(manuscript one string)
do:ŋ pi:(r) cəŋkaom	two clusters of coconuts	(coconuts two clusters)
phlē:ŋ mūəy sōmrap	a set of musical instruments	(music one set)
'ōmbōh pi:(r) hōŋ	two reels of cotton	(cotton two reels)
sac bvy trānaot	three skewers of meat	(meat three skewers)
trvy mūəy kōntūy	one fish	(fish one tail)
mlū: mūəy trābo:k	one wrapper of betel	(betel one wrapper)
khao-'a:v pi:(r) sōmrap	two suits	(trousers-shirt two sets)

The coefficient is essential.

e) Reference to people or animals in pairs and groups, e.g.

siəm mūəy pūək	a group of Thais	(Thai one group)
dōmrvy mūəy hvo:ŋ	a herd of elephant	(elephant one herd)

Although these nouns plus numeral could occur without a coefficient, these coefficients are essential to the kind of counting required.

f) Reference to objects considered as items, kinds, examples, e.g.

la:n pi:(r) ya:ŋ	two kinds of car	(cars two kinds)
dōmlo:ŋ bvy baep	three kinds of potato	(potato three kinds)
haet pram praka:(r)	five reasons	(reasons five items)

Again the nouns could occur with numeral and no coefficient, but the kind of numeration required makes the coefficient essential.

g) Reference is to the date, e.g.

thəy ʔŋki:ə(r), 15 rō:c khæ mēākara, 'Tuesday, the 15th of the waning moon, month of January'.

The word, kavt, 'to wax', occurs in the same way as rō:c. Both are thus classifiable as numeral coefficients. The coefficient is essential.

1.2.3. *Membership of other word categories.* Most of the forms classifiable as numeral coefficients may be separately classified as nouns or verbs. Thus the word, ca:n, is catalysed as a noun, (by its use with particles which regularly precede or regularly follow nouns, e.g. knoŋ ca:n nūh, 'in that bowl, (in bowl that)') and cōp is catalysable as a verb, (by its occurrence with particles which regularly precede verbs, e.g. mun cōp, 'isn't at-an-end'). Both are catalysable as numeral coefficients by their occurrence after numerals, however, e.g.

ba:y pi:(r) ca:n	two bowlfuls of rice	(rice two bowls)
sot:t(r) byy cōp	recite three times	(recite three get-to-the-ends)

Although the connection between the same form used as noun, verb or coefficient is lexical, an interesting point of grammatical comparison is seen in the fact that sometimes the coefficient is qualified like a noun. Thus the following utterance was heard, when meat was being served, 'aoy mēdom thom! 'Give (him) a big piece! (give one-piece big)'. mē, the colloquial form of multiplying mūəy in numbers, occurs also before coefficients. The headword, sac, 'meat', was here absent, mooted by the context of situation. The verb, thom, was used attributively with the coefficient, dom, which occurs as a noun as well as a coefficient.

Frequency of occurrence in the function of noun or verb causes one to feel that a form is primarily noun or verb and only secondarily coefficient and thus to make the dictionary entry, '1.n.---2.c.---', or '1.v.---2.c.'. There are, however, some words which occur with greater frequency as coefficients and some which may never occur as nouns. Words expressing measurements such as pyi:əm, 'fathom', hat(th), 'handpsan', ki:lo:, 'kilo' are unlikely to occur in a context in which they would be catalysed as nouns. rō:c, and kavt, the words relating to the waxing and waning of the moon, do not seem to occur as members of other categories. The infixed forms, rəndō:c and khnavt supply noun-partners for these words. sōlvk, 'single leaf', is a numeral coefficient of which no other usage has been noted; it has a parallel, non-infixed form, slvk, 'leaf', which occurs as a noun.

1.2.4. *Grammatical relationship with the numeral.* Numeration may take place in first reference with numerals only, as in mūəy, pi:(r), byy, buən, 'one, two, three, four;. A noun may be followed by a numeral only, with no coefficient, e.g.

siəvphu pi:(r)	two books	(books two)
chkae mūəy	one dog	(dog one)

When a coefficient is used, it follows the numeral in close junction. It is

convenient to postulate a numeral construct X , which may consist of numeral only, $x(x)$ or numeral followed by a coefficient, $x(x)c$.

X may be used attributively with the noun as in *mənūs(s) bvy nēāk*, 'three men, (men three persons)'. 'Three tall men' may be either *mənūs(s) bvy nēāk thom* or *mənūs(s) thom bvy nēāk*. Between a noun and its attribute, then, even though they are closely bound by being uttered as one separate phrase, the connection is sufficiently loose for another word (attributive verb, for example) or sequence of words, (e.g. xc) to occur. Sometimes a particle occurs between a noun and its attribute, still uttered as one phrase, e.g.

<i>cəmriəŋ dɔ pirəʊh nūh</i>	that song, the pretty one	(song the good-to-hear that)
<i>nēāk-bəmray 'a khmae(r)</i>	this servant, the	(servant the Cambodian
<i>nih</i>	one	this)

Between a numeral and the coefficient, however, no such interrupting element is permissible. Thus if in the example, 'three tall men', x occurs after the noun, and before *thom*, c follows it before *thom*. The extremely close nature of the sequence, xc , may be the reason for the occurrence of constructions which need to be analysed as particles; they are contractions of *mūəy* and a coefficient, e.g.

<i>mdɔ:ŋ</i>	once	(<i>dɔ:ŋ</i> time)
<i>mkha:ŋ</i>	on one side	(<i>kha:ŋ</i> side)
<i>mya:ŋ</i>	one way	(<i>ya:ŋ</i> way)
<i>mnēāk</i>	one person	(<i>nēāk</i> person) ⁶⁾

1.3. Headwords and uses of the numeral construct

1.3.1. *Grammatical points.* In first reference there are the following possible constructions, involving the numeral construct:

- a) noun-headword with numeral construct, either nX or $n --- X$
- b) verb-headword with numeral construct, $v --- --- X$
- c) no headword, x or $--- X ---$.

a) nX , where $X = x$ only.

Some nouns may be followed by a numeral without a following numeral coefficient. In such cases the numeration takes place with direct reference to the noun, which represents a countable substance or object, e.g.

<i>chkae bvy</i>	three dogs	(dogs three)
<i>siəpɸy pì:(r)</i>	two books	(books two)

nX , where $X = xc$.

Other nouns are normally in careful speech or written style followed by xc , (e.g. nouns referring lexically to persons) but may in colloquial speech be followed only by the numeral. In the context of measuring, both x and c must follow the noun. In the sequence, nxc , the numeration refers directly to the coefficient and only indirectly to the noun.

⁶⁾ The comparable word-forms, *mərɔ:y*, *məpɔən*, contractions of *mūəy* and *rɔ:y*, *pɔən*, are catalysed as numerals, however. Similarly, *mpɸuy* 'twenty', (originally 'one twenty') which has no alternative form, *mūəy* *ɸuy* now.

b) A verb may have a grammatical relationship with a numeral, e.g.

vi:ə pəət phnəm by cùm	He went round the Phnom	(He went-round the (Phnom
	three times	three rounds)
vi:ə sraek pi:(r) mət	He called out twice	(He called-out two mouths)
vi:ə so:t(r) by cəp	He recited (it) three times	(He recited three ends)

c) Numeral constructs are used alone, without any headword at all in expressions relating to time, space and money, e.g.

by maon	three hours
pi:(r) ki:lo:maet(r)	two kilometres
dəp riəl ha:syp se:n	ten piastres, fifty cents

In second reference the headword may be absent from the kinds of numeration discussed in a) and b) above, e.g.

lo:k mi:ən kon-pros tē?	Have you any sons, sir?	(Mr. has sons no?)
ba:t, mi:ən pi:(r) nəək	Yes, two	(Yes, have two persons)

The headword, ko:n-pros is mooted in the first speaker's utterance.

1.3.2. *Lexical points.* The relationship between the numeral coefficient and the headword, noun or verb, is entirely a lexical matter; the coefficient, ha:p, 'bushel', is no more likely to be used with mənūs(s) as headword than is the attributive verb, slo:t, 'kind', likely to occur with 'əŋko:(r), 'husked rice'. The question of whether or not one uses a coefficient in cases where it might be omitted is, however a matter of style. To a certain extent coefficients may be used as flourishes to elevate the style, e.g. haet(u) by ya:n, 'three reasons, (reasons three ways)'.

The translation of a numeral construct used attributively with a noun may show very different constructions in English e.g.

ba:y pi:(r) vək	two ladlefuls of rice	(rice two ladles)
dəmrɪ pi:(r) hvo:n	two herds of elephant	(elephant two herds)

may be contrasted with

siəpɸy pi:(r)-rə:y tūmpəə(r)	a two-hundred-page book	(book two-hundred pages)
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and

to buən crūŋ	a four-cornered table	(table four corners)
pra:sa:t prampul kəmpul	a temple with seven minarets	(temple seven minarets)

The Cambodian construction is, however, the same.

1.4. Additional note

1.4.1. *The classification of three 'numerals' as coefficients.* Where one numeral follows another it is occurring in the position which is held to be the sole means of catalysing the numeral coefficient. However, the numeral has itself been catalysed as such by its occurrence after ti:, 'place'.

At first sight, the words phlo:n, 'forty', and slyk, 'four hundred', (used in counting fruit and vegetables) and the word, dombə:, 'a foursome', seem

to resemble the terms, rō:y, pōn, m̄:n, saen, li:ən, and kaot(i) (the hundreds and thousands) in that they are always preceded by a numeral which multiplies them, e.g. do:ŋ pi:(r) phlo:n, 'eighty coconuts', (coconuts two forties)'.
 The 'hundreds' are, however, also followed by coefficients, e.g.

pi:(r)-rō:y riəl	two hundred piastres	
mənūs(s) buən-pōn nēək	four thousand men	(men four thousand persons)

This is not possible with phlo:n, sl̄k and dōmbō:, of which the usage is confined to the kind of sequence just given, e.g.

do:ŋ bvy phlo:n	one hundred and twenty coconuts	(coconuts three forties)
daəm-tnaot pi:(r) sl̄k	eight hundred sugar-palms	(sugar-palms two four-hundreds)
səw:(r) pi:(r) dōmbō	two sets of four pillars	(pillars two sets-of-four)

These three special 'numerals' (in the lexical sense) are thus held to be numeral coefficients.

2. OLD KHMER (7TH-12TH CENTURY INSCRIPTIONS)

2.1. Numerals

2.1.1. *Catalysis.* The numerals may be catalysed for the present purpose by reference to their relationship, traceable through their lexical meanings which are in turn established by means of Modern Khmer, to the Old Khmer numerical figures, 1-9, 10, 20 and 100. The words, kanlah, 'half' and mimoy, 'each', seem to occur in exactly the same contexts as the numerals and might also be catalysed as numerals at a later stage.

2.1.2. *Lexicon.* The following terms occur; they are given in both forms, pre-Angkor/Angkor, where different:

- 1-5 moy/mvay, mvāy,vyar pi pon/pvan, pvān, pram (pramvyal and pramvyar occur for 'seven');
 10 tap;
 20 bhai 30 plon;
 100 Sanskrit çata;
 400 slik.

2.1.3. *Internal grammatical characteristics.* In the composition of the numbers 6-19, sequences of these terms are to be added together, (6 pram-moy, 7 pram-vyar, 11 tap-moy, etc.).

From 20 onwards the 'twenties' are multiplied by 1-4, e.g. bhai 4 = 80. Perhaps before the borrowing of the Sanskrit word, çata, 100, the numbers, 1-9 occurred regularly before plon, 40, thus rising to moy slik, 400. plon has in fact been noted in only one occurrence, slā plon 2, '80 arecas, (arecas forties 2)'.

2.1.4. *Written figures and their arrangement.* In the Old Khmer script there were symbols for the numbers, 1–9, for 10, 20 and 100. Each twenty or hundred additional to the one indicated by the symbol was recorded by a stroke above the sign, e.g. the numeral 47 was represented by the 20-sign with an additional upper stroke and the 7-sign at the right.

2.2. Numeral coefficients

2.2.1. Catalysis

(i) An examination of many word-sequences, including numerals, shows that numerals frequently occur as the third member of a series consisting of noun + other word + numeral. Words occurring in the middle position may be classified as numeral coefficients_i (*c_i*) e.g.

toñ tem̃ 1	1 coconut tree	(coconut tree 1)
marica lih̃ pi	three lih̃ ⁷⁾ of pepper	(pepper three lih̃)
sre anle pram	five areas of rice-field	(ricefield places five)
prak samrap mvay	one set of silverware	(silver set one)
rañko thvlañ tapp-vyar	twelve thvlañ ⁸⁾ of husked rice	(husked-rice thvlañ twelve)
ghrta antvañ pramvay ⁹⁾	six containers of melted butter	(melted-butter wells six)

tem̃, lih̃, anle, samrap, thvlañ, antvañ are thus catalysed as numeral coefficients.

A noun may be followed by a numeral only, e.g. *krapì 4, 4 buffaloes*; *kon 2, '2 children'*. The coefficient and numeral may also occur together but separated from the noun by other words, e.g.

khāl prak mvay ñan liñ tap	a silver bowl weighing ten liñ	(bowl silver one weight liñ ten)
sre neh (- -) kamsteñ vrah̃	These 2 plots of rice-field	(rice field this (gave) Kam-
vryañ daij jamhvāt 2	(given) personally by Kam-	steñ Vrah̃ Vryañ separately
	plots 2)	

Where a numeral occurs with these coefficients, however, they are in the word-order, *cx*.

In the pre-Angkor inscriptions numerals are nearly always given in figures. A few cases have been noted of numerals written as words and in these cases the word-order of numeral and coefficient is changed round, e.g.

ky moy 'nak ku moy 'nak	One female serf, one female	(Female one person female
sin	serf in addition	one person more)
toñ mvay tem̃	one coconut tree	(coconut one tree) ¹⁰⁾
mvay bhāga	one part	
sre mvay pāda	one foot of ricefield	(ricefield one foot)
rañko pi lih̃	three lih̃ of husked rice	(husked-rice three lih̃) ¹¹⁾

In the Angkor inscriptions, whether the numeral is given as a figure or a word, the order for numeral and coefficient is *cx*, e.g.

⁷⁾ Weight measurement.

⁸⁾ Capacity measurement.

⁹⁾ Contraction of *pram-mvay*.

¹⁰⁾ Contrast pre-Angkor *toñ tem̃ 1*, '1 coconut tree, (coconut tree 1)'.

¹¹⁾ Contrast pre-Angkor *rañko lih̃ 3*, '3 lih̃ of husked rice, (husked-rice lih̃ 3)'.

chpar anle pi	three market-gardens	(market-garden places three)
ti cek bhāga vyar	land divided into two parts	(land divided-into parts two)
raŋko thlvān tapp vyar	twelve thlvān of husked rice	(husked rice thlvān twelve)
çvetatandula droñ mvay	one droñ ¹² of white rice	(white-rice droñ one)
raŋko thloñ 1	1 thloñ of husked rice	(husked-rice thloñ 1)
toñ teñ 10	10 coconut trees	(coconut trees 10)

The order *cx* in the Angkor period, when considered in addition to the far more numerous occurrences of *cx* in comparison with *xc* in the pre-Angkor inscriptions leads one to regard the above-mentioned pre-Angkor *xc* occurrences as exceptional and due perhaps to the writing out of the numeral as a word (not usual in the earlier inscriptions) and/or to their being composed with one exception, of the numeral one, and coefficient.

(ii) There is, however, a second kind of numeral coefficient, *c_{ii}*, which always, in both pre-Angkor and Angkor periods, follows the numeral, forming sequences of which most are independent of a noun, e.g. *tap nā*, 'ten times'; *moy thñai*, 'one-day'; *moy hvat*, 'one occasion'; *moy roc*, 'the first day of the waning moon'; *saptami*¹³) *ket*, 'the seventh day of the waxing moon'.

This construction occurs side by side with the previous one, e.g. (*raŋko*) *je pi mvay thñai*, 'three *je* (of husked rice) (for) one day, ((husked-rice) *je* three one day)'. The occurrence of *tap nā* saves us from having only the numeral, one, in this context. It happens that 'nak', 'person', is, like the 'time'-coefficients, found also only in the *xc* position, e.g.

ku moy 'anak sin another female serf (female-serf, one person more)

2.2.2. *Lexicon*

(i) All Old Khmer words which have been noted and catalysed as *c_i* are given here in paragraphs, a)–c):

a) Weights and measures. Weights e.g. of silver and gold *jyañ*, *tul*, *liñ*, *liñ*. Capacity measurements, (solids) *droñ*, *thloñ/thlvān*, *je*. (Liquids), *antvañ*. Length (material), *yau*, (land) *jeñ*, *pāda*; (area) *sanre* 'ricefield' *jañnhvat*, 'piece of ricefield of which the width is usually specified'. Value, *mas*, a piece of gold', *vija* 'sowing area'. Unspecific measurements, *bhāga*, 'part', *tanlap*, 'box', *vnek*, 'ladle'.

b) Methods of arrangement. *samrap*, 'set'; *vnañ*, 'mixture (?)', *set*; *dneñ*, 'team, yoke'; *khse*, 'string, (e.g. of pearls)'; *damnuk*, 'pair, collection (e.g. of earrings)'; *par*, *la*, 'some quantitative collection, (e.g. of buckles)'.
c) Items. *tree*, *tneñ*, 'trunk (for counting trees)'.
(ii) Time-pointers.

a) *nā*, 'time'; *hvat*, 'occasion'; *thñai/thñai*, 'day'; *chnam*, 'year'; *çaka*, 'era'; *ket*, *khnet*, 'period of waxing moon', *roc*, *rñnoc*, 'period of waning moon'.

b) 'nak', 'person'.

Members of the two coefficient classes are distinct apart from the exceptions mentioned above under 2.2.1. (i), the pre-Angkor occurrences with inverted order.

¹²) Capacity measurement

¹³) It was usual for Sanskrit numerals to be used to express the date.

2.2.3. *Membership of other word categories.* The limited number of Old Khmer texts does not give enough evidence to justify a definite statement about all the words catalysed as numeral coefficients, (i) and (ii). One might expect for example, that words representing regular fixed weights and measures such as *jyañ*, *tul*, *droñ*, *tloñ*, *je*, *liñ*, *yau* would be only coefficients; yet it is possible that *je*, capacity measurement related to modern *кюпч* ‘basket (containing one bushel)’, which is both noun and coefficient in Modern Khmer, was also a noun in Old Khmer. One ventures to make a statement, therefore, only about instances where occurrences can be attested.

Thus *jeñ*, *mas*, *bhāga*, *teñ*, occur as both *n* and *c_i*; ‘*nak*, *tñai*, *chnam*,¹⁴⁾ *ket*, *hvat*¹⁵⁾ as both *n* and *c_{ii}*.

2.2.4. *Grammatical relationship with the numeral.* Two kinds of numeral construct might be postulated for Old Khmer, one consisting of *x* or *c_ix* and the other of *xc_{ii}*.

2.3. Headwords and uses of the numeral construct

2.3.1. *Grammatical points.* *X* (= *x/c_ix*) is normally associated with a noun headword which may precede immediately or precede by several words. *X* (= *xc_{ii}*) is used alone except in connection with persons.

2.3.2. *Lexical points.* Old Khmer *cx* occurrences with *n* preceding are all ‘quantitative’ e.g.

kalmon <i>jyañ</i> 9	9 <i>jyañ</i> of wax	(wax <i>jyañ</i> 9)
samlo <i>vnāk</i> 1	1 mixture of stew	(stew mixture 1)
sre <i>mas</i> 3	ricefield (worth) 3 pieces of gold/3 gold pieces’ worth of ricefield	(ricefield gold-pieces 3)
sre <i>vija</i> 20	ricefield (worth) 20 sowing measures/ 20 sowing measures-worth of ricefield	(ricefield sowing-measures 20)

cx separated from the noun appears in translation to be more attributive and less quantitative, e.g.

<i>rūpyakalaça</i> <i>nān</i> <i>jyañ</i> 8	a silver flask weighing 8 <i>jyañ</i>	(silver-flask weigh <i>jyañ</i> 8)
<i>ti cek</i> <i>bhāga</i> <i>vyar</i>	land divided into two parts	(land divided-into parts two)

but in fact, from the Khmer point of view, the construction differs only in the separation from the noun.

2.4. Additional notes

2.4.1. In Old Khmer the words, *bhai*, ‘twenty’, *plon*, ‘forty’, *slik*, ‘four

¹⁴⁾ In inscription K. 90, nord, 11, *cnañ* occurs as follows: *pon hvat cnañ ta moy*, ‘four occasions in the one year’, and may here be regarded as *n*.

¹⁵⁾ *hvat* occurs with *mimoy/mimvay* both before and after it, thus operating as both *n* and *c*.

hundred' and *çata*, 'hundred' are followed by a multiplying numeral, e.g.

tmur <i>çata</i> mvay	one hundred oxen	(oxen hundred one)
krapî bhài mvay	twenty buffalo	(buffalo twenty one)

If a further numeral occurs it is to be added on, not multiplied, e.g.

tmur bhài 1 7	27 oxen	(oxen twenty 1 7)
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The position of *bhài*, *plon*, *slik* and the borrowed *çata* are as for M.K. *rô:y*, *pðæn*, *mɔ:n*, etc. They are required in all counting (and not, as *phlo:n* and *slɔ:k* in M.K., just for fruit and vegetables) and they are used with numeral coefficients, e.g.

slā tnerñ <i>çata</i> 1	1 hundred areca-trees	(areca trunks hundred 1)
slā tērñ <i>slik</i> 1	400 areca-trees	(areca trunks hour-fundred 1)

2.4.2. Sanskrit words are freely used in O.K. Two Sanskrit words, *divasa* and *samvatsara*, have been noted in a context, *ncx* which would catalyse them as *c_i* although they are in fact lexically connected with time, e.g. *ple divasa moy* and *ple samvatsara moy*. This may be attributable to their Sanskrit origin or it may be that divisions of time set up as a measure should be regarded as *nx*, not *cx*, cf. *pon hvat cnañ ta moy*, 'four times a year, (four times year the one)' where *cnañ* seems to occur as a noun, would then be *mnx*, not *ncx*.

2.4.3. There is an apparent absence of coefficient in a recurring phrase: *sru x*, e.g. *sru 20*, '20 (measures of) paddy'.

2.4.4. The following numeral coefficients are formed with infixed -n- and partnered by words having no infix,¹⁶

s-an-re <i>c_i</i> specific area of ricefield	sre <i>n</i> ricfield
t-n-em <i>c_i</i> trunk of tree	tem <i>n</i> , <i>c_i</i> tree
d-n-em <i>c_i</i> team, yoke	*dem (M.K. tum 'to yoke')
k-hn-et <i>c_{ii}</i> period of waxing moon	ket <i>n</i> , <i>c_{ii}</i> period of waxing moon
r-n-oc <i>n</i> , <i>c_{ii}</i> period of waning moon	roc <i>c_{ii}</i> period of waning moon
v-n-ek <i>c_i</i> ladleful	*vek (M.K. vè:k 'ladle')
t-an-loñ <i>c_i</i> a tloñ measure	tloñ (capacity measurement)

3. MIDDLE KHMER (17TH CENTURY INSCRIPTIONS)

3.1. Numerals

3.1.1. *Catalysis*. Again, as for O.K., a numeral category may be established by reference to the relationship of certain word-forms, of which the lexical meaning is known through Modern Khmer, to the numerical figures in their various combinations.

¹⁶ See my 'Prefixation and Infixation in Old Mon, Old Khmer and Modern Khmer', in *LCSEAP*. The list (68) may be tentatively increased by the addition of *tnerñ*, *dnerñ*, *knet*, *rnoc*, *vnek*.

3.1.2. *Lexicon*. The following terms have been noted:

mù:y, mvð:y; ¹⁷) pì:r, piyr; bvy; bo:n, buən; pram;
 16 pra:mù:y-twəntə:p (cf. M.K. pram-mùəy-dondəp);
 1000 pì:ən; ¹⁸)
 10 000 saen.

One may assume the following:

10 tə:p (cf. twəntə:p above);
 30 mù:y phuy or mphuy; ¹⁹)
 30-90 As for M.K. (Thai loanwords).

3.1.3. *Internal grammatical characteristics*. From occurrences such as pra:mù:y, 'six', pra:mù:y-twəntə:p, 'sixteen', one may assume that numbers were composed as in O.K. and M.K. The single m in these spellings would seem to indicate that stress fell on the second syllable, as in M.K. The occurrence of final l in prampyl, 'seven', is in line with modern prampul and at least one O.K. occurrence of pramvyl. pì:ən and saen (modern pəən and saen) are multiplied by the preceding numeral as in M.K. e.g. mù:y pì:ən mù:y saen, one thousand, ten thousand (ten-thousand one).

3.1.4. *Written figures and their arrangement*. As for M.K.

3.2. Numeral coefficients

3.2.1. Catalysis

(i) Numerals frequently occur in sequences consisting of noun + other word + numeral. Words occurring in the central position may be thus classified as numeral coefficients i, e.g.

kruəŋ-ba:y sɔmrəp 3	3 sets of rice-utensils	(rice-utensils sets 3)
kəntɛ:l khnavy sɔmrəp 2	2 sets of mats and cushions	(mats cushions sets 2)
cau sra:mne:r 'vntɛəməð: li:	novice Indamoli, one	(title novice Indamoli person one)
'əŋ(k) mù:y		

The coefficient + numeral are separated from the noun headword by an attributive verb:

prɛəh mi:əs 'əŋ(k) pì:r	two gold 'Buddhas' (and)	(Buddhas gold bodies two)
prɛəh prak 'əŋ(k) pì:r	two silver ones	Buddhas silver bodies two)

In the following example more words intervene:

saŋ prɛəh mi:əs tumŋə:n	make a 'Buddha' of gold	(make Buddha gold weigh
təmlvŋ 4	weighing 4 təmlvŋ	təmlvŋ 4

(ii) A second kind of numeral coefficient follows the numeral forming a sequence xc, e.g.

5 taəŋ (M.K. dɔ:ŋ)	5 times
2 kri:ə	2 occasions
16 chnam	16 years

¹⁷) Transcribed as for Modern Khmer.

¹⁸) No short-mark was used for the 'a'-vowel or 'inherent' vowel at this time.

¹⁹) Here one assumes that O.K. word order in bhai moy has by this stage been reversed.

Khmer numerals and numeral coefficients

ko:n pi:(r) nĕək	two children	(children two persons)
maha:səŋkhĕəri:əc tĕəŋ	all the 16 great priests	(great-priest all 16 bodies)
16 'əŋ(k)		
prĕəh səŋ(kh) 16 'əŋ(k)	16 venerable persons in the community	(venerable-persons community 16 bodies)
phwuk(kho) 11 'əŋ(kh)	11 bkkkhus	(bhikkus 11 bodies)
som co:l nirpi:ən mū:y	ask to enter some part of nirvana	(ask enter nirvana one place)
'ənlĕ		

3.2.2. *Lexicon*

(i) c_i . Words catalysed as c_i are given in paragraphs a)–c):

a) Weight/value, tamlŋ, 'a measure', ba:t, slŋ, 'measures of silver or gold (4 slŋ = 1 ba:t)'; cŋci:ŋ, lŋŋ, 'values by weight'. Distance, hat(th), 'handspan'.

b) sŋrap, 'set'.

c) 'əŋ(k), 'image'.

(ii) c_{ii} . Words catalysed as c_{ii} are given in paragraphs a)–c):

a) Time-pointers, taŋ, 'time', kri:ə, 'occasion', chnam, 'year', 'period of waning moon'.

b) nĕək, 'person', 'əŋ(k), 'religious person'.

c) anle, 'place', sa:r, 'item'.

Members of the two coefficient classes seem to be distinct, though the same form, 'əŋ(k) is c_i with reference to images of the Buddha and c_{ii} with reference to clergy.

3.2.3. *Membership of other word categories.* 'əŋ(k) occurs as n , c_i and c_{ii} . Insufficient evidence, otherwise.

3.2.4. *Grammatical relationship with the numeral.* Two kinds of numeral construct might be postulated for Middle Khmer, one consisting of x or $c_i x$ and the other of $x c_{ii}$.

3.3. *Headwords and uses of the numeral construct*

3.3.1. *Grammatical points.* $X (= x/c_i x)$ is usually associated with a noun headword which may precede immediately or precede by several words. $X (= x c_{ii})$ is used alone except in connection with persons.

3.3.2. *Lexical points.* Occurrences of X used attributively with n are 'quantitative', e.g.

krmŋj sla: sŋrap 1	1 set of areca utensils	(utensils areca set 1)
sŋmbo:r - - mū:y sa:r	one kind of riches	(riches - - one item)

3.4. *Additional notes*

No evidence of phlo:n, slŋk, etc. has been noted.

4. REAM KER

4.1. *Numerals*

Catalysis, lexicon, internal grammatical characteristics, written figures.

The notes given above for Modern Khmer may be taken as applicable to the language of the Ream Ker.

4.2. Numeral coefficients

4.2.1. *Catalysis*. This may be carried out according to occurrence immediately following the numeral, as in Modern Khmer.

4.2.2. *Lexicon*. A limited number of occurrences are cited:

a) Measurement yò:c(+ n), 'distance = approximately 10 miles)' e.g. bò:k --- prambv̄y-hm̄v:n yò:c(+ n), 'returned --- the eighty thousand miles, (returned --- eight-ten-thousand yojana)'.

b) chnam, 'year' e.g. kùmrup pram-mùəy chnam, 'for fully six years, (complete six years)'.

ri:ətr̄v̄y-ka:l, 'night-time' e.g. 'əs mùəy ri:ətr̄v̄y-ka:l 'the whole of one night, (all one night-time);.

c) lò:ka, 'place' e.g. tv̄i:p dɔ buən lò:ka, 'land in four places (land the four places)'.

d) persons pr̄əəh-'əŋ(k), 'venerable person', e.g.

pr̄əəh n̄əəp̄əp̄ədy t̄əŋ	all threee venerable leaders	(venerable chiefs all three
bv̄y pr̄əəh-'əŋ(k)		venerable-persons)

ksatr̄v̄y, ksatra, 'princess, prince', e.g.

t̄əŋ pi:r ksatr̄v̄y ksatra	both prince and princess	(all two princess prince)
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sdac, 'king', e.g.

pr̄əəh bv̄yda t̄əŋ pi:(r)	the two kingly fathers	(venerable fathers all two kings)
sdac		

'əŋk̄i:ə, 'person', e.g.

pr̄əəh ba:t ksatra t̄əŋ	all five eminent princes	(venerable foot (= respected)
pram 'əŋk̄i:ə		princes all five persons)

e) general items, pr̄əka(r), e.g.

'əs 'vn̄tri:y pram pr̄əka:(r)	all five kinds of power	(all power five items)
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sa, 'item', e.g.

ka:k mùəy sa	a certain crow	(crow one item)
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4.2.3. *Membership of other word categories*. lò:ka, sdac and ksatr̄v̄y, ksatra are primarily nouns and only incidentally coefficients. It seems to be rather by poetic licence that person-subjects are introduced by means of a numeral construct, e.g., at the beginning of a new paragraph, stanza and sentence, t̄əŋ pi:(r) ksatr̄v̄y ksatra thva:y b̄əŋk̄um pr̄əəh bv̄yda, 'Both prince and princess greeted the royal father (all two princess prince offer greeting venerable father)'. In M.K. prose style this would be ksatr̄v̄y ksatra t̄əŋ pi:(r) n̄əək. Cf. also the sentence beginning t̄əŋ bv̄y pr̄əəh-'əŋ(k) yi:ətra --- 'The three princes went --- (all three venerable-persons go - - -)'. In M.K.: ksatra t̄əŋ bv̄y pr̄əəh-'əŋ(k).

4.2.4. *Grammatical relationship with numeral.* Numerals occur without coefficients even when persons are counted; the elevated style and the fact that reference is to elevated persons does not make the use of a coefficient necessary, e.g.

maha russry tɛəŋ mʉəy	all the 100 000 million great	(great hermits all one)
saen kaoʔ(i)	hermits	hundredthousand million)
'a:ma:t(y) mʉəy	a certain counsellor	(counsellor one)
tɛ:pɪ tɛəŋ bvy	the three goddesses	(goddesses all three)

4.3. *Headwords and uses of numeral constructs*

4.3.1. *Grammatical points.* Absence of headword when persons are counted seems more common than in present-day spoken or written Khmer (to which the language is most closely related); this was pointed out in 4.2.3.

Another feature which is unusual in Modern Khmer is the use of two coefficients together in, e.g.

tɛəŋ pɪ:(r) ksatrvy ksatra both the prince and princess (all two princess prince)

This would not arise in spoken M.K. in this particular context because one would say 'ksatra ksatrvy tɛəŋ pɪ:(r) prɛəh-'ɔŋ(k)' using two nouns but only one coefficient.

4.3.2. *Lexical points.* There is a tendency to transfer headword to coefficient position, as has been mentioned in 4.2.3. and thus to use, in the function of coefficient, a wider variety of words, belonging also to the category of noun, than one would expect to hear so used in everyday speech.

5. SUMMARY BY DIACHRONIC COMPARISON

5.1. *Numerals*

5.1.1. In all states of the language, catalysis might be by reference to written figures in the first place.

5.1.2. *Lexicon.* The five-term system goes back to O.K., although the written figures did not represent it. The lexicon is consistent throughout except for the terms introduced from Thai, which had no counterpart in O.K., and ɕata from Sanskrit which is not met after O.K.

5.1.3. *Internal grammatical characteristics.* The method of composition of the numbers is consistent apart from the changes which resulted in the introduction of terms for each of the 'tens' and the variety provided by 'dondɔp' for the composition of the 'teens'. It is not, I think known at what stage dondɔp was first used. There seems to be only one very remote possibility of its occurrence in O.K. ²⁰⁾

5.1.4. *Written figures and their arrangement.* O.K. differs from succeeding states of the language in having special symbols for 10, 20

²⁰⁾ K. 450, 6. tañtāp 1.

and 100, and not therefore using the hundreds, tens and units positions.

5.2. Numeral coefficients

5.2.1. *Catalysis*. This may be carried out by reference to close juxtaposition but varies in the order of the *x* and *c*.

5.2.2. *Lexicon*. The following terms occur as coefficients either in O.K. and M.K. or throughout:

	O.K.	M.K.
c_i	je '(capacity measure) samrap 'set' dneñ 'team, yoke' khse 'string' teñ 'tree'	kəncv 'basket (1 bushel) səmrəp 'set' thnum 'team, yoke' khsae 'string' dəm 'tree'
?	par 'set, collection' (exact meaning uncertain)	dəmbə:(r) 'set of four'
c_{ii}	thñai 'day' ket 'period of waxing moon' roc 'period of waning moon' chnam 'year'	thñay 'day' kayt 'period of waxing moon' rò:c 'period of waning moon' chnam 'year'

5.2.3. *Membership of other word categories*. It is usual in all states for most coefficients to be members of noun or verb categories as well, while some, chiefly weights and measures, tend to be exclusively coefficients. Only in O.K. is there evidence of a formal distinction between coefficients and other words.

5.2.4. *Grammatical relationship with the numeral*. The relationship of coefficient with numeral has always been close but the order of the two categories in relation to each other has changed. This is the most outstanding difference between O.K. and M.K. within the terms of reference which are involved here. 18th century Thai influence may account for the final change of all coefficients to the c_{ii} position, but cannot account for the O.K. and Middle K. diversity of positions.

5.3. Headwords and uses of numeral construct

5.3.1. *Grammatical points*. The numeral construct has similar uses at all periods. In the Ream Ker the headword is often absent in initiating contexts and the 'noun' is used as a coefficient.

5.4. Additional notes

5.4.1. *plon* and *slik*, catalysed as numerals in O.K. and becoming restricted in usage when Thai 'tens' were borrowed, have by the M.K. stage moved into the category of coefficients used only in counting fruit and vegetables.

LINGUISTICS IN CAMBODIA AND ON CAMBODIAN

This article is concerned with linguistic work done since the early 1940's either in Cambodia or on Cambodian. The former comprises almost exclusively work done by Cambodians on their own language. Outside work on Cambodian includes publications from various parts of the world, chiefly from Europe and Russia, and shows wider scope and greater diversity of approach. In the introductory sections, 1 and 2, these two groups of publications are treated separately. In the following six sections, however, works published both in Cambodia and elsewhere are discussed together under subject headings. Short bibliographic references are given sometimes in footnotes as the books or articles arise in the course of discussion. A full bibliography will be found at the end of the article.

1. THE WORK OF CAMBODIAN LINGUISTS

The most distinguished philological and literary work of Cambodia in this century has been associated in some way with the Buddhist Institute of Phnom Penh and the adjacent Pali School, which is now part of the Royal University of Cambodia. Publications have been under the auspices of either the Bibliothèque Royale or the Buddhist Institute, whose journal, *Kambūjasuriyā*, has been the vehicle of publication for many new poetic compositions since its inception in 1927. The energies of highly educated Cambodians whose interests lie in the literary and linguistic heritage of Cambodia have been turned to the task of making Cambodian literature and religious works written in Pali available to the public, rather than of producing strictly linguistic work. Thus publications include many religious texts in Pali or translated from Pali, which have sometimes been annotated or accompanied by a commentary. Texts of literary works of Cambodian origin have been published direct from collections of manuscripts and have also in some cases been edited with notes. Such work was not thought to come within the scope of this article. The seventeenth century inscriptions of Cambodia have been published with linguistic notes; these will be discussed below in the section on Old Khmer. Purely linguistic work, not related to specific texts, has been produced by individual authors, unconnected with the Buddhist Institute, as well as by the Buddhist Institute. Several bilingual dictionaries have appeared in the period with which we are concerned, designed to meet the growing needs of foreigners learning Cambodian or of Cambodians learning foreign languages.

Manuals on the Khmer orthography or grammar, written entirely in