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\textsuperscript{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 Henderson\textsuperscript{2}) 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.\textsuperscript{3}) Numerals may be catalysed by their occurrence immediately after the word ti:, ‘place’\textsuperscript{4}) ti: mûño, ti: pi:(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-‘bvy, ‘(five-three)

\textsuperscript{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.

\textsuperscript{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 wa from the w to the a, viz. wâ and has had to be omitted from the vowel y 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.

\textsuperscript{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.

\textsuperscript{4}) Two other words, ponma:n, ‘how many’ and cravn ‘many’ are thus also catalysed as numerals.
eight', hoksyp-'pi:(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-mûy-’râ:y, 'six hundred', pram-buân-’pôan, 'nine thousand'. When further numerals follows a multiplied term the whole number is a series of words, e.g. pram-’râ:y cvtsyp buân, '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 mûy, pi:(r), bvy, buân, pram (plus irregular prampûl); 10 dop and 'teen', dôndôp; 20 mphûy.

The Thai loan-words, 30–100, sa:msem, saesyp, ha:ssyp, hoksyp, cvtsyp, paetsyp, kaussyp, rô:y and 1 000, pôan, 10 000, mv:n, 100 000, saen, million, li:son.

Sanskrit loan-words, ten million kaoţ(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-mûy, 8, pram-bvy, 18, dop-pram-bvy, 24, mphûy-pram, 56, ha:ssyp-pram-mûy. prampûl is the spoken form of the written prampy-pi:(r), which is sometimes read as pram-pi:. pram-dôndôp, pram-bvy-dôndôp, 15, 18, etc., are alternative forms of dop-pram, dop-pram-bvy.

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, mûy-pôan, pram-rô:y. Subsequent numbers are added, e.g. 20 601, pi:(r)-mv:n pram-mûy-rô:y mûy. A multiplying mûy has in the spoken language the alternative form mû, e.g. morâ:y, mûpôan.

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. Numerical coefficients

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

mûnûs (s) buân nêak four men (men5) four persons
bry thnaj three days
’ôka:o(r) pram cîal five baskets of husked rice (husked-rice five baskets)

nêak, thnaj, cîal 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.
Khmer numerals and numeral coefficients

lexical characteristics.

a) Reference to persons, e.g.

ko:n bry nēak  three children  (children three persons)
sdac bry prahah -ơŋ(k)  three kings  (three kings eminent-bodies)
lō:k-sōŋ(kh) bry ơŋ(k)  three monks  (monks three bodies)

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

b) Reference to shapes, e.g.

baarvı̄ pı̄(r) dām  two cigarettes  (cigarettes two trunks)
smau mūy săsay  one blade of grass  (grass one sinew)
thnam pı̄(r) krōap  two pills  (medicine two seeds)
skō:(r) dōp phaen  ten lumps of sugar  (sugar ten discs)
kradā:s pı̄(r) sōnlīk  two sheets of paper  (paper two leaves)
′vt(th) mūy 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.

tuuk-tea mūy pı̄ŋ  one cup of tea  (water-tea one cup)
skō:(r) bry niːal  three pounds of sugar  (sugar three pounds)
dy dōp pỹːam  ten fathoms of land  (land ten fathoms)
sompwāt pı̄(r) tboːŋ  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 mūy khsae  a fascicle of manuscript pages  (manuscript one string)
dɔːŋ pı̄(r) cɔŋkəom  two clusters of coconuts  (coconuts two clusters)
phleːŋ mūy sırərap  a set of musical instruments  (music one set)
′ɔmbōh pı̄(r) hoŋ  two reels of cotton  (cotton two reels)
sac bry trənaot  three skewers of meat  (meat three skewers)
trvỳ mūy kontûy  one fish  (fish one tail)
mìː mūy trvableːk  one wrapper of betel  (betal one wrapper)
khaːo-′av pı̄(r) somrərap  two suits  (trousers-shirt two sets)

The coefficient is essential.

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

siːm mūy púːak  a group of Thais  (Thais one group)
domryan mūy hvoːŋ  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.

lən pı̄(r) yavŋ  two kinds of car  (cars two kinds)
dom-reply bvy baep  three kinds of potato  (potato three kinds)
haet pram prakaː(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.

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The word, kavt, ‘to wax’, occurs in the same way as rò:γ. 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:no, is catalysed as a noun, (by its use with particles which regularly precede or regularly follow nouns, e.g. knoŋ ca:no 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:no | two bowlfuls of rice | (rice two bowls) |
| sot:h(r) bry 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 mādom thom! ‘Give (him) a big piece! (give one-piece big)’. ma, the colloquial form of multiplying mūay 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:ɔm, ‘fathom’, hat(th), ‘handspan’, ki:lo:, ‘kilo’ are unlikely to occur in a context in which they would be catalysed as nouns. rò:γ, 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, ranō:γ and khna:γ supply noun-partners for these words. sol:d, ‘single leaf’, is a numeral coefficient of which no other usage has been noted; it has a parallel, non-infixed form, sl:d, ‘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 mūay, pi:(r), by, buan, ‘one, two, three, four;’. A noun may be followed by a numeral only, with no coefficient, e.g.

| si:vphyu pi:(r) | two books | (books two) |
| chkae mūay | one dog | (dog one) |

When a coefficient is used, it follows the numeral in close junction. It is
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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 m¤n€s(s) bvy n€ak, ‘three men, (men three persons)’. ‘Three tall men’ may be either m¤n€s(s) bvy n€ak thom or m¤n€s(s) thom bvy n€ak. 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.

\[
\begin{align*}
\text{cømriø} & \text{ do pØrøø nh} & \text{that song, the pretty one} & \text{ (song the good-to-hear that)} \\
\text{nøak-bømøav 'a khømae(r)} & \text{nh} & \text{this servant, the} & \text{ (servant the Cambodian)} \\
& & \text{one} & \text{this})
\end{align*}
\]

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 møøy and a coefficient, e.g.

\[
\begin{align*}
\text{mdø} & \text{ once} & \text{(doø time)} \\
\text{mkøaø} & \text{ on one side} & \text{(kaøø side)} \\
\text{myaø} & \text{ one way} & \text{(yaøø way)} \\
\text{mnøøak} & \text{ one person} & \text{(nøøak person)}
\end{align*}
\]

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.

\[
\begin{align*}
\text{chkæ bry} & \text{ three dogs} & \text{(dogs three)} \\
\text{søøøøpønu pø(r)} & \text{two books} & \text{(books two)}
\end{align*}
\]

$nX$, 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, mœøy, mœøø, contractions of mœøy and rœy, pœø, are catalysed as numerals, however. Similarly, mœøøø 'twenty', (originally 'one twenty') which has no alternative form, mœøy phøø now.
b) A verb may have a grammatical relationship with a numeral, e.g.

\[ \text{vi:\textcircled{c} p\text{\textordmasculine}t phn\text{\textordmasculine}m bvy c\text{\textordmasculine}m} \quad \text{He went round the Phnom} \]
\[ \text{three times} \quad \text{(He went-round the (Phnom three rounds)} \]
\[ \text{vi:\textcircled{c} sr\text{\textordmasculine}ek pi:(r) m\text{\textordmasculine}t} \quad \text{He called out twice} \]
\[ \text{(He called-out two mouths) \]
\[ \text{vi:\textcircled{c} so:(r) bvy cp} \quad \text{He recited (it) three times} \]
\[ \text{(He recited three ends) \]

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

\[ \text{bvy ma\text{\textordmasculine}n} \quad \text{three hours} \]
\[ \text{pi:(r) ki:lo:maet(r)} \quad \text{two kilometres} \]
\[ \text{dop rial ha:sp se:n} \quad \text{ten piastres, fifty cents} \]

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

\[ \text{lo\text{\textordmasculine}k mi:an kon-pros t\text{\textordmasculine}} \quad \text{Have you any sons, sir?} \]
\[ \text{(Mr. has sons no?) \]
\[ \text{bat:t mi:an pi:(r) n\text{\textordmasculine}ak} \quad \text{Yes, two} \]
\[ \text{(Yes, have two persons) \]

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 m\text{\textordmasculine}n\text{\textordmasculine}s(s) as headword than is the attributive verb, slo:t, ‘kind’, likely to occur with ’n\text{\textordmasculine}k\text{\textordmasculine}k\text{\textordmasculine}k:(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) bvy 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.

\[ \text{ba:y pi:(r) v\text{\textordmasculine}k} \quad \text{two ladefuls of rice} \]
\[ \text{ (rice two ladies)} \]
\[ \text{dam\text{\textordmasculine}ry pi:(r) hvo:n} \quad \text{two herds of elephant} \]
\[ \text{ (elephant two herds)} \]

may be contrasted with

\[ \text{siavphvu pi:(r)-r\text{\textordmasculine}y t\text{\textordmasculine}mp\text{\textordmasculine}s(r)} \quad \text{a two-hundred-page book} \]
\[ \text{ (book two-hundred pages)} \]

and

\[ \text{to buan cr\text{\textordmasculine}n} \quad \text{a four-cornered table} \]
\[ \text{ (table four corners)} \]
\[ \text{pra:sa:t prampul komp\text{\textordmasculine}l} \quad \text{a temple with seven minarets} \]
\[ \text{ (temple seven minarets)} \]

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, dombox:, ‘a foursome’, seem
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to resemble the terms, ṛa:y, pōan, mën:n, saen, li:ûn, and kəot(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)-rọ:y rial  two hundred piastres
mänus(s) buån-pōan nêak  four thousand men (men four thousand persons)

This is not possible with phlo:n, slûk and dómbo:, 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 three forties)
cocoanuts
daam-tnaot pi:(r) slûk  eight hundred sugar-palms (sugar-palms two four-
hundreds)
sasə(r) pi:(r) dómbo  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, mvây,vyar pi pon/pvan, pvan, 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, slâ 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, e.g.

<table>
<thead>
<tr>
<th>Cambodian</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>toñ ten 1</td>
<td>1 coconut tree</td>
</tr>
<tr>
<td>marica lih pi</td>
<td>three lih³ of pepper</td>
</tr>
<tr>
<td>sre anle pram</td>
<td>five areas of rice-field</td>
</tr>
<tr>
<td>prak samrap mvay</td>
<td>one set of silverware</td>
</tr>
<tr>
<td>rańko thvlań tapp-yvar</td>
<td>twelve thvlań⁸ of husked rice</td>
</tr>
<tr>
<td>ghṛta antvān pramvay⁹</td>
<td>six containers of melted butter</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>English</th>
<th>Ephemeral</th>
</tr>
</thead>
<tbody>
<tr>
<td>(coconut tree 1)</td>
<td>(pepper three lih)</td>
</tr>
<tr>
<td>(rice field places five)</td>
<td>(silver set one)</td>
</tr>
<tr>
<td>(husked-rice thvlań twelve)</td>
<td>(melted-butter wells six)</td>
</tr>
</tbody>
</table>

ten, lih, anle, samrap, thvlań, antvań are thus catalysed as numeral coefficients.

A noun may be followed by a numeral only, e.g. krap 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.

<table>
<thead>
<tr>
<th>Cambodian</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>khāl prak mvay aan lih tap</td>
<td>a silver bowl weighing ten lih</td>
</tr>
<tr>
<td>sre neh (- -) kaṁśten vrah</td>
<td>These 2 plots of rice-field</td>
</tr>
<tr>
<td>vryań dhai jarihvat 2</td>
<td>(given) personally by Kaṁśten Vraḥ Vryan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>English</th>
<th>Ephemeral</th>
</tr>
</thead>
<tbody>
<tr>
<td>(bowl silver one weight lih ten)</td>
<td>(rice field this (gave) Kaṁśten Vraḥ Vryan separately plots 2)</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Cambodian</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>ky moy ’nak ku moy ’nak</td>
<td>One female serf, one female</td>
</tr>
<tr>
<td>sin</td>
<td>serf in addition</td>
</tr>
<tr>
<td>toñ mvay ten</td>
<td>one coconut tree</td>
</tr>
<tr>
<td>mvay bhāga</td>
<td>one part</td>
</tr>
<tr>
<td>sre mvay pāda</td>
<td>one foot of ricefield</td>
</tr>
<tr>
<td>rańko pi lih</td>
<td>three lih of husked rice</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>English</th>
<th>Ephemeral</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Female one person female)</td>
<td>(one person more)</td>
</tr>
<tr>
<td>(coconut one tree)⁹</td>
<td></td>
</tr>
<tr>
<td>(ricefield one foot)</td>
<td></td>
</tr>
<tr>
<td>(husked-rice three lih)¹¹</td>
<td></td>
</tr>
</tbody>
</table>

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.

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³ Weight measurement.
⁸ Capacity measurement.
⁹ Contraction of pram-mvay.
¹⁰ Contrast pre-Angkor toñ ten 1, ‘1 coconut tree, (coconut tree 1)’.
¹¹ Contrast pre-Angkor rańko lih 3, ‘3 lih of husked rice, (husked-rice lih 3)’. 
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chpar anle pi  three market-gardens  (market-garden places three)
ti cek bhāga vyar  land divided into two parts  (land divided-into parts two)
raňko thlián tapp vyar  twelve thlián of husked rice  (husked rice thlián twelve)
çvetatandula drōn mvay  one drōn\(^{12}\) of white rice  (white-rice drōn one)
raňko thlión 1  1 thlión of husked rice  (husked-rice thlión 1)
toň tenh 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, \(ci\), 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 thāi, 'one-day'; moy hvat, 'one occasion'; moy roc, 'the first day of the waning moon'; saptemi\(^{13}\) ket, 'the seventh day of the waxing moon'.

This construction occurs side by side with the previous one, e.g. (raňko) je pi mvay thnāi, '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 \(c\) are given here in paragraphs, a)–c):

a) Weights and measures. Weights e.g. of silver and gold jyañ, tul, liñ, lih. Capacity measurements, (solids) drōn, tlon/thlián, je. (Liquids), antvañ. Length (material), yau, (land) jeñ, pāda; (area) sanre 'ricesfield' jañhvat, 'piece of ricefield of which the width is usually specified'. Value, mas, a piece of gold', vija 'sowing area'. Unspecified measurements, bhāga, 'part', tanlap, 'box', vnek, 'ladle'.

b) Methods of arrangement. samrap, 'set'; vnak, 'mixture (?), set'; dneñ, 'team, yoke'; khse, 'string, (e.g. of pearls)'; damnut, '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'; thnāi/thnāi, 'day'; chnam, 'year'; čaka, 'era'; ket, khnet, 'period of waxing moon', roc, rīnoc, '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 köçv ‘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, tem, occur as both n and c; 'nak, tínai, chnam, ket, hvat\(^{15}\) as both n and cii.

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, and the other of xcii.

2.3. Headwords and uses of the numeral construct

2.3.1. Grammatical points. X (= x/cx) is normally associated with a noun headword which may precede immediately or precede by several words. X (= xcii) 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.

<table>
<thead>
<tr>
<th>khmer word</th>
<th>translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>kalm on jyañ 9</td>
<td>9 jyañ of wax</td>
</tr>
<tr>
<td>samlo vnāk 1</td>
<td>1 mixture of stew</td>
</tr>
<tr>
<td>sre mas 3</td>
<td>ricefield (worth) 3 pieces of gold</td>
</tr>
<tr>
<td>sre vija 20</td>
<td>ricefield (worth) 20 sowing measures</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>khmer word</th>
<th>translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>rūpya kalakaça nān jyañ 8</td>
<td>a silver flask weighing 8 jyañ</td>
</tr>
<tr>
<td>ti ček bhāga vyar</td>
<td>land divided into two parts</td>
</tr>
</tbody>
</table>

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.
Khmer numerals and numeral coefficients

hundred’ and cāta, ‘hundred’ are followed by a multiplying numeral, e.g.
tmōr cāta m̄vay
krāpi bhāi m̄vay
one hundred oxen
twenty buffalo
(oxen hundred one)
(buffalo twenty one)

If a further numeral occurs it is to be added on, not multiplied, e.g.
tmōr bhāi 1 7
27 oxen
(oxen twenty 1 7)

The position of bhāi, plon, slik and the borrowed cāta are as for M.K.
rū:y, pōn, m̄v:n, etc. They are required in all counting (and not, as phlo:n and slyk in M.K., just for fruit and vegetables) and they are used with numeral coefficients, e.g.
slăt temn cāta 1
slăt tem slik 1
1 hundred areca-trees
400 areca-trees
(area trunks hundred 1)
(area 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 c₁, 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 cnām ta moy, ‘four times a year, (four times year the one)’ where cnām 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 infused -n- and partnered by words having no infix,¹⁶

<table>
<thead>
<tr>
<th>C₁</th>
<th>English</th>
<th>Khmer</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>s-an-re</td>
<td>c₁</td>
<td>sre n</td>
<td>ricfield</td>
</tr>
<tr>
<td>t-n-em</td>
<td>c₁ trunk of tree</td>
<td>tem n, c₁ tree</td>
<td></td>
</tr>
<tr>
<td>d-n-em</td>
<td>c₁ team, yoke</td>
<td>*dem (M.K. tum ‘to yoke’)</td>
<td></td>
</tr>
<tr>
<td>k-hn-et</td>
<td>c₁₁ period of waxing moon</td>
<td>ket n, c₁₁ period of waxing moon</td>
<td></td>
</tr>
<tr>
<td>r-n-oc n</td>
<td>c₁₁ period of waning moon</td>
<td>roc c₁₁ period of waning moon</td>
<td></td>
</tr>
<tr>
<td>v-n-ek</td>
<td>c₁ ladleful</td>
<td>*vek (M.K. vê:k ‘ladle’)</td>
<td></td>
</tr>
<tr>
<td>t-an-loń</td>
<td>c₁ a tloń measure</td>
<td>tloń (capacity measurement)</td>
<td></td>
</tr>
</tbody>
</table>

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 Infexion in Old Mon, Old Khmer and Modern Khmer’, in LCSEAP. The list (68) may be tentatively increased by the addition of tneñ, dneñ, knet, rnoc, vneñ.
3.1.2. **Lexicon.** The following terms have been noted:
mû:y, mvô:y; \(^{17}\) pi:r, piy:r, byô:y; bo:n, buan; pram;
16 pra:mû:y-twântô:p (cf. M.K. pram-mû:y-dôndô:p);
1000 pi:o:n; \(^{18}\)
10 000 saen.

One may assume the following:
10 tô:p (cf. twântô:p above);
30 mû:y phûry or mphûy; \(^{19}\)
30-90 As for M.K. (Thai loanwords).

3.1.3. **Internal grammatical characteristics.** From occurrences such as pra:mû:y, ‘six’, pra:mû:y-twântô: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 prampyil, ‘seven’, is in line with modern prampul and at least one O.K. occurrence of pramyal. pi:o:n and saen (modern pô:n and saen) are multiplied by the preceding numeral as in M.K. e.g. mû:y pi:o:n mû: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.

| kruôô-ba:y somrap 3 | 3 sets of rice-utensils (rice-utensils sets 3) |
| köntêl khnâvy somrap 2 | 2 sets of mats and cushions (mats cushions sets 2) |
| cau sra:mner 'ûntôomô: li: 'ôñ(k) mû:y | novice Indamoli, one (title novice Indamoli person one) |

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

prêâh mi:as 'ôñ(k) pi:r two gold ‘Buddhas’ (and) (Buddhas gold bodies two)
prêâh prak 'ôñ(k) pi:r two silver ones (Buddhas silver bodies two)

In the following example more words intervene:

saⁿ prêâh mi:as tumô:j:n make a ‘Buddha’ of gold (make Buddha gold weigh
tômû:j:n 4 weighing 4 tômû:j:n
tômû:j:n 4)

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

5 taõ (M.K. dô:j) 5 times
2 kri:a 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

3.2.2. Lexicon
(i) \( c_i \). Words catalysed as \( c_i \) are given in paragraphs a)-c):
   a) Weight/value, tomlv\( \eta \), ‘a measure’, baːt, slv\( \eta \), ‘measures of silver or gold (4 slv\( \eta \) = 1 baːt)’; cînciː\( \eta \), luv\( \eta \), ‘values by weight’. Distance, hat(th), ‘handspan’.
   b) somrap, ‘set’.
   c) ‘\( \eta \)’, ‘image’.

(ii) \( c_{ii} \). Words catalysed as \( c_{ii} \) are given in paragraphs a)-c):
   b) nēak, ‘person’, ‘\( \eta \)’, ‘religious person’.
   c) anle, ‘place’, saːr, ‘item’.

Members of the two coefficient classes seem to be distinct, though the same form, ‘\( \eta \)’ 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. ‘\( \eta \)’ 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 \( xc_{ii} \).

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. \( X = xc_{ii} \) is used alone except in connection with persons.

3.3.2. Lexical points. Occurrences of \( X \) used attributively with \( n \) are ‘quantitative’, e.g.

<table>
<thead>
<tr>
<th>khmer</th>
<th>meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>krmn slaː somrap l</td>
<td>1 set of areca utensils</td>
</tr>
<tr>
<td>somboːr - - múːy saːr</td>
<td>one kind of riches</td>
</tr>
</tbody>
</table>

3.4. Additional notes
No evidence of phloː\( n, slyk \), 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. Numerical 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 យោះ៖ច ( + n), ‘distance = approximately 10 miles’ e.g. ប៊ៃ:១ - - - - pramvry-hmy:n យោះ៖ច ( + n), ‘returned - - - - the eighty thousand miles, (returned - - - - eight-ten-thousand yojana).’

b) ឆ្មា, ‘year’ e.g. កែមូស pram-mūy ឆ្មា, ‘for fully six years, (complete six years)’

  រុូ:ប្រ្លុេ:ត-ការ, ‘night-time’ e.g. ៥៤ មូស រុូ:ប្រ្លុេ:ត-ការ ’the whole of one night, (all one night-time);’

c) នី:ការ, ‘place’ e.g. វី:ធ ដៅ បុណ្ណ នី:ការ, ‘land in four places (land in four places);’

  d) persons ព្រះ-ឆ្ន(k), ‘venerable person’, e.g.

  ព្រះ នាពាក្សាមា:ក្ស តាយ ព្រះ-ឆ្ន(k) (venerable chiefs all three

  សុរត្រុយ, ស្តាខ នាក្សម, ‘princess, prince’, e.g.

  តាយ ពិរ: សុរត្រុយ ស្តាខ  ប៉ុន្តែព្រះ-ឆ្ន  (both prince and princess

  សុរត្រុយ, ‘king’, e.g.

  ព្រះ បុរុយ:ត តាយ ពិរ: សុរត្រុយ ស្តាខ   (the two kingly fathers

  សុរត្រុយ  (venerable fathers all two kings)

  េញី:រ, ‘person’, e.g.

  ព្រះ បុរុយ:ត ខ្មែរ តាយ ប៉ុន្តែព្រះ-ឆ្ន  (all five eminent princes

  អេញី:រ  (venerable foot (= respected)

  ផ្សេងប្រយែង ព្រះ-ឆ្ន  (princes all five persons)

  e) general items, praka(r), e.g.

  ៥៤ យ្ល្វាង:ព្រះ បុរុយ:ត  (all five kinds of power

  អេញី:រ  (all power five items)

  សា, ‘item’, e.g.

  កំ:មូស sa  (a certain crow

  អេញី:រ  (crow one item)

4.2.3. Membership of other word categories. នី:ការ, សុរត្រុយ and ស្តាខ 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, តាយ ពិរ: សុរត្រុយ ស្តាខ ឈ្លើយ ប៊ៃ:១ ព្រះ បុរុយ:ត  ‘Both prince and princess greeted the royal father (all two princess prince offer greeting venerable father).’ In M.K. prose style this would be ស្តាខ តាយ ពិរ: សុរត្រុយ  ‘The three princes went - - - - (all three venerable-persons go - - - -).’ In M.K.: ស្តាខ តាយ ព្រះ-ឆ្ន.
Khmer numerals and numeral coefficients

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 russvy tessa myey  all the 100 000 million great
saen kət(i)           hermits              (great hermits all one
'tama'ti(y) myey    a certain counsellor  hundred thousand million)
tessa plo bvy        the three goddesses     (counsellor one)
                    (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.

tessa pi:(r) ksotr v 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 ‘ksotr v ksotr v tessa pi:(r) prəəh-əŋ(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 çata 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 ‘dondop’ for the composition of the ‘teens’. It is not, I think known at what stage dondop 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. tañatp 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:

<table>
<thead>
<tr>
<th>O.K.</th>
<th>M.K.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$c_i$ je 'capacity measure'</td>
<td>$\kappa \sigma \varsigma$ 'basket (1 bushel)'</td>
</tr>
<tr>
<td>samrap 'set'</td>
<td>somrap 'set'</td>
</tr>
<tr>
<td>dneñ 'team, yoke'</td>
<td>thnum 'team, yoke'</td>
</tr>
<tr>
<td>khse 'string'</td>
<td>khsae 'string'</td>
</tr>
<tr>
<td>tem 'tree'</td>
<td>daam 'tree'</td>
</tr>
<tr>
<td>$?$ par 'set, collection'</td>
<td>dombo:(r) 'set of four'</td>
</tr>
<tr>
<td>(exact meaning uncertain)</td>
<td></td>
</tr>
<tr>
<td>$c_{ii}$ thñai 'day'</td>
<td>thñay 'day'</td>
</tr>
<tr>
<td>ket 'period of waxing moon'</td>
<td>kavt 'period of waxing moon'</td>
</tr>
<tr>
<td>roc 'period of waning moon'</td>
<td>röːc 'period of waning moon'</td>
</tr>
<tr>
<td>chnam 'year'</td>
<td>chnam 'year'</td>
</tr>
</tbody>
</table>

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