Some Properties of Burmese Script

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0 Introduction

0.1 Indic Scripts

- The group of phonographic script systems which are descendants of the script of Aśokan prākrit inscriptions in 3cBC. (Sawada 2011: 48, originally in Japanese, slightly modified)

- Indic scripts in Southeast Asia developed from the ‘extensive’ use of (Pallava-)Grantha script, i.e. the application of the script originally invented for Prākrit and Sanskrit to local languages. (Sawada 2008: 456, originally in Japanese)
0.2 Burmese language and Burmese script

**Burmese language**

- Burmic, Burmish, Lolo-Burmese, Tibeto-Burman (Nishi 1999)
- Burmish group consists of Burmese dialects such as Yangon-Mandalay, Dawe (Tavoyan), Rakhine (Arakan), Intha, as well as Maruic languages such as Lhaovo (Maru), Lacid (Lashi), Zaiwa (Atsi), Ngochang (Nishi 1999)

**Burmese script**

- Assumed to be the result of the application of Mon script to Burmese language
- The oldest dated document in Burmese language is *Rājakumār (Myazedi) Inscriptions* (AD1112).
• Discrepancies between spelling and sounds of Modern Burmese due to historical sound change, observable from the following data:
  – Transcriptions with Chinese Characters of Miǎn-Tiàn-Guǎn-Yì-Yǔ 缅甸館詮語 compiled in Ming period, AD15c (Nishida 1972)
  – Borrowing words from Aryan languages (mainly Pāli) into Burmese
  – Borrowing words from Burmese into Shan
  – Phonological correspondence between Burmese and other Burmish languages
• Thought to be the base of such scripts as Ahom, Shan and Tai-Na
1 Retention of *virāma* ञञञञ

1.1 Akṣara segmentation

Pāli. *cintita-m attan-o* (thought-ACC self-GEN) ‘one’s own thought’

(Rājakumār Inscription, Pillar A, Pāli Face, l.19)
• Akṣara segmentation segments a sound sequence into akṣaras, i.e. units which end in a vowel: CV, CCV, CCCV.

<table>
<thead>
<tr>
<th>C</th>
<th>v</th>
<th>CC</th>
<th>v</th>
<th>C</th>
<th>v</th>
<th>CC</th>
<th>v</th>
<th>C</th>
<th>v</th>
</tr>
</thead>
<tbody>
<tr>
<td>c</td>
<td>i</td>
<td>n=t</td>
<td>i</td>
<td>t</td>
<td>a</td>
<td>m</td>
<td>a</td>
<td>t</td>
<td>=t</td>
</tr>
</tbody>
</table>

\{c i n = t i t a m a t = t a n o\}

C: consonant letter  CC: conjunct consonant letter  v: vowel sign

• A sequence of consonants is notated by a **conjunct consonant letter (ligature)**, which essentially is a cluster of consonant glyphs stacked vertically: e.g. \(\overset{\text{ligature}}{\text{n=t}}\), \(\overset{\text{ligature}}{\text{t=t}}\)

• An akṣara (delimited by | s) often does not coincide with a syllable notation (indicated by coloring).
1.2 Syllable-based segmentation

Old Burmese ‘one thousand six hundreds (twenty-eight)’

(Rājakumār Inscription, Pillar A, Burmese Face, ll.1–2)

cf. ModB.

/ tả thau\^nL chauʔ yaL /

one thousand six hundred
Virāma ={`} (called ဗုဒ္ဓကိုကို /ʔャိ/ ‘killer’ in Burmese) explicitly indicates final consonant letters, i.e. the end of closed syllable notation.

Virāma is essential to syllabic segmentation in Burmese script because the consonant letters without virāma are taken as ‘non-final’.
Akṣara segmentation does not fit in with Burmese. If ‘one thousand six hundreds’ is written using akṣara segmentation, the spelling will become tremendously complicated.

\[
\begin{array}{cccc}
\infty & \infty & \infty & \infty \\
\{ t & a & c & t h \} & o & n g^\wedge & k h &=r & o & k &=r &=y & a a \\
C & v & v & CC & v & v & CCC & v & CCC & v & v
\end{array}
\]

Compare with the actual spelling:
1.3 History of virāma

In Pāli, consonants do not appear in absolute final position. But in Sanskrit (and also some variants of Prākrit) consonants can appear in the position, though it is rare.

To notate such consonants, for which neither single nor conjunct consonant letters are unavailable, the convention of subscript consonant letter were introduced.

An example of subscript consonant letter

\{sid=dham\}

Prākrit inscription of the 10th cave, Nāsik, Maharashtra, India. ca.AD1c.

(Epigraphia Indica. Vol. VIII. Plate 6.)
In the late AD4c ~ 5c, a short horizontal line (maybe functioned as a reference line) was added above the subscript consonant letter.

An example of \textit{vir\={a}ma}

\{(n\sim=c)\ opaneyam\}'

Sanskrit copper plate inscription of King Chandravarman of Kalinga, Bobbili, Andra Pradesh, India. 1st half of AD5c. (\textit{Epigraphia Indica}. Vol. XXVII. Plate 8)
Virāma in Southeast Asian Indic scripts

Mon:
{klam̥ ti Deý’}
Wat Pho Rāŋg Inscription, Nakhon Pathom, Thailand, AD5c.
(Cœdès 1929: 30)

Khmer:
{kamratān’ Añ́’}
K149, Prasat Sambor, Sambor Prei Kuk, Kompong Thum, Cambodia, AD6–7c.

Cham:
{niy’ kāla}
C37, Po Nagar Temple, Khánh Hoa, Vietnam, AD813.
K31, Phnom Chisor, Ta Keo, Cambodia, AD1019. ll.1–4: the supposedly earliest Khmer inscription almost lacking *virāma*

Consonant letters without *virāma*, Consonant letter with *virāma*
Types of final consonant notation in modern SE Asian Indic scripts

Virāma type using virāma to mark final consonant letters: Javanese, Mon, Burmese, Shan etc. Burmese မစ် ‘domino-like game’

Final letter type using special final consonant letters, as the compensation for virāma: Cham Cham မီး ‘to do commerce’

Unmarked type using consonant letters by themselves as final consonant letters: Khmer, Thai*, Lao* Thai ဗ ‘sedge’

* indicates that the script has never had virāma

Subscript type using consonant letters subscript to the vowel sign as final consonant letters: Tham* N.Thai ง ‘sedge’

cf. Sgo Karen, Missionary Pwo Karen (no final consonants); Buginese (Final consonants are unwritten.)
2 Reinterpretation of the length opposition of vowel signs

2.1 ‘Traditional’ vowel-tone chart of Modern Burmese script

<table>
<thead>
<tr>
<th></th>
<th>/a/</th>
<th>/i/</th>
<th>/u/</th>
<th>/e/</th>
<th>/ɛ/</th>
<th>/ɔ/</th>
<th>/o/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creaky</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Level</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Heavy</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

- Pattern A: only heavy tone sign appears.
- Pattern B: both heavy and creaky tone signs appear.
- Pattern C: only creaky tone sign appears.

※ Level tone does not have its own sign.
2.2 Original $5 \times 2$ system of vowel notation of Indic script

In Sanskrit, \{ai\} vs. \{e\} and \{au\} vs. \{o\} are taken as ‘long-short’ oppositions.
2.3  Vowel notation of Mon script in AD11c

In Mon script, the ‘long-short’ opposition of vowel signs are reinterpreted as that of syllable types:

‘long’ notations signified open syllables, and
‘short’ notations signified closed syllables ending with */⁻ʔ/. 
{e} and {o}, treated as ‘long’ notations distinct from {ai} and {au} respectively, lacked the corresponding ‘short’ notations.

‘Long’

{-aa}† {-ii}† {-uu}† {-e}† {-o}†

*/-a/ */-i/ */-u/ */-e/ */-o/

‘Short’

{-a} {-i} {-u}

*/-a?/ */-i?/ */-u?/
So, the complex ‘short’ notations containing the final consonant letter Armor{[@’] signifying */-ʔ/ were introduced to fill the gap.

‘Long’

\[
\begin{array}{cccccc}
\{-aa\}^\dagger & \{-ii\}^\dagger & \{-uu\}^\dagger & \{-e\}^\dagger & \{-o\}^\dagger \\
*/-a/ & */-i/ & */-u/ & */-e/ & */-o/ & (rare)
\end{array}
\]

‘Short’

\[
\begin{array}{cccccc}
\{-a\} & \{-i\} & \{-u\} & \{-e@’\} & \{-o@’\} \\
*/-aʔ/ & */-iʔ/ & */-uʔ/ & */-eʔ/ & */-oʔ/ &
\end{array}
\]

† ‘There were not open syllable words in Proto Mon. The first ones seem to have been introduced by borrowing from adjacent languages and Sanskrit-Pāli.’ (Ferlus 1974: 66. Original in French.)
2.4 Vowel(-tonal) notation of Burmese script in AD12c

In Burmese script, the ‘long-short’ opposition was reinterpreted again as tonal opposition L, H vs. C.

‘Long’

\[
\begin{align*}
&\text{\{aa\}} \quad \text{\{ii\}} \quad \text{\{uu\}} \quad \text{\{-e\}} \quad \text{\{-o\}} \\
&\text{*/-a}^{L,H}/ \quad \text{*/-i}^{L,H}/ \quad \text{*/-u}^{L,H}/ \quad \text{*/-e}^{L,H}/ \quad \text{*/-o}^{L,H}/
\end{align*}
\]

‘Short’

\[
\begin{align*}
&\text{\{a\}} \quad \text{\{i\}} \quad \text{\{u\}} \quad \text{\{-e\}'\} \quad \text{\{-o\}'\}} \\
&\text{*/-a}^{C}/ \quad \text{*/-i}^{C}/ \quad \text{*/-u}^{C}/ \quad \text{*/-e}^{C}/ \quad \text{*/-o}^{C}/
\end{align*}
\]
Incorporating the notations of rhymes with */-y/, */-w/

*/-aw/

Vowel sign traced back to {-au} in the original system.

Originally a part of \( \textcircled{a} \textcircled{w} \), extracted as a distinct sign.

Analyzed as a final consonant sign \{-W\} to notate */-w/.

So, \( \textcircled{a} \textcircled{w} \) can be reanalyzed as the combination of vowel sign \{-o\} + final consonant sign \{-W\} in parallel with \( \textcircled{o} \textcircled{w} \) \{-ow’\}, a variant of \( \textcircled{o} \textcircled{w} \) \{-aw’\}. 
2 Reinterpretation of the length opposition of vowel signs

*-ay/

\{-aY\} Originally a part of the vowel sign \{-ai\}, extracted as a distinct sign. Analyzed as a final consonant sign \{-Y\} to notate *-/y/, parallel with \{.

Digraph

*-əw/

\{-uiw’\} is a digraph invented to write a central vowel which must have been unable to be written properly with any of existing vowel signs.
vowel -y/-w

\[ \text{Long} \]
\[ \text{Short} \]

Rhymes with creaky tone are written with \( \ddot{s} \), which can be analyzed as a conjunct consonant letter containing \( \ddot{s} \) ‘killed’ by \textit{virāma}.

※ Not a few inscriptions do not use \( \dddot{s} \) and \( \dddot{s} \), so to speak ‘non Creaky-Sensitive’ (Sawada2003: 325)
2.5 Change to the modern vowel notation system

*Sound changes*

<table>
<thead>
<tr>
<th>AD12c</th>
<th>ModB</th>
</tr>
</thead>
<tbody>
<tr>
<td>*/-ay/</td>
<td>*/-ε/</td>
</tr>
<tr>
<td>*/-uy/</td>
<td>*/-wε/</td>
</tr>
<tr>
<td>*/-iy/</td>
<td>*/-e/</td>
</tr>
<tr>
<td>*/-ɔ/</td>
<td>*/-ɔ/</td>
</tr>
<tr>
<td>*/-aw/</td>
<td>*/-o/</td>
</tr>
<tr>
<td>*/-əw/</td>
<td>*/-o/</td>
</tr>
</tbody>
</table>
Reinterpretation of the length opposition of vowel signs

‘Long’  

{-aa}  {-ii}  {-uu}  {-e}  {-o}  
*/-a\textsuperscript{L,H}/  */-i\textsuperscript{L,H}/  */-u\textsuperscript{L,H}/  *//-e\textsuperscript{L,H}/  *//-o\textsuperscript{L,H}/

{-ay'}  {-uy'}  {-iy'}  {-aw'}  {-uiw'}  
*/-ay\textsuperscript{L,H}/  */-uy\textsuperscript{L,H}/  *//-iy\textsuperscript{L,H}/  *//-aw\textsuperscript{L,H}/  *//-uiw\textsuperscript{L,H}/

{-aY}  {-oW}  
*//-a\textsuperscript{L,H}/  *//-o\textsuperscript{L,H}/
Reinterpretation of the length opposition of vowel signs

<table>
<thead>
<tr>
<th>Vowel</th>
<th>Short Length</th>
<th>Long Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>[-a]</td>
<td>[-a(L(H))]</td>
</tr>
<tr>
<td>e</td>
<td>[-e]</td>
<td>[-e(L(H))]</td>
</tr>
<tr>
<td>i</td>
<td>[-i]</td>
<td>[-i(L(H))]</td>
</tr>
<tr>
<td>u</td>
<td>[-u]</td>
<td>[-u(L(H))]</td>
</tr>
<tr>
<td>o</td>
<td>[-o]</td>
<td>[-o(L(H))]</td>
</tr>
<tr>
<td>y</td>
<td>[-y(H)]</td>
<td>[-y(L))]</td>
</tr>
<tr>
<td>w</td>
<td>[-w(L))]</td>
<td>[-w(L,H))]</td>
</tr>
</tbody>
</table>

Symbols:
- \(\circ\) for short length
- \(\bullet\) for long length

Additional symbols:
- \(\circ\) for vowel signs
- \(\bullet\) for long vowel signs
- \(\circ\circ\) for stressed vowel signs
- \(\circ\circ\circ\) for long stressed vowel signs

Arrows indicate transitions between short and long vowel signs.

The table shows the mapping of short vowel signs to long vowel signs, with additional symbols for stressed and long stressed vowels.
Heavy tone sign – .ibatis

- derived from *visarga* which signifies syllable final aspiration in Sanskrit

- *Visarga* also appears in Burmese inscriptions of AD12c, but it is merely optional.

- The first inscription using – .ibatis to write /a^H/ obligatorily is maybe *Kaunghmudaw Pagoda Inscription* (AD1636) in Sagaing.

Note that ӝ, not ӝ, not ӝ, not ӝ

- Current usages with ‘long’ vowel signs, such as ӝ ӝ ӝ ӝ ӝ became obligatory not earlier than AD18c.
2 Reinterpretation of the length opposition of vowel signs

'Short'

\[
\begin{align*}
\text{\{-a\}} & \quad \text{\{-i\}} & \quad \text{\{-u\}} & \quad \text{\{-e\}} & \quad \text{\{-o\}} \\
\ast/-a^c/ & \quad \ast/-i^c/ & \quad \ast/-u^c/ & \quad \ast/-e^c/ & \quad \ast/-o^c/
\end{align*}
\]

\[
\begin{align*}
\text{\{-ay=\}} & \quad \text{\{-uy=\}} & \quad \text{\{-iy=\}} & \quad \text{\{-aw=\}} & \quad \text{\{-ow=\}} & \quad \text{\{-uiw=\}} \\
\ast/-ay^c/ & \quad \ast/-uy^c/ & \quad \ast/-iy^c/ & \quad \ast/-aw^c/ & \quad \ast/-ow^c/ & \quad \ast/-uiw^c/
\end{align*}
\]
2 Reinterpretation of the length opposition of vowel signs

\[ \begin{array}{cccccc}
\{ -a \} & \{ -i \} & \{ -u \} & \{ -e \} & \{ -o \} \\
/-a^c/ & /-i^c/ & /-u^c/ & /-e^c/ & /-o^c/ \\
\end{array} \]

\[\begin{array}{cccc}
\{ -aY. \} & \{ -uy=^@' \} & \{ -iy=^@' \} & \{ -aw=^@' \} \\
/-e^c/ & /-uy^c/ & /-iy^c/ & */-aw^c/ \\
\end{array}\]

\[\begin{array}{cccc}
\{ -we. \} & \{ -uiw=^@' \} \\
/-we^c/ & /-e^c/ \\
\end{array}\]
Reinterpretation of the length opposition of vowel signs

*Creaky Tone sign* $\sim$

\[ \sim \frac{\text{ Sagaing}}{\text{ Kaunghmudaw Pagoda Inscription}} \quad \sim \quad \text{Bagan} \quad \text{Uyingyi Monastery Ink Inscription} \]

Obverse, l.24 Obverse, l.9 (left) & l.4 (right) AD1636 AD1768 computer font modern
Summary of vowel-tone notation

<table>
<thead>
<tr>
<th></th>
<th>/a/</th>
<th>/i/</th>
<th>/u/</th>
<th>/e/</th>
<th>/o/</th>
<th>/ɛ/</th>
<th>/ɔ/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td>⊗ {-aa}</td>
<td>⊙ {-ii}</td>
<td>⊙ -uu}</td>
<td>⊗ {-e}</td>
<td>⊙ -ui}</td>
<td>⊙ {-ay'}</td>
<td>⊙ {-o'}</td>
</tr>
<tr>
<td>Heavy</td>
<td>⊗{-aa:}</td>
<td>⊙{-ii:}</td>
<td>⊙{-uu:}</td>
<td>⊗{-e:}</td>
<td>⊙{-ui:}</td>
<td>⊙ {-aY}</td>
<td>⊙ {-o}</td>
</tr>
<tr>
<td>Creaky</td>
<td>⊗ {-a}</td>
<td>⊙ {-i}</td>
<td>⊙ {-u}</td>
<td>⊗ {-e.}</td>
<td>⊙ {-ui.}</td>
<td>⊙ {-aY.}</td>
<td>⊙ {-o.}</td>
</tr>
</tbody>
</table>

- **Pattern A**: only heavy tone sign appears.
  Two vowel signs constituting a ‘long-short’ pair are used for tonal distinction:
  Heavy tone sign – ⊗ cooccurs with ‘long’ vowel signs (for L).

- **Pattern B**: both heavy and creaky tone signs appear.
  One and the same vowel sign is used for all tones.

- **Pattern C**: only creaky tone sign appears.
  Two ‘unpaired’ notations are used for tonal distinction:
  Creaky tone sign – ⊙ cooccurs with notations for H.
3 Class change of vowel letter आ

Prākrit/Sanskrit inscriptions
- Originally {a} belongs the class of vowel letter.
- Very low occurrence ratio. (Vowel letters usually occur only sentence-initially.)

Mon inscriptions
- आ {@’} has already occurred in the earliest inscriptions.
- A letter which can take a virāma is taken to belong to the class of consonant letter.
  (Remember that the function of virāma is to indicate final consonants explicitly.)
Class change of vowel letter ๐

- ๐ notates */ʔ/. → ๐ notates */ʔaʔ/.

※ Therefore, it is in fact inappropriate to call ๐ ‘zero’-consonant letter.

- Accordingly, ๐ was reanalyzed as the combination of a consonant letter {ⓐ} and a vowel sign {-aa}.

- Other vowel letters ๏| ๏| ๏| ๏| ๏| ๏ must have notated syllables with */ʔ-ʔ/.

- In AD11–12c Mon inscriptions, ๐ took a vowel sign only in ๐๔๐๔ {＠ut’} ‘all’.
Burmese inscriptions

- Burmese inherited  따른, hence  as a consonant letter, from Mon.

- The earliest usage of  with vowel signs:

  \( \text{ADB} /\text{æw}/ \text{<title prefixed to the name of a woman>} \) (AD1147)

  ※ Note that the syllable cannot be written with any existing vowel letter.

- Native Burmese lexical words came to be written with  later than the mid AD15c.

- In ModB. script, vowel letters are used in words borrowed from Pāli, and ‘Zero’-consonant letter is used in native Burmese words, in principle.
Distribution of ‘zero’-consonant letter in modern SE Asian Indic scripts

Scripts with both vowel letters and ‘zero’-consonant letter
- Vowel letters are used regularly, and ‘zero’-consonant letter is used optionally: Cham
- ‘Zero’-consonant letter is used to notate syllables which cannot be notated by any vowel letter: Mon
- ‘Zero’-consonant letter is used to write native words in principle: Burmese, Khmer, Tham (Lanna); Javanese ({h-} is used as ‘zero’-consonant letter.)

Scripts with ‘zero’-consonant letter but not vowel letters
Thai, Lao, Shan
References


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