Proposal to Encode the Newar Script in ISO/IEC 10646

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1   Introduction

This is a proposal to encode the Newar script in the Universal Character Set (ISO/IEC 10646). Feedback is requested from experts and the user community regarding the character repertoire, the representative character glyphs, and other attested characters that are not yet proposed for encoding.

Script Name   The proposed name for the script block is 'Newar'. It is a tentative assignment and may change based upon feedback from the user community.

Allocation   The block is allocated to the Supplementary Multilingual Plane (SMP) at U+11400.

Character Names   Character names follow the convention used in the UCS for characters of other Brahmi-based scripts. In some cases, the character names differ from indigenous Newar names. Where possible, Newar names have been provided as aliases in the names list.

Character Repertoire   The proposed repertoire consists of 91 characters (see the code chart and names list in figures 1 and 2). The intent is to enable the broadest representation of the Newar script, from the historical forms of Old Newar manuscripts to the present style of 'Prachalit' known as 'Nepal Lipi'. The repertoire contains characters that may not be in current use, but which are nonetheless historically attested. The representative character glyphs are based upon the letterforms in *Pracalita Lipiyā Varṇamālā* (Nepal Lipi Guthi, 1992). Characters not yet proposed for encoding are identified in Section 5.

Justification for Independent Encoding   Although the Newar script has structural and graphical similarities to Devanagari, it is proposed for independent encoding on account of its rendering requirements. These include, but are not limited to, the combining and shaping behaviors of dependent vowel signs; the shaping of consonant-letter headstrokes in certain environments; and the contextual shaping of consonants in conjuncts. These are regular features of the Newar script and must be properly represented in plain text.

Font   The Newar glyphs used here are based upon the 'Rabison' typeface developed by Rabison Shakya in 2002 for his *Nepala Lipi Varnamala: Alphabet of the Nepalese Script*. The present author has modified several of Shakya's original designs and added several new glyphs.

2   Background

Newar is a Brahmi-based script used for writing Newar (ISO 639-3: new), a Tibeto-Burman language spoken by 825,000 people in Nepal, predominantly in the Kathmandu Valley. The Newar language is known indigenously as नेवाः राय् / नेवाः भाय् 'Newa Bhay' and in the Nepali language as नेपाल राया / नेपाल भाषा 'Nepal Bhasa'. Although it is called 'Nepal Bhasa', Newar is distinct from the Indo-Aryan language Nepali (ISO 639-3: nep), the official language of the Federal Democratic Republic of Nepal, which is known also as 'Gorkhali' and 'Khaskura'. Newar is the fifth most-spoken language in Nepal. It is also spoken by 14,000 people in the Indian state of Sikkim, where it is recognized by the Government of Sikkim as an official language of the state. The Newar language is currently written in Devanagari; however, the Newar script is being promoted as the written standard by various Newar organizations. The script is also used for writing Sanskrit and Nepali. It was used historically for writing Maithili, Bengali, and Hindi.

The Newar script is a descendent of Brahmi through the northern Gupta script. It related to Devanagari and has affinity to the Bengali and Tirhuta scripts. Tables that illustrate the evolution of Newar characters from Brahmi are shown in Figure 35. The Newar script is the modern and current form of the "even-headed" or "flat-headed" (पाचुमोल *pācumola*) script, which is one of three writing systems traditionally associated with Newar linguistic culture since the 10th century.

The script is known by several names: 'Nepal', 'Newar', 'Newari', 'Prachalit'. The first proper reference appears in the 1654 inscription of Pratap Malla (r. 1641–74) at Hanuman Dhoka in Durbar Square, Kathmandu (see figure 7), where it is referred to as नेवार आखर *nevāra ākhara* "Newar Script". The term नेवारी 'Nevari' / 'Newari' is first used in the 18th century by Capuchin monks and it enters into common usage in English in the early 19th century. Both 'Newar' and 'Newari' are derived from the Newar self-designation नेवाः *nevāḥ*. The first use of 'Nepal' for the name of the script was by Pannāprasāda Jośī in *Nepāla Deśyā Akṣarabodha* (1950), who called it नेपालाक्षर 'Nepal Akshar'. The epigraphist Hemarāja Śākyavaṃśa identified the script as थौंकन्हे प्रचलित लिपि 'Thaunkanhe Prachalit Akha' in *Nepāla Lipi Saṃgraha* (1953) and in *Nepāla Lipi-Prakāśa* (1973) he called it प्रचलित नेवारी लिपि 'Prachalit Newari Lipi', giving rise to 'Prachalit Lipi' or the "Current Script", which is name by which the script is most commonly known. The more indigenous name नेवाः आखः / नेवाः आखः 'Newa Akha' is also found. At present, the names प्रचलित नेपाल लिपि 'Prachalit Nepal Lipi' and नेपाल लिपि 'Nepal Lipi' are promoted by Newar organizations. Both 'Newari' and 'Newar' are used in English, but the latter is the current scholarly designation for the language and script.

The Newar script has been used since its emergence in the 10th century. The first recorded use of the script is a manuscript of the *Laṅkāvatāra Sūtra*, which is dated 908 CE (see Figure 3). The script was actively used until the latter half of the 18th century, when Gorkha rule ended the reign of Newar dynasties in 1769. After that time, use of the Newar language and script began to decline. In 1905, the Rana government banned the use of both the Newar script and language. It imposed harsh discriminatory policies against the Newar language, including imprisonment and exile for those who studied the language and published in it. The ban was lifted in 1951 when Rana rule was brought to an end. However, the effects of the policies against the Newar language and Newar scholarship, in general, linger in the present.

In the latter half of the 20th century, several efforts were undertaken to revive and promote Newar linguistic traditions. Organizations were established for the preservation and study of the Newar script and manuscripts. The Nepal-German Manuscript Preservation Project (NGMPP) was a joint effort initiated in 1970 between His Majesty's Government of Nepal and the German Research Council (Deutsche Forschungsgemeinschaft). It operated until 2002 and produced nearly 180,000 manuscripts on microfilm. NGMPP was succeeded by the Nepalese-German Manuscript Cataloguing Project (NGMCP) in 2002 and continues to operate at the Nepal Research Centre in Kathmandu. Other efforts for the preservation of Newar manuscripts were launched by Asa Safu Kuthi, a private library in Kathmandu, who goal is to digitize Newar manuscripts.

In the 1980s, Newars formed organizations to promote scholarship in the language and to revive usage of the script. Two organizations dedicated to the study, preservation, and promotion of the Newar script, as well as Ranjana, are the Nepal Lipi Guthi (Kathmandu) and Lipi Thapu Guthi (Lalitpur). Nepal Lipi Guthi has most actively promoted the script. It developed a standard for it in September 1989 under the advisement of leading Newar scholars. In March 2010, it convened the Nepal Lipi Encoding Committee in order to study approaches to encoding the Newar and Ranjana scripts in the UCS.

Some of the historical and current applications of the script are:

1. *Inscriptions*   Nearly all inscriptions on stone, copper plates, and other materials from the 10th century until the establishment of the Shah regime in 1769 were produced in the Newar script (Kamal P. Malla, personal correspondence, 2011). See figures 4 and 7 for examples of Newar inscriptions.

2. *Coinage*   The script appears on coins issued by Malla rulers until 1768 (see figures 5 and 6.

3. *Manuscripts*   Nearly 30,000 manuscripts are written in the Newar script (Malla 1981: 23). The majority of these are manuscripts containing Sanskrit texts.

4. *Books*   The first books were published in the Newar script by the Nepal Printing Press in the 1960s. Printing was performed using metal types commissioned by Pushpa Ratna Sagar.

5. *Metal Fonts*   Printing technology for the script was first introduced in 1952 by Pushpa Ratna Sagar (Tuladhar 2009). Sagar commissioned Gyan Ratna Bajracharya to design the glyphs and sent the drawings to the Eastern Type Foundry in Kolkata, India. The first Newar typewriter was produced by Sagar in 1986. The glyphs were designed by Keshav Ratna Bajracharya and taken by Sagar to Allahabad, India where typebars were developed by the Characters Types foundry and fitted to a Remington typewriter.

6. *Literary Periodicals*   Several literary journals and periodicals have been published in the Newar script during the past decade. The *Paubha* is a quarterly journal published by the Nepal Lipi Guthi, Kathmandu. The *Lipi Pau* is a monthly periodical (edited by Naresh Bir Shakya) published by Elohan Publications, Kathmandu (see figure 14). The *Thapu* is a literary annual (edited by Rajit Bahadur Shrestha) published by Lipi Thapu Guthi, Lalitpur.

7. *Government Publications*   The script is used in official government publications. In Sikkim, it is used for the Newar-language edition of the government bulletin titled *Sikkim Herald* (sub-editor Meena Pradhan), published by the Department of Information and Public Relations, Government of Sikkim.

8. *Ephemera*   The script is used on cover pages of books, the masts of newspapers, greeting cards, invitations, banners, and in signage.

9. *Digital Publications*   Activities aimed at the use and preservation of the Newar script and language are currently conducted in digital media. "Nepal Lipi Online" नेपाल लिपि ज्लाह्लिन publishes an annual supplement in the script, which is distributed in Portable Document Format (PDF).

10. *Digitized Typefaces*   Several digitized Newar typefaces are used for print and digital publications (see tables 2–5 for a comparison). The first was developed by Sunil Maharjan in 1994 for Navin Press. Subhash Printing Press produced "Newa Regular" in 1999. A third font was designed in 2000 by Rabindra Pachhai for Nepal Lipi Guthi. Also in 2000, 'Rabison Nepal Lipi' was produced by Rabison Shakya. These were followed by the 'Kumari' font, designed by Rajendra Shrestha, and 'Swati' by Samir Karmacharya. All fonts are based upon legacy encodings. The most recent is 'Aakha', developed by Suwarn Vajracharya and a team of designers.

Although Newar users have adapted the script for use in digital platforms, the solutions do not allow for the representation of the Newar script in plain text. The lack of a Unicode standard for Newar impedes its use in basic computing activities, such as writing e-mails, creating websites, and in digital publishing, as well as in larger scale efforts such as localization and internationalization. There are several organizations dedicated to the preservation of Newar manuscripts and to the promotion of the Newar language and scripts. An encoding for Newar in the UCS will provide the foundation for developing the necessary resources to support such efforts and to meet the needs of the Newar community in Nepal, Sikkim, and around the globe.

3   Description of the Encoding

3.1   Structure

The general structure (phonetic order, *mātrā* reordering, use of *virāma*, etc.) of Newar is similar to that of Devanagari. It is written from left-to-right. Certain consonant-vowel combinations are written as ligatures; certain vowel signs modify the graphical structure of the consonants with which they combine. Consonant clusters are represented as conjuncts and independent ligatures.

3.2   Virāma

The Newar ◌ VIRAMA is identical to the Devanagari VIRAMA. It is used for silencing the inherent vowel of a consonant and for producing conjuncts. The default rendering of VIRAMA is as a visible sign.

3.3   Vowels

There are 14 vowel letters proposed for encoding:

अ A	उ U	ऌ VOCALIC L	ओ O
आ AA	ऊ UU	ॡ VOCALIC LL	औ AU
इ I	ऋ VOCALIC R	ए E	
ई II	ॠ VOCALIC RR	ऐ AI	

Except for अ A, each vowel letter is written as a dependent sign when it is not initial.

3.4   Vowel Signs

There are 13 dependent vowel signs proposed for encoding:

◌ा VOWEL SIGN AA	◌ VOWEL SIGN VOCALIC R	◌ VOWEL SIGN AI
◌ VOWEL SIGN I	◌ VOWEL SIGN VOCALIC RR	◌ VOWEL SIGN O
◌ VOWEL SIGN II	◌ VOWEL SIGN VOCALIC L	◌ VOWEL SIGN AU
◌ VOWEL SIGN U	◌ VOWEL SIGN VOCALIC LL	
◌ VOWEL SIGN UU	◌ VOWEL SIGN E	

Vowel length   Vowel length is typically indicated using dependent vowel signs. However, the sign ○୫ VISARGA is also used for marking vowel length (see Section 3.9).

Shaping behavior   The ○̃ VOWEL SIGN E, ○̐ VOWEL SIGN AI, ○ী VOWEL SIGN O, ○ৌ VOWEL SIGN AU replace the headstroke of consonants with which they combine.

Contextual forms   The ○ा VOWEL SIGN AA ○̃ VOWEL SIGN E, ○̐ VOWEL SIGN AI, ○ী VOWEL SIGN O, ○ৌ VOWEL SIGN AU are written using contextual forms when combined with the consonants ग GA, ঞ NYA, ০ TTHA, ণ NNA, थ THA, ध DHA, श SHA. The shaping behavior is described in Section 3.6.

Category values   General category and Indic matra category values are based upon the regular vowel signs, not the contextual forms (see Section 6.4).

3.5 Consonants

There are 33 consonant letters proposed for encoding:

क	KA	ঞ	NYA	ध	DHA	ल	LA
ख	KHA	ट	TTA	न	NA	व	VA
ग	GA	০	TTHA	य	PA	श	SHA
घ	GHA	ঠ	DDA	र̃	PHA	ष	SSA
ঢ	NGA	ঢ	DDHA	व	BA	स	SA
च	CA	ণ	NNA	त	BHA	ह	HA
ক	CHA	ग	TA	म	MA		
ঙ	JA	थ	THA	य	YA		
म	JHA	द	DA	न	RA		

Each consonant letter bears the inherent vowel /a/, represented by ऄ A, which is silenced using ◌্ VIRAMA.

'Headed' and 'headless' letters   Consonants are classified into two categories based upon their graphical structure: those with a headstroke (मालद् *moladu* 'headed') and those without (मालमद् *molamadu* 'headless'). There are 7 letters without a head-stroke: ग GA, ঞ NYA, ০ TTHA, ণ NNA, थ THA, ध DHA, श SHA. When these letters are combined with certain vowel signs, the signs are written using contextual forms (see Section 3.6).

Consonant conjuncts   Consonant clusters are written as conjuncts (see Section 3.7).

Contextual forms   Two letters have contextual forms when they occur in certain consonant-vowel combinations: त BHA → ণ; ह HA → द (see Section 3.6).

Variant forms   Several letters have glyphic variants, which are to be managed through fonts: ग = ग GA; ত = म JHA; ক্ত = ঞ NYA; ব = न RA; থ = श SHA.

'Resonant breathy' consonants   The glyphs ह্, ह্, ह্, ह্, ह্, ह্, ह্. are often included in script charts (see figure 28). They are not independent letters, but are conjuncts that structurally represent consonant clusters with initial ह HA (see figure 16 and 22–24). In modern orthography, yhey are used for writing the 'resonant

breathy' sounds of Newar. Thus, while the base letter of ह्न *hna* is ह HA, it may be parsed as either /hna/ or /nha/ depending on its lexical environment. These glyphs are to be treated as conjuncts and are to be represented with ह HA as the initial consonant. The tables below show the correct sequences for conjuncts with HA in initial and non-initial positions:

Initial HA			Non-initial HA		
<ह HA, ◌, ङ NGA>	ह्ङ	*hṅa*	<ङ NGA, ◌, ह HA>	ङ्ह	*ṅha*
<ह HA, ◌, ञ NYA>	ह्ञ	*hña*	<ञ NYA, ◌, ह HA>	ञ्ह	*ñha*
<ह HA, ◌, ण NNA>	ह्ण	*hṇa*	<ण NNA, ◌, ह HA>	ण्ह	*hṇa*
<ह HA, ◌, न NA>	ह्न	*hna*	<न NA, ◌, ह HA>	न्ह	*nha*
<ह HA, ◌, म MA>	ह्म	*hma*	<म MA, ◌, ह HA>	म्ह	*mha*
<ह HA, ◌, र RA>	ह्र	*hra*	<र RA, ◌, ह HA>	र्ह	*rha*
<ह HA, ◌, ल LA>	ह्ल	*hla*	<ल LA, ◌, ह HA>	ल्ह	*lha*

The use of HA-initial conjuncts for writing 'resonant breathy' consonants distorts the original meaning of these glyphs. If users intend to write such letters using HA-initial conjuncts, then the font must render both HA-initial and HA-non-initial clusters using identical conjunct glyphs.

3.6 Consonant-Vowel Combinations

Consonant-vowel (CV) combinations are produced by attaching a dependent-vowel sign to a consonant letter. Combinations involving certain consonants have additional rendering requirements, as do those involving certain vowel signs. The cases described below are normal behaviors for the script.

'Wavy-headed' signs   The ◌ VOWEL SIGN E, ◌ VOWEL SIGN AI, ◌ा VOWEL SIGN O, ◌ा VOWEL SIGN AU have wavy headstrokes. When they combine with a 'headed' consonant, the consonant's headstroke is removed: <क KA, ◌ VOWEL SIGN E> → <(क → क), ◌> → के *ke*. These signs are to be rendered in a font using a glyph substitution rule for the consonant glyph that specifies the following vowel as a contextual constraint.

Contextual forms for 'headless' consonants   When a 'wavy-headed' vowel sign or VOWEL SIGN AA is combined with a 'headless' consonant, the vowel sign is written using a contextual form. The contextual forms of VOWEL SIGN AI, VOWEL SIGN O, and VOWEL SIGN AU are two-part vowel signs.

	Regular	Contextual	Occurs with
VOWEL SIGN AA	◌ा	◌ा	ग GA, ञ NYA, ठ TTHA, ण NNA, थ THA, ध DHA, श SHA
VOWEL SIGN E	◌̃	◌	ग GA, ञ NYA, ठ TTHA, ण NNA, थ THA, ध DHA, श SHA
VOWEL SIGN AI	◌̃	◌	ग GA, ञ NYA, ठ TTHA, ण NNA, थ THA, ध DHA, श SHA
VOWEL SIGN O	◌ा	◌ा	ग GA, ञ NYA, ठ TTHA, ण NNA, थ THA, ध DHA, श SHA
VOWEL SIGN AU	◌ा	◌ा	ग GA, ञ NYA, ठ TTHA, ण NNA, थ THA, ध DHA, श SHA

Examples: <ग GA, ा VOWEL SIGN AA> → <ग, (ा → ा)> → गा *gā*; <ग GA, ँ VOWEL SIGN E> → <ग, (ँ → ॊ)> → ॆग *ge*.

Contextual forms of other signs   The following vowel signs change shape when they occur in CVs with particular consonants:

	Regular	Contextual	Occurs with
VOWEL SIGN U	ु	ु	ग GA, त TA, भ BHA, श SHA

Contextual forms of consonant letters   In addition to the above, the shapes of some consonant letters are modified before combining with certain vowel signs:

	Regular	Contextual	Occurs with
BHA	भ	भ	ु VOWEL SIGN U, ू VOWEL SIGN UU, ृ VOWEL SIGN VOCALIC R, ॄ VOWEL SIGN VOCALIC RR ॢ VOWEL SIGN VOCALIC L, ॣ VOWEL SIGN VOCALIC LL
HA	ह	ह	ु VOWEL SIGN U, ू VOWEL SIGN UU, ृ VOWEL SIGN VOCALIC R, ॄ VOWEL SIGN VOCALIC RR ॢ VOWEL SIGN VOCALIC L, ॣ VOWEL SIGN VOCALIC LL

Ligatures   The following CV combinations are written as ligatures:

Ligature	Encoded Representation
ञु *ju*	<ज JA, ु VOWEL SIGN U>
ञू *jū*	<ज JA, ू VOWEL SIGN UU>
रु *ru*	<र RA, ु VOWEL SIGN U>
रू *rū*	<र RA, ू VOWEL SIGN UU>

3.7   Consonant Conjuncts

Consonant clusters are written as conjuncts. Conjuncts are represented using VIRAMA, which is written after each consonant in a cluster. Newar conjuncts are written vertically, horizontally, and as independent ligatures.

3.7.1   Rendering Rules

Conjuncts are rendered using condensed, half, post-base, and full forms of letters, as well as independent ligatures (see Table 1). Condensed forms are used for writing vertical conjuncts. A condensed form is produced by reducing the size of a letter's body. If present, the right descender may also be adjusted vertically

		Initial		Non-initial				Initial		Non-initial	
		Cond	Half	Cond	Post			Cond	Half	Cond	Post
KA	क	क	—	क	—	DA	द	द	—	द	—
KHA	ख	ख	रु	ख	—	DHA	ध	ध	६	ध	—
GA	ग	ग	ऽ	ग	—	NA	न	न	ᴦ	न	—
GHA	घ	घ	६	घ	—	PA	प	प	ᴛ	प	—
NGA	८	८	—	८	—	PHA	रु	रु	—	रु	—
CA	च	च	ᴤ	च	—	BA	व	व	ᴛ	व	—
CHA	छ	छ	—	छ	—	BHA	व	ᴧ	ᴋ	ᴧ	—
JA	ज	ज	—	ज	—	MA	म	म	ᴲ	म	—
JHA	म	म	ᴦ	म	—	YA	य	य	ᴦ	य	—
NYA	꣑	꣑	—	꣑	—	RA	न	—	ᴦ, ᴄ	ᴐ	—
TTA	ट	ट	—	ट	—	LA	ल	ल	ᴛ	ल	—
TTHA	꣑	꣑	—	꣑	—	VA	व	व	ᴛ	व	—
DDA	꣑	꣑	—	꣑	—	SHA	श	श	ᴋ	श	—
DDHA	꣑	꣑	—	꣑	—	SSA	ष	ष	�	ष	—
NNA	ण	ण	ᴄ	—	ᴄ	SA	स	स	ᴦ	ᴐ	—
TA	त	त	ᴄ	—	ा	HA	ह	द	—	ᴄ	—
THA	थ	थ	ᴦ	—	꣑						

Table 1: Forms of consonant letters used in initial and non-initial positions in conjuncts. 'Cond' = condensed form; 'Half' = half-form; 'Post' = post-base form.

depending upon the position of the letter in the cluster. Half-forms are used for writing horizontal conjuncts. Half-forms are generally used only for consonants with right descenders. A half-form is produced by removing the right descender. Post-base forms are contextual forms of letters that are used only when the letter occurs in a non-initial position.

The shape of a consonant in a conjunct is determined by its structure, namely the presence of a headstroke and the number of edges that touch the head height.

General conjunct formation   Below are the general rules for conjunct formation. Ligatures and exceptions are noted in the next paragraph.

1. *Single edge with descender*   This group includes the 'headed' letters क KA, ग GA, च CA, ग TA, न NA, ब BA, ६ PHA, न RA, ल LA, व VA and the 'headless' letters ण NNA, श SHA.

   - Join at the top and bottom terminals of the descender: <क KA, ◌, व VA> → क्व *kva*; <क KA, ◌, ट TTA> → क्ट *kṭa*; <ग GA, ◌, न RA> → ग्र *gra*; <श SHA, ◌, च CA> → श्च *śca*; <ल LA, ◌, ल LA> → ल्ल *lla*.

   - The letters KA, NNA, TA, RA have exceptional behaviors.

2. *Single edge without descender*   This group includes the 'headed' letters ङ NGA, छ CHA, ज JA, ट TTA, ड DDA, ढ DDHA, द DA, भ BHA, ह HA and the 'headless' letters ञ NYA, ठ TTHA,

   - Join to following letters at bottom center: <छ CHA, ◌, न RA> → छ्र *chra*; <ञ NYA, ◌, च CA> → ञ्च *ñca*.

   - Join to preceding letters at the top-most edge: <द DA, ◌, द DA> → द्द *dda*.

   - The letters JA and HA have exceptional behavior.

3. *Multiple edges*   This group includes the 'headed' letters ख KHA, घ GHA, झ JHA, प PA, म MA, य YA, ष SSA, स SA and the 'headless' letters थ THA, ध DHA

   - Join to following letters at the bottom terminal of the right descender: <म MA, ◌, ब BA> → म्ब *mba*, <म MA, ◌, ञ NYA> → म्ञ *mña*. <स SA, ◌, क KA> → स्क *ska*.

   - Join to preceding letters at the top edge of the lowered left descender: <ल LA, ◌, म MA> → ल्म *lma*; <ल LA, ◌, य YA> → ल्य *lya*; <ञ NYA, ◌, झ JHA> → ञ्झ *ñjha*; <म MA, ◌, य YA> → म्य *mya*; <स SA, ◌, प PA> → स्प *spa*; <स SA, ◌, म MA> → स्म *sma*.

   - The letter THA has exceptional behavior.

   - When a 'headless' letter is followed by a multiple-edged 'headed' letter (ख KHA, घ GHA, झ JHA, प PA, म MA, स SA, ष SSA, य YA), the head-stroke of the latter is removed and replaced by a short diagonal stroke (*svāphuti*) that connects the two letters. This stroke originates at the right top edge of the 'headless' letter and extends through the body of the 'headed' letter and connects to its right descender at 3/4 of the stem height. For example, <ग GA, ◌, य YA> → ग्य *gya*; <ध DHA, ◌, म MA> → ध्म *dhma*. The use of contextual forms of vowel signs with 'headless' letters is discussed in Section 3.6. The same rules for these signs pertain to 'headless' letters when they appear as the base letter in conjuncts.

Independent ligatures   The clusters *kṣa* and *jña* are rendered as distinct ligatures: <क KA, ◌, ष SSA> → क्ष *kṣa*; <ज JA, ◌, ञ NYA> → ज्ञ *jña*.

Exceptions   Certain consonants have other shaping behaviors when they occur in conjuncts:

1. क KA   When initial, KA takes the shape क. When followed by a consonant with two descenders, KA is written 'around' the condensed form of the letter, with its right 'arm' extending through the following letter: <क KA, ◌, म MA> → (क, ◌,म) → क्म *kma*.

2. ज JA   When initial, JA is written as जः ज JA, ◌, व VA → ज्व *jva*. When followed by a consonant with two descenders, JA is written 'around' the condensed form of the letter, with its right 'arm' extending through the following letter: <ज JA, ◌, म MA> → (ज, ◌,म) → ज्म *jma*.

3. ण NNA   When non-initial, NNA is rendered as ◌, eg. <ष SSA, ◌, ण NNA> → ष्ण *ṣṇa*.

4. त TA   When initial TA is followed by क KA or स SA it is written as ◌, eg. <त TA, ◌, स SA> = त्स *tsa*. When non-initial, it is written as <◌: न NA, ◌, त TA> = न्त *nta*. When written as a geminate, a VIRAMA is added to the glyph: <त TA, ◌, त TA> → त्त *tta*.

5. थ THA   When THA is non-initial, it is rendered as ◌, eg. स SA, ◌, थ THA → स्थ *stha*.

6. र RA   The default shape when initial is the half form ◌. When initial in non-Newar words, it is written as ◌ *repha* <र RA, ◌ VIRAMA, ⃝ ZWJ>. The behavior of initial RA is similar to Devanagari र RA, but the rendering is opposite: the default shape corresponds to the 'eyelash repha', while the representation with ZWJ corresponds to the normal Devanagari *repha*. Non-initial RA is rendered as ◌: प्र *pra*, थ्र *thra*; there are no *vattu* variants.

7. ह HA   When initial, HA is written as ह. Non-initial letters are written within the lower left curve. When followed by a consonant with two descenders, the right 'arm' of HA is extended through the non-initial letter: ह HA, ◌, म MA → (ह, ◌,म) → ह्म *hma*. See also the discussion of 'resonant breathy' letters using HA-initial conjuncts in Section 3.5.

Orientation   The current preference is for producing vertical conjuncts; however, manuscript sources show a variety of orientations, such as horizontal and cascading. Variations in orientation generally occur with letters that possess right descenders, eg. <न NA, ◌, द DA> may be written as न्द and न्द. Conjuncts may also be written horizontally when clusters contain more than two consonants, eg. <न NA, ◌, द DA, ◌, र RA> is written as न्द्र *ndra*. These variations are a matter of rendering and are to be controlled at the font level.

Explicit half forms   Explicit half forms may be produced by writing ⃝ U+200D ZERO WIDTH JOINER after VIRAMA, eg. <न NA, ◌, ⃝ ZWJ> → न.

Font requirements for the rendering of conjuncts   It is expected that a basic Newar font will contain the necessary glyphs for representing conjuncts. A consonant cluster is depicted with the appropriate conjunct glyph only if such a glyph is available in the font. If the conjunct glyph is unavailable, the bare consonants in the cluster are depicted using their full forms combined with a visible VIRAMA. While such rendering of conjuncts may not be typical, they are necessary for the representation of the script in plain text.

3.8   Digits

Newar has a full set of decimal digits: ० ZERO, १ ONE, २ TWO, ३ THREE, ४ FOUR, ५ FIVE, ६ SIX, ७ SEVEN, ८ EIGHT, ९ NINE. The following glyphic variants are attested: ३ = ३ THREE; ४ = ४ FOUR; ५ = ५ FIVE. These variants are to be managed through fonts.

3.9 Various signs

The following 6 signs proposed for encoding:

1. ̐ CANDRABINDU   The *candrabindu* is used for indicating nasalization. The variant form ̇ is attested.

2. ̊ ANUSVARA   The *anusvāra* is used for indicating nasalization. The variant form ̇ is also attested. The ANUSVARA is placed at the right edge of the character with which it is combined.

3. ◌ȣ VISARGA   This sign represents post-vocalic aspiration (/h/). The variant forms ◌: and ◌ᵒ are attested. The VISARGA is also used for marking vowel length (see Section 3.4).

4. ◌ NUKTA   This sign is used for transcribing sounds for which distinct characters do not exist, such as those in loanwords. See figure 44 for example of use.

5. ऽ AVAGRAHA   This sign is used for marking the elision of word-initial अ *a* in Sanskrit as a result of sandhi. An example of use is given in figure 48. The Devanagari-like variant form ऽ is attested.

6. ꣹ FINAL ANUSVARA   The FINAL ANUSVARA sign has various uses (see figures 37 and 38). In some manuscripts it represents nasalization; it corresponds graphically to ◌ং U+0982 BENGALI SIGN ANUSVARA. In other sources, it is used as a form of punctuation. It has the variant forms ꣹ and ꣸.

3.10 Punctuation

The following punctuation characters are proposed for encoding. See Section 5 for questions regarding the encoding of additional punctuation marks.

1. । DANDA and ॥ DOUBLE DANDA   The ends of sentences and larger text blocks are generally indicated with । DANDA and ॥ DOUBLE DANDA. There are several variant forms: ।, ।, ॥, ॥, ॥, ॥, The distinct appearance of Newar *daṇḍā*-s and the existence of variant forms requires the encoding of these characters.

2. ، COMMA and ؞ DOUBLE COMMA   The Newar COMMA is used as a phrase separator, while the DOUBLE COMMA is used for marking the end of sentences.

3. ꣷ GAP FILLER   This sign is used for marking breaks and filling gaps in a line at a margin (see figure 47). It has several variant forms: ꣷ, ꣷ, ꣷ, ꣷ, ꣷ (see also figure 50). Examples of use of variant forms are given in figures 42 and 43.

4. ˙ HIGH SPACING DOT   This sign is used for inter-word and intra-word spacing.

5. ° ABBREVIATION SIGN CIRCLE   This sign is used for indicating abbreviation (see figure 46).

6. × ABBREVIATION SIGN CROSS   This sign is used for indicating abbreviation.

The following punctuation character is not proposed for encoding:

1. ・   The ・ middle dot is often used in manuscripts for marking word and other boundaties (see figure 45). This character may be written using the generic · U+00B7 MIDDLE DOT.

3.11　Invocation Signs

The following 3 invocation signs are proposed for encoding:

1. ꣼ OM　This sign represents the sacred syllable *oṃ*. It is also written literally using the sequence <ओ o, ँ CANDRABINDU> as ॐ.

2. ꣽ SIDDHI　This sign represents the Sanskrit invocation सिद्धिरस्तु *siddhirastu* "may there be success". It is written at the beginning of a text, often with ꣼ OM, eg. ꣽ꣼. It corresponds to the sign ৭ *āñjī* in related scripts such as Bengali.

3. ꧀ SVASTI　This sign represents the Sanskrit benediction स्वस्ति *svasti* "may it be auspicious". It has several glyphic variants, eg. ꧂.

3.12　Ornamental Marks

The following ornamental marks are proposed for encoding:

1. ※ FLOWER　This sign is used for marking the end of text sections (see figures 40 and 41).

2. ৪ VAJRA　This sign is used for marking the end of text sections.

3. ⌇ PLACEHOLDER MARK　This sign is used for filling gaps in a line and as a mark for end of text.

The following space-filling character is not proposed for encoding:

1. ꣸　This sign is used for marking ends of sections and as a space-filling mark (see figure 41). It corresponds to ꣸ U+A8F8 DEVANAGARI SIGN PUSHPIKA. It may be represented using the Devanagari character.

3.13　Collation

The primary sort order for Newar is as follows:

अ A < आ AA < ꣷ I < ꣸ II < उ U < ऊ UU < ऋ VOCALIC R <

ॠ VOCALIC RR < ꣹ VOCALIC L < ꣺ VOCALIC LL < ꣻ E < ꣼ AI < ओ O <

औ AU < क KA < ख KHA < ग GA < घ GHA < ङ NGA < च CA < छ CHA <

ज JA < झ JHA < ञ NYA < ट TTA < ठ TTHA < ड DDA < ढ DDHA <

ण NNA < त TA < थ THA < द DA < ध DHA < न NA < प PA < फ PHA <

ब BA < भ BHA < म MA < य YA < र RA < ल LA < व VA < श SHA <

ष SSA < स SA < ह HA < ा SIGN AA < ि SIGN I < ी SIGN II < ु SIGN U <

ू SIGN UU < ृ SIGN VOCALIC R < ॄ SIGN VOCALIC RR < ॢ SIGN VOCALIC L <

ॣ SIGN VOCALIC LL < ॆ SIGN E < ै SIGN AI < ो SIGN O < ौ SIGN AU < ् VIRAMA

The following have secondary weights: ँ CANDRABINDU, ं ANUSVARA, ः VISARGA, ़ NUKTA.

4   Other Details

Kūṭākṣara   *Kūṭākṣara*-s, or monograms, are calligraphic presentations of words or consonant sequences that written as a single ligature (see figures 9 and 10). These are presentation forms of text sequences. They are out of scope for character encoding and representation in plain text.

Headstrokes and Headlines   The headstrokes of Newar letters do not connect to preceding or following letters. Connection of headstrokes of characters that form a syllable may occur, such as in the combination of a consonant letter and a dependent vowel sign. The majority of Newar manuscripts attest this behavior. However, there is no particular rule that describes the joining properties of headstrokes. Variations in the writing of headstrokes are to be attributed to scribal preferences. In modern digitized typefaces the headstrokes of glyphs connect, but this feature may be an influence of modern Devanagari typography.

5   Characters Not Proposed

Several characters attested in Newar manuscripts are not yet proposed for encoding. Some of these characters are described below, along with the rationale for excluding them from the proposed encoding.

1. *Punctuation*   The characters ⵏ and ⵗ are used in some manuscripts for marking the ends of passage, section, or larger blocks of text. They are used alongside ǁ ᴅᴏᴜʙʟᴇ ᴅᴀɴᴅᴀ (see figure 39). They are also used at the end of section in conjunction with the ※ ꜰʟᴏᴡᴇʀ as ⵏ ※ ⵗ (see figure 40). These 'arrow' *daṇḍā*-s have the glyphic variants ⵏ, ⵏ and ⵗ, ⵗ.

2. *'Letter-Numerals'*   A numeration system using letter-like characters instead of regular digits is used in several Old Newar manuscripts (see figure Figure 52). There are at least 27 such Newar 'letter-numerals': units (1–9), tens (10–90), and the hundreds up to 400. In many cases, the number forms are used alongside digits; see the *Kāraṇḍavyūha* published by Lokesh Chandra (1981). There are several variant forms and many letter-numbers resemble those of other scripts, such as Brahmi. It may be possible to unify Newar letter-numbers with corresponding Brahmi characters.

3. *Editorial Marks*   Various editorial marks are used in manuscripts for indicating the addition (ˏ , ˘) and deletion (⁚⁚⁚) of text, as well as omissions, eg. ⵥ *kākapada*. Several such characters are shown in Figure 50. Should editorial marks be encoded on a per script basis or would be it reasonable to unify such marks in a pan-Indic block?

4. *Additional Ornaments*   There are several characters similar to the proposed ※ ꜰʟᴏᴡᴇʀ (see figure 51). Should these be encoded separately or unified with ɴᴇᴡᴀʀ ꜰʟᴏᴡᴇʀ, where applicable?

5. *Musical Symbols*   Several symbols are used in Bajanbol manuscripts for music notation (see figure 11). Marks used for indicating rests of various lengths for drums include ○, ⓞ, ⊕, ⊘, ⊚, ⊙, ⊙ (Lienhard 1988: 142–143). Other symbols are ⸴, ⸲, ⁚, ⁞. Additional research is required in order to determine the number of such marks, their meanings, and the status of their usage.

6. *Newly-Created Vowel Signs*   The sign ౿ has been promoted by some Newar users as a new addition for representing the vowel /æ/ (see Figure 53). The vowel exists in the Newar language, but it is not distinctly represented in the script or in Devanagari orthography for the language.

6   Character Data

6.1   Character Properties

The properties for Newar in the Unicode Character Database format are:

```
11400;NEWAR LETTER A;Lo;0;L;;;;;N;;;;;
11401;NEWAR LETTER AA;Lo;0;L;;;;;N;;;;;
11402;NEWAR LETTER I;Lo;0;L;;;;;N;;;;;
11403;NEWAR LETTER II;Lo;0;L;;;;;N;;;;;
11404;NEWAR LETTER U;Lo;0;L;;;;;N;;;;;
11405;NEWAR LETTER UU;Lo;0;L;;;;;N;;;;;
11406;NEWAR LETTER VOCALIC R;Lo;0;L;;;;;N;;;;;
11407;NEWAR LETTER VOCALIC RR;Lo;0;L;;;;;N;;;;;
11408;NEWAR LETTER VOCALIC L;Lo;0;L;;;;;N;;;;;
11409;NEWAR LETTER VOCALIC LL;Lo;0;L;;;;;N;;;;;
1140A;NEWAR LETTER E;Lo;0;L;;;;;N;;;;;
1140B;NEWAR LETTER AI;Lo;0;L;;;;;N;;;;;
1140C;NEWAR LETTER O;Lo;0;L;;;;;N;;;;;
1140D;NEWAR LETTER AU;Lo;0;L;;;;;N;;;;;
1140E;NEWAR LETTER KA;Lo;0;L;;;;;N;;;;;
1140F;NEWAR LETTER KHA;Lo;0;L;;;;;N;;;;;
11410;NEWAR LETTER GA;Lo;0;L;;;;;N;;;;;
11411;NEWAR LETTER GHA;Lo;0;L;;;;;N;;;;;
11412;NEWAR LETTER NGA;Lo;0;L;;;;;N;;;;;
11413;NEWAR LETTER CA;Lo;0;L;;;;;N;;;;;
11414;NEWAR LETTER CHA;Lo;0;L;;;;;N;;;;;
11415;NEWAR LETTER JA;Lo;0;L;;;;;N;;;;;
11416;NEWAR LETTER JHA;Lo;0;L;;;;;N;;;;;
11417;NEWAR LETTER NYA;Lo;0;L;;;;;N;;;;;
11418;NEWAR LETTER TTA;Lo;0;L;;;;;N;;;;;
11419;NEWAR LETTER TTHA;Lo;0;L;;;;;N;;;;;
1141A;NEWAR LETTER DDA;Lo;0;L;;;;;N;;;;;
1141B;NEWAR LETTER DDHA;Lo;0;L;;;;;N;;;;;
1141C;NEWAR LETTER NNA;Lo;0;L;;;;;N;;;;;
1141D;NEWAR LETTER TA;Lo;0;L;;;;;N;;;;;
1141E;NEWAR LETTER THA;Lo;0;L;;;;;N;;;;;
1141F;NEWAR LETTER DA;Lo;0;L;;;;;N;;;;;
11420;NEWAR LETTER DHA;Lo;0;L;;;;;N;;;;;
11421;NEWAR LETTER NA;Lo;0;L;;;;;N;;;;;
11422;NEWAR LETTER PA;Lo;0;L;;;;;N;;;;;
11423;NEWAR LETTER PHA;Lo;0;L;;;;;N;;;;;
11424;NEWAR LETTER BA;Lo;0;L;;;;;N;;;;;
11425;NEWAR LETTER BHA;Lo;0;L;;;;;N;;;;;
11426;NEWAR LETTER MA;Lo;0;L;;;;;N;;;;;
11427;NEWAR LETTER YA;Lo;0;L;;;;;N;;;;;
11428;NEWAR LETTER RA;Lo;0;L;;;;;N;;;;;
11429;NEWAR LETTER LA;Lo;0;L;;;;;N;;;;;
1142A;NEWAR LETTER VA;Lo;0;L;;;;;N;;;;;
1142B;NEWAR LETTER SHA;Lo;0;L;;;;;N;;;;;
1142C;NEWAR LETTER SSA;Lo;0;L;;;;;N;;;;;
1142D;NEWAR LETTER SA;Lo;0;L;;;;;N;;;;;
1142E;NEWAR LETTER HA;Lo;0;L;;;;;N;;;;;
1142F;NEWAR VOWEL SIGN AA;Mc;0;L;;;;;N;;;;;
11430;NEWAR VOWEL SIGN I;Mc;0;L;;;;;N;;;;;
11431;NEWAR VOWEL SIGN II;Mc;0;L;;;;;N;;;;;
11432;NEWAR VOWEL SIGN U;Mn;0;NSM;;;;;N;;;;;
11433;NEWAR VOWEL SIGN UU;Mn;0;NSM;;;;;N;;;;;
11434;NEWAR VOWEL SIGN VOCALIC R;Mn;0;NSM;;;;;N;;;;;
11435;NEWAR VOWEL SIGN VOCALIC RR;Mn;0;NSM;;;;;N;;;;;
```

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```
11436;NEWAR VOWEL SIGN VOCALIC L;Mn;0;NSM;;;;;N;;;;;
11437;NEWAR VOWEL SIGN VOCALIC LL;Mn;0;NSM;;;;;N;;;;;
11438;NEWAR VOWEL SIGN E;Mn;0;NSM;;;;;N;;;;;
11439;NEWAR VOWEL SIGN AI;Mn;0;NSM;;;;;N;;;;;
1143A;NEWAR VOWEL SIGN O;Mc;0;L;;;;;N;;;;;
1143B;NEWAR VOWEL SIGN AU;Mc;0;L;;;;;N;;;;;
1143C;NEWAR SIGN VIRAMA;Mn;9;NSM;;;;;N;;;;;
1143D;NEWAR SIGN CANDRABINDU;Mn;0;NSM;;;;;N;;;;;
1143E;NEWAR SIGN ANUSVARA;Mn;0;NSM;;;;;N;;;;;
1143F;NEWAR SIGN VISARGA;Mc;0;L;;;;;N;;;;;
11440;NEWAR SIGN NUKTA;Mn;7;NSM;;;;;N;;;;;
11441;NEWAR SIGN AVAGRAHA;Lo;0;L;;;;;N;;;;;
11442;NEWAR SIGN FINAL ANUSVARA;Lo;0;L;;;;;N;;;;;
11443;NEWAR OM;Lo;0;L;;;;;N;;;;;
11444;NEWAR SIDDHI;So;0;L;;;;;N;;;;;
11445;NEWAR SVASTI;So;0;L;;;;;N;;;;;
11446;NEWAR DANDA;Po;0;L;;;;;N;;;;;
11447;NEWAR DOUBLE DANDA;Po;0;L;;;;;N;;;;;
11448;NEWAR COMMA;Po;0;L;;;;;N;;;;;
11449;NEWAR DOUBLE COMMA;Po;0;L;;;;;N;;;;;
1144A;NEWAR GAP FILLER;Po;0;L;;;;;N;;;;;
1144B;NEWAR HIGH SPACING DOT;Po;0;L;;;;;N;;;;;
1144C;NEWAR ABBREVIATION SIGN CIRCLE;Po;0;L;;;;;N;;;;;
1144D;NEWAR ABBREVIATION SIGN CROSS;Po;0;L;;;;;N;;;;;
1144E;<reserved>
1144F;<reserved>
11450;NEWAR DIGIT ZERO;Nd;0;L;;0;0;0;N;;;;;
11451;NEWAR DIGIT ONE;Nd;0;L;;1;1;1;N;;;;;
11452;NEWAR DIGIT TWO;Nd;0;L;;2;2;2;N;;;;;
11453;NEWAR DIGIT THREE;Nd;0;L;;3;3;3;N;;;;;
11454;NEWAR DIGIT FOUR;Nd;0;L;;4;4;4;N;;;;;
11455;NEWAR DIGIT FIVE;Nd;0;L;;5;5;5;N;;;;;
11456;NEWAR DIGIT SIX;Nd;0;L;;6;6;6;N;;;;;
11457;NEWAR DIGIT SEVEN;Nd;0;L;;7;7;7;N;;;;;
11458;NEWAR DIGIT EIGHT;Nd;0;L;;8;8;8;N;;;;;
11459;NEWAR DIGIT NINE;Nd;0;L;;9;9;9;N;;;;;
1145A;NEWAR FLOWER;So;0;L;;;;;N;;;;;
1145B;NEWAR VAJRA;So;0;L;;;;;N;;;;;
1145C;NEWAR PLACEHOLDER MARK;So;0;L;;;;;N;;;;;
```

6.2 Linebreaking

Linebreaking properties given in the data format of `LineBreak.txt`:

```
11400..1142E; AL   # LETTER A .. LETTER HA
1142F..11440; CM   # SIGN AA .. SIGN NUKTA
11441..11445; AL   # SIGN AVAGRAHA .. SVASTI
11446..1144D; BA   # DANDA .. ABBREVIATION SIGN CROSS
11450..11459; NU   # DIGIT ZERO .. DIGIT NINE
1145A..1145C; AL   # FLOWER .. PLACEHOLDER MARK
```

6.3 Syllabic Categories

Syllabic categories given in the data format of `IndicSyllabicCategory.txt`:

```
# Indic_Syllabic_Category=Bindu
1143D..1143E ; Bindu            # Mn     [2] SIGN CANDRABINDU .. SIGN ANUSVARA
```

```
# Indic_Syllabic_Category=Visarga
1143F         ; Visarga          # Mc         SIGN VISARGA


# Indic_Syllabic_Category=Avagraha
11441         ; Avagraha         # Lo         SIGN AVAGRAHA


# Indic_Syllabic_Category=Nukta
11440         ; Nukta            # Mn         SIGN NUKTA


# Indic_Syllabic_Category=Virama
1143F         ; Virama           # Mn         SIGN VIRAMA


# Indic_Syllabic_Category=Vowel_Independent
11400..1140D ; Vowel_Independent # Lo    [14] LETTER A .. LETTER AU


# Indic_Syllabic_Category=Vowel_Dependent
1142F..11431 ; Vowel_Dependent   # Mc     [3] VOWEL SIGN AA .. VOWEL SIGN II
11432..11439 ; Vowel_Dependent   # Mn     [8] VOWEL SIGN U .. VOWEL SIGN AI
1143A..1143B ; Vowel_Dependent   # Mc     [2] VOWEL SIGN O .. VOWEL SIGN AU


# Indic_Syllabic_Category=Consonant
1140E..1142E ; Consonant         # Lo    [33] LETTER KA .. LETTER HA
```

6.4 Matra Categories

Matra categories given in the data format of `IndicMatraCategory.txt`:

```
# Indic_Matra_Category=Right
1142F         ; Right            # Mc       VOWEL SIGN AA
11431         ; Right            # Mc       VOWEL SIGN II


# Indic_Matra_Category=Left
11430         ; Left             # Mc       VOWEL SIGN I


# Indic_Matra_Category=Top
11438..11439  ; Top              # Mn   [2] VOWEL SIGN E .. VOWEL SIGN AI


# Indic_Matra_Category=Top_And_Right
1143A..1143B  ; Top_And_Right    # Mc   [2] VOWEL SIGN 0 .. VOWEL SIGN AU


# Indic_Matra_Category=Bottom
11432..11437  ; Bottom           # Mn   [6] VOWEL SIGN U .. VOWEL SIGN VOCALIC LL
1143C         ; Bottom           # Mn       SIGN VIRAMA
```

6.5 'Confusable' Characters

Several Newar characters are similar to those of Devanagari, Bengali, and other modern Indic scripts. 'Confusion' data for these similarities are provided below:

```
11400 NEWAR LETTER A                 ;   0985 BENGALI LETTER A
11401 NEWAR LETTER AA                ;   0986 BENGALI LETTER AA
11404 NEWAR LETTER U                 ;   0909 DEVANAGARI LETTER U
11405 NEWAR LETTER UU                ;   090A DEVANAGARI LETTER UU
1140E NEWAR LETTER KA                ;   0915 DEVANAGARI LETTER KA
1140F NEWAR LETTER KHA               ;   0916 DEVANAGARI LETTER KHA
11410 NEWAR LETTER GA                ;   0997 BENGALI LETTER GA
11411 NEWAR LETTER GHA               ;   0918 DEVANAGARI LETTER GHA
11415 NEWAR LETTER JA                ;   099C BENGALI LETTER JA
```

```
11416 NEWAR LETTER JHA                   ;  11497 TIRHUTA LETTER JHA
11417 NEWAR LETTER NYA                   ;  099E BENGALI LETTER NYA
11419 NEWAR LETTER TTHA                  ;  1119C SHARADA LETTER TTHA
1141C NEWAR LETTER NNA                   ;  1149D TIRHUTA LETTER NNA
1141E NEWAR LETTER THA                   ;  0925 DEVANAGARI LETTER THA
1141F NEWAR LETTER DA                    ;  0926 DEVANAGARI LETTER DA
11420 NEWAR LETTER DHA                   ;  0927 DEVANAGARI LETTER DHA
11421 NEWAR LETTER NA                    ;  0928 DEVANAGARI LETTER NA
11422 NEWAR LETTER PA                    ;  092A DEVANAGARI LETTER PA
11424 NEWAR LETTER BA                    ;  0935 DEVANAGARI LETTER VA
11426 NEWAR LETTER MA                    ;  092E DEVANAGARI LETTER MA
11427 NEWAR LETTER YA                    ;  092F DEVANAGARI LETTER YA
11429 NEWAR LETTER LA                    ;  0932 DEVANAGARI LETTER LA
1142A NEWAR LETTER VA                    ;  0935 DEVANAGARI LETTER VA
1142C NEWAR LETTER SSA                   ;  0937 DEVANAGARI LETTER SSA
1142D NEWAR LETTER SA                    ;  0938 DEVANAGARI LETTER SA
1142E NEWAR LETTER HA                    ;  0939 DEVANAGARI LETTER HA
1142F NEWAR VOWEL SIGN AA                ;  093E DEVANAGARI VOWEL SIGN AA
11430 NEWAR VOWEL SIGN I                 ;  093F DEVANAGARI VOWEL SIGN I
11431 NEWAR VOWEL SIGN II                ;  0940 DEVANAGARI VOWEL SIGN II
11432 NEWAR VOWEL SIGN U                 ;  09C1 BENGALI VOWEL SIGN U
11433 NEWAR VOWEL SIGN UU                ;  09C2 BENGALI VOWEL SIGN UU
11434 NEWAR VOWEL SIGN VOCALIC R         ;  0943 DEVANAGARI VOWEL SIGN VOCALIC R
11435 NEWAR VOWEL SIGN VOCALIC RR        ;  0944 DEVANAGARI VOWEL SIGN VOCALIC RR
1143C NEWAR SIGN VIRAMA                  ;  094D DEVANAGARI SIGN VIRAMA
1143D NEWAR SIGN CANDRABINDU             ;  0F82 TIBETAN SIGN NYI ZLA NAA DA
1143E NEWAR SIGN ANUSVARA                ;  114C0 TIRHUTA SIGN ANUSVARA
11441 NEWAR SIGN FINAL ANUSVARA          ;  0982 BENGALI SIGN ANUSVARA
1144C NEWAR ABBREVIATION SIGN CIRCLE     ;  0970 DEVANAGARI ABBREVIATION SIGN
1144D NEWAR ABBREVIATION SIGN CROSS      ;  0058 LATIN CAPITAL LETTER X
```

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8   Acknowledgments

Proposal to Encode the Newar Script in ISO/IEC 10646 *Anshuman Pandey*

	1140	1141	1142	1143	1144	1145	1146	1147
0	अ 11400	ग 11410	ध 11420	िं 11430	ं 11440	० 11450		
1	आ 11401	घ 11411	न 11421	ी 11431	३ 11441	१ 11451		
2	ॡ 11402	ढ 11412	प 11422	ॖ 11432	ः 11442	२ 11452		
3	ॡ 11403	व 11413	फ 11423	ॗ 11433	ॐ 11443	३ 11453		
4	उ 11404	क्ष 11414	ब 11424	ॖ 11434	९ 11444	४ 11454		
5	ऊ 11405	ज 11415	र 11425	ॗ 11435	ॽ 11445	५ 11455		
6	ऋ 11406	म 11416	म 11426	ॖ 11436	१ 11446	६ 11456		
7	ॠ 11407	ॐ 11417	य 11427	ॗ 11437	॥ 11447	७ 11457		
8	ए 11408	ट 11418	न 11428	ँ 11438	ॽ 11448	८ 11458		
9	ऐ 11409	ठ 11419	ल 11429	ँ 11439	ॽ 11449	९ 11459		
A	ऑ 1140A	ठ 1141A	व 1142A	ाँ 1143A	ः 1144A	✶ 1145A		
B	ओ 1140B	ड 1141B	श 1142B	ाँ 1143B	· 1144B	꧁꧂ 1145B		
C	ऒ 1140C	ढ 1141C	ष 1142C	ँ 1143C	० 1144C	ॿ 1145C		
D	औ 1140D	ण 1141D	स 1142D	ँ 1143D	✕ 1144D			
E	क 1140E	थ 1141E	ह 1142E	ँ 1143E				
F	ख 1140F	द 1141F	ा 1142F	४ 1143F				

Figure 1: Proposed code chart for Newar.

The script is also known as 'Nepal Lipi', 'Nepalakshar', 'Newah Akhah', 'Newari', 'Pachumol', and 'Prachalit'.

Independent vowels

11400	अ	NEWAR LETTER A
11401	आ	NEWAR LETTER AA
11402	इ	NEWAR LETTER I
11403	ई	NEWAR LETTER II
11404	उ	NEWAR LETTER U
11405	ऊ	NEWAR LETTER UU
11406	ऋ	NEWAR LETTER VOCALIC R
11407	ॠ	NEWAR LETTER VOCALIC RR
11408	ऌ	NEWAR LETTER VOCALIC L
11409	ॡ	NEWAR LETTER VOCALIC LL
1140A	ए	NEWAR LETTER E
1140B	ऐ	NEWAR LETTER AI
1140C	ओ	NEWAR LETTER O
1140D	औ	NEWAR LETTER AU

Consonants

1140E	क	NEWAR LETTER KA
1140F	ख	NEWAR LETTER KHA
11410	ग	NEWAR LETTER GA
11411	घ	NEWAR LETTER GHA
11412	ङ	NEWAR LETTER NGA
11413	च	NEWAR LETTER CA
11414	छ	NEWAR LETTER CHA
11415	ज	NEWAR LETTER JA
11416	झ	NEWAR LETTER JHA
11417	ञ	NEWAR LETTER NYA
11418	ट	NEWAR LETTER TTA
11419	ठ	NEWAR LETTER TTHA
1141A	ड	NEWAR LETTER DDA
1141B	ढ	NEWAR LETTER DDHA
1141C	ण	NEWAR LETTER NNA
1141D	त	NEWAR LETTER TA
1141E	थ	NEWAR LETTER THA
1141F	द	NEWAR LETTER DA
11420	ध	NEWAR LETTER DHA
11421	न	NEWAR LETTER NA
11422	प	NEWAR LETTER PA
11423	फ	NEWAR LETTER PHA
11424	ब	NEWAR LETTER BA
11425	भ	NEWAR LETTER BHA
11426	म	NEWAR LETTER MA
11427	य	NEWAR LETTER YA
11428	र	NEWAR LETTER RA
11429	ल	NEWAR LETTER LA
1142A	व	NEWAR LETTER VA
1142B	श	NEWAR LETTER SHA
1142C	ष	NEWAR LETTER SSA
1142D	स	NEWAR LETTER SA
1142E	ह	NEWAR LETTER HA

Dependent vowel signs

1142F	ा	NEWAR VOWEL SIGN AA
11430	ि	NEWAR VOWEL SIGN I
11431	ी	NEWAR VOWEL SIGN II
11432	ु	NEWAR VOWEL SIGN U
11433	ू	NEWAR VOWEL SIGN UU
11434	ृ	NEWAR VOWEL SIGN VOCALIC R
11435	ॄ	NEWAR VOWEL SIGN VOCALIC RR
11436	ॢ	NEWAR VOWEL SIGN VOCALIC L
11437	ॣ	NEWAR VOWEL SIGN VOCALIC LL
11438	े	NEWAR VOWEL SIGN E
11439	ै	NEWAR VOWEL SIGN AI
1143A	ो	NEWAR VOWEL SIGN O
1143B	ौ	NEWAR VOWEL SIGN AU

Various signs

1143C	्	NEWAR SIGN VIRAMA
		= tutipala, halant
1143D	ँ	NEWAR SIGN CANDRABINDU
		= milaphuti
1143E	ं	NEWAR SIGN ANUSVARA
		= sinhaphuti
1143F	ः	NEWAR SIGN VISARGA
		= lyuphuti
		• Also used for marking vowel length
11440	़	NEWAR SIGN NUKTA
11441	ऽ	NEWAR SIGN AVAGRAHA
11442	ᳲ	NEWAR SIGN FINAL ANUSVARA
		• Used for nasalization
		= small m
		• Also used for punctuation

Invocation signs

11443	ॐ	NEWAR OM
11444	ꣾ	NEWAR SIDDHI
		• Written at the beginning of a text
		= bhin chin
11445	॰	NEWAR SVASTI
		• Written at the beginning of a text

Punctuation

11446	।	NEWAR DANDA
		= dipu chin
11447	॥	NEWAR DOUBLE DANDA
		= nidhvah dipu chin
11448	،	NEWAR COMMA
		• Phrase separator
11449	؛	NEWAR DOUBLE COMMA
		• Phrase separator
1144A	؟	NEWAR GAP FILLER
		• Used for filling gaps at end of line
		= thay jayke chin
		• Also used for hyphenation
		= khangva svapu chin
1144B	˙	NEWAR HIGH SPACING DOT
1144C	°	NEWAR ABBREVIATION SIGN CIRCLE
1144D	×	NEWAR ABBREVIATION SIGN CROSS

Digits

11450	०	NEWAR DIGIT ZERO
11451	१	NEWAR DIGIT ONE
11452	२	NEWAR DIGIT TWO
11453	३	NEWAR DIGIT THREE
11454	४	NEWAR DIGIT FOUR
11455	५	NEWAR DIGIT FIVE
11456	६	NEWAR DIGIT SIX
11457	७	NEWAR DIGIT SEVEN
11458	८	NEWAR DIGIT EIGHT
11459	९	NEWAR DIGIT NINE

Various signs

1145A	✸	NEWAR FLOWER
		= pushpika
1145B	꣍	NEWAR VAJRA
1145C	⌇	NEWAR PLACEHOLDER MARK

Figure 2: Proposed names list for Newar.

A   Sample Newar Documents

Figure 3: The first folio of the *Laṅkāvatāra Sūtra* in the Newar script (from Lokesh Chandra 1977: 1).

Figure 4: An 18th century Newar inscription at Sunko Dhoka at Durbar Square, Bhaktapur. Photo courtesy of Adam Holloway.

Obverse   Reverse

Figure 5: A silver quarter *tanka* of Bhupatindra Malla from 1696 (NS 816). The reverse reads, श्री श्री जय भूपतिंद्रि मल्ल देव. It bears the date ८१६ 816.

Obverse   Reverse

Figure 6: A silver half *mohar* of Jaya Prakash Malla from 1753 (NS 873). The observe reads, from clockwise, श्रीर जय प्रकाश मल्ल. It continues on the reverse: देव. It bears the date ८७३ 873.

Figure 7: An inscription by king Pratap Malla produced in 1654 at Hanuman Dhoka in Kathmandu. The inscription has text in 15 scripts. It is the first attested usage of the name *nevāra ākhara* "Newar Script".
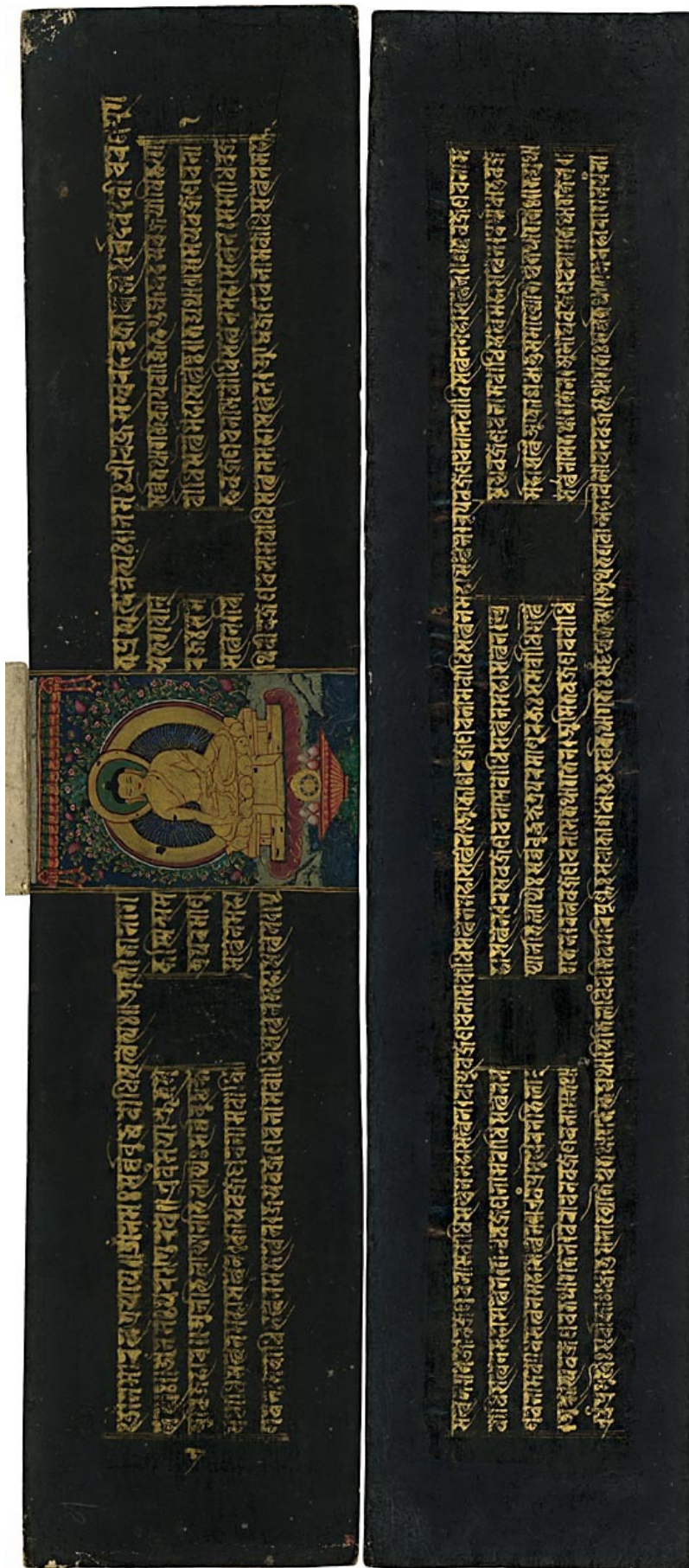
MS 2096
Buddhist tantra. Nepal, 1801

Figure 8: Folios from a manuscript of the *Guhyasamāja Tantra* from Nepal dated 1801. The Newar script is written in gold ink on indigo paper (from The Schøyen Collection, Mss. 2096).

PLATE 80

[लिपिचित्र ६२]

नेवारी लिपिको कूराक्षर

कालमाहेश्वरविधि भन्ने पुस्तकबाट
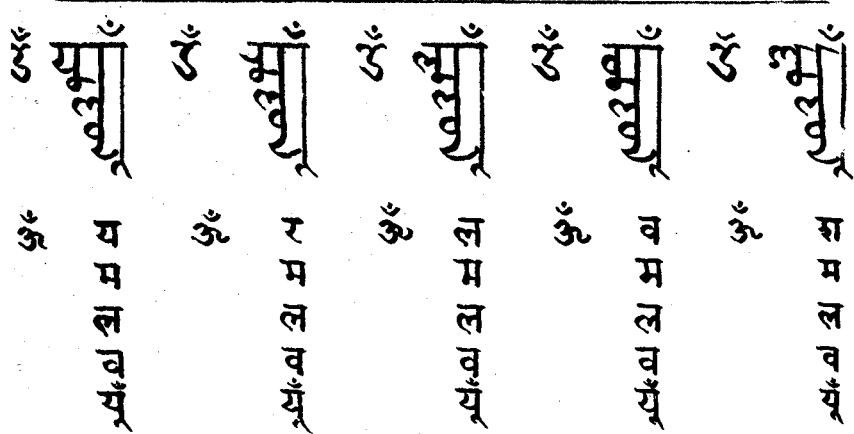
पश्चिमचरुविधान भन्ने पुस्तकबाट
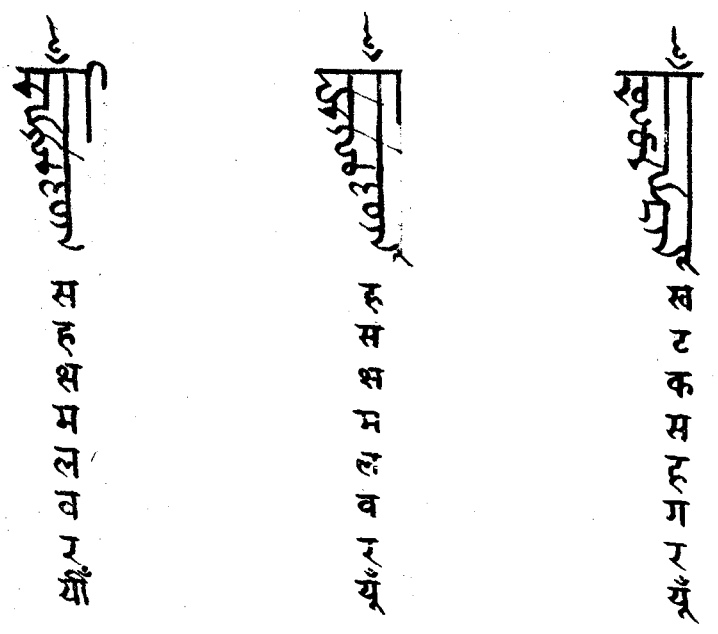
Figure 9: Examples of *kūṭākṣara* "monogram" in the Newar script (from Rajbanshi 1974: Plate 80). These examples show two forms of CANDRABINDU.
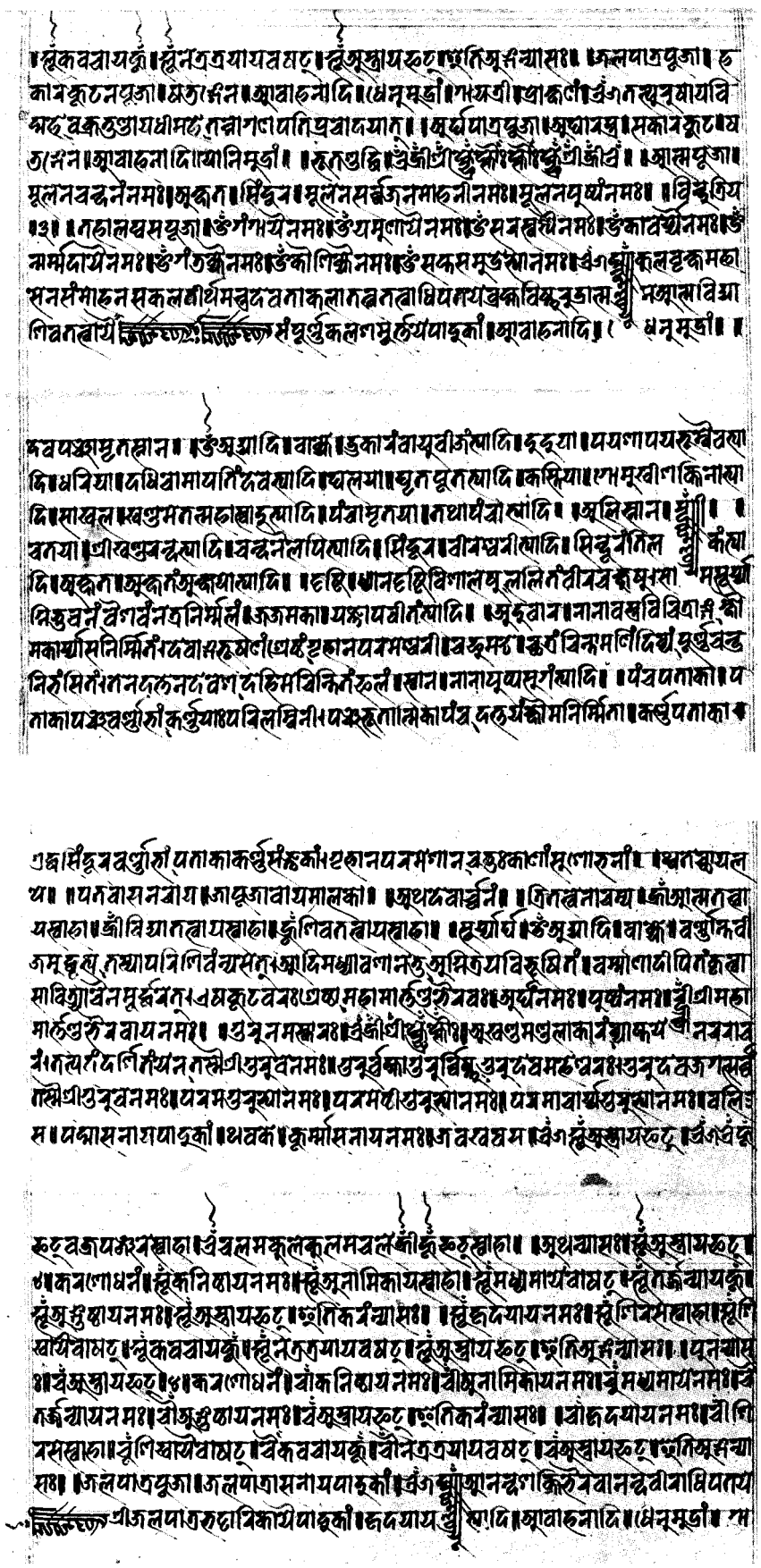
Figure 10: Folios of a manuscript showing the use of *kūṭākṣara*-s in running text (from Lienhard 1988: Plate IX).
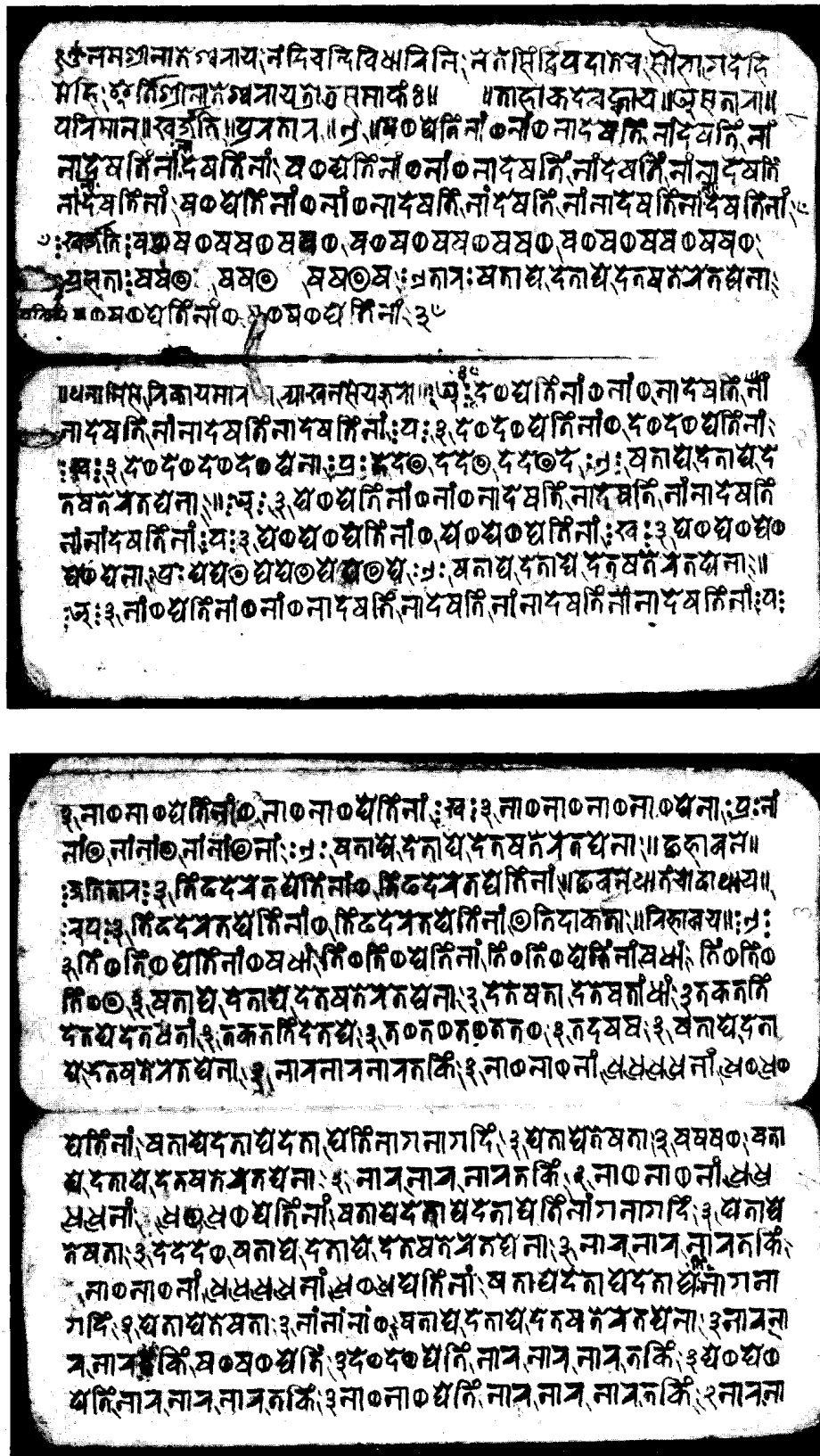
Figure 11: Folios of a *bājanabol* manuscript written in Newar (from Lienhard 1988: Plate X). The musical notation symbols shown in the folios are discussed in Section 5, item #5.

Figure 12: Rendering of an inscription in the Newar script (from Shakyavansha 1973: 44).

TIBETO-BURMAN FAMILY. Tibeto-Himalayan Group.
NĒWĀRĪ.

(Nepal.)

Figure 13: Specimen of 'Newari' from the *Linguistic Survey of India* (from Grierson 1909: 221).

Figure 14: Cover of *Lipi Pau* magazine.

B   Script Charts
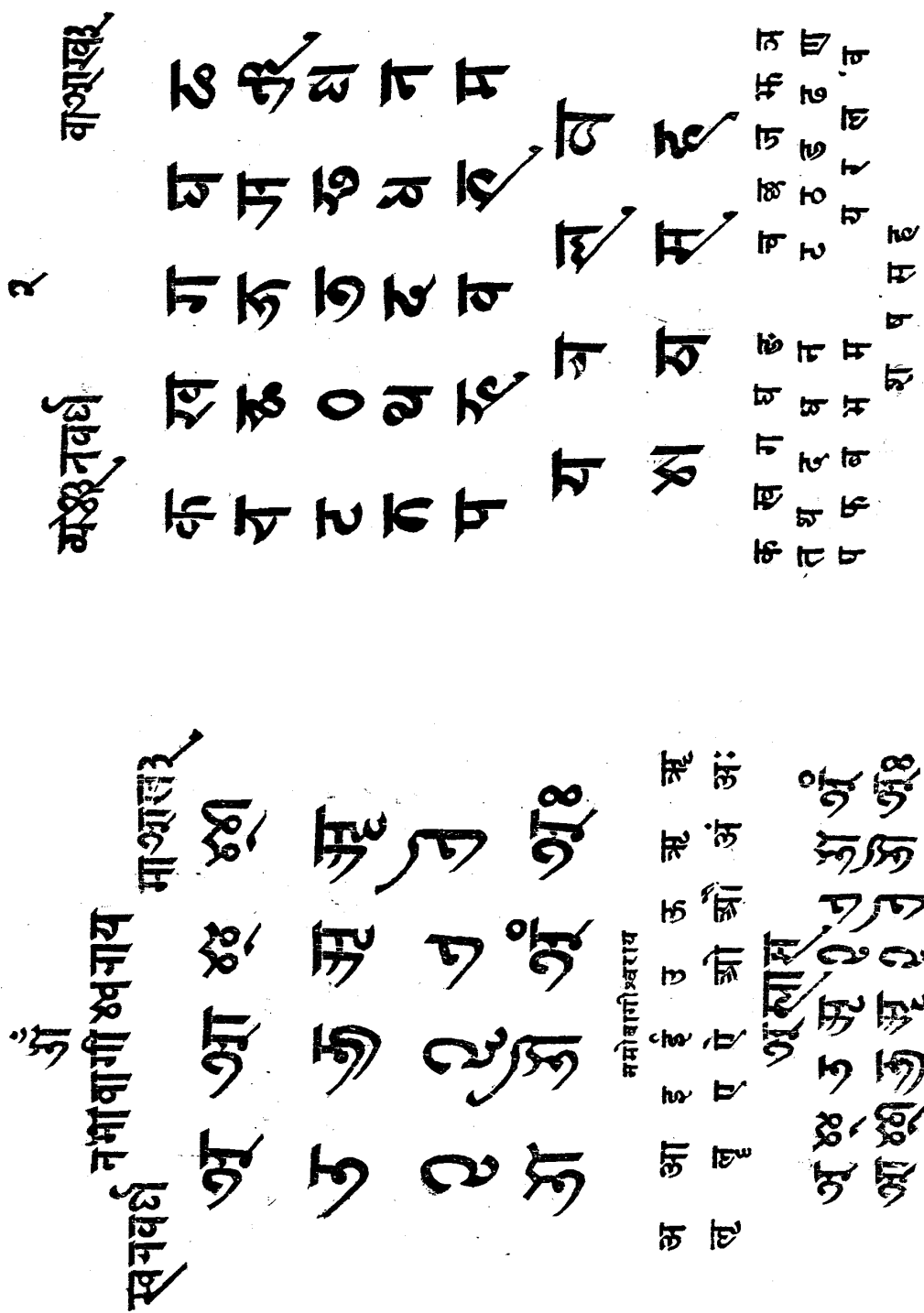
Figure 15: Chart of नेपाल अक्षर 'Nepal Akshar' vowels and consonants (from Jośī 1950: 1, 2).

Figure 16: Tables of conjuncts (from Jośī 1950: 5, 6, 8). Note in particular the ह HA initial conjuncts and their Devanagari correspondences.

प्राचीन लिपि वर्णमाला
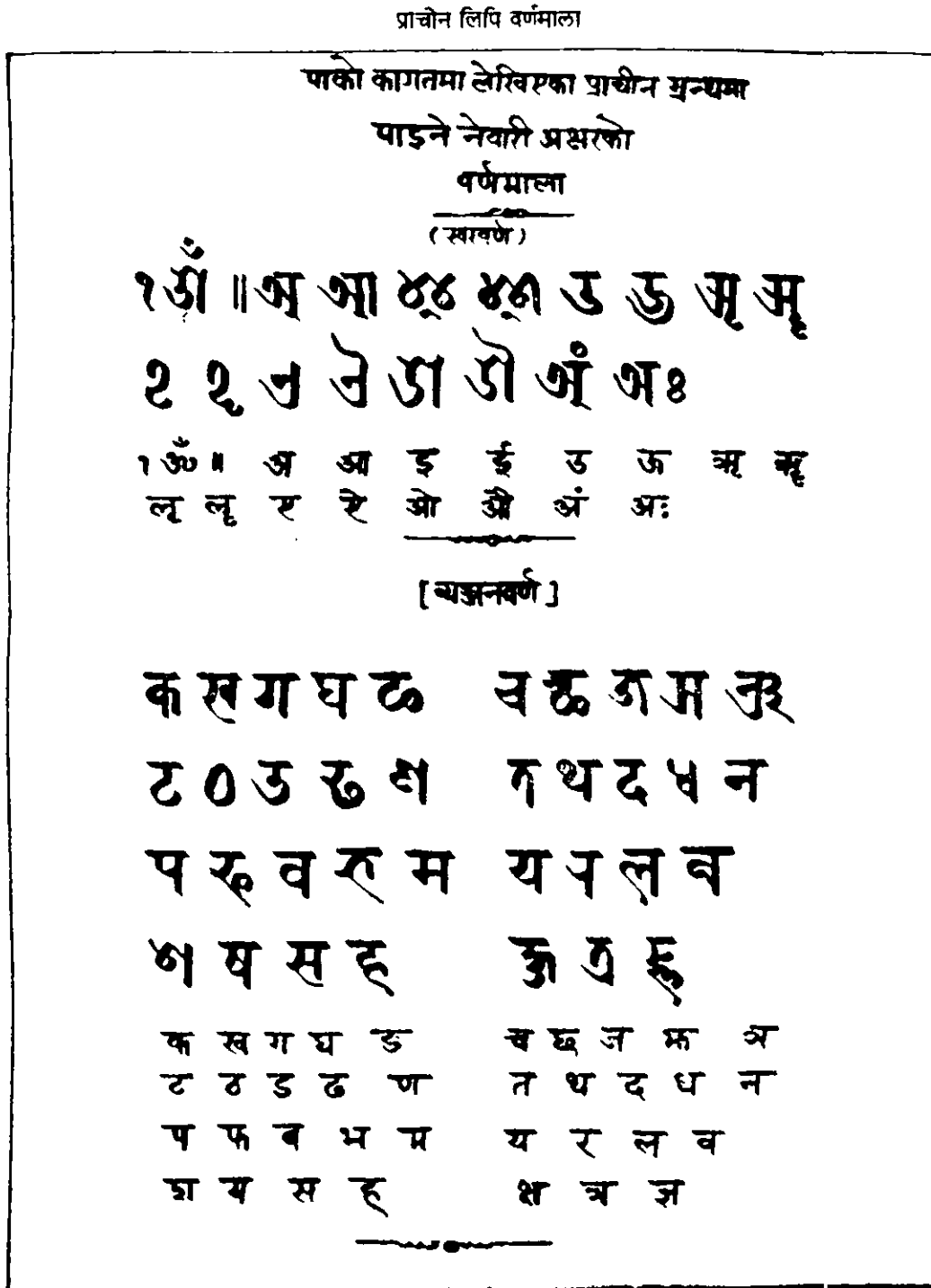
Figure 17: Chart of the Newar script (from Rajavanshi 1953: 1).

[स्वरवर्ण]

ब्राह्मी	पूर्वलिच्छवि	उत्तरसिद्धवि	भोटे	रञ्जना	सुजिंमोल	पाचुयोल	देवनागरी

[१]

Figure 18: Chart comparing various scripts used in Nepal (from Rajavanshi 1960: 1). Note the use of the name पाचुमोल *pācumola* for the Newar script.

Figure 19: Chart of थौंकन्हे प्रचलित आखः 'Thaunkahne Prachalit Akha' (from Shakyavansha 1985: 36–37).

Figure 20: Chart of प्रचलित नेवारी 'Prachalit Nevari' (from Shakyavansha 1973: 39).

Figure 21: Chart of CV combinations for KA through NGA (from Shakyavansha 1973: 40).

Figure 22: Formation of conjuncts with YA (from Shakyavansha 1973: 41).

Figure 23: Formation of conjuncts with RA and LA (from Shakyavansha 1973: 42).

Figure 24: Formation of conjuncts with LA and VA (from Shakyavansha 1973: 43).

Figure 25: Variant forms of vowel letters and digits (from Lipi Thapu Guthi).
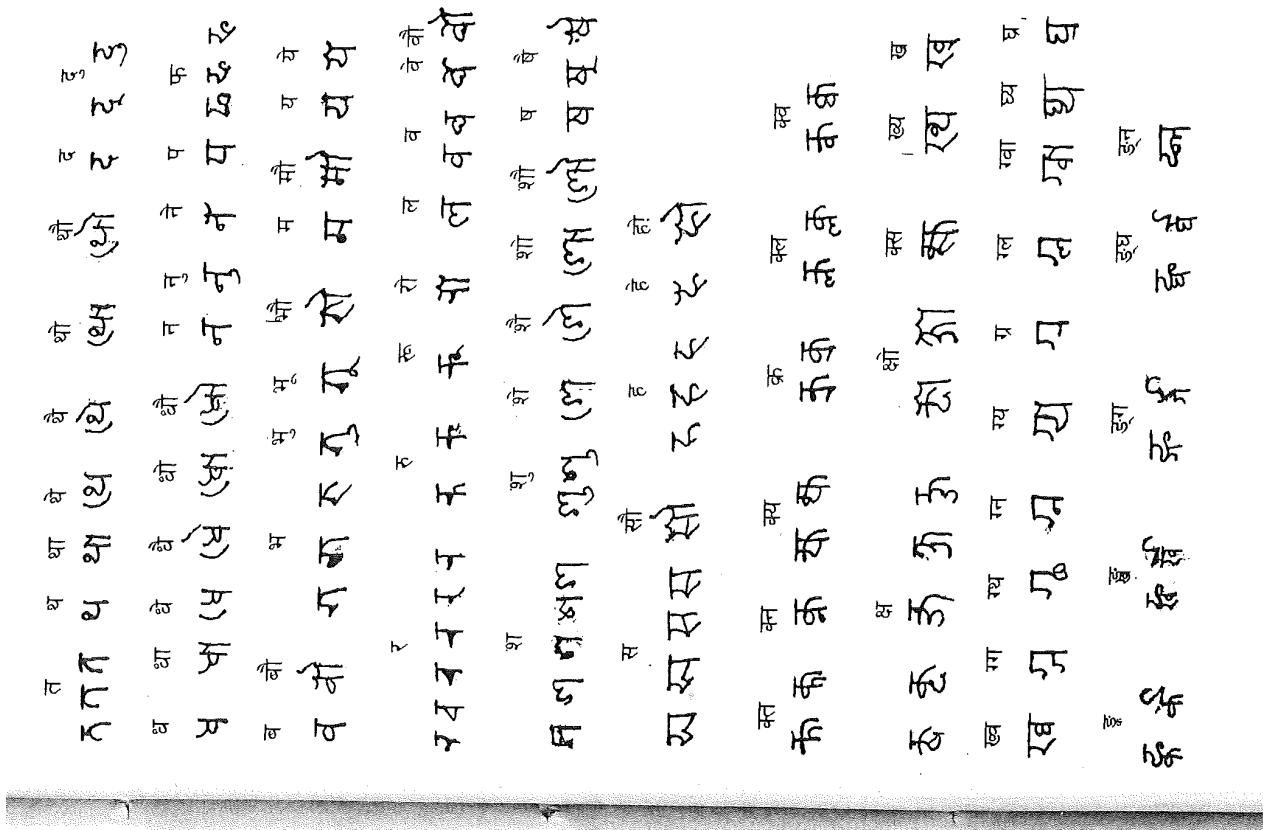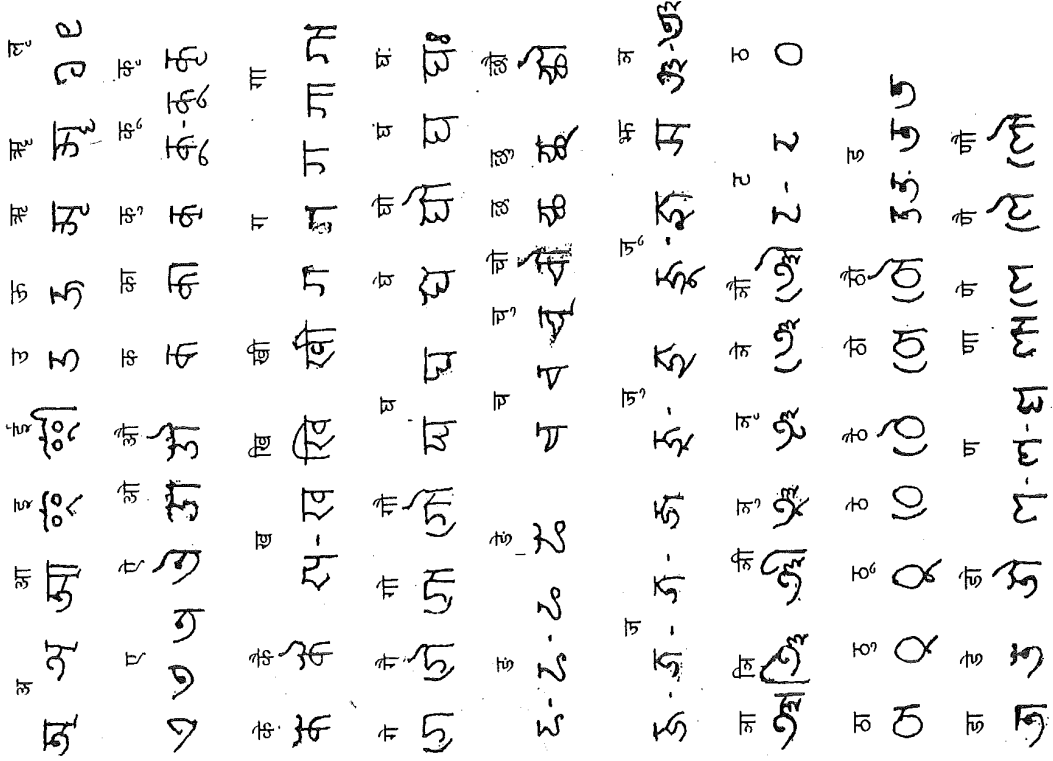
Figure 26: Chart of Newar script (from Regmi: Figure 27).

46

Figure 27: Chart of Newar script (from Regmi: Figure 27).

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नेपाल प्रचलित लिपि Nepal Standard Script

माँआख: मुक्कँ १६ (झिखु)ग: दु। माँआख: मुक्कँ १६ (झिखु)ग: दु। There are 17 vowels

ह्रस्व - अ इ उ ऋ लृ ए ओ अँ अं
Short sound - a i u ri lri e o an am

दीर्घ - आ ई ऊ ॠ लॄ ऐ औ अ:
Long sounded a: i: u: ri: lri: e: o: ah

बा:आख: - मुक्कँ ३६ (सुइखु)ग: दु। बा:आख: - मुक्कँ ३६ (सुइखु)ग: दु। There are 36 consonants

क ख ग घ ङ   च छ ज झ ञ
ka kha ga gha nga   ca/cha chha ja jha nya

ट ठ ड ढ ण   त थ द ध न
Ta Tha Da Dha Na   ta tha da dha na

प फ ब भ म   य र ल व
Pa pha/fa ba bha ma   ya ra la va

श ष स ह क्ष त्र ज्ञ
Sha sha sa ha ksa tra gyan

ङ्ह न्ह म्ह ह ल्ह
Ngha nha mha rha lha

देवनागरि आख: स्यूर्पिँ छिक्रपिन्त: प्रचलित लिपि उलि थाकुइ मखु जुइमा:।
To those of you, who are familiar with the Indian Devanagari script, the Nepal standard script should not be that difficult, I guess.

- सुव नेवाः Suva Newah.
नेपाल संवत ११२९, सिल्ला २६ ञिनिना: (21.02.2009)
Let me hear how you found the above scripts after some trial on your own. Next lesson will be on sounds of consonants.

Figure 28: Basic letters and signs of Prachalit Nepal from an online script tutorial (from "The Newah" 2009).

C Comparative Charts

निच्छिवि पूर्वकाल PRE-LKHCHHAVI PERIOD	लिच्छिविकाल LICHCHHAVI PERIOD		मल्ल एर्व शाहकाल MALLA AND SHAHA PERIOD							
ब्राह्मी BRAHMI	पूर्वलिन्छिवि PRO-LICHCHHAVI	उनरलिन्छिवि POST-LICHCHHAVI	किरात KIRAT	रञ्जना RANJANA	भुजिमो BHUJIMO	नेवारी NEWARI	मैथिली MAITHILI	तिब्बती TIBETAN	नन्दिनागरी NANDINAGARI	देवनागरी DEVANAGARI
Ⴈ	ऋ	☊	ॐ	ऄ	अ	अ	अ	ॲ	ᔆ	अ A
ⴕ	ऋॖ	☊ॖ	ॐ	आ	आ	आ	आ	ॲॖ	ᔆ	आ Ā
∴	ॊ	ॖ		ॏ	ॣ	ॣ	ॐ	ॐ	ᔆ	इ I
	ॊ	ॖ	ॐ	ॏ	ॣ	ॣ	ॐ	ॐ	ᔆ	ई Ī
L	ⴑ	ॐ		ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	उ U
	ॐ	ॐ		ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ऊ Ū
	ॐ			ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ऋ RI
	ॐ			ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॠ RĪ
	ॐ	ॐ		ॐ	ॐ	ॐ	न	ॐ	ॐ	ऌ LRĪ
	ॐ	ॐ		ॐ	ॐ	ॐ	न	ॐ	ॐ	ॡ LRĪ
▽	▽	▽	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ए E
	▽	▽	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ऐ AI
⊥	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ओ O
	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	औ AU
ⴕ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	अं AM
ⴕ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	ॐ	अः AH
+	ॐ	ॐ	Z	ॐ	ॐ	क	ॐ	ग	ॐ	क KA
⌃	ॐ	ॐ	ॐ	ॐ	ॐ	ख	ॐ	ॐ	ॐ	ख KHA

Figure 29: Comparison of letters A to KHA of Newari, Ranjana, Bhujimol, etc. (from Government of Nepal 1962).

Figure 30: Comparison of letters GA to DDHA of Newari, Ranjana, Bhujimol, etc. (from Government of Nepal 1962).

लिन्छविपूर्वकाल PRE-LICHCHHAVI PERIOD	लिन्छविकाल LICHCHHAVI PERIOD		मल्ल स्वं शाहकाल MALLA AND SHĀHA PERIOD							
ब्राह्मी BRAHMI	पूर्वलिन्छवि PRO-LICHCHHAVI	उतरलिन्छवि POST-LICHCHHAVI	किरात KIRAT	रञ्जना RANJANA	सुजिमो BHUJIMO	नेवारी NEWARI	मैथिली MAITHILI	तिब्बती TIBETAN	नन्दिनागरी NANDINAGARI	देवनागरी DEVANAGARI
										ण NA
										त TA
										थ THA
										द DA
										ध DHA
										न NA
										प PA
										फ PHA
										ब BA
										भ BHA
										म MA
										य YA
										र RA
										ळ LA
										व VA
										श SHA
										ष SA
										स SA

Figure 31: Comparison of letters NNA to SA of Newari, Ranjana, Bhujimol, etc. (from Government of Nepal 1962).

Figure 32: Comparison of letters HA and some ligatures of Newari, Ranjana, Bhujimol, etc. (from Government of Nepal 1962).

Figure 33: Comparison of digits of Newari, Ranjana, Bhujimol, etc. (from Government of Nepal 1962).

Scripts Used in Writing Maithili
मैथिली लिखबामे व्यवहृत लिपि
(1) Tirhutā (2) Newārī (3) Nāgarī (4) Roman

(1)	(2)	(3)	(4)		(1)	(2)	(3)	(4)		(1)	(2)	(3)	(4)		(1)	(2)	(3)	(4)
		अ	a				छ	chh				य	y				कृ	kri
		आ	ā				ज	j				र	r				क्य	ky
		इ	i				झ	jh				ल	l				क्र	kr
		ई	ī				ञ	ñ				व	v				क्व	kv
		उ	u				ट	ṭ				श	sh				द्ध	ddh
		ऊ	ū				ठ	ṭh				ष	ṣ				त्त	tt
		ऋ	ri				ड	ḍ				स	s				श्र	shr
		ए	e				ढ	ḍh				ह	h				ष्ठ	sth
		ऐ	ai				ण	ṇ				क	ka				नु	nu
		ओ	o				त	t				का	kā				न्व	nv
		औ	au				थ	th				कि	ki				ह्म	hm
		अं	ṁ				द	d				की	kī				१	1
		अः	ḥ				ध	dh				कु	ku				२	2
		क	k				न	n				कू	kū				३	3
		ख	kh				प	p				के	ke				४	4
		ग	g				फ	ph				कै	kai				५	5
		घ	gh				ब	b				को	ko				६	6
		ङ	ṅ				भ	bh				कौ	kau				७	7
		च	ch				म	m				क्ष	kṣ				८	8
												त्र	tr				९	9
												ज्ञ	gẙ				१०	10

xxxi   xxxii

Figure 34: Comparison of Maithili, Newari, and Devanagari (from Jha 1999: xxxi–xxxii).

Figure 35: Evolution of Newar from Brahmi (from Rajbanshi 1974: Plates 74, 75, 76).

	Newa	Pachhai	Rabison	Kumari	Swati	Aakha
A	अ	अ	अ	अ	अ	अ
AA	आ	आ	आ	आ	आ	आ
I	इ	इ	इ	इ	इ	इ
II	ई	ई	ई	ई	ई	ई
U	उ	उ	उ	उ	उ	उ
UU	ऊ	ऊ	ऊ	ऊ	ऊ	ऊ
VOCALIC R	—	—	ऋ	—	ऋ	ऋ
VOCALIC RR	—	—	—	—	—	ॠ
VOCALIC L	—	—	—	—	—	ऌ
VOCALIC LL	—	—	—	—	—	ॡ
E	ए	ए	ए	ए	ए	ए
AI	ऐ	ऐ	ऐ	ऐ	ऐ	ऐ
O	ओ	ओ	ओ	ओ	ओ	ओ
AU	औ	औ	औ	औ	औ	औ

Table 2: Comparison of vowel letters and signs of various digitized Newar typefaces.

	Newa	Pachhai	Rabison	Kumari	Swati	Aakha
VOWEL SIGN A	—	—	—	—	—	—
VOWEL SIGN AA	◌ा	◌ा	◌ा	◌ा	◌ा	◌ा
VOWEL SIGN I	ि◌	ि◌	ि◌	ि◌	ि◌	ि◌
VOWEL SIGN II	◌ी	◌ी	◌ी	◌ी	◌ी	◌ी
VOWEL SIGN U	◌ु	◌ु	◌ु	◌ु	◌ु	◌ु
VOWEL SIGN UU	◌ू	◌ू	◌ू	◌ू	◌ू	◌ू
VOWEL SIGN VOCALIC R	◌ृ	◌ृ	◌ृ	◌ृ	◌ृ	◌ृ
VOWEL SIGN VOCALIC RR	—	—	—	—	—	◌ॄ
VOWEL SIGN E	◌ॆ	◌ॆ	◌ॆ	◌ॆ	◌ॆ	◌ॆ
VOWEL SIGN AI	◌ै	◌ै	◌ै	◌ै	◌ै	◌ै
VOWEL SIGN O	◌ो	◌ो	◌ो	◌ो	◌ो	◌ो
VOWEL SIGN AU	◌ौ	◌ौ	◌ौ	◌ौ	◌ौ	◌ौ

Table 3: Comparison of vowel letters and signs of various digitized Newar typefaces.

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	Newa	Pachhai	Rabison	Kumari	Swati	Aakha
KA	क	क	क	क	की	क
KHA	ख	ख	ख	ख	ख	ख
GA	ग	ग	ग	ग	ग	ग
GHA	घ	घ	घ	घ	ध	घ
NGA	६	ﾌ	ﾌ	ﾌ	ﾌ	ﾌ
CA	च	च	च	च	च	च
CHA	ﾛ	ﾛ	ﾛ	ﾛ	ﾛ	ﾛ
JA	ﾗ	ﾗ	ﾗ	ﾗ	ﾗ	ﾗ
JHA	म	म	म	म	म	म
NYA	ﾚ	ﾚ	ﾚ	ﾚ	ﾚ	ﾚ
TTA	ट	ट	ट	ट	ट	ट
TTHA	०	०	०	०	०	०
DDA	ﾖ	ﾖ	ﾖ	ﾖ	ﾖ	ﾖ
DDHA	ﾓ	ﾓ	ﾓ	ढ	ﾓ	ﾓ
NNA	ﾛ	ﾛ	ﾛ	ﾛ	ﾛ	ﾛ
TA	त	त	त	त	त	त
THA	थ	थ	थ	थ	थ	थ

Table 4: Comparison of consonant letters of various digitized Newar typefaces.

	Newa	Pachhai	Rabison	Kumari	Swati	Aakha
DA	(??)	(??)	द	द	द	द
DHA	ध	ध	ध	ध	ध	ध
NA	न	न	न	न	न	न
PA	प	य	य	य	य	य
PHA	रू	रू	रू	रू	रू	रू
BA	व	व	व	व	व	व
BHA	र	र	र	र	र	र
MA	म	म	म	म	म	म
YA	य	य	य	य	य	य
RA	न	न	न	न	न	न
LA	ल	ल	ल	ल	ल	ल
VA	व	व	व	ब	ब	ब
SHA	श	श	श	श	श	श
SSA	य	ष	ष	ष	ष	ष
SA	स	स	स	स	स	स
HA	ह	ह	ह	ह	ह	ह

Table 5: Comparison of consonant letters of various digitized Newar typefaces.

D   Usage of Characters in Manuscripts

Figure 36: The Newar varnamala in a manuscript (U Tokyo MS Matsunami 419, f.238r). Original image provided by Iain Sinclair.

Figure 37: Use of ꣼ FINAL ANUSVARA and dandas (from Lokesh Chandra 1981: 317).

Figure 38: Use of ꣼ FINAL ANUSVARA after ○ ANUSVARA (from Lokesh Chandra 1981: 317).

Figure 39: Use of ⟫ RIGHTWARD ARROW DANDA and ⟪ LEFTWARD ARROW DANDA used alongside ‖ DOUBLE DANDA (from Lokesh Chandra 1981: 319). Note the sequence ⟪⟫ in the last line, which are written without the accompanying ǀ DANDA.

Figure 40: Use of ⟫ RIGHTWARD ARROW DANDA and ⟪ LEFTWARD ARROW DANDA written with ※ FLOWER (from Lokesh Chandra 1981: 357).
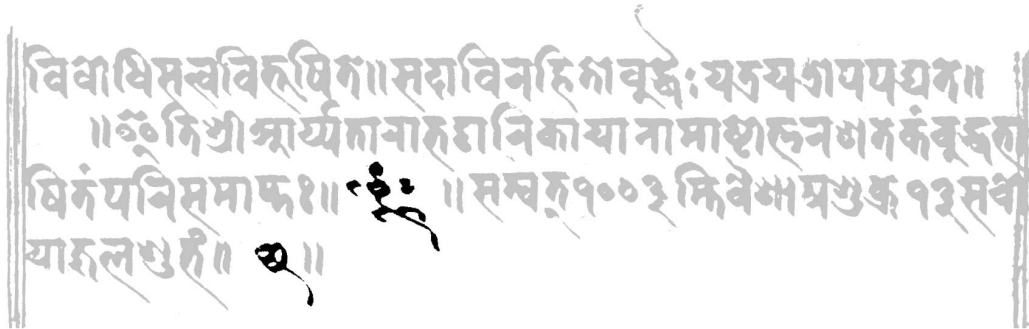
Figure 41: Variant of ※ FLOWER in the form of a flower with stem, and a ✿ PUSHPIKA (from Lokesh Chandra 1981: 231).

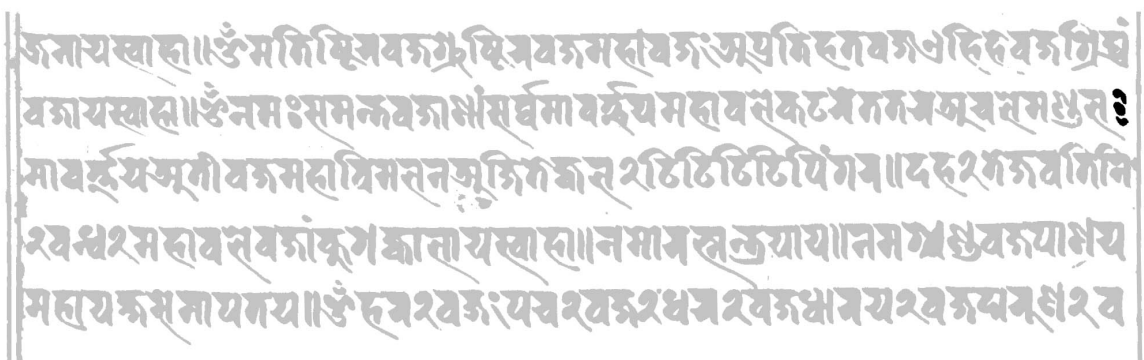Figure 42: Variant of ꣸ GAP FILLER at a mid-line break (from Lokesh Chandra 1981: 348).

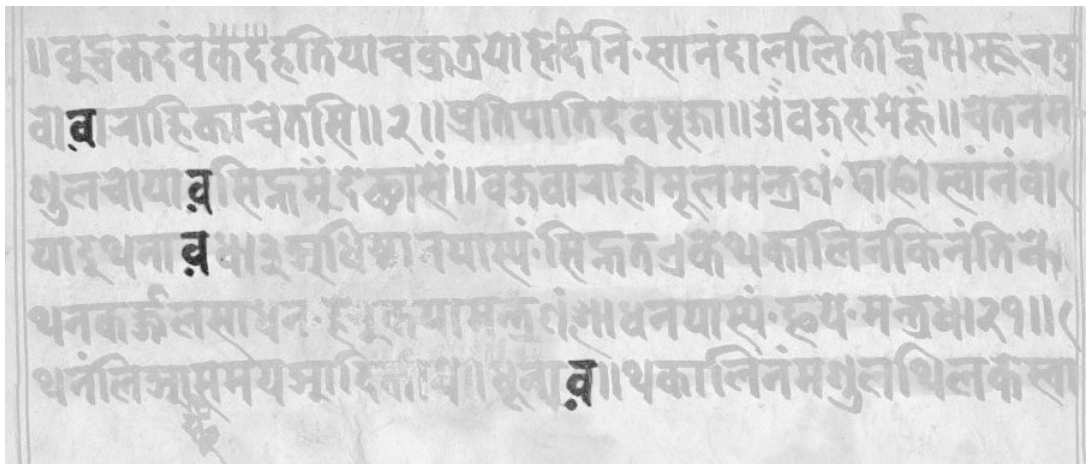Figure 43: Variant of ꣸ GAP FILLER at end of line (from Lokesh Chandra 1981: 323).

Figure 44: Text showing ◌ ɴᴜᴋᴛᴀ combined with व ᴠᴀ (Asha Archives Mss. 3327, folio 5v). Original image provided by Iain Sinclair.
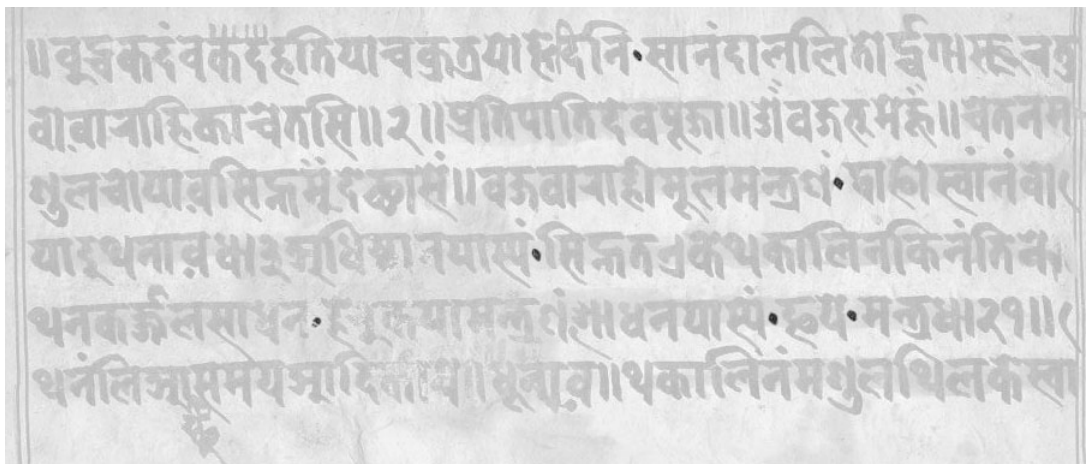

Figure 45: Text showing the use of the · middle dot as a word and phrase separator (Asha Archives Mss. 3327, folio 5v). Original image provided by Iain Sinclair.
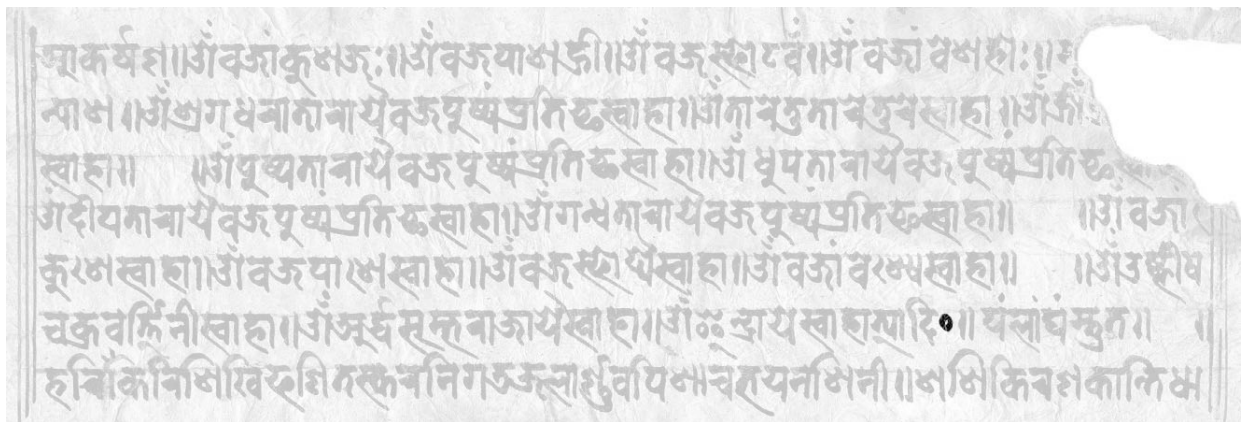

Figure 46: Text showing the use of ◦ ᴀʙʙʀᴇᴠɪᴀᴛɪᴏɴ ꜱɪɢɴ ᴄɪʀᴄʟᴇ (Asha Archives Mss. 3314, folio 5v). Original image provided by Iain Sinclair.

Figure 47: The ꣾ GAP FILLER used at ends of line (from Lokesh Chandra 1981: 41).

Figure 48: Use of ꣷ AVAGRAHA (from Lokesh Chandra 1981: 41).

Figure 49: Various punctuation marks (from Lokesh Chandra 1981: 98).

E   Various Signs and Numerals

Figure 50: Various signs found in Newar manuscripts (from Shakyavansha 1973: 84).
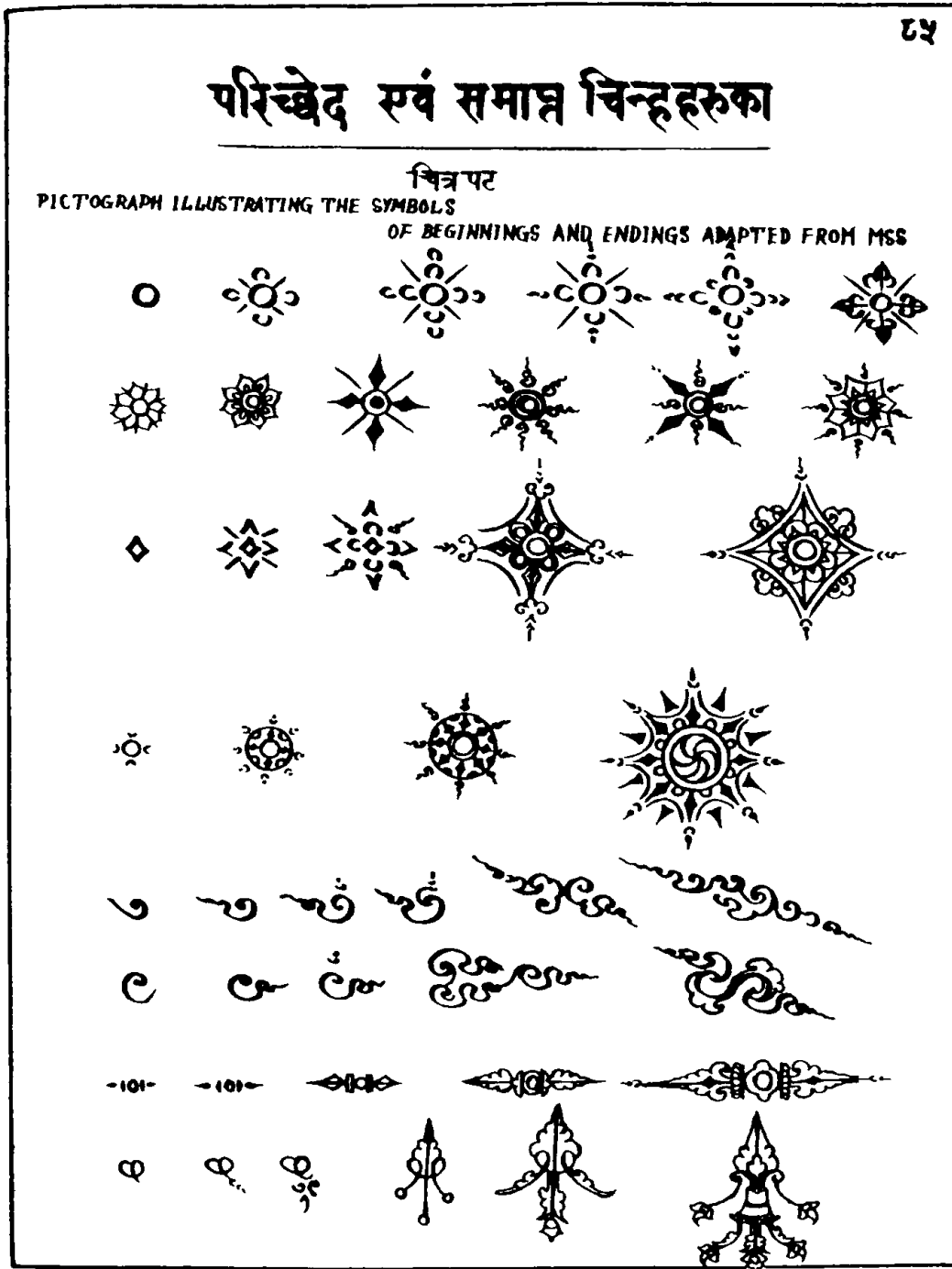
Figure 51: Various symbols and flourishes found in Newar manuscripts (from Shakyavansha 1973: 85).

Figure 52: Letter-numerals used in old Newari manuscripts (from Ranbanshi 1974: Plate 85 and 86).

Symbols of Nepal Lipi

In addition to dependent vowel signs noted above, there are symbols in Nepal Lipi as below:

○̊	Sinhaphuti (Anusvara)		○̐	Milaphuti (Chandrabindu)
○꣹	Lyuphuti (Visarga)		ǀ	Dipuchin (Danda/Virama/period)
○	Tutipala chin (Halanta)		ǁ	Nidho Dipuchin (Double Danda/Virama/period)
੨	Bhin chin (Siddhi/Subha) sign		੧ ੨	Akhala hilabulachin (changer)
`	Khangvo jhasuchin (comma)		˅˄	Khalithasaytegu chin (blank)
∧	Akhala tophyuchin (Kaakapada/ missing letter indicator)		////	Mhusa chin (delete)
⸡	Khangvo svapu chin (word connector)		⦙⦙⦙⦙	Bhinka chin (correction)
‖⸩‖	Kvocagu chin (end sign)			

A New Symbol for AE diphthong

Although there are many words that read AE sound in Nepal Bhasa, there is no dependent sign for it. Further there are also a number of foreign names starting with AE vowel sounds of many counhtries in the world. Therefore, a dependent sign for AE is considered very vital and this author proposes a new dependent symbol ⟨ for (AE) to be added in the dependent symbols of vowels when encoding Nepal Lipi to fecilitiate writing both local and foreign words as in क्षा (mhyay-daughter); कानडा (Canada), काव्ना (Canbera), अट्स्टर्डम् (Amsterdam). The author proposes the sign to be named *Beikoh chin* (bent symbol) as one needs to bend one's jaw to pronounce AE, and add lyuphuti (visarga) for a long letter as in अॉन् (Ann).

Figure 53: Excerpt from Vajracharya (2010: 7) showing various symbols used in the Newar script as well as a description of a newly-created vowel sign *beikoh chin*. This vowel sign is not a candidate for encoding.

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ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646[1]
Please fill all the sections A, B and C below.
Please read Principles and Procedures Document (P & P) from http://www.dkuug.dk/JTC1/SC2/WG2/docs/principles.html **for guidelines and details before filling this form.**
Please ensure you are using the latest Form from http://www.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html.
See also http://www.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html **for latest** *Roadmaps.*

A. Administrative

1. **Title:** *Proposal to Encode the Newar Script in ISO/IEC 10646*
2. Requester's name: *Script Encoding Initiative (SEI) / Anshuman Pandey <pandey@umich.edu>*
3. Requester type (Member body/Liaison/Individual contribution): *Liaison contribution*
4. Submission date: *2012-02-29*
5. Requester's reference (if applicable):
6. Choose one of the following:
   This is a complete proposal: *Yes*
   (or) More information will be provided later:

B. Technical – General

1. Choose one of the following:
   a. This proposal is for a new script (set of characters): *Yes*
      Proposed name of script: *Newar*
   b. The proposal is for addition of character(s) to an existing block:
      Name of the existing block:
2. Number of characters in proposal: *91*
3. Proposed category (select one from below - see section 2.2 of P&P document):
   A-Contemporary **X**   B.1-Specialized (small collection)   B.2-Specialized (large collection)
   C-Major extinct   D-Attested extinct   E-Minor extinct
   F-Archaic Hieroglyphic or Ideographic   G-Obscure or questionable usage symbols
4. Is a repertoire including character names provided? *Yes*
   a. If YES, are the names in accordance with the "character naming guidelines"
      in Annex L of P&P document? *Yes*
   b. Are the character shapes attached in a legible form suitable for review? *Yes*
5. Fonts related:
   a. Who will provide the appropriate computerized font to the Project Editor of 10646 for publishing the standard?
      The chart font will be provided by Anshuman Pandey, pending the authorization for use by Rabison Shakya, the original developer of the 'Rabison' font, from which the glyphs are derived.
   b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.):
      Anshuman Pandey (pandey@umich.edu) and Rabison Shakya
6. References:
   a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided? *Yes*
   b. Are published examples of use (such as samples from newspapers, magazines, or other sources)
   of proposed characters attached? *Yes*
7. Special encoding issues:
   Does the proposal address other aspects of character data processing (if applicable) such as input,
   presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)? *Yes*

8. Additional Information:
Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script. Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization related information. See the Unicode standard at http://www.unicode.org for such information on other scripts. Also see Unicode Character Database (http://www.unicode.org/reports/tr44/) and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before?   *No*
   If YES explain

2. Has contact been made to members of the user community (for example: National Body,
   user groups of the script or characters, other experts, etc.)?   *Yes*
   If YES, with whom?
   Kamal P. Malla <kamal.malla@gmail.com>
   Kashinath Tamot <kashinath.tamot@nepalmandal.org>
   Suwarn Vajracharya <suwan_vj@hotmail.com>
   Iain Sinclair <risinc@hotmail.com>
   Alexander von Rospatt <rospatt@berkeley.edu>
   Patrick Hall <p.a.v.hall@btinternet.com>

   If YES, available relevant documents: *See text of proposal*

3. Information on the user community for the proposed characters (for example:
   size, demographics, information technology use, or publishing use) is included?   *Yes*
   Reference: *Size of user community is unknown. Script is used for print and digital publications.*

4. The context of use for the proposed characters (type of use; common or rare)   *Common*
   Reference: *The Newar script is used for writing Newar (Nepal Bhasa), Sanskrit, and other languages.*
   The script is also known as 'Prachalit', 'Nepal Lipi', 'Newari', etc.

5. Are the proposed characters in current use by the user community?   *Yes*
   If YES, where? Reference: *By speakers of Newar in Nepal, Sikkim (India), and the diaspora.*

6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely
   in the BMP?   *No*
   If YES, is a rationale provided?
   If YES, reference:

7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)?   *Yes*

8. Can any of the proposed characters be considered a presentation form of an existing
   character or character sequence?   *No*
   If YES, is a rationale for its inclusion provided?
   If YES, reference:

9. Can any of the proposed characters be encoded using a composed character sequence of either
   existing characters or other proposed characters?   *No*
   If YES, is a rationale for its inclusion provided?
   If YES, reference:

10. Can any of the proposed character(s) be considered to be similar (in appearance or function)
    to an existing character?   *Yes*
    If YES, is a rationale for its inclusion provided?   *Yes*
    If YES, reference: *See text of proposal for similarities between Newar, Devanagari, etc.*

11. Does the proposal include use of combining characters and/or use of composite sequences?   *Yes*
    If YES, is a rationale for such use provided?   *Yes*
    If YES, reference: *Combining vowel signs*
    Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided?
    If YES, reference:

12. Does the proposal contain characters with any special properties such as
    control function or similar semantics?   *Yes*
    If YES, describe in detail (include attachment if necessary)   *Virama*
    See text of proposal

13. Does the proposal contain any Ideographic compatibility characters?   *No*
    If YES, are the equivalent corresponding unified ideographic characters identified?
    If YES, reference: