

Revised proposal to encode the Ol Onal script

Biswajit Mandal

Jan Kučera, Charles University

October 25, 2022

This is a proposal to encode a new script in the Universal Character Set. The Ol Onal script is used in parts of Odisha, West Bengal and Jharkhand in India to write the Bhumij language.

Document history:

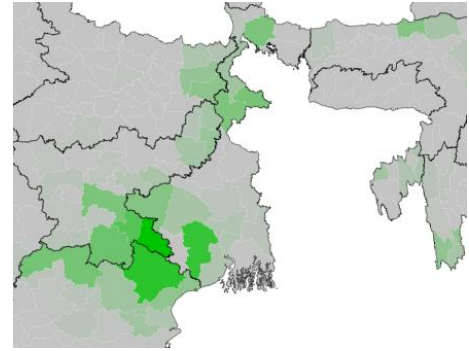
2022-10-25 More typos and missing sign in Table 8.

2022-10-14 Fixed typos and data inconsistency

2022-07-16 Added script-specific abbreviation sign and dandas script extensions, fixed line breaking data for signs, changed all letters from Lu to Lo category, assigned codepoints and added metadata and ISO form.

2022-07-07 Added script-specific vowels, comparison to Ol Chiki and Nag Mundari signs, space usage, proposed ISO 639 code and included evidence by the script author.

2022-04-20 Original proposal



Distribution of 27,506 respondents reporting a mother tongue classified under Bhumij in the north east India, according to 2011 census data.

Used in	Odisha, West Bengal, Jharkhand
Languages	Bhumij (Austroasiatic)
ISO 15924	—
ISO 639	—

1 BACKGROUND

The Ol Onal script (Ol Onal: ଓଲ ଓନାଲ; Odia: ଅଲ ଅନଲ; Bengali: অল অনল; Devanagari: अल अनल) is an alphabetical script written from left to right. It was developed for writing Bhumij (Ol Onal: ଡଢ଼ଡ଼ଡ଼ଡ଼; Odia: ଭୂମିଜ୍; Bengali: ভূমিজ; Devanagari: भूमिज), an Austroasiatic (Munda) language spoken primarily in the states of Jharkhand, Odisha, West Bengal and Assam (Census of India reported 27,506 respondents with mother tongue classified under Bhumij in 2011). Bhumij has been written in the Odia, Bengali, Devanagari and Latin scripts, as well as the script proposed in this document, Ol Onal, which was invented by Mahendra Nath Sardar between 1981 and 1992. Ol Onal is also known as *Bhumij Lipi* or *Bhumij Onal*.

In 1992, a Bhumij community organization based in Odisha, Adim Bhumij Samaj, held a contest for a new script to be used for writing the Bhumij language. Three different scripts were developed, and eventually the organization approved Ol Onal script by Mahendra Nath Sardar from Mahadevdihi (born 1956), and adopted it as an official script for the Bhumij language. In its initial stage, Ol Onal was a casing alphabetical script – the capital letters are known as *Ol Onal*, while the small letters are known as *Galang Onal* (these can be seen in Figure 3 and Figure 5). However, all the teaching and printed materials in Bhumij were produced using Ol Onal (i.e., capital letters). Galang Onal is not used anymore and it is not proposed for encoding in this proposal.

The Bhumij language is an Austroasiatic language of North Munda group [1, p. 324]. Mundari and Bhumij are closely related and mutually intelligible, but with considerable differences [2, p. 4]. Some scholars consider Bhumij to be a dialect of Mundari, while others treat it as a separate language [3, p. 195]. Odisha recognized Bhumij as a

separate language in 2010. Some of the Bhumij speakers call themselves ‘Bhumij Munda’ people [4, p. 14]. The word *Bhumij* means “one who is born from the soil” and it is derived from भूमि *bhūmi* (a *land* or *soil*) [5, p. 173].¹

Information on Ol Onal in English is limited, most of the materials are written in Bhumij, Hindi, Bengali or Odia. A number of different organizations and individuals have published primers for the script, as well as anthologies of stories and poems. There has been a considerable surge of interest in the script in recent years.

1.1 EDUCATION

In West Bengal, there are 26 Bhumij schools run by *West Bengal Adibasi Bhumij Language Development Board*. In Odisha, there are 9 Bhumij learning schools run by *Adim Bhumij Samaj* (estd in 1981). In Jharkhand, there are 10 schools run by *Ayoan Akhra* (estd in 1977-78). *Adibashi Saudo Assam* runs various workshops all over the Assam. *All India Bhumij Education, Social Cultural & Council*, a national level council organizes teaching Ol Onal in schools and runs workshops throughout nearly all Bhumij inhabited districts of Odisha, West Bengal, Assam and Jharkhand.

The *Tata Tisco* foundation sponsors various Ol Onal learning centres: *Shahid Sundar Nagar Singh Ol Onal Akhra*, *Shahid Raghunath Singh Ol Onal Akhra*, *Shahid Pratap Singh Bhumij Bhasha Bhakul*, etc. The first Bhumij-Ol Onal school opened in Rouanshi, Mayurbhanj, Odisha in 1998. Some of the Bhumij elementary schools in Odisha are run by the state government.

1.2 SCRIPT NAME

In some sources, the script name is spelled as अल अनल (al anal) in Devanagari and ଅଲ ଅନଲ (al anal) in Odia, with Ol Onal used in the Latin script [6, 7]. In other sources, the script name is spelled as ओल ओनोल (ol onol) in Devanagari as well as Ol Onol in the Latin script [8, 9]. In this document, the name Ol Onal is proposed based on its popularity amongst users online. The term *Ol Onal* is a combination of two words, where *ol* means *to draw* and *onal* means *a shape or diagram*.

1.3 USAGE

The Ol Onal script is currently used in writing and print for various purposes:

- **Educational Materials:** Primary educational materials for teaching Bhumij and Ol Onal are published by various Bhumij associations and individuals. Example of primers:
 - Barnā Hisir (Bhumij) ଗୁଣ୍ଡିଚା ଗୀତା (ଗୁଣ୍ଡିଚା) by Yudhisthir Sardar (2019)
 - Ādim Bhūmij Bhāṣā आदिम भूमिज भाषा by Luskū Sāmād (2018)
 - Ol Cheden Tanal ଓଲ ଚେନ ତନଲ ଓଲ ଚେନ ତନଲ by Anil Munda (2014)
 - Aabu Podao Tonal ଗାବୁ ପଦାଉ ଟନାଲ ଓଲ ଚେନ ତନଲ by Anil Munda (2014)
 - Āṛāṅg ceden tōnōl आड़ांग चेदेन तनल by Anil Munda (2001)
- **Magazine:** Ārsi आरसि is a Hindi-Bhumij bilingual quarterly magazine published by *Bhumij Bhāṣhā Sāhitya Vikās Parisad*. Sometimes it carries Ol Onal articles.
- **Ritual Works:** Ol Onal used in various religious or ritual purposes of Bhumij community (Figure 7).
- **Ephemera:** various Bhumij associations produce and distribute Ol Onal banners and pamphlets.
- **Other usage:** Ol Onal used in inscriptions, wedding invitation cards, wall paintings, etc.

¹ For an alternative etymology of *Bhumij*, see [6, p. 2].

1.4 FONTS

To date five fonts were made for Ol Onal, all designed by Anil Kumar Munda of Mayurbhanj district, Odisha in 2013-2014 (see Figure 30 for comparison). They are based a simple non-Unicode mapping of Ol Onal characters to the basic Latin block, without any typographical features. The font used in this proposal is “Ol Onal Krishna”.

2 SCRIPT OVERVIEW

Ol Onal is an alphabetical script written from left to right. There are no attested conjuncts or ligatures. There is minimal handwritten evidence, all published material is using one of the fonts from 2014. As such, the script is proposed to be encoded as a simple alphabet, without any complex shaping requirements.

2.1 LETTERS

Similar to Nag Mundari and Ol Chiki, Ol Onal is traditionally presented in a tabular form where the first column are vowels, and each row contains letters whose name start with the respective vowel (see Table 1).

















































 O /ɔ/	 OM /m/	 ONG /ŋ/	 ORR /ɾ/	 OO /o/	 OY /j/
 A /a/	 AD /dʰ/	 AB /b/	 AH /ɦ/	 AL /l/	 AW /w/
 I /i/	 IT /t̪/	 IP /p/	 ITT /t̪ʰ/	 ID /d̪/	 IN /n/
 U /u/	 UK /k/	 UDD /d̪/	 UJ /d̪ʒ/	 UNY /ɲ/	 UR /r/
 E /e/	 ES /s/	 EH /h/	 EC /tʃ/	 ENN /ɳ/	 EG /g/

Table 1. Overview of Ol Onal letters with their names and pronunciation.

Among these, we find

- Vowels:  O,  OO,  A,  I,  U,  E,
- Retroflex:  ORR,  ITT,  UDD,
- Nasals:  OM,  ONG,  IN,  UNY,  ENN,
- Ejective:  AD,
- Dentals:  IT,  ID,
- Aspirated/Fricative:  EH.

2.2 SIGNS

The script further makes use of 3 signs called *ṭiḍaḥ* ଡିଡ଼ାହ, for nasalization, prolongation and glottalization (see Table 2 and below).

◌̣	◌̣̣	◌̣̣̣
MU	IKIR	HODDOND
/ṭ̣/	/ṭ̣̣/	/ṭ̣̣̣/

Table 2. Overview of Ol Onal signs with their names and function.

The MU sign is equivalent to NAG MUNDARI SIGN MUHOR and OL CHIKI MU TTUDDAG. The IKIR sign is graphically corresponding to NAG MUNDARI SIGN IKIR and OL CHIKI GAAHLA TTUDDAAG, however, these are all different in function. The Ol Chiki signs are letter modifiers and clearly spacing in character, while the Nag Mundari signs are non-spacing marks.

In Ol Onal the signs are non-spacing. Due to the non-Unicode font limitations, the marks tend to be on the right side of characters in printed text, however, the handwritten evidence suggests that was not the original intention. They are therefore proposed as above and below non-spacing marks.

Both MU and IKIR signs can theoretically co-occur in Ol Onal, with mark-like semantics for collation:

$A < A+MU < A+IKIR < A+IKIR+MU = A+MU+IKIR$.

2.2.1 MU sign ◌̣ (nasalization)

The sign *mu* (୧୩) is the nasalization sign of Ol Onal, akin to *anunāsika* in Devanagari. It is a dot positioned above vowels.

While written evidence places the sign on top of base characters, existing fonts always put the dot in the top right position.

Examples of use:

- ଗାୱାଲି /gāwla/ villager
- ମୂଢ଼ /mũ/ nose
- କୱା /kṵ/ a kind of sound
- ହେଡ଼େ /hēde/ black

Occurrences in evidence:

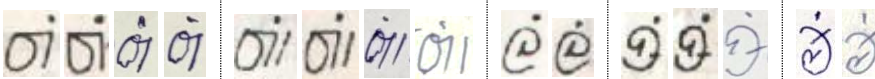
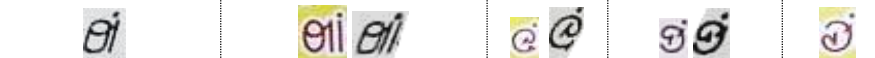
Base letter:	O	A	E	U	I
Handwritten:					
Based on the font:					

Table 3. Examples of vowels carrying the MU sign

Some of the published materials show the *mu* sign also on non-vowels (namely ଠ AW, ଡ ONG and ଢ UK), but these are deemed to be authoring errors.

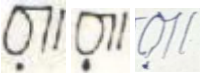

115 **2.2.2 IKIR sign ൹ (prolongation)**
 116 The sign *ikir* (ඉඳිඉඳි) is a long phoneme sign. It is a dot positioned below letter ൹ A only. The script currently
 117 does not distinguish lengths of any other vowels, but encoding long A automatically would create barriers for such
 118 development in the future.

119 While written evidence places the sign at the bottom of base characters, existing fonts always put the dot in the
 120 bottom right position.

121 Examples of use:

- 122 • ඳඉඳි /da:l/ pulse
- 123 • ඹඉඳි /ha:l/ wet
- 124 • ඹඉඳි /ba:i/ to make

125 Occurrences in evidence:

Base letter:	A
Handwritten:	
Based on the font:	

126 *Table 4. Examples of vowels carrying the IKIR sign*




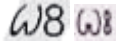
127 Some of the published materials show the *ikir* sign on ൹ IN, but these are deemed to be authoring errors. Since the
 128 non-Unicode fonts map this sign to a full stop, some of the materials use it in place of a full stop for various
 129 purposes.

130 **2.2.3 HODDOND sign ൹ (glottalization)**
 131 The sign *hoddond* (ඉඉඉඉඉඉ) is a glottalizational sign. It can only follow the letters ൹ AB and ൹ UJ. The
 132 *hoddond* mark is visually similar to U+0B03 ORIA SIGN VISARGA ൹, however it is distinct in function. This character
 133 is proposed as a separate, uncased letter.

134 Examples of use:

- 135 • ඳඉඉඉඉඉ /dab?na/ shoulder
- 136 • ඹඉඉඉඉඉ /hisab?/ account
- 137 • ඹඉඉඉ /bʰaɖɔ?/ feast
- 138 • ൹ඉඉඉඉඉ /ɖʒahadɔ?/ ship

139 Occurrences in evidence:

Base letter:	AB	UJ
Handwritten:		
Based on the font:		

140 *Table 5. Examples of vowels carrying the IKIR sign*

141 Some of the published materials show the *hoddond* sign on ൹ EH and ൹ OM, but these are deemed to be authoring
 142 errors. Since the non-Unicode fonts map this sign to a colon, some of the materials use it in place of colon.

143 **2.3 DIGITS**

144 Ol Onal has a full set of decimal digits, see Table 6.

0	১	২	৩	৪	৫	৬	৭	৮	৯
0	1	2	3	4	5	6	7	8	9

145 *Table 6. Ol Onal digits.*

146 Originally the digits had a different design (see Figure 31) but the shapes were changed when the first digital fonts
147 were made in 2013, due to technical difficulties of representing the original shapes. All printed evidence contains
148 the digits as shown above in Table 6.

149 **2.4 PUNCTUATION**

150 Devanagari-like Danda is used by Ol Onal to end a sentence. No evidence contains double danda, although Figure
151 25 shows two single dandas for both Devanagari and Ol Onal. Since Bengali uses danda and double danda from the
152 Devanagari block via script extensions and therefore keyboard layouts in the area share the same character, it is
153 proposed to extend the same danda and double danda usage to the Ol Onal script as well, to avoid confusion and
154 additional complexity for users.

155 Figure 26 shows the usage of an abbreviation sign used in Ol Onal text. While this orthographic tradition also
156 comes from the Nagari family of scripts, historically in Unicode each script has its own dedicated abbreviation
157 sign. Since disunifying the characters later would lead to ambiguous texts, the sign is proposed separately as
158 U+1E5FF OL ONAL ABBREVIATION SIGN, despite occurring only once in the evidence.

159 Western-style punctuation is also used. Evidence shows the usage of comma, question marks, dashes, colons,
160 double quotation marks, parenthesis, slashes, backslashes, percent signs and simple mathematical operators.
161 Figure 17 uses full stop instead of danda, for other misuses of dot below as a full stop, see figures in 7.5.5.

162 Some evidence uses backslash in Ol Onal where slash is used in equivalent text in Latin or Devanagari (e.g. as a
163 date separator).

164 Words are separated by space (see for example Figure 15 or Figure 17).

165 **2.5 WORD BREAKING**

166 Words written in Ol Onal can be broken across lines. Evidence shows western-like hyphenation in such cases, see
167 Figure 10. No rules of where a word can be broken have been formalised.

168 While the *hoddond* sign is graphically based on *visarga*, it has a distinct function as a glottal stop. As such, no
169 special breaking properties around *hoddond* are proposed.

3 PROPOSED CHARACTERS

This document proposes 44 characters in total – 30 letters (Table 7), 4 signs (Table 8) and 10 digits (Table 9).

Ol Onal	Character Name	IPA	orya	deva	beng	class
ଠ	OL ONAL LETTER O	/ɔ/	ଅ	अ	অ	Lo
ଡ	OL ONAL LETTER OM	/m/	ମ୍	म्	ম্	Lo
ଙ	OL ONAL LETTER ONG	/ŋ/	ଙ୍	ङ्	ঙ্	Lo
ଞ	OL ONAL LETTER ORR	/ɾ/	ଞ୍	Ṛ	ড়্	Lo
ଠ	OL ONAL LETTER OO	/o/	ଠ	ओ	ও	Lo
ଠ	OL ONAL LETTER OY	/j/	ଠ	य	য়	Lo
ଠ	OL ONAL LETTER A	/a/	ଠ	आ	আ	Lo
ଠ	OL ONAL LETTER AD	/dʰ/	ଠ	द्	দ্	Lo
ଠ	OL ONAL LETTER AB	/b/	ଠ	ब्	ব্	Lo
ଠ	OL ONAL LETTER AH	/ɦ/	ଠ	अः	অঃ	Lo
ଠ	OL ONAL LETTER AL	/l/	ଠ	ल्	ল্	Lo
ଠ	OL ONAL LETTER AW	/w/	ଠ	व्	ওয়া	Lo
ଠ	OL ONAL LETTER I	/i/	ଠ	इ	ই	Lo
ଠ	OL ONAL LETTER IT	/t̪/	ଠ	त्	ত্	Lo
ଠ	OL ONAL LETTER IP	/p/	ଠ	प्	প্	Lo
ଠ	OL ONAL LETTER ITT	/t̪/	ଠ	ट्	ট্	Lo
ଠ	OL ONAL LETTER ID	/d̪/	ଠ	द्	দ্	Lo
ଠ	OL ONAL LETTER IN	/n/	ଠ	न्	ন্	Lo
ଠ	OL ONAL LETTER U	/u/	ଠ	उ	উ	Lo
ଠ	OL ONAL LETTER UK	/k/	ଠ	क्	ক্	Lo
ଠ	OL ONAL LETTER UDD	/d̪/	ଠ	ङ्	ড্	Lo
ଠ	OL ONAL LETTER UJ	/d͡ʒ/	ଠ	ज्	জ্	Lo
ଠ	OL ONAL LETTER UNY	/ɲ/	ଠ	ञ्	ঞ	Lo
ଠ	OL ONAL LETTER UR	/r/	ଠ	र्	র্	Lo
ଠ	OL ONAL LETTER E	/e/	ଠ	ए	এ	Lo
ଠ	OL ONAL LETTER ES	/s/	ଠ	स्	স্	Lo
ଠ	OL ONAL LETTER EH	/h/	ଠ	ह्	হ্	Lo
ଠ	OL ONAL LETTER EC	/t͡ʃ/	ଠ	च्	চ্	Lo
ଠ	OL ONAL LETTER ENN	/ɳ/	ଠ	ण्	ণ্	Lo
ଠ	OL ONAL LETTER EG	/g/	ଠ	ग्	গ্	Lo

Table 7. Proposed Ol Onal letters

Ol Onal	Character Name	IPA	orya	deva	beng	class
◌̇	OL ONAL SIGN MU	/̇/				Mn
◌̈	OL ONAL SIGN IKIR	/̈/				Mn
◌̉	OL ONAL SIGN HODDOND	/̉/				Lo
◌̊	OL ONAL ABBREVIATION SIGN			◌̊	◌̊	Po

Table 8. Proposed Ol Onal signs

Ol Onal	Character Name	Value	orya	deva	beng	class
0	OL ONAL DIGIT ZERO	◌̊	◌̊	◌̊	◌̊	Nd
১	OL ONAL DIGIT ONE	1	১	१	১	Nd
২	OL ONAL DIGIT TWO	2	২	२	২	Nd
৩	OL ONAL DIGIT THREE	3	৩	३	৩	Nd
৪	OL ONAL DIGIT FOUR	4	৪	४	৪	Nd
৫	OL ONAL DIGIT FIVE	5	৫	৫	৫	Nd
৬	OL ONAL DIGIT SIX	6	৬	৬	৬	Nd
৭	OL ONAL DIGIT SEVEN	7	৭	৭	৭	Nd
৮	OL ONAL DIGIT EIGHT	8	৮	৮	৮	Nd
৯	OL ONAL DIGIT NINE	9	৯	৯	৯	Nd

Table 9. Proposed Ol Onal digits

3.1 CHARACTER PROPERTIES

This proposal does not use complex shaping for rendering Ol Onal.

3.1.1 UnicodeData.txt

```

1E5D0;OL ONAL LETTER O;Lo;0;L;;;;;N;;;;;
1E5D1;OL ONAL LETTER OM;Lo;0;L;;;;;N;;;;;
1E5D2;OL ONAL LETTER ONG;Lo;0;L;;;;;N;;;;;
1E5D3;OL ONAL LETTER ORR;Lo;0;L;;;;;N;;;;;
1E5D4;OL ONAL LETTER OO;Lo;0;L;;;;;N;;;;;
1E5D5;OL ONAL LETTER OY;Lo;0;L;;;;;N;;;;;
1E5D6;OL ONAL LETTER A;Lo;0;L;;;;;N;;;;;
1E5D7;OL ONAL LETTER AD;Lo;0;L;;;;;N;;;;;
1E5D8;OL ONAL LETTER AB;Lo;0;L;;;;;N;;;;;
1E5D9;OL ONAL LETTER AH;Lo;0;L;;;;;N;;;;;
1E5DA;OL ONAL LETTER AL;Lo;0;L;;;;;N;;;;;
1E5DB;OL ONAL LETTER AW;Lo;0;L;;;;;N;;;;;
1E5DC;OL ONAL LETTER I;Lo;0;L;;;;;N;;;;;
1E5DD;OL ONAL LETTER IT;Lo;0;L;;;;;N;;;;;
1E5DE;OL ONAL LETTER IP;Lo;0;L;;;;;N;;;;;
1E5DF;OL ONAL LETTER ITT;Lo;0;L;;;;;N;;;;;
1E5E0;OL ONAL LETTER ID;Lo;0;L;;;;;N;;;;;
1E5E1;OL ONAL LETTER IN;Lo;0;L;;;;;N;;;;;
1E5E2;OL ONAL LETTER U;Lo;0;L;;;;;N;;;;;
1E5E3;OL ONAL LETTER UK;Lo;0;L;;;;;N;;;;;
1E5E4;OL ONAL LETTER UDD;Lo;0;L;;;;;N;;;;;
1E5E5;OL ONAL LETTER UJ;Lo;0;L;;;;;N;;;;;
1E5E6;OL ONAL LETTER UNY;Lo;0;L;;;;;N;;;;;
1E5E7;OL ONAL LETTER UR;Lo;0;L;;;;;N;;;;;
1E5E8;OL ONAL LETTER E;Lo;0;L;;;;;N;;;;;
1E5E9;OL ONAL LETTER ES;Lo;0;L;;;;;N;;;;;
1E5EA;OL ONAL LETTER EH;Lo;0;L;;;;;N;;;;;
1E5EB;OL ONAL LETTER EC;Lo;0;L;;;;;N;;;;;

```


208 1E5EC;OL ONAL LETTER ENN;Lo;0;L;;;;N;;;;;
 209 1E5ED;OL ONAL LETTER EG;Lo;0;L;;;;N;;;;;
 210
 211 1E5EE;OL ONAL SIGN MU;Mn;230;NSM;;;;N;;;;;
 212 1E5EF;OL ONAL SIGN IKIR;Mn;220;NSM;;;;N;;;;;
 213 1E5F0;OL ONAL SIGN HODDOND;Lo;0;L;;;;N;;;;;
 214 1E5F1;OL ONAL DIGIT ZERO;Nd;0;L;;0;0;0;N;;;;;
 215 1E5F2;OL ONAL DIGIT ONE;Nd;0;L;;1;1;1;N;;;;;
 216 1E5F3;OL ONAL DIGIT TWO;Nd;0;L;;2;2;2;N;;;;;
 217 1E5F4;OL ONAL DIGIT THREE;Nd;0;L;;3;3;3;N;;;;;
 218 1E5F5;OL ONAL DIGIT FOUR;Nd;0;L;;4;4;4;N;;;;;
 219 1E5F6;OL ONAL DIGIT FIVE;Nd;0;L;;5;5;5;N;;;;;
 220 1E5F7;OL ONAL DIGIT SIX;Nd;0;L;;6;6;6;N;;;;;
 221 1E5F8;OL ONAL DIGIT SEVEN;Nd;0;L;;7;7;7;N;;;;;
 222 1E5F9;OL ONAL DIGIT EIGHT;Nd;0;L;;8;8;8;N;;;;;
 223 1E5FA;OL ONAL DIGIT NINE;Nd;0;L;;9;9;9;N;;;;;
 224 1E5FF;OL ONAL ABBREVIATION SIGN;Po;0;L;;;;N;;;;;

225 3.1.2 LineBreak.txt

226 1E5D0..1E5ED;AL # Lo [30] OL ONAL LETTER O..OL ONAL LETTER EG
 227 1E5EE..1E5EF;CM # Mn [2] OL ONAL SIGN MU..OL ONAL SIGN IKIR
 228 1E5F0;AL # Lo OL ONAL SIGN HODDOND
 229 1E5F1..1E5FA;NU # Nd [10] OL ONAL DIGIT ZERO..ON ONAL DIGIT NINE
 230 1E5FF;AL # Po OL ONAL ABBREVIATION SIGN

231 3.1.3 ScriptExtensions.txt

232 # =====
 233
 234 # Script_Extensions=Beng Deva Dogr Gong Gonm Gran Gujr Guru Knda Mahj Mlym Nand Orya Sind Sinh
 235 Sylo Takr Taml Telu Tirh Ol
 236
 237 0964 ; Beng Deva Dogr Gong Gonm Gran Gujr Guru Knda Mahj Mlym Nand Orya Sind Sinh Sylo
 238 Takr Taml Telu Tirh Ol # Po DEVANAGARI DANDA
 239
 240 # Total code points: 1
 241
 242 # =====
 243
 244 # Script_Extensions=Beng Deva Dogr Gong Gonm Gran Gujr Guru Knda Limb Mahj Mlym Nand Orya Sind
 245 Sinh Sylo Takr Taml Telu Tirh Ol
 246
 247 0965 ; Beng Deva Dogr Gong Gonm Gran Gujr Guru Knda Limb Mahj Mlym Nand Orya Sind Sinh
 248 Sylo Takr Taml Telu Tirh Ol # Po DEVANAGARI DOUBLE DANDA
 249
 250 # Total code points: 1

251 4 COLLATION

252 The collation order follows digits, letters and signs in their encoding order:

253 1E5F1 1E5F2 1E5F3 1E5F4 1E5F5 1E5F6 1E5F7 1E5F8 1E5F9 1E5FA 1E5D0 1E5D1
 0 < ୧ < ୨ < ୩ < ୪ < ୫ < ୬ < ୭ < ୮ < ୯ < ୦ < ୧ <
 254 1E5D2 1E5D3 1E5D4 1E5D5 1E5D6 1E5D7 1E5D8 1E5D9 1E5DA 1E5DB 1E5DC 1E5DD
 ୨ < ୩ < ୪ < ୫ < ୬ < ୭ < ୮ < ୯ < ୦ < ୧ < ୨ < ୩ < ୪ <
 255 1E5DE 1E5DF 1E5E0 1E5E1 1E5E2 1E5E3 1E5E4 1E5E5 1E5E6 1E5E7 1E5E8 1E5E9
 ୦ < ୧ < ୨ < ୩ < ୪ < ୫ < ୬ < ୭ < ୮ < ୯ < ୦ < ୧ < ୨ <
 256 1E5EA 1E5EB 1E5EC 1E5ED 1E5EE 1E5EF 1E5F0 1E5FF
 ୩ < ୪ < ୫ < ୬ < ୭ < ୮ < ୯ < ୦

257 In an alphabetical list of words, nasalization is expected to come before prolongation, like in the following list (of
258 hypothetical words):

- 259 1. ᱚᱱᱚᱛᱚᱱ /gawla/ <EG, A, AW, AL, A>
260 2. ᱚᱱᱚᱛᱚᱱ /gāwla/ <EG, A, MU, AW, AL, A>
261 3. ᱚᱱᱚᱛᱚᱱ /gaːwla/ <EG, A, IKIR, AW, AL, A>
262 4. ᱚᱱᱚᱛᱚᱱ /gãːwla/ <EG, A, IKIR, MU, AW, AL, A>

263 5 METADATA

264

Name	Script_Code	Age	Size	Sample	Sample_Code	Origin Country	Density
Ol_Onal	Olon		44	ᱚᱱ	1E5D0	India	1

265

Likely Language	Lang_Code	ID Usage (UAX31)	RTL?	LB letters?	Shaping Req?	IME?	Has Case?
Mundari	unr	Limited_Use	no	no	min	no	no

266 The Bhumij language is a language of the Mundari subfamily.

267 6 ACKNOWLEDGMENT

268 We would like to thank Ol Guru Mahendra Nath Sardar, the script inventor, for his valuable instructions regarding
269 the proposal and Anil Munda (Jharkhand), the font creator, for providing various linguistic materials, books, etc.
270 We would also like to thank Dhananjay Sardar, Mensingh Donda, and Sunita Munda, for their help on this
271 proposal, and Tapan Kumar Sardar and Dhananjay Singh Sardar from West Bengal for providing various books and
272 pictures of Ol Onal as used in West Bengal.

1E5D0

Ol Onal

1E5FF

	1E5D	1E5E	1E5F
0	ᄒ 1E5D0	ᄃ 1E5E0	ᄄ 1E5F0
1	ᄅ 1E5D1	ᄆ 1E5E1	ᄇ 1E5F1
2	ᄈ 1E5D2	ᄉ 1E5E2	ᄊ 1E5F2
3	ᄋ 1E5D3	ᄌ 1E5E3	ᄍ 1E5F3
4	ᄎ 1E5D4	ᄏ 1E5E4	ᄐ 1E5F4
5	ᄑ 1E5D5	ᄒ 1E5E5	ᄓ 1E5F5
6	ᄔ 1E5D6	ᄕ 1E5E6	ᄖ 1E5F6
7	ᄗ 1E5D7	ᄘ 1E5E7	ᄙ 1E5F7
8	ᄚ 1E5D8	ᄛ 1E5E8	ᄜ 1E5F8
9	ᄝ 1E5D9	ᄞ 1E5E9	ᄟ 1E5F9
A	ᄠ 1E5DA	ᄡ 1E5EA	ᄢ 1E5FA
B	ᄣ 1E5DB	ᄤ 1E5EB	
C	ᄥ 1E5DC	ᄦ 1E5EC	
D	ᄧ 1E5DD	ᄨ 1E5ED	
E	ᄩ 1E5DE	ᄪ 1E5EE	
F	ᄫ 1E5DF	ᄬ 1E5EF	ᄭ 1E5FF

Letters

1E5D0	ᄒ	OL ONAL LETTER O
1E5D1	ᄅ	OL ONAL LETTER OM
1E5D2	ᄈ	OL ONAL LETTER ONG
1E5D3	ᄋ	OL ONAL LETTER ORR
1E5D4	ᄎ	OL ONAL LETTER OO
1E5D5	ᄑ	OL ONAL LETTER OY
1E5D6	ᄔ	OL ONAL LETTER A
1E5D7	ᄗ	OL ONAL LETTER AD
1E5D8	ᄚ	OL ONAL LETTER AB
1E5D9	ᄝ	OL ONAL LETTER AH
1E5DA	ᄠ	OL ONAL LETTER AL
1E5DB	ᄣ	OL ONAL LETTER AW
1E5DC	ᄥ	OL ONAL LETTER I
1E5DD	ᄧ	OL ONAL LETTER IT
1E5DE	ᄩ	OL ONAL LETTER IP
1E5DF	ᄫ	OL ONAL LETTER ITT
1E5E0	ᄃ	OL ONAL LETTER ID
1E5E1	ᄆ	OL ONAL LETTER IN
1E5E2	ᄉ	OL ONAL LETTER U
1E5E3	ᄌ	OL ONAL LETTER UK
1E5E4	ᄏ	OL ONAL LETTER UDD
1E5E5	ᄒ	OL ONAL LETTER UJ
1E5E6	ᄕ	OL ONAL LETTER UNY
1E5E7	ᄘ	OL ONAL LETTER UR
1E5E8	ᄛ	OL ONAL LETTER E
1E5E9	ᄞ	OL ONAL LETTER ES
1E5EA	ᄡ	OL ONAL LETTER EH
1E5EB	ᄤ	OL ONAL LETTER EC
1E5EC	ᄦ	OL ONAL LETTER ENN
1E5ED	ᄨ	OL ONAL LETTER EG

Signs

1E5EE	ᄪ	OL ONAL SIGN MU
1E5EF	ᄬ	OL ONAL SIGN IKIR
1E5F0	ᄭ	OL ONAL SIGN HODDONG

Digits

1E5F1	ᄇ	OL ONAL DIGIT ZERO
1E5F2	ᄊ	OL ONAL DIGIT ONE
1E5F3	ᄍ	OL ONAL DIGIT TWO
1E5F4	ᄐ	OL ONAL DIGIT THREE
1E5F5	ᄓ	OL ONAL DIGIT FOUR
1E5F6	ᄖ	OL ONAL DIGIT FIVE
1E5F7	ᄙ	OL ONAL DIGIT SIX
1E5F8	ᄜ	OL ONAL DIGIT SEVEN
1E5F9	ᄟ	OL ONAL DIGIT EIGHT
1E5FA	ᄚ	OL ONAL DIGIT NINE

Signs

1E5FF	ᄭ	OL ONAL ABBREVIATION SIGN
-------	---	---------------------------

7 EVIDENCE

7.1 PRIMERS

7.1.1 Handwritten

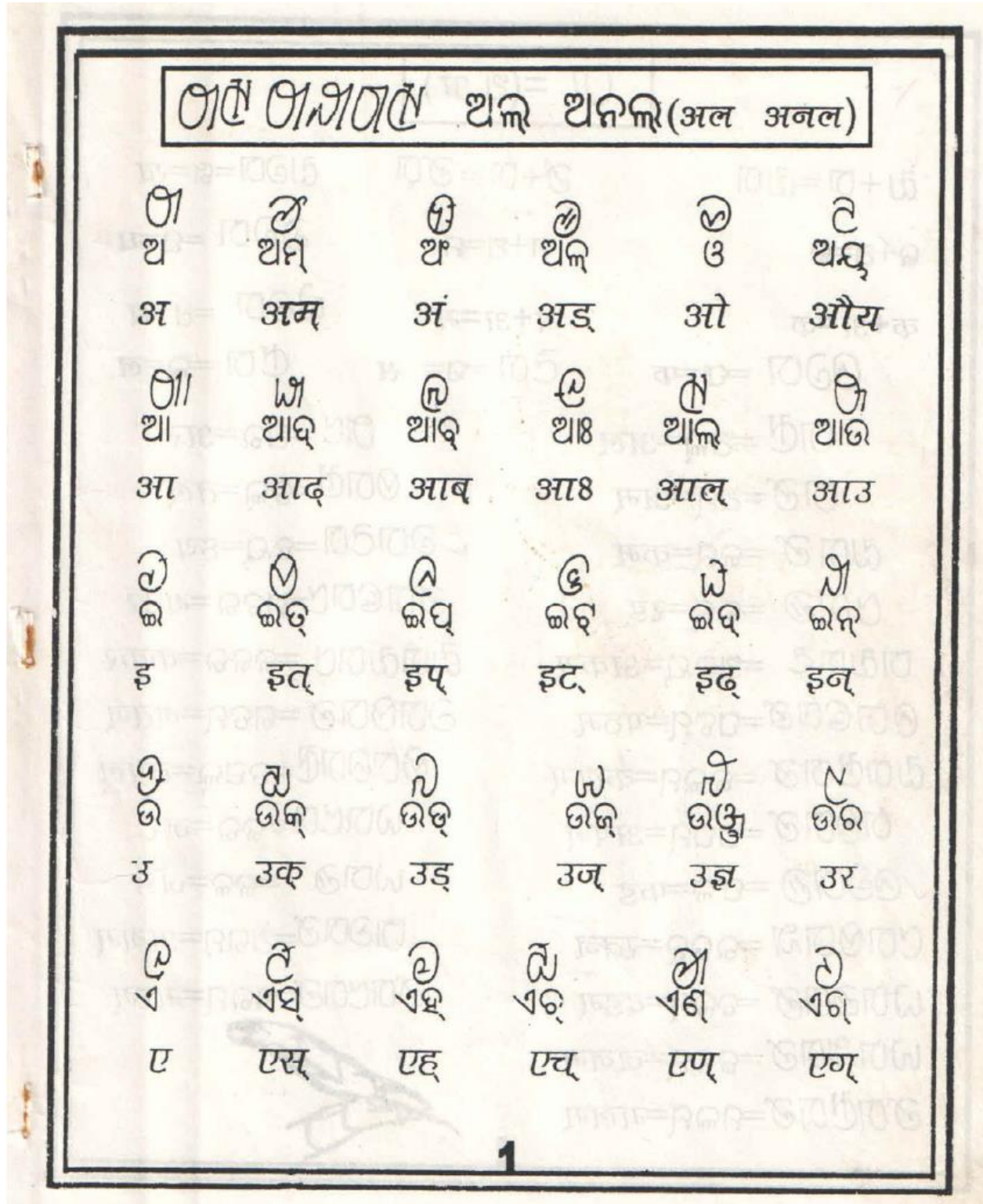


Figure 1. Handwritten Ol Onal chart [6, p. 1], Odisha.

7.1.2 Font-based

ଓଲ ଓନାଲ ଲିପି(OL ONAL LIPI)=(अल अनल लिपि)					
ଓ ଅ(अ) OH ଅ	ଓ ଅମ(म) OM ଅମ	ଓ ଅଂ() ONG ଅଂ	ଓ ଅଢ(ड़) OD ଅଢ	ଓ ଓ(ओ) OHO ଓ	ଓ ଓୟ(य) OY ଅୟ
ଓ ଆ(आ) AAH ଆ	ଓ ଆଧ(ध) ADH ଆଧ	ଓ ଆବ(ब) ABO ଆବ	ଓ ଆ:(ः) AHA ଆଃ	ଓ ଆଲ(ल) AAL ଆଲ	ଓ ଆବ(व) AU ଆବୁ
ଓ ଇ(इ) EHI ଇ	ଓ ଇତ(त) ETH ଇତ	ଓ ଇପ(प) EFE ଇପ	ଓ ଇଟ(ट) EET ଇଟ	ଓ ଇଦ(द) EDH ଇଦ	ଓ ଇନ(न) EN ଇନ
ଓ ଉ(उ) UH ଉ	ଓ ଉକ(क) UK ଉକ	ଓ ଉଡ(ड) UD ଉଡ	ଓ ଉଜ(ज) UGE ଉଜ	ଓ ଉଞ(ञ) UNG ଉଞ	ଓ ଉର(र) UR ଉର
ଓ ଏ(ए) EA ଏ	ଓ ଏସ(स) ES ଏସ	ଓ ଏହ(ह) EHE ଏହ	ଓ ଏଚ(च) ECH ଏଚ	ଓ ଏଞ(ण) ENG ଏଞ	ଓ ଏଗ(ग) EG ଏଗ

Figure 2. Font-based Ol Onal chart [7, p. 4]

1. ઇત ઇશિઇત ઓલ ઓનોલ (Capital Letters)

ઇ(અ)	ઇ(અમ્)	ઇ(અં)	ઇ(અડ)	ઇ(ઓ)	ઇ(અય્)
ઇ/(આ)	ળ(આદ્)	ઇ(આવ્)	ઇ(આઃ)	ળ(આલ્)	ઇ(આવ્)
ઇ(ઇ)	ઇ(ઇત્)	ઇ(ઇપ્)	ઇ(ઇટ્)	ઇ(ઇદ્)	ળ(ઇન્)
ઇ(ઉ)	ળ(ઉક્)	ઇ(ઉડ્)	ઇ(ઉજ્)	ળ(ઉઝ્)	ઇ(ઉર)
ઇ(એ)	ઇ(એસ્)	ઇ(એહ)	ળ(એચ્)	ઇ(એળ્)	ઇ(એગ્)

2. ળઇશિઇત ઇશિઇત ગાલાં ઓનોલ (Small Letters)

ઇ(અ)	ઇ(અમ્)	ઇ(અં)	ઇ(અડ)	ઇ(ઓ)	ઇ(અય્)
ઇ/(આ)	ળ(આદ્)	ઇ(આવ્)	ઇ(આઃ)	ળ(આલ્)	ઇ(આવ્)
ઇ(ઇ)	ઇ(ઇત્)	ઇ(ઇપ્)	ઇ(ઇટ્)	ઇ(ઇદ્)	ળ(ઇન્)
ઇ(ઉ)	ળ(ઉક્)	ઇ(ઉડ્)	ઇ(ઉજ્)	ળ(ઉઝ્)	ઇ(ઉર)
ઇ(એ)	ઇ(એસ્)	ઇ(એહ)	ળ(એચ્)	ઇ(એળ્)	ઇ(એગ્)

3. ચિન્હ / પહદ

+	=	સાબે / જોડ ચિન્હ / ળઇ/ઇ/ Plus(Adding)
-	=	મેગેદ / ઘટાવ ચિન્હ / ળઇ/ઇ/ Mines (substracting)
×	=	દબડ / ગુણા / ળઇ/ઇ/ Multiply (Into)
÷	=	ઘટાવ / ભાગ / ળઇ/ઇ/ Divide

4. ળઇશિઇત / ગોનેલ (લેખા) / સંખ્યા / Number (Counting)

English	લિપિ તે	હિન્દી	English	ભૂમિજ
0	0	શૂન્ય	Zero	સામા
1	1	એક	One	મજ્
2	2	દો	Two	બાર
3	3	તીન	Three	આપેજ્
4	4	ચાર	Four	ઉપુન
5	5	પાંચ	Five	મળે
6	6	છઃ	Six	તુરે

[1]

Figure 3. Font-based Ol Onal and digits chart [8, p. 1]. Small letters not proposed.

3 फरवरी 1900 ई० रे बिरसा गिरफ्तार (साब इचि) जाना । इनिज के राँची जेल तेको कुल केजिज् आ । जेल रे हैजा ते इनिज गोज जाना । 9 जून 1900 ई० दुला सेता 9 बजा बिरसा शहीद जानाज । बिरसा हाः विद्रोह उलगुलान नुमु ते विख्यात जाना ।

धरती आबा भगवान बिरसा मुण्डा [ओल ओनोल ते]

[illegible][illegible]

Figure 4. A sample text in both Devanagari and Ol Onal from a primer [8, p. 68]. Shows the usage of danda, parenthesis, quotation marks, digits (1875 3 1900) and dot above.

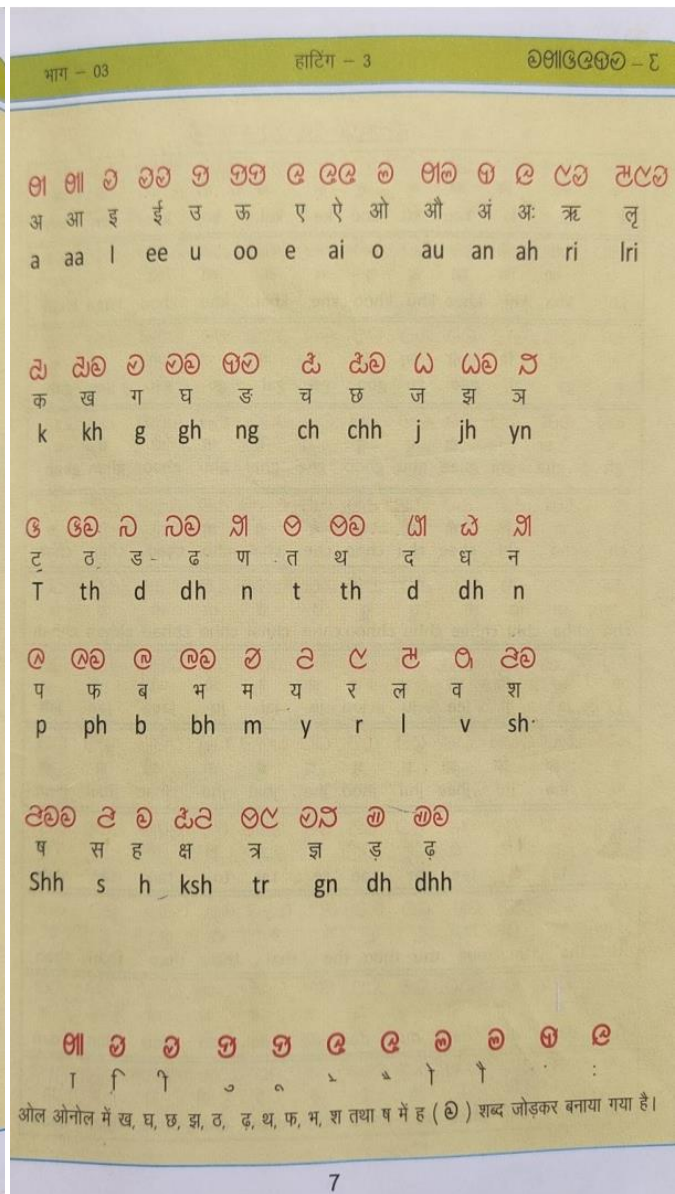
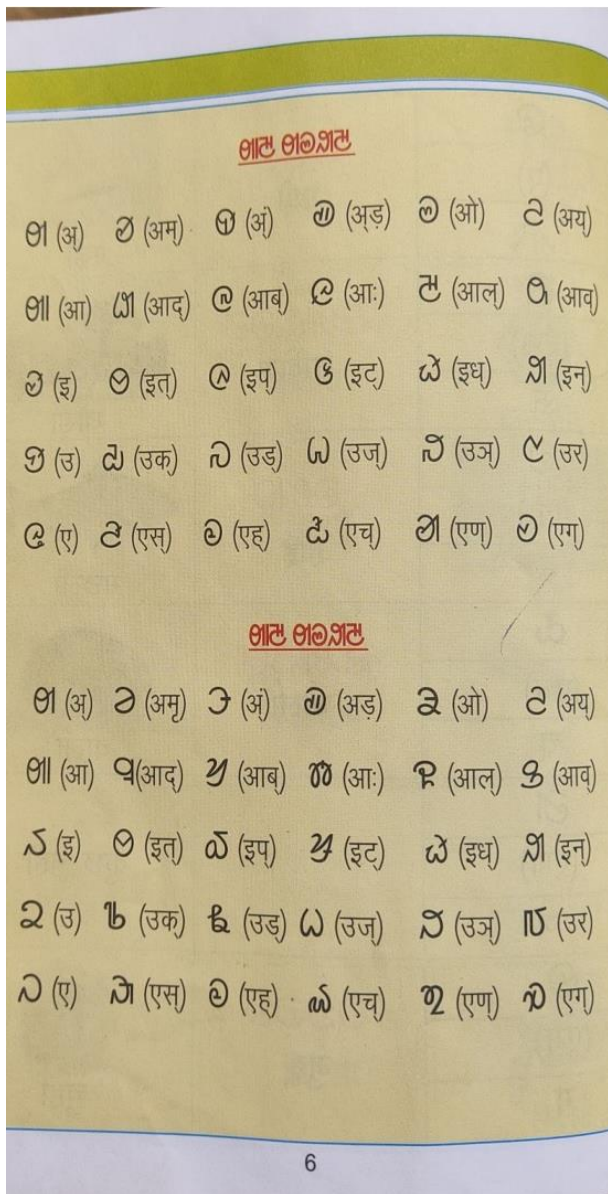


Figure 5. Font-based Ol Onal chart and its relation to Devanagari [10, pp. 6-7]. Small letters not proposed.

अ	आ	इ	ई	उ	ऊ	ए	ऐ	ओ	औ	अं	अः
ष	षा	षि	षी	षु	षू	षे	षै	षो	षौ	षं	षः
sh	sha	shi	shee	shu	shoo	she	shai	sho	shao	shan	shah
अ	आ	इ	ई	उ	ऊ	ए	ऐ	ओ	औ	अं	अः
स	सा	सि	सी	सु	सू	से	सै	सो	सौ	सं	सः
s	sh	si	see	su	soo	se	sai	so	sau	san	sah
अ	आ	इ	ई	उ	ऊ	ए	ऐ	ओ	औ	अं	अः
ह	हा	हि	ही	हु	हू	हे	है	हो	हौ	हं	हः
h	ha	hi	hee	hu	hoo	he	hai	ho	hau	han	hah
अ	आ	इ	ई	उ	ऊ	ए	ऐ	ओ	औ	अं	अः
क्ष	क्षा	क्षि	क्षी	क्षु	क्षू	क्षे	क्षै	क्षो	क्षौ	क्षं	क्षः
ksh	ksha	kshi	kshee	kshu	kshoo	kshe	kshai	ksho	kshau	kshan	kshah
अ	आ	इ	ई	उ	ऊ	ए	ऐ	ओ	औ	अं	अः
त्र	त्रा	त्रि	त्री	त्रु	त्रू	त्रे	त्रै	त्रो	त्रौ	त्रं	त्रः
trh	trha	tri	tree	trhu	trhoo	trhe	trhai	trho	trhau	trhan	trhah
अ	आ	इ	ई	उ	ऊ	ए	ऐ	ओ	औ	अं	अः
ज्ञ	ज्ञा	ज्ञि	ज्ञी	ज्ञु	ज्ञू	ज्ञे	ज्ञै	ज्ञो	ज्ञौ	ज्ञं	ज्ञः
gn	gnha	gnhi	gnee	gnu	gnoo	gne	gnai	gno	gnau	gnan	gnah
अ	आ	इ	ई	उ	ऊ	ए	ऐ	ओ	औ	अं	अः
ध	धा	धि	धी	धु	धू	धे	धै	धो	धौ	धं	धः
d	dha	dhi	dhee	dhu	dho	dhe	dhai	dho	dhaui	dhan	dhan
अ	आ	इ	ई	उ	ऊ	ए	ऐ	ओ	औ	अं	अः
ढ	ढा	ढि	ढी	ढु	ढू	ढे	ढै	ढो	ढौ	ढं	ढः
dhh	dha	dhi	dhee	dhu	dho	dhe	dhai	dho	dhaui	dhan	dhan

ଭୂମିଜ ଭାଷା ରେୟା: ଗୋନେଲ କୋ	ଭାଷା	ଭାଷା	ଭାଷା
0	0	ଭାଷା	ସାମା
1	୧	ଭାଷା	ମୋଞ୍ଜ
2	2	ଭାଷା	ବାର
3	୩	ଭାଷା	ଆପେ
4	୪	ଭାଷା	ଉପୁନ
5	୫	ଭାଷା	ମୋଢ଼େ(ମୋଞ୍ଜ)
6	୬	ଭାଷା	ତୁରେ
7	୭	ଭାଷା	ଇୟାଲି
8	୮	ଭାଷା	ଇରାଲି
9	୯	ଭାଷା	ଆରେଲି
10	୧୦	ଭାଷା	ଗେଲେ
11	୧୧	ଭାଷା	ଗୋମୋଞ୍ଜ
12	୧୨	ଭାଷା	ଗୋବାର
13	୧୩	ଭାଷା	ଗୋଆପେ
14	୧୪	ଭାଷା	ଗୋଉପୁନ
15	୧୫	ଭାଷା	ଗୋମୋଢ଼େ
16	୧୬	ଭାଷା	ଗୋତୁରେ
17	୧୭	ଭାଷା	ଗୋୟାଲି
18	୧୮	ଭାଷା	ଗୋଇରାଲି
19	୧୯	ଭାଷା	ଗୋଆରିଲି
20	୨୦	ଭାଷା	ଇସି

Figure 6. Font-based Ol Onal chart of digits and selection of syllables [10, pp. 10-11].

7.2 PUBLIC SPACES

7.2.1 Odisha

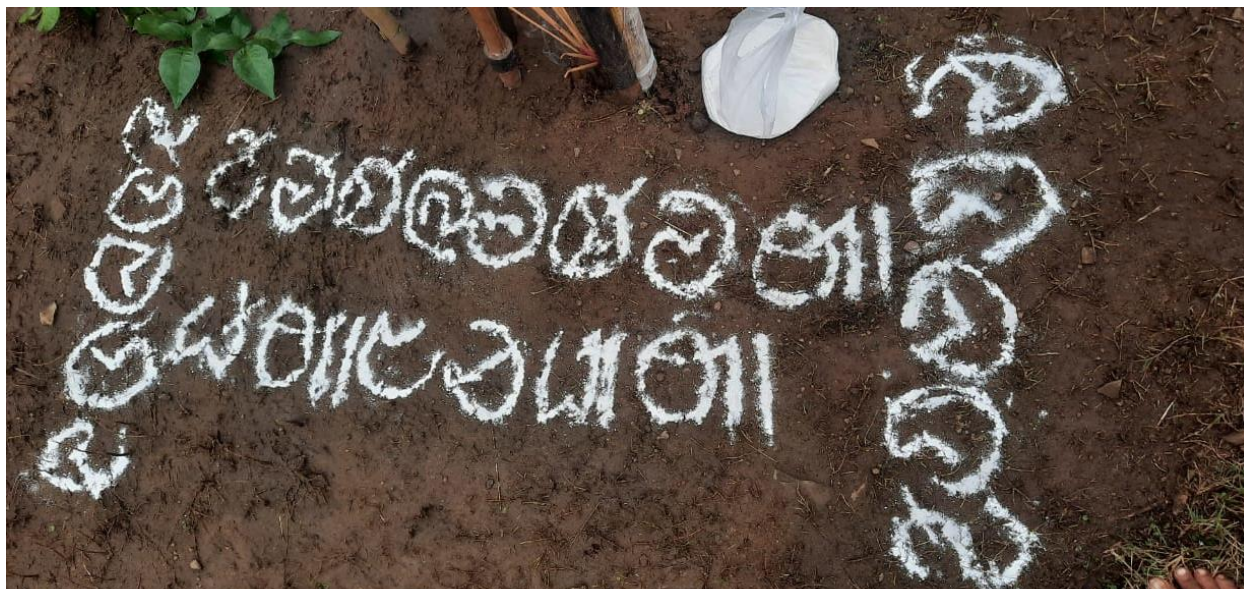


Figure 7. Ol Onal used in Bhumij rituals in Odisha, 2020.



Figure 8. Graveyard headstone in Odisha.

7.2.2 Jharkhand



Figure 9. A banner showing the handwritten form Ol Onal, Bhumij Language and manuscript Launch Programme at Jamshedpur, Jharkhand 2013.

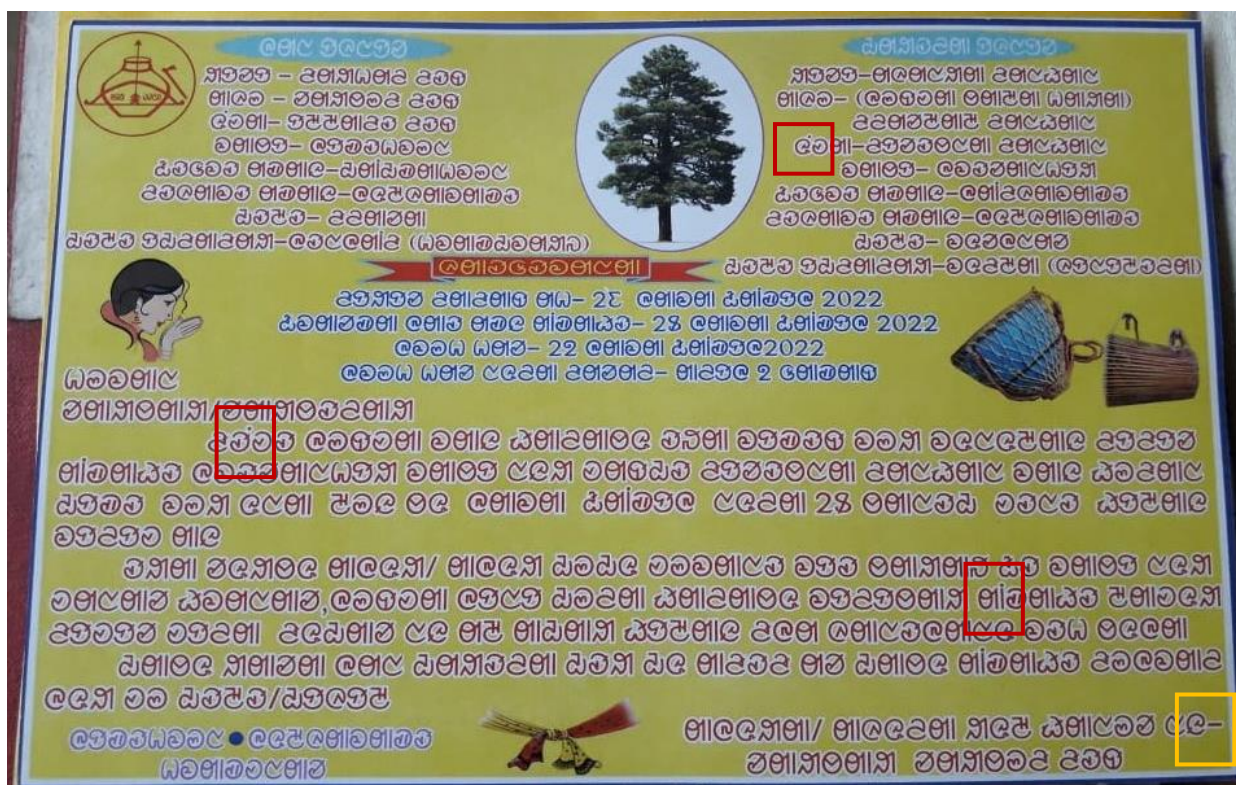


Figure 10. A wedding invitation poster in Jharkhan, 2022.
Shows the use of *dot above*, slashes, commas, and hyphenation including *word breaking*.

7.2.3 West Bengal



Figure 11. A Sign board of Shahid Raghunath Singh Bhumijs Ol Onal Aakhra school in West Bengal, established 2018.



Figure 12. A banner of West Bengal Adibasi Bhumijs Language Development Board, 2021.



Figure 13. Ol Onal inscription on a memorial of Martyr Ganganarayan Singh in West Bengal, 2021.



Figure 14. Ol Onal used on idol *Sohid (Martyr) Bir (Brave) Durjon Singh* at *Jhargram* in *West Bengal*, 2020.



Figure 15. Ol Onal used on idol in West Bengal. Shows the usage of the [hoddon](#) sign.



Figure 16. Ol Onal written on a boundary wall in Jhargram, West Bengal, 2020.

7.3 EPHEMERA

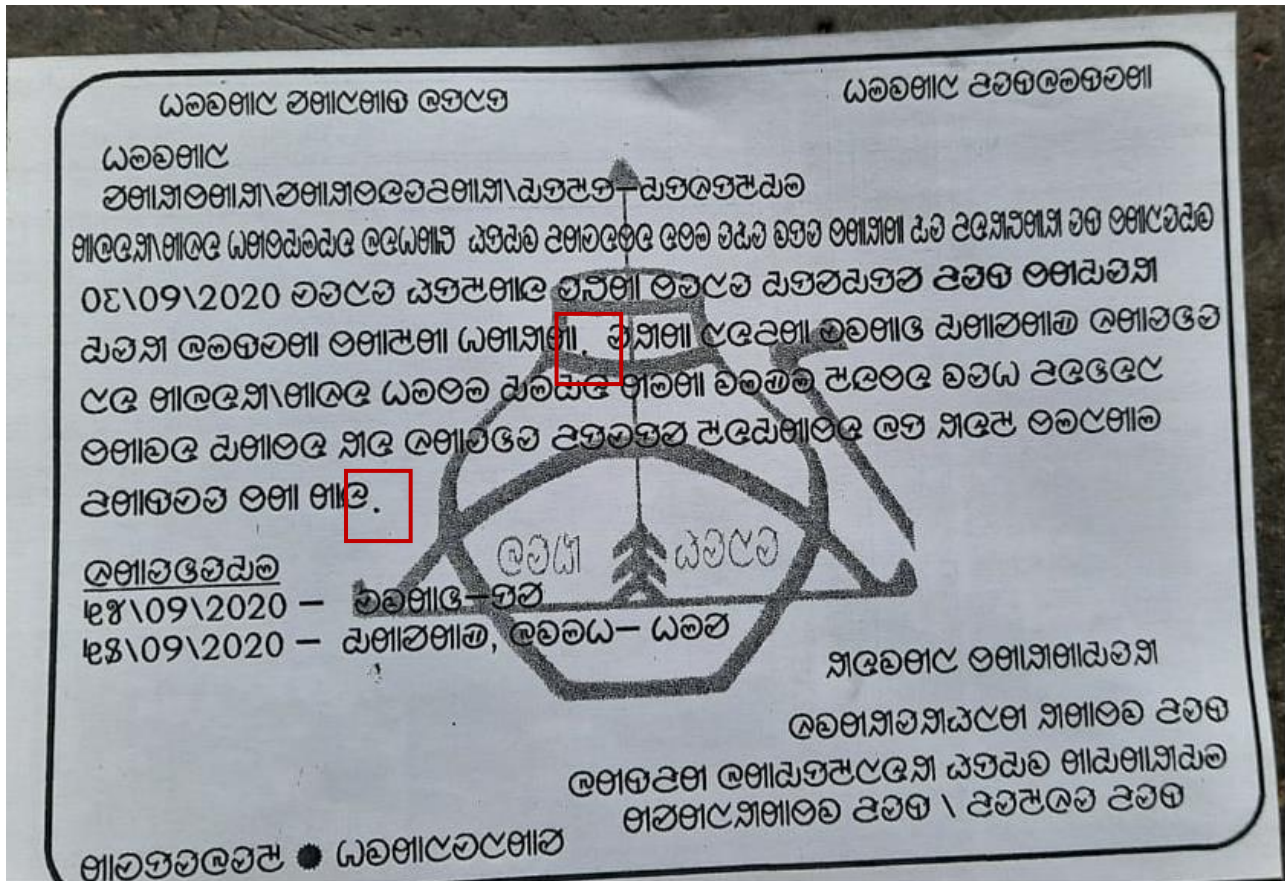


Figure 17. A notice written in Ol Onal, 2020.

Shows the usage of dot below as a full stop instead of danda, backslashes, hyphens and commas.

ପଞ୍ଚମ ସମାଧାନ

[illegible][illegible][illegible]

Figure 18. Reeni hala text handwritten by the script author, Mahendra Nath.

7.5 SPECIFIC FEATURES

7.5.1 MU sign (dot above)

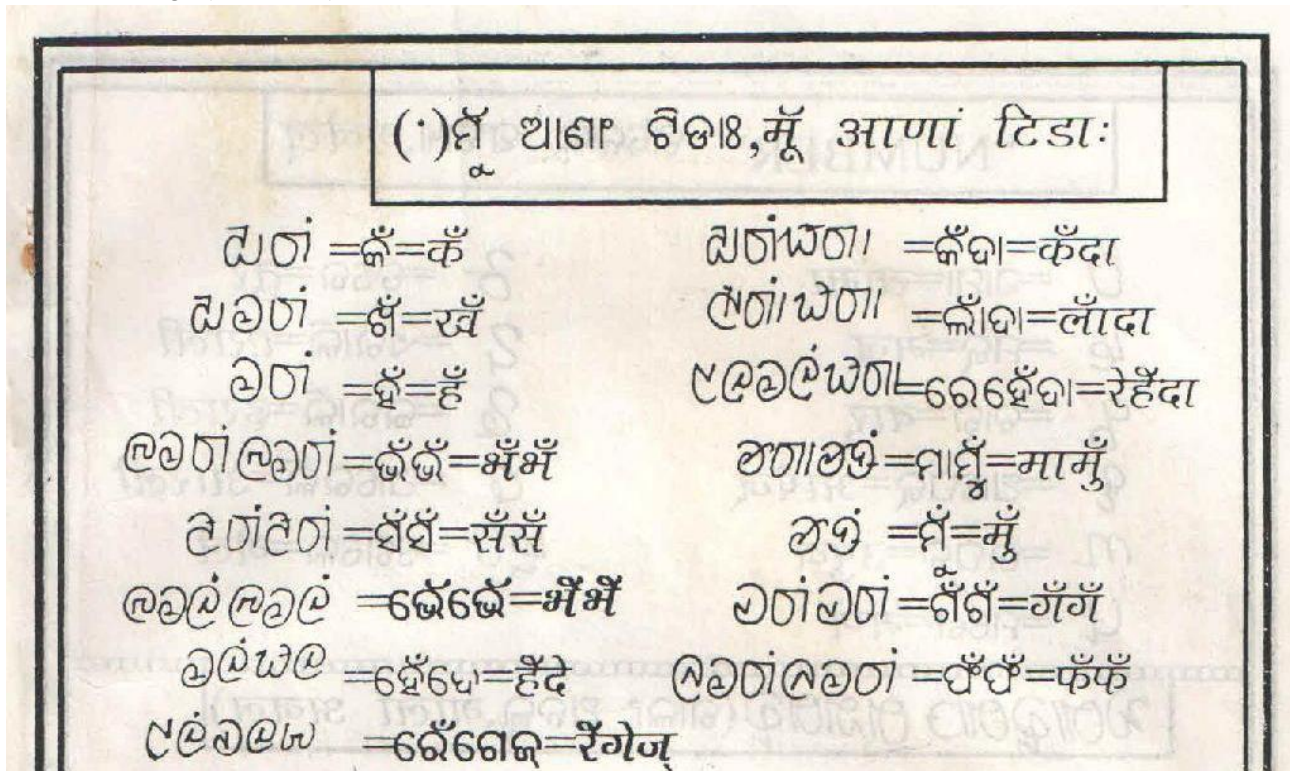


Figure 19. Examples of dot above usage in a handwritten primer [6, p. 11]

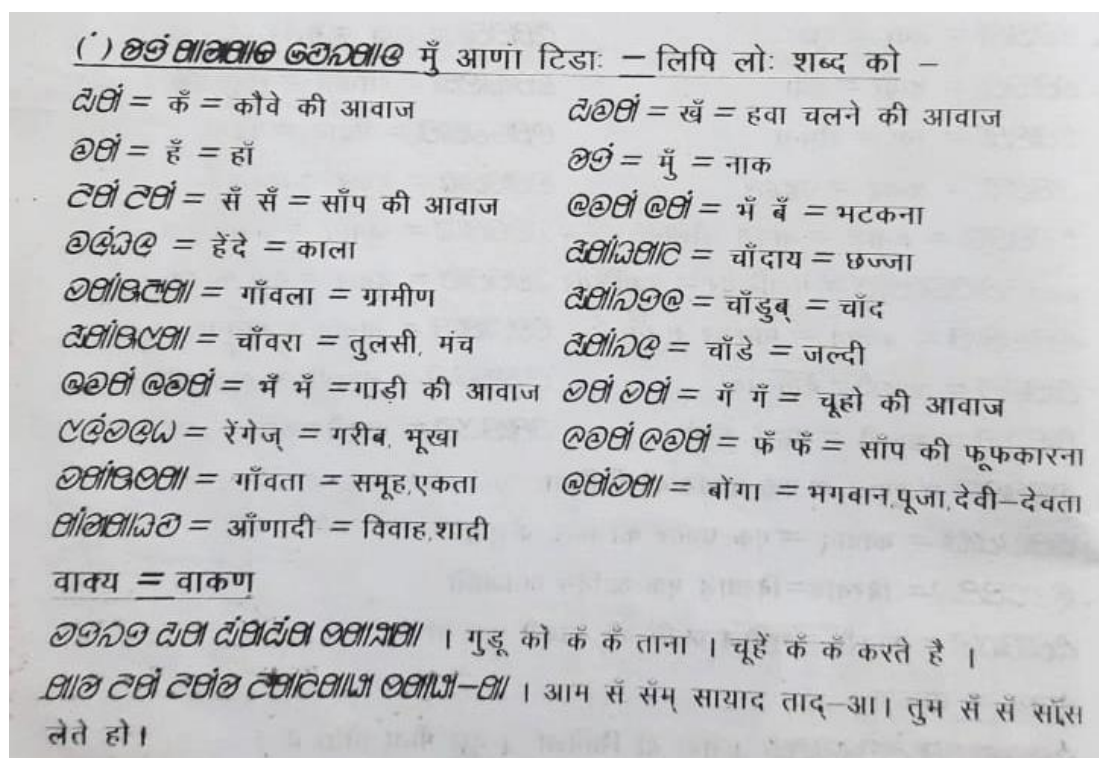


Figure 20. Examples of dot above usage in a font-based primer [8, p. 17].

7.5.2 IKIR sign (dot below)

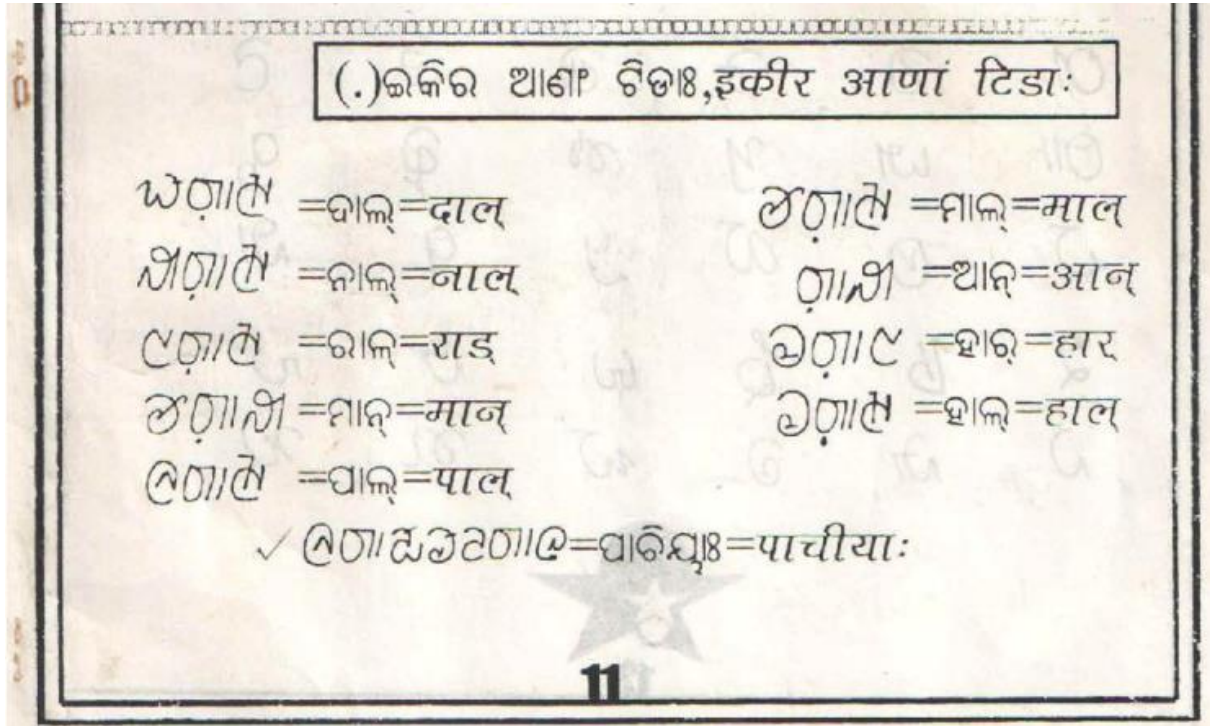


Figure 21. Examples of dot below usage in a handwritten primer [6, p. 11].

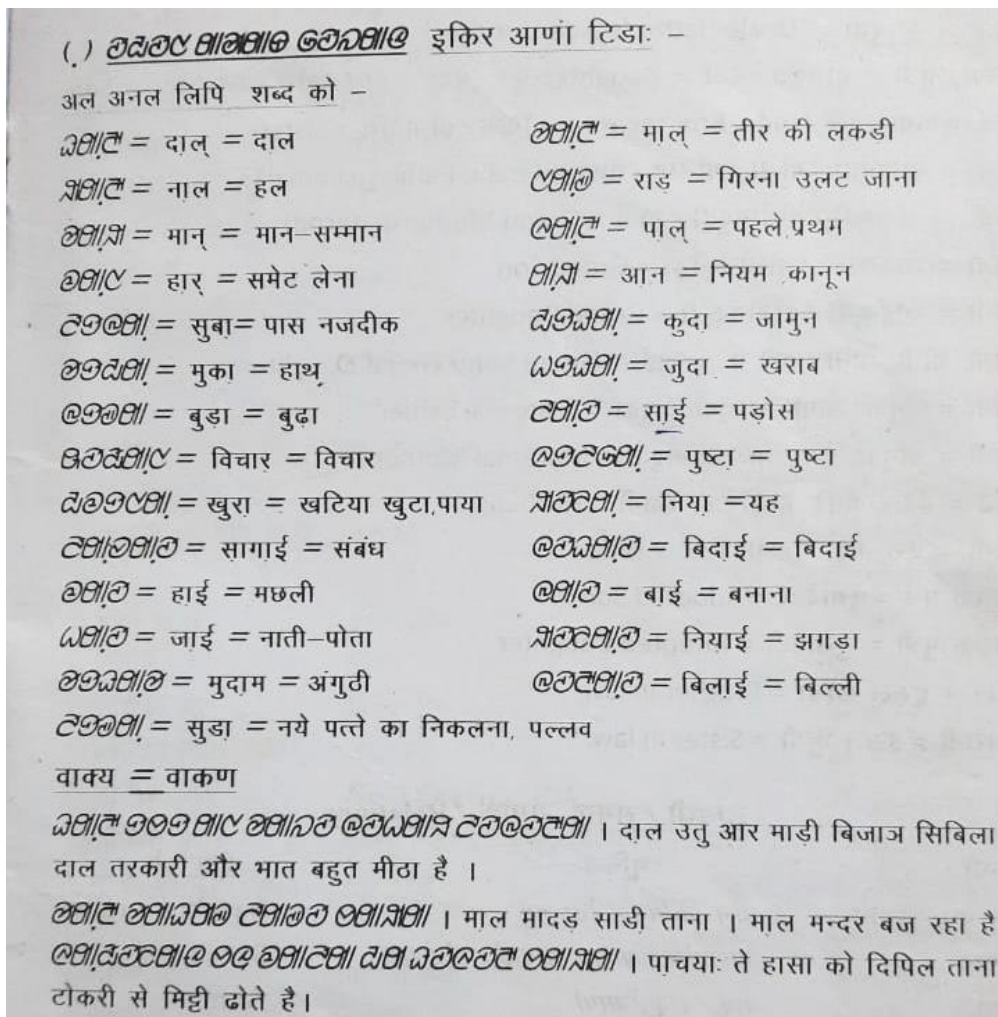
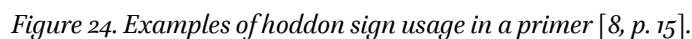
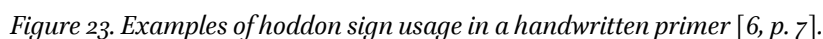


Figure 22. Examples of dot below usage in a font-based primer [8, p. 18]



7.5.5 Misuse

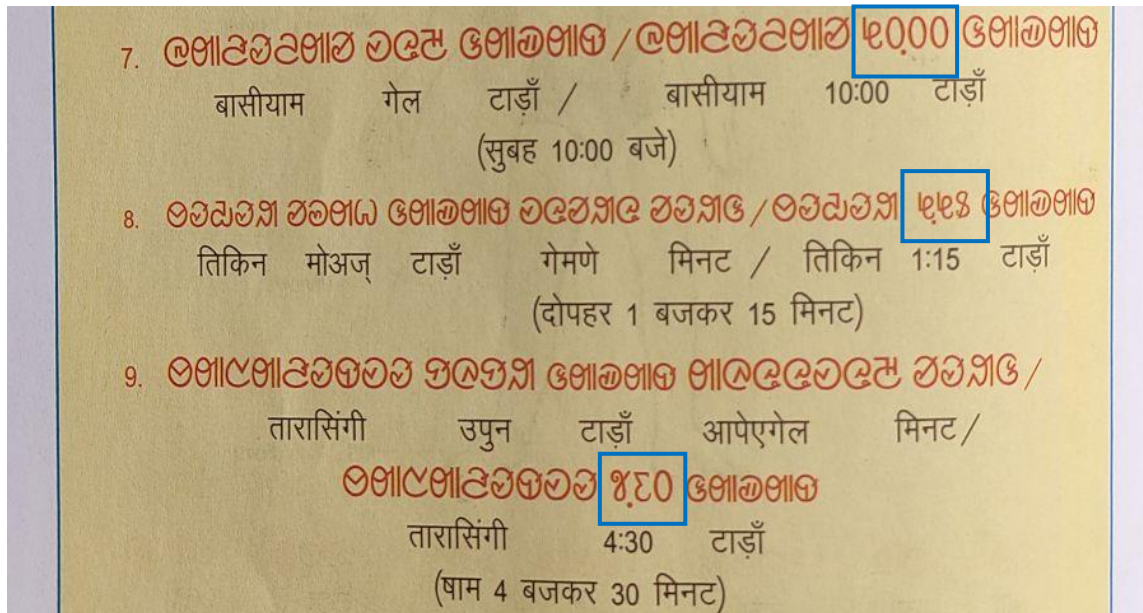


Figure 27. Full stop as a time separator (the font maps the dot below to full stop) [10, p. 24].

See also Figure 17 for its usage as an end of sentence.

ଫୁଲ୍‌ସ୍ଟପ୍ ଚିହ୍ନ (ଚିନା କୋ) – ଚିହ୍ନ	
୧ (,) ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଫୁଲ୍‌ସ୍ଟପ୍ ଚିହ୍ନ (ଆଙ୍ଗା ତିଂଗୁ ଚିନା) – ଅଲ୍ପ ବିରାମ	
୨ (;) ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଫୁଲ୍‌ସ୍ଟପ୍ ଚିହ୍ନ (ତାଲା ଚିନା) – ଅର୍ଦ୍ଧ ବିରାମ	
୩ (।) ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଫୁଲ୍‌ସ୍ଟପ୍ ଚିହ୍ନ (ତିଂଗୁ ଚିନା) – ପୂର୍ଣ୍ଣ ବିରାମ	
୪ (?) ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଫୁଲ୍‌ସ୍ଟପ୍ ଚିହ୍ନ (କୁକଲୀ ଚିନା) – ପ୍ରଶ୍ନ ଚିହ୍ନ	
୫ (–) ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଫୁଲ୍‌ସ୍ଟପ୍ ଚିହ୍ନ (ପାରକା ଚିନା) – ପ୍ରଶ୍ନ ଚିହ୍ନ	
୬ (!) ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଫୁଲ୍‌ସ୍ଟପ୍ ଚିହ୍ନ (ହାହଡ଼ା ଚିନା) – ଆଶ୍ଚର୍ଯ୍ୟ ଚିହ୍ନ	
୭ (+) ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଫୁଲ୍‌ସ୍ଟପ୍ ଚିହ୍ନ (ସାବେ ଚିନା) – ଯୋଡ଼ ଚିହ୍ନ	
୮ (x) ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଫୁଲ୍‌ସ୍ଟପ୍ ଚିହ୍ନ (ଦବଡ଼ ଚିନା) – ଗୁଣା ଚିହ୍ନ	
୯ (-) ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଫୁଲ୍‌ସ୍ଟପ୍ ଚିହ୍ନ (ଭେଗେଦ ଚିନା) – ଘଟାବ ଚିହ୍ନ	
୧୦ (÷) ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଫୁଲ୍‌ସ୍ଟପ୍ ଚିହ୍ନ (ହାଟୀଜ ଚିନା) – ଭାଗ ଚିହ୍ନ	

Figure 28. Full stop (dot below in font) used for ordinal numbers [9, p. 18].

ଫୁଲ୍‌ସ୍ଟପ୍ ଚିହ୍ନ (ଗୋନେତୋଲ) ଗଣିତ	
୧ (+) ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଫୁଲ୍‌ସ୍ଟପ୍ ଚିହ୍ନ	
୧୨	୫୨
+ ୨୫	+ ୨୫
୩୭	୭୭
୧୬	୫୮
+ ୨୨	+ ୧୪
୩୮	୭୨

Figure 29. The hoddon sign used as a colon due to font mapping [9, p. 24].

8 REFERENCES

9

- [1] G. v. Driem, "South Asia and the Middle East," in *Encyclopedia of the World's Endangered Languages*, Oxon, Routledge, 2007, pp. 283-348.
- [2] N. Ramaswami, *Bhumij Grammar*, Mysore: Central Institute of Indian Languages, 1992.
- [3] G. D. Anderson, T. Osada and K. D. Harrison, "Ho and the Other Kherwarian Languages," in *The Munda Languages*, Oxon, Routledge, 2008, pp. 195-255.
- [4] R. K. Das, *Development from tribal perspective: a study of Santal, Bhumij, and Kharia-inhabited villages of Midnapore, West Bengal*, Kolkata: Biswajit Das, 2005.
- [5] E. T. Dalton, *Descriptive Ethnology of Bengal*, Calcutta: Office of the Superintendent of Government Printing, 1872.
- [6] A. Munda, *Adim Bhumij Lipi: Ol Cheden Tanal*, Ruansi: Adim Bhumij Bhasa, 2014.
- [7] A. Munda, *Aabu Podao Tonol*, 2014.
- [8] L. Sāmād, *Ādim Bhūmij Bhāṣā*, 2018.
- [9] M. Donda, *Ol Onol Book*, 2018.
- [10] Y. Sardar, *Barnā Hisir (Bhumij)*, Jamshedpur, 2019.

	O OM ONG ORR OO OY	A AD AB AH AL AW
KRISHNA_OL_ONAL_OLD	୦ୠୡୢୣ୤	୦ୠୡୢୣ୤
Ol_Onal_Classic	୦ୠୡୢୣ୤	୦ୠୡୢୣ୤
KRISHNA_ONAL_NARMAL	୦ୠୡୢୣ୤	୦ୠୡୢୣ୤
SUNITA_OL ONAL	୦ୠୡୢୣ୤	୦ୠୡୢୣ୤
GALANG_ONAL	୦ୠୡୢୣ୤	୦ୠୡୢୣ୤
	I IT IP IID IN	U UK UDD UJ UNY UR
KRISHNA_OL_ONAL_OLD	ୠୡୢୣ୤୦ୠ	ୠୡୢୣ୤୦ୠ
Ol_Onal_Classic	ୠୡୢୣ୤୦ୠ	ୠୡୢୣ୤୦ୠ
KRISHNA_ONAL_NARMAL	ୠୡୢୣ୤୦ୠ	ୠୡୢୣ୤୦ୠ
SUNITA_OL ONAL	ୠୡୢୣ୤୦ୠ	ୠୡୢୣ୤୦ୠ
GALANG_ONAL	ୠୡୢୣ୤୦ୠ	ୠୡୢୣ୤୦ୠ
	E ES EH EC ENN EG	୦ 1 2 3 4 5 6 7 8 9
KRISHNA_OL_ONAL_OLD	ୡୢୣ୤୦ୠୡୢ	ୡୢୣ୤୦ୠୡୢ
Ol_Onal_Classic	ୡୢୣ୤୦ୠୡୢ	ୡୢୣ୤୦ୠୡୢ
KRISHNA_ONAL_NARMAL	ୡୢୣ୤୦ୠୡୢ	ୡୢୣ୤୦ୠୡୢ
SUNITA_OL ONAL	ୡୢୣ୤୦ୠୡୢ	ୡୢୣ୤୦ୠୡୢ
GALANG_ONAL	ୡୢୣ୤୦ୠୡୢ	ୡୢୣ୤୦ୠୡୢ

Figure 30. All Ol Onal fonts date, created by Anil Munda in 2013-2014.

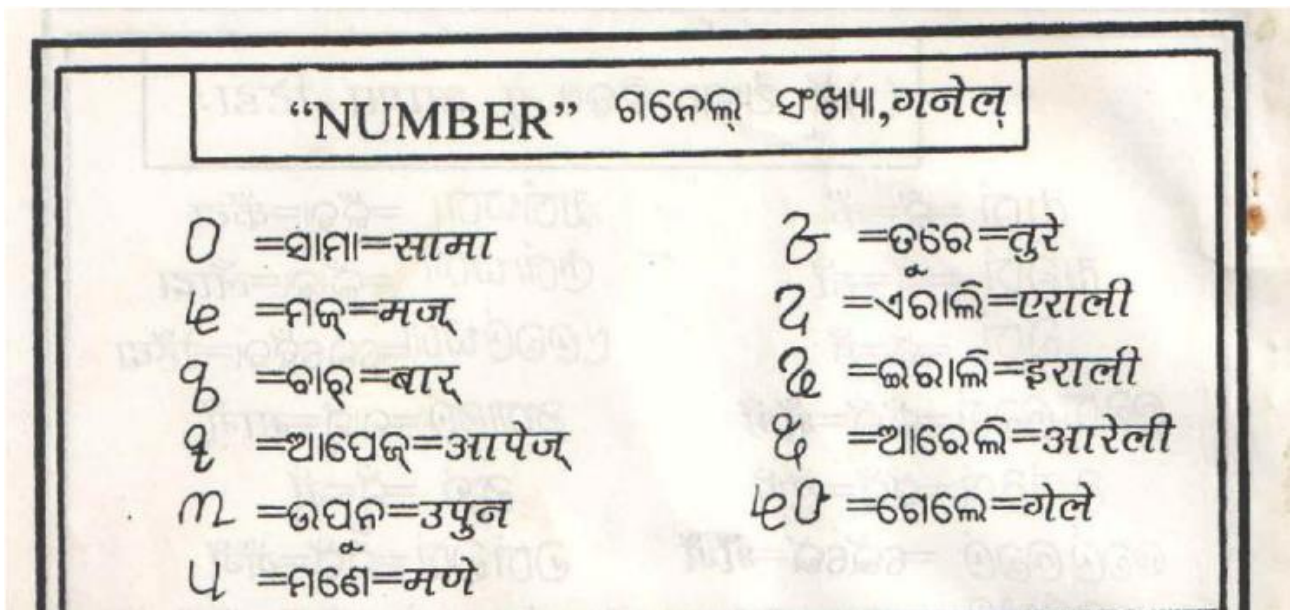


Figure 31. Original shapes of Ol Onal digits (pre-font) [6, p. 12]. Not proposed in this document.

Key Board Mapping For - OLONAL FONT – ଓଲ ଓନାଲ ଟଫଣ୍ଟ



OL ONAL

Bhumij Language Copyright@ 1998-2015. ANIL MUNDA. All rights reserved. the set of Five Diffirent teypes fonts for Ol Onal Fonts inculd. E-mail:-anil4kisna@gmail.com/ E-mail:-bhumij1998@gmail.com

Figure 32. An existing keyboard mapping for Ol Onal. Small leters not proposed.

**ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646¹**

Please fill all the sections A, B and C below.

Please read Principles and Procedures Document (P & P) from <http://std.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://std.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html>.

See also <http://std.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html> for latest Roadmaps.

A. Administrative

1. Title:	<i>OI Onal</i>	
2. Requester's name:	<i>Biswajit Mandal</i>	
3. Requester type (Member body/Liaison/Individual contribution):	<i>Individual contribution</i>	
4. Submission date:	<i>2022-07-16</i>	
5. Requester's reference (if applicable):		
6. Choose one of the following:		
This is a complete proposal:		<i>X</i>
(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):	<i>OI Onal</i>	<i>X</i>
Proposed name of script:		
b. The proposal is for addition of character(s) to an existing block:		
Name of the existing block:		
2. Number of characters in proposal:		
3. Proposed category (select one from below - see section 2.2 of P&P document):		
A-Contemporary <i>X</i>	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?		
a. If YES, are the names in accordance with the "character naming guidelines" in Annex L of P&P document?		<i>YES</i>
b. Are the character shapes attached in a legible form suitable for review?		<i>YES</i>
5. Fonts related:		
a. Who will provide the appropriate computerized font to the Project Editor of 10646 for publishing the standard?		
<i>Anil Munda</i>		
b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.):		
<i>anil4kisna@gmail.com</i>		
6. References:		
a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided?		<i>YES</i>
b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached?		<i>YES</i>
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)?		
<i>existing keyboard layout in appendix, collation data</i>		

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.

¹ Form number: N4502-F (Original 1994-10-14; Revised 1995-01, 1995-04, 1996-04, 1996-08, 1999-03, 2001-05, 2001-09, 2003-11, 2005-01, 2005-09, 2005-10, 2007-03, 2008-05, 2009-11, 2011-03, 2012-01)

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? <i>Bhumij communities in Odisha, Jharkhand and West Bengal</i>	
If YES, available relevant documents:	
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included?	YES
Reference: <i>India Census 2011, community members</i>	
4. The context of use for the proposed characters (type of use; common or rare)	
Reference:	
5. Are the proposed characters in current use by the user community?	YES
If YES, where? Reference: <i>Odisha, Jharkhand, West Bengal (figures in 7.2)</i>	
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, or could be confused with, an existing character?	YES
If YES, is a rationale for its inclusion provided?	
If YES, reference: <i>abbreviation mark (section 2.4)</i>	
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?	
If YES, reference: <i>dots above and below (section 2.2)</i>	
Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided?	NO
If YES, reference:	
12. Does the proposal contain characters with any special properties such as control function or similar semantics?	NO
If YES, describe in detail (include attachment if necessary)	
13. Does the proposal contain any Ideographic compatibility characters?	NO
If YES, are the equivalent corresponding unified ideographic characters identified?	
If YES, reference:	