

Unicode request for annotations to **B b**, **Ð ð** and **G g**

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We request character annotations and an illustration in the Core Spec to facilitate the bowl-struck variants of Latin letters <B b, Ð ð, G g>. These characters have stem- or tail-struck glyphs in the Unicode charts, but are also assigned to the bowl-struck glyphs <B b, Ð ð, G g> that are found in orthographies of languages such as Kiowa. SEW consensus to a previous version of this proposal was that disunification of <B b, Ð ð, G g> from <B b, Ð ð, G g> was not justified, and furthermore that the *tau gallicum* <Ð ð> (U+A7C7, A7C8) was not an appropriate substitute for bowl-struck <Ð ð> in the orthographies of modern languages. Variation selectors were also not an acceptable solution, as orthographies should not be dependent on non-printing characters. We therefore request annotations to the Unicode names list, in the hope that future language-tagging and font support will handle the needed graphic distinction. Such an approach would require some minority languages to be tagged incorrectly, and also for phonetic notation to be tagged as a specific (and generally arbitrary) language, but at least the option will be available.

Overstriking began as a typewriter substitution for unavailable phonetic symbols, and bowl-struck <b b, g g> were the usual typewriter substitutes for the voiced fricatives [β ð γ], for example in Laycock's and Z'graggen's data on the languages of New Guinea. Their records have been faithfully replicated with bowl-struck letters in publications that otherwise use IPA letters. Graphic fidelity to the original is important because substituting the characters without author oversight risks corrupting the data. Typewriter-driven bowl-struck notation became so entrenched that linguists began using it in handwriting (Figure 23). The convention has been adopted into the modern orthographies of several languages, with added capital letters, and publishers do not substitute these forms with stem- or tail-struck <B b, Ð ð, G g>. For example, the Chimila orthography developed in 2000-2002 consistently uses the letter <G g> with a mid-height bar in publication. Current Kiowa orthography uses <B b, Ð ð, G g> for tenuis plosives (as in *dá:bitgàu*, IPA /tá:pìt^hkà/, 'poked the eyes'), and alphabetizes these letters separately from the voiced plosives <B b, D d, G g>. When digitizing these letters in Unicode, publishers generally resort to U+0336 COMBINING LONG STROKE OVERLAY rather than falling back on atomic <B b, Ð ð, G g>; an example is the 2010 Kadiwéu translation of the Bible by Wycliffe Bible Translators. Non-Unicode solutions include custom fonts and HTML 'strikethrough' formatting, which risk corruption in data storage. For example, online orthographic material of Pilagá uses a custom web font to display <B b>, but it is not Unicode compliant (Figure 1).

El alfabeto pilagá surgió del consenso de los representantes de todas las comunidades y después de muchos encuentros y deliberaciones. Estas actividades tuvieron lugar en la comunidad de Ayo La Bomba en el año 1996.
 Consta de veintitrés letras, de las cuales cuatro son vocales y diecinueve, consonantes:
a b ċ d e g r h i k l λ m n ñ o p q s t w y ´
 Cada una de estas letras representa un sonido diferente de la lengua pilagá.

Figure 1. Lenguapilaga.com (2024). Online presentation of the Pilaga alphabet, using a custom web font to ensure that is displayed with the stroke across the bowl, as well enabling the letter <ɾ>, now scheduled for Latin Extended-D. The underlying characters are the non-Unicode-compliant <a b c d e g r h i k l j m n ò o p q s t w y ´>. The description at top begins, “the Pilagá alphabet emerged from the consensus of representatives of all communities and after many meetings and deliberations.”

Besides Kiowa in the United States, orthographies that use these letters include those of Northern Emberá [emp] in Panama, with <B b, Ð ð> for the implosive consonants /b, d/; of Pilagá [plg] in Argentina, with <B b>; of Kadiwéu [kbc] in Brazil, with <G g>; and of Chimila [cbg] in Colombia, also with <G g>. All three pairs were used in the orthography of Bamileke in Cameroon before they were replaced by the General Alphabet of Cameroon Languages in the late 1970s.

Lower-case <b d g> are the most recurring problem in digitizing several decades of manuscripts of the nearly 1,000 languages of New Guinea that one of us (Usher) has worked with. Z’graggen in particular was quite prolific – his fieldnotes encompass several hundred languages and over 100,000 lexical items. Besides Admiralty Islands and the four published Madang volumes, there are unpublished volumes for Ramu River, Finisterre, Schouten Islands and Astrolabe Bay. In at least a few cases this is likely to be the last record we will have for the language in question.

In the Uralic Phonetic Alphabet, small-capital <Ð> with a short stroke on the stem has been used for a devoiced variant of <ð>, the alveolar flap (e.g. Sovijärvi & Peltola 1970). Other authors have used <Ð> with a full overstruck bar for a devoiced dental approximant (Figure 25).

Free SIL fonts such as Gentium support bowl-struck <b d g g> as character variants of <b d g g>, though as of this writing capital letters are not included. The SIL website enables downloaders to ‘tune’ its fonts so that the bowl-struck glyphs will be the default display form of these characters.

Typographers should note that the customized design of capital <G> on the cover of the Bamileke booklet in Figure 17 contrasts with the less legible manual-typewriter hack <G> found in the interior text. <G> would presumably have been used throughout if it had been practical.

Thanks to Denis Moyogo Jacquerye for feedback and several of the illustrations.

Core Spec

I suggest adding the following to the Core Spec, in section 7.1 Latin:

Letters with overstruck strokes can vary in the placement of those strokes. Language orthographies such as Kiowa and Northern Emberá, as well as phonetic notation, are typeset with the strokes set at mid-height in the letters U+0243 LATIN CAPITAL LETTER B WITH STROKE, U+0180 LATIN SMALL LETTER B WITH STROKE, U+0110 LATIN CAPITAL LETTER D WITH STROKE, U+0111 LATIN SMALL LETTER D WITH STROKE, U+01E4 LATIN CAPITAL LETTER G WITH STROKE, U+01E5 LATIN SMALL LETTER G WITH STROKE. The strokes fall across the bowls of the lower-case letters, rather than across the stem or tail, and may cross the full width of the capital letters.

Figure 7-xx. Stem-struck and bowl-struck allographs of letters with strokes.

Casing pairs of stem-struck glyphs

Ɓ ƃ, Ɖ ɗ, Ɠ Ɣ

Casing pairs of bowl-struck glyphs

Ɓ ƃ, Ɖ ɗ, Ɠ Ɣ or Ɠ Ɣ

These variants are not encoded as distinct characters in the Unicode standard. Rather, bowl-struck and stem-struck variants can be implemented with font features such as style selectors.

Annotations

Annotations to add

0110 Ɖ LATIN CAPITAL LETTER D WITH STROKE

used in Kiowa and other orthographies, where the glyph is D with an overstruck bar

0111 ɗ LATIN SMALL LETTER D WITH STROKE

used in Kiowa and other orthographies, where the glyph is a bowl-struck d

0180 ƃ LATIN SMALL LETTER B WITH STROKE

used in Kiowa and other orthographies, where the glyph is a bowl-struck b

01E4 Ɠ LATIN CAPITAL LETTER G WITH STROKE

used in Kiowa and other orthographies, where the glyph is G with an overstruck bar

01E5 Ɣ LATIN SMALL LETTER G WITH STROKE

used in Kiowa and other orthographies, where the glyph is a bowl-struck g

0243 Ɓ LATIN CAPITAL LETTER B WITH STROKE

used in Kiowa and other orthographies, where the glyph is B with an overstruck bar

1D06 Ð LATIN LETTER SMALL CAPITAL ETH

used with a short stroke for a devoiced alveolar flap and with a full overstruck bar for a devoiced dental approximant

A7C7 Đ LATIN CAPITAL LETTER D WITH SHORT STROKE OVERLAY

= tau gallicum

→ 00D0 Ð latin capital letter eth

→ 0110 Đ latin capital letter d with stroke

L2/24-234, *Unicode request for barred letters*, noted that the proposed superscript letters <^{b d g}> at 1DFD2..1DFD4 would need annotations for bowl-struck allographs <^{b d g}> in line with whatever was decided for baseline <^{b d g}>. Semantically distinct superscripts are used for phonetic notation, as in Figure 22.

1DFD2 ^b MODIFIER LETTER SMALL B WITH STROKE

used in phonetic transcription, where the glyph may be bowl-struck

1DFD3 ^d MODIFIER LETTER SMALL D WITH STROKE

used in phonetic transcription, where the glyph may be bowl-struck

1DFD4 ^g MODIFIER LETTER SMALL G WITH STROKE

used in phonetic transcription, where the glyph may be bowl-struck

Annotations to remove

The annotation ‘indicates a dental affricate’ should be removed from U+A7C8, as it only applies to Gaulish and even there it was not dental in the modern sense, but something like [ts] or [st]. The label *tau gallicum* is sufficient for that identification, but would be better listed under the capital character because the Gaulish alphabet was unicameral.

A7C8 đ LATIN SMALL LETTER D WITH SHORT STROKE OVERLAY

= tau gallicum

→ indicates a dental affricate

→ 0111 đ latin small letter d with stroke

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Figures

<p>Yisoedifii 'Él clavó algo (hacia abajo)' Ñis'onafii 'Me caí sentado' B'iyelacafii 'Se volvió a sumergir' Qoyasacafii 'Algo es arrojado (hacia abajo)'</p>
<p>N'ontak</p> <p>1) Aw'an he'n leta' hoka'l'io' som'e w'awege siyacadipi, awaçalege gam'e lemalate he'n liki'i' qoye'n naam'e ale'w m'e p'atege he'n ko'λ'aca. 2) Qataca awawoyake ga' adenatanacakii, awenatacañiilege som'e qowapiyi hoka'l'i wañ'a di' lenacat qoyen da' Fortín Yunká (so' wo'e 1919) qataca so' wañ'a hoka'li'o' di' Ayo La Bombá (so' wo'e 1947).</p>
<p>N'ontak 18</p> <p>Aw'ontacana ha'n liki'ipi ha'n čikienacnqate qanč'e awen yiqoda'tsalo naa' netedañ'a hañi' A qataca ñi' B. qaidi yiset da' qoyitacayaca'n naa' n'aqtaqa m'e yiqoda'tsalo.</p>
<p>W'o so' nolo' qanč'e hayem saeyi di' noik lenacat luan B. Albedi qanač'e hayem sonetanyi haso' nenotacaki m'e taya'a dim'e, qanač'e hayem ñiqotacawa heso' mač'e ñitesoqo'. Sibiedaq qanač'e ñinotacayi degesa da' qadidiaa da' ñawanacay'i' di qadayi m'e netañ'adi. Sinko saa' nolo'co'te da' sowaqa'tedi. Kal'i yem som'e nemacak qanač'e yitaca ñ'iyelacasoq, sew'etak ñi' ñitesoqo' wacac'e n'acatetapela't, nayi qataca degesa da' yidiaa da' sete' s'iyelaq, sekaet laqaya qamačaca degesa da' yeči ñidotapela't da' saqapiyañi.</p>
<p>-K'AP: En esta época se observa la floración del quebracho, árbol representativo de zona y momento representativo de esta etapa. Comprende aproximadamente los meses de marzo y abril. -NAQABIA'CA: Abarca los meses de mayo, junio y julio. En esta época la marisca es escasa porque no hay frutos y generalmente está caracterizada por la sequía. Sin embargo, es un momento apto para cazar, por ejemplo, quirquinchos. -NAWO'CO: El monte se llena de flores. Abarca los meses de septiembre a noviembre.</p>

Figure 2. Vidal *et al.* (2014 I: 87, II: 81, II: 31, II: 58, III: 65.) <B b> in Pilagá. Page II: 31 mentions columns 'A' and 'B' (barred B) of a table.

(9) *l-k'oqte so' Nadienek m'e lk'oso haso' Sobiasae qatasa*
 POS.3-hija CL Nadienek RLTV POS.3-hijo FEM.CL **Sobiasae** Conj
di m'e l-et'a Tegenqodi.
 CL.DEM POS.3-padre Tegenqodi
 '(Añsole era) hija de Nadienek (Marcos Salinas) que era hijo de **Sobiasae**
 y Tegenqodi (fallecido).'

Figure 3. Vidal (2015: 59). A Pilagá text from a different publisher, with better typesetting.

ba	be	bi	bo	bu	bu
Ledia:					
bada	bareka	bido			
badua	beda	bi			
baido	bichichi	besia			

Dadyi Bedeada Bλdia

Figure 4. *Dadyi Bedeada Bλdia* (2006, front cover). <B b> in Northern Embera.

bâbò: [pbah-boh], *n. anim.* – oversized wild mustang is so called (cp. **Tau:tseñ**)

Noun #	1 or 2	3 or more
oversized wild mustang	bâbò:	bâbò:gàu

Bâbò: [pbah-boh], *n. name* – personal name of Horace Monroe Poolaw (BIA Record: Monroe Poolaw)

Bâbò:p'àu: [pbah-boh-p'aw], *n. placename* – "AmericanHorse-River", an upper branch of the Pease River in Texas, described as midway between the Red River and the Staked Plains where they are one day's journey apart. Named from a fight in which the Kiowa captured several horses, the largest they had ever seen, from Texans in the winter of 1841-1842. Also known as **Tóñzótgótp'àu:** & **Bí:bòp'àu:**

bàbâ [pbah-pbah], *adv.* – up or against (occurs largely as a compound form as in: **k'ópbábâ** 'against the mountain/s' or **tóñ:bábâ** 'by the water or oceanside')

Figure 5. Poolaw (2023: 106). <B b> in Kiowa. There is also a <g> (blue). This is not script g; the script form is merely an effect of the sans-serif font.

ḏá:bìn [tdah-been], *v. basic adj* – big eyed; having large eyes

ḏá:bîn [tdah-been], *n. name* – personal name Kiowas called one of the non-indian bankers in Mountain View, Oklahoma, literally “Eyes-Big” due to his large bulging eyes

ḏá:bìntáíí: [tdah-been-tah-lee], *n. name* – personal name of Dau-bien or Big Eyed Boy, member of the **Áldóyòì**

ḏá:bònmàui [tdah-bohn-moy], *n. name* – personal name of Tah-bone-mah (1881 Kiowa Census, Male); origin of the Kiowa surname Tahbonemah

ḏá:bitàu:bòp [tdah-pbee-taw-pboh], *v. 2part* – poking the eye or eyes (as with finger)

PAST (perfective)	ḏá:bitàutgàu	poked eye/s
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Figure 6. Poolaw (2023: 178). <ḏ ḏ> in the Kiowa-English dictionary *ḡáuiḏòñ:gyà-t'áukáuiḏòñ:gyá*, the title itself which uses the letter. The last token, **ḏá:bitgàu** (blue), contains all three barred letters.

Gàuáu:p'é:dè [gkaw-aw-p'ay-day], *n. name* – personal name of Kau-pate, “Rising Crow” (1881 Kiowa Census, Male)

Gàuáu:t'á:gyài [gkaw-aw-t'ah-gyigh], *n. name* – personal name of Kau-ti-keah or Big Joe, “Good Crow” (1881 Kiowa Census, Male) leader of the Tsěñ:tánmàu

ḡáubót [gkaw-boht], *n. ????* – boat or canoe; any type of boat, as river boat, motor boat, etc. (cultural note: the original Kiowa boat, as the name denotes, was a tub like thing mad by stretching a ‘green’ buffalo stomach or hide over a frameword of green tree limbs, usually willow. Belongings were carried across in them when streams and rivers were flooded or deep for horses to wade through, with swimmers alongside doing the pushing and steering)

Noun #	1 or 2	3 or more
boat / canoe	ḡáubót	ḡáubót

ḡáubótḡù:dò [gkaw-boht-gkoo-tdoh], *n. anim.* – House Sparrow or Common English sparrow that was introduced to the Americas; probably first seen by Kiowas on the Gulf coast, swarming about boats; hence, the literal translation “Boat-bird”

Figure 7. Poolaw (2023: 302). <ḡ ḡ> in the Kiowa-English dictionary *ḡáuiḏòñ:gyà-t'áukáuiḏòñ:gyá*, the title itself which uses the letter.

12 Consonants of Similar Sound				
	voiced	aspirated	voiceless	ejective
Bilabial (tongue to lips)	b	ɸ	p	p'
Dental (tongue to teeth)	d	ɗ	t	t'
Velar (back tongue to roof of mouth)	g	ɠ	k	k'
Alveolar (tongue along roots of teeth)	z	s	ts	ts'

Figure 8. Poolaw, Botone-Willis & Kauley-Poolaw (n.d.: 8). The columns are mislabeled: *p t k ts* are the aspirated consonants (Dane Poolaw p.c.).

Questions/Statements	Responses
Háu hégáu yán hái:gyádàu:?	Hàu:! [Yáɸ hái:gyá.] <i>háu:nè!</i> <i>háun yáɸ hái:gâu.</i>
Háu èm ɸòĩɸhyômdàu?	Hàu:! [à ɸòĩɸhyômdàu.] <i>Háu:nè!</i>
Háu èm ɠáui:t'àu:yà?	Hàu:! Shándè [à ɠáui:t'àu:yà.] <i>Háu:nè!</i>

Figure 9. Poolaw, Botone-Willis & Kauley-Poolaw (n.d.: 43). <ɸ> and <ɠ> in Kiowa.

-Warra zocārã ununadua. Nañ ějũāra biræɗadua id-
jæɸ jũma nañ ějũāne ɸeara ɸārã jɿwaedæ erøɸeæɗad-
ua. ɸæda ɸeara, ĩbana ɸeara, druabema animarã siæ
jũma poya erøɸeæɗadua.-

Figure 10. Wycliffe (2011: GEN 1.27). <ɸ> (and <ɗ>) in Northern Embera. The capital form <ɸ> (blue) is idiosyncratic; when the title *Ācōrē Bēdēa* is written in all caps on the title page, it is *ĀCŌRĒ BĒDĒA* with the capital of <ɗ> similarly formatted with an overstruck virgule. Compare Figure 4 for a government-published primer that uses the expected capital <ɸ>.

Figure 2.2: Consonant Chart for Jicarilla Apache

Consonants	Front of Mouth		
	Labial	Alveolar	Palatal
Stops			
Plain	ɸ	ɬ	
Voiced	b	d dl dz	j
Aspirated		t tʰ ts	ch
Glottalized		t' tʰ' ts'	ch'

In Jicarilla **ɬ** is a plain stop, [dl] is
 ed. The **ɸ** and **ɬ** are less voiced
 2). This distinction, though clear to

Figure 11. Phone *et al.* (2007: 13). This is a professionally typeset dictionary. The publisher could have used stem-struck and <d> if they had preferred.

ɸ	ř	ɣ
m	n	ŋ

These are illustrated in the following, in which [ɸ] is characteristic of closed syllables, paralleling [i] in open syllables; the final vowel in these forms is phonetically [ɛ], but that is irrelevant to the analysis at this point:

sɪɸé	'cut down'	tɪřé	'stop'	ndɪɣé	'I'm not coming'
nɪmé	'put out'	bɪné	'go to'	nɪŋé	'sweet'

dwòp è bà:	dwò ɸ è bà	'twelve (ten plus two)'
èfit è nàŋ:	èfiřè nàŋ	'nineteen (fifteen plus four)'
úfòk ibà:	úfò ɣ ibà	'two houses'

Figure 12. Welmers (1974: 75). Bilabial flap and uvular flap <ɣ> in Efik.

	Affri- cate	Dental		ts		
		Alveolar	{f. tʃ l. dʒ}			tʃ
Nasal		Labial		m	m	m
		Dento-alveolar		n	n	n
		Palatal			ɲ	ɲ
		Palato-velar		ŋ	ŋ	ŋ
		Bi-labial				n[ŋ]
		Labio-dental	{f. f l. v}	f	f	f
Fricative		Dental	{f. θ l. ð}			θ
		Dento-alveolar	{f. s l. z}	s	s	s
		Alveo-palatal	{f. ʃ l. ʒ}	ʃ	ʃ	s[z]
		Palatal			x[ç]	
		Palato-velar				g[ɣ]
		Pharyngeal		x		x
						b[b]
						f

Figure 13. Malécot (1974: 2525). Use of Spanish <b ɖ ɣ> for fricatives in a source that otherwise uses IPA, including <ð> rather than <ɖ> for English /ð/.

dʒ	0.88					
tʃ	0.63					
ʒ	0.16					
	100.00					
/l/	<[l]	4.08				
	<[ɫ]	3.61				
			/x/	<[x]	1.62	
				<[ç]	3.70	
			/b/	<[b]	1.27	
				<[ɸ]	3.72	
			/d/	<[d]	2.96	
				<[ɖ]	6.12	
			/g/	<[g]	0.30	
				<[ɣ]	0.94	
			/s/	<[s]	13.29	
				<[z]	1.31	
			/r/	<[r]	9.95	
				<[r:]	0.93	

Figure 14. Malécot (1974: 2527). Relative frequencies of Spanish allophones [b ɖ ɣ] vs [b d g], as well as German [x] vs [ç] (center) and English [l] vs [ɫ] (left).

G	G	Gó	demander secours
Gh	Ḡ	ḡòm	parole, langue
H	H	Há	donner
K	K	Ká	erre ;
Kh	K	ké	brûle, consume !

b	b	Bí	se perdre
bh	ḃ	Ḃé	fruit noir
d	d	Dó	demander
dh	ḏ	Ḑé	époux

Figure 15. Ntagne (1975: 4). Bamileke (Cameroon) orthography with barred Aa Bb Dd Gg Kk Pp Tt Uu. Digraphs in h are the old orthography.

Fà? - La kéwé yan gé yú?ηwá?á.
 Ḡòm fà? mḡé mǒ : zàzòm, mhwe vóp, kíηmnyé.

Figure 16. Ntagne (1975: 9). <Ḡ ḡ> in running text.



Figure 17. Nissim *et al.* (1977: front cover). A custom glyph <G> in the word <gom> 'language' on the title page. In the rest of the text, manual overstrike is used, as in the previous figure.

The voiced bilabial stop /b/ has two allophones [b] and [b̥]. The stop occurs following a bilabial nasal: *íyémbémi* [iyɛmbemi] 'he/it is not here'. The fricative [b̥] occurs elsewhere: *bémi* [b̥emi] 'he goes'; *úhikǎnò* [ub̥xano] 'you fill it up!'. With some speakers [b̥] fluctuates with [b] utterance initial, *bánùdámí* [banuřami] [banuřami] 'morning'. The fricative allophone [b̥], when preceding the

Figure 18. Frantz (1966: 2). Gadsup (New Guinea).

Type I examples:
tépelabos, tepelabosi 'wall'
bip, bipu 'offspring'
abar, abara 'sky'
boteb, botebo 'powder, lime'
tiz, tiza 'Pull it out.'

Figure 19. Pence (1966: 54). Kunimaipa (New Guinea).

Fricatives	ɸ		ɣ
Lateral		l	
Nasals	m	n	ŋ
Semivowels	w	y	

These are illustrated in the following paradigm.

[pee]	<i>basket</i>	[te]	<i>scorpion</i>	[keɛ]	<i>go up</i>
ɸyeɛ	<i>old</i>	[lɛmi]	<i>important man</i>	ɣɪɪ	<i>coconut</i>

Figure 20. Henderson (1975: 820). Yeletnye (New Guinea) in phonetic transcription. The script form of <ɣ> harmonizes with IPA script <g> rather than with the <g> of the surrounding text, though this may be due to using a sans-serif font for phonetic transcription but a serif font for the main text.

Voiced oral fricative v [b] and
 voiceless oral fricatives f [p], s and h.
 Sonorant nasals m, n, ng [n] and
 obstruant nasals mm [m], nn [ñ].

Figure 21. Stringer & Hotz (1979: 9, 1970: 4). Waffa (New Guinea).

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/jauk/ [ja^{up}k] 'in the status of bachelorhood'; /jouk/ [jo^{up}k] 'danger or fear as of attack'; /mauke/ [ma^{ub}-gʒ] 'periodic pig feast'; /ouk-ekke/ [...ɔ^{ub}-gʒkʒ] 'sickness'; symbols [p^uk] and [ɸ-g] represent the phonetic complex of bilabial closure preceding and simultaneous with backed velar closure in the preceding examples.¹²

Figure 22. Bromley (1961: 29). Baseline g and superscript ɸ, <ɸg>, in Dani.

11 TANGUAT'	gʷnɔk	10 IGOM	raʃuan-
12 ANDARUM	gɪɾ	11 TANGUAT'	abɪnɔk
13 ITUTANG	gɪa	12 ANDARUM	ɔ:n
14 MIDSI-VINDI	gɪa	13 ITUTANG	abana
15 AKRUKAY	gɪɾ	9 TANGU	anduar uŋsunuab
16 BRERI	ɾɔ	10 IGOM	gɪrɔduŋ-

Figure 23. Z'graggen (1972: 186, 191, 213). Z'graggen uses <ɸ> and <ɣ> in manuscript despite otherwise using Americanist or IPA letters such as <ʌ ɛ ə ŋ ɔ ?>. The barred-letter convention is clearly intended here.

<i>saliva</i>	45	I2	Biyom	fas-	
G1	Sileibi	apa	I3	Tauya	ɛɛɸati-
G2	Katiati	aba	I4	Faita	ŋgɸb-
G3	Osum	nipo-	G6	Moresada	ʌsəg, ander
G4	Pondoma	aba	G7	Wadaginam	arugwɔt
G5	Ikundun	-gawɔpɔŋ			
G6	Moresada	-sambɔp			

Figure 24. Z'graggen (1980: 9, 75, 58). Z'graggen's barred <ɸ ɣ ɸ> convention is maintained in publication despite the ability of the publisher and printer to handle IPA letters such as <ʌ ɛ ə ŋ ɔ>.

- durch den Konsonanten zeigt eine spirantische Aussprache. Hierzu gehören **B** und **ɸ**.
 Der mit kleinen Antiquamajuskeln bezeichnete Vokal zeigt die Stimmlosigkeit des Vokals. Die etwas über der Zeile befindlichen ^E und ^x bezeichnen einen stimmlosen unbestimmten Vokalhauch. Ebenso sind solche Konsonanten-Antiquamajuskeln wie ^g, ^d und ^B Zeichen für die Stimmlosigkeit.

Figure 25. Lehtisalo (1956: cvii). Explanation of the devoiced dental approximant <ɸ>. Labial <ɸ> (blue) is already encoded at U+1D03.