Dɵlk'ʷahke: The First Carrier Writing System*

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Abstract. Carrier, an Athabaskan language of the central interior of British Columbia, was first written in 1885 in a derivative of the Cree syllabics, in which, for a time, there was mass literacy. This writing system, including extensions of the normative version, is here for the first time described in detail. In spite of its name, it is shown to be an alphabetic writing system. The usage of the system is discussed, and the extensive differences between it and the antecedent Cree and Northeastern Athabaskan writing systems are elucidated.

1. Introduction

Carrier, the Athabaskan language spoken over a large region of the central interior of British Columbia, was first written for practical purposes[1] in 1885 in a writing system known as the "Déné Syllabics" or "Carrier Syllabics", ultimately derived from the Cree syllabics. It was designed and introduced by Father Adrien-Gabriel Morice (1859-1938), a missionary of the Oblates of Mary Immaculate, at the Stuart's Lake mission at Fort Saint James. Although this writing system is not entirely unknown to scholarship, it is generally known only from the chart forming part of the front matter of the Roman Catholic Prayerbook (Morice 1904/1933) or brief normative descriptions by its creator (Morice 1890, 1902). Although it differs considerably from its Cree ancestor, Carrier tends simply to be listed as one of the languages making use of a variant of the Cree system. Even the most explicit treatment (Nichols 1996:610) merely reproduces the chart from Morice (1890) without further discussion. My purpose here is to describe in detail the actual structure and use of this writing system as well as its relationship to the Cree system and its other descendants.
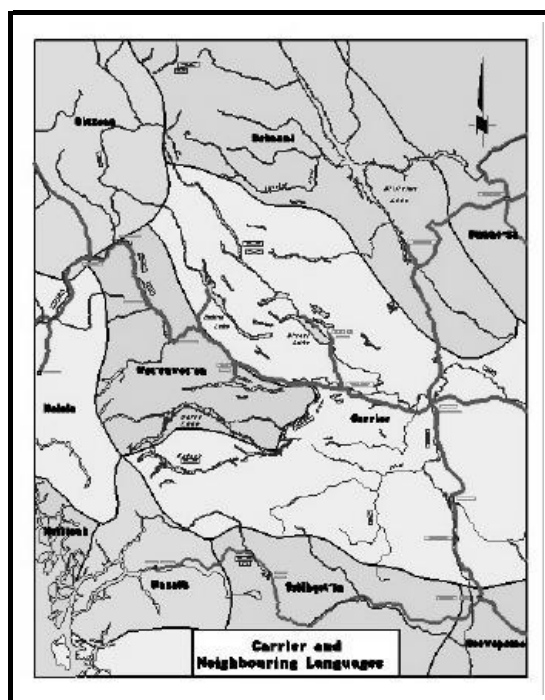
(1) **The Languages of Central British Columbia**

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[1] Several wordlists were recorded in *ad hoc* English-based transcriptions by fur traders, beginning with Alexander MacKenzie in 1793, but they never attempted to create a practical writing system. Father Morice (FILL IN REFERENCE HERE) mentions that an unsuccesful attempt was made to introduce the Cree syllabics prior to his arrival in Fort Saint James. No other record of this survives.

This writing system is known in Carrier[2] as *dʌlkʷahke* ⊃ᶦᵛ≪ʰꓭ [3] "toad feet".[4] Father Morice always referred to syllabics in Carrier as *dʌčʌnk'ʌt* ⊃ꓭ'ꓭᵀ "on trees", but this term is unknown to Carrier people today, and may never have gained currency among Carrier people.

2. Usage

Father Morice taught the syllabics only a few times, but they spread rapidly from one person to another and soon came to be widely used. In the preface to his reading textbook (Morice 1894:5) he wrote:

> An hour's lesson repeated on five or six days in the four most important villages was all the teaching received by the younger generation of the Carriers most of whom mastered the whole syllabary and set upon reading and writing with ease and correction ere any Primer had been printed for their benefit.

Morice (1889:166) noted that people learned to read and write "after one or two weeks' ... private instruction from others." This was not mere boasting on the part of Father Morice: both oral tradition and the testimony of current users confirm his claim. For example, elder Mac Squinas of Ulkatcho told me that as a child he learned to read and write in about a week, in sessions of a half-hour or so each evening, "from my auntie, out on the trap line".

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[2] Except where otherwise specified, information about the Carrier language is based on my own field work on the language since 1992 and residence in Carrier territory from 1994-2001.

[3] The font used here is a Metafont font created by Richmond Thomason and the author. There is also a Windows Truetype font, created by Sarah Holland for Tl'azt'en Nation.

[4] The word *dʌlkʷah*, literally "croaker", historically refers to the Western Toad *Bufo boreas*, distinguished from *tsasdli*, the Spotted Frog *Rana pretiosa*. Most modern dialects of Carrier have eliminated the contrast, some preserving *dʌlkʷah*, others *tsasdli*. The Cheslatta dialect preserves the distinction.

(2) A Page from the Prayerbook

Within a few months of the introduction of the syllabics, a lengthy message was written on the wall of the jail in Richfield, one of the many small outliers of Barkerville, about 80km East of Quesnel. This is the first known document in the Carrier language.[5] Considerable material was published in syllabics, including a reading primer (Morice 1890/1894)[6], two editions of the Roman Catholic Prayerbook (Morice 1904/1933), illustrated in (2), and 24 issues, each eight pages, of a bimonthly newspaper, the *Dʌstl'ʌs Nax^wʌlnʌk* (ᑕˢᑫˢ ᒣ⋟ˈᑕ′), published from 1891 to 1894. The first page of the first issue is shown in (3).

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[5] A photograph of this text may be found on p. 176 of Walker (1996).

[6] I have never seen the first edition of the primer, but we know of its existence because Father Morice refers to it in the Preface to the second edition, and we know the date because, in the Carrier language preface to the second edition (p. 9) he says that it was published four years earlier.

(3) The First Page of the First Issue of the Newspaper

In the second issue of the newspaper dated November 1891, Father Morice reported 84 subscriptions from 16 communities ranging from Bełk'aček[7] in the West

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[7] The principal village of the Cheslatta Carrier Nation, this village was destroyed by the Kemano hydroelectric project in 1952. This interpretion is not entirely clear, since Father Morice writes *Bitkače*. His /k/ rather than /k'/ is presumably an error. The use of /i/ rather than /e/ and the lack of the final /k/ are expected in the Stuart Lake dialect in which Morice wrote. However, in my experience, it is not usual for Carrier people to translate placenames in this way. This suggests that he might mean another place. The best candidate is *Bitk'a* "Whitefish Lake", South of the Northwest end of Stuart Lake. The stream that runs from Whitefish Lake

to Fort George in the East, from Yekuče at the Northwest end of Stuart Lake to Williams Lake, 240km South of Prince George. (See Figure (4) for the locations of the Carrier communities.)
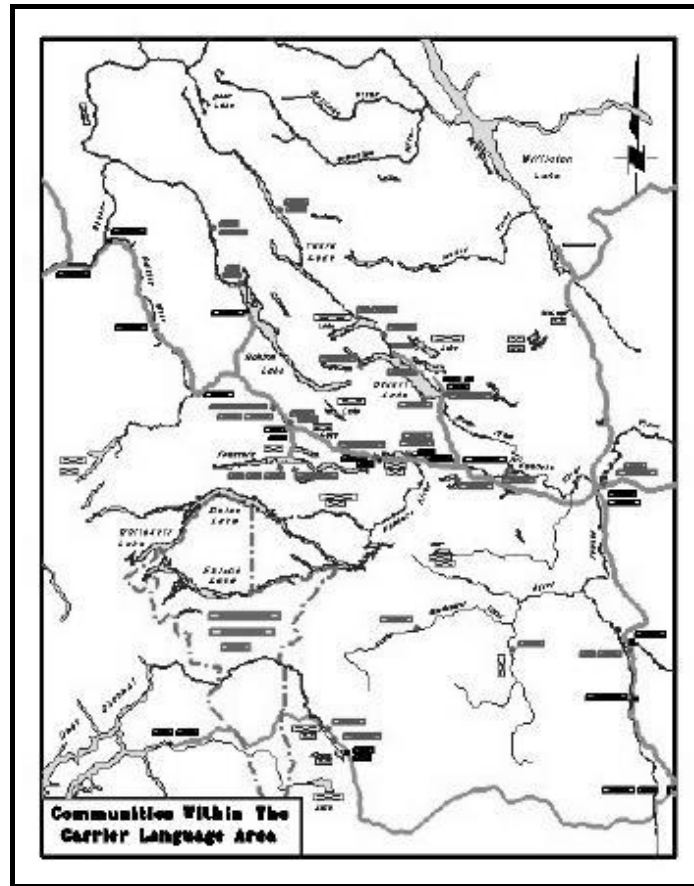
(4) Map of Carrier Territory

Only the southernmost portion of Carrier territory, comprising the present-day Red Bluff, Nazko, Kluskus, and Ulkatcho bands, is not included. As it is very likely that each copy was read by several people, this indicates a significant readership.

Carrier people corresponded with each other in syllabics. Louis-Billy Prince (1864-1962) corresponded with Father Morice in syllabics until his death in 1938.[8] Some kept diaries and business accounts in syllabics.

Grave markers were written in syllabics, both on wood and on stone. None of the wooden markers remains legible, but dozens of headstones inscribed in syllabics

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into Stuart Lake is called *Biłk'akoh*, so its debouchure into Stuart Lake could be *Biłk'ače*. However, in such cases *če* is usually attached to the full name of the river, without omission of *koh* "river", which in this context becomes /ku/. The expected form is therefore *Biłk'akuče*, not *Biłk'ače*. In any case, I am not aware of there having been a settlement at the mouth of the *Biłk'akoh*. It therefore seems most likely that Morice intended the Cheslatta village.

[8] Personal communication, 1998, from Mrs. Lizette Hall, Mr. Prince's daughter.

remain. Indeed, there are no headstones in Carrier in any other writing system: Headstones are either in syllabics or in English. A typical example is shown in (5).

(5) The Gravestone of Belzeni

A gravestone in the Nak'a<u>z</u>dli graveyard in Fort Saint James. The inscription reads /be-l-ze-ni da-z-sa-ʔ no-k'-be-m-ba-r 9 1918/ *Belzeni da<u>zs</u>ai Novembar 9 1918* "Belzeni died November 9th 1918". *Belzeni* is the Carrier adaptation of French *Virginie*. The /i/ of *da<u>zs</u>ai/* omits the main part of the character, retaining only the diacritic. Photograph by the author.

The headstones frequently contain errors and are difficult to interpret. In addition to the errors that the authors of the text may have made, errors were probably introduced by the carvers. Few headstones were manufactured locally. In general they were ordered through the Hudson's Bay Company and produced in Victoria or the Lower Mainland. The stonemasons knew neither the syllabics nor the Carrier language but merely copied from a work order, often with less than perfect accuracy. In a few cases, entire lines are garbled. For example, the last line of the gravestone of Pius George in S̱aik'u<u>z</u>, illustrated in (6), contains several errors.

(6) The Gravestone of Pius George

A gravestone in the S̲aik'ʌz̲ (Stony Creek) graveyard. After the line *Nov. 25. 1918* in English, it reads: ᐱᑕ Ꞌᘐ ᘐ ᓯ ᒼ Ꞇᙆᐅ Ꞌ ᗪ ᕁ Ꞌᘐ ᘐᕄᐅꞋ ᘐ ᗪ ᒫ ᘐ /ho-da b-ba-yʌ-s jo-z da-z-sa-i m-be-lʌ n-di ni-ł-e-n ba tʌ-du-dli/. To make sense, this must be emended to: ᐱ⟦ʰ⟧ᑕ Ꞌᘐ ᘐ ᓯ Ꞇᙆᐅ Ꞌ ᗪ ⟦Ꞇ⟧ Ꞌᘐ ᘐᕄ⟦•⟧ᐅꞋ ᘐ ⟦ᗪᎯᒫ⟧ᘐ /ho-**h**-da b-ba-yʌ-s jo-z da-z-sa-i m-be-**la** n-di yʌ-ni-ł-**ʔ**-en ba **te-na**-du-dli/ *Hohda Payʌs joz dazsai. Mbela ndi yʌnilʔen ba tenadudli.* "Then Pius George died. May whoever sees this pray for him." Photograph by the author.

According to the accounts of the elders, it quickly became common to write messages on blazes on trees. This constituted a transformation of a tradition from before the development of a true writing system, in which symbols were written or carved on blazes. Most of the trees thus marked are no longer in existence due to the passage of time and logging, but many people remember that they were fairly common, and a few remain, though they are now generally removed for safe-keeping. A photograph of one of the few surviving messages on a tree is shown in (7).
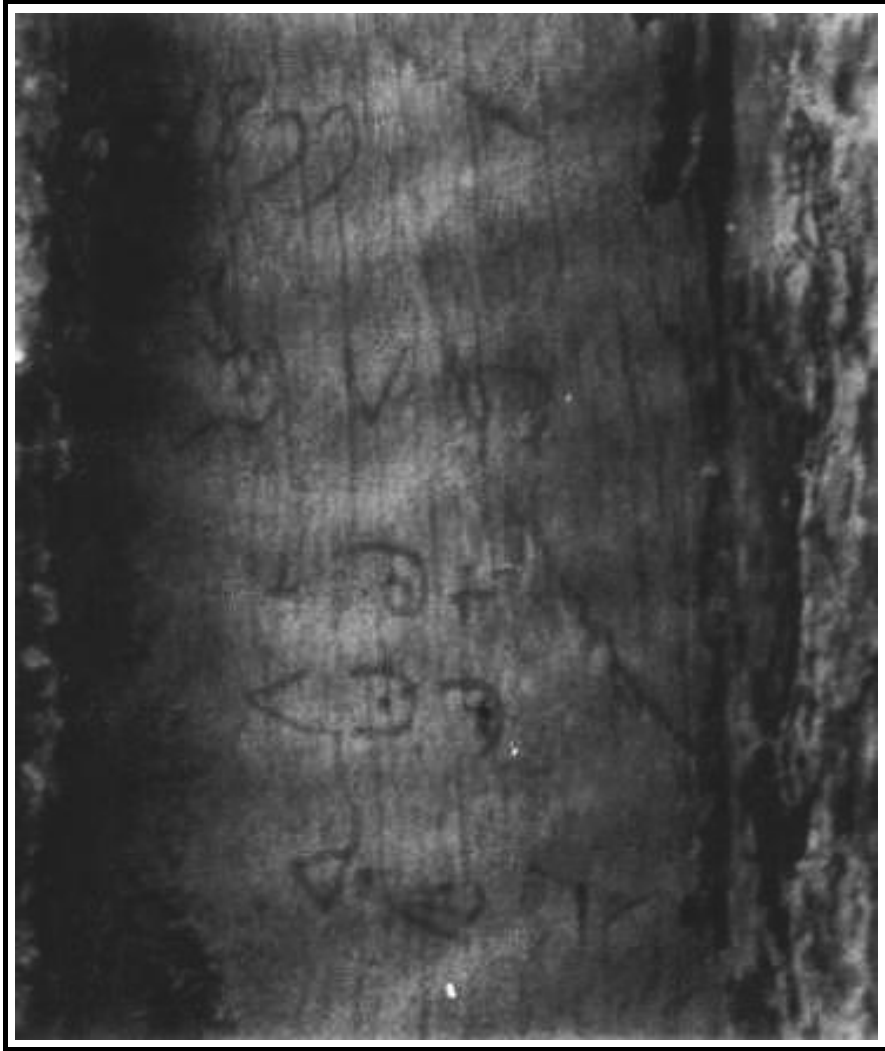
(7) A Tree Along the Cheslatta/Nadleh Trail

The text reads: 1899 ꗦ ꛚꗛ ꗟ+ ꕚ ꗏ ꕪꕮꞋ /1899 zi-hu-ni b-ye-r ha-di ni a-d-wa-n/ *1899 Zi huni. Byer hadi ni. Adwan.* "1899. There is a corpse. Pierre says hello. (signed) Antoine.". It apparently refers to a bush burial. According to Nadleh elders, Pierre and Antoine were partners in trapping. Photograph by Craig Hooper, Vanderhoof Forest District.

In short, for several decades there appears to have been mass literacy in syllabics. Beginning in the 1920s the use of syllabics began to decline. This was probably due to the establishment in 1923 of Lejac Residential School, where the use of Carrier was forbidden except for prayer and singing hymns. For a few years prayers and hymns were read from the syllabic Prayerbook and syllabics were actually taught at Lejac, but eventually the bishop turned against the syllabics and insisted that the Prayerbook be issued in a new version written in roman letters. In 1938 the third edition of the Prayerbook was published, using the somewhat idiosyncratic,

subphonemic writing system used by Father Morice in his scholarly publications. The replacement of the syllabic Prayerbook with the roman version eliminated school as a source of instruction in syllabics. The isolation of the children from their families, especially in the winter, when there was much free time in the evenings on the trap line to spend on such things as teaching syllabics, greatly reduced their opportunity to learn to read and write from their elders. The result was a precipitous decline in knowledge of syllabics. Today, only a few people read and write syllabics, and some of these only learned it as adults.

An example of the abruptness of the loss of literacy in syllabics is Mrs. Lizette Hall, a daughter of Louis-Billy Prince. As already mentioned, her father was literate in syllabics and corresponded extensively with Father Morice in syllabics. Although Mrs. Hall is a fluent speaker of Carrier and in later life became literate in Carrier in the Carrier Linguistic Committee writing system, she never learned syllabics, even though she lived with her father and took care of him for many years. When her father got older and did not want to write out his letters himself, he dictated to Mrs. Hall, who wrote on her father's behalf to Father Morice in English, as she was not then literate in Carrier (Lizette Hall, personal communication, 1998).

Although only a small minority of people today can read or write syllabics, many people regard syllabics as a more authentic, more traditional way to write Carrier than the English-based[9] Carrier Linguistic Committee writing system. Some people also believe that syllabics are a more effective tool for writing the language. As a result, syllabics are often used to give an aura of tradition on objects used in public, such as drums, and in public places, such as the mural painted by highschool students on the north wall of the Overwaitea supermarket in Fort Saint James, illustrated in Figure (8).

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[9] I say "English-based" because this system not only uses Roman letters but often uses letters and digraphs with their English values, such as <oo> for /u/ and <u> for /ʌ/.

(8) The Overwaitea Mural in Fort Saint James

Part of the mural on the North wall of the Overwaitea supermarket in Fort Saint James. The text reads: Ⰳ'ᗷ ꙅᑕᓕ ᐸ'ᑐᵀ ꚉ ᕽᕉᐧ ꙅᑫʰ ꙅ𐐀ᕽᓯ ᐅᵀ ᐳᐧ⪽ ᗌ ᗅ 𝕞 ꙅ𐐀 ᓬʰ𐐀ᕽᕉ . ꙅₛᗌᵛ ᗷᑕ ᓬʰ𐐀ᴵ ꙡ𝕞 ᗌᑕ ᐁᴵᕉʰ . ᗺᑕ ꙅ 𐐀𝕞 . /yʌ-n-ka nʌ-dʌ-ł-ne a-n-dʌ-t dzi-n ŋ-ja-n ne-zi-h nʌ-sʌ-h-di-l ʌ-t hʌ-k-wa tʌ-be-čo mʌ-si no-h-ts'ʌ-t-ni. dʌ-s-de-ŋ ts'ʌ-la nʌ-h-di-ł su-čo bʌ-na ɣu-ł-ni-h. tsa-na mʌ-si-čo./ With the emendation of /a-n-dʌ-t/ to /ʔ-a-n-di-t/, /ŋ-ja-n/ to /n-ja-n/, and /ʌ-t/ to /ʔ-e-t/, we have: yʌnka nʌdʌłne ʔandit dzin njan nezih nʌsʌhdil ʔet hʌkʷa tʌbečo mʌsi nohts'ʌtni. dʌsdeŋ ts'ʌla nʌhdił sučo bʌna ɣułnih. tsana mʌsičo. "Aboriginal people! We thank you very much for coming here beside us today. ... Thank you very much." The intended meaning of /dʌ-s-de-ŋ ts'ʌ-la nʌ-h-di-ł su-čo bʌ-na ɣu-ł-ni-h. tsa-na/ is unclear. Photograph by the author.

Those non-native people aware of the existence of the syllabics apparently have a similar image of syllabics — the Pioneers' memorial constructed on the occasion of the Centennial of Confederation in 1967 in Prince George contains a meaningless text in syllabics, shown in Figure (9).

(9) Part of the Pioneers' Memorial in Prince George

The syllabic text under the mural on the inner wall of the Pioneers' Memorial in Foundation Park in Prince George at the corner of 7th Avenue and Dominion Street. It reads *yʌk'ʌt tuk'o dʌdi*. The characters are well-formed but the text is meaningless as it stands. It may be an imperfect rendering of the three separate words ꓛ'ᗷ˥ ᐸ ᗰ ʰ ꓷꓷ *yʌnk'ʌt tuk'oh dʌni* "land", "river", "moose". Photograph by the author.

Materials written in syllabics were read by speakers of Babine, as evidenced by the five subscriptions from Old Fort and seven from Fort Babine reported by Father Morice in the November 1891 issue of the *Dʌstl'ʌs Naxʷʌlnʌk*.

At one time Sekani people also wrote in syllabics, but they apparently always wrote in the Carrier language, not in Sekani. According to Harry Chingee of McLeod Lake (personal communication, August 1993), his father, whom he believed to be typical of his generation, could speak Carrier and could read and write Carrier in syllabics. The one gravestone at McLeod Lake in syllabics is in Carrier, not Sekani.[10] For example, the third person singular possessive prefix /u/ would be /bi/ in Sekani.

Syllabics were occasionally used for other languages. The first two editions of the Prayerbook (Morice 1904/1933) contain four Latin hymns written in syllabics. Carrier people occasionally used the syllabics to write English. Indeed, the Barkerville jail text contains the line ꓷ' ᗡ Ǝ+ꓛs ᗕ ᗩ Ǝ ᗕ ' /dʌ-m bʌ-ga-r di-s je-l ba-ga-bi-l/ /dʌm bʌgʌr dis jel bagabil/ "Dumb bugger! This jail [is in] Barkerville." written in syllabics.

There is one syllabic text in an unknown language, on a photograph belonging to Mrs. Anne Troy, showing a sleigh drawn by a team of horses, once in the possession of her father, the late Alexi Jack of Cheslatta. On the back is the inscription *ditnab doč'ak*. This is not interpretable as Carrier. According to Christine Dawson (personal communication, June 1998) and Mac Squinas (personal communication, July 1998), it is not interpretable as Nuxalk (Bella Coola), the Salishan language that Mr. Jack is known also to have spoken.

3. The Original Version of the Writing System

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[10] There is one Sekani word in the inscription, /uske/, which according to Sharon Hargus (p.c. 1993) is Sekani for "fisherman". As we can see from the English text, this is the family name or epithet of the father of the two boys.

3.1. The Sound System of Carrier

Carrier has the six vowels: *a, e, i, o, u,* and *ʌ*. In addition to the vowels, the nasals may also be syllabic. The consonantal inventory is shown in (11).[11] /p/, /f/ and /r/ are in parentheses because these sounds are not native to Carrier but are found in words borrowed from other languages. /γ^w/ has merged with /w/ for most current speakers, but older speakers still pronounce it [γ^w].

(11) The Consonants of Carrier

Labial	Dental	Alveolar	Palatal	Velar	Labio-Velar	Laryngeal
(p)		t		k	k^w	ʔ
b		d		g	g^w	
		t'		k'	$k^{'w}$	
	t̠s̠	ts/tl	č			
	d̠z̠	dz/dl	j			
	t̠s̠'	ts'/tl'	č'			
(f)	s̠	s	š	x		
	z̠	z		γ	γ^w	
m		n	ɲ	ŋ		
w		l/(r)	y			
x^w		ł				h

Two of the native consonants of Carrier are extremely rare. Indeed, the distribution of /ŋ/ in Carrier can only be described as bizarre. [ŋ] occurs phonetically as the allophone of /n/ before velars. However, each dialect has one or two morpheme containing an unpredictable [ŋ] in the coda, which requires us to give /ŋ/ a marginal phonemic status. Which morphemes contain /ŋ/ varies from dialect to dialect. In the Stuart Lake dialect on which Father Morice based his analysis, the only such morpheme is /-t̠s̠ʌŋ/ "flesh", which takes the form /-t̠s̠ʌn/ in the Southern dialects. Some dialects, both Stuart Lake and Southern, have /ŋ/ in the word for "full summer", e.g. Stuart Lake [daŋ] and Lheidli [daiŋ]. The palatal nasal /ɲ/ is found only in a group of related morphemes all referring to the second person singular, such as the independent pronoun /ɲʌn/ and the possessive prefix, underlyingly /ɲ/. For many speakers, probably all in most of the Southern dialects, /ɲ/ has been reanalyzed as /ny/. Conservative speakers of the Stuart Lake dialect contrast the two, e.g. [n̩yʌn] "your land" or "your song" but [ɲʌn] "you", but most Southern dialect speakers merge these into [n̩yʌn].

All consonants with the exception of /ŋ/ are found in the onset. Onsets generally consist of a single consonant. Permitted onset clusters begin with either /s/ or /ł/, e.g. /sba/ "for me" /łba/ "for each other".

Codas are much more restricted. The ejective and aspirate series are not found in the coda. Affricates do not appear in the coda, with the exception of a handful of instances of word-final /ts/, nor does /š/. Codas contain at most a single consonant.

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[11] This is my own analysis, which differs only in small details from that of Walker (1974) and from the analysis implicit in Morice (1932).

Carrier syllables therefore are of the form $((C_1)C_2)V(C_3)$ or N, since the syllabic nasals occur in very restricted contexts.

3.2. The Syllabics

The following chart[12] shows the symbols of the normative version of the syllabics, as found in the first two editions of the Roman Catholic Prayerbook.

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[12] The chart gives the principal values of the symbols. As discussed below, ˇ /k'/ is also used as a diacritic to derive /v/ from /b/. Since Morice only distinguished the lamino-dental fricatives /s̱/ and /ẕ/ from the apico-alveolars /s/ and /z/ in coda position, the apico-alveolar CV graphs also represent the lamino-dentals.

(12) Chart of the Normative Carrier Syllabics

C\V	a	ʌ	e	i	o	u	isolated
b							⊥
t							
d							т
t'							
k							\
g							´
k'							˅
č							
j							
č'							
ts/t̠s							
dz/d̠z							
ts'/t̠s'							
n							᾽
m							ʻ
ŋ							ˇ
l							ι
ł							ʟ
tl							
dl							
tl'							
s							s
s̠							s̠
z							z
z̠							z̠
š							s̠
x							⫽
γ							‖
h							h
w							
xʷ							
y							
none							
ʔ							.

The majority of the symbols represent a consonant followed by a vowel. Each row in the chart contains a different initial consonant. Each of the first six columns contains a different vowel. Thus, the symbol ∈ in the G row and the A column represents *ga*, while the symbol ᴍ in the M row and the O column represents *mo*.

Notice that all of the syllables beginning with the same consonant are written with symbols that have the same shape; they differ only in their orientation and in whether they contain a dot or a vertical bar. If the symbol points to the left, the vowel is *a* (e.g. ∈ *ga*). If it points upward, the vowel is *o* (e.g. ᴍ *go*). If it points

downward, the vowel is u (e.g. �negation gu). If it points to the right and has no diacritic, the vowel is Λ (e.g. $\ni$ $g\Lambda$). If it points to the right and has a dot in it, the vowel is i (e.g. $\ni$ gi). Finally, if it points to the right and has a vertical bar in it, the vowel is e (e.g. $\ni$ ge). The penultimate row contains the symbols used to write vowels with no preceding consonant. These follow the same principle.

It is desirable to be more precise about what is meant by the orientation of a character. A natural assumption is that we mean that the character is rotated to obtain the four orientations. However, it turns out that for some characters reflections are also involved. This does not affect the majority of the characters, namely those that are symmetric about the x-axis. However, for those characters that are not symmetric about the x-axis, a rotation of 180 degrees is not the same as a reflection about the y-axis. The transformations necessary to derive the three other orientations from the /a/ form for the asymmetric characters are listed in (13). The first row gives the rotation angles of the symmetric characters for comparison.

(13) Transformations Characterizing Vowels

	Λ	o	u
symmetric	180	270	90
j	180	270	90
č'	180	270	90
y	180	270+y	90+y
n	180	90+x	270+x
m	180	90+x	270+x
l	0+y	270	90
tl	0+y	270	90+y
dl	0+y	270	270+x
tl'	0+y	270	270+x

The notation used here specifies each transformation as a combination of two components. The first component is a rotation, in which case the angle is specified. The second component is a reflection. This is left empty if there is no reflection. Otherwise the notation indicates whether the reflection is about the x-axis or the y-axis.

Clearly, there is no invariant association between the vowel and the orientation of the graph characterized in terms of rotation and reflection. Rather, the orientation of the graph apparently must be characterized in terms of the direction in which the major axis points. The invariants are therefore: /a/ pointing to the left, /Λ/ pointing to the right, /o/ pointing upward, and /u/ pointing downward. For most graphs there is a clearly defined major axis and some kind of point (possibly rounded), so that it is clear what it means to point in a certain direction. However, I at least find it difficult to decide the orientation of /y/, and even more so /j/ and /č/, presumably because the major axis is not well defined.

The other defect of this approach to the invariant is that it does not completely specify the form of the character. That is, for an assymetric shape, specifying the direction in which it points is equivalent to specifying the angle through which it

must be rotated (after choosing one orientation as basic), but leaves the reflection about its major axis unspecified. Remembering the direction in which a vowel points is therefore sufficient to allow one to read it correctly, but not to write it. This is evidently a source of errors in handwritten texts. Indeed, it appears to be characteristic of *dʌlkʷahke* texts from the Blackwater/West Road River dialect group, comprising the four southernmost bands, that the /n/ series is written in a nonstandard fashion, with, e.g. ⊃ for /nʌ/ instead of ⊃.

The symbols for the isolated vowels are also used to write syllables beginning with glottal stop. There is no series of symbols for the combination of glottal stop plus vowel. Instead, there is a separate symbol for glottal stop, a raised dot, which may precede an isolated vowel symbol. Thus, we have *ʔa* ·◁, *ʔʌ* ·▷, *ʔe* ·▷, *ʔi* ·▷, *ʔo* ·△, and *ʔu* ·▽.

Father Morice frequently failed to hear syllable-initial glottal stop and hence failed to write it. In texts written by Carrier people, glottal stop in both onset and coda position is most frequently not indicated. The diacritics that distinguish /e/ and /i/ from /ʌ/ are frequently missing in texts by native speakers.

The symbols that we have discussed thus far do not provide any way of writing consonants at the end of a syllable. For this purpose, there is a separate set of isolated[13] consonant symbols. These are the symbols in the seventh column. For example, ' is the symbol for isolated *n*. The word *šʌn* "song" is therefore written Ǝ' . Note the symbol ˘ for the very rare /ŋ/, which occurs only syllable-finally, as in *ʔʌtsʌŋ* "meat" ·▷Ǝ˘ . Glottal stop at the end of a syllable is written with the same symbol used at the beginning. For example, *hodizʔeʔ* "I learned" is written ∧⊃z ·▷:

The symbols for the isolated stops are given in the lenis rows because Morice analyzed coda obstruents as lenis. This contrasts with the usual usage of the currently dominant Carrier Linguistic Committee writing system, in which the alveolar and velar obstruents are written as <t> and <k> in the coda. The labial is written <b> as there is no /p/.
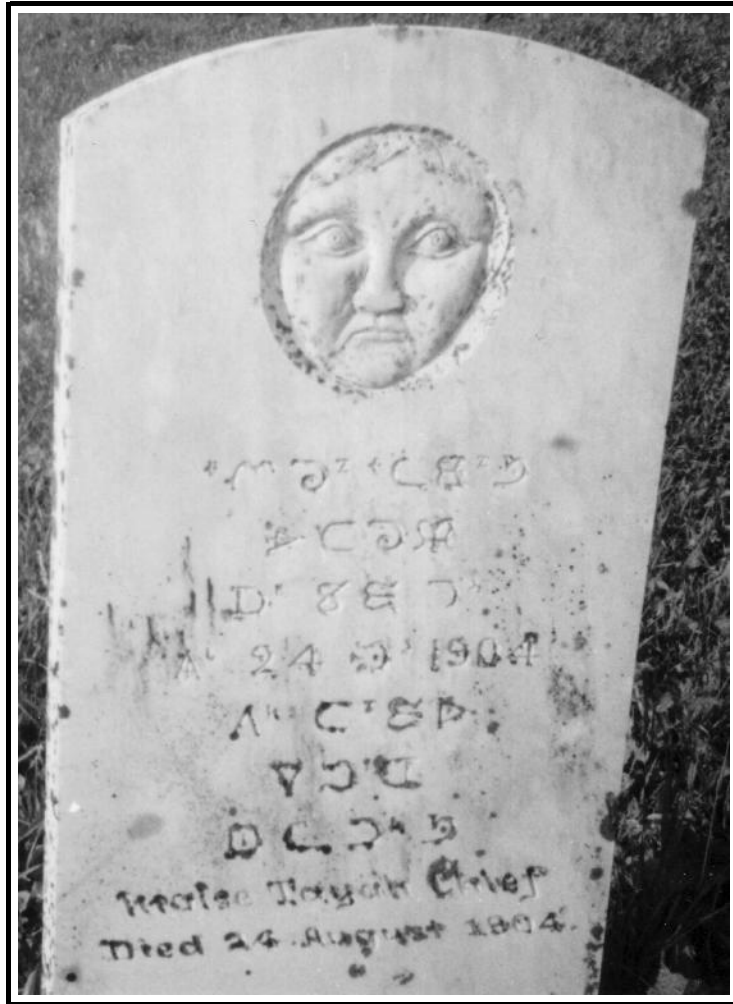
When an onset consonant precedes another consonant, it is written with one of the isolated consonant symbols. For example, *sba* is written: ꜱ◁ . Here, *s* is separated from the vowel by *b*, so it cannot be written using a CV symbol and must be written with the symbol for isolated *s* just as it is when it occurs at the end of a syllable. Another example is '◁' *njan* "here", where the syllabic *n* of the first sylllable and the syllable-final *n* are both written with the isolated *n* symbol.

The labiovelars /kʷ/, /gʷ/ and /kʼʷ/are not treated as single consonants in syllabics. Instead, they are written with /w/-series symbols preceded by the symbols for isolated /k/, /g/, and /kʼ/ respectively. For example, we write /kʷa/ '≤, /gʷa/ ≤ and /kʼʷa/ ˇ≤ (As the glottalized stops do not occur syllable-finally, this is the only use for ˇ/kʼ/.)

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[13] The "isolated" symbols are generally referred to as "finals" in the literature on syllabics, including the charts found in many of the religious works, such as the one in (18) below. However, this term is not accurate in the case of Carrier since as we shall see some of these symbols are used in positions other than syllable-final.

There is no symbol for coda *w*. Coda *w* is written as *u* ▽. For example, *ʔaw* "not" is written ·◁▽. Similarly, what might be analyzed as coda /y/ is written /i/, e.g. Ɛ▷ /mai/ "berry".

It is unclear why Father Morice included a graph for isolated /š/ (ꙅ) since /š/ never appears in the coda nor as the first member of an onset cluster.[14] It is possible that at the time he created the syllabics he was unaware of this.

In carefully written or printed text, spacing follows European conventions, with characters belonging to the same word close together and larger spaces between words. However, in hand-written texts and gravestone inscriptions spacing is often erratic.

Father Morice did not specify any special punctuation, and in his own publications in syllabics followed English conventions. Other syllabic texts contain sporadic periods, and in one case, an exclamation point; other punctuation marks are not attested.

Father Morice intended proper nouns, both personal and place names, to be preceded by an asterisk (*) and followed this practice in his own writing, as may be seen in (3). For example, the line below the title of the newspaper reads *ᑕ�easterᗅz ᓭ ▷ᒡ ▷ᔆᑊ ᑕ /*-Na-k'a-z-dli e-t ʌ-ts'i-n-la/ /Nak'azdli [ʔ]et [ʔ]ʌts'inla/ "we made it at Nak'aẕdli (Fort Saint James)". However, Carrier people did not adopt this proposal; I am aware of only one example of this usage in materials written by Carrier people, namely prefixed to the given name *Moyiz* "Moise" and the place name *Nak'aẕdli* on the gravestone of Moise Tayoh in the Nak'aẕdli cemetary, shown in (14).[15]

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[14] In loans, coda /š/ is replaced by /s/, e.g. /mʌs/ "porridge" from English *mush* /mʌš/.

[15] Father Morice also proposed the use of a small circle to indicate a lengthened vowel. To my knowledge this was never used, probably because Morice decided that vowel length did not need to be written. In point of fact, although there are no underlying length distinctions in Carrier, there are contexts in which the morphophonemics creates surface long vowels, of which Morice was not aware.

(14) The Gravestone of Moise Tayoh

The gravestone of Moise Tayoh in the Nak'a̱zdli graveyard in Fort Saint James. The Carrier text reads: *ꟽꝋꝫ ᶻ *ᒪꟼꝪꝫ ꙅ Ꙅᒪꝋ℞ Ꝋˡ8 ꞓꓭꞌ 24 Ꝋ ᶻ 1904 ꓥʰ ꒿ᶻꞛꝰ ∇ꓱꓸ ꓷ Ꝋᒪꓳʰ ꙅ /mo-yi-z na-k'a-z-dli xʷʌ-da-yi-čo bʌ-ł 8 sa-nʌ-n xʷo-ł 24 dzi-n 1904 ho-h da-z-sa-i u-zʌ-l ba te-na-dʌ-h-dli/ *Moyiz nak'azdli xʷʌdayičo bʌł 8 sanʌn xʷoł 24 dzin 1904 hoh dazsai uzʌlba tenadʌhdli* "Moise, Chief of Nak'a̱zdli, died August 24, 1904. Pray for his soul." Photograph by the author.

3.3. Gaps

One defect of the system is the lack of a thoroughgoing distinction between the apico-alveolar and lamino-dental fricatives and affricates. The lamino-dentals contrast with the apico-alveolars (e.g. /yʌs/ "wolf" vs. /yʌs̱/ "snow"), though with low functional load. The contrast appears to have been decreasing over the past two centuries. Transcriptions of Carrier by Alexander Mackenzie (Mackenzie 1801:188-

189) suggest that in 1793 the lamino-dentals were interdentals, as their cognates are in some other Athabaskan languages.[16] By Father Morice's time they were apparently already lamino-dental. At present, the lamino-dentals have merged with the apico-alveolars for all speakers in some dialects, and for most speakers in the other dialects. With only a few exceptions, even those who produce the distinction find it difficult to hear and write consistently.

Although the syllabics provide a distinction between *s* and *s̱* and between *z* and *ẕ*, this distinction is made only in coda position, not before a vowel. The corresponding distinctions between /ts/ and /ṯs̱/, /dz/ and ḏẕ/, and /ts'/ and /ṯs̱'/, are not made at all. It is presumably the lack of this distinction that underlies the comment of Richard Walker, the architect of the English-based Carrier Linguistic Committee writing system, reported by W. Walker (1996:177), that he found the syllabary to be "19 letters short of a phonemic alphabet". Ironically, due to the now nearly complete merger of the two series, the Carrier translation of the New Testament (Carrier Bible Translation Committee 1995) does not mark the lamino-dentals.[17]

There is no provision for /ɲ/. The morphemes that contain it are common enough that Father Morice must have heard them. He probably did not realize that /ɲ/ needed to be distinguished from /ny/, or if he did, did not consider it worthwhile to make the distinction.

There is no symbol for isolated *ts*, probably because coda /ts/ was so rare that when he created the syllabics Father Morice was unaware of its existence. I have found no examples of coda /ts/ in Father Morice's writings. Father Morice introduced the syllabics in the latter part of 1885, only a short time after his transfer to Fort Saint James from Williams Lake (Mullhall 1986). While in Williams Lake, which is at the border of Chilcotin and Shuswap territory and is not Carrier-speaking, he had acquainted himself with Carrier by working with Jimmy Alexander, the son of a Carrier woman and the Hudson's Bay factor, who was sent to St. Joseph's school, and through limited contact with Southern Carrier speakers. When he introduced the syllabics Father Morice had therefore had no more than three years' acquaintance with the language, almost all of it in an environment in which his duties did not involve Carrier and in which he had limited contact with Carrier speakers. It is therefore understandable that he would not have had a complete understanding of the phonology.

The rarity of coda /ts/ is explained by the fact that inherited /ts/ became /z/ in Carrier (Story 1984:15). The Stuart Lake dialect presently has only four instances of coda /ts/. These are *ʔuts* "oats", *baɫats* "potlatch", -*ɣʌts* "cartilage", and -*tast'ots* "fascia". The first two are unquestionably loans from English and (ultimately) Nuuchanulth, respectively; the latter two are probably loans from Babine. (Other

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[16] The evidence consists of the fact that Mackenzie wrote <th> for /ṯs̱/. He wrote <thigah> for modern /ṯs̱iɣa/ "hair of the head", <thie> for modern /ṯs̱i/ "head", and <thoula> for modern /ṯs̱ula/ "tongue". If he had heard a lamino-dental, he would presumably have written <s> or possibly <sh>.

[17] In fairness to the Carrier Linguistic Committee, this was not the only reason for developing an alternative to the syllabics. The fact that the CLC system, unlike the syllabics, could be typed on an ordinary English typewriter and printed using standard fonts was a great advantage in the 1960s.

dialects of Carrier have the expected -$\gamma_A z$ for "cartilage".) These can in theory be handled by writing isolated t ᵀ followed by isolated s �५, e.g. ⊲ ⊂ᵀ�५ *baɫats* "potlatch".

When the syllabics were created in 1885, the Nak'aẕdli dialect did not have /kʷ/ at the end of a syllable. The syllables that now end in /ʌkʷ/ (/kʷ/ never follows any other vowel) then ended in /uk/. Therefore, no device was provided for writing final /kʷ/. And since there is no device for writing final /w/, it is not possible to use the symbol for isolated /k/ followed by the symbol for isolated /w/. One possibility is to write *uk* ▽ᶜbut read /ʌkʷ/ in those dialects in which historical /uk/ has become /ʌkʷ/. Indeed, it is possible that [ʌkʷ] is still underlyingly /uk/.

Carrier is a tonal language, in the sense that there are words that differ only in their tone pattern. Father Morice was aware of this and in his major publication on the language (Morice 1932) mentioned it and attempted to mark it. More recently, it has been proposed (Pike 1986, Story 1989) that Carrier has a pitch-accent system of the Japanese type. The syllabics make no attempt to represent tone. It is not known whether this is because Father Morice was unaware of the tonal distinctions in 1885 or whether he was aware of them but considered their functional load too small to be worth marking.

4. Extensions

The syllabics as promulgated by Father Morice were intended for a pure form of Carrier into which no European words had been borrowed. In fact, already in the 19th century European words were borrowed into Carrier, and the need arose to write sounds not native to Carrier. The writing system was extended in a variety of ways to meet this need.

Two extensions were made by Father Morice himself in order to write the four Latin hymns he printed in the Prayerbook. In order to write /r/, which does not occur in native Carrier words, he used a roman <r>. He did not introduce a new series of CV-symbols, but used the r as he did the raised dot he used for the glottal stop, that is, followed by one of the symbols for an isolated vowel. For example, *ra* is written r⊲ Some examples of this extension are found in materials written by Carrier people, e.g. a gravestone in the Ṣaik'uẕ (Stony Creek) graveyard bearing the name *Rosy*: r△Ɔ /r-o-zi/ *rozi*.

In order to write Latin /f/ and /v/, Father Morice used an h rotated 180 degrees, thus: ꜧ.[18] Here again he did not introduce a new set of "syllabic" symbols but used the ꜧ together with the symbols for isolated vowels, e.g. ⊲ꜧ▷ *Ave.*[19] There is no evidence that this character was ever used by Carrier people.

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[18] Doug Hitch (p.c. 2002) suggests that Father Morice may have based this on the cursive version of the Greek letter ϕ.

[19] It is unclear why Father Morice did not distinguish /f/ and /v/. The Latin of the hymns in the Prayerbook evidently reflects the pronounciation of a French speaker further adapted to the phonology of Carrier. For example, Latin /u/ is rendered with the symbols for /i/, presumably because Latin orthographic <u> was prounced as a high front rounded vowel [y], following French orthographic conventions. As Carrier lacks front rounded vowels, this was then converted to /i/. Examples include Latin *populi* rendered ⌂ Ð Ɔ /bo-bi-li/ and Latin

Additional extensions are found in syllabic texts written by Carrier people, especially on tombstones. One such extension is a means of writing /r/ at the end of a syllable. For this purpose, a symbol resembling a plus sign is used. An example may be seen in the gravestone of Belzeni illustrated in (5) above. This extension evidently came into use almost immediately, as it is found in the Barkerville Jail text of 1885, where it is used to write the /r/ of the English phrase "dumb bugger".

The sound /p/ is not native to Carrier. It is sometimes written by writing the isolated *b* symbol ˧ before the *b*-series symbol with the appropriate vowel. For example, the name *Pol* "Paul" is written *b-bo-l* ˧ᐱ ˈ on the gravestone of Johnnie Paul in Ṣaik'uẓ (Stoney Creek). Similarly, the name *Payʌs* "Pius" is written *b-ba-yʌ-s* ˧ᗐ ᑐs on the gravestone of Pius George in Ṣaik'uẓ, illustrated in (6) above.

The sound /f/ is not native to Carrier. As noted above, Father Morice provided his own means of writing /f/ or /v/, but this was apparently never used by Carrier people. There are only two known instances of a word with /f/ in syllabic texts composed by Carrier speakers.

What appears to be a means of writing /f/ is found on a single gravestone, dated 1890, in the Lheidli T'enneh graveyard in Fort George Park. Here, the name *Sophie* /sofi/ is written ᛖ ʰ ᗞ /so-h-bi/. It is not clear whether this reflects a rejection of Father Morice's own device for writing /f/. It may be that Morice's ᥑ was not familiar to Carrier people in 1890, since the first edition of the prayerbook did not appear until 1904. Yet another possibility is that, at this early date, *Sophie* was pronounced [sopʰi] rather than [sofi] and that this is an alternative device for writing /p/, not /f/.

In the gravestone of Johnny Paul in the Ṣaik'uẓ (Stony Creek) graveyard, dated 1934, *February* is written ➤˧ᑐ ᗐ /xʷe-b-yʌ-li/ *xʷebyʌli*. Here we cannot be sure whether this was an attempt to write /f/ or a strict writing of a rendering of foreign [f] as /xʷ/.

The sound /v/ is not native to Carrier. It is sometimes written using a convention similar to that for writing *p*. The symbol for isolated *k'* ᵛ (which, presumably not coincidentally, looks like a roman *v*) is written before the *b*-series symbol with the appropriate vowel. For example, in the gravestone of Belzeni illustrated above in (5), *novembar* "November" is written *no-k'-be-m-ba-r* ᑌ ᵛ ᗞ ˈ ᗐ +.

5. Structure

The Carrier syllabics have an unusual degree of internal graphical structure. Not only do they exhibit a fair degree of decomposition into distinctive features, but they also exhibit an unusual, and generally misunderstood, relationship between their graphical components and phonological constituent structure.

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salus rendered ᗕ ᗕ s /sa-li-s/. It is possible that at the time at which Father Morice first transcribed these hymns Carrier speakers did not distinguish /f/ from /v/, but there is no evidence bearing on this point. Many elders can still sing the Latin hymns that they learned as children, including those in the Prayerbook. However, the pronounciation that they use is typical Church Latin, not the French/Carrier pronounciation rendered by Father Morice.

5.1. Featural Decomposition

Syllabics exhibit a systematic association between graphical and phonological features. This is especially notable in the representation of the stops and affricates, where the three series are systematically related to each other. Taking the unaspirated series as the base, the ejectives all have a characteristic wedge-shaped indentation, while the aspirates are distinguished from their unaspirated counterparts by a "closing" line. In thus partially decomposing segments into distinctive features, the syllabics resemble Korean *hangul*.[20]

This is the most systematic and thoroughgoing of the graphical/phonological relationships, but by no means the only one. There are a number of more restricted regularities.

1. The isolated velar stops (ˋ /k/, ´/g/, ˇ /k'/) are all angular, with different orientations for the three series. The ejective (ˇ) is wedge-shaped, evoking the distinctive graphical feature of the pre-vocalic ejectives.

2. The isolated nasals (ˋ/m/, ʼ/n/, ˘/ŋ/) are all crescent-shaped, with different orientations for the three points of articulation.

3. The non-lateral affricates are related to the corresponding fricatives by the addition of a small T-like symbol, resembling the isolated /t/ graph. ⪦/sa/ ⪦/tsa/ ⊂/za/ ⊂/dza/ ⪥/ša/ ⪥/ča/

4. Similarly, the lateral affricates are related to the corresponding plain laterals by means of the same short stroke, in this case capping the "back-hook". ⊂ /lha/ ⊂/tla/ ⊂/la/ ⊂/dla/

Although the graphical regularities mentioned are related in a systematic way to sound structure, overall system is lacking, and it is difficult to understand Father Morice's intentions. Here is his own description (Morice 1933:8-9):[21]

> All the cognate sounds are rendered by similarly formed characters the general shape of which denotes the phonetic group to which they belong, while their modifications determine the particular sound they represent, so that our 30 sets of letters are practically reduced to 9, viz.: ◁⊂◁⊏⊏⊏⊏⪦. Nor should it be forgotten that those modifications take place in conformity with logical, and therefore easily learnt, rules. Take, for instance, the sign ⪦ ... *Sa*. Let us now insert therein the perpendicular line which, when used as an internal accretion to a sign, corresponds to the *h* of the Roman alphabet (as in ◁ *rha* [xa], ≪ *hwa* [xʷa], ◁ *tha* [ta], ⊟ *kha* [ka]), and we obtain ⪥ *sha* [ša].

Father Morice does not explicitly list in every case which characters he considers to be the derivatives of the nine basic characters he lists above, but it is possible,

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[20] *hangul* is basically an alphabetic system, but there are a number of regularities which reflect an analysis into distinctive features. For example, Korean has three series of stops and affricates: unaspirated, aspirated, and tense. The basic symbols are those for the unaspirated series. The aspirated series are derived by adding a stroke; the tense series are derived by doubling.

[21] I have added the IPA values in square brackets.

from his remarks and from the shapes, to work this out without ambiguity. My reconstruction of his derivational relationships is presented in (15). Just as he used the /a/ series characters to stand for the shape, so do I. The basic characters are listed in the first column; the derivatives, if any, follow.

(15) Father Morice's Derivative Sets

I	d	t	t'		
II	g	k	k'		
III	l	ł	tl	dl	tl'
IV	z	dz			
V	b				
VI	n	m			
VII	φ	h	w	xʷ	x	γ
VIII	s	ts	ts'	š	č
IX	y	j	č'		

The first two sets reflect the systematic representation of the three stop/affricate series already discussed. The third row does too, with the exception that the relationship between the voiced and voiceless simple laterals is unique. The relationship between /z/ and /dz/ in the fourth column is the same as for the other fricative/affricate pairs. /b/ has no derivatives.

The relationship between /m/ and /n/ is unique; there is no evident parallel in the relationships of the labial and alveolar stops. The seventh row is problematic. Father Morice clearly indicates that the null consonant is the base, so all of the other forms must be derived from it by removal of the base of the triangle. This of course has no parallel elsewhere in the system. Given that the /h/-series symbol is the simplest, as are the others he mentions as basic, it seems likely that his ◁ is a typographical error. Even so, taking the base of this series to be ‹ the relationships among the derivatives have no parallels.

The last two rows pose some peculiar problems. The relationships among the derivatives of /s/ in the eighth row are as expected; that is, the unaspirated and ejective affricates are related like other stops and affricates of these two series, and the affricate /č/ is related to the corresponding fricative /š/ as other affricates are related to the corresponding fricative. What is peculiar is the relationship between /s/ and /š/, that is, that he wrote /š/ (e.g. ⊟ /ša/) by adding to /s/ (e.g. ⊟

/sa/) the line otherwise added to the unaspirated stops and affricates to write the aspirates.

As Father Morice explains in the passage quoted above, he perceived this relationship as regular, namely as equivalent to the addition of <h> in the Roman alphabet. He seems here to confound its use in ordinary English orthography to distinguish /s/ from /š/ with its use in phonetic transcription to mark aspiration. And even if there were a single orthographic system that used <h> in the same as he did the line, he would seem to have been sufficiently knowledgable about phonetics as not to confuse a difference in point of articulation with aspiration. Of course, in English <h> functions as a pure diacritic, with no phonetic content: there is no phonetic generalization over the pairs <c>:<ch> (/k/:/č/), <g>:<gh> (/g/:/f/), <s>:<sh> (/s/:/š/), <t>:<th> (/t/:/θ˜þ/), <w>:<wh> (/w/:/hʷ/), so Morice's usage is in this sense like that of English. However, insofar as Morice was trying to give phonetic consistency to his modifiers, as he seems to have been, his use of the bar to derive /š/ from /s/ is anomalous.

One might therefore take this anomaly to suggest that the phonetics of /s/ and /š/ were not the same in Father Morice's day, that is, to be precise, that what is now [s] was then [z] and that what is now [š] was then [s] and what is now [s] was then [z] or [sʰ]. This is very unlikely. To begin with, it raises the problem of what the phonetic value of /z/ was, if not [z]. Secondly, if such a change had occured, we would expect to have a record of it. If it had occurred during Father Morice's lifetime, we would expect him to have recorded it.

Father Morice, was a good phonetician, the first to write an Athabaskan language in such a way as to record all of the segmental phonemic distinctions, and wrote extensively on the language. Although he left Fort Saint James in 1904, he returned for a visit in 1919, and he corresponded extensively with Carrier people, especially Louis-Billie Prince, until his death in 1938. In his major publication on the language, Morice (1932), he took care to record obsolescent features of the language of the elderly and changes in progress. If the change had happened after Father Morice's time, people now living should remember people whose speech reflected the earlier stage, but no one does.

Third, /s/ and /š/ participate in the stem-initial alternations between voiceless and voiced fricatives as we would expect from their current phonetic values. Finally, if Father Morice used the line to mark voicelessness or aspiration in the alveolar fricative, it is left unexplained why he did not use the same device to represent the distinction between /x/ and /γ/ (compare ≺ /xa/ and ⊲ /γa/.)

Row IX presents another anomaly. The relationship between the two derivatives is partially as expected, in that the ejective has the characteristic indentation of that series. However, it is also anomalous, in that the /j/, which is voiced, is related to the basic character by the addition of the stroke that usually adds aspiration. What is most peculiar is the value of the basic character itself. If this set paralleled the other obstruent sets, the basic character would represent /j/. On the basis of the two derivatives, we would expect /č/. The fact that it is actually /y/ is quite unexpected.

Two facts contribute to an explanation for this anomaly. First, Morice already had another way of deriving the shape for the aspirated affricate, namely by adding

the "cap" to the shape for /š/. Second, as Story (1984:13-14) has argued on independent grounds, what are now [j] and [č'] were in Morice's time palatal stops, not yet affricated. To Morice, therefore, they had no particularly close relationship to /č/. He of course had no way of knowing at the time that all three were reflexes of the Proto-Athabaskan front velar series. Morice presumably grouped these three phonemes on the basis of their palatality; none of them being aspirated, he made an arbitrary choice was to which of the two non-ejectives would be basic. Morice's failure to relate current /j/ and /č'/ to /č/ confirms, albeit weakly, Story's interpretation of the phonetics of Carrier in his time.

As a final point, we may note a relationship that Father Morice did not consider in listing his nine basic shapes: /s/ is obviously related to /z/ by the addition of a central axis. This is reminiscent of his use of a line to mark the aspirates, but it not only marks a different phonetic relationship, but is in a different relationship to the rest of the character.

In sum, the full set of shapes contains a great deal of internal structure, with many shapes derivable from other shapes by simple operations, some of them recurring. In the case of the stops and affricates, the three series are related in a perfectly systematic way, suggesting the abstraction of phonological features. In some other cases, there are subregularities that pair graphical and phonological features. However, some of the graphical components are not related in any systematic way to phonological features, and in one case, namely that of the stroke that with the stops and affricates represents aspiration, he followed a generalization that makes no phonological or phonetic sense.

5.2. Level of Structural Analysis

The *dʌlkʼʷahke* was referred to as a syllabary by Father Morice, and has been so characterized by all authors since. This is, apparently, because most of the graphs represent a tautosyllabic CV sequence, such as *ga* or *mo*, which may constitute a syllable by itself. However, this is not a valid argument for treating this writing system as a syllabary, as it tells us nothing about the atomic level of phonological analysis on which the system is based. In fact, it cannot be a syllabary, since syllables more complex than CV are never written with a single graph. As we have seen, the coda consonants are always written by means of a distinct set of isolated consonant graphs, and the offglides of diphthongs are written with a vowel letter following the main (C)V. Similarly, the first consonant of an onset cluster is written by means of a separate graph.

Morice himself made this point in regard to Tibetan (1934:364, fn.23):[22]

S'il faut en croire Lepsius (*Standard Alphabet*), le système d'écriture thibétain serait syllabique, ce qui n'empêche que l'alphabet qu'il en donne lui-même

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[22] "If one were to believe Lepsius (*Standard Alphabet*), the Tibetan writing system would be syllabic, in spite of which the alphabet that he himself gives contains consonants not accompanied by vowels, which is rather opposed to syllabicity."

comprend des consonnes non accompagnées de voyelles, ce qui est plutôt opposé au syllabisme.

His point is equally applicable to the *dʌlkʷahke*.

Indeed, there are examples of words containing two coda consonants, each written with a member of the isolated series. An extreme example is illustrated in (16). Here the single syllable /blens/ "Prince" is written with no less than four graphs, one for the CV core, one for the first onset consonant, and two for the two coda consonants.
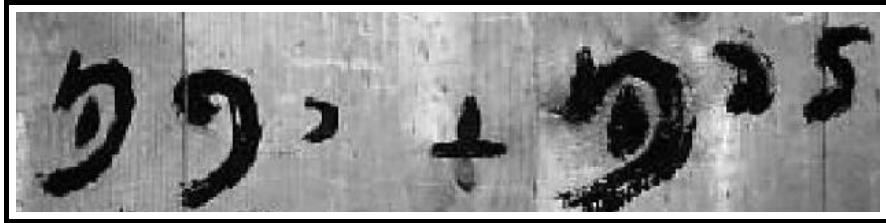
(16) A Graffito in the Fur Warehouse

Part of a graffito on the wall of the fur warehouse of the Hudson's Bay post in the National Historic Park in Fort Saint James. It reads: ꓔꓮꓸ ꓤꓳꓹꓢ le-yo-n b-le-n-s /leyon blens/ "Leon Prince". Photograph by the author.

Even the CV graphs are not really atomic, for they are perfectly analyzable into a consonantal component, the shape, and a vocalic component, the orientation plus diacritic. The difference between the syllabics and the roman alphabet is that in the roman alphabet the consonants and vowels are represented by distinct, spatially separable symbols, while in the *dʌlkʷahke* the relationship is more abstract.

Additional evidence of the fundamentally segmental character of this writing system comes from the fact that from the outset Father Morice wrote glottal stop with a separate letter, not only in the coda, but in immediately prevocalic onset position, and that when he added devices for writing Latin /f/, /v/, and /r/, he did not create new sets of CV graphs, but wrote these consonants with letters of their own, like the glottal stop.

The innovations for writing /p/ and /v/ also show evidence of segmental consciousness. In both cases, an existing letter is used as a diacritic to change the value of the consonant of the following graph. The use of the same device for syllables with different vowels indicates segregation of the initial consonant from the following vowel.

6. Relationship to Antecedent Writing Systems

The Carrier syllabics are one of the several derivatives of the Cree syllabics created in 1840 by the Reverend James Evans (McLean 1890, Harper 1985). The

Cree system, which soon spread back to Ojibwe, for which it was originally created, has two main branches. One leads to Inuktitut, for which syllabics remain the dominant writing system in Canada outside of Labrador and the Western Arctic (Harper 1983). The other leads, via what are now Manitoba, Saskatchewan, Alberta and the Northwest Territories, to Carrier.

This Athabaskan branch of the Cree syllabics came about when missionaries who worked with both the Cree and Athabaskan-speaking people in Alberta adapted the Cree writing system to Athabaskan languages (Walker 1996). It was used to write Slave, Dogrib, and Chippewyan in Alberta, Sasketchewan, Manitoba and the Northwest Territories. To a limited extent it is still in use by speakers of Slave and Dogrib, as well as in some Chippewyan communities. [23] Charts showing this version of the writing system may be found in Petitot (1876) and Kirkby (1881), the latter reproduced in (18).

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[23] A detailed study of the history and usage of the syllabics in the Northeastern Athabaskan region remains to be done. My information about current usage comes from personal communications in 1993 with Doug Hitch, then of the now disbanded Language Bureau of the Government of the Northwest Territories as well as with speakers of the languages, and examination of printed materials in these languages.

(18) Chart of the Northeastern Athabaskan Syllabics

Adapting a writing system designed for Cree to an Athabaskan language requires considerable modification because of the large difference in segmental inventories. The phonemic inventory of Cree is given in (19) and (20), following Wolfart (1996).

(19) Cree Vowels (4 x length)

a a: i i: o o: e e:

(20) Cree Consonants (10)

p t č k m n s h w y

Not counting vowel length, Cree has only 14 phonemes. Athabaskan languages have much larger inventories, especially of consonants. Li (1933) lists 7 vowel qualities and 36 consonants for Chippewyan. Rice (1989) lists six vowel qualities and as many as 37 consonants for Slave depending on dialect. Carrier has six vowels and forty-one consonants counted conservatively; this number increases to 44 if we include the three additional consonants (/p/, /f/, /r/) introduced in loanwords from European languages.

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In order to provide fully for the larger vowel systems of the Athabaskan languages, some device other than the four orientations of the characters was necessary. The Northeastern Athabaskan system used a diacritic to add one vowel. Father Morice extended this device by using two diacritics to distinguish all six vowels of Carrier.

The most important adapation, however, was the representation of all of the consonants. The Northeastern Athabaskan system expanded on the Cree inventory to some extent, but not enough. It provided for a total of 17 consonants in CV graphs plus 11 finals. This means that it distinguished only about half as many consonants as necessary. It added an aspiration/voicing distinction, unnecessary in Cree, with just one series and allophonic voicing, but made no provision for the ejectives. A single graph (labelled "kl" in Kirkby's chart) is provided to cover /ł/, /tl/, and /tl'/, reflecting the fact that English speakers tend to mis-perceive all three as /kl/. The glottal stop is not represented.

The *dʌlkʷʰahke* is far superior in its coverage of the consonants. Although as we have seen there are minor gaps in the *dʌlkʷʰahke*, except for the very rare /ɲ/ and the lamino-dentals in pre-vocalic position, it provides for all of the sounds of Carrier. It distinguishes all three obstruent series, recognizes all of the laterals, and even provides for the glottal stop. In short, it is vastly superior to its antecedent.

Although the *dʌlkʷʰahke* is clearly derived from the Northeastern Athabaskan syllabics, there is very little continuity in detail. Not only were many character shapes added in order to provide for additional consonants, but most of the original shapes were discarded: only five of the 18 non-final consonant shapes (including the null consonant) were retained. Of the finals, six of the eleven shapes were retained. Even where shapes were retained, the association with sound was changed more often than not. Of the five non-final consonant shapes retained, only two represent the same consonants (null and /d/). Of the six final shapes retained, only three (/k/, /n/, /m/) represent the same consonants. Of the vowel orientations, only that for /a/ is the same. The dot used as a diacritic to distinguish vowels functions differently: in the Northeastern Athabaskan system, it distinguishes /u/ from /o/, while in the Carrier system, it distinguishes /i/ from /ʌ/.

Another difference between the two systems emerges if we consider the transformations associated with the vowels, listed in (21), keeping in mind that reflections are not distinguishable from rotations for graphs symmetric about the x-axis.

(21) Transformations Characterizing Vowels in the NWT System

	e	i	o
symmetric	90	270+y	0+y
l	90	270+y	0+y
t	90	270+y	0+y
g	180	180+y	0+y
k	180	180+y	0+y
kl	180	180+y	0+y
m	180	180+y	0+y
n	180	180+y	0+y
s	180	180+y	0+y
sh	180	180+y	0+y
th	180	180+y	0+y
y	180	180+y	0+y
tz	270	90	0+y

As with the *dʌlkʷahke* there is no invariant for orientation expressible in terms of rotation and reflection. That is, the relationship between a CV graph and the vowel is not definable in terms of rotations and reflections. We notice, however, that in this system the invariant of a consonant is not a pure shape; orientation is also a component. /k/ and /n/ have the same shape. They are distinguished only by orientation: the stem is always vertical for /k/ and always horizontal for /n/. One improvement made by Father Morice is therefore the perfect separation of shape from orientation. No two CV graph sets have the same shape.

The *dʌlkʷahke* differs from its antecedent in yet one more way. While the *dʌlkʷahke* has considerable internal structure, its antecedent has virtually none; there is no systematic relationship among the consonant shapes.

In sum, although derived in its general character from the Northeastern Athabaskan adaptation of the Cree syllabics, the *dʌlkʷahke* is quite different in detail. The shapes of the letters are in general quite different, and even where the same, often have entirely different values. The internal structure of the *dʌlkʷahke* is an innovation, as is its essentially complete coverage of the sound system.

7. Conclusion

The *dʌlkʷahke* was the first reasonably adequate writing system for an Athabaskan language. Although it failed to provide for some distinctions, they had low functional load and did not interfere significantly with the ability of the system to represent the language. Described as a syllabary, it is in fact an alphabet, for it is clearly based on an analysis of utterances into individual segments. Although the internal structure of the system is not as clean as it might be, or as Father Morice thought it was, the construction of the symbols from smaller components was sufficiently regular as to make the system easy to learn, allowing it to spread rapidly through informal instruction. Carrier people used it for a wide variety of purposes, and extended it to write new sounds that entered their language through loanwords.

That Father Morice should have created such a system after less than three years' study of Carrier, with no formal training in linguistics, at a time at which phonetics, phonology, and the creation of writing systems were not well understood, is truly remarkable. Although he based it on the Northeastern Athabaskan derivative of the Cree syllabics, his adaptation was much better suited to the complex sound system of an Athabaskan language and had a more systematic internal structure.

It is ironic that when in 1890 a council of Oblates met to develop a writing system for Chinook Jargon and the Salishan languages of Southern British Columbia, they rejected Father Morice's suggestion of adapting the *dʌlkʷahke* and instead commissioned Father Jean-Marie LeJeune to adapt the French Duployé shorthand system (Mulhall 1986).[24] The result, known as *wawa* writing, after the Chinook Jargon term for "language", provided an adequate representation of the sounds of English and of the European version(s) of Chinook Jargon,[25] for which it was extensively used. It was, however, a poor writing system for the native versions of Chinook Jargon and the Salishan languages, because, by failing to provide for most of the "exotic" sounds of these languages, it seriously underdifferentiated them.[26] Father Morice (1894:7) described its inadequacy as follows:

> ... no unprejudiced philologist ever so little conversant with the numerous sounds of the Salish dialects which have absolutely no equivalent in the French language, will deny the fact that the Duployé stenography, which is excellent in the land of the Gauls, is altogether out of place among the natives of British Columbia, since it is utterly inadequate to the task of faithfully rendering, say, one-fifth of the sounds of their languages.

It is no doubt not an accident that the *wawa* writing saw extensive use for Chinook Jargon, but that, as far as I can determine, it was not used for the Salishan languages except in religious materials written by Europeans: it never came into general use. The Oblate council made a mistake in favouring the simplicity of the Duployé system over the *dʌlkʷahke*, which was far better suited for the complex sound systems of the native languages.

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[24] To my knowledge this writing system has never been studied in any detail. The only exception is the recent paper (Robertson 2002) on the representation of the non-low front vowels in Chinook Jargon.

[25] That is, Chinook Jargon without some or all of the sounds that Europeans found exotic, such as ejectives, uvulars, and lateral fricatives and affricates

[26] The *wawa* writing did provide for a few "exotic" sounds. As shown by the alphabet chart in LeJeune (1924;5), it included letters for the voiceless lateral fricative [ɬ], the ejective [k'], and the affricate [ts]. The lateral affricates were written as clusters. It did not provide for the ejectives other than [k'] or for glottal stop, nor did it distinguish uvular from velar consonants.

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