

An Embarrassment of Riches: The Proliferation of Tlingit Writing Systems

James A. Crippen

University of Hawai'i at Mānoa – jcrippen@gmail.com

December 11, 2007

Abstract

Tlingit, a Na-Dené (Athabaskan-Eyak-Tlingit) language of the northern Pacific Northwest, has a peculiarly large number of writing systems both for the use of native speakers and for transcription. Such an “embarrassment of riches” causes rifts among the community of native speakers and impedes the spread of literacy by making texts in one orthography difficult for users of another orthography. This article first presents a summary of Tlingit phonetics, reviews the extant transcription and orthographic systems, and offers some criticism based on proposed guidelines of completeness, effectiveness, and popularity. Also addressed is the Not Invented Here problem in orthographic development.

CONTENTS

1	Introduction	3
1.1	The language	4
1.2	Sounds of the language	6
1.2.1	Consonants	7
1.2.2	Vowels	10
1.2.3	Borrowing	12
1.3	Notational conventions	13
1.4	A peculiar name	13

2	History of written Tlingit	16
2.1	Lapérouse and Wrangell	17
2.2	Veniaminov’s Cyrillic-based orthography	18
2.3	Hall Young’s Latin attempt	20
2.4	Anthropological transcriptions	21
2.4.1	Krause	21
2.4.2	Swanton	22
2.4.3	Boas	22
2.4.4	J.P. Harrington	22
2.4.5	R. Olson	22
2.4.6	F. De Laguna	22
2.4.7	Inaccurate attempts	22
2.5	Native literacy in English	23
2.6	Kelly and Willard’s orthography	23
2.7	The Naish-Story orthography	25
2.7.1	First version	25
2.7.2	Second version	27
2.8	The Revised Popular orthography	27
2.9	Leer’s transcription	28
2.10	The Canadian orthography	29
2.11	The “E-Mail” orthography	30
3	Criticism	31
4	Conclusions	31
5	References	32
6	Appendix: Wordlists	37
7	Appendix: Phoneme charts	39

LIST OF TABLES

1	Consonants in IPA	8
2	Vowels in IPA	11
3	Orthographic indicator symbols	14
4	Words transcribed by La Pérouse	18
5	Examples of <i>M</i>	23

6	Consonants in <i>WK</i>	24
7	Vowels in <i>WK</i>	24
8	Consonants in <i>NS1</i>	25
9	Vowels in <i>NS1</i>	27
10	Vowels in <i>RP</i>	28
11	Variations of the unaspirated uvular stop /q/ in <i>RP</i>	28
12	Vowels in <i>L</i>	28
13	Vowel quality symbols in <i>L</i>	29
14	Consonants in <i>L</i>	29
15	Consonants in <i>C</i>	30
16	Vowels in <i>C</i>	30
17	Comparison of orthographies	31
18	Selected words from Wrangell's word list	37
19	Selected words from Wrangell's comparative list	38
20	Consonants in IPA	39
21	Vowels in IPA	39
22	Consonants in <i>S</i>	40
23	Vowels in <i>S</i>	40
24	Consonants in <i>B</i>	41
25	Vowels in <i>B</i>	41
26	Consonants in <i>D1</i>	42
27	Vowels in <i>D2</i>	42
28	Consonants in <i>D2</i>	43
29	Vowels in <i>D2</i>	43
30	Consonants in <i>L</i>	44
31	Consonants in <i>NS1</i>	45
32	Vowels in <i>NS1</i>	45
33	Consonants in <i>RP</i>	46
34	Vowels in <i>RP</i>	46
35	Consonants in <i>C</i>	47
36	Vowels in <i>C</i>	47
37	Consonants in <i>E</i>	48
38	Vowels in <i>E</i>	48

1. INTRODUCTION

Pacific Northwest Coast languages spoken from southern Oregon to Southeast Alaska form a sprachbund [[cite Mithun]] that is famous for remarkably rich con-

sonant systems. As a consequence, these languages were fairly resistant to orthographic development through to the late 20th century. Furthermore, even transcription attempts were spotty and unreliable until the arrival of the Americanist anthropologists in the late 19th and early 20th centuries. Thus there is little reliable written material for these languages even today.

Tlingit (Eng. /'klɪŋkɪt/, Tl. /ʔɪŋkɪt/) however is an exception to this rule. It has a typically rich phonology with between 42 and 46 consonants, distinguishes at least two tones along with vowel length, features extremely rare consonants such as ejective fricatives, and even features a few syllables lacking vowels. Nevertheless, attempts at transcribing Tlingit and even developing orthographies for it started quite early. This has led to a wide variety of texts and word lists scattered throughout historical documents, all of which are essentially unreadable without highly specialized knowledge. Indeed, even the most recent orthographic efforts have led to three different orthographies in popular use, with texts in one being difficult or unusable for those experienced with another orthography.

In this paper I will attempt to catalog this “embarrassment of riches”, the various transcriptions and orthographies which have been used historically, explaining them in their contexts and describing their structure where possible. I will review the orthographies both defunct and in current use, and address the various positive and negative aspects of each orthography in comparison to the others and from an independent perspective. In addition, I will speculate on the reasons why Tlingit has been the perhaps unwilling recipient of so many writing systems, and hopefully provide a guide for linguists on certain problematic sociocultural issues in orthographic development that easily trap the unwary.

1.1. THE LANGUAGE

Tlingit is a remote branch of the Na-Dené or Athabaskan-Eyak-Tlingit family of North America.¹ It is severely endangered, with 1500 speakers in 1995 [cite Krauss 1995] and in 2007 probably on the low end between three and five hundred. Estimations by SIL currently place the total at 800 speakers with 80 in Canada [cite Ethnologue], however I find this somewhat optimistic. All speakers are above age 60 at the time of writing, except for two or three in their late 50s. The language thus has not been passed from parent to child for at least half a century, and is currently not being learned by any people as a first language. According to the Fishman scale for language endangerment (Tsunoda 2005), Tlingit is somewhere between stage

1. “Na-Dené” here excludes Haida, which is probably unrelated, although controversy continues (Dürr & Renner 1995). For a recent approach see Enrico (2004).

7 and 8, and in Krauss's classification (id.) Tlingit would fall between severely and critically endangered. More descriptively, Tlingit can be described today as moribund and bound to die in the next half-century if revitalization is unsuccessful.

Tlingit is characterized by a very complex verb morphology typically described with a large slot-and-filler template of up to 18 prefix slots and 5 suffix slots surrounding the root. The root is almost always monosyllabic, and features a system of tone and length changes which agree with aspect and mood, as well as ablaut for some vowel-final roots. Incorporation of both verb arguments is possible, though the class of nouns which can be incorporated is restricted. Tlingit lacks basic tenses, but has a large number of aspects and moods marked within the verb and with a small set of auxiliary verbs.

The classifier is a relatively famous portmanteau morpheme found in Na-Dené languages, and can be considered the hallmark of the family. It appears in Tlingit in its most complex form with a set of 16 different morphemes arranged on three axes (4×2×2). The classifier represents or agrees with a large variety of verbal phenomena including voice, transitivity, physical shape or construction, aspect, irrealis, and negation, among others. Unlike most other Na-Dené languages, Tlingit retains the use of the classifier to distinguish shape and construction of objects, whereas most other family members have lost this function. Thus descriptions of other Na-Dené languages tend to deride the term "classifier" because it does not serve a true classificatory function, however in Tlingit the term is still somewhat apt.

Compared to the verb, noun morphology is relatively simple. Nouns are mostly mono- or disyllabic and are marked with 2 grammatical cases, 8 locative cases, and 6 postpositions. Number marking is restricted to a collective plural which is marked with different morphemes depending on noun class, however not all nouns may be marked for number, and number is often ignored where it is not obligatory. A very small class of nouns have suppletive roots for number.

Argument marking is done both in the verb and on the noun, with an ergative-absolutive system and split intransitivity. The default word order is AOV/SV, but unlike most other Na-Dené languages, Tlingit word order is very flexible and thus phrases are routinely left or right dislocated for topic emphasis. The verb has agreement prefixes for both ergative and absolutive arguments, and noun phrase arguments can be dropped when the agreement prefixes are sufficiently clear. Most sentences have one or both arguments missing and represented solely by agreement prefixes, hence verb transitivity can be somewhat obscure.

According to Leer (1991) there are few dialects in Tlingit despite a large geographic distribution, with high intelligibility between extant dialects. He lists

Northern Tlingit, Transitional Southern Tlingit, Sanya-Henya Tlingit, and Tongass Tlingit. As of 2007 there are no speakers of Tongass Tlingit alive, probably less than ten Sanya-Henya speakers, and only a small handful of Transitional speakers. Northern speakers thus form the majority of present Tlingit speakers, and hence their speech is the focus of all documentation and revitalization efforts today. As a consequence there is only a small amount of documentation on the Tongass Tlingit dialect (Williams et al. 1978), and little to no documentation on the Transitional Southern or Sanya-Henya dialects.

Leer subdivides Northern Tlingit into several subdialects which he names in turn *Greater Northern Tlingit* covering the majority of the northern settlements, *Far Northern Tlingit* spoken in Yakutat, Haines, and by some in Hoonah, and *Interior Tlingit* spoken in Carcross in the Yukon and in the towns of Atlin and Teslin in far northern British Columbia. A convenient geographic distinction can then be made between the Interior Tlingit and the *Coastal Tlingit* based on which side of the Coast Range the community is primarily found, although this distinction has more basis in lifestyle than in language.

I have found that each settlement has a sort of communilect which is more or less variable depending on the intensiveness of exogamy in the last few generations and on immigration from now abandoned settlements. The distinctiveness of different communilects within each dialect group is greater in the Interior dialects than it is among the Coastal dialects, and this distinction is found most strongly in certain regular phonological phenomena as well as borrowings from neighboring Athabaskan languages. On the other hand, the distinction between different communilects on the coast is mostly represented by semantic differences in temporal terminology (e.g. names of months and seasons), use of various contractions, and forms of certain highly variable function words.

1.2. SOUNDS OF THE LANGUAGE

Since all Tlingit orthographies are phonemic, involving the encoding of the salient sounds of the language into written symbols, before describing the various writing systems it is necessary to account for the basic phonemes of the language as well as several significant issues in dialect variation. The following discussion is nowhere near a comprehensive analysis of Tlingit phonology – a subject worth many years of research – but instead is a short description of the phonemes and some variations which have yet to be mentioned in the extant literature on Tlingit. A more thorough investigation of Tlingit phonetics is provided by Maddieson et al. (2001), although much still remains to be investigated.

1.2.1. CONSONANTS

As with many other indigenous languages of the Pacific Northwest, Tlingit is famous for having a complex consonant system, particularly including ejective fricatives which are extremely rare among human languages. [\[Citation?\]](#) A chart of the phonemic consonants of Tlingit is given in table 1 on the following page.

Oral stops and affricates have a three-way distinction between unaspirated, aspirated, and ejective forms. Fricatives are found in ejective and non-ejective forms, the only exceptions being the lack of an ejective postalveolar fricative */ʃ/, and the articulatory impossibility of an ejective glottal fricative. The Tlingit speaking and learning communities are conscious of the rarity of ejectives in general, and of the extraordinary rarity of ejective fricatives in particular. Subsequently the claim has arisen that Tlingit possesses four unique phonemes not found in any other language. In fact /s'/ is found in some Hausa dialects (Maddieson et al. 2001) and both /s'/, /ʃ'/, and /ʃ'/ exist in Upper Necaxa Totonac (Beck 2006). Yapese and Kabardian also feature phonemic ejective fricatives [\[cite\]](#), however the two /x'/ and /χ'/ are not attested in any other language to my knowledge, although I would greatly appreciate information otherwise.

The lack of */ʃ/ is interesting because it is the only hole in an otherwise complete distribution of ejective obstruents. It has been explained to me by some Tlingit speakers as missing “because it sounds too much like /tʃ/”. This is unlikely because the two are very clearly distinct to my ear, and Upper Necaxa Totonac speakers presumably have no problems differentiating the two. However */ʃ/ seems to require more articulatory effort than other ejective fricatives, particularly in producing enough glottal pressure to maintain the sound long enough to be easily heard, so perhaps proto-Tlingit speakers chose not to extend ejectivity to this fricative because of the relative effort involved.

Other interesting facts of note about the Tlingit consonant inventory include the absence of the voiced laterals like [l] despite the existence of several voiceless lateral fricatives and affricates, and the almost total absence of labial consonants except for the bilabial-velar approximant /w/ and the bilabial nasal /m/. The latter is not well described, but is found as a morphophonemic variant of /w/ in some of the Interior communilects (Leer et al. 2001).

Although the consonant system of Tlingit is fairly complex, there is apparently some flexibility in the place of articulation for certain consonants. Thus one speaker may consistently articulate a postalveolar fricative where most speakers use an alveolar fricative. Other speakers in my experience do not usually comment on this, and the differences do not seem to hinder communication. I lack

	<i>bilabial</i>	<i>dental/alveolar</i>	<i>postalveolar</i>	<i>palatal</i>	<i>lateral</i>	<i>velar</i>	<i>labial-velar</i>	<i>uvular</i>	<i>labial-uvular</i>	<i>glottal</i>	<i>labial-glottal</i>
<i>unaspirated stop</i>		t				k	k ^w	q	q ^w	ʔ	ʔ ^(ʔ^w)
<i>aspirated stop</i>		t ^h				k ^h	k ^{hw}	q ^h	q ^{hw}		
<i>ejective stop</i>		t'				k'	k' ^w	q'	q' ^w		
<i>nasal stop</i>	(m)	n									
<i>fricative</i>		s	ʃ		ɬ	x	x ^w	χ	χ ^w	h	ʔ ^(h^w)
<i>ejective fricative</i>		s'			ɬ'	x'	x' ^w	χ'	χ' ^w		
<i>unasp. affricate</i>		ts	tʃ		tɬ						
<i>aspirated affricate</i>		ts ^h	tʃ ^h		tɬ ^h						
<i>ejective affricate</i>		ts'	tʃ'		tɬ'						
<i>approximant</i>				j		†(w)	w				

Table 1: The phonemic consonants of Tlingit in IPA notation.

clear recordings of speakers younger than about age 50, so it is possible that this variation is due to aging, language atrophy, or other external factors. A particularly salient variation is the articulation of the various lateral obstruents. Some speakers consistently use a very apical closure and others a more laminal closure, the latter resulting in an audibly lower pitched frication noise. Nonetheless, speakers never seem to remark on this difference.

Final stops and affricates are reduced from three to two – the unaspirated and aspirated distinction is lost in coda position. In fact, the sound used in this position varies widely from a very aspirated sound to an unreleased sound, however speakers do not attribute a difference in meaning. Thus the form /hít/ may be realized in ordinary speech as something like [hít^h], [hít], or [hít^ʔ] with no discrimination between them. Orthographies tend to write the final stops as aspirated, whereas transcriptions often show final stops as unaspirated.

There are a few allophones for the phonemes given in table 1. Of particular note are the fronted palatovelar obstruents [ç], [c], and the like for the velars /x/, /k/, etc. before the two high front vowels /i:/ and /ɪ/, but this does not seem to be generalized to other front or high vowels. In addition, use of voiceless uvular trills [ʀ] and [ʀ'] for /χ/ and /χ'/ is extremely common. This tendency for trilling or pulsating with all the ejective fricatives is described by Maddieson et al. (2001)

as “scrapiness”, something which they attribute to intermittent closure of a highly restricted articulatory channel combined with loose saliva.

A characteristic difference between most L1 speakers and almost all L2 learners of Tlingit as well as a some of the youngest L1 speakers is the use of voiced oral stops in place of unaspirated oral stops, even extending to [G] and [G^w] for /q/ and /q^w/. This is almost unquestionably due to influence from locally spoken English dialects, although in L2 learners there is probably considerable reinforcement from orthographic practice as will be shown later in this paper. Indeed, L2 learners are almost entirely L1 speakers of English² and thus lack distinction between aspirated and unaspirated stops, hence they typically generalize all unaspirated stops as voiced stops. This is one of the most salient features of the “English accent” for L2 learners.

There appears to be some variation among speakers between their use of a true voiceless laminal postalveolar fricative [ʃ] and a voiceless apical retroflexed alveopalatal fricative [ʂ] which is very similar to the Russian /ʂ/ written ⟨ш⟩. This variation extends to the affricate series as well, forming [tʃ], [tʃ^h], and [tʃʰ]. Whether this phonetic variation is free, idiolectal, or communilectal remains to be determined, however it is a salient feature in naïve descriptions of the “Tlingit accent” in English speech, whether spoken by a bilingual or an English monolingual who acquired an English phonology from their L2-English parents.

This variation between [ʃ] and [ʂ] is somehow associated with a perception of English /s/ as [ʃ] as well, evidenced by the numerous English loans which contain Tlingit /ʃ/ for English /s/ despite the fact that Tlingit has an essentially identical /s/. Examples of this latter phenomenon include /ʃtí:n/ “steel” and /k^wʌná:ʃɪʃ/ “molasses” among others. I have not investigated whether there are any speakers who regularly produce [ʂ] for [ʃ], but I presume that such speakers might use [ʃ] or perhaps laminal [ʂ] for /s/ and hence might have been the source of perturbation of /s/ in English loans. If this was the case, current speakers must have undergone an extremely rapid sound shift, perhaps related to the change of /ʉ/.

Two consonants in table 1 on the preceding page are marginal although probably phonemic. As a consequence, these have been marked with parentheses and a superscript question mark. The voiceless labial-glottal fricative /h^w/ appears in only a few words in certain communilects, notably the form [ʔu:h^wá:n], the first person plural pronoun. This sound may have arisen by rounding spread from /u/ to following /h/ in the most common form /ʔu:há:n/. Whether this sound predates European contact is uncertain, but if not then some influence may be due

2. The exceptions can be counted on one hand in a population of 50–100 dedicated learners.

to English /m/. It apparently has appeared by analogy in the second person plural pronoun [ji:h^wá:n], commonly /ji:há:n/. It should be noted that both of these words are variable among different speakers even in the same communilect. The other marginal phoneme is /ʔ^w/, a rounded glottal stop. Leer (1991) provides this sound in his table of Tlingit consonants but gives no examples of its use. I have never heard this sound uttered spontaneously, but a few of my informants have produced it in isolation on request, although all were uncertain whether they actually used it in their speech.

The velar approximant †/ɰ/ was previously a phoneme in many if not all Tlingit dialects; however, it gradually disappeared through the end of the 20th century and may no longer exist in any living speaker's speech. For this reason it is marked with a superscript dagger. It appears in many earlier transcriptions as ⟨g⟩ or the Cyrillic cognate ⟨r⟩ in the place of what is today either /w/ or /j/ depending on context from surrounding rounded vowels or consonants. Since the /j/~w/ variation is predictable but confusing, in morphological descriptions it has been written as ⟨ÿ⟩ or Greek ⟨γ⟩, or inaccurately as IPA ⟨ɣ⟩. This symbol is not normally used except in a few works transcribing conservative speakers who maintained the /ɰ/ phoneme. On the other hand, it appears frequently in linguistic descriptions because of its perceived explanatory power to account for various morphophonological phenomena. The traditional linguist's term for this sound is "gamma", and it is still used as a convenience term among linguists studying Tlingit today.

1.2.2. VOWELS

In contrast with the consonant system, the vowel system of Tlingit is relatively simple, as with most Pacific Northwest languages. Tlingit has four basic vowels with an additional length distinction, as shown in table 2 on the next page. Actual vowel quality between long and short vowels is considerably different for many speakers, although some have free variation between true short vowels and the other short forms. This difference in quality I attribute to "laxness" but I have done no empirical research into the phenomenon. The short low vowel /ʌ/ is often pronounced [ə] in unstressed environments, as is the relatively less common vowel /ɛ/. This raising/centralizing tendency probably led to the partial shift of /ʌ/ to /ɛ/ in the Carcross communilect of the Interior, a phenomenon noted by Leer et al. (2001) and often mentioned by Coastal speakers.

Unlike many Na-Dené languages, Tlingit does not distinguish nasality of vowels. Some of the Interior communilects, especially that spoken in Teslin, distinguish nasality in some wh-question words and loanwords from Athabaskan languages (Leer et al. 2001). This nasality is presumably due to contact with Athabas-

height	long/tense			short/lax		
	front	central	back	front	central	back
close	i:		u:	ɪ		ʊ
mid	e:			ɛ		
open		a:			ʌ	

Table 2: The phonemic vowels of Tlingit in IPA notation. Phonemic tones vary among dialects.

kan languages that feature phonemic nasalized vowels, and this contact probably also had an influence on the development of /m/ in Interior Tlingit. Nasalized vowels do appear in the speech of some Coastal (i.e. non-Interior) speakers without any neighboring nasal consonants, but they are restricted to discourse markers such as [hã:w] “well then, so”, [hã:] “hmm, let’s see”, [hã] “huh, oh”, and [ʔãã] “yeah”. Contrast these with nonnasalized [ha:ʔ] “wow, gee”, and [ʔəə] “eh, er” (disfluency), used for distinctly different discourse purposes.

Tone is a salient feature in all living Tlingit dialects, although its realization varies among them (Leer 1991:14ff). The Northern and Interior dialects, the most widely spoken dialects today, maintain a binary distinction between high and low tone; they are together called Two-Tone Tlingit. The Sanya-Henya dialects spoken around Ketchikan and the outer Prince of Wales Island coast have a more complex system involving high, low, and falling tones dependent on vowel length and tone register. This system is described as “sing-song” by Two-Tone speakers, and is likened to the speech of Norwegian L2 speakers of English. The recently extinct Tongass dialect lacked tone and instead used a quaternary vowel system similar to Eyak, with modal, long, fading (breathy voiced), and glottalized (final glottal closure) vowels; see e.g. table 13 on page 29. Jeff Leer convincingly argued that this system changed to a tonal one in a manner similar to the change in Athabaskan languages (Leer 1991; Williams et al. 1978), and thus solidified the relationship of Tlingit to Eyak and hence the Na-Dené family.

Another feature of vowels is the lack of distinction between long and short final vowels for certain morphemes. The third person possessive pronoun can be pronounced either /tu:/ or /tʊ/ depending on dialect, idiolect, or speaker intention, and speakers typically ignore the difference. Only where minimal pairs exist is the distinction maintained, as in /q^ha:/ “one, indefinite human pronoun” and /q^hʌ/

“and”, and even then there may be no clear indication in speech where context provides enough to distinguish the two. This is naturally an issue in transcription and orthography, since the lack of distinction is lexically specified. Some routinely use long final vowels, some short, some a mix of the two. Transcriptions often display the habit of a particular speaker; Shotridge for example tended to use short vowels and most of Boas’s transcriptions bear this out.

1.2.3. BORROWING

The two loanwords mentioned previously, /ʃtí:n/ “steel” and /kʷʌná:ʃɪʃ/ “molasses”, highlight another very important issue in Tlingit phonetics which has been little mentioned, that of loanword adaptation. Tlingit has been described as resistant to borrowing [cite?], a feature which it supposedly shares with other Na-Dené languages. This is at least true for verbs since they are so morphologically complex in Na-Dené languages that the class is difficult to expand. But Tlingit borrowed nouns for many novel objects during the Russian and early American periods, mostly from Chinook Jargon and English.³ Although attempts are being made in the revitalization community to avoid borrowing in favor of lexical innovation, loanwords probably comprise a third of the post-contact noun lexicon.

A very short discussion of loanword phonology in the context of borrowings from Chinook Jargon is given by Johnson (1978:211). The adaptation of English /l/ to Tlingit /n/ is regular in loanwords, thus /ʃkú:n/ “school”, which also shows Tlingit sensitivity to the deaspirated /k/ in the /sk/ cluster in English, as the aspirated */ʃkʰú:n/ is not found. Also note change of the English bilabial nasal /m/ to the Tlingit /kʷ/ in /kʷʌná:ʃɪʃ/ “molasses”. Tlingit regularly adapts all labials in loanwords to rounded velars. Thus /kʷʌtʌ/ derives from “butter” with the English /b/ replaced by the unaspirated /kʷ/, and the same has occurred with /kʷí:ʌ/ for “beer”. The only labials which do not change to velar are the bilabial /w/ which exists in Tlingit, and word-final /m/ which becomes /w/ as in /ná:w/ “liquor” derived from CJ /lam/ which itself is from English “rum”. Dialects which have /m/ seem to have less problem with imported labials, such that the Interior noun dictionary lists ⟨bata⟩_C, etc. [cite]

3. Historical sources show that early interactions with Euro-Americans were conducted mostly in Chinook Jargon or the undescribed “Haida Jargon”, and that English became important only after the Klondike Gold Rush in the 1890s. Elders today recall their parents and grandparents speaking fluent Chinook Jargon to both Indians and whites.

1.3. NOTATIONAL CONVENTIONS

In this article I use an extension of the ⟨angle brackets⟩ usually used to represent graphemes. Because this article contains so many different writing systems each form will be given with a subscript indicating the orthography in use. The form ⟨X⟩ stands for a grapheme in an unspecified, implicit orthography. For a form in an explicit orthography, the citation is ⟨X⟩_O for the grapheme ⟨X⟩ in the orthography symbolized by *O*. For example, the form ⟨k̲⟩_{RP} is equivalent to both ⟨kh⟩_C and ⟨kh⟩_E (symbolically ⟨k̲⟩_{RP} ≡ ⟨kh⟩_{C,E}) where *RP* is the Revised popular orthography, *C* is the Canadian orthography, and *E* is the E-mail orthography. All of these are equivalent to the Tlingit phoneme written /q^h/ in IPA transcription. Table 3 on the next page gives the list of orthographic indicator symbols used in this article.

1.4. A PECULIAR NAME

The name “Tlingit” is peculiar for a few reasons. It is an English ethnonym derived from the Tlingit /ʔm.kít/ meaning “person, people”. Despite erroneous claims made by a number of popular English dictionaries, the common English pronunciation /ˈklɪŋkɪt/ (Maddieson et al. 2001:136) as used by most English-speaking Tlingit and others in the region is identical to a hypothetical English compound “cling-kit”. This pronunciation is clearly at odds with its spelling, although it does fit with the prohibition of an initial /tɫ/ cluster in English.

An explanation from Chinook Jargon is possible for this peculiar borrowing into English. Chinook Jargon (CJ) was used as a trade language between heterolingual groups in the Pacific Northwest during the 19th and early 20th centuries and possibly earlier; its greatest geographic extent was from Oregon along the coast to southeastern Alaska (Holm 1989:595). In CJ as spoken by most Native Americans and some other fluent speakers, the voiceless lateral fricative sound /ʔ/ is common, as it is in many if not all of the languages of the Pacific Northwest. Thomason (1983:826) gives Hale’s claim that /ʔ/ and /tʃ/ were pronounced as /kl/ word initially and /tɫ/ word finally by native English speakers. The use of /kl/ as representative of the initial /ʔ/ in /ʔm.kít/ would then naturally follow from English speakers with experience of CJ. Thus native English speakers with a modicum of competence in CJ were likely to produce /klɪŋkɪt/ when approximating /ʔm.kít/, substituting /kl/ for /ʔ/ and stress for tone. Presumably the stress later shifted from the last to the first syllable under influence from other English disyllabic words once it had been reanalyzed as an English word rather than an approximation of a Tlingit word.

4. Or perhaps split into two syllables as /t.l/?

	<i>System</i>	<i>Symbol</i>	<i>Remarks</i>
<i>Orthographies</i>	E-mail	<i>E</i>	unpublished
	Canadian	<i>C</i>	e.g. Nyman & Leer (1993)
	Revised popular	<i>RP</i>	e.g. Dauenhauer & Dauenhauer (1987)
	Naish-Story 2	<i>N2</i>	Naish et al. (1976)
	Naish-Story 1	<i>N1</i>	Naish & Story (1973)
	Ad hoc English	<i>EN</i>	e.g. Keithahn (1940)
	Willard-Kelly	<i>WK</i>	Kelly & Willard (1905)
	Veniaminov Cyrillic	<i>V</i>	Nadezhdin (1896, ca. 1830)
<i>Transcriptions</i>	Leer combined	<i>L</i>	Leer (1991)
	Leer Tongass	<i>T</i>	Williams et al. (1978)
	De Laguna 2	<i>D2</i>	De Laguna (1972)
	De Laguna 1	<i>D1</i>	De Laguna (1960)
	Harrington	<i>H</i>	unpublished, excerpts in De Laguna (1972)
	Olson	<i>OL</i>	Olson (1967)
	Oberg	<i>OB</i>	Oberg (1940)
	Boas	<i>B</i>	Boas (1917)
	Swanton	<i>S</i>	Swanton (1908, 1909, 1911)
	De La Grasserie	<i>G</i>	De La Grasserie (1902)
	Emmons	<i>E</i>	Emmons (1991, ca. 1900)
	S. Hall Young	<i>Y</i>	Young (1886)
	Krause	<i>K</i>	Krause (1956, orig. 1885)
	Wrangell Cyrillic	<i>W</i>	Wrangell (1980, orig. 1839)
	La Perouse	<i>LP</i>	Lapérouse (1937, orig. 1789)

Table 3: List of symbols representing orthographies discussed in this article.

This is an adequate explanation for the pronunciation of the name, however the reason for the peculiar spelling of English /kl/ by ⟨tl⟩ still remains to be explained. Initial /kl/ is not foreign to English speakers and they would be unlikely to spell it any other way than ⟨kl⟩ or ⟨cl⟩. However, Thomason (1983:827) gives three examples of CJ writers using ⟨tl⟩ as representative of initial /k/, so the rule of initial /kl/ is certainly not static. A possible explanation is that the pronunciation and the spelling of the word were developed independently, with most English speakers using a /kl/ in speech, but certain people conscious of the inaccuracy of the English pronunciation using the written ⟨tl⟩ to indicate this fact.

In sum, the name /'kɫɪŋ.kʰɪt/ was borrowed from Tlingit into English with influence from CJ speakers, although probably not directly through CJ itself. The

spelling also developed from strong CJ influence, and the mismatch between the two is a historical accident of inconsistency and variation in CJ writing, and not from pronunciation misunderstandings. The alleged “dictionary” pronunciation of */tliŋk^hit/ found in several popular English dictionaries was inferred orthographically by English speakers who likely were never exposed to either CJ or to the common English pronunciation of /^hklɪŋ.k^hit/.

The name “Tlingit” has suffered from a wide variety of other spellings over its history of contact with English speakers, including such examples as ⟨Thlingit⟩, ⟨Hlinkit⟩, and ⟨Qulinkit⟩, among others. A complete list of these spelling variations has not yet been compiled, but it would be of great help to researchers searching computer databases of older publications.

To further confuse the record, during the Russian period of Alaskan colonization the Tlingit were known to the Russians and their scribes by a completely different ethnonym, usually rendered as ⟨Колошъ⟩ [cite?], but also occasionally as ⟨Колюжъ⟩ as by Davydov (1977) or ⟨Колюшъ⟩ as by Kamenskii (1985). German transcriptions of this name include ⟨Koulischen⟩ and ⟨Koljuschen⟩, as used by Aurel Krause in the first professional ethnography of the Tlingit (Krause 1956). The French also described the Tlingit as ⟨Kolsches⟩ [cite] which name was clearly borrowed from German writers, however later writers moved to ⟨Tlinkit⟩, e.g. De La Grasserie (1902). The term *kolosh* is apparently derived from the Aleut ⟨kalu:kax⟩,⁵ which is a term describing the labret prominently worn by aristocratic Tlingit women (De Laguna 1990:226). The Dena’ina of the Cook Inlet apparently adopted the Russian name for the Tlingit with their term ⟨gulušutna⟩ or ⟨gulušuh^hna⟩ (id.).

Other Native ethnonyms for the Tlingit were quite varied. The Haida, one of the two groups having perhaps the most prehistoric contact with the Tlingit, had at least two names for them. One was ⟨kí’naġit⟩, clearly derived from the Tlingit’s own name for themselves, and the other was ⟨lanġas⟩, which means roughly “northerners” (De Laguna 1990:226). The Coast Tsimshian, the other close neighbors of the Tlingit, called them ⟨gyid-ġbane’dz⟩ meaning “people of the north”. The Chugachmiut Eskimos, a group of the Alutiiq or Sugpiaq people who inhabit most of Prince William Sound, called their neighbors and mortal enemies the Yakutat Tlingit ⟨axłut⟩ or “killer whales” after the crest of a prominent clan in Yakutat (id.). The Eyak, close neighbors of the Yakutat Tlingit, gave the name to that group (Tl. ⟨Laxaayik Kwáan⟩_R /ʔΛ.χa:.jík^h q^{hw}á:n/) with their term for the Tlingit, ⟨λaʔxaʔlahġ⟩, roughly “people of ⟨λaʔxaʔ⟩” which is the Eyak name for Yakutat

5. This Aleut word and the following Dena’ina terms are given in their original transcriptions.

Bay (id.).

2. HISTORY OF WRITTEN TLINGIT

As with most indigenous languages of North America, Tlingit people before contact felt little need to write (Mithun 1999:34). The only form of permanent record similar to writing was in the form of petroglyphs, which though very common throughout Southeast Alaska remain mostly inscrutable. Some of the first explorers in the region collected wordlists, the earliest being Lapérouse. Subsequent Russian exploration and colonization provided a long period of contact during which the Russians attempted to describe the peculiar language of their aggressive neighbors. Russian Orthodox missionaries were witness to a flowering of interest in religion among the Tlingit, and as was their practice with other native groups in Alaska, they developed a Cyrillic-based orthography for writing translations of tracts and songs. Unlike the Aleut orthography, Cyrillic Tlingit never gained great popularity and hence faded with the expansion of American missionaries in the region.

Early communications between Americans and Tlingits seem to have been conducted largely in Chinook Jargon, such as Muir described in his circumnavigation of the Alexander Archipelago accompanied by several Stikine Tlingit dignitaries (Muir 1915). Thus there was little need felt by either Americans or the Tlingits themselves to record the Tlingit language in any meaningful written manner. Exceptions include a number of signs which give Tlingit names, such as those found on some houses in Angoon in the 1880s. This situation changed with the coming of American missionaries to the region, and Presbyterian minister S. Hall Young made a valiant attempt to record Tlingit in the face of official opposition from his church leaders such as Sheldon Jackson. However the church finally won out and Tlingit was not to be seriously written for Tlingit audiences for another century.

About the same time as S. Hall Young's efforts, the first professional anthropologists began to arrive in the region. As is their wont, these researchers immediately began recording fragments of Tlingit in a number of different transcription systems, some better than others. With the arrival of Boas and his students the first truly accurate transcriptions of Tlingit appeared, particularly after Boas's extensive work with the native speaker Louis Shotridge. Shotridge went on to adapt the transcription system into an actual orthography, although it seems he never taught other Tlingits in its use. It seems to have been measured as too clumsy to present to the general public however, as evinced by the note at the beginning of this paper.

Anthropologists from the 1900s onward settled on a fairly regular system based on Boas's transcriptions, although adapted over time as the practices of the American tradition changed. Leer encountered the little-known Tongass dialect which featured a completely different system of vowel quality distinctions and expanded his transcription system to cover this. Harrington went so far as to develop a practical orthography during his work among the Yakutat Tlingit, however this did not seem to catch on within the community. Increasing English literacy among the Tlingit quickly led to many personal attempts at writing Tlingit using English spelling conventions, a practice which continues today.

The first truly popular orthography was worked out by Constance Naish and Gillian Story during their linguistic fieldwork under the ægis of the Summer Institute of Linguistics. Driven by the desire to provide bible translations in every practically possible language, they produced an orthography which covered all the phonemic distinctions in Tlingit in a fairly regular manner. Development of noun and verb dictionaries refined the script to become what is now known as the Revised Popular orthography, still in use today.

Further work in language documentation among the Interior dialects gave rise to the Canadian orthography, one which more closely resembles the practical orthographies used among the many Athabaskan languages in the Yukon Territory. This system is still in use among most Canadian Tlingit communities, however some have shifted back to the Revised Popular orthography because of the increasing number of texts available in it.

Finally, the 1990s saw the adaptation of the Revised Popular orthography to the use of e-mail and other electronic text. In this pre-Unicode era, the typewriter-based diacritics of the RP orthography proved difficult to translate, so eventually a new system better adapted to "plain text" grew out of community consensus. This e-mail orthography is seeing increasing use in situations outside of computing, and may lead the way towards unification between the other major orthographies. Current issues in the 21st century include the problem of aligning all of the orthographies with best practices in Unicode encoding.

2.1. LAPÉROUSE AND WRANGELL

[[Wordlist from Jean François de Galaup, comte de Lapérouse and someone in his crew. Published from his journals in 1789.]]

<i>English</i>	<i>French</i>	<i>Tlingit</i>	<i>IPA transcription</i>
“hair”	cheveux	khlrleies	?
“chief and friend”	chef et ami	alcaou	/ʔa:nq ^h á:wu/
“seal tooth”	dent de phoque	kaourré	/q ^h a: ʔu:χó/*
“face and head”	tête et visage	kaaga	/q ^h a: ʔá/

Table 4: Words transcribed by La Pérouse.

[[Rear Admiral Ferdinand Petrovich von Wrangell’s Cyrillic wordlists with German and Russian glosses and comparisons to other Alaskan languages (Wrangell 1980).]]

2.2. VENIAMINOV’S CYRILLIC-BASED ORTHOGRAPHY

Russian Orthodox priest Ivan Veniaminov,⁶ later Metropolitan of Moscow and canonized as Saint Innocent of Alaska, was the first activist for native literacy in Alaska. He developed a Cyrillic-based orthography for Unangan Aleut and produced a number of texts in that language both original and translated. In addition to working on the Aleut language in the 1820s, he devoted several years to Tlingit writing and literacy in the 1830s during his residency at Sitka. The fruit of his labors included the adaptation of the Cyrillic alphabet to the writing of Tlingit, informed to some extent by his prior work on Aleut.

I have been unable to obtain original copies of any of Veniaminov’s work, and it appears that much of it was unpublished and kept only in various church archives. But recent work by archivists at the All Saints of North America Orthodox Church has brought online a number of examples in digital form.⁷ Because these works were originally published all around the same period but were developed over a long timespan, they represent a spectrum of orthographic sophistication.

One of the least sophisticated examples is from Father Veniaminov’s *Indication of the Pathway into the Kingdom of Heaven* (Veniaminov 1901). In the digitized version there are no diacritics, hence the text is limited to only the basic Cyrillic alphabet plus an additional Latin ⟨k⟩. Also, hyphenation into syllable units, the perennial sign of poor language understanding, is pervasive throughout the text. Since other texts are much more elaborate, it is possible that this text is one of the earliest translated into Tlingit.

6. Also spelled variously as *Ioann*, *John* and *Venyaminov*, *Veniaminoff*, etc. Much of this is adapted from the Orthodox Church of America official biography: <http://www.oca.org/hsbioinnocent.asp>.

7. See <http://www.asna.ca/alaska/> for Tlingit as well as Aleut, Yup’ik, and Alutiiq/Sugpiaq texts.

Тлин-кит тлел ев-ту-сне, ча-ац як тлат-ки как е сна-ка-тит, так ка-ат-хи-ех, тле ас ву-на-ву тлел е-ску-стич; Теки Ан-ка-у тин ас кука-ту-стит, тлел ча-ас тлех хондрет ка чу тлех та-у-зент так, ча-тлех ас ку-ка-ка-стит, ча ас Тики Ан-ка-у тин е ху-ка-сти кне-сти ча-ат-ке час ю а-ях ак ас а-я-ини Тики Ан-ка-у ту ит Исусъ Христосъ. (Veniaminov 1901:8)

ʔnkít tʰe:ʔ jé:-wtusné, tʃʰ [atsʔ] jʌχ tʰátki kʰa:χ jé:-s-[nʌkʰʌtʰitʔ], tʰa:qʰ qʰá: ʔʌt-[χi:jé:χʔ], tʰé ʔa:s wuná:-wu tʰé:ʔ jé:-s-qʰustʰi:-tʃ ...

From the example quote above and the tentative transcription below it, we can see a number of different features of this orthography. Hyphens are used to break most syllables except in the loanwords ⟨Исусъ Христосъ⟩ “Jesus Christ” and ⟨хондрет⟩ “hundred” (/há:ntit/ and the word ⟨Тики⟩ “high up” in ⟨Тики Ан-ка-у⟩ “God, lit. high up aristocrat” (/tʰkʰí: ʔa:nqʰá:wu/). The Cyrillic ⟨к⟩ is generally used to represent velar stops as in ⟨Тлин-кит⟩ “Tlingit”, and the Latin cognate letter ⟨k⟩ sometimes represents various uvular consonants such as /χ/ in ⟨ак⟩ “my” (/ʔʌχ/) and /qʰ/ in ka “and” (/qʰʌ/). This usage is not consistent however, as evinced by Ан-ка-у “aristocrat” where ⟨к⟩ represents a uvular /qʰ/. The lateral obstruents /ʎ/ and /tʰ/ are not clearly differentiated in initial position, given as ⟨тл⟩, but ⟨л⟩ is consistently used to represent word-final /ʎ/. Also, /h/ is not differentiated from /x/ or the other velar fricatives, as shown by ⟨хондрет⟩; this word is also interesting as a direct Russification of the English word “hundred” rather than a transcription of the Tlingit borrowing, since Tlingit speakers lack any sort of [r] and would be unlikely to pronounce it.

One of the more sophisticated examples is from Reader Ivan Nadezhdin’s *Sbornik (Selections) of Church Hymns and Prayers* (Nadezhdin 1896). I have no historical data on Nadezhdin, but it is likely that he was a native speaker of Tlingit who was educated through the Orthodox Church’s school at Sitka. He may or may not have been literate, as I am uncertain whether he actually wrote this work himself or dictated it to some other church worker. The preface to the digital edition states that “the transcribers have done their best to transcribe the text accurately, reflecting the intricacies of the accented Russian typeset used for the Tlingit language at the turn of the 20th century”, so we can hopefully rely on their text as a reasonable and probably faithful facsimile of the original.

Тлѣкъ гатыги, А-шакунъ Йшъ-икъ ахайнъ, чальтакатъ алшатычъ,
куцъ тлѣткитынъ чутлѣанъ чальтакатъ туватынчатъ лтуватыни-
ать-тынъ. (Nadezhdin 1896:8)

tʰé:x' ʷʌtʰí:ʷɪ, ha: ʃa:kú:n ʔi:ʃ-ʔi:q [ʔʌxá:nʔ], tʃʷʌ ʃtʌkʰʌt ha: ʃʔ [ʃa:t ʔi:tʃ], xu:ts tʰʌtki-tʰi:n tʃʷʌ tʰé:n tʃʷʌ ʃtʌkʰʌt tʰu:wʌtʰí:ntʃ ʔʌt ʃ tʰu:wʌ-tʰí:ni ʔʌt-tʰi:n.

The most salient characteristic of this quote is the numerous diacritics used very unusually for Cyrillic. However, these diacritics are used very consistently to produce a transcription that is far more accurate than the previous example. The breve diacritic is used for two different letters; in ⟨ǃ⟩ it gives /ʃ/ or part of /tʰ/ in this excerpt, and probably represents /ʃ/ in the other laterals as well. Over ⟨κ⟩ the breve seems to represent any uvular or velar phoneme which is not /kʰ/ or /x/, e.g. /xʷ/ in ⟨Тлѣкъъ⟩ (/tʰé:xʷ/) and /q/ in ⟨-иќъъ⟩ (/ʔi:qʰ/).

A very interesting feature of this example is the use of ⟨ɾ⟩ in the second word ⟨гатǃги⟩. As mentioned earlier in the discussion of phonology, this represents the velar approximant /ʷ/ which has apparently disappeared from current speech but which persisted through to the mid-20th century if not later. In the typical speech of Northern Tlingit speakers today, this word would be /jʌtʰí:jɪ/ “to be (attrib.)” with the velar approximant replaced by a palatal approximant.

Apparently there was a dramatic improvement in both orthographic accuracy and orthographic completeness in the span of time between this example and the previous example. This improvement was probably due to the increasing contribution of native speakers literate in the Cyrillic tradition through Orthodox church education. Although Tlingit Cyrillic literacy died out in the early 20th century, if it had continued Tlingit might have had the good fortune to develop a very useable orthography and perhaps a subsequent literary tradition over fifty years earlier.

2.3. HALL YOUNG’S LATIN ATTEMPT

[[Description of Presbyterian resistance to orthographic development and translation efforts.]]

HAH ISH, ahsa dekee yæity; ee sie kuhtoohluhtook. Wu-eh chutltakut Ankowuh enuh-satee. Ee toowu yah ut nukatee yah tlutk kuk, chuwæ Dekee yuh nukatee. Hak æh natee yah yukyee suknen. Hah hlushikæ-aih kuh ee sunuhkaq, chuh adæ hah eenah tin kooh too tsee tee yæyuh. Hlih hlooshekæayi ut hodæ yah hah jeen hluh ut dekh. hæ hah kusneen hlooshekæi ut hoduh. Hæ ee ieyih setee chutltakut ahn, kah hlitseen, kah kuhdoosheek chuklæh neeyis. AMEN. (Young 1886)

ha: ʔi:ʃ, wa: sʌ tɪkʰi: jé: jʌti:, ʔi: sa:ʃi kʌχtʰu:ʃʌtʰu:k. wʌʔé tʃʷʌ ʃtʌkʰʌt ʔa:nqʰá:wʌ ʔʌnʌχ sʌtʰi:. ʔi: tʰu:wʌ jʌχ ʔʌt nʌkʰʌtʰi: jʌχ [tʰʌtkiʔ] kók, tʃʷʌ wé: tɪkʰi: jʌχ nʌkʰʌtʰi: ...

2.4. ANTHROPOLOGICAL TRANSCRIPTIONS

With the flowering of anthropology in the 19th century, it was inevitable that American and German anthropologists would encounter the Tlingit and attempt to transcribe their language. The earliest apparent attempts were Krause circa 1882 and Emmons circa 1890. The earliest transcription attempts that achieved moderate success, accurately recording most of the phonemes in Tlingit, were from Boas's student John Swanton in the 1900s (1908; 1909; 1911). Boas himself provided the first truly accurate transcription of Tlingit with the assistance of native speaker Louis Shotridge (Boas 1917). Boas's transcription, the semi-standardized system used throughout Americanist anthropology and linguists even through today, provides the basis for the transcriptions by Durlach (1928), Velten (1939), Naish and Story in their technical work (1966), De Laguna (1960; 1972), and Leer (1991), among many others.

2.4.1. KRAUSE

Aurel Krause and his brother Arthur were geographers sent by the Geographical Society of Bremen⁸ to investigate the Chukchi Peninsula in 1878–1879. Aurel returned north in the fall of 1881 to work among the Tlingit in Klukwan for two years and the results of his ethnographic study were published as *Die Tlinkit-Indianer* at Jena in 1885. This text was translated by Erna Gunther in 1956 and remains today one of the more reliable ethnographic reports from the 19th century (Krause 1956). A thorough ethnographer, Krause included many native terms throughout his text, and even dedicated an entire chapter to discussion of the Tlingit language. But despite his ethnographic skill, Krause made for a lousy field linguist. He was informed in his work by Veniaminov's existing efforts, but consciously chose to ignore a number of phonemic distinctions in Tlingit:

Veniaminov gives three ways of pronouncing *k* and *t* and introduces special symbols for them. Since these differences are difficult to define and also since our ear can scarcely distinguish them, I have contented myself with one symbol. Also *t* is preceded with a heavy throat sound and for this reason is often confused with a *k* as our transcription and that of others shows. (Krause 1956:232)

Nevertheless, he notes a few things which had not yet been commented upon. For example, he describes the tendency for /n/ to vary with [l] for some individu-

8. The same organization where Franz Boas started his career in anthropology.

als; compare La Pérouse's ⟨alcaou⟩_{LP} for /ʔa:nq^há:wu/.⁹ He also notes that Tlingit speakers tended to substitute /l/ for /ɬ/ in L2 English, a fact which is later mentioned in other historical accounts. Additionally, he was well aware of the lack of standardization in transcriptions, saying “those Indian words recorded by an Englishman are often different to the point of not being recognizable as those recorded by a German or a Russian”. His vocabulary list is of some historical importance, although much of it is compiled from previous collections by Veniaminov and others.

2.4.2. SWANTON

2.4.3. BOAS

[[Boas's standardized transcription system. Note that he developed it through intensive work with Shotridge, and Shotridge actually used it as a writing system. Hence it was initially a transcription but became an orthography through use. Shotridge also did editing on texts written in it, correcting and changing things. Judith Berman has details.]]

2.4.4. J.P. HARRINGTON

[[Harrington's orthography in his work from Yakutat, as from De Laguna (1972).]]

2.4.5. R. OLSON

[[Ronald Olson's transcription in *The Social Structure of the Tlingit*.]]

2.4.6. F. DE LAGUNA

[[De Laguna's transcription in *Under Mt. St. Elias*. Her transcription in *The Tlingit Indians*. Differences.]]

2.4.7. INACCURATE ATTEMPTS

[[Emmons's non-system. Kalervo Oberg's transcription in *Social and Economic Conditions among the Tlingit*.]]

De Laguna describes Emmons's attitude towards accurate transcription: “To him, his spelling was perfectly clear, and when Miss Bella Weitzner attempted to secure a consistent system of orthography from him, he brushed this aside as unnecessary” (Emmons 1991, xiv). Emmons's method cannot be called a true system, since it is both inadequate and inconsistent. As shown in table 5 on the following page, Emmons would spell the same Tlingit word – in this case clan names – in multiple ways, sometimes even in the same document.

9. I have never heard this, but the claim appears repeatedly in the literature. The phenomenon may no longer exist among today's speakers.

Emmons's transcription	IPA transcription	RP spelling
Con nuh ut de	/qa:nλχʔłti:/	<u>G</u> aanax.ádi
Con-nah-hut-tee	/qa:nλχʔłti:/	<u>G</u> aanax.ádi
Quash gae kwan	/k ^{hw} á:ʃk'iq ^{hw} á:n/	Kwáashk'ikwáan
Qwash-qwa-qwan	/k ^{hw} á:ʃk'iq ^{hw} á:n/	Kwáashk'ikwáan
Thluke nuh ut de	/ʔ'ok ^{hw} nλχʔłti/	L'uknax.ádi
Thluke-nar-hut-tee	/ʔ'ok ^{hw} nλχʔłti/	L'uknax.ádi
Ka gwan tan	/k ^h a:k ^w a:nt ^h a:n/	Kaagwaantaan
Kar-qwan-ton	/k ^h a:k ^w a:nt ^h a:n/	Kaagwaantaan

Table 5: Examples of Emmons's attempted transcriptions.

[[What differentiates an anthropological transcription from an “attempt”? Note that Boas's is obviously fairly thorough, but De La Grasserie's and Olson's aren't terribly accurate. Emmons's is inconsistent as well as inaccurate.]]

2.5. NATIVE LITERACY IN ENGLISH

[[Attempts of to transcribe using English spelling conventions by Tlingit native speakers, e.g. in *Haa Aani* Tom Ukas's ⟨Kiksuddy⟩_A, the book ⟨Kahtaha⟩_A, and the Chief Shakes book from Wrangell. Of all the native speakers alive today, probably the majority continue to use ad-hoc English-based forms when they need to write Tlingit.]]

2.6. KELLY AND WILLARD'S ORTHOGRAPHY

William Kelly and Frances Willard developed a ruthlessly Anglicized orthography based on Daniel Webster's transcription system for American English (Kelly & Willard 1905). They were aware of the Boasian transcriptions of Tlingit but preferred to invent their own. Their reason for using the Websterian style of transcription was because their grammar sketch was supposedly intended for colloquial use, an intention belied by the complexity of symbols and diacritics used.

The authors are aware that the scientific orthography, in which the vowels have their continental sounds and the consonants their English pronunciation, is now in general use by ethnologists. But as this grammar is intended for colloquial use only, we have adhered mainly to the Websterian orthoepy and phonetic principles of spelling. (Kelly & Willard 1905:715)

	<i>dental/alveolar</i>	<i>postalveolar</i>	<i>palatal</i>	<i>lateral</i>	<i>velar</i>	<i>labial-velar</i>	<i>uvular</i>	<i>labial-uvular</i>	<i>glottal</i>
<i>unaspirated stop</i>	d				g	g ^{oo}	ḡ	ḡ ^{oo}	—
<i>aspirated stop</i>	t				c~k	k ^{oo}	ḵ~ḷ	qu	
<i>ejective stop</i>	dt				g´	g´ ^{oo}	(ḵ~ḷ)	—	
<i>nasal stop</i>	n								
<i>fricative</i>	s	sh		hl	CH	CH ^{oo}	‘h	‘h ^{oo}	h
<i>ejective fricative</i>	sz			(DL)	g`	g` ^{oo}	ḡ	ḡ ^{oo}	
<i>unasp. affricate</i>	—	j		dl					
<i>aspirated affricate</i>	ts	ch		tl					
<i>ejective affricate</i>	dts	dj		DL					
<i>approximant</i>			y			w~ũ			

Table 6: Consonants in the Williard-Kelly orthography.

The vowels are where the influence from Daniel Webster’s pronunciation transcription system shows the most clearly, with a basis in English vowel names rather than in actual pronunciation.

<i>Sym.</i>	<i>IPA</i>	<i>Example</i>	<i>Transcription</i>	<i>Meaning</i>
ā	/e:/	dā	/de:/	trail, way, path
ä	/a:/	ät	/ʔa:t/	maternal aunt
â	/ə/	—	—	—
aũ	/aw/	dtaũ	/t’á:w/	feather
ē	/i:/	hēn	/hí:n/	fresh water, river
ě	/ε/	tě	/té/	stone, rock
ī	/aɪ/	yī	/ja:j/	whale
ĩ	/ɪ/	jĩn	/tʃín/	hand, arm
ū	/ju:/	ū’dā	/jú:de:/	that way
ũ	/ʌ/	gōowũcān	/kɔwʌk ^h a:n/	deer
ōō	/u:/	gōōn	/kú:n/	spring
oo	/ʊ/	ha-gōō	/ha:kú/	come here
ē-ē	/i:j/	yē-ē	/ji:j/	?

Table 7: Vowels in the Willard-Kelly orthography.

	<i>dental/alveolar</i>	<i>postalveolar</i>	<i>palatal</i>	<i>lateral</i>	<i>velar</i>	<i>labial-velar</i>	<i>uvular</i>	<i>labial-uvular</i>	<i>glottal</i>	<i>labial-glottal</i>
<i>unaspirated stop</i>	d				g	gw	ḡ	ḡw	.	.w
<i>aspirated stop</i>	t				k	kw	ḱ	ḱw		
<i>ejective stop</i>	tʼ				kʼ	kʼw	ḱʼ	ḱʼw		
<i>nasal stop</i>	n									
<i>fricative</i>	s	sh		l	x	xw	ḵ	ḵw	h	hw
<i>ejective fricative</i>	sʼ			lʼ	xʼ	xʼw	ḵʼ	ḵʼw		
<i>unasp. affricate</i>	dz	j		dl						
<i>aspirated affricate</i>	ts	ch		tl						
<i>ejective affricate</i>	tsʼ	chʼ		tlʼ						
<i>approximant</i>			y		ɣ	w				

Table 8: Consonants in the first Naish-Story orthography.

2.7. THE NAISH-STORY ORTHOGRAPHY

2.7.1. FIRST VERSION

[[Earliest attempt from the the Gospel of John and the first Noun Dictionary. Vowels based on standardized English pronunciations. Uses digraphs to indicate length, but not like “double-vowel” system used for Navajo since vowels are English-based. The exception is long /a:/ which is monographic ⟨a⟩_{NI}, inconsistent with digraphic length. Diacritics mark low/plain/high tones in a tone register system that accords roughly with Transitional dialect. /ʌ/ is ⟨u⟩_{NI} and /ʊ/ is ⟨o⟩_{NI}. Word-final monographic vowels are represented with vowel + ⟨h⟩_{NI} digraph, because “the one-letter vowels in Tlingit seem to be harder to read at the ends of words” (Naish & Story 1963, xiv). Indeterminate final vowels are written long.]]

In the early 1960s linguists Constance Naish and Gillian Story visited Angoon to document Tlingit under the auspices of the Summer Institute of Linguistics. Their major publications began with their Master’s theses published at the School of Oriental and African Studies, University of London, in 1966. One of the goals of their work was to determine the feasibility and utility of a Bible translation for Tlingit, and as a consequence to develop an orthography and basic written materials for the language community.

The first widely available publication in their new orthography was the *English-Tlingit Dictionary: Nouns* (Naish & Story 1963) which was a thematically arranged selection of English nouns and their Tlingit counterparts. It included seventeen pages on the orthography and gave English equivalents where possible. An additional published work in this orthography is the Tlingit translation of the Gospel of John (Anonymous 1969), which contains 130 pages of dense Tlingit text.

This orthography which I call “Naish-Story 1” or *NI* is given in tables 8 and 9. It was specifically designed to accompany preexisting literacy in English, and so has a number of peculiarities not found in orthographies for other Pacific Northwest Coast or Athabaskan languages. The most obvious reflex of English orthography is in the representation of vowels, where /i:/ is written ⟨ee⟩ and /u:/ is written ⟨oo⟩ (Naish & Story 1963). The other vowels follow suit, with the use of ⟨u⟩ for /ʌ/ explained by the English example “dust”, ⟨i⟩ for /ɪ/ by E. “fish”, ⟨ei⟩ for /e:/ by E. “vein”, ⟨e⟩ for /ɛ/ by E. “nest”, and ⟨o⟩ by E. “wolf”. The long vowel /a:/ is peculiar, since instead of a digraph it is represented with a monographic ⟨a⟩, and explained by English “calm”.

Another peculiarity of vowel representation was in the use of vowel + ⟨h⟩ digraphs for short vowels and the aberrant monographic long vowel ⟨a⟩. These digraphs only occur in word-final position, and their use is explained because “the one-letter vowels in Tlingit seem to be harder to read at the ends of words” (Naish & Story 1963, xiv). Examples given in the dictionary include ⟨hàt kutíh⟩ /hà:t kʰʌtʰí/ “bring it (round obj.)”, and ⟨doo shúh⟩ /tu: ʃá/ “3SG.POSS head” for the short vowels, and ⟨sháh⟩ /ʃá:/ “women” for the monographic long vowel /a/.

The use of digraphs ⟨ch⟩, ⟨sh⟩, ⟨ts⟩, and ⟨dz⟩ are again clearly influenced by English orthography. What may not be so clear a derivation from English writing is the representation of the unaspirated obstruents with graphemes that represent voiced obstruents in English. An alternative might have been to give the unaspirated obstruents with their IPA equivalent, and to use a digraph with ⟨h⟩ to represent the aspirated stops. However, English speakers routinely perceive unaspirated obstruents as voiced [cite?], and English speakers are unlikely to mistake aspirated obstruents for anything else. Thus it is a simple mapping from voiced obstruents in English to unaspirated obstruents in Tlingit. In addition, since the Boasian transcriptions used variations of ⟨d⟩_B and ⟨g⟩_B to represent unaspirated obstruents, *NI* could be seen as following in the Boasian tradition.

Since *NI* was developed in the era of ubiquitous typewriters, it uses the underscore diacritic ⟨_⟩ to differentiate velar from uvular consonants; thus ⟨k⟩ is velar /kʰ/ but ⟨k⟩ is uvular /qʰ/. Using a diacritic to differentiate the velars from uvulars is a good compromise in one sense because the division between them is rather

tone	height	long/tense			short/lax		
		front	central	back	front	central	back
low	close	èe		òo	ì		ò
	mid	èi			è		
	open		a			ù	
plain	close	ee		oo	i		o
	mid	ei			e		
	open		a			u	
high	close	ée		óo	í		ó
	mid	éi			é		
	open		á			ú	

Table 9: Vowels in the first Naish-Story orthography.

large and this takes 10 consonants out of the problem of mapping a consonant heavy system to a limited number of Latin alphabet glyphs. In addition, typing an underscore diacritic with a typewriter is relatively easy by backspacing and overstriking. As we will see in later sections, this seemingly obvious choice at the time causes some difficult problems when computer technology intervenes.

2.7.2. SECOND VERSION

[[Next revision in the Verb Dictionary. Still uses low/plain/high tones. Changed /Λ/ to ⟨a⟩_{N2} and /U/ to ⟨u⟩_{N2}. Discarded ⟨h⟩_{N1} on vowels. Final vowels still usually long.]]

In the end, *N1* was a peculiar first attempt. It managed to capture the major phonemic distinctions in a one sound–one symbol correspondence that is supposed to be the linguistic ideal for an orthography. However, its internal inconsistencies and somewhat arbitrary design make it clumsy and difficult to learn. Naish and Story were clearly aware of this fact after having used it for some time, and hence developed the second version of their orthographic system. This system I represent as *N2*.

2.8. THE REVISED POPULAR ORTHOGRAPHY

[[Introduced (?) in the revised Noun Dictionary. Uses only low/high tones. Final vowels now short except for determiners and some particles. Dauenhauers later

(ca. 1990s) shift to short vowels for determiners and particles. Also note ⟨l⟩_{RP} used for occasional /l/ in contrast with /ɬ/.]]

tone	height	long/tense			short/lax		
		front	central	back	front	central	back
low	close	ee		oo	i		u
	mid	ei			e		
	open		aa			a	
high	close	ée		óó	í		ú
	mid	éi			é		
	open		áa			á	

Table 10: Vowels in the Revised Popular orthography.

Ḡ ḡ	Ḡ ḡ	Ḡ Ḡ	Ḡ ḡ

Table 11: Variations of the unaspirated uvular stop /q/ in the Revised Popular orthography.

2.9. LEER'S TRANSCRIPTION

[[His first work with Tongass Tlingit ca. 1979 introduces signs for the unique vowel qualities.]]

[[His PhD dissertation features a transcription system which supplies both the quaternary Tongass vowel qualities and the Northern binary tone and binary length all on the same grapheme.]]

	front	central	back
close	i		u
mid	e		
open		a	

Table 12: Leer's vowels.

	<i>Citation</i>	<i>Tongass</i>	<i>Sanya-Henya</i>	<i>Two-Tone</i>
<i>upstep</i>	ǃ	v	ǃ	ǃ
<i>non-upstep</i>	v	v	ǃ~v	v
	v'	v' ([v:])	v·	v·
	ǃ'	v' ([vʔ])	ǃ·	ǃ·
<i>upstep</i>	ǃ·	v· ([v:])	ǃ·	ǃ·
<i>non-upstep</i>	v·	v·	ǃ·	v·

Table 13: Leer's vowel quality symbols (1991:13).

	<i>alveolar</i>	<i>postalveolar</i>	<i>palatal</i>	<i>lateral</i>	<i>velar</i>	<i>labial-velar</i>	<i>uvular</i>	<i>labial-uvular</i>	<i>glottal</i>	<i>labial-glottal</i>
<i>unaspirated stop</i>	d				g	g ^w	ɠ	ɠ ^w	ʔ	ʔ ^w
<i>aspirated stop</i>	t				k	k ^w	q	q ^w		
<i>ejective stop</i>	t'				k'	k' ^w	q'	q' ^w		
<i>nasal stop</i>	n									
<i>fricative</i>	s	š		ɬ	x	x ^w	χ	χ ^w	h	h ^w
<i>ejective fricative</i>	s'			ɬ'	x'	x' ^w	χ'	χ' ^w		
<i>unasp. affricate</i>	ʒ	ʒ̣		ɮ						
<i>aspirated affricate</i>	c	č		ɮ̣						
<i>ejective affricate</i>	c'	č'		ɮ̣'						
<i>approximant</i>			y		ɥ	w				

Table 14: Leer's consonants (1991:10).

2.10. THE CANADIAN ORTHOGRAPHY

[[Development by Jeff Leer and John Ritter. Similarity with Athabaskan orthographies in the Yukon Territory. Introduces digraph ⟨kh⟩_C for ⟨k⟩_{RP}, etc. New vowel quality system denotes both tone and length using quaternary set of diacritics.]]

	<i>bilabial</i>	<i>dental/alveolar</i>	<i>postalveolar</i>	<i>palatal</i>	<i>lateral</i>	<i>velar</i>	<i>labial-velar</i>	<i>uvular</i>	<i>labial-uvular</i>	<i>glottal</i>	<i>labial-glottal</i>
<i>unaspirated stop</i>		d				g	gw	gh	ghw	.	.w
<i>aspirated stop</i>		t				k	kw	kh	khw		
<i>ejective stop</i>		t'				k'	k'w	kh'	kh'w		
<i>nasal stop</i>	m	n									
<i>fricative</i>		s	sh		ɬ	x	xw	xh	xhw	h	hw
<i>ejective fricative</i>		s'			ɬ'	x'	x'w	xh'	xh'w		
<i>unasp. affricate</i>		dz	j		dɬ						
<i>aspirated affricate</i>		ts	ch		tɬ						
<i>ejective affricate</i>		ts'	ch'		tɬ'						
<i>approximant</i>				y		ÿ	w				

Table 15: Consonants in the Canadian orthography.

tone	height	long/tense			short/lax		
		<i>front</i>	<i>central</i>	<i>back</i>	<i>front</i>	<i>central</i>	<i>back</i>
<i>low</i>	<i>close</i>	ì		ù	i		u
	<i>mid</i>	è			e		
	<i>open</i>		à			a	
<i>high</i>	<i>close</i>	î		û	í		ú
	<i>mid</i>	ê			é		
	<i>open</i>		â			á	

Table 16: Vowels in the Canadian orthography.

2.11. THE “E-MAIL” ORTHOGRAPHY

[[Difficulty with underscore diacritic. Use of postposed underscore character ⟨ ⟩_E, e.g. ⟨k ⟩_E for /q^h/. Shift to use of ⟨h⟩_E to represent underscore as with Canadian, so ⟨kh⟩_E for /q^h/. Independent development or influenced by Canadian? Using underscore sequence leaves apparent word break and is thus distracting, hence shift.]]

[[Unresolved problem with sequential collisions, e.g. ⟨kh⟩ vs. ⟨k⟩+⟨h⟩ (cf. ⟨k̲⟩_R vs. ⟨k⟩_R+⟨h⟩_R). Naish-Story handles this with a “breaking” ⟨.⟩.]]

[[Use of accents is inconsistent, depending on whether a particular writer has their computer configured to type acute accents easily. Discuss problems with computer input methods.]]

[[Use of HTML e-mail makes possible underscore using markup. HTML e-mail is still fairly unpopular and is inconsistent between different e-mail programs. Distinction between writing and markup. Major problem with using markup for orthography is that markup is not reliably preserved in transformations like cut-and-paste, encoding conversion, file format conversion, etc.]]

3. CRITICISM

[[Completeness, effectiveness, and consistency. Completeness is correspondence with the phonetic or phonological sound inventory. Effectiveness is the ease of learning and use for a native speaker. Consistency is the regularity between different transcriptions.]]

[[Problems with familiarity. Problems with complexity. Problems with diacritics. Problems with alphabet ordering.]]

[[Comparisons between orthographies.]]

<i>Gloss</i>	<i>Transcription</i>	<i>N1</i>	<i>N2</i>	<i>RP</i>	<i>C</i>	<i>E</i>
worm	/tʰók ^{hw} χ ^w /	tʰókw̲	tʰúkw̲	tʰúkw̲	tʰúkw̲h	tʰúkw̲h
lunch	/ɰú:w/	ȳóow	ȳóow	ȳóow	ÿúw	ÿóow
cranberry	/k ^h Δx ^w é:χ/	kuxwéi̲	kaxwéi̲	kaxwéi̲	kaxwêxh	kaxwéixh
person	/q ^h á:/	káh	káa	káa	khâ	kháa
vest	/ʔʊʔtʃíni/	l.oljini	l.uljini	l.uljini	ł.uljini	l.uljini
its tail flipper	/ʔΛ ki:ní/	uh gèeni	a gèeni	a geení	a gini	a geení

Table 17: Comparison of selected orthographies.

4. CONCLUSIONS

[[How many methods of writing have been used historically?]]

[[Usage today: the three competing systems.]]

[[Continuing inconsistencies and spelling problems in academia. Intentional illiteracy among native speakers.]]

Although Mr. [Louis] Shotridge has learned to employ the phonetic system which has been devised and approved by the most experienced

investigators for recording native languages, it is not employed in the writing of Chilkat [Tlingit] words which occur in the article now published. To write native words in unfamiliar characters repels the eye of all but the student familiar with the system employed. In writing the native words, therefore, the twenty-six letters of our alphabet are employed in such combinations as will give the nearest approach they are capable of giving to the phonetics of the Tlingit language. (Anonymous 1913)

[[Influences of the orthographic voiced-voiceless distinction on L2 learners, in contrast to the actual unaspirated-aspirated distinction among native speakers. Possible rise of voiced-voiceless among the youngest speakers — informal observation but no formal tests yet.]]

[[Why did so many orthographies develop? One possible reason is the phonetic peculiarity of the language, even in comparison with other Northwest Coast indigenous languages. Another reason is the Not Invented Here (NIH, see Jargon File) syndrome, where each group rejects outside developments in favor of internal projects.]]

5. REFERENCES

- Anonymous. 1913. "Notes". *The Museum Journal (Univ. of Penn.)* 4(3): 114.
- 1969. *Dikée Ankáwoo doo Yéet dàt John-ch kawshixidee Yoox'utúnk: The gospel of John in the Tlingit language*. Santa Ana, Calif.: Wycliffe Bible Translators.
- Beck, David. 2006. "The emergence of ejective fricatives in Upper Necaxa Totonac". Vol. 1 in *University of Alberta working papers in linguistics*. Edmonton: University of Alberta.
- Boas, Franz. 1917. *Grammatical notes on the language of the Tlingit indians*. Vol. 8 in *University Museum Anthropological Publications*. Philadelphia: University of Pennsylvania.
- Dauenhauer, Nora Marks, & Richard Dauenhauer. 1987. *Haa shuká, our ancestors: Tlingit oral narratives*. Vol. 1 in *Masterpieces of Tlingit oral literature*. Seattle: University of Washington Press. ISBN 0-295-96495-2.
- 1990. *Haa tuwunáagu yís: For healing our spirit*. Vol. 2 in *Masterpieces of Tlingit oral literature*. Seattle: University of Washington Press. ISBN 0-295-96850-8.
- 1994. *Haa kusteeyí, our culture: Tlingit life stories*. Vol. 3 in *Masterpieces of Tlingit oral literature*. Seattle: University of Washington Press. ISBN 0-295-97401-X.
- 2000. *Beginning Tlingit*. 4th edn. Juneau, Alaska: Sealaska Heritage Foundation Press. ISBN 0-9679311-1-8.

- Davydov, Gavriilo Ivanovich. 1977. *Two voyages to Russian America: 1802–1807*. No. 10 in *Materials for the study of Alaska history*, Richard A. Pierce, ed. Kingston, Ontario: Limestone Press. Orig. *Двукратное путешествие в Америку морскихъ офицеровъ Хвостова и Давыдова, писанное симъ последнимъ*, St. Petersburg 1810. ISBN 0-919642-75-6.
- De La Grasserie, Raoul. 1902. *Cinq langues de la Colombie Britannique: Haïda, Tshimshian, Kwagiutl, Nootka et Tlinkit*. Vol. 24 in *Bibliothèque Linguistique Américaine*. Paris: J. Maisonneuve.
- De Laguna, Frederica. 1960. *The story of a Tlingit community: A problem in the relationship between archaeological, ethnological, and historical methods*. Vol. 172 in *Smithsonian Institution Bureau of American Ethnology Bulletins*. Washington, DC: U. S. Government Printing Office.
- 1972. *Under Mount Saint Elias: The History and Culture of the Yakutat Tlingit*. Vol. 7 (in three parts) in *Smithsonian Contributions to Anthropology*. Washington, DC: Smithsonian Institution Press.
- 1990. “Tlingit”. Pp. 203–228 in Suttles, Wayne, ed. (1990).
- Durlach, Theresa Mayer. 1928. *The relationship systems of the Tlingit, Haida, and Tsimshian*. Vol. 11 in *Publications of the American Ethnological Society*, Franz Boas, ed. New York: American Ethnological Society.
- Dürr, Michael, & Egon Renner. 1995. “The history of the Na-Dene controversy: A sketch with an addendum by Heinz-Jürgen Pinnow”. Pp. 3–25 in Dürr, Michael, Egon Renner, & Wolfgang Oleschinski, eds. (1995).
- Dürr, Michael, Egon Renner, & Wolfgang Oleschinski, eds. 1995. *Language and culture in native North America: Studies in honor of Heinz-Jürgen Pinnow*. No. 2 in *Studies in Native American linguistics*. Munich: Lincom. ISBN 3-8956-004-2.
- Emmons, George Thornton. 1991. *The Tlingit Indians*. Vol. 70 in *Anthropological papers of the American Museum of Natural History*. New York: American Museum of Natural History. Edited with additions by de Laguna, Frederica. ISBN 0-295-97008-1.
- Enrico, John. 2004. “Toward Proto-Na-Dene”. *Anthropological Linguistics* 46(3): 229–302.
- Goldschmidt, Walter R., & Theodore H. Haas. 1998. *Haa aaní, our land: Tlingit and Haida land rights and use*, Thomas F. Thornton, ed. Seattle: University of Washington Press. Orig. *Possessory rights of the natives of Southeastern Alaska*, 1946. ISBN 0-295-97639-X.
- Hinckley, Ted C. 1996. *The Canoe Rocks: Alaska's Tlingit and the Euroamerican frontier, 1800–1912*. Lanham, Maryland: University Press of America. ISBN 0-7618-0210-X.
- Holm, John A. 1989. *Pidgins and creoles. Cambridge languages surveys*. Cambridge: Cambridge University Press. ISBN 0-521-35940-6.
- Johnson, Samuel Victor. 1978. “Chinook Jargon: A computer assisted analysis of variation in an American Indian pidgin”. PhD dissertation. Lawrence, Kansas: University of Kansas.

- Kamenskii, Anatolii. 1985. *Tlingit Indians of Alaska*. Vol. 2 in *The Rasmuson Library Historical Translation Series*. Fairbanks, Alaska: University of Alaska Press. Orig. *Индиане Аляский*. ISBN 0-912006-18-8.
- Kan, Sergei. 1989. *Symbolic Immortality: The Tlingit Potlatch of the Nineteenth Century*. *Smithsonian Series in Ethnographic Inquiry*. Washington, D.C.: Smithsonian Institution Press. ISBN 1-56098-309-4.
- Keithahn, Edward L. 1940. *The Authentic History of Shakes Island and Clan*. Wrangell, Alaska: Wrangell Historical Society.
- Kelly, William A., & Frances H. Willard. 1905. "Grammar and vocabulary of the Hlingit language of Southeastern Alaska". In: *Report of the Commissioner of Education*. Vol. 1. *Annual reports of the Department of the Interior for the fiscal year ended June 30, 1904*. Washington, D.C.: U.S. Government Printing Office. Ch. 10, pp. 715–766.
- Krause, Aurel. 1956. *The Tlingit Indians. Results of a trip to the Northwest Coast of America and the Bering Straits*. No. 26 in *American Ethnological Society Monographs*. Seattle: University of Washington Press. Orig. *Die Tlinkit-Indianer*, Jena 1885. ISBN 0-295-95075-7.
- Lapérouse, Jean François de Galaup. 1937. *Le voyage de Lapérouse sur les côtes de l'Alaska et de la Californie*. Vol. X in *Historical documents – Institut Français de Washington*, Gilbert Chinard, ed. Baltimore: Johns Hopkins Press.
- Leer, Jeff. 1991. "The Schetic Categories of the Tlingit Verb". PhD dissertation. Chicago, Illinois: University of Chicago.
- Leer, Jeff, Doug Hitch, & John Ritter. 2001. *Interior Tlingit noun dictionary: The dialects spoken by Tlingit elders of Carcross and Teslin, Yukon, and Atlin, British Columbia*. Whitehorse, Yukon: Yukon Native Language Center. ISBN 1-55242-227-5.
- Liedtke, Stefan. 1995. "The etymology of Tlingit tʰukw̥x̄". Pp. 161–172 in Dürr, Michael, Egon Renner, & Wolfgang Oleschinski, eds. (1995).
- Maddieson, Ian, Caroline L. Smith, & Nicola Bessell. 2001. "Aspects of the phonetics of Tlingit". *Anthropological Linguistics* 43(2): 135–176.
- Mithun, Marianne. 1999. *Languages of native North America*. Cambridge: Cambridge University Press. ISBN 0-521-23228-7.
- Muir, John. 1915. *Travels in Alaska*. Boston: Houghton Mifflin.
- Nadezhdin, Ivan. 1896. *Sbornik (selections) of church hymns and prayers*. Orig. *Сборникъ церковныхъ пѣснопѣний и молитвословій на колошинскомъ нарѣчїи*. Digital version by All Saints of North America Orthodox Church, 2005. San Francisco. URL: <http://www.asna.ca/alaska/tlingit/sbornik-tlingit.pdf>.
- Naish, Constance M. 1966. "A syntactic study of Tlingit". MA thesis. School of Oriental, African Languages, University of London.
- Naish, Constance M., & Gillian L. Story. 1963. *English-Tlingit dictionary: Nouns*. 1st edn. Fairbanks, Alaska: Summer Institute of Linguistics.
- 1973. *Tlingit verb dictionary*. Fairbanks, Alaska: Alaska Native Language Center. ISBN 0933769253.

- Naish, Constance M., Gillian L. Story, Henry Davis, & Jeff Leer. 1976. *English-Tlingit dictionary: Nouns*. 2nd edn. Sitka, Alaska: Sheldon Jackson College.
- Nyman, Elizabeth, & Jeff Leer. 1993. *Gagiwduł.àt: Brought forth to reconfirm. The legacy of a Taku River Tlingit clan*. Fairbanks, Alaska: Alaska Native Language Center. ISBN 1-55500-048-7.
- Oberg, Kalervo. 1940. "The social economy of the Tlingit Indians". PhD thesis. Chicago: University of Chicago, Dept. of Anthropology.
- Olson, Ronald LeRoy. 1967. *Social Structure and Social Life of the Tlingit in Alaska*. Vol. 26 in *University of California Anthropological Records*. Berkeley: University of California Press.
- Story, Gillian L. 1966. "A morphological study of Tlingit". MA thesis. London: School of Oriental, African Languages, University of London.
- Suttles, Wayne, ed. 1990. *Northwest Coast*. Vol. 7 in *Handbook of North American Indians*. Washington, DC: Smithsonian Institution Press. ISBN 978-0-160203-90-9.
- Swanton, John R. 1908. *Social condition, beliefs, and linguistic relationship of the Tlingit Indians*. Washington, D.C.: U.S. Government Printing Office.
- 1909. *Tlingit myths and texts*. Vol. 39 in *Bulletins of the Smithsonian Institution Bureau of American Ethnology*. Washington, D.C.: U.S. Government Printing Office.
- 1911. "Tlingit". Pp. 159–204 in, ed. (1911).
- Thomason, Sarah G. 1983. "Chinook Jargon in areal and historical context". *Language* 59(4): 820–870.
- Tsunoda, Tasaku. 2005. *Language endangerment and language revitalization*. Vol. 148 in *Trends in linguistics: Studies and monographs*. Berlin: Mouton de Gruyter. ISBN 3-11-017662-9.
- Velten, Henry. 1939. "Two southern Tlingit tales". *International Journal of American Linguistics* 10(2/3): 65–74.
- Veniaminov, Ivan. 1846. *Observations about the Tlingit & Kodiak (Alutiiq) languages*. Orig. *Замѣчанія о колошенскомъ и кадѣяскомъ языкахъ и отчасти о прочихъ россійско-американскихъ, съ присовокупленіемъ россійско-колошенскаго словаря, содержащаго болѣе 1000 словъ, изъ коихъ на нѣкоторыя сдѣланы поясненія*. Digital version by All Saints of North America Orthodox Church, 2007. St. Petersburg.
- 1901. *Indication of the pathway into the kingdom of Heaven*. Orig. *Указаніе пути въ царствіе небесное: Ка-вак-шіи ев-у-ту-ци-ни-и дте тику ан-ка-у хан-те*. Digital version by All Saints of North America Orthodox Church, 2005. Translated into Tlingit by S.I. Kostromitinov. Sitka, Alaska.
- Williams, Frank, Emma Williams, & Jeff Leer. 1978. *Tongass Texts*. Fairbanks, Alaska: Alaska Native Language Center.
- Wrangell, Ferdinand Petrovich. 1980. *Russian America: Statistical and ethnographic information*. No. 15 in *Materials for the study of Alaska history*, Richard A. Pierce, ed.

Kingston, Ontario: Limestone Press. Orig. *Statistische und ethnographische Nachrichten über die Russische Besitzungen an der Nordwestküste von Amerika*, St. Petersburg 1839.
Young, Samuel Hall. 1886. "The first book in the Tlinkit language". *The Glacier* 1(9): 9.
Actual volume, number, and date is uncertain. From Alaska State Museum archives.

6. APPENDIX: WORDLISTS

This appendix contains selected items from the two extensive wordlists published by Wrangell in 1839 (Wrangell 1980).

<i>English</i>	<i>German Words</i>	<i>Russian Words</i>	<i>Tlingit Words</i>	
	<i>Deutsche Wörter</i>	<i>Russische Wörter</i>	<i>Koloschische Wörter</i>	<i>IPA transcription</i>
	<i>Нѣмецкія слова</i>	<i>Русскія слова</i>	<i>Колошскія слова</i>	
“morning”	Morgen	Утро	Цуу-тагъ	/ts ^h u:t ^h á:t/
“noon”	Mittag	Полдень	Яки-еи	/jak ^h (j)í:ji/*
“evening”	Abend	Вечеръ	Ха-анна	/xá:nɒ/
“midnight”	Mitternacht	Полночь	Татъ-к[е/г]инъ	/t ^h ɒtkí:n/
“person”	Mensch	Человѣкъ	Тлиנקитъ	/ɬŋkít/
“boy”	Knabe	Ребенокъ	Туканеги	/t ^h ok ^h ɒné:ki/*
“old man”	Greis	Старикъ	Шаанъ	/ʃa:n/*
“old woman”	Altes Weib	Старуха	Шааншаутъ	/ʃa:n ʃa:wát/*
“head”	Kopf	Голова	Ахша	/ʔɒx ʃá/
“face”	Gesicht	Лицо	Ахыга	/ʔɒx ɕá/
“mouth”	Mund	Ротъ	Ахъе	/ʔɒx x'é/
“tongue”	Zunge	Языкъ	Тлюгъ	/ʔú:t/
“ear”	Ohren	Уши	Ахкукъ	/ʔɒx kók/
“finger”	Finger	Пальцы	Ахкекъ	/ʔɒx t ^h é:q/
“(finger)nails”	Nägel	Ногти	Ахъ-хаку	/ʔɒx xak ^w /
“shoulder”	Schulter	Плечо	Ахъ-хыкъ	/ʔɒx xík/
“stone”	Stein	Камень	Те	/t'é/
“mud”	Lehm	Глина	Ссе	/s'é/
“tree”	Baum	Дерево	Ась	/ʔa:s/
“wolverine”	Vielfrass	Россомаха	Ну-ускъ	/nu:sk ^w /
“Dall sheep”	Wildes Schaaf	Дикой баранъ	Чану[?]ъ	/tʃɒnwu:/
“reindeer”	Rennthier	Олень	Вот-цыхъ	/wɒtsíx/

Table 18: Selected words from Wrangell’s Tlingit word list.

<i>English</i>	<i>German Deutsch Нѣмецкія слова</i>	<i>Russian Russisch Русскія слова</i>	<i>Tlingit in Sitka Koloschen am Sitcha Колошѣ Ситхенск</i>	<i>IPA transcription</i>
“sun”	Sonne	Солнце	Каканъ	/qaká:n/
“moon”	Mond	Мѣсяць	Тысь	/tís/
“stars”	Sterne	Звѣзды	Кухтанагы	/kʰútχʔɬjɒɒɒhɬ/
“clouds”	Wolke	Облако	Куць	/kú:s’/
“thunder”	Donner	Громъ	Хетль	/xe:tɬ/
“lightning”	Blitz	Молнія	Гатьликуку-хетль	/ʔú:kχʊ xe:tɬ/?
“snow”	Schnee	Снѣгъ	Тлѣтъ	/tɬe:t/
“rain”	Regen	Дождь	Сіу	/sí:w/
“ice”	Eis	Ледъ	Тыкъ	/t’íx’/
“water”	Wasser	Вода	Гинъ	/hín/
“river”	Fluss	Рѣка	Инъ-тлѣнь	/hín tɬʰe:n/
“cold”	Kalt	Холодно	Кусыатъ	/qʰʊsɪʔá:t’/

Table 19: Selected words from Wrangell’s comparative Alaskan list.

7. APPENDIX: PHONEME CHARTS

This section contains all of the phoneme charts for the various transcriptions and orthographies mentioned in the paper. Charts which have already been given in the text are repeated here for convenience. Some orthographies or transcriptions do not have a clear phonemic structure; in such cases the systems are presented as simple lists of symbol-sound correspondences.

	<i>bilabial</i>	<i>dental/alveolar</i>	<i>postalveolar</i>	<i>palatal</i>	<i>lateral</i>	<i>velar</i>	<i>labial-velar</i>	<i>uvular</i>	<i>labial-uvular</i>	<i>glottal</i>	<i>labial-glottal</i>
<i>unaspirated stop</i>		t				k	k ^w	q	q ^w	ʔ	ʔ(ʔ ^w)
<i>aspirated stop</i>		t ^h				k ^h	k ^{hw}	q ^h	q ^{hw}		
<i>ejective stop</i>		tʼ				kʼ	kʷ	qʼ	qʷ		
<i>nasal stop</i>	(m)	n									
<i>fricative</i>		s	ʃ		ʎ	x	x ^w	χ	χ ^w	h	ʔ(h ^w)
<i>ejective fricative</i>		sʼ			ʎʼ	xʼ	xʷ	χʼ	χʷ		
<i>unasp. affricate</i>		ts	tʃ		tʎ						
<i>aspirated affricate</i>		ts ^h	tʃ ^h		tʎ ^h						
<i>ejective affricate</i>		tsʼ	tʃʼ		tʎʼ						
<i>approximant</i>				j		ʔ(ɥ)	w				

Table 20: The phonemic consonants of Tlingit in IPA notation.

<i>height</i>	<i>long/tense</i>			<i>short/lax</i>		
	<i>front</i>	<i>central</i>	<i>back</i>	<i>front</i>	<i>central</i>	<i>back</i>
<i>close</i>	i:		u:	ɪ		ʊ
<i>mid</i>	e:			ɛ		
<i>open</i>		a:			ʌ	

Table 21: The phonemic vowels of Tlingit in IPA notation. Phonemic tones vary among dialects.

	<i>dental/alveolar</i>	<i>postalveolar</i>	<i>palatal</i>	<i>lateral</i>	<i>velar</i>	<i>labial-velar</i>	<i>uvular</i>	<i>labial-uvular</i>	<i>glottal</i>
<i>unaspirated stop</i>	d				g	g ^o ~g ^u	g̤	g̤ ^o ~g̤ ^u	—
<i>aspirated stop</i>	t				k	k ^o ~k ^u	q	q ^o ~q ^u	
<i>ejective stop</i>	t!				k!	k! ^o ~k! ^u	q!	q! ^o ~q! ^u	
<i>nasal stop</i>	n								
<i>fricative</i>	s	c		ɬ	x	x ^o ~x ^u	ɣ	ɣ ^o ~ɣ ^u	h
<i>ejective fricative</i>	s!			—	(k!)	(k! ^o ~k! ^u)	(q!)	(q! ^o ~q! ^u)	
<i>unasp. affricate</i>	dz	dj		ɮ					
<i>aspirated affricate</i>	ts	tc		ɮ					
<i>ejective affricate</i>	ts!	tc!		ɮ!					
<i>approximant</i>			y		y	w			

Table 22: Swanton's consonants (Swanton 1911).

tone	height	long/tense			short/lax		
		<i>front</i>	<i>central</i>	<i>back</i>	<i>front</i>	<i>central</i>	<i>back</i>
<i>low</i>	<i>close</i>	ī		ū~ō	i~î		u~o
	<i>mid</i>	ē			e~ê		
	<i>open</i>		ā~a			A~a~ê	
<i>high</i>	<i>close</i>	ī́		ū́~ṓ	í~î́		ú~ó
	<i>mid</i>	ḗ			é~ế		
	<i>open</i>		ā́			Á~á	

Table 23: Swanton's vowels (Swanton 1911).

	<i>dental/alveolar</i>	<i>postalveolar</i>	<i>palatal</i>	<i>lateral</i>	<i>velar</i>	<i>labial-velar</i>	<i>uvular</i>	<i>labial-uvular</i>	<i>glottal</i>
<i>unaspirated stop</i>	d				g	g ^u	g̤	g̤ ^u	ʔ
<i>aspirated stop</i>	t ^h				k ^h	k ^h u	q ^h	q ^h u	
<i>ejective stop</i>	tʼ				kʼ	kʷ	qʼ	qʷ	
<i>nasal stop</i>	n								
<i>fricative</i>	s	c		ɬ	x	x ^u	ɣ	ɣ ^u	h
<i>ejective fricative</i>	sʼ			ɬʼ	xʼ	x ^u	ɣʼ	ɣ ^u	
<i>unasp. affricate</i>	dz	dj		ɮ					
<i>aspirated affricate</i>	ts	tc		ɮ					
<i>ejective affricate</i>	tsʼ	tcʼ		ɮʼ					
<i>approximant</i>			y		y	w			

Table 24: Boas's consonants (Boas 1917; Durlach 1928).

tone	height	long/tense			short/lax		
		<i>front</i>	<i>central</i>	<i>back</i>	<i>front</i>	<i>central</i>	<i>back</i>
<i>low</i>	<i>close</i>	ì		ù	ì		ù
	<i>mid</i>	è			è		
	<i>open</i>		à			à	
<i>high</i>	<i>close</i>	í		ú	í		ú
	<i>mid</i>	é			é		
	<i>open</i>		á			á	

Table 25: Boas's vowels (Boas 1917; Durlach 1928).

	<i>dental/alveolar</i>	<i>postalveolar</i>	<i>palatal</i>	<i>lateral</i>	<i>velar</i>	<i>labial-velar</i>	<i>uvular</i>	<i>labial-uvular</i>	<i>glottal</i>
<i>unaspirated stop</i>	d				g	g ^w	ɢ	ɢ ^w	ʔ
<i>aspirated stop</i>	t				k	k ^w	q	q ^w	
<i>ejective stop</i>	t̥				k̥	k̥ ^w	q̥	q̥ ^w	
<i>nasal stop</i>	n								
<i>fricative</i>	s	c		ɬ	x	x ^w	χ	χ ^w	h
<i>ejective fricative</i>	s̥			ɬ̥	x̥	x̥ ^w	χ̥	χ̥ ^w	
<i>unasp. affricate</i>	dz	ʃ		dʃ					
<i>aspirated affricate</i>	ts	tc		tʃ					
<i>ejective affricate</i>	t̥s̥	t̥c̥		t̥ʃ̥					
<i>approximant</i>			y		ɣ	w			

Table 26: De Laguna's earlier consonants (De Laguna 1972).

<i>tone</i>	<i>height</i>	<i>long/tense</i>			<i>short/lax</i>		
		<i>front</i>	<i>central</i>	<i>back</i>	<i>front</i>	<i>central</i>	<i>back</i>
<i>low</i>	<i>close</i>	ì		ù	ì		ù
	<i>mid</i>	é			É		
	<i>open</i>		à			À	
<i>plain</i>	<i>close</i>	i		u	I		U
	<i>mid</i>	e			E		
	<i>open</i>		a			A	
<i>high</i>	<i>close</i>	í		ú	í		ú
	<i>mid</i>	é			É		
	<i>open</i>		á			Á	

Table 27: De Laguna's earlier vowels (De Laguna 1972).

	<i>dental/alveolar</i>	<i>postalveolar</i>	<i>palatal</i>	<i>lateral</i>	<i>velar</i>	<i>labial-velar</i>	<i>uvular</i>	<i>labial-uvular</i>	<i>glottal</i>
<i>unaspirated stop</i>	d				g	g ^w	g̤	g̤ ^w	ʔ
<i>aspirated stop</i>	t				k	k ^w	q	q ^w	
<i>ejective stop</i>	t̥				k̥	k̥ ^w	q̥	q̥ ^w	
<i>nasal stop</i>	n								
<i>fricative</i>	s	š		ɬ	x	x ^w	x̤	x̤ ^w	h
<i>ejective fricative</i>	s̥			ɬ̥	x̥	x̥ ^w	x̤̥	x̤̥ ^w	
<i>unasp. affricate</i>	ʒ	ʒ̥		λ					
<i>aspirated affricate</i>	c	č		λ̥					
<i>ejective affricate</i>	c̥	č̥		λ̥̥					
<i>approximant</i>			y		ɣ	w			

Table 28: De Laguna's later consonants (Emmons 1991).

<i>tone</i>	<i>height</i>	<i>long/tense</i>			<i>short/lax</i>		
		<i>front</i>	<i>central</i>	<i>back</i>	<i>front</i>	<i>central</i>	<i>back</i>
<i>low</i>	<i>close</i>	i·		u·	i		u
	<i>mid</i>	e·			e		
	<i>open</i>		a·			a	
<i>high</i>	<i>close</i>	í·		ú·	í		ú
	<i>mid</i>	é·			é		
	<i>open</i>		á·			á	

Table 29: De Laguna's later vowels.

	<i>alveolar</i>	<i>postalveolar</i>	<i>palatal</i>	<i>lateral</i>	<i>velar</i>	<i>labial-velar</i>	<i>uvular</i>	<i>labial-uvular</i>	<i>glottal</i>	<i>labial-glottal</i>
<i>unaspirated stop</i>	d				g	g ^w	ɠ	ɠ ^w	ʔ	ʔ ^w
<i>aspirated stop</i>	t				k	k ^w	q	q ^w		
<i>ejective stop</i>	t'				k'	k' ^w	q'	q' ^w		
<i>nasal stop</i>	n									
<i>fricative</i>	s	ʃ		l	x	x ^w	x̣	x̣ ^w	h	h ^w
<i>ejective fricative</i>	s'			l'	x'	x' ^w	x̣'	x̣' ^w		
<i>unasp. affricate</i>	ʒ	ʒ̣		ʎ						
<i>aspirated affricate</i>	c	č		ʎ						
<i>ejective affricate</i>	c'	č'		ʎ'						
<i>approximant</i>			y	ÿ	w					

Table 30: Leer's consonants (1991:10).

	<i>dental/alveolar</i>	<i>postalveolar</i>	<i>palatal</i>	<i>lateral</i>	<i>velar</i>	<i>labial-velar</i>	<i>uvular</i>	<i>labial-uvular</i>	<i>glottal</i>	<i>labial-glottal</i>
<i>unaspirated stop</i>	d				g	gw	ɢ	ɢw	.	.w
<i>aspirated stop</i>	t				k	kw	ᵑ	ᵑw		
<i>ejective stop</i>	tʼ				kʼ	kʼw	ᵑʼ	ᵑʼw		
<i>nasal stop</i>	n									
<i>fricative</i>	s	sh		l	x	xw	ɣ	ɣw	h	hw
<i>ejective fricative</i>	sʼ			lʼ	xʼ	xʼw	ɣʼ	ɣʼw		
<i>unasp. affricate</i>	dz	j		dl						
<i>aspirated affricate</i>	ts	ch		tl						
<i>ejective affricate</i>	tsʼ	chʼ		tlʼ						
<i>approximant</i>			y		ɣ	w				

Table 31: Consonants in the first Naish-Story orthography.

tone	height	long/tense			short/lax		
		<i>front</i>	<i>central</i>	<i>back</i>	<i>front</i>	<i>central</i>	<i>back</i>
<i>low</i>	<i>close</i>	èè		òò	ì		ò
	<i>mid</i>	èi			è		
	<i>open</i>		a			ù	
<i>plain</i>	<i>close</i>	ee		oo	i		o
	<i>mid</i>	ei			e		
	<i>open</i>		a			u	
<i>high</i>	<i>close</i>	ée		óó	í		ó
	<i>mid</i>	éi			é		
	<i>open</i>		á			ú	

Table 32: Vowels in the first Naish-Story orthography.

	<i>bilabial</i>	<i>dental/alveolar</i>	<i>postalveolar</i>	<i>palatal</i>	<i>lateral</i>	<i>velar</i>	<i>labial-velar</i>	<i>uvular</i>	<i>labial-uvular</i>	<i>glottal</i>	<i>labial-glottal</i>
<i>unaspirated stop</i>		d				g	gw	ɢ	ɢw	.	.w
<i>aspirated stop</i>		t				k	kw	ᵑ	ᵑw		
<i>ejective stop</i>		tʰ				kʰ	kʰw	ᵑʰ	ᵑʰw		
<i>nasal stop</i>	m	n									
<i>fricative</i>		s	sh		l	x	xw	ɣ	ɣw	h	hw
<i>ejective fricative</i>		sʰ			lʰ	xʰ	xʰw	ɣʰ	ɣʰw		
<i>unasp. affricate</i>		dz	j		dl						
<i>aspirated affricate</i>		ts	ch		tl						
<i>ejective affricate</i>		tsʰ	chʰ		tlʰ						
<i>approximant</i>				y		ÿ	w				

Table 33: Consonants in the Revised Popular orthography.

tone	height	long/tense			short/lax		
		<i>front</i>	<i>central</i>	<i>back</i>	<i>front</i>	<i>central</i>	<i>back</i>
<i>low</i>	<i>close</i>	ee		oo	i		u
	<i>mid</i>	ei			e		
	<i>open</i>		aa			a	
<i>high</i>	<i>close</i>	ée		óó	í		ú
	<i>mid</i>	éi			é		
	<i>open</i>		áa			á	

Table 34: Vowels in the Revised Popular orthography.

	<i>bilabial</i>	<i>dental/alveolar</i>	<i>postalveolar</i>	<i>palatal</i>	<i>lateral</i>	<i>velar</i>	<i>labial-velar</i>	<i>uvular</i>	<i>labial-uvular</i>	<i>glottal</i>	<i>labial-glottal</i>
<i>unaspirated stop</i>		d				g	gw	gh	ghw	.	.w
<i>aspirated stop</i>		t				k	kw	kh	khw		
<i>ejective stop</i>		t'				k'	k'w	kh'	kh'w		
<i>nasal stop</i>	m	n									
<i>fricative</i>		s	sh		ɬ	x	xw	xh	xhw	h	hw
<i>ejective fricative</i>		s'			ɬ'	x'	x'w	xh'	xh'w		
<i>unasp. affricate</i>		dz	j		dɬ						
<i>aspirated affricate</i>		ts	ch		tɬ						
<i>ejective affricate</i>		ts'	ch'		tɬ'						
<i>approximant</i>				y		ÿ	w				

Table 35: Consonants in the Canadian orthography.

tone	height	long/tense			short/lax		
		<i>front</i>	<i>central</i>	<i>back</i>	<i>front</i>	<i>central</i>	<i>back</i>
<i>low</i>	<i>close</i>	ì		ù	i		u
	<i>mid</i>	è			e		
	<i>open</i>		à			a	
<i>high</i>	<i>close</i>	î		û	í		ú
	<i>mid</i>	ê			é		
	<i>open</i>		â			á	

Table 36: Vowels in the Canadian orthography.

	<i>bilabial</i>	<i>dental/alveolar</i>	<i>postalveolar</i>	<i>palatal</i>	<i>lateral</i>	<i>velar</i>	<i>labial-velar</i>	<i>uvular</i>	<i>labial-uvular</i>	<i>glottal</i>	<i>labial-glottal</i>
<i>unaspirated stop</i>		d				g	gw	gh	ghw	.	.w
<i>aspirated stop</i>		t				k	kw	kh	khw		
<i>ejective stop</i>		t'				k'	k'w	kh'	kh'w		
<i>nasal stop</i>	m	n									
<i>fricative</i>		s	sh		l	x	xw	xh	xhw	h	hw
<i>ejective fricative</i>		s'			l'	x'	x'w	xh'	xh'w		
<i>unasp. affricate</i>		dz	j		dl						
<i>aspirated affricate</i>		ts	ch		tl						
<i>ejective affricate</i>		ts'	ch'		tl'						
<i>approximant</i>				y		ÿ	w				

Table 37: Consonants in the E-mail orthography.

tone	height	long/tense			short/lax		
		<i>front</i>	<i>central</i>	<i>back</i>	<i>front</i>	<i>central</i>	<i>back</i>
<i>low</i>	<i>close</i>	ee		oo	i		u
	<i>mid</i>	ei			e		
	<i>open</i>		aa			a	
<i>high</i>	<i>close</i>	ée		óó	í		ú
	<i>mid</i>	éi			é		
	<i>open</i>		áa			á	

Table 38: Vowels in the E-mail orthography.