

ON THE PHONOLOGICAL DESCRIPTION OF THE
HEILTSUK LANGUAGE

by

John C. Rath

The aim of this paper is to discuss the various problems connected with finding a system of phonemes in terms of which heard Heiltsuk speech can satisfactorily be represented in written form.

The division of the paper is as follows. After the presentation of general information (Chapter 1), and of a methodological digression about the standard of satisfactoriness to be applied (Chapter 2), a survey is offered of the various symbols used in narrow transcriptions of elicited Heiltsuk speech (Chapter 3). Follows an inventory of regularities and singularities observed with the occurrences of those symbols (Chapter 4) and, finally, the step-by-step reconstruction of the observations in phonological terms proper (Chapter 5).

1. Introductory

1.1 The empirical data to be discussed in this paper were collected in summer 1972, by Frits H. Kortlandt, and in summer 1973, by the present writer. In both cases the research was financially supported by the Netherlands Organization for the Advancement of Pure Research (Z.W.O.); in the latter case additional support was granted by the Band Council of Bella

Bella.

Under the title of "Tones in Wakashan", a report by Mr. Kortlandt on his findings is included in the Dutch Contributions to the 8th International Conference on Salish Languages. It is worth mentioning here already that the conjecture about Heiltsuk preserving ancient characteristics has gained further plausibility.

Though in the second period of field-work the bulk of was supplied by Mr. William S. Freeman, who had also been informant to Mr. Kortlandt, and by Mr. Angus Campbell, the contributions of Mr. Willie Gladstone and of Mr. Marshal and Mrs. Evelyn Windsor should not go unmentioned.

1.2 Heiltsuk is a northern member of the Wakashan family of languages. Whatever the origin of the name 'Heiltsuk', as the language is nowadays spoken both in Bella Bella and in Klemtu (British Columbia), it is a better name than 'Bella Bella (language)'.

Phonologically, but in any case morphologically Heiltsuk is closely related to the Kwakiutl language as described by Franz Boas.¹⁾ Unfortunately the relationship to the languages spoken in Rivers Inlet and in Kitimat is as yet virtually unknown. From Boas information on this point is hard to draw, as it is unclear how far he distinguished between Heiltsuk proper and the language of Rivers Inlet.

For instance, in the Introduction to his Kwakiutl grammar Boas writes: (205)

North of the Kwakiutl area, beginning at Rivers Inlet another dialect of the language is spoken which differs considerably from the Kwakiutl here discussed. The languages are not easily mutually intelligible, partly on account of differences in vocabulary, partly on account of differences in grammatical forms.

This is a peculiar passage. First the author says that north of the Kwakiutl area just another "dialect" is spoken of "the language". But what can be meant by "the language" here? Hardly Kwakiutl, for then Boas' words would imply that Kwakiutl is also spoken where it is not spoken. Let us therefore assume that the whole first sentence in the quoted passage is a slip of the pen which has been subsequently corrected by Boas' speaking of mutually unintelligible languages.

Still, we then look in vain for a definition of that language

that Boas must have assumed was spoken "north of the Kwakiutl area". Further, there is no suggestion on Boas' part that this supposed language is actually a group of languages comprising Heiltsuk and the languages of Rivers Inlet and Kitimat.

That Boas did not draw a sharp distinction between Heiltsuk and the language of Rivers Inlet can be concluded to from the second Appendix to his Kwakiutl grammar. This Appendix (296-299) purports to be about "the Bella Bella dialect", as Boas calls it, and has actually been a major source of inspiration for the elaboration of the Heiltsuk deictic system. But roughly adequate though the first deictic paradigms in the Appendix are (apart from all phonological questions, that is), on page 299 a paradigm is presented which is less adequate and in fact conflicts with a corresponding earlier one. (297) The subsequent talk of "the closely related dialect of Rivers Inlet" and the wider context of the paradigm suggest that either two appendices have been lumped together, or Boas neglected the difference between Heiltsuk and the language of Rivers Inlet.

Evidence in favour of the latter conclusion is provided by the series of stories Boas has edited under the title of Bella Bella Texts.²⁾ In the Preface to this edition Boas says that

In the present village of the Bella Bella all the different tribes of that group have been assembled and there is a considerable variety of pronunciation among the divisions of the tribe. (.....) It was remarkably difficult to obtain any kind of connected texts and for this reason it seemed advantageous to read to the natives the Rivers Inlet texts previously [in the Preface] referred to, which were then repeated by the Bella Bella. Most of this work was done with one informant, Willy Gladstone. The differences between the two dialects are very slight. [my italics]

Now attempts to have the stories retold met with difficulty. This can of course be due to a culturally determined reluctance to 'telling stories one does not own', and also to bad pronunciation on my part. For not in one supposed Heiltsuk text does Boas indicate the pitch-pattern of the words, and pitch is phonemic in Heiltsuk. But more likely is that Mr. Gladstone, who actually speaks both Heiltsuk and the language of Rivers Inlet, repeated Boas' dictations in the latter language again.³⁾

Unfortunately Mr. Gladstone does not remember the details of his cooperation with Boas. But the fragments of other

stories than his own which I tried to read to him, were identified by him as in the language of Rivers Inlet. Moreover, the vocabulary to the Texts contains many words Boas explicitly marks as Heiltsuk, but that Mr. Freeman identified as in the Rivers Inlet language.

In sum, Boas is less reliable as a guide in the matter of the relationships between Kwakiutl and its northern neighbour-languages. The best we can do at present is therefore to rank Kwakiutl, Heiltsuk, and the languages of Rivers Inlet and Kitimat on equal footing as as many 'North-Wakashan' languages. This in its turn implies that just as 'North-Wakashan' is to be preferred to the genealogically biassed term 'Kwakiutlic', 'South-Wakashan' is to be used as a neutral generic term instead of 'Nootkan'.

2. Methodology

2.1 In a recent reprint of his article "Aspects of Prosodic Analysis", ⁴⁾ R.H. Robins argues for what he calls the 'nominalist' view of the nature of the phoneme as against the 'realist' and 'conceptualist' views.

As he points out (190), in the realist view it is assumed that "phonemes exist in some way in languages apart from the work of the analyst". Consequently, this analyst could be said to be finding a system of phonemes in a quite literal sense.

In the conceptualist view this idea of phonemes somehow existing in advance of phonemic analysis is given a more toned-down version by explaining 'somehow existing' as 'existing in the mind of the speaker of the language concerned'.

The nominalist view, finally, opposes both of the former in that it rejects the very talk of existence in connection with phonemes, and replaces it by talk of the practical usefulness of the word 'phoneme' for the systematic description of a corpus of linguistic data. What could be said to exist are sheets of paper with narrow transcriptions on one side and their respective meanings (expressed in some meta-language) on the other. As Robins himself puts it, in the nominalist view

Phonemes, like all other technical terms in linguistics, take their place as part of the linguist's 'language about language', and no more than that.

Acceptance of the first two points of view implies acceptance of the idea "that there is only one accurate phonemic analysis of any one set of data" (190).

Acceptance of the nominalist view, on the other hand, commits to the idea that (191)

No one analysis, or mode of analysis, is the only one accurate or sacrosanct, but any account of the language, in any terms, is an adequate statement and analysis, provided that, and to the extent to which, it comprehensively and economically explains what is heard (and read) in the language, and 'renews connection' with further experience of it. Questions of truth and falsity of 'what is there' and 'what is not there', only arise on the view here set out at the level of the barest phonetic observation and recording, before any analysis has taken place.

As Robins goes on to say, a particular consequence of the nominalist view is admission of the possibility of phonological analysis not in terms of phonemes at all. If 'phoneme' is but a useful word, so too could be 'syllable' and notably the key-words 'prosody' and 'phonematic unit' in the approach to phonological analysis initiated by Firth.

Also, phonemic and non-phonemic phonological analyses may be conceived of as complementary. To quote Robins once again, (191)

It is, however, legitimate to claim that from its origin the phoneme concept has been primarily tied to transcription, the representation of a language in terms of its phonic material by means of discrete and consecutive letters or symbols on paper (.....), and that in consequence of this, phoneme theories have necessarily concentrated on minimal contrast in identical environment, emphasizing the paradigmatic aspect of phonological relationships at the expense of the syntagmatic (...) aspect (...). Where a language is unwritten, or where the orthography is far from adequate as a key to pronunciation, a phonemic analysis may well be indispensable as the basis of a workable transcription unburdened with the excess of different symbols required in a narrow impressionistically 'accurate' phonetic transcription. But phonological analysis need not stop at or be based on phonemic transcription.

So much for Robins' paper, now for the standpoint adhered to in mine.

2.2 The extensiveness of the above quotations actually indicates approval. I consider myself a 'nominalist' in Robins' sense of that word, if only because to my mind the 'realist' view is difficult to understand, whereas the 'conceptualist' view uncomfortably reminds one of a dated sort of psychology.

For granting that regularities in speech sounds are connected with regularities in the brain processes involved in producing and perceiving speech, the idea that the connection is actually a one-to-one correspondence goes wholly unsubstantiated and is not even plausible. Such an idea is on a par with postulating that perceiving a visual shape, say a letter, amounts to the brain finding a 'template' to match the stimulus-complex emitted by that letter.⁵⁾

For the rest, the main consequence of my nominalism for the analysis to follow shortly, is that I shall not hesitate to call on morphological evidence in cases where (my) phonological reasoning leaves room for alternative transcriptions. Should morphological evidence be inconclusive or even non-existent, the 'safest' transcription will be advanced, that is, the one with redundant symbols.

3. Survey of Symbols Used in Narrow Transcriptions

3.1 Use of the following adapted I.P.A.-symbolism appeared necessary in field-notations:

	Consonants								
	Plosives			Fricatives	Nasals			Glides	
	Plain	Aspirated	Glottalized		Plain	Pre-Glottalized	Con-Glottalized	Plain	Glottalized
bilabial	b	p	p̚		m	m̥	m̩	w	w̥
dental-alveolar	d	t	t̚		n	n̥	n̩		
alveolar				s					
affricate-alveolar	z	c	c̚						
lateral				ɬ	l	l̥	l̩		
affricate-lateral	ɮ	ɮ̥	ɮ̚						
palatal								y	y̥
palatal-velar	g	k	k̚	x					
velar-labialized	g ^o	k ^o	k̚ ^o	x ^o					
uvular	ʁ	q	q̚	χ					
uvular-labialized	ʁ ^o	q ^o	q̚ ^o	χ ^o					
laryngeal			ʔ	h					

Apart from the use of one more symbol: h , and his not mentioning something like the phenomenon I call 'conglottalization', Boas draws similar distinctions for Kwakiutl. In view however of some of his wordings in the Kwakiutl grammar, it should be emphasized that in Heiltsuk all plosives are as a rule voiceless, granted the occurrence of voiced allophones of the plain and (very rarely) the glottalized ones. Fricatives too are voiceless, except [h] that sounds as in German and Dutch. [h] has been ranked as a fricative only because IPA does so.

With plosives, aspiration is heavy, whereas glottal release is weak. Much as Boas has pointed out for Kwakiutl (209), the difference between aspirated and non-aspirated plosives is one that is easier to notice than the difference between plain and glottalized plosives.

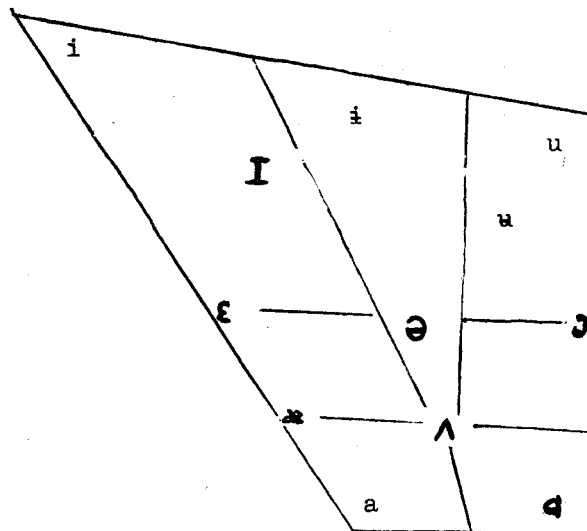
The pre-glottalization of nasals and glides is not easy to hear either. But the case is somewhat different with conglottalization, for here the presence of glottal stricture goes hand in hand with lengthening of resonance of the nasal.

Though $\text{[p, t, c, \lambda]}$ have a sound-value that could be approximated by writing $\text{[b^h, d^h, z^h, \lambda^h]}$, with [k, k^o, q, q^o] the aspiration amounts to genuine friction. Thus, for instance, [k] would have to be approximated by [g^x] .

Notably in Mr. Freeman's speech, [g^o] sometimes approximated [q^o] , though the difference was never really blurred.

Aspiration of fricatives was interpreted as an immediately following [h] . Though never really clearly, this [h] could sometimes actually be heard separately.

The set of vowels heard is this.



Because of its frequent occurrence, the symbol 'a' is used instead of 'u' for the convenience of typewriting.

Not mentioned in the chart are the diphtongs [ɛi] and [au]. Their sound-value is not quite constant. Most conspicuously in Mr. Campbell's speech, [ɛi] may approximate [ai] on the one hand and a longish [e] on the other. Further, [au] may not be distinguishable from [ou], and may even reach [o]. The only regularity observed in these sound-fluctuations was that [e] occurs more frequently after [h]. But even in this position it appeared to be just an allophone of [ɛi]. For the sake of convenience these diphtongs will therefore henceforward be written 'ey' and 'aw', as has also been done by Mr. Kortlandt in his mentioned report.

For the rest, all this wealth of vowels can without much ado be reduced to just [a, ʌ, ə, i, u, ey, aw]. This will be shown in the next chapter. Still further reduction is a matter of phonological interpretation in the stricter sense, but is not difficult either.

3.2 Prosodic features noted were pitch, length, and accent (stress). Pitch is indicated as a concomitant feature of a vowel. The rare cases where this device could not be applied, are presented in 4.19.

Broadly speaking, pitch is either high or low, and in words that do not exclusively consist of consonants (as e.g. [qqs] 'eye'), at least one high or low tone is heard. But 'high' and 'low' should not be taken in an absolute sense. Rather the words 'high' and 'low' stand for rising and falling of tone, respectively, whereas the 'starting-point' of the rise or fall may be higher with one elicited word than with another, even from one and the same informant.

In themselves, high and low pitch are easy enough to render by means of the superscripts ' and ` , respectively. But also is needed a notational device to render the peculiar pitch-pattern of items such as [dəna] 'to pull', and [tənik^o] 'cold'. In these items only one 'peak of pitch' can be heard. To indicate this sort of pitch-pattern, I use the notation [dǎná], [tǎník^o]. Thus, [dǎná] represents a start of the pitch at 'neutral' level, while the rise proper takes place with [a]. One could try to depict the pitch-pattern in question with [dǎna].

Other items with this pitch-pattern are for instance
 [ˈgɪlǎ] 'to go on all fours', [ˈʒǎnǎlǎ] 'packing and
 carrying on the arm', [ˈqʰǎlǎ] 'to live', [ˈsɪyǎ]
 'hair', [ˈʒʰwǎ] 'raven'.

[ˈdɪyǎ] 'to wipe' and [ˈčuwǎ] 'to give' also have
 but one, [ˈkʰuwǎbǔwǎ] '(man's) shirt' but two peaks of
 pitch. In all these cases, however, where the vowels
 forming a 'pitch-unit' are separated by a plain glide,
 the localization of the peak of the pitch is undeterminable.

Further, the mark " as an indication of neutral
 pitch, has sometimes to be used twice in succession, as
 in [ˈsxsbǎʔǎlǎ] 'to sharpen a knife', [ˈnǎlǎʔǎyǎs]
 'east'.

Also with an element of neutral pitch is the item
 [ˈpǎlpǎlǎ] 'to blink repeatedly'.

Finally, neutral pitch is frequently heard before an
 occurrence of glottalization. For instance in the item
 [ˈdǎn2úłłfǎlǎ] 'to pull the seine from the boat to the
 float'. The sound-value of this item could be characterized
 as lying in between * [ˈdǎnʰúłłfǎlǎ] and
 * [ˈdǎnnʰúłłfǎlǎ] (though more on the side of the latter).
 That is, one hears one stretch of slightly prolonged
 nasal resonance, shortly after the start of which
 glottal stricture occurs but without actually interrupting
 the resonance.

3.2.1 Greater length characterizes [ˈá, í, ú, à, ì, ù] ; the
 remaining vowels of the chart always sound shorter. How long
 exactly the former vowels sound is subject to considerable
 variation. In emphatic speech, the high-pitched ones are half-long
 to long; the low-pitched ones are as rule slightly shorter. This
 apparently automatic shortening becomes more extreme after
 glottalized consonants, with some speakers at least. Thus, Mr.
 Freeman pronounces [ˈwǎ:çǎ] 'dog', but Mr. Campbell [ˈwǎ:çǎ].
 In rapid speech one may even hear [ˈwǎçǎ], with a first vowel
 that is hardly distinguishable from [ˈǎ]. A related phenomenon
 was observed by Boas in Kwakiutl. (207)

Worth mentioning is also that with some speakers rounding and

spreading of the lips in producing [ʔu] and [ʔi], respectively, is less pronounced than for instance with Mr. Freeman. Actually these vowels then tend towards [ʔu/o] and [ʔɪ/e], and may even resemble allophones of the diphthongs [ʔaw] and [ʔey].

3.2.2 Accent can be heard in words with a pitch-contour as exemplified by the following items: (1) [ʔhəwma] 'to ask a question', (2) [ʔtɪnɪqà] 'to sweat', (3) [ʔlɛqeywála] 'cap'. The place of the accent, however, appears to be a matter of dialect.

The first item is pronounced identically by all informants, viz. [ʔhəwma]. This, incidentally, is another reason why even [ʔdɪyá] could not be written * [ʔdɪyá]. The latter spelling suggests a sort of prominence of one part of the word which [ʔdɪyá] actually lacks.

Now in pronouncing the other two items Mr. Freeman maintains the accent with the first high-pitched vowel, and one hears him say [ʔtɪnɪqà], [ʔlɛqeywála]. But from Mr. Campbell one hears [ʔtɪnɪqà], [ʔlɛqeywála]. In his case the rise of the pitch is less high with the unaccented vowel(s) than with the accented one, which could even cause an impression of neutral or low initial pitch.

3.3 At any rate, both length and accent are linked with pitch and predictable. In the transcriptions hereafter they are not indicated, unless for special purposes.

Pitch, for that matter, is no doubt phonemic, witness the occurrence of the following pairs.

[ʔkʰas]	'mussels'	[ʔkʰis]	'sitting together on the beach'
[ʔkʰàs]	'sitting outside'(sg.)	[ʔkʰìs]	'sitting together on the ground (outside)'
[ʔhəwla]	'small thing' (sg.)		
[ʔhəwla]	'small things'		
[ʔyákɪla]	'to spoil something'		
[ʔyákɪla]	'to spoil the reputation of another person'		

Also important are the pairs:

[ʔwàwà]	'of the same size or age'	[ʔʔɪlɛàsú]	'to be killed'
[ʔwàwá]	'allies'	[ʔʔɪlɛàsù]	'you kill'

[^hʔúpíǵǎ_] 'one shin-bone' [^hǵ^oáǐǐflá_] 'to finish'
 [^hʔùpíǵǎ_] 'both shin-bones' [^hǵ^oáǐǐlǎ_] 'finished'

However, as will be shown in the chapters to follow, the ways in which pitch distinguishes words are less easy to state than the fact that it does.

4. Analysis of the Data

Still in IPA-terms, the following states the correlations holding between the occurrences of the symbols in the corpus.

4.1 Glottalized consonants of whatever kind, [^hʔ_], and plain plosives do not occur word-finally.

4.2 Plain and glottalized plosives are bound to the following positions:

- (a) word-initially;
- (b) after a fricative;
- (c) after an aspirated plosive (in this position they do not occur too frequently. Examples: [^hpk^oàs_] 'wild man, Sasquatch' [^hhámczù_] 'table');
- (d) after a vowel or diphthong;
- (e) after a nasal (that is then always preceded by a vowel or diphthong. Examples: [^hlámdu_] 'Klentú' , [^hmáxémtǎ_] 'boxing').

4.3 (Pre-)glottalized nasals and glides occur

- (a) word-initially;
- (b) after a fricative;
- (c) after a vowel or diphthong provided yet another vowel or diphthong follows, as in [^hʔúbeyǎ_] 'point of land';
- (d) after a nasal (that is preceded by a vowel or diphthong), as in [^hǵílwǎ_] 'canoe', [^hlámhǎzi_] 'to be tied up alongside another boat'.

As for position (a), Mr. Freeman frequently says [^h#ʔüw..._] where Mr. Campbell has [^h#w'..._]. Thus, one hears [^hʔüwíkinǎx^o_] vs. [^hwíkinǎx^o_] ('people of Rivers Inlet'). Inversely, it is from Mr. C. that [^hʔiyǎlá_] ('waving the hands') was heard, whereas Mr. F. pronounced [^hyǎlá_].

About position (c) it is to be noted that the preceding vowel must be long, as in [ʔíhá] 'jackpine'; ooligan-grease', [dútilálá] 'to report (to a group)', [háya] 'to hide oneself'. In the exceptions to this rule, the short vowel has low pitch, while its presence is due to one or another sort of variation. For instance, one hears [náhánáyú] 'sling' (Mr. C.) and [náhánáyú] (Mr. F.); [láláxstwá] 'to put putty into the seams' (Mr. F.) and [láláxstwá] (Mr. C.).

4.3.1 Conglottalized nasals are as a rule preceded by a short vowel, the pitch of which is but the onset of a pitch-pattern such as one hears in [dǎhá] and [síyá], or in [sxsbǎlá]. However, in emphatic speech this vowel may obtain special relief and sound low-pitched. Thus, one now hears [zúsǎl2íyfm] 'spade', now [zúsǎl2íyfm]; now [k^oǎl2ís] 'to lie down on the beach', now [k^oǎl2ís]. An item with one high and one low pitch-peak is [bábǎl2à] 'jealous (sexually)'. In emphatic speech it may reach the value [bábǎl2à].

Rare are the cases of conglottalization preceded by a high-pitched short vowel, viz. [ǎm2ǎxtbǎ] 'plugged feeling in the nose when you have caught a cold', [zízǎpǎn2ǎxsǎm] 'Japanese woman', [hǎn2ǎgǎwǎey] 'two boats tied up to each other'.

4.4 [ʔ] is always followed by some vowel. The sequence of [ʔ] plus a vowel, seen as a whole, occurs (a) word-initially, (b) after a fricative (with peculiarities to be discussed later), and (c) after a vowel or diphthong. Examples: [ǎw^ok] 'pity', [sǎlǎlút] 'to blame someone', [pǎǎǎnt] 'to lay a board flat on a log', [ǎǎǎsúlf] 'hellebore', [heýǎeyǎzǎq^olǎ] 'to speak Heiltsuk' (pl.)

After [ʔ], the vowel written [ǎ] usually approximates [ǎ].

4.5 After [s] one may or may not hear a short vowel before the sequence of plain nasal or glide plus long vowel. Thus, one may hear both [sǎlá] and [slǎ] 'to drill'. Consider also the alternation of the sequences [..síy..] and [..sý..], as illustrated by [kǎxǎsǎyáyú] 'a saw' and [ǎxǎsǎyǎáwt] 'to pull a boat up the rocky shore'.

4.6 As also pointed out by Mr. Kortlandt in his mentioned report, consonants may form clusters. The final member of a cluster may be any consonant, and the first may be a plain nasal (cf. $[-múmg^0\hat{a}twà]$ 'ear ornament'), but for the rest no other components are allowed but aspirated plosives, or fricatives.

Further, clustering of consonants is possible throughout the word, as illustrated by $[-ccxstwá]$ 'to wipe tears from the eyes', $[-mí\hat{a}la\hat{w}t]$ 'to move s.th. over on the table', $[-ma\hat{w}x^0\hat{a}y\hat{a}xc\hat{x}^0]$ 'that (invisible) cat there-with-you'.

Not found were the clusters $^*[-..ss..]$, $^*[-..cs..]$, $^*[-..ls..]$, $^*[-..t\hat{x}..]$

4.7 After $[-u]$ and $[-aw]$, no palatal velars or unlabialized uvulars can immediately follow, only labialized ones can.

$[-\hat{x}\hat{a}\hat{x}^0\hat{a}q^0\hat{a}x^0t]$ 'red spring salmon', which alternates with $[-\hat{x}\hat{a}\hat{x}^0\hat{a}q^0\hat{a}xt]$, presents a case of 'progressive' labialization of the $[-\hat{x}]$ in connection with vowel-reduction. For the second occurrence of $[-\hat{a}]$ in these items must be taken to correspond with the vowel in the suffix $\{^1\hat{a}x\hat{d}\}$. (About vowel-reduction, see also 3.2.1)

4.8 Different than in Kwakiutl (Boas, p. 214), in Heiltsuk labialized velars and uvulars may precede $[-u]$. In addition to the already mentioned item $[-g^0\hat{u}k^0]$, the following are important examples:

$[-k^0\hat{u}x^0\hat{a}]$ 'warm, hot' (cf. $[-k^0\hat{u}w\hat{a}b\hat{i}w\hat{a}]$ '(man's) shirt')
 $[-x^0\hat{u}m\hat{i}t\hat{a}]$ 'to see-saw' (cf. $[-k^0\hat{u}m\hat{i}s\hat{i}l\hat{a}m]$ 'completely dry creek')
 $[-q^0\hat{u}n\hat{a}]$ 'thumb' (cf. $[-\hat{x}^0\hat{u}n\hat{a}]$ 'to pay', $[-q^0\hat{u}m\hat{a}]$ 'avalanche')

On the other hand, a detail to be noted is that in the sequences $[-g^0\hat{u}]$, $[-k^0\hat{u}]$, and so on, there is but one prolonged labialization.

Word-initially, palatal velars followed by $[-u]$ are rare. $[-k\hat{u}k^0s\hat{x}t\hat{a}]$ 'to shave' and $[-k\hat{u}s]$ 'not to be the case', with their derivatives, are the only cases in point which can be cited from the corpus.

4.9 Let 'C₁' represent any consonant out of the following set (1), 'C₂' any consonant out of the set (2), and so on. Let 'C' represent any consonant out of any set, and let 'N' represent any nasal.

set (1)	b	p	p'	m	m'
	d	t	t'	n	n'
	z	c	c'	s	
	ʎ	ʂ	ʂ'	ɬ	ɬ'
set (2)					
g					
k					
k'					
x					
y					
y'					
set (3)					
g ^o					
k ^o					
k' ^o					
x ^o					
w					
w'					
set (4)					
ʒ					
q					
q'					
ʃ					
h					
ʔ					

The specifics of the occurrences of short vowels can then be stated as follows.

4.9.1 [ə̃] occurs in the position C₁ - N^C. Examples:
 ? - #

[ˈkbám] 'button', [ˈmáncà] 'to measure', [ˈbálx^olá] 'man from Bella Coola', [ˈʔáŋqlá] 'grunting (the act of ..)'.
 When not a reduced [ə̃] or [ə̃], [ə̃] occurs in the same position as [ə̃], but also in between those members of set (1) that cannot form a cluster. One finds [ˈpəl] 'thin and flat', [ˈməlgíwálà] 'pitlamping', [ˈmètá] 'quivering', [ˈʎəsná] 'branch', [ˈpəlpələ] 'to blink (repeatedly)'.

4.9.2 [ɪ̃] occurs in the position C₂ - N^C. Examples:
 ? - #

[ˈyíłxá] 'to rub, to smear', [ˈlíxɪ̃n] 'pole'. As well as in the positions of [ɪ̃], [ɪ̃] occurs in between non-clustering members of sets (1) and (2). Examples: [ˈkɪ̃lx] 'metal, iron', [ˈmɪ̃xá] 'to punch', [ˈpɪ̃xá] 'to make grooves (in wood)', [ˈkɪ̃sqás] 'lazy'.

Though rarely, [ɪ̃] may reach the value of [ə̃]. But as a rule, before and after consonants of set (2) the sound [ə̃] is excluded.

4.9.3 [ú̃] is not completely comparable with [ɛ̃, ɪ̃], since it only occurs in the position C₃ - N^C, as in [ˈwánxɛ̃] 'to sneak into a boat', [ˈk^oú̃łxá] 'to sleep on a boat'. Its sound-value may easily approximate [ú̃], except when C₃ is a labialized uvular, in which case a rather [ɛ̃]-resembling sound is heard. When the nasal is [m̃], one usually hears the cardinal vowel [ú̃], e.g. [ˈq^oú̃mxiwà].

'white man'.

[⁻à_], with a value ranging from [⁻ù_] to [⁻ə_] to [⁻ə_], parallels [⁻á_], as for instance in [⁻k^oáls_] 'lying down on the ground (outside)'. When the nasal is [⁻m_], one hears [⁻ù_] again: [⁻x^oúk^oúm_] '(Indian) rice'.

In view of the preceding sections one might expect [⁻à_] to occur between the non-clustering members of sets (1) and (3). In point of practice, however, in these positions it is not possible to determine whether what one hears is [⁻ù_] or [⁻à_].

Irrespective of pitch, cases of * .. $\begin{matrix} n & C \\ \uparrow & 1 \end{matrix} \#$ can be said not to occur in the corpus (but see 4.13).

As pointed out in 4.7 already, [⁻à_] may also be an allophone of [⁻à_]. With a value very close to [⁻ə_] it can be heard in [⁻leýnàk^o_] 'to go home' (Mr. F.), which alternated with [⁻leýnàk^o_] (Mr. C.).

In a few cases, [⁻ʔ_] is followed by [⁻ʔ^a_] (or [⁻ʔ^a_]), viz. in [⁻ʔ^am_] 'father' and [⁻ʔ^a_] '(and) then'. The former item alternates with [⁻ʔ^am_] (both in Mr. Freeman's and Mr. Campbell's pronunciation), the latter item was pronounced [⁻ʔ^awá_] by Mr. Gladstone. Also, there is [⁻ʔ^awáklà_] 'slow, to work slowly' on the one hand, and [⁻ʔ^aʔ^awáklà_] 'to take one's time' on the other.

4.9.4 [⁻ʔ_] occurs in the positions $\begin{matrix} C_1 \\ C_3 - n \end{matrix} \begin{matrix} 1 & C \\ \uparrow & \end{matrix} \#$.
C₄

Examples: [⁻nán_] 'grizzly bear', [⁻gilùdán_] 'horse', [⁻lǎǎ^obáls_] 'standing on the point of a ridge', [⁻qáncà_] 'to adze', [⁻núg^oánc_] 'we (incl.)', [⁻hánlám_] 'bow', [⁻ʔánx^oà_] 'bruised'.

When the nasal [⁻m_] occupies the position just indicated for [⁻l,n_], it is preceded by [⁻á_] rather than [⁻ʔ_].

Examples: [⁻hámsà_] 'to eat', [⁻ʔámlà_] 'to play', [⁻ʔásmà_] 'to badminton together'. It should not go unmentioned that otherwise than after C₄, [⁻.. $\begin{matrix} 1 \\ n \end{matrix}$.._] and particularly [⁻.. ám .._] are sometimes practically indistinguishable from the corresponding forms with [⁻ə_].

Boas made a similar point for Kwakiutl (214).

[⁻λ̥] (or [⁻ä], when the nasal is [⁻m]) occurs in the position C₄ - N^C_#, as in [⁻q̣älp̣tälä] 'pole or pile that has been driven very deeply', [⁻häṃgílä] 'cooking'. One of the rare cases of C₁ - N^C_# is [⁻ḷänṣḷänc̣ä] 'submarine'. Though [⁻λ̥] does occur between non-clustering members of sets (1) and (4), it cannot be distinguished from [⁻ä] in that position if one of the surrounding consonants is glottalized (cf. 3.2.1). Thus, one hears [⁻ṇäx̣ä] 'bucking the wind/the tide' (here the value of [⁻λ̥] is almost [⁻ä], and clearly distinguishable from the -short- [⁻ä] in [⁻zäx̣sṭäwt] 'to dye clothes'). But with [⁻ḷäq̣ä] 'to spread berries on a surface (to dry them)', [⁻ḷäq̣ḳ^o] 'sun-dried berries', [⁻q̣äsḳälä] 'to chew (chewing gum)', and so on, the sound-value of the [⁻λ̥] may also reach [⁻ä, ä].

4.9.5 [⁻é] occurs exclusively in the position C₂ - N^C_#. Instances of [⁻é] could not be found. Though [⁻ṭäỵäṣü] 'you get out of sight' is matched by [⁻ṭäỵämṣü] 'Yes, you get out of sight', [⁻ḥäỵäṣü] 'you hide yourself' is matched by [⁻ḥäỵämṣü]. Apparently [⁻é] and [⁻ī] correspond to [⁻ä, ä] and [⁻ä] in the same position but preceded by a C₁ or C₃. Thus, [⁻g̣éḷsṭüt] 'to make the first set' is an example comparable to [⁻ṭämḳ^oḳ^o] 'cured salmon eggs', whereas [⁻g̣ílt] 'long' is comparable to [⁻ṭäṃq̣^oä] 'to plunge'.

4.10 [⁻æ] is always preceded by a consonant of set (2), as in [⁻ḳäq̣ä] 'crow'. When low-pitched, its sound-value may reach [⁻ī]. One hears [⁻p̣eỵḳǟs] 'ten' (Mr. C.) and [⁻ḷeỵḳis] (Mr. F.). That [⁻æ] can be equated with [⁻a], can be seen from the alternation [⁻g̣äé̄lä] 'before' (Mr. C.), [⁻ḡälä] (Mr. F.).

In the position - C₂, one may hear a slightly diphthongal [⁻äi] instead of [⁻a]. In transcriptions this is taken for granted.

4.11 The low-pitched [⁻eȳ, äw̄] can only occur after a consonant of set (4), as in [⁻g̣eȳsq̣pm̄í] 'freckles' [⁻q̄äw̄sk̄] (?) 'this here is yours'. With high pitch, the diphthongs may occur after any consonant.

Although [⁻i, u], with either pitch, may occur after [⁻h, ʔ], these vowels never occur after the remaining members of set (4), i.e. the uvulars.⁶⁾

Before uvulars, [⁻ị[̣]] or [⁻ị[̣]] is heard rather than [⁻ị].

In transcriptions this is not given special attention either.

4.12 $[\bar{i}]$ is always an allophone of $[\bar{i}]$. Its occurrence can be illustrated as follows.

$[\bar{c}ak^o \bar{c}a\lambda] = [\bar{c}ak^o \bar{c}a] \text{ 'sea urchin'}$

$[\bar{w}ig^o \bar{i}sb\bar{a}] = [\bar{w}ig^o \bar{i}sb\bar{a}] \text{ 'eagle's nose'}$

$[\bar{x}^o \bar{f}q^o \bar{a}] = [\bar{x}^o \bar{f}q^o \bar{a}] \text{ 'to give a whistle'}$

4.13 With sequences of the type C V N C, such as they were presented in 4.9 ff., a short vowel of undeterminable pitch may be heard after the nasal if the following consonant is one of $[\bar{k}, k^o, q, q^o]$, and most noticeably so if it is one of $[\bar{x}, x^o, \bar{x}, \bar{x}^o]$.

Before $[\bar{x}^o]$ this vowel may reach a value as far near $[\bar{u}]$ as some variants of $[\bar{u}]$. Thus, shortness is the only characteristic distinguishing the second vowel in $[\bar{n} \bar{a} nux^o s\bar{a}m]$ 'date' (the fruit) from the second vowel in $[\bar{n} \bar{a} : n\bar{u} : x^o]$ 'to be concerned about a person'.

Before $[\bar{x}]$ one hears $[\bar{a} / \wedge]$, before $[\bar{x}]$: $[\bar{a} / \bar{x}]$, and before $[\bar{x}^o]$: $[\bar{a} / \bar{u}]$. Examples: $[\bar{k} \bar{x} l \bar{x}]$ 'metal, iron', $[\bar{g} \bar{a} m \bar{a} \bar{x} s \bar{a} m]$ 'left-handed person', $[\bar{q}^o \bar{s} l \bar{a} \bar{x}^o s \bar{a} s]$ 'wrenched ankle'.

For the sake of economy, these vowels too have been kept out of transcriptions.

4.14 After the vowel $[\bar{a}]$, free variation was noted between $[\bar{w} \bar{u} \dots]$ and $[\bar{u} \dots]$; after both $[\bar{a}]$ and $[\bar{u}]$, between $[\bar{y} \bar{i} \dots]$ and $[\bar{i} \dots]$. Thus,

Standard item (by morphological criteria)	Variant
$[\bar{l} \bar{a} w \bar{u} n \bar{a} m]$ 'husband'	$[\bar{l} \bar{a} f \bar{u} n \bar{a} m]$
$[\bar{l} \bar{a} y \bar{i} n \bar{u} x^o]$ 'someone good at long-lining (for halibut)	$[\bar{l} \bar{a} f \bar{i} n \bar{u} x^o]$
$[\bar{p} \bar{u} y \bar{i} l \bar{a} k^o]$ 'home-made bread'	$[\bar{p} \bar{u} f \bar{i} l \bar{a} k^o]$

$[\bar{i}]$ in the last two items is slightly more open than $[\bar{i}]$, and shorter as well. But it does not reach $[\bar{x}]$. As for pitch, the sequences * $[\bar{w} \bar{u} n \bar{a} m]$ and * $[\bar{y} \bar{i} n \bar{u} \dots]$ etc. are like $[\bar{d} \bar{a} n \bar{a}]$ (cf. 3.2).

When followed by the sequence $\bar{x} N C$, $[\bar{y}]$ is always in

free variation with [ʔ]. Thus, besides [háyimsù] 'Yes, you hide yourself', one has [háʔimsù]; besides [làyinc] 'Do we (inc.)?' one has [làʔinc]. In the available corpus this sequence does not occur word-initially. The sequence w u N C does, but only within the word is it liable to a similar sort of variation. For instance, one hears [ʔuʔálxʔit] 'to do for a second time' as well as [ʔuʔálxʔit] (or even [ʔuʔálxʔit] -cf. 4.3.1).

4.15 Furthermore, after [x^o] and [x̥^o] glottal stricture may interrupt rather than follow the resonance due to liprounding, and hence sound somewhat like [w̥]. For instance, 'white' (said of an animal) is something in between [múx^oʔán] and [múx^owán]. Similarly, though one hears [tálxʔit] 'to open up', the morphologically related item 'to strike (as with a bat)' is something in between [tálx^oʔit] and [tálx^owit].

With [x̥ápx^oʔú] 'little child' one however hears an 'isolated' [ʔ].

4.16 Not only in the items mentioned in 4.14, but also in cases such as [kíxʔáná] 'to play the violin' and [ʔálxʔáyúk^o] 'murdered person' one encounters the pitch-pattern of [dóná]. Items such as [sxs báʔá] 'to sharpen a knife' and [mèlèʔáyás] 'east' have been referred to in 3.2 already.

4.17 Between [ʔ] and plosives or fricatives, only long vowels can occur.

Excluded are the sequences u^a_i, i^a_u, aⁱ_u, otherwise than as instances of free variation mentioned in 4.14

After [ʔ], [ə] may undergo the shortening that is otherwise characteristic of glottalized plosives. Hence, in [ʔálaʔx̥^osúlí] 'hellebore' and [ʔáʔeʔnfx̥] 'eyebrows' the first vowel may approximate [ʔ.ə]. But as a rule, [ʔ] cannot be preceded by short vowels.

4.18 After [x̥], the sequences [ʔi] and [ʔu] do not occur, only [ʔey] and [ʔaw] (with either pitch).

4.19 [h] occurs in the following positions: (a) word-initially, as in [hímás] 'chief', [húq^oà] 'to vomit', [hixálá] 'fast, speed'; (b) after a long vowel, as in [ʔuhú] '(unidentified small black sea-bird)', [híʔfhí] 'they-down-there'; (c) after a fricative, as in the reduplicated form [húx^ohúx^oà] 'to

whistle (at intervals, as a boat does)'. Voiced as it is, [h] in the last mentioned position is not easy to hear, any more than for instance in [g^oáshiq^oàs] 'this side of a field', [háýásk^oàshilà] 'about to get married', [qálxháwls^m] 'scissors'.

After [x], [hi] and [hu] do not occur, so the only respect in which [h] does not parallel [ʔ], is that it does not occur before [ə, i, u]. ([h] does occur before [ʌ, q]; cf. 4.9.4).

To be sure, [m̥kɪls] 'grouse' and [m̥xɪmə] 'to punch on the face' could possibly be written as [hm̥kɪls] and [hm̥xɪmə], though writing the pitch-mark over the symbol 'm' is in itself sufficient to indicate that there is only nasal voicing. But transcribing * [hámkɪls] and * [hámxɪmə] would be unsatisfying, because the symbol 'a' does not correspond to any sound-feature that can actually be heard. Again, the parallelism between [h] and [ʔ] is not complete.

4.19.1 The item [híʔihì] 'they-down-there' is particularly interesting. It could be elicited from Mr. Campbell only, and was recognized by the younger generation in Bella Bella (i.e. those about thirty years old) as "the old language". The second occurrence of [h] in the item is more strongly palatalized than the first, and resembles a pre-aspirated [h^y]. The [ʔ] too is palatalized, but still to be distinguished from [y] in the synonymous item [híyí] that was elicited from Mr. Freeman. However, a variant of [híyí] appeared to be [híʔiyí], again with a palatalized [ʔ].

Now the sequences [yí] and [yì], with definite pitch, are unknown in the corpus; [híyí] is therefore a unique case. Moreover, items beginning with [y] do not reduplicate as * [yíyí...] but as [ʔiyí....]. For instance, the plural of [yálà] 'to wave (with the hands)' is [ʔiyálà]. So [y] in [híyí], and the sequence [ʔiy] in [híʔiyí], could be just variants of a palatalized [ʔ]. This variation is not likely to be unique, for that matter. [láʔàxci] 'to go away' is morphologically related to [lámyàxciànc] 'Yes, we are going to go away' and [gályàxci] 'to move away ahead of the others'. Another related item with [ʔ] is [gəxʔàxcixs] 'come here!'.

4.19.2 The following suggests that, in some positions at least, [y] in one dialect corresponds to [h] in another.

With Mr. Campbell, an item as 'river, creek down-there' sounds [cɪxláyàx̣ɛy], but with Mr. Freeman [cɪxláàx̣ɛy] or [cɪxláhàx̣ɛy]. That is to say, both [áà] and [áhà] represent uninterrupted voicing anyway, but after the 'peak' of the high pitch a sudden 'flaw' will follow that was sometimes perceived as [h] plus [à].

4.19.3 In a few cases word-initial [h] is immediately followed by [y], as in [hyútà] 'accustomed to'. Much like [y] in [híyí], [hy] has a variant [hīy], witness [hīyútà].

Notice that besides [hyútà] one has [yúsà] 'to sip'.

4.20 In the position N^{C} , [a] does not occur, whereas glides cannot be followed by a consonant or the word-boundary at all. But [i] and [u] do occur in the mentioned position, for instance in [lú] 'nephew, niece, cousin' and [láḳʰɪms] 'standing alongside' (both of these items from Mr. Freeman). However, the former item is pronounced [lūwál] by Mr. Campbell, while Mr. Freeman, as well as offering an alternative item [láḳʰiyɪms], now pronounced [hɪsábúls], now [hɪsábūwáls] 'under the bottom of s.th. outside the house'. Besides [i,u], diphthongs may precede N^{C} .

4.21 The only word-final vowels are [a,i,u].

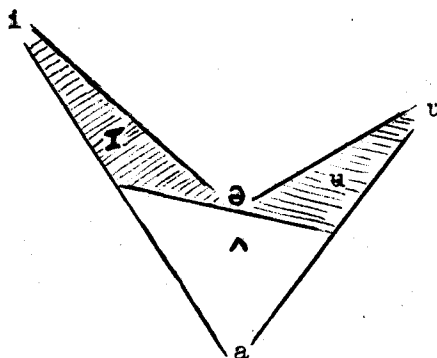
So much for the present state of analysis of the corpus, apart from the details that will be discussed in due course in the next chapter. But now for the question of how to synthesize the results of the analysis into a more parsimonious set of aids to memory for the pronunciation than that of IPA.

5. Consonants, Resonants, and Syllabifiers

5.1 In what follows, the brackets () are used to mark the status of a symbol as halfway between narrow and broad transcription. These brackets are also put around complexes of symbols containing at least one symbol with that status.

C'_4 indicates any member of the following sub-set of the set (4) in 4.9, viz. $\boxed{\text{ɣ} , q , \text{q}' , \text{x}}$.

Further, the observations in 4.9 - 4.10 and in 4.12 are now resumed by reducing the number of vowels to the following seven, the diphthongs being left out of consideration.



That is, to characterize the structure of items such as [gɛlxʔit] the formula $\text{[C}_2\text{ɛNC ..]}$ will be used, not $\text{[C}_2\text{ɛNC..]}$. The item [tɛmnug^ə] will be considered an instance of $\text{[C}_1\text{ɛNC ..]}$, and so on. Thus, when figuring around meta-linguistic formulae, square brackets have a slightly adapted meaning

Finally, from now on pitch will always be indicated, ^ over a symbol represents either high or low pitch, but not the type of pitch connected with the mark " .

The phonological argument, then, runs as follows.

5.2 The occurrence of items such as [mkiʔls] (see 4.19) suggests that the [ə] in $\text{[C}_1\text{əNC]}$ (let C represent the word-boundary as well) is a feature imposed by C_1 rather than an inherent part of the nasal itself. But then writing the symbol 'ə' is redundant; one can also write the pitch-mark over the nasal itself.

The following survey, as well as showing possible paradigmatic oppositions in between C and NC, extends this line of reasoning. For the time being, [ʔ] and [h] are ignored.

Type of item	Instances	Simplifications
$C_1 \hat{a} NC$	$[-'c\acute{a}m_]'$ 'index-finger'	$C_1 \hat{a} NC$ as in ($\acute{c}m$)
$C_1 \hat{a} NC$	$[-'n\acute{a}n_]'$ 'grizzly bear'	
$C_1 \hat{a} NC$	$[-'l\acute{a}n_]'$ 'singing (a folk song)'	
$C_1 \hat{a} NC$	$[-'l\acute{a}l_]'$ 'nephew, niece, cousin'	
$C_2 \hat{a} NC$	$[-'g\acute{a}l\acute{t}_]'$ 'long'	$C_2 \hat{a} NC$ as in ($g\acute{t}$)
$C_2 \hat{a} NC$	$[-'g\acute{a}l\acute{x}\acute{t}_]'$ 'to be first'	
$C_2 \hat{a} NC$	-. -	
$C_2 \hat{a} NC$	$[-'f\acute{y}\acute{u}msq\acute{e}y\acute{k}^o_]'$ '(s.o.) devoted to visiting'	
$C_3 \hat{a} NC$	$[-'q\acute{a}m\acute{s}t\acute{u}_]'$ 'brown'	$C_3 \hat{a} NC$ as in ($q\acute{a}m\acute{s}t\acute{u}$)
$C_3 \hat{a} NC$	$[-'tw\acute{a}mn\acute{u}g^o\acute{a}_]'$ 'Yes, I am wading'	
$C_3 \hat{a} NC$	$[-'l\acute{a}x^o\acute{a}ms_]'$ 'standing alongside'	
$C_3 \hat{a} NC$	→ (The instances that do occur are of the type $C_3 \hat{a} NC$, and hence to be considered variants of $C_3 \hat{a} NC$)	
$C_4 \hat{a} NC$	$[-'q\acute{a}nc\acute{a}_]'$ 'to mend a net'	$C_4 \hat{a} NC$ as in ($q\acute{a}nc\acute{a}$)
$C_4 \hat{a} NC$	(But there is: $[-'l\acute{a}g\acute{e}y\acute{l}k^o_]'$ 'sheltered by a tent in the house')	
$C_4 \hat{a} NC$		

This survey exhaustively represents the environments in which $[-'a_]$ and $[-'a_]$ occur. So why not eliminate the symbol 'a' by writing 'a' instead. Moreover, this device may give constancy of transcriptional shape to many morphemes, as illustrated by the following items.

/-tánŋ ^o à_/	'I am wading'	
/-tásù_/	'You are wading'	
(tánc)	'We (incl.) are wading'	= /-tánc_/
(tántk ^o)	'We (excl.) are wading'	= /-tántk ^o _/

To this should be added that the symbol-sequence (C₄áNC), though at any rate conceivable, does not represent another sound-complex than does (C₄áNC). The neutralization can be illustrated with the etymology of /-qálk^o_/ 'braided'. That the root is $\sqrt{qá\dot{a}}$ can be seen from /-qá\dot{a}à_/ 'to braid'. Now, before the passive nominalizing suffix =k^o, root-final /-l_/ always turns into /-1_/, so *(qá\dot{a}lk^o) would be acceptable from a morphological point of view. Phonologically it would be acceptable too, in view of the position of the symbol 'á'. However, morphological analysis is not always as easy as with /-qá\dot{a}lk^o_, and therefore even in this case I prefer the transcription (qá\dot{a}lk^o).

In my opinion it is no use pointing out that this obscures the structure of the root. That structure is obscured already by the change of 'l' into '1', and a separate, non-phonological transcription specifying the morpheme-structure is necessary anyway. Thus, in a lexicon (qá\dot{a}lk^o) would have to be specified further as {qá\dot{a}l-k^o}, the symbol '=' indicating the 'softening' effect on the root-final consonant. 7)

5.2.1 The occurrence of /-m̥k̥ls_/ suggests, but in itself of course does not demonstrate that the interpretations (C₁áNC) for /-C₁áNC_, (C₂áNC) for /-C₂áNC_, and so on, are warranted. The decisive argument is that (1) /-N̂_/ does occur, but that (2) /-CVN̂C_/ is not instantiated in the corpus. That's why we can safely interpret /-cám_/ as (cám̥) or (cám̥) or, given that the feature /-ə_/ is predictable (after C₁ it must occur if none of the other three possible features does), as (cám̥).

By the same token, the interpretability of 'a' in /-nán_/ as 'a', is not in itself a reason for writing (nán). For * /-ná:f̥_/ does not occur, and the sequence /-an_/ sounds as much as a unit as does /-am_/ in /-cám_/ . So why not write (nán̥).

The choice between (C_{1,2,3} á NC) and (C_{1,2,3} a NC) being a matter of expediency, I decide in favour of the latter

alternative because

(1) not only sequences of the type $\left[\begin{smallmatrix} \text{C} \\ \text{a} \end{smallmatrix} \right]_{1,2,3} \hat{\text{NC}}$, but also sequences of the type $\left[\begin{smallmatrix} \text{C} \\ \text{a} \end{smallmatrix} \right] \hat{\text{NC}}$ can be interpreted as sequences with the pitch-mark written over the nasal-symbol; (2) uniformly applied, this device of writing the pitch-mark as far to the right as possible, saves us an objection against the interpretation of $\left[\text{mámálǎmǎ} \right]$ 'to swim around' as (mámálmǎ). The at least conceivable item $\left[\text{mámálmǎ} \right]^*$ would now have to be interpreted as $\left[\text{mámálmǎ} \right]^*$, and could not be confused with the former. For an existing case with $\left[\text{....} \hat{\text{NN}} \text{....} \right]$, take $\left[\text{támǎnǔg}^{\circ} \hat{\text{a}} \right] = (\text{támǎnǔg}^{\circ} \hat{\text{a}})$ 'Yes, I am wading'. The interpretation of items of the type $\left[\text{..} \text{C} \begin{smallmatrix} \text{ö} \\ \text{u} \end{smallmatrix} \text{N} \hat{\text{a}} \right]$, and hence of $\left[\text{mámálǎmǎ} \right]$, will be discussed in 5.3.2. That uniform application of the device in point is important, will be shown in 5.3.3.

5.3 As for point (1) in the preceding section, in addition to the non-occurrence of $\left[\begin{smallmatrix} \text{C} \\ \text{a} \end{smallmatrix} \right] \hat{\text{NC}}$, it is to be considered that an opposition between $\left[\begin{smallmatrix} \text{C} \\ \text{a} \end{smallmatrix} \right] \hat{\text{NC}}$ and $\left[\begin{smallmatrix} \text{C} \\ \text{a} \end{smallmatrix} \right] \text{NC}$, and between $\left[\begin{smallmatrix} \text{C} \\ \text{a} \end{smallmatrix} \right] \text{NC}$ and $\left[\begin{smallmatrix} \text{C} \\ \text{a} \end{smallmatrix} \right] \text{üwǎNC}$, is factually indemonstrable. And as pointed out in 4.20, there are cases where sequences of the former types alternate with those of the latter, for instance $\left[\lambda \hat{\text{u}} \right]$ with $\left[\lambda \text{üwǎ} \right]$.

One may therefore wonder how far there is also phonological point in using the IPA-labels 'vowels' and 'consonant' for the sort of elements in between the extremes of sequences $\left[\begin{smallmatrix} \text{C} \\ \text{a} \end{smallmatrix} \right] \hat{\text{NC}}$. As far as that goes, the occurrence of $\left[\text{mǎkǎls} \right]$ 'grouse' etc. (see 4.19) is actually an indication that the nasals (the plain ones at least) cannot be simply equated with consonants, and that a chart of Heiltsuk phonemes would have to mention at least the following four headings: (1) consonants (never pitched); (2) nasals (now pitched, i.e. 'syllabic', now without pitch, i.e. 'consonantic'); (3) vowels and diphthongs (always pitched); (4) syllabifiers. Instead of the word 'syllabic' one could of course prefer 'vocalic', and instead of 'syllabifiers' one could talk of 'tonemes' or even 'vocalifiers'.

That it is not possible to drop the fourth category, and to incorporate the syllabic nasals as as many elements in the third category, already follows from the occurrence of words with two vowels but only one instance of pitch, as in $\left[\text{dǎnǎ} \right]$ 'to pull' and the alternant $\left[\lambda \text{üwǎ} \right]$ of $\left[\lambda \hat{\text{u}} \right]$.

Further, with a separate category of syllabifiers it would

become possible to describe the $[\lambda\acute{u}l_]$ / $[\lambda\acute{u}w\acute{u}l_]$ alternation as due to indifference of the 'localization' of the syllabifier, i.e. of the point where the pitch is highest or lowest. If, that is, we can interpret the $[\acute{u}_]$ in $[\lambda\acute{u}l_]$ and the $[\acute{u}_]$ in for instance $[\lambda\acute{a}\acute{x}^o\acute{i}ms_]$ in such a manner that they lose their status of vowels. For vowels, it has been said, are inherently pitched.

5.3.1 Now, the neutralization of the opposition between (... $\acute{N}C$...) and (... $a\acute{N}C$...) after C'_4 , at once helps us understand why $^*[\acute{C}'_4i\acute{N}C_]$ and $^*[\acute{C}'_4a\acute{N}C_]$ do not occur, if we assume two things.

(1) The following correlation holds:

$$[\acute{N}_]:[\acute{N}_]=[\acute{y}_]:[\acute{i}_]=[\acute{w}_]:[\acute{u}_]$$

Taking a moment for granted the occurrence of glottalized nasals and glides, an arbitrary couple of symbols can then be dropped out the following four: 'i', 'u', 'w', 'y'. For typographic reasons I maintain 'i' and 'u', for the palatal and bilabial glide, respectively.

(2) $[\acute{e}y_]$ = (aí) and $[\acute{a}w_]$ = (aú). Structurally, (aí) and (aú) are then on a par with (a \acute{N}), while the oppositions ($C'_4a\acute{i}C$) vs. ($C'_4\acute{i}C$) and ($C'_4a\acute{u}C$) vs. ($C'_4\acute{u}C$) are neutralized, exactly as is that between ($C'_4a\acute{N}C$) vs. ($C'_4\acute{N}C$).

This interpretation of $[\acute{i}, u, ey, aw_]$ fits in with the observation in 4.9.4 that $^*[\acute{C}'_{1,2,3}eyC_]$, $^*[\acute{C}'_{1,2,3}awC_]$, and $^*[\acute{C}'_{1,2,3}\lambda\acute{N}C_]$ do not occur, whereas $[\acute{C}'_4eyC_]$, $[\acute{C}'_4awC_]$, and $[\acute{C}'_4\lambda\acute{N}C_]$ do. The case of $[\acute{l}\acute{a}nsl\lambda\acute{n}c\acute{a}_]$ is exceptional, and, for that matter, informants accepted $[\acute{l}\acute{a}nsl\grave{a}n\acute{c}\acute{a}_]$. Opposition between $[\acute{\lambda}_]$ and $[\acute{\theta}_]$, in the indicated environment, cannot be demonstrated or even made plausible anyway.

Morphologically, the interpretation has but advantages. Consider the following series of items:

$[\acute{t}\acute{a}k_]$ = (ták)	'He-right-here is wading'
$[\acute{t}\acute{a}w_]$ = (taú)	'He-there-with-you is wading'
$[\acute{t}\acute{e}y_]$ = (taí)	'He-down-there is wading'
$[\acute{t}\acute{a}mk_]$ = (taák)	'Yes, he-right-here is wading'
$[\acute{t}\acute{a}m\grave{u}_]$ = (támù)	'Yes, he-there-with-you is wading'
$[\acute{t}\acute{a}m\grave{i}_]$ = (támì)	'Yes, he-down-there is wading'

For the sort of reasons mentioned in 5.2, all instances of $[-C_4^i ey]$ and $[-C_4^i aw]$ will be interpreted as $(C_4^i i)$ and $(C_4^i u)$, respectively.

5.3.2 The category of nasals, proposed in 5.3, should now be understood as just part of the wider category of resonants. The symbol 'R' will henceforward be used to represent any member of this category.

The items $[-\lambda \acute{u}l]$ and $[-\lambda \acute{u}w\acute{a}l]$, $[-\lambda \acute{a}x^o \acute{i}ms]$ and $[-\lambda \acute{a}x^o \acute{i}y^o ms]$, can now be described as all of them containing a sequence of the type (CRR). Presence of but one syllabifier over two resonants at the same time, the first of which is a glide, can then be held responsible for the alternation. And we write $(\lambda \acute{u}l)$ and $(\lambda \acute{a}x^o \acute{i}ms)$.

It should not go unmentioned, however, that as far as the present stage of the morphological analysis of the corpus allows to say, the alternation obtains with atomic morphemes only. The item $[-c \acute{i}y \acute{i}m \acute{x} \acute{s} \acute{a}l \acute{a}y \acute{u}]$ 'brailer; dip-net', for instance, from which a root \sqrt{cf} can be abstracted⁸⁾, never sounded * $[-c \acute{i}m \acute{x} \acute{s} \acute{a}l \acute{a}y \acute{u}]$. On the other hand, the item appeared to have a variant $[-cy \acute{i}m \acute{x} \acute{s} \acute{a}l \acute{a}y \acute{u}]$. This reduction of the feature $[-i]$, and, in other items, of $[-\acute{u}]$, obtains only after fricatives and aspirated plosives.

The $[-u]$ in items like $[-c \acute{i}y \acute{u}l \acute{a}m]$ (a synonym of $[-c \acute{i}y \acute{i}m \acute{x} \acute{s} \acute{a}l \acute{a}y \acute{u}]$), and the $[-i]$ in items like $[-b \acute{u}w \acute{i}k^o]$ 'pregnant', correspond positionally to $[-iN]$ and $[-uN]$ in $[-\lambda \acute{a}x^o \acute{i}y^o ms]$ and $[-\lambda \acute{u}w \acute{a}l]$, respectively. And as expressed in the correlation proposed in 5.3.1, $[-\acute{i}]$ and $[-\acute{u}]$ in $[-iN]$ and $[-uN]$ are but environment-coloured features contracted by the nasal by virtue of being syllabic (**otherwise than in word-initial position, as in $[-\acute{m}k \acute{i}ls]$**). Given further the assumption that resonants in general also sound syllabic when conjoined with another resonant in what I shall call a syllabic cluster, the mentioned correspondence warrants the interpretations $[-c \acute{i}y \acute{u}l \acute{a}m] = (ci \acute{u}l \acute{a}m)$ and $[-b \acute{u}w \acute{i}k^o] = (bu \acute{i}k^o)$.

Items like $[-d \acute{o}n \acute{u}l \acute{a}m]$ can at once be interpreted as $(dn \acute{u}l \acute{a}m)$, because the feature $[-\acute{o}]$ is the same feature that would be contracted by the nasal if it were syllabic by itself.

But more important, if (a) could be described as the sixth resonant, say as the laryngeal glide, we could at once interpret $[-b \acute{u}w \acute{a}]$ 'to flee, to escape', $[-d \acute{i}y \acute{a}]$ 'to wipe', $[-\acute{g} \acute{a}y \acute{a}l \acute{a}] = [-\acute{g} \acute{e}y \acute{a}l \acute{a}]$ 'long (ago)', $[-k^o \acute{u}w \acute{a}b \acute{u}w \acute{a}]$ '(man's) shirt' as $(bu \acute{a})$, $(di \acute{a})$, $(\acute{g}i \acute{a}l \acute{a})$, $(k^o \acute{u} \acute{a}b \acute{u} \acute{a})$. For the reason stated in the preceding

section, $[-d\acute{a}n\acute{a}]$ 'to pull', $[-w\acute{u}l\acute{a}]$ 'to arrest' would be interpretable as (dná), (ulá). (cf. $[-d\acute{a}nk\acute{e}y]$ 'purseine-fishing' = (dnkáf), and $[-w\acute{u}lk^o]$ 'imprisoned (person)' = (ulk^o)).

5.3.3 At this point, taking a moment for granted the actual interpretability of (a) in the suggested manner, another illustration can be given of the importance of the device of writing the syllabifier over the last member of a syllabic cluster, however composed.

The item $[-q^o\acute{y}l\acute{a}w\acute{y}\acute{a}]$ 'narrow escape' presents a case of a syllabic cluster with three members. By interpreting it as (^oq^oláuia), no confusion can arise with an item ^{*}(^oq^oláuia), that would sound ^{*} $[-q^o\acute{y}l\acute{a}w\acute{y}\acute{a}]$.

5.4 After $[-\acute{x}]$, the sequences $[-\acute{y}\acute{i}]$ and $[-\acute{y}\acute{u}]$ do not occur (cf. 4.18). This, and for instance a comparison of $[-m\acute{a}l\acute{?}\acute{a}n\acute{x}]$ '2 years', $[-m\acute{u}x^o\acute{?}\acute{a}n\acute{x}]$ '4 years' (see 4.15; the extension of resonance is taken for granted), and $[-s\acute{k}\acute{a}\acute{x}\acute{?}\acute{a}n\acute{x}]$ '5 years', suggests the following correlations:

$$[-N] : [-\overset{\acute{a}N}{\underset{\acute{a}N}{\hat{a}N}}] = [-\acute{N}] : [-\overset{\acute{a}N}{\underset{\acute{a}N}{\hat{a}N}}]$$

$$[-y] : [-\acute{i}] = [-\acute{y}] : [-\acute{?}\acute{i}]$$

$$[-w] : [-\acute{u}] = [-\acute{w}] : [-\acute{?}\acute{u}]$$

The category of resonants then comprises ten members: (m), (^om), (^on), (n), (l), (^ol), (i), (^oi), (u), (^ou).

The syllabic glottalized resonants have but a limited distribution (cf. 4.4) Examples of their occurrence after fricatives, with the glottalization indicated before the resonant, to make easier typewriting, are (mál^oh^ox), (múx^oh^ox), (s^okáx^oh^ox) -the interpretations of the three above items- and also $[-\acute{g}^o\acute{a}l\acute{?}\acute{f}l\acute{a}]$ = (^og^oál^oflá) 'to finish', $[-\acute{x}\acute{a}p\acute{x}^o\acute{?}\acute{u}]$ = (^oxápx^oú) 'little child', $[-\acute{p}\acute{a}x\acute{?}\acute{i}t]$ = (páx^oit) 'to start working; to reach with the hand', $[-\acute{p}\acute{i}\acute{x}\acute{?}\acute{e}y\acute{t}]$ = (píx^oit) 'it gets mouldy', $[-\acute{x}\acute{?}\acute{a}w\acute{s}d\acute{i}f\acute{a}]$ = (^oxá^oúsdísa) 'to drag a boat up the beach'. At the beginning of a word: $[-\acute{?}\acute{i}t\acute{a}]$ = (^oítá) 'to row (backwards)', $[-\acute{?}\acute{u}q^o\acute{a}]$ = (^oúq^oà) 'to believe'.

Only rarely does a syllabic glottalized resonant occur after another singly syllabic plain or glottalized resonant. From Mr. Campbell can be cited $[-ʔiʔitey]$ 'they-down-there are rowing', $[-húʔuq^oey]$ 'they-down-there are vomiting', $[-híʔihí]$ 'they-down-there', and the sequences $[-uʔu]$ and $[-uʔumk]$ in items such as $[-dúq^olasùʔu]$ 'he-there-with-you is being seen' and $[-dúq^olasùʔumk]$ (?) 'Yes, he-right-here is being seen'. But with all of these items the phenomenon can be observed which has been discussed in 4.19.1 on the occasion of $[-híʔihí]$, viz. that the sound of what is here transcribed as $[-ʔ]$, is hardly different from that of a preglottalized glide. For that matter, besides $[-dúq^olasùʔu]$, from Mr. Campbell could be elicited $[-dúq^olasùʔwi]$ 'he-down-there is being seen'.

Now, this is not to suggest interpretations $*(ʔiʔitaf)$ etc. For as pointed out in 4.17, sequences $[-uʔ_a^i]$ do not occur at all (apart from free variation), any more than sequences $[-iʔ_a^u]$. So sequences $[-uʔ_a^i]$ and $[-iʔ_a^u]$ can be interpreted (u_a^i) and (i_a^u) , respectively. Thus: $(dúq^olasùʔi)$. The above items $[-ʔiʔitey]$ etc. can then be interpreted as $(ʔiʔitaf)$, $(húʔuq^oaf)$, $(híʔihí)$, $(dúq^olasùʔu)$. But we have to add the stipulation that the 'progressive effect' of a syllabic glide on a following syllabic glottalized glide is diminished or zero, if the vowel-parts of these glides are identical.

To this can be added that, in Mr. Freeman's speech, an item such as $[-lawk^oalasùʔux^o]$ (also: $[-...ʔax^o]$) actually alternated with $[-lawk^oalasùʔwux^o]$ 'he-there-with you is being coerced'.

5.4.1 On the other hand, syllabic glottalized resonants may also form a syllabic cluster with preceding plain resonants, and examples of this are legion. $[-ʔuʔálxʔit]$ 'to do s.th. a second time' (Mr. F.) is a case in point. The more emphatic speech is, the more the item sounds as

$[-ʔuʔálxʔit]$. Applying the device of writing the syllabifier over the right-most resonant, the interpretation is $(ʔuʔálxʔit)$.

Other examples are (the $[-ʔ]$ / $[-w]$ or $[-ʔ]$ / $[-y]$ alternation not indicated in the narrow transcriptions):

[⁻míʔímxà] = (mí'íxà) -pl. of [⁻míxá] 'to punch' -
[⁻níʔínx^oálá] = (ní'íx^oálá) -pl. of [⁻nùx^oálá] 'near, close'-
[⁻líʔímsəmt] = (lí'msəmt) 'to wrap up' -cf. [⁻lípà] 'gambling
with stones to be rolled'-)
[⁻múʔúm^oà] = (mu'mk^oà) -pl. of [⁻múk^oà] 'to tie with a rope'-
[⁻xúʔúm] = (xú'm) 'ripe; cooked' -cf. [⁻xúpà] 'to barbecue'

The above interpretations make at once for a solution of cases of conglottalization. The pattern of the interpretations is (CR'RC..). Now, with a nasal preceding in the cluster and, say, an (i) following, this pattern would be realized as [~C+N'ic..] or [~C+NN'ic..]. The symbol '+' here represents a feature such as nasals contract when they are syllabic.

Thus, [k^oul2is] will be written as (k^ol'is) ('to lie down on the beach').

5.4.2 With (a) as just another resonant, the following interpretations need no further comment:

[-wáʔám] = (uá'm) '(fresh) water' -cf. [-wápá] 'to dilute'-
[-máʔám̩à] = (ma'm̩à) -pl. of [-máʔà] 'to shake hands'-
[-zixsistáʔálsà] = (zixsista'ílsà) 'to push down, over'

With a cluster-final glide, one can then expect the appearance of a diphthong. Thus, $[-k^{\circ}a^?eys]$ 'to sit down on the beach' is interpreted as $(k^{\circ}a^?is)$.

Morphologically, for that matter, ($k^o l$ 'fs) and ($k^o a$ 'fs) are on a par: $\{k^o l = fs\}$ and $\{k^o a = fs\}$ are their analyses. (cf.: $[-k^o \acute{a} l x d \acute{s} m 2 \acute{a} _] = (k^o l x d m \acute{a})$ 'bed' and $[-k^o \acute{a} x d \acute{m} m 2 \acute{a} _] = (k^o \acute{a} x d m \acute{a})$ 'chair'). 9)

As suggested by the just cited examples, the resonant (a) then has a preglottalized counterpart (^ha), sounding [ʔa] when syllabic. [sɪʔaɪt] 'to blame s.o.' could therefore become (sɪʔaɪt).

The only problem, however, is that it is unclear what a consonantic realization of the tentative phonemes (a) and (ʔ) would sound like.

5.5 As for (a), it is no use trying to identify [h] as its consonantic realization. [h] occurs in morpheme-initial position only, but knowing this is not sufficient to decide if (saípauà) 'waste meat' (cf. (sápà) 'to skin') is to be pronounced [-seýpauà] or * [-shípauà]. The items (tá) = {t-á}

'to wade' and ($\lambda\acute{a}$) = $\{\lambda-\acute{a}\}$ 'to split up with a wedge' are there to show that a morpheme-boundary after the very first element of a word, is at least conceivable.

On the other hand, the occurrence of $[\text{h}\acute{a}m\acute{g}\acute{i}\acute{l}\acute{a}]$ 'cooking' and $[\text{h}\acute{a}n\acute{x}\lambda\acute{a}\acute{i}\acute{s}]$ 'barrel for catching rainwater from the roof', as well as of $[\text{p}\acute{a}m\acute{k}^{\circ}]$ 'dam', $[\text{p}\acute{a}w\acute{x}^{\circ}\acute{a}\acute{l}\acute{a}]$ 'packing and carrying on one's back', is still an unsolved problem. For (a) does not normally occur in a low-pitched cluster. From $[\text{d}\acute{a}s\acute{a}]$ 'to dive for something' one can derive $[\text{d}\acute{a}s\acute{e}y]$ = (dasaf) 'he-down-there is diving for something'. But $[\text{p}\acute{a}\acute{l}\acute{a}]$ 'to work' occasions $[\text{p}\acute{a}\acute{l}\acute{i}]$ 'he-down-there is working'.

Now, the sequence $[\text{h}\acute{a}N]$ does not occur other than word-initially. $[\text{h}\acute{e}y]$ and $[\text{h}\acute{a}w]$ do, but are then preceded by $[\text{x}]$ (cf. 4.19). So in the latter position these two sequences can be interpreted as (hí) and (hū).

One could therefore try to interpret $[\text{h}\acute{a}m\acute{g}\acute{i}\acute{l}\acute{a}]$ and $[\text{h}\acute{a}n\acute{x}\lambda\acute{a}\acute{i}\acute{s}]$ as ($\acute{a}m\acute{g}\acute{i}\acute{l}\acute{a}$) and ($\acute{a}n\acute{x}\lambda\acute{a}\acute{i}\acute{s}$), respectively. That is, one could assume that

- the consonantic (a) occurs word-initially only, and is always accompanied by the feature $[\text{h}]$;

- the at least conceivable opposition between ($\hat{a}\hat{a}\hat{i}\hat{C}..$) and ($\hat{a}\hat{i}\hat{C}..$) is neutralized, as is that between ($\hat{C}\hat{a}\hat{i}\hat{C}..$) and ($\hat{C}\hat{i}\hat{C}..$) (cf. 5.2 and 5.3.1).

By the same token, $[\text{p}\acute{a}m\acute{k}^{\circ}]$ and $[\text{p}\acute{a}w\acute{x}^{\circ}\acute{a}\acute{l}\acute{a}]$ would have to be interpreted as ($\acute{a}m\acute{k}^{\circ}$) and ($\acute{a}w\acute{x}^{\circ}\acute{a}\acute{l}\acute{a}$). Also, $[\text{h}\acute{a}m\acute{s}\acute{a}]$ 'to eat' could then as well be interpreted ($\acute{a}m\acute{s}\acute{a}$); $[\text{p}\acute{a}w\acute{k}^{\circ}]$ 'pity' as ($\acute{a}w\acute{k}^{\circ}$); $[\text{p}\acute{e}y\acute{k}w\acute{a}]$ 'to win (a game, a race): to succeed' as ($\acute{a}ikw\acute{a}$).

Even so, these interpretations are objectionable. It is not attractive to have transcriptions that do make separate mention of the feature $[\text{h}]$, as in ($\acute{h}\acute{i}\acute{m}\acute{a}\acute{s}$) = $[\text{h}\acute{i}\acute{m}\acute{a}\acute{s}]$ 'chief', and transcriptions that do not do this, such as ($\acute{a}m\acute{g}\acute{i}\acute{l}\acute{a}$) and ($\acute{a}m\acute{s}\acute{a}$).

Moreover, the sequences $[\text{p}\acute{a}N]$, $[\text{p}\acute{e}y]$, $[\text{p}\acute{a}w]$ may occur in other positions than just word-initially, after $[\text{x}]$ or, as part of a syllabic cluster, after (a). As illustrated by the following examples, one may also find the sequences in point after a vowel or diphthong that is itself preceded by word-initial $[\text{h}]$ or $[\text{p}]$. Take

[^hey^hám^hlà] -pl. of [^hám^hlà] 'to play'-

[^hey^hám^hbey] 'they (boats) down-there are tied up to the wharf'

(cf. [^hám^hbá] '(boat) tied up to the wharf')

[^hey^héy^hzàq^hlà] -pl. of [^héy^hzàq^hlà] 'to speak Heiltsuk'-

[^hey^háwsà] -pl. of [^háwsà] 'to count'-

[^há^héykwá^héys] 'contest, persons competing' -cf. [^héykwá] 'to win (a game, a race); to succeed'-

5.5.1 To deal with this, let us first stipulate that all glottalized resonants, consonantic or syllabic, be interpreted biphonemically. This interpretation is feasible because besides [^háNC..] (as in [^hánqlá] 'grunting'), one does not find * [^hNC..]. For typographic reasons, the feature [^h] will be rendered as ('). Thus, the transcription (λu'ix'it) developed earlier, does not undergo any change. But [^hálà] 'weather' turns into ('álà), [^hyák] 'bad' into ('iák).

Other considerations in favour of such a biphonemic interpretation are the [^hw]/[^hüw] and [^hy]/[^hiy] alternations mentioned in 4.3, and the occurrence of alternations such as [^hmèt^héy^hálà] / [^hmèt^héy^hínálà] 'quivering of the arm', [^hsxs^hbálá] / [^hsxs^hbá^hlá] 'to sharpen a knife'.

Further, we lay down the rule that whenever one hears [^háN], [^hey], or [^háw] otherwise than after [^hč] or in a syllabic cluster, this is due to the presence of (a), that is, of a cluster consisting of the consonant (') and the consonantic resonant (a). Thus, [^héykwá] is written as ('áikuá), [^háwk^h] as ('áuk^h), [^hám^hk^h] as ('ám^hk^h).

The sequences [^háN], [^hey], and [^háw] can then be treated in a parallel manner. Thus, [^hámsà] is interpreted as (hámsà), [^hám^hgílá] as (hámgílá), [^hán^hčlá^háls] as (háñčlá'ís), [^héy^hčils] 'clear underbrush' as (háixils).

As a matter of fact, the consonant-cluster (ha) can be taken to reduplicate in a resonant-like manner, in many cases at least. The plural of [^hmüwá] = (muá) 'to fetch with a boat; to get a person to the shore with a boat' is [^hmímüwá] = (mí'muá). That of [^hnáqà] 'to drink' is [^hnínáqà] = (ní'náqà). But the pattern (R_cí'R_c ..)--R_c means: consonantic resonant-- is also to be recognized in (háí'áúsà) -plural of (háúsà) 'to count'-, (háí'ám^hbáí) -from (hámbá) '(boat) tied up to the wharf'-,

(haíʔaíʔzàq⁰là) -pl. of (haíʔzàq⁰là) - .

5.5.2 Wherever they are heard, $\text{[}^{\text{h}}\text{hã]}_7$ and $\text{[}^{\text{ʔ}}\text{ʔã]}_7$ can be interpreted as (hã) and ('ã). Thus, $\text{[}^{\text{h}}\text{hãlã]}_7$ 'to rest' becomes (hãlã); $\text{[}^{\text{ʔ}}\text{ʔãx}^{\text{0}}\text{ʔãx}^{\text{0}}\text{ní]}_7$ 'thrush' : ('ãx⁰,ãx⁰ní) ; $\text{[}^{\text{h}}\text{hãslã]}_7$ 'to breathe' : (hãslã); $\text{[}^{\text{ʔ}}\text{ʔãqã]}_7$ 'to come' : ('ãqã).

5.5.3 Items beginning with $\text{[}^{\text{h}}\text{h]}_7$ or $\text{[}^{\text{ʔ}}\text{ʔ]}_7$ may also display the pitch-pattern of $\text{[}^{\text{d}}\text{dñã]}_7$. One for instance finds $\text{[}^{\text{h}}\text{hãney]}_7$ '(boat) lying on the water', $\text{[}^{\text{h}}\text{hãwíñãk}^{\text{0}}\text{lã]}_7$ 'week-days', $\text{[}^{\text{ʔ}}\text{ʔãlã]}_7$ 'to bury; funeral', $\text{[}^{\text{ʔ}}\text{ʔãwã]}_7 = \text{[}^{\text{ʔ}}\text{ʔ}^{\text{h}}\text{]}_7$ '(and) then' (see 4.9.3).

Because definitely low or high pitch is always indicated, the following interpretation of the above items is possible: (hanaí), (hauí'nãk⁰là), ('alã), ('auã).

5.6 Let C_1 represent any plosive, fricative, or consonantic resonant out of set (1) in 4.9, C_2 any one out of set (2), and so on. But let C_4 represent any uvular. Further, let C' represent **any plosive or fricative** out of set (1), or a **consonantic resonant** out of set (1) in so far as it is followed by a long vowel. C'_2 and C'_4 , then, have a corresponding meaning. Finally, let every symbol C' ... represent the word-boundary as well.

With these symbols, the environments in which long, high-pitched vowels may occur, can be specified as follows:

$\text{[}^{\text{C}}\text{C}_{1,2,3,4} \acute{a} \text{C}'_{1,2,3,4}\text{]}_7$, $\text{[}^{\text{C}}\text{C}_{1,2,3} \acute{a} \text{C}'_{1,2,3,4}\text{]}_7$, $\text{[}^{\text{C}}\text{C}_{1,2,3} \acute{a} \text{C}'_{1,3}\text{]}_7$.

Low-pitched long vowels occur in similar environments. This can be illustrated with the inversion of pitch a high-pitched root may undergo under the influence of certain suffixes. $\text{[}^{\text{z}}\text{zíkã]}_7$ 'to push (s.o.) with a stick' is regularly connected with $\text{[}^{\text{z}}\text{zìxsút]}_7$ 'to push through s.th. soft'.

Sequences $\text{[}^{\text{C}}\text{C}_4 \hat{a}\text{]}_7$ are not to be found, only $\text{[}^{\text{C}}\text{C}_4 \hat{e}\text{y}\text{]}_7$. The latter sequences are always interpreted as $(C_4 \hat{i})$ and $(C_4 \hat{u})$. Obviously, the vowels are considered syllabic resonants.

As for the type $\text{[}^{\text{C}}\text{C}_{1,2,3} \hat{a} \text{C}_3\text{]}_7$, the choice is between an interpretation as $(C_{1,2,3} \hat{a} C_3)$ or as $(C_{1,2,3} \hat{a} C_{2,4})$. The former alternative is to be preferred, as presence of $\text{[}^{\text{C}}\text{C}_4 \hat{a}\text{]}_7$ puts a restriction on the sort of plosive/fricative that may

follow anyway.

5.6.1 Low-pitched short vowels may also occur in the indicated environments, though with the further restrictions that they do not occur word-finally or before a consonantic resonant, and that they appear in a predictable manner in between plosives/fricatives that cannot form a cluster (see 4.9 ff.).

Thus, the $[\text{ɛ}]$ in for instance $[\text{zəp}^{\text{a}}\text{n}]$ 'Japanese man' and $[\text{m}^{\text{a}}\text{t}^{\text{a}}]$ 'quivering' can be eliminated from transcriptions, hence (zpañ) and (mtá).

Theoretically, $[\text{ɛ}]$, $[\text{ə}]$, $[\text{ɜ}]$ in the indicated environments could be considered 'coloured shwas', and hence be eliminated as well. In practice, it is unfortunately impossible to distinguish consistently or to prove opposition between $[\text{ɛ}]$ and $[\text{i}]$; $[\text{ə}]$ and $[\text{u}]$, $[\text{ɜ}]$ and $[\text{a}]$ (see also 4.9.3 ff.) For instance, $[\text{d}^{\text{u}}\text{x}^{\text{o}}\text{s}^{\text{u}}\text{t}]$ 'to X-ray s.o.' (which is related to $[\text{d}^{\text{u}}\text{q}^{\text{o}}\text{l}^{\text{a}}]$ 'to watch') may also sound $[\text{d}^{\text{a}}\text{x}^{\text{o}}\text{s}^{\text{u}}\text{t}]$ and even tend towards $[\text{d}^{\text{ɜ}}\text{x}^{\text{o}}\text{s}^{\text{u}}\text{t}]$. And one now hears $[\text{p}^{\text{a}}\text{q}^{\text{a}}\text{s}^{\text{a}}]$ 'to lay a board flat on the ground', now $[\text{p}^{\text{a}}\text{q}^{\text{ɜ}}\text{s}^{\text{a}}]$. The morpheme-structure of the latter item is $\{\text{p}^{\text{a}}\text{q}^{\text{ɜ}}\text{-s-a}\}$.

Even in the case of $[\text{m}^{\text{i}}\text{x}^{\text{a}}]$ 'to punch', where the $[\text{ɛ}]$ may easily approximate $[\text{ɜ}]$, it is by morphological criteria only that the $[\text{ɛ}]$ can be assigned the status of a short and eliminable vowel. For $[\text{x}]$ happens to turn into $[\text{n}]$ under the influence of 'softening' suffixes, for instance $\{\text{-}^{\text{a}}\text{ó}\text{i}\}$. Thus, from the relationship between $[\text{m}^{\text{i}}\text{x}^{\text{a}}]$ and $[\text{m}^{\text{ɜ}}\text{n}^{\text{a}}\text{ó}\text{i}]$ 'drum', one could conclude to the eliminability of $[\text{ɛ}]$ in the former item. Still, $[\text{m}^{\text{i}}\text{x}^{\text{a}}]$ is an acceptable pronunciation.

But if one wishes to avoid transcriptions the adequacy of which is dependent on the adequacy of one's morphological analyses, the only alternative left is to interpret $[\text{ɛ}]$, $[\text{ə}]$, and $[\text{ɜ}]$ in the indicated environments as (i), (u), and (a). On the whole, this alternative is more attractive because it saves quite a number of rules for the pronunciation of transcriptions. For the intercalation of $[\text{ɜ}]$ in for instance * (pqa) 'to taste' would require another rule than that of $[\text{ɜ}]$ in * (kxmalà) 'to close both eyes'. In the former case we have a consonant of set (1) followed by one of set (4), in the other a consonant of set (2) followed by

one of set (4).

Notice that in the case of $[-m\dot{x}\acute{a}]$ one could still write * (mxá) because * (màxá) or * (mùxá) are excluded anyway. In between $[-m]$ and $[-x]$ here, only $[-\acute{a}, \grave{a}, \acute{í}, \acute{i}/\acute{x}]$ can occur. But in between $[-\acute{k}]$ and $[-s]$ in for instance $[-\acute{k}\dot{i}s\acute{a}]$ / $[-\acute{k}\dot{i}s\acute{a}]$ 'crease, creasy', one can have $[-\acute{a}, \grave{a}, \acute{í}, \acute{i}/\acute{x}, \acute{ú}, \acute{ù}]$. For the sake of a uniform treatment of the low-pitched vowels, $[-m\dot{x}\acute{a}]$ will be interpreted as (mìxá), $[-\acute{k}\dot{i}s\acute{a}]$ as (kìsá), $[-p\acute{a}q\grave{a}s\grave{a}]$ as (paqàsà).

5.7 In all cases where in between $[-\acute{?}]$ and a consonantic nasal or glide, a vowel with 'neutral' pitch is heard, the value of this vowel is predictable. After $[-\acute{x}]$ or $[-\acute{a}]$, $[-\acute{ä}]$ is heard; after $[-\acute{ey}]$ or $[-\acute{i}]$, the vowel $[-\acute{i}]$. Examples: $[-sxs\dot{b}\acute{a}\acute{ä}l\acute{a}]$ 'to sharpen a knife', $[-\acute{?}\acute{ä}l\acute{x}\acute{ä}y\acute{u}k^0]$ 'murdered person', $[-\acute{m}\acute{ä}t\acute{x}\acute{e}y\acute{ä}n\acute{ä}l\acute{ä}]$ 'quivering of the arm', $[-\acute{k}^0\acute{ä}x\acute{d}\acute{i}\acute{l}f\acute{l}]$ 'sitting on the foot-end of a bed'.

Moreover, besides $[-\acute{?}\acute{ä}l\acute{x}\acute{ä}y\acute{u}k^0]$ one hears $[-\acute{?}\acute{ä}l\acute{x}\acute{y}\acute{u}k^0]$. As also illustrated by the examples cited in 5.5.1, the 'intercalated vowels' in point need not always be present. We therefore write (sxsba'lá), (⁰älx'íuk⁰), (mtxí'nálä), (⁰k'äxdi'lf¹).

5.8 In items such as $[-\acute{t}\acute{ä}l\acute{ä}m\acute{m}\acute{ä}]$ 'to jump (said of a salmon or herring)' and $[-\acute{q}s \# \acute{g}\acute{x}\acute{n}\acute{ä}m\acute{m}\acute{ä}]$ 'my wife', one hears lengthening of the resonance of $[-\acute{m}]$. In interpretations, the mere adjacency of a high pitch-mark and a low one is sufficient to signalize this. Hence, (¹tlmä), (qs gnmä). (cíxlääxi) will be used for both $[-\acute{c}\acute{i}x\acute{l}\acute{ä}\acute{ä}x\acute{e}y]$ / $[-\acute{c}\acute{i}x\acute{l}\acute{ä}h\acute{ä}x\acute{e}y]$ and $[-\acute{c}\acute{i}x\acute{l}\acute{ä}y\acute{ä}x\acute{e}y]$ (cf. 4.19.2).

In the same vein, $[-\acute{n}\acute{i}n\acute{i}y\acute{ä}]$ 'earthquake' will be written as (nínifä), and $[-\acute{w}\acute{ä}n\acute{u}w\acute{ä}l\acute{s}]$ 'to sneak out of a house' as ('unúls).

5.9 All of the plosives and fricatives mentioned in 4.9, are word-distinctive. (See also Mr. Kortlandt's remarks on this point).

The shape of the Heiltsuk system of phonemes, therefore, is as follows.

	Consonants			Fricatives	Resonants	
	Plosives					
	Plain	Aspirated	Glottalized			
1	b d z λ	p t c *	ᵐ ᵗ ᶜ *	s ʃ	m n l	Nasals
2	g	k	ᵑ	x	i	Glides
3	g ^o g ^x	k ^o q ^o	ᵑ ^o ᵑ ^x	x ^o x ^x	u	
4	ɣ	q	ᵑ	ɣ		
5		h	ʔ		a	

Syllabifiers
.

The numbers (1) - (4) correspond with the features contracted by a dependently or independently syllabic nasal when it is preceded by a consonant or consonantic resonant. Thus, because /d/ is a phoneme of set no (1), /dná/ sounds [ˈd̥n̥á], and /d̥dn̥ / 'bell' sounds [ˈd̥d̥n̥á]. Because /u/ is a phoneme of set no. (3), /'unálà / 'to sneak' sounds [ˈw̥un̥álà], and so on.

5.10 This set of phonemes and the various rules for the pronunciation of broad transcriptions, which rules have been developed in the foregoing arguments, are still to be completed with a set of morphonemic rules. But one should not expect the latter rules to be a simple reedition of those mentioned by Boas for Kwakiutl. For instance, according to Boas, "The voiced continuants m, n, l, y, w become ^hm, ^hn, ^hl, ^hy, ^hw when sonantized or glottalized".(212). But for Heiltsuk this does not hold true, as can be seen from the case of {k^ol̥=fs} = /k^ol̥'fs/, discussed in 5.4.2. Rather, the suffix can here be said to contract a glottal stop. Also, a number of suffixes contract /h/ = [ˈh], instead of 'hardening' or 'softening' a root-final fricative. Again, the representativity of Kwakiutl for the North-Wakashan type of language should not be taken absolutely.

- 1) Franz Boas, "Kwakiutl Grammar. With a Glossary of the Suffixes" (edited by Helene Boas Yampolsky and Zellig S. Harris), Transactions of the American Philosophical Society, Vol. 37, Part 3, Philadelphia, 1947, pp. 201-377 .
- 2) Franz Boas, Bella Bella Texts, Columbia University Press, 1928.
- 3) For in that same Preface Boas complains that in Rivers Inlet itself "only two sickly men could be found who were able to dictate", but who could not translate. Thus, what Boas actually collected were stories from Rivers Inlet, to which were added a few other ones in genuine Heiltsuk, such as those told by Mr. Willie Gladstone himself (e.g. "The Raven and the Fisherman", p. 10 ff.)
- 4) in: Prosodic Analysis, edited by F.R. Palmer, Oxford University Press, 1970, pp. 188-200.
- 5) cf. Ulric Neisser, Cognitive Psychology, Appleton-Century-Crofts, 1967, p. 183 ff.
- 6) Also, one hears [ˈǧəyálà], [ˈǧǧyálà], or even [ˈǧǧyálà] 'long (ago)', not * [ˈǧīyálà]. Instead of * [ˈǧüwakà], one hears [ˈǧǧwákà] or [ˈǧǧwákà] 'to give a name (to a person, ceremonially)'.
- 7) The symbol has been taken over from Boas. Notice that in Heiltsuk the pitch of the stem/root and that of the suffixes may be interdependent. So far the rules governing this are only partly understood.
- 8) Cf. [ˈcɪxʔit] 'to dip up; to serve water'. Strictly speaking, this item might contain a root * √cɪk . But Boas mentions a Kwakiutl root √tsä , with the meaning-aspect 'to draw water'. Cf. Franz Boas & George Hunt, "Kwakiutl Texts", in: The Jesup North Pacific Expedition (edited by Franz Boas), Memoir of

the American Museum of Natural History, New York,
Volume III, Leiden (E.J. Brill) & New York (Stechert),
1905, p. 521.

- 9) To this should be added that the parallel holds because
(a) happens to be the first high-pitched resonant of the
word here. Otherwise it would have formed a non-glottalized
syllabic cluster with the (f). Compare the following series:

<u>(a)</u>	(m'fsgm)	one dollar	<u>(b)</u>	(m'fsgm'is)	one quart
	(m'asm)	two dollars		(m'asm'is)	two quarts
	(i'utx ^o sm)	three dollars		(i'utx ^o sm'is)	three quarts
	(m'usgm)	four dollars		(m'usgm'is)	four quarts
	(sk'asgm)	five dollars		(sk'asgm'is)	five quarts
<u>(a')</u>	(m'nfk'lbà)	one cloth	<u>(b')</u>	(m'nfk'blì)	one blanket
	(m'alk'lbà)	two cloths		(m'alk'ba'fì)	two blankets
	(i'utx ^o lbà)	three cloths		(i'utx ^o lbafì)	three blankets
	(m'uk ^o lbà)	four cloths		(m'uk ^o blì)	four blankets
	(sk'ak'lbà)	five cloths		(sk'ak'ba'fì)	five blankets

(a) and (a') run parallel, for both {-s(g)m} and {-ba}
take the reverse pitch of the root. But (b) and (b') diverge,
and not only because {-il} does not simply take the reverse
pitch of the root. As can be seen, (a) is more often than
not 'irreactive'.