ANOTHER LOOK AT TILLAMOOK PHONOLOGY
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A conference on Salish should have as its prime object of attention
substantive matters of Salish languages. Of course, it is all to the
good if these matters also have something to offer general linguistic
theory. Naturally, we will wish to bring to bear any lessons from
theoretical linguistics that can instruct us in solving specifically
Salish problems. It should be clear from the outset, then, that my
main concern is to explore avenues of further light on an interesting
problematic area of Salish.

However, Salish languages have phonologies that cannot fail to be
of considerable interest to students of phonology and of linguistics at
large. Moreover, Tillamook is bound to be somewhat of a curiosity or
museum-piece among the world of phonologies. This effect is heightened
nowadays, when a strong renewed interest in universals is asserting
itself throughout the field of linguistics. To the degree that there
are linguistic universals, one of two things must be true: Either all
languages are somehow the same, and we must still apply great effort
to the unravelling of what is really surface difference--a view which
changes our understanding, but not the magnitude of our total task. Or
else the true universals are so abstract in form that we will be a long
time in making a connexion between them and the order of things that
current grammars tend to talk about.

L.C. and M.T. Thompson (A fresh look at Tillamook phonology, IJAL
32.313-19, 1966), in the course of bringing invaluable fresh data as
well as insights and reasoning to this urgent problem, have recently
said that "Tillamook is meaningfully characterized as a language totally
devoid of labial elements." (TT 316, §3.3) It is the purpose of the present
paper to laythe foundations, in brief compass, for a discussion of what
that statement may mean. TT (315, §3) have stated regarding their work
"It is beyond the purpose of this paper to present an extensive treatment
of the phonology." Certainly, I, who have not even heard nor read texts
in the language, could not pretend to to exceed their claim. Apart from
the inherent interest of the problem, it is rather the urgency of the
matter, while there is yet a surviving speaker available for possible
re-check, that leads me to urge this on your attention.

What does it mean to lack labial elements? Clearly it does not mean
the same thing as to lack e.g. coarticulated velaro-labial sounds (as in
West African languages), or front-palatal groove articulations (as in
Polish or Serbo-Croatian, which incidentally in both languages are
generated in any case by rule), or uvular consonants. There are obviously
types of articulation, or features, that few languages have, and others
that few lack. Here is a sort of asymptotic universal. Languages with
any sort of elaboration of consonant features (which means practically
all known languages) may usually be expected to show labials; I ignore
here the question, not without importance, whether in such a framework
vowels may be independent of consonants in feature composition.

Yet there does seem to be a built-in tendency in human language to
show a weakness in the labials. We find widespread scattered evidence
of this in Eurasia. Keltic is well known for having lost *p; I have
discussed this in relation to the later resolutions of the labio-velars
in Lochlann 1, 1958. Then there is the well recognized blank in the
earliest reachable Indo-European. This affects, seemingly strangely,
what would be expected to be *b, but Pedersen (Die idg. Verschlusslaute
...ca.1950--I havent the exact ref. for the monograph, KDAkadVidenskab,
Købdnhavn) has suggested a prehistoric shift in the consonant orders.
Semitic, and particularly Arabic, show an asymmetry in the (voiceless)
labial, and that must have some connexion with the fact that the emphatic
feature fails to apply to the labials (I know none of what must be a
rich Semitist literature on this point). Mongolian shows within its
reconstructable history an instability in *p; see Poppe, Vgl. Grammatik,
and other work cited. For Ket I have noted (Ural-Altaische Jahrbücher
32.129-32, 1960) an asymmetry (lack of p) and impoverishment in the
labials, in which h interestingly participates. In the New World there
is similar evidence to be found: Athapaskan, with its lone labial

stop. And the whole Mayan family, with its asymmetric voiced b;
in the latter case we may see the seeds of the phenomenon in the
anomalous development of Maya-Chipayan *ph > h and the merger of
asymmetric *v (see Hamp, IJAL 33.74-6, 1967). The prehistory of
Japanese shows a weakening of p to h, but it is clearly not removed from
the surface system, since it remains in the strong or geminated position.
In all these cases we see an asymmetric development in the labials,
normally affecting the voiceless member where the opposition applies.

Cases of total lack of labials, or a whole order of labials, are
different, even though we might envisage their genesis as somehow ticked
off in each case by developments such as we see partially realized above.
Incidentally, the realistic likelihood of this happening independently
over and over again, with no historic (and therefore a human-universal)
connexion, seems assured by the fact that we can see the recoverable
process clearly on quite dissimilar grounds in Keltia (regardless of the
conceivable relation to IE *b and *sw), Arabic, Mongolian, Japanese, and
Mayan. Hottentot also shows, in relation to the rest of Khoisan, special
distributional properties for the labial, but that is rather in the
direction of greater freedom. As I say, we might envisage some cases of
total lack of labials as having their start in such partial developments,
since there seems to be provision for this built into human speech. But
as amatter of fact, of the cases that have come to my attention several
can be interpreted much more directly, or, in a sense, as not having
occurred at all. A Polynesian case such as Tahitian is easily explained,
so to speak, as having too few features in the first place; the opposition
[+grave] : [-grave] is exactly equivalent to the Hawaiian one of [+flat]
: [-flat] . What requires explanation or notice here is rather the
impoverished number in the total matrix of features. Then in a case of
the type seen in Chatino : Zapotec(an) (if such others exist, apart from
Proto-Otomanguean as reconstructed by Rensch) we have exactly the same
situation as I have argued to be the case in early Keltic dialects for
*kᵂ. That is to say, the same feature [+flat] is always present, but .
the detail of the position of articulatory occlusion varies from language
to language. For Iroquoian the case is fundamentally the same, but just
one step removed, so to speak. Despite the absence of surface labials,
Postal has argued for the existence of underlying segments marked by a
feature corresponding to this, from which the observed surface structures
are generated by rule. Thus the dictionary entries of Mohawk do not lack
the usual feature of 'rounding', though the terminal phonetics for the
most part do.

For purposes of our present discussion, the surprising thing is this:
In all these last cases the total number of phonemes, or feature-bundles
per segment, is, as languages go, a modest one. Put another way, the
feature of rounding fills out a rather spare list, with not too many
specifications per matrix-column, in these instances; in this sense, we
may leave aside the consideration whether the feature is notably rewritten
in earlier or in very late rules. But the case of Tillamook seems different
Here we have a relatively rich array of feature-bundles; paucity of
numbers cannot be alleged as a reason for the Tillamook incidence of
features. What is more, we appear also to have ostensibly (either by
etymology or by plausible feature specification) rounded (post)velars.

On the report of competent phoneticians and field workers such as the
Thompsons, we must immediately accept one sense in which Tillamook lacks
labials (assuming that a last remaining speaker is typical of a community):
There is no evidence for the usual labial contractions in the articulatory
production of finished phonetic sentences. But as a typological problem,
we may yet ask two further questions. Is it possible that some other
articulation does acoustic duty for the expected labial feature? Is there
some other systematic distinctive feature that does duty, isomorphously,
for the feature that, on the basis of other Salish languages, we might
call 'rounded'?

To answer the first question, we need an acoustic analysis. It is
known (e.g. Jakobson, Fant, Halle, Preliminaries 1952, p.31) that in
phonological systems and in borrowing of loanwords pharyngeal constriction
and lip-rounding may operate articulatorily in lieu of one another. The
difference is merely one of physical orientation; either the front or the
back end of the oral chamber is constricted. TT 316, §3.3 describe the ɔ
colouring of q (qᵂ) and the ɪ colouring of k (kᵂ) as produced by a
"cupping of the tongue". Is this accompanied by, symptomatic of, or
equivalent to constriction of the pharyngeal opening?

The answer to this question, while thoroughly interesting, will
however neither be complete for Tillamook, nor adequate for our total
understanding of the full Salish interrelationships involved. The
answer to the second question calls, in effect, for a provisional
distinctive-feature ama lysis of the whole language. On the basis of
current theory, of course, such an analysis to be maximally economical
and correct should take into account all pertinent morpho-syntactic
information--the rules of the base and T components, plus any semantic
feature specifications to lexical entries that might happen also to
apply. My analysis will be possibly short of the mark by the fact that I
can work only from surface phonetics, plus a few obsavations (e.g. the
reduplication by [λ] of underlying [x̣'] --a sort of Salish Grassmann's
Law; see examples in Reichard, IJAL 25.242-3, 1959) of morpho-syntactic
character; but I simply hope that it will not be damagingly deficient,
and that some important lines will emerge.

There is a sense in which any feature analysis of a Salish language
is of fairly immediate interest to almost any other language of the family.
Consider the following charts (my own rearrangements):
Tillamook (TT)

	t̓	c̓	č̓	ƛ̓	k̓	k̓ʷ	q̓	q̓ʷ	?
	t	c	č		k	kʷ	q	qʷ	
		s	š	ɬ	x	xʷ	x̣	x̣ʷ	h
	n		l					y	w

Upper Chehalis (Kinkade)

p̓,	t̓	c̓	č̓	ƛ̓	k̓	k̓ʷ	q̓	q̓ʷ	?
p	t	c	č		k	kʷ	q	qʷ	
		s	š	ɬ		xʷ	x̣	x̣ʷ	h
m	n		l					y	w

Twana (Drachman preliminary version; without his permission; eliminating
    borrowed and dubious segments)

p̓	t̓	c̓	č̓	ƛ̓	k̓	k̓ʷ	q̓	q̓ʷ	?
p	t	c	č		k	kʷ	q	qʷ	
		s	š	ɬ		xʷ	x̣	x̣ʷ	h
b	d		l					y	w

Reichard (eliminating special innovation and incorporating recent better
    knowledge)

p̓	t̓	c̓	č̓	ƛ̓	(k̓)	k̓ʷ	q̓	q̓ʷ	?
p	t	c	č	ƛ	(k)	kʷ	q	qʷ	
		s	š	ɬ		xʷ	x̣	x̣ʷ	h
m	n		l					y	w

CA has some retroflexes, but lacks the lateral affricates; CA and Kal
lack the unrounded front velars.

It would seem reasonable if the underlying matrices for these systems
of segments were not too different, and if the rules of the phonological
components were fairly comparable.

Perhaps we may hazard another guess from this tabulation: It has
been noted by several workers (Elmendorf passim; Reichard, IJAL 26.53,
1960) that the lexicon diverges among the different languages far more
than the rest of the grammar. How this came about and what this means is
one sort of question, and I do not propose to enter upon that matter
here. But we may also ask: What sort of rules will permit that? It would
seem to me that the following (as in Semitic, but not in IE generally)
would be a minimum set of necessary conditions:
1. Features necessary to specify underlying forms shoudl also appear in
surface forms.
2. There should be a fair number of phonological rules redistributing the
incidence of Vs and Cs; this prevents elements from getting "frozen" in
one shape, then to become the victim of a simple Lautgesetz.
3. These rules shoudld affect large numbers and broad categories of
elements. Such generality makes their subdetail easily recoverable.
4. Context-sensitivity for such rules should be relatively simple.
This hinders context from becoming part of the rule and vice versa.
5. Features of rule-marking (Lakoff, On the nature of syntactic

irregularity, Cambridge 1965) should be minimized. This is in part a
more precise specification of (3) above.

If the above conditions are correct, (1) should enhance the ultimate
relevance of our present attempt to sketch the feature matrix of Tillamook.

To approach the consonants we do best to start with the vowels.
From TT §3.6 we may extract the following summary tabulation:

q,qʷ pal.,ł	kʷ,qʷ,x̣ʷ, w,h	unround. (post)vels.	front _k	C_	?	} C-envs.

i   [e,ǫ

e[æ]   eᵛ

a   æ⃗   ʋ

ə[~ʌ] ɪɐ̃   E⃗,ɪ   ᶺu ~ o   E⃗   I⃗   lowering
                                              effect]

Let us now classify these vowels by phonetic range.

i	high ~ mid; front	OR	non-compact, acute
æ	low, *"unrounded" (TT fn.8)		compact, acute
a	low, "rounded" (also fn.8)		compact, non-acute
ə	non-front, non-low		non-compact, otherwise best unspecified and filled in by rule

Because the front Vs seem not to permit much retraction, we regard them
as the marked member phonetically; hence they are called acute here, but
see further below. Likewise, low vowels stay low, while the non-low are
attracted up and down; hence the former are marked phonetically, and are
compact. The results so far may be approximated as follows:

	i	æ	a	ə
acute	+	+	−	
compact	−	+	+	−

There are two difficulties with this. Schwa is ambiguously specified,
though this is deliberate,to try to allow the indeterminacy and overlap
observed; though it contravenes the binarism. Still, this could be
mended. More important is the fact that (a) as we shall see, we want for
the Cs not acute, but grave, and it would be desirable not to multiply
features; and (b) we can then adopt no convention (e.g. 'observe the
plusses') that will tell us which is the marked member (either in the
sense of phonetically restricted, or of less usual and therefore
economically specified for purposes of symbol counting).

Let us now classify the above sets of environmental consonants by
the vowel effect which they seem to provoke.

back velars, ?	lowering	OR	compact
pals., lat., k-series	raising,fronting		non-compact, non-grave
"rounded",unclustered h	backing,"roundg"		grave
unrounded (post)velars	fronting		non-grave

That is to say, compact is obvious and easily decided. Backing and
"rounding" go together, and are efficiently attributed to grave; this
is clearly the more restricted, hence marked, member. Unless we find a
pressing need to proliferate our set of features, we shall not, of course,
wish to do so.

We may now solve the dilemma of acute/grave by abandoning simple
binarism and adopting marking rules. (If I do not use marking through-
out in what follows, it is because I may not in some instances see its
advantage clearly enough, or I may lack syntactic information to make
decisions, or because my technical skill and understanding are as yet
inadequate; in such cases, I simply enter customary + or −.)

Let us revamp our vowel matrix:

	i	æ	a	ə
cons	-	-	-	-
grave	m	m	u	u
compact	u	m	m	u

Now, anticipating our results for the Cs which will preserve the values arrived at above on strong grounds, we write the following rules to convert marking to ᴍ + and -.

(i) $\begin{bmatrix} m\ comp \end{bmatrix} \rightarrow \begin{bmatrix} +\ comp \end{bmatrix}$

(ii) $\begin{bmatrix} m\ grv \end{bmatrix} \rightarrow \begin{bmatrix} -\ grv \end{bmatrix}$ in env. $\begin{bmatrix} -\ cons \\ \underline{} \end{bmatrix}$

(iii) $\begin{bmatrix} m\ grv \end{bmatrix} \rightarrow \begin{bmatrix} +\ grv \end{bmatrix}$ " " $\begin{bmatrix} \underline{} \\ +\ cons \end{bmatrix}$

Obviously, (ii) and (iii) would be well collapsed into an alpha-rule.

(ii.a) $\begin{bmatrix} m\ grv \end{bmatrix} \rightarrow \begin{bmatrix} \alpha\ grv \end{bmatrix}$ in env. $\begin{bmatrix} \alpha cons \end{bmatrix}$

Now we may procede to the consonant matrix. For clarity of the argument, we will first fill in just those feature-specifications which result from the above analysis, plus others which seem pretty obvious at a glance and on past experience.

	t	c	ƛʼ	č	k	q	kʷ	qʷ	s	š	ɬ	x	xʷ	x̣	x̣ʷ	n	ʔ	h	l	w	y
cons	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
voc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			+	+	+
chkd	±	±	(±)	+	+	+	+	+													
cont	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+		-	+			
nas																m					
lat		m								m									m		
grv		(u)	u	u	u	m	m		u	(u)	u	m	u	m				m	(u)	m	
comp		(u)	u	u	m		m		u	(u)	u		m	m		m	m	(u)			

Parenthesis means that the feature can be specified by redundancy rule. The checked and unchecked (currently being called <u>glot</u>, I believe) stops are collapsed into the same entry to save space.

The key problem, as well as our starting problem, is to find the most natural and parsimonious distinctions for the stops; the spirants for the most part will then follow. Let us assume that kʷ and xʷ follow k for compactness. Now we have all that TT call (318) "back" (of the stops proper) successfully specified; t,c, s must all be [u grv] and [u comp]. So is n, by rule. ʔ and y are [u grv]. Since we want w and y to fit naturally with i and ə, they must be [u comp], by rule.

Now we need some more features to distinguish the "front" Cs. The groove segments must be strident. But what separates t from k, c from č, s from š? Note (TT 316, and Edel) that k is ḱ, especially before i. To distinguish t/ḱ etc., <u>Preliminaries</u> (27) would invoke compactness, but this is already exploited on strong grounds. I therefore suggest sharpness (which currently might be assigned, with changed signs, by some to <u>anterior</u>).

As we have seen, the lone nasal is easy, and w/y are clear up to this point; l follows the latter and the laterals quite naturally. Now h (and ʔ) cannot be [-cons, -voc], since we require [+grv] by the above alpha rule; we seek then to distinguish the laryngeals from the sonants. Note (TT 315) that aspiration in clusters is correlated with checked Cs; that hints at a motivation for calling the laryngeals [+chkd], and the sonants accordingly [-chkd]. With this marking, we may now write grv and comp for the laryngeals in by rule. Our matrix now looks as follows:

	t	c	ƛ'	č,	k	q	kʷ	qʷ	s	š	ł	x	xʷ	x̣	x̣ʷ	n	?	h	l	w	y
cons	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
voc	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	+	+	+	+	+
chkd	±	±	(+)	±	±	±	±	±									+	+	(−)	−	−
cont	−	−	−	−	−	−	−	−	+	+	+	+	+	+	+		−	+			
nas																m					
lat			m								m								m		
grv	u	u	(u)	u	u	u	m	m	u	u	(u)	u	m	u	m	(u)	(u)	(m)	(u)	m	u
comp	u	u	(u)	u	u	m	u	m	u	u	(u)	u	u	m	m	(u)	(m)	(m)	(u)	(u)	(u)
stri	−	+		+	−				+	+	−										
shrp	−	−		+	+				−	+											

In all of this, certainly grv and comp are the two most interesting features, and in them seems to lie the answer to our question. Tillamook seems indeed to be a language lacking rounding in the conventional sense, i.e. a feature <u>flat</u>. This applies even to the segments labelled with "w".

And now an interesting diachronic fact comes out. Salish p and m appear to have merged in Tillamook with h and w; note now that the latter pair share features with the segments labelled "w". On the other hand, to judge by Drachman's Twana, h and w were marked in the old system with [+grv]. Thus, by merging flat and grv, Tillamook has placed more of a load on compactness for the back Cs. This has called forth in a limited rôle the feature sharp (or the like). Hence, by merger, Tillamook may not have saved a feature; it may have merely traded one.

Note, too, that, counter to most languages, k is [−grv, −comp]. If that were true throughout Salish, it would explain its unstable behaviour.

<div align="right">Beograd, 1 June 1967</div>