THE ALVEOPALATAL SHIFT IN COWLITZ SALISH

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1. It has long been the practice to divide Salishan languages into k-languages and č-languages, i.e., those with unlabialized front velar consonants and those which have changed these to alveopalatals. At issue are a plain and a glottalized voiceless stop or affricate and a voiceless fricative: k k̓ x and č č̓ š. For convenience these will be referred to as the "k-series" and the "č-series". This sort of typological classification of Salish has been made by Boas, Voegelin, Swadesh and others.[1] But it is rather irrelevant genetically, since the č-languages are located at both geographical ends of the family separated by most of the k-languages, and any relevant connection between the two sets of č-languages is highly unlikely. Coeur d'Alene and Spokane-Kalispel-Flathead are the easternmost Interior Salishan languages, and are the only č-languages of that subgroup. Tillamook and all but one Coast Salishan language (not including Bella Coola, which is a subgroup by itself, and is a k-language) are č-languages. The one exception is Lower Cowlitz, the southernmost Coast Salishan language.[2]

But Cowlitz is not that simple. It has both the

k-series and the č-series,[3] both historically related to those in all the other languages. Both series are phonemic, and are even sometimes in morphophonemic alternation. In a sense, here is a case of a sound-shift caught in transit. It must be pointed out that most Coast Salishan languages do have a few morphemes containing phonemes from the k-series (and Mainland Halkomelem regularly retains x, palatalized), whether as recent changes, residue, borrowing, sound-symbolism, or whatever; but these are seldom frequent (for example, Ch has apparently residual kə́y grandmother, borrowed čík̓ik wagon, and a few others). In Cz, both series are frequent. Of a rough count of just over 380 morphemes with a phoneme from one or the other series, roughly one third are in the č-series:

	Initial	Non-initial	Total
c̓	20	5	25
č	13	23	36
š	14	49	63
k̓	27	19	46
k	47	82	129
x	25	59	84

These figures are approximate and minimal, but the relationships between them can be considered constant. Furthermore, some very common inflectional affixes (e.g., one reflexive, the benefactive, one variant of the collective, and some of the most common lexical suffixes) contain phonemes of the č-series, and these may occur no more frequently than affixes containing k-series phonemes (such as the other reflexive, another variant of the collective, or the independent personal pronominal particles). One gets no impression that either series is uncommon, as is the case with the k-series in other Coast Salishan languages.

1.1. Members of the k-series and the č-series occur in contrasting environments in Cz (e.g., c̓ayə́š grease, fat,

ʔkayə́xʷ sour, bitter; x̣ə́š bad, x̣áx house; mə́xčəʔn head-louse, mə́x̣kən horns), and so must be considered phonemically distinct. And, as noted above, morphophonemic alternations between the two series may occur. Some of these (e.g., tínx muscle, sinew, tíniši his muscle, sinew; syálxʷtk brother-in-law, syálxʷtači his brother-in-law; -ank side, belly, -nači his side, belly) are predictable in terms of morpheme co-occurrence, but others are not (e.g., mə́xčəʔn head-louse, mə́xkaʔni his louse; ʔíx cold, qisʔíšəltawaʔni a fan; cílks- five (objects), čílačš five), and there are also instances where the alternations do not occur where they would be expected by analogy with the first set given (e.g., x̣áx house, x̣áxi his house; kə́lx reed mat, kalə́xi his mat; čípqs beard, x̣ʷáqʷsčpqsəm shave).

2. These alternations lead one to expect regular relationships between the two series. And there are several clear causes for the shift of some of the č-series, but I can account historically for only a little more than half (59 percent) of all the morphemes with č-series phonemes. These fall into three groups: (a) There are 15 or so cases of known borrowing from Chinook Jargon, French, English, or Sahaptin. These are (from Chinook Jargon) šúšukli God, Jesus, angel, šó·kʷəmən sugar bowl, kʷušú pig, píšpiš cat, lapišmú saddle-blanket, lašimní chimney, lapyó·š hoe, (from French) ʔašél personal name, (from English) čáyni Chinese, wáč clock, watch, šípiči? mutton, məšín automobile, and (from Sahaptin) qašqá·š strawberry roan. (There are also a few borrowings with k: from Chinook Jargon are kíkʷəlikʷut skirt, lisák sack, bag, pocket, wəmúsmuski cow, číkčik wagon, kapú coat, likʷó·k rooster; from English are kás train, skáw ferry, qisástakən yarn for making socks, and probably wáks go, walk; and from

Sahaptin sawítk wild carrot and yákima Yakima, Sahaptin.) Some of these borrowings have been further derived by Cz affixes. It is also probable that a number of the unexplained forms are also borrowings (for example, ʔayayáš clumsy, stupid, likáy spotted horse, and činúkʷšitəm owl, ogre are probably borrowed forms), predominantly from the only Salishan neighbor of the Cz, the Upper Chehalis. But because of the close similarity between these two languages, identification of such borrowings is virtually impossible. (b) There are at least a dozen instances of shifts from alveolars c c̓ s to alveopalatals: c̓áyəš fat, grease (Ch sc̓áyəš), šáʔš liver (Ch sáʔš), c̓úšaka always (Ch c̓úsac̓a), c̓amúyɬaʔ snail (Chinook c̓əmó·ikxan). Most of these are intramorphemic assimilations to alveopalatals which are derived from front velars, but the reason why these front velars shifted in the first place is unclear. A late rule can account for this assimilation; it must follow the k to č rules (1 and 2, below): Rule 3. c c̓ s > č c̓ š in a morpheme with č c̓ š or y (or, if you prefer,[4]

$$\begin{bmatrix}-\text{Sonorant}\\+\text{Anterior}\\-\text{Lateral}\\+\text{Strident}\end{bmatrix} \longrightarrow [+\text{High}] \;/\; \underline{\qquad} \begin{bmatrix}-\text{Syllabic}\\+\text{High}\\-\text{Back}\\-\text{Lateral}\end{bmatrix}$$

). I will return to the relationship between alveolars and the k- and č-series shortly. (c) Most explainable occurrences of č-series phonemes are conditioned sound-shifts of two types. The largest group of these occurs before a high front vowel: Rule 1. k k̓ x > č c̓ š before i (or

$$\begin{bmatrix}-\text{Sonorant}\\+\text{High}\\+\text{Back}\\-\text{Round}\end{bmatrix} \longrightarrow [-\text{Back}] \;/\; \underline{\qquad} \begin{bmatrix}+\text{Syllabic}\\+\text{High}\\-\text{Back}\end{bmatrix}$$

). There are so few cases of a k-series phoneme before i that this must be considered a regular shift. Examples are c̓íl̓k widow, čé·taq- argue, túl̓šil̓s- hint. Unlike other similar matters in Cz, this shift even applies across certain

morpheme boundaries, i.e., before the third person possessive suffix -i or before a lexical suffix beginning with i, and possibly in a few other places. The minor pattern consists of nine occurrences of č-series phonemes which appear to be instances of a regular dissimilation of a k-series phone and a following back velar within the same morpheme: Rule 2. k k̓ x > č c̓ š before a back consonant in the same morpheme (or

$$\begin{bmatrix}-\text{Sonorant}\\+\text{High}\\+\text{Back}\\-\text{Round}\end{bmatrix} \longrightarrow [-\text{Back}] \;/\; \underline{\quad} \begin{bmatrix}+\text{Consonantal}\\-\text{High}\\+\text{Back}\end{bmatrix}).$$

Examples of this are sc̓ə́q^{w}ən hip joint, čə́nčənq̓ɨnalən stuttering, k^{w}ašə́q- pop. The intramorphemic environment is an important restriction; there are eight instances of a k-series phoneme occurring before a back velar, but in all these cases the latter is in a different morpheme, e.g., ɨə́k-iq fall over, kə́m-ay̓q fall out, tip over, káw-yaq̓^{w}umx settle down (to live), kát-čiq̓^{w}iṁɨtən̓ stirrups, čsk-ɨ́yq ant, tks-ɨ́q̓^{w} upper-class person, ɨə́k-stq- take in, enter, tə́k-sx̣^{w}q^{w} starve. There is one exception: s?ə́xaqən it is snowing. Dissimilation may be an unusual source of regular sound change,[5] and these Cz instances are few in number; it does appear to be a consistent characteristic, however, that a k-series phoneme may not precede a back velar within a morpheme.

But how does one account for all the other occurrences of č-series phonemes? Or, if this was a general shift, then how does one account for all the unshifted k-series phonemes, which, after all, outnumber those of the č-series by more than two to one? I cannot answer these questions, but simply give here several examples from both series, and offer a few speculations which might eventually explain

a few more forms. (a) č-series: čúyuk^{w}- bend, wəčál bracken roots, čá·kt waist, táčənmən attached to, šáw? bone, ɬíšɬ have a cold, sčšnó? money. (b) k-series: kayəx^{w} sour, ləlk full, kási? star, sx^{w}áyks rabbit, xəmímx mourning dove.

2.1. Noted above was the shift of alveolars c č s to corresponding alveopalatals in assimilation to alveopalatals previously derived from the k-series (Rule 3). This appears to be the result of an antipathy in Cz between alveolars and alveopalatals; I know of only one morpheme in which both occur: mésčəm muskrat. But the intramorphemic occurrence of these alveolars and a k-series phoneme is quite common: kásc- hide, čək- all gone, kəč- enter, ride, čúk-/čawək- cut, xácxc- trot, cápx creek. It may be that an alveolar-alveopalatal antipathy has served to block the shift of the k-series to the č-series. This could be described as a sound-shift blocked by dissimilation of the two series. Furthermore, this could serve to explain four instances of a k-series phoneme before a front vowel (whether or not this front vowel is in the same morpheme): ké·c little, sək-i its splitting, s-cíki-t-n he's crumpling it, čsk-íyq ant. This is not a new notion, but certainly an obscure one. Posner calls this phenomenon "conservative dissimilation", but does not discuss it. I have found it discussed in only two places: Grammont, who calls it "la dissimilation préventive", and in Hashimoto in a discussion of Ancient Chinese.[6] If this is a valid concept for Cz, Rule 1 will have to be modified as follows: Rule 1a. k k̓ x > č čˀ š before i except when c čˀ s occurs in the same morpheme. However, an explanation is still required of how a few forms managed to get by this dissimilation restriction (see Section 2(b)),

resulting in the ensuing assimilation of the alveolars. This restriction is purely intramorphemic: the absolutive (or nominalizer) s- prefix, the stative aspect ?ac- prefix, and various suffixes with alveolars co-occur freely with roots containing alveopalatals, and suffixes with alveopalatals co-occur freely with roots containing alveolars. But note that the simple form of the word for five, čílačš, is treated as a single morpheme in this respect, even though it can be analyzed into two morphemes, although this division may be pre-Cz (see Section 2.2).

Note the parallels between the two dissimilatory phenomena, the shift of k-series to č-series phones before back velars and the non-shift of the k-series in the presence of the alveolar series (c č s). Both are intramorphemic, as contrasted with the shift before front vowels. And both involve the dissimilation of articulatorily adjacent consonant series. Given c č k q, c and k may co-occur, and č and q may co-occur, but c and č or k and q may not. This double dissimilation is not directly reflected in the rules. But č and k may co-occur: məxčən head-louse, čá·kt waist, kayáčɨ sleepy, čílk widow. No morphemes have been found containing back velars and alveolars together with either front velars or alveopalatals (i.e., q-k-c or q-č-c). Thus so far nothing indicates that ordering is necessary between the two dissimilatory phenomena.

Because all instances of č-series phonemes (except in borrowings) are ultimately derived either from the c-series (by assimilation) or from the k-series (by regular sound-shifts, even though all the circumstances cannot yet be accounted for--comparative evidence indicates that this regularity must be so), it is reasonable to assume that

č and k were at one time only allophones of a single phoneme. They became distinctive when borrowings and assimilations of c brought them into contrast. Thus the obstruent series given above was earlier /c [č k] q/. The problem is to determine all the environments in which the č allophone occurred.

2.2. The word for five leads to another speculation which complicates the whole problem considerably. Comparative evidence suggests a probable reconstruction of PS *cil-akis five. This *ki sequence accounts easily for Cz čílačš (by Rule 1 with subsequent application of Rule 3) and could also suggest that many other instances of the č-series phonemes derive from forms that formerly had an i following them, now lost.[7] But there is no evidence for this in most cases. Besides the example just discussed (five), I know only of pánačš ten from PS *pan-akis, x̣ʷáq̓ʷsčpqsəm shave from čípqs beard, -š-/-ši- benefactive, and -č/-či reflexive. Further difficulty is added by the forms with morphophonemic alternations between the two series (see Section 1.1). For example, although Cz čílačš is explainable by PS *cil-akis, Cz cílks- (which occurs with various suffixes, e.g., cílksɨtumx fifty, cílksɨqʷ five days, cílksɨušən five times) is not. One possible explanation would be a PS alternation of forms with and without the *i in the suffix, and there is some evidence that this was the case in five. But such evidence is lacking as yet for the other pairs (except insofar as these Cz forms provide the evidence, but that is circular), and the problem must be left for now at the speculative stage.

2.3. Another environment which may condition the shift to alveopalatals is a following u. This would

generalize the earlier rule (1) that k before a high front vowel becomes č to Rule 1b. k k̓ x > č č̓ š before a high vowel except when c c̓ s occurs in the same morpheme. But the evidence for this is extremely slight, perhaps expectedly so; I have only three morphemes that qualify: čúš- in čúšaka always and čó·šəm always (the š is an assimilated s by Rule 3; cf. Ch čús always), čúyuk̓ʷ- bend, and šúλ̓- stick, get stuck. PS *k was presumably not common before *u; even so, there is at least one counterexample to the formulation just made: kʷúpaʔ grandfather (cf. Ch čúpaʔ). There seems to be no contrast in Cz between k and kʷ before u--only kʷ occurs. But PS did have such a contrast, or sequences of ču could not arise, and some Interior Salishan languages still make this contrast. The history of forms with *ku is rather irregular, some languages generally converting these to kʷu, others converting only some. Perhaps Cz converted only a few, grandfather among them. This form is reconstructable as PS *kúpay̓; the initial sequence becomes kʷu in Sliammon kʷúkʷpa, Bella Coola kʷukʷpi, Lillooet and Thompson kʷúkʷpiʔ (where it means boss), as well as Cz, and it becomes ču in Ch and Quinault čúpaʔ. Another reflex of PS *ku turns up in Cz kásiʔ star, with an unexpected á as first vowel; the PS form is reconstructable as something like *kúsimt (cf. Sliammon and Nooksack kʷúsən, Lummi kʷósən, Halkomelem kʷásən, Thompson nkʷəkʷúsən̓, Kalispel ɬkʷkʷúsəm̓, etc., but Puget čúsəd). A pre-Olympic change of *u to *a would be necessary to account for this form if Rule 1b is applicable, and such a rule would have to precede Rule 1b. Other instances of Cz {ku} (phonemically /kʷu/) derive from the merging of ə and a following w to u, and would not be affected by Rule 1b, which would be ordered before

this merger: Rule 4. əw > u. Examples of this are xʷúɬ road (with automatic rounding of the x; cf. xawáli his road), kʷúɬ wife (cf. kawáɬani his wife), sxʷu?úmitən he is crying (compare with these the Ch cognates šə́wɬ, čə́wɬ, sšə?úmitən).

3. Several other speculations to account for the shift of k k̓ x to č č̓ š are suggestive, but do not hold up because of the counterexamples. I have suggested that following i, u, or a back consonant conditioned the shift. It seems reasonable to expect that one of these same sounds preceding a k-series phone might have a similar effect. But there are only seven occurrences of i (or y) before č or š (a suffix -íč, perhaps reflexive, on yəlwíč go clear around and talíč- help, the lexical suffix -íčən back, bag, basket, a probable suffix -iš on pó?tmišəm down to the river and čaʔumíš awkward, ?íšti clumsy, kʷá·yš part in hair, ɬíšɬ- have a cold, and qisʎíšəltawaʔɬ a fan). But contrary to these are eleven instances of a k-series phoneme following i, one of them the usual form of cold, ʎíx, occurring as the root in fan (above; this word cannot, incidentally, be a borrowing; the affixes are typical only of Cz). Five of these may retain k by preventive dissimilation from a c-series phoneme: cíks bee, cík- rub, qiscítikanəm mountain pass, čikús- frown, and síkəlxayu? snake. In two other cases, an x may derive from PS *x̣ or *xʷ: ʎíx cold and ?íx go after. Similarly, the k of bee and rub may derive from *q (see Section 4). But this still leaves four forms, not many less than the examples of i before č: sx̣ʷáyks rabbit, tikʔá·?ka? revolver, x̣íkəlsən peel, and níx this.

A preceding u or w is even rarer than a following one and tells us nothing. The only instance before a č-series

phoneme is ʔúšaməṉ- sorry, and the only intramorphemic instance before a k-series phoneme is sq̓iyúx prop. Two more instances occur, one of which is across a morpheme boundary, but, as has been shown, the conditioning factors for this sound shift are usually intramorphemic: ɬíw-x he took it off (furthermore, this x is derived from *xʷ; cf. Ch ɬíw-xʷ). The other instance arises from a stress shift, vowel deletion, and application of Rule 4: č̓úk̓- from č̓awə́k̓- cut (which has an underlying form *cəwə́k̓-).

A č-series phoneme has been found following a back consonant in only three forms, and two of these are probably across morpheme boundaries, although I cannot analyze the forms: q̓áɬč̓əm̓ beaver, x̣aɬíɬčəṉ roots, and (s)x̣asíɬšəṉ driftwood. On the other hand, there are seven morphemes with k or x following a back consonant: sx̣ʷáyks rabbit (Ch sx̣ʷáyčs), qə́lk- crawl (Ch qíl(a)č̓-), x̣áx house (Ch x̣áš), qə́nx mouth (Ch qə́nš; but this x derives from PS *xʷ), sq̓ʷə́mx sweathouse, sq̓axápəṉ he is telling a lie (probably an error for x̣; cf. Lower Chehalis q̓ə́x̣əp), and sq̓iyúx prop. So none of these three possible explanations is substantiated.

A little more profitable, but less convincing, speculation stems from the fact that a non-pronominal word-final nasal has been found preceded frequently by č-series phonemes, but only once or twice convincingly by k-series phonemes. But this seems intuitively to be an unlikely environment; furthermore, most of these final nasals constitute a separate morpheme, violating the general pattern of the palatal shifts being intramorphemic (the notable exception being before i). And whenever anything else is added to the form, this pattern collapses, and members of the č-series or the k-series occur freely. Only two things

argue in favor of this being a condition for the sound-shift, and neither is very convincing. One is simply that the pattern exists. The other is that nasals are known to develop to front vowels in a few Salishan languages (e.g., in Spokane, post-consonantal n before s- absolutive becomes i, as in či səmə?ém I am a woman from čn I; or the suffix sequence -nún-t-s becomes [-núys];[8] a development of n to i is also reported to be a probable occurrence in Tillamook).[9] Since this is so, there may be a special relationship between nasals and front vowels that would allow both to cause a shift of k to č. The following are all the instances of this which I have recorded: q̓áɬč̓əm̓ beaver, p̓əlé·č̓əm̓ inside-out, mésčəm̓ muskrat, swaq̓éx̣čən frog, méxčə̓n̓ head-louse, x̣alíɬčən roots, xáy̓načəm backwards, yáx̣ʷnačəm wiggle, -ičən back, bag, basket, stó·l̓šən fruit, berries, taxʷál̓šən blend work in a basket, pó?tmišəm down to the river, ɬá?kʷix̣ašə̓m̓ clear around, kʷupámapšən palm, (s)x̣asíɬšən driftwood, ?acyášən a pack, -šən foot, leg, -šən times. The only certain form with k is cútkən maybe. Another may be kən I, but this is a pronominal, and I excluded pronominals above; however, all the other examples before pronominal suffixes are third person, either the continuative aspect subject or the completive aspect object: tákɬak̓ən it is aching, ?it yalék̓ən he twisted it, ?it lék̓ən he filled it, ?it p̓alék̓ən he turned it over, ?it č̓awék̓ən he cut it off, ?it číkən he rubbed it. I have recorded four other instances with a k-series phoneme, but there are reasons to doubt their accuracy: séx̣kən scratched on the back and sqíwxən track both involve the lexical suffixes back and foot that normally occur in this position (and without a following third person possessive -i) as -íčən and -šən,

respectively (sqíwxən may be a back formation from sqíwxanən he is smelling a track, from qíw- smell). q̓ʷalítk̓əń skin probably also involves the suffix for back, but otherwise I cannot analyze the form, and it looks improbable. sə́k̓əm swim has an unexpected stress pattern; I would expect *sak̓ə́m, and the stressed vowel would exempt the form from this hypothesized rule (the ə that occurs in the other forms is epenthetic, and is added by a very low-level rule, not relevant here).

4. My final speculation involves the origin of the Cz k-series. Several instances of Cz x derive from PS *xʷ, e.g., tə́mx earth, land (cf. Thompson təmíxʷ), qə́nx mouth (cf. Skagit qə́dxʷ), -x completive third person object (cf. Ch -xʷ). The only analogous evidence that some instances of Cz k or k̓ derive from *kʷ or *k̓ʷ is nks- always (cf. Ch nkʷs-), but the possibility remains open that some other forms can be explained with this type of origin. There is also fragmentary evidence that a few instances of Cz k k̓ x may derive from PS back velars, e.g., cíks bee (cf. Squamish cíq- stab), cík- rub (cf. Thompson cíq- pat, tame), łíš- have a cold (cf. Thompson łáx̣i cold, Tillamook x̣é?əł cold), x̌íx cold (cf. Skagit x̌áx̣, Nooksack x̣əyx̌), sxʷu?úmitən cry (cf. Ch šə?úm-, Skagit x̣á·b, Halkomelem x̣é·m, Squamish x̣əh-m), sə́k̓- split (cf. Columbian sə́q̓- split, but both Thompson sə́q̓- and sə́k̓- crack; sound symbolism may be involved in this q̓/k̓ pair). It may be that k-series phonemes derived from these two sources developed too late to undergo the further shift to the č-series; I know of no certain instances of PS *xʷ ending up as Cz š (but it does develop to š in Ch), and łíš- have a cold is the only possible instance of Cz š from PS *x̣ that I can cite. However, even if these sources

could account for retentions of some of the k-series phonemes, they do not explain the problematic shifts to č-series phonemes, because there are numerous instances of k-series phonemes which clearly derive from PS *k *k̓ *x (e.g., kálx hand). But a profitable line of investigation would be to determine the PS origin of all instances of k-series and č-series phonemes. If the č-series derive only from the PS k-series, then it might shed light on the problem to eliminate all instances of Cz k k̓ x derived from other PS series from further consideration, and look for patterns among those derived from *k *k̓ *x, assuming that only this set was susceptible to the shift to č c̓ š in Cz. Unfortunately such a procedure is not possible. I have compared Cz forms with extensive vocabularies available to me in Columbian (from my own field notes) and in Squamish (from Kuipers' The Squamish Language),[10] but find no cognates for a large number of forms.

5. In spite of the difficulties in explaining the Cz palatal shift, the data may be instructive to general historical linguistic theory. The notion that sound change is a gradual process seems to be in general disfavor among linguists today. But one must distinguish at least three types of gradual change: (1) a gradual shift in the point or manner of articulation; (2) a gradual shift through the vocabulary; and (3) a gradual shift among the speakers. This third type cannot be considered here because the only two remaining speakers were sisters (who were, besides, less than fluent in the language). Their sole use of the language was with their mother, who died in 1963 at age 105, and they should be considered continuations of her idiolect. In any case, since there are no other speakers, there is no way to check variations

within the language.

Most attention has been given to the first-mentioned type of sound change--a gradual shift in articulation. Although such a gradual shift is possible for some kinds of phonetic change, it is impossible for others, and has frequently been shown not to be the case at all. It seems to me that the existing morphophonemic alternations make it unlikely that there was a gradual shift in articulation in Cz. A complete rejection of this type of change can be found in a review by Halle and Keyser.[11] They prefer, rather, that sound change be a "discrete phenomenon" which is the result of "adding, subtracting, or modifying one rule"[12] in the grammar, but say that such a change diffuses gradually through a language community. Granting that the change is abrupt within an idiolect, and diffuses through the language community, I do not see how the Cz shift can be described in terms of "adding, subtracting, or modifying one rule" or many rules. Unless all instances of the shift can be explained, rules will not work. The remaining option is that sound change may be lexically gradual. Wang suggests this possibility in Competing changes as a cause of residue,[13] but his explanation that one change may be blocked by another competing for the same part of the lexicon does not seem to apply to Cz. Instead, Cz may have one change blocked by another competing for the same part of the phonology--i.e., *q *q̓ *x̣ and *k^{w} *k̓^{w} *x^{w} changing to Cz k k̓ x and overlapping the shift of that series to č č̓ š in progress; the assimilation of c c̓ s to č č̓ š would overlap and compete from the opposite direction. Unless and until explanations can be found to account for the many still unexplained instances of the Cz č-series, a gradual spread of the sound change through the vocabulary is the only solution I can offer.

FOOTNOTES

1. Franz Boas and Herman Haeberlin, Sound shifts in Salishan dialects, IJAL 4.117-136 (1927). Voegelin based his classification on Boas and Haeberlin: C. F. Voegelin, North American Indian languages still spoken and their genetic relationships, in Language, Culture and Personality: Essays in Memory of Edward Sapir, edited by Leslie Spier, A. Irving Hallowell and Stanley S. Newman, Menasha, Wisconsin (1941). Swadesh based his classification primarily on the same source: Morris Swadesh, Salish phonologic geography, Language 28.232-248 (1952).

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2. Boas and Haeberlin did classify Cowlitz as a k-language, but recognized that it was not exclusively so: "Cowl has usually, and UCh 2 very often k and x where the

tc dialects have tc and c'' (read k, x, č, č, š, respectively). Since there remain only two speakers of Cowlitz and three or four of Upper Chehalis, it is no longer possible to verify Boas' Upper Chehalis 2 dialect--no trace of it remains.

3. The phonemes of Cowlitz are p p̓ t t̓ c c̓ ƛ̓ č č̓ k k̓ kʷ k̓ʷ q q̓ qʷ q̓ʷ ʔ s š x xʷ χ χ̓ʷ h m m̓ n n̓ l l̓ y y̓ w w̓; i u a ə; vowel length, and at least two degrees of stress. Vowel length lowers i to [æ·] (written here e·), and u to [ɔ·] (written here o·). The morphological process realized as length with i, u, and a converts ə to [æ] (short; written here e). ŭ before ʔ is realized as [ɔ̆ʔ] (written here ŏʔ). To the extent that the symbols e and o are used, and epenthetic ə is written, the transcriptions are not entirely phonemic. Note that e· is like i in its effect on consonants, but e (short) is not. The following abbreviations will be used: Cz Cowlitz, Ch Upper Chehalis, PS Proto-Salishan. Ch forms cited here will use the same notational conventions I have adopted here for Cz (i.e., i e· u o· a a· ə e o) rather than that of my earlier writings on Ch (which were, respectively e e· o o· a a· ə ə· o).

4. Distinctive feature terminology is from Noam Chomsky and Morris Halle, Sound Pattern of English (New York, 1968); it is as good--or bad--as any system, and is generally known. This notation is added here for the benefit of those who find it informative. It is used in conformity with Chapter 9 of Sound Patterns.

5. Knud Togeby, in Qu'est que la dissimilation? (Romance Philology 17.642-667 (1964)) rejects dissimilation

as a type of regular sound change, relegating it to an infrequent, sporadic occurrence. He seeks explanations for apparent dissimilations cited by Rebecca R. Posner in her Consonantal Dissimilation in the Romance Languages (Oxford, 1961).

6. Maurice Grammont, Traité de phonétique, 8th ed. (Paris, 1965), p. 329. Grammont cites several examples, one of which is very much like the Cz problem: "en ʿIraq un k, qui sans cela serait devenu č, reste k devant č (c'est évidemment à la 1re phase, ḱ, que l'évolution a été arrêtée): ačil "repas", mais akilčen "votre repas"."

Mantaro J. Hashimoto, Internal evidence for Ancient Chinese palatal endings, Lg 46.336-365 (1970). Hashimoto suggests that the presence of palatal consonant endings in Ancient Chinese prevented, through dissimilation, an otherwise regular palatalization of velar and glottal initials, thus leading to the creation of some troublesome doublets in Mandarin and other Northern Chinese dialects.

7. The loss of vowels is regular in Cz. Briefly, and somewhat simplified, a final XVC sequence (where X is any consonant or consonants) is reduced to XC; unstressed vowels are deleted before any CCV sequence (čílačš is an unexplained exception, but cílks- is regular; the second vowel of čílačš may be explained by secondary stress, but the role of secondary stress in Salish is not yet fully understood).

8. Barry F. Carlson, A Grammar of Spokan, unpublished Ph.D. dissertation, University of Hawaii, 1972, pp. 16 and 102.

9. Laurence C. Thompson, personal communication.

10. The Hague, 1967.

11. Morris Halle and Samuel Jay Keyser, Review of John Hart's works on English orthography and pronunciation, 1551, 1569, 1570: Part II, phonology, edited by Bror Danielsson. Language 43.773-784 (1967).

12. Ibid., p. 779.

13. William S-Y. Wang. Language 45.9-25 (1969).

APPENDIX

Additional examples are given here. Abbreviations not used in the text are: Cm Columbian, Ka Kalispel, Lo Lower Chehalis, Pg Puget Salish, Qn Quinault, Se Sechelt, Sq Squamish.

1. Additional predictable morphophonemic alternations: stə̓́k̓ jacket, stə̓́čiˑ his jacket; ʔacwə́nx doctor, swanə́šiˑ his doctor; -mx people, -m(i)ši his people; -mx plural X, -m(i)ši his plural X.

2. Additional unpredictable morphophonemic alternations: p̓ə́l̓k̓-, p̓alə́k̓-ən turn over, p̓əlé·c̓əm̓ inside-out; pə́nks- ten, pə́načš ten; stə́·l̓šən fruit, stə́·l̓xaniˑ her fruit; ʔacyə́xanił carry on the back, ʔacyə́šən a pack; -ičən back, bag, basket, -kəniˑ his back, bag, basket; -xan- or -xən- foot, leg, -šən foot, leg and -šiniˑ his foot, leg.

3. Additional unexpected morphophonemic alternations: sə́k̓- split, sə́k̓iˑ its splitting; sawítk wild carrot, sawítakiˑ her carrot; lisə́k sack, lisə́kiˑ his sack; c̓ík̓c̓ik wagon, c̓ík̓c̓ikiˑ his wagon; c̓úk̓-, c̓awə́k̓- cut, sc̓awə́k̓iˑ its cutting. Note that three of these are borrowings.

4. Shifts from alveolars to alveopalatals: č̓ílačš five (Ch cílačs, Lo cíl̓əč, Qn cílaks, Sq cíačis, Cm cílkst; PS *cil-akis); pə́načš ten (Ch pə́načs, Lo pə́·n̓əč, Qn pə́naks; PS *pan-akis); x̣ə́š bad (Ch x̣ə́s, Lo x̣ə́s); c̓ə́·šəm always (Ch c̓ús); šyə́·qʷił hat. If correct, two others may belong here: c̓íxʷip- iron, press (Ch c̓íxiaʔpiḿił [sic]); c̓íx̣i- fry (Ch c̓íx̣ḿił, Cm c̓íx̣-; but Pg c̓íx̣(i)).

5. k k̓ x to č č̓ š before i:
čín-łni- poison (Cm n-kəɬ-cín-); číl̓q^{w}u? tears coming out of the eyes; číə chickadee; yálx^{w}tači his brother-in-law (cf. syálx^{w}tk; Ch syáx̣^{w}tč); s̓táči his jacket (from s̓ták); sxíynači his crab (cf. sxíyənk crab, crawfish); s̓tačé? island (Ch s̓tačé·?); nəxánči small chipmunk; súpsəɬči its tail (Ch súpsnč, Lo súpsɬəč); k^{w}əntáčic shake hands (Ch sk^{w}ənátač̓iɬ); -nači lower part, side, belly (cf. -ənk; Ch -n(a)č); -či reflexive; sč̓in(?) silver salmon; č̓íɬx^{w} pillow (Cm k̓aɬqín pillow, k̓áɬ- up against ?); č̓ípt red elderberry; č̓ípqs beard (Ch č̓púcqs, Lo (s)č̓əpúcqəs); č̓éq̓q- squeak, whine; č̓íɬls messed-up hair (Ch č̓ísls); máč̓iła? flea (Ch máč̓ɬn?); tíniši his muscles (cf. tínx; Ch tínš, Cm tínx); sq̓^{w}aʌ̓áši her baskets (filled) (Ch sq̓^{w}áʌ̓š picked berries); swanáši his doctor (cf. ?acwánx; Ch ?acwánš); ?ałtaníši his arteries; -m(i)ši his people (cf. -mx); -umiši his plural X (cf. -mx; his plural people is -mix^{w}umiši); -ši- benefactive (Ch -ši-, Cm -x(i)-). Exceptions to Rule 1 are: łákiq fall over (cf. łákayq; Ch łáčiyq hit with missile); xíynk- walk backwards and sxíyənk crab, crawfish (cf. xáy̓načəm or xáy̓načəm backwards); x̣áxi his house (cf. x̣áx, -x̣x; Ch x̣áš, Lo x̣áš); kaláxi his mat (cf. kálx reed mat; Ch čálš).

6. k k̓ x to č č̓ š before a back velar consonant:
sčátqłəm̓ animal (Ch sčátqłəm? grizzly bear, Pg sčátqłəb); sč̓áq^{w} sucker; sč̓áq^{w}psəm back of neck; ?ac̓álé·q^{w}ɬ groove (Ch ?ac̓álq^{w}ɬ); šáq cloud (Ch -šq); šáqɬ stain a cloth.

7. Additional instances of č č̓ š (note that not all those previously cited have been explained):
sčátx^{w}əɬ̓ black bear (Ch, Lo, Se sčátx^{w}ən?, Pg sčátx^{w}əd);

čé?xʷmalən sunburned; čaƛumíš awkward; spə́nč squirrel; ƛə́lčɬ keep up, never quit (Ch ƛə́lč-); ɬítlčak yás yesterday; wánačɬ- lost (Ch wánačɬ); sčé? buttocks; q̓aɬ-čášənɬ dangerous (Ch čáhšɬ); šé? here (Ch šé?, Loší?); šə́kʷiyaxc-hiccough (Ch šə́kʷiyaxʷc); túlšəlsən guessing; tálšəls chase, follow; sƛaláš deer (Ch (s)ƛaláš, Cm sƛálx Coast deer); čayə́š grease, fat (Ch sčayə́š); šá?š liver (Ch sá?š); p̓ašə́xʷ- go flat; lá·šəm- clear the forest.

8. Additional instances of k k̓ x:
káɬ- give (Ch čáɬ-, Cm káɬ-); káws nut; skáw sister-in-law (Ch sčáw, Cm skáw; PS *skáw); kəlt and; ká· where (Ch čá·; PS *ka-); kátyən fishnet; káwlən pretend; kálwi-cx guest; kásuci- outside; kanílstxʷayaq- kneel, confess; kássən keep (a secret); kác- lay something down; kən?ó· maybe (Ch čən?ò); kán- three (Ch čán-, Sq čán-; PS *kan-); ká?ɬi? three (Ch čá·ɬi, Cm ka?ɬás); ká·wan lie on side; ká?o someplace else; káwlic Cowlitz; kən- make a mistake; kakáltəmtən carpentering (Ch čč-áxʷ build a house, Sq čá?-t make); katísa? strawberry (Ch čatísa?); kə́nnaməns dissatisfied; kə́məmt- cry (Ch čə́m-); ká?xa? take it away!; kə́m̓- bend over, stoop (Ch čə́m?-qs-, Sq čə́m?- close; come together, be folded, doubled up); kə́w- pack; kálkʷu- look for lice; tkcó? between; tkxán? there, opposite; -kɬ our (Ch -čɬ); -aka(?) hand (Ch -ača, Cm -akst); ?aks- an aspect; ?aks- color; -ƛk belly (Ch ƛáč; PS *ƛá(?)k); -ksa again (Ch -čsa); -kx you (Ch -čš); -alaka? nomen actoris (Ch -alača); yákəmx near (Ch yá?čəm?š); tákɬ(a)k̓- sick, ache (Ch táčɬ(a)č); yə́mks sinew, pack-strap (Ch yə́nkʷs); ?áy̓tk lots of; né?sk younger brother (Ch né?sči); ƛa?ílkɬ skin (Ch sƛə?íčɬ); yəmkə́si its tallow (Ch yə́mciš-s); čakálnut give up (Ch čə́č- all gone, use up); məxkən horns; ?ac-k̓álə́lksti?

cramp in the side (Ch čál-čsti); xə́lk- pull (Ch šə́lč-); čə́kaɬ earn, win (Ch čə́č-); mə́ɬk summer (Ch mə́ɬč); súskpəɬ hemlock (Ch súsčp-nɬ); ɬakálwasumx she married him; tə́ktkəni humming-bird (Ch tə́čtčni, Sq təčtəčnís); ʔacmə́lmalakɬ pleats; ɬakə́x put or take out; pátk- reach; nə́k- sink (Ch nə́č-); wáyəlk- let go (Ch wáyəlč-); ʔáʔctixkəna memory (Ch ʔácti-kʷn remember); pútakaʔ half done; stəkáli Indian pipe (Ch stə́q ʔ); sə́ksk- swim (of a fish) (Ch sə́č-); ʔáyakakamən thimble; ʔákan then; tawáks- stab (Ch tawáqsi- or tawáksi-); k̓áɬ drown (Ch č̓áɬ-); k̓álx branch (Ch č̓álš); ʔac-k̓á·čkʷu puddle (Ch č̓áčxʷiyq); k̓álɬ get in trouble; sk̓átp rib; k̓anáp̓ scissors (Ch č̓anáp̓); k̓anə́p̓ən squeeze; k̓alálus a cross; sk̓á·k̓aʔ crow (Ch sk̓á·k̓a, Lo sk̓éh, Pg k̓áʔk̓aʔ); k̓axʷóʔ oil, grease, lard; k̓éc- put in the mouth (Ch č̓éč-); k̓ə́t- nibble, gnaw (Ch č̓ə́t-, Pg č̓íti- chew up, Sq č̓ít-inʔ); k̓ə́sk̓s hair (Ch sč̓ə́s); k̓léh salal berry (Ch k̓(ʔ)léh); k̓áp- tame; sk̓énəmtən shiver, shake (Ch č̓én-, Pg č̓ə́dəb); k̓áyk̓ay- tickle; tk̓acnáwəɬ older; t̓knámc half-breed; -k̓p wood (Ch -č̓p, Lo -čəp, Pg -čup, Cm -átkʷp); ɬə́k̓ sharp, ache, sore (Ch ɬə́č̓, Lo ɬə́č̓(ʔə), Sq ɬíč̓ be cut); nák̓- one (Ch nač̓-, Pg dčú and də́č̓uʔ, Cm nk̓ʷ-); t̓ik̓á·ʔkaʔ revolver; yalə́k̓ən twist (Cm yə́rk̓ʷ- bend); lə́k̓- fill (Ch, Lo lə́č̓, Sq yə́č̓, ʔCm lík̓- fill, put dirt on); wák̓- uncover (Ch wáč̓-, ʔPg gʷə́č̓- look for); ɬə́mɬamak̓ wrinkled; wə́lk̓ polish, shine (Ch wə́lč̓- glitter, Pg gʷílič̓əb); nək̓á·l̓us coyote (Ch snəč̓əlʔ, Ka sənč̓əlé(p); PS *s-n-k̓əl̓-); sxamálaxʷ people (Ch sšaɬmálaxʷ); x to (Ch š); sxə́n husband (Ch sšə́nʔ, Lo šə́n); xaɣ̓álumən saddle (Ch šaɣ̓áwimən); xánʔ there (Ch, Lo šánʔ); sxə́p blanket (Ch šə́p- cover); xə́w(a)ɬ- raise, grow (Ch šə́wɬ, Sq šə́way); ʔacxəná·səɬ lie on back (Ch šaná?səm, Cm xə́ɬ- put a flat object on); xə́yʔ mind, heed, obey; xasə́k̓ʷ wild (Ch časə́k̓ʷ); xə́ƛɬ break in two (Ch x̣ə́ƛɬ); xáɬən- clubbed; xápən yawn;

sxə́pawən going down; sxamyúpi his side; nxəm̓tə́ni his children/relatives; xə́pi? comb (Ch šapáy?); txmé·n̓stəm stay where you are; nx- -tən kin plural (Ch nš- -tn); -cx reflexive (Ch -cš); -wax reciprocal (Ch -uwš, Cm -wáxʷ); -tumx -ty (Ch -tumš); wácxanəm dance (Ch wətšə́nm); yáyɬx stingy; tawílx sitting (Ch tawé·lš); tíwxtn crossing; t̓əmx- both (Ch t̓əmš-); sík̓əlxayu? snake; λ̓áqʷtum̓x enough; λ̓áxλ̓x tree, wood (Ch λ̓ášλ̓š); ?ím̓x grass for baskets (Ch ?ím?); tə́q̓tum̓x middle; məsímx a personal name; sá·tanx knead; yax nothing but; táylaxkʷu? out of breath; x̣ə́pənxtən drying-rack for berries; skanál̓xanəm make a mistake; ?ac?ə́x̣tkʷəlx Indian doctor (Ch ?ac?ə́x̣tkʷlš, Cm λ̓a?-kʷílx); ?áyəlx happy; ?acwánx doctor (Ch ?acwánš); scəxá?is partner; walátx soft; wə́x- pull (Ch wə́š-).