

## TONOGENESIS IN BAW DA GWR

Proto BDG was a basically disyllabic language with a relatively simple sound system:

Voiceless Stops: p t k q (bilabial, dental/coronal, velar, uvular)

Voiced Stops: b d g

Nasals: m n ŋ

Voiceless continuants: s h

Liquids: l r (\*r was probably an retroflexed approximate [ɹ] like Amer.Engl /r/)

Semivowels: w y

Vowels: i a u

Permitted forms were V(C), CV(C) (though monosyllables were rare); some CVV(C), but mostly (C)VCV(C). The V of monosyllables was inherently stressed; but stress could occur on either syllable of the disyllables. (When citing the generic -VV- and CVCV(C) forms, the stressed vowel will be symbolized with "A", thus "-VA-, CVCAC" indicate final stressed forms, "-AV-, CACV(C)" those with initial stress.

The only restrictions on occurrence involved sequences of w/u and y/i (in either order), and r's in successive syllables., thus no \*rVr(V)(C) or \*(C)VrVr, and of course no \*rVrVr. Identical C in successive syllables were disfavored and rare, but not forbidden. Otherwise, every C could occur in every possible position, and any V in either syllable.

Due both to (probably) colloquial pronunciations in the predominant Ang Lay dialect, and (certainly) to incorporation of many forms from closely related dialects/languages as ang Lay expanded its influence over the entire territory, a class of *leniting phonemes* (intervocalic and final only) was added to the system, to be symbolized here as B D G and L. B, via fricative [β] > w, D via [ð] > y, G via [ɣ] > ʉ (a centralizing/lowering semivowel), while L, in certain environments, > velarized [ɫ] or palatalized [ʎ]<sup>1</sup>, ultimately > w and y resp. The main effect of these new phonemes was to create sequences of w/u and y/i. As a result, there are many doublets in the modern language, e.g. forms with a plain stop or /l/ vs. forms that show the effects of the leniting consonants (usually diphthongized or long vowel). A constraint on more than one [+Len] consonant per lexeme seems to have been an Ang Lay innovation.

Over time, in stressed vowels tended to be weakened or dropped, and sequences of V[wy]V diphthongized, eventually reducing the original disyllables to monosyllables, and in the course of that process, tones developed to distinguish the many homophones. Among the factors that determined these tones were: voicing of initial and original medial-- now final-- consonants, the original stress pattern, diphthongs and long vowels.

Some analysts have proposed adding "Tonality" to the distinctive feature matrix of PBD, with ternary values-- + for high tonality, 0 for mid, - for low-- though ternary valued features are considered controversial and difficult to work with. In essence, however, the voiceless stops plus \*s, \*l, \*y, \*h and \*i were +Ton (high); \*q, \*r, \*m, \*n \*w and \*u were 0Ton (mid); while voiced \*b, \*d, \*g, \*ŋ and \*a

---

<sup>1</sup> The rule is: L > [ɫ] > w in sequences involving \*a and \*u (i.e. a\_a, a\_u, u\_u and u\_a, plus final position /a.u]\_#; while L > [ʎ] > y /i\_i and /i\_#.

were -Ton (low). (The tonality of the vowels came into play only if the form lacked an initial C.) Some 0Ton consonants-- especially \*m, \*n and \*d-- and the vowel \*u, could shift tonality > +Ton. depending on environment. In tabular form:

**Tonality of original consonants and vowels:**

p	t	k	q	b	d	g	m	n	ŋ	w	r	l	y	s	h	i	a	u
+	+	+	0	-	-	-	0	0	-	0	0	+	+	+	+	+	-	0
H	H	H	M	L	L	L	M	M	L	M	M	H	H	H	H	H	L	M

(Leniting consonants had the same tonality as their plain counterparts.)

The new initial phonemes that developed by various sound changes acquired tonality depending on the source consonant(s), direction of sound change, etc. For example, due to unstressed V loss, the sequences \*\*p--bA(C) or \*\*b--pA(C) both > new /f/, but f < pb- has +Ton (H), while f < bp- has -Ton (L). These changes will be detailed in the relevant sections (expecially §4.2b) to follow.

In addition to common high, mid and low tones, some forms developed the two complex tones-- high-falling and low-rising. These five tones of modern BDG range approximately over a musical fifth or sixth-- high tone at 5 or 6, mid at 3 (essentially, normal speaking voice), low at 1. High-falling is 5/6--4, while low-rising is 1--2. They will be abbreviated hereafter as H, M, L, F, R.

Let us now examine the tonal development of the various forms.

**1 Monosyllables.**

1a. The single vowels \*i, a, u survive unchanged and have their basic tonality: /i-H/, /a-L/, /u-M/ (although in all other cases, \*u behaves as H).

1b. If there was an initial C, the form has the tonality of that C or one of the complex tones. Later sound changes do not affect the tone-- \*t > ts/\_i, (H) \*d > dz/\_i (M, note raising of tonality due to the high vowel, but only in the case of \*di); and the vowels \*i, u lower > e, o following \*q.

1c. If there was a final C, i.e. VC, it determines the tone, usually regardless of the vowel's tonality. Both final \*q and \*h lower preceding \*i,u > e, o. (\*-h is ult. lost, but the forms retain H tone). Final w/y ordinarily form diphthongs (with tone determined by the semivowel), but may irregularly undergo crasis, where the new vowels [æ](written "è") and [ɔ] (written "ò") arise < \*-ay and \*-aw resp.-- these vowels are -Ton (L). Leniting consonants are rare in VC forms, in fact \*L is not permitted (for unknown reasons<sup>2</sup>). Where B,D,G occur, they simply form vowel+semivowel diphthongs or, in the case of \*-uB and \*-iD, long vowels (these diphthongs never undergo crasis).. G via [u] creates V+ə diphthongs with \*i,u (written "iÿ, uÿ", while a+ə > a:. Since B,D,G are originally of -Ton(L), forms with high vowels (i/u) have F tone; all others are L.

1d. Forms with initial and final C: The initial determines the tone, with some influence from the final C (excluding \*w,y and \*B,D,G) An initial +Ton with finals + or 0Ton > H; if the final is \*h, it lowers \*i,u > e,o, the \*h drops, but the tone remains H<sup>3</sup>. +Ton with final -Ton > F; initial 0Ton with finals +, - or 0Ton > M. NB: forms with \*q in either position always > M, with high-vowel lowering. An exception is \*qan, which > L. Initial -Ton with -/0Ton final > L, while -Ton\_\_+Ton will > R.

2 But perhaps because, since most monosyllables were grammatical particles, they tended not to be borrowed from the other dialects.  
 3 There are irreg. cases where \*-h lengthens the V (and lowers high V), then drops. In rare cases, \*-h does not drop. But H tone remains.

Sequences of \*[qk]Vk and \*qVq show dissimilation-- [qk]Vk > /xVk/ (the /x/ forms < q are M, while those with /x/ < k are H) while qVq > /hVq-M/.

Final \*w,y and \*B,D,G form diphthongs (or long /i:, u:/ < \*iD, uB, aG). Original V[wy} may undergo irregular crasis. The tones are then as follows:

+Ton/ 0Ton/ -Ton + V[wy] > H, M, L resp.

+Ton + V[B,D,G] > F, 0Ton + the same > M, 0Ton + the same > L

+Ton + [è,ò] > F (when \*iw/\*uy > /ÿ/ tone remains H); 0Ton with these V > M, except q[è,ò] > L; -Ton with these V > L, except -Ton + ÿ > R

In all cases, as usual, \*t,d,s palatalize > /ts,dz,š/ before /i/ or /i:/.

Initial \*h, which ordinarily drops later on, is *retained* if the medial (now final) C is \*q,s or h (though \*-h does eventually drop). NB the initial h- resulting from a qVq sequences never drops.

## 2. Disyllables, initial stress

2.1a. (C)AV(C) and (C)AhV(C) undergo special sound changes.

2.1a.1 In (C)AV(C), the vowel sequences (always *unlike* vowels by MS Rules) undergo crasis, in part similar to what we have already seen in the case of some \*-aw, ay, iw/uy; Thus -ái and -áu > new è, ò (-Ton), and -iu/ui > ÿ (+Ton). In addition, -ía > e, and úa > o, these are 0Ton. If there is no initial C, these now monosyllabic vowels determine the tone: ÿ-H, e,o-M, è,ò-L. With an initial C, tones are:

+Ton + è,ò > F; 0Ton + è,ò > M (except qè/qò > L), -Ton + è,ò > L.

+Ton + e,o,ÿ > H; 0Ton + same > M; -Ton + e,o > L but -Ton + ÿ > R. Note in both cases, initial \*h- forms retain H tone, even though the \*h ult. drops.

Palatalization of \*t,d,s and q-lowering, being later rules, cannot apply to these forms since their environments have been eliminated.

If there is a final C but no initial C, then--

è/ò +Ton > R; è/ò 0Ton > M, è/ò -Ton > L

e/o +Ton or 0Ton > M, e/o -Ton > L

ÿ +Ton or 0Ton > H, ÿ -Ton > F

If the form has both initial and final C ("True Consonants \*[ptkqbdgmn]lrs] but not \*h,w,y,B,D,G,L), then the two C govern the tone, as follows:

+Ton\_\_+Ton all > H; +Ton\_\_0Ton all > H except in case of final \*-q, which dictates M in all cases. +Ton\_\_-Ton all > F

0Ton\_\_+Ton mostly > M, but \*n\_\_+Ton > H; 0Ton\_\_0Ton all > M, likewise 0Ton\_\_-Ton, except q[è,ò,a:] -Ton > L

-Ton\_\_+Ton all > R; -Ton[e,o,ÿ]0Ton > M but L if the vowel is è/ò; -Ton\_\_-Ton all > L

Final \*h has no affect on these new vowels, and simply drops.

2,1a,2 Final \*w,y and B,D form -A+w/y# diphthongs; G forms -Vÿ diphthongs, some of which lengthen. Because \*w is 0Ton and \*y is +Ton, while \*\*BDG are -Ton, their tonal outcomes differ: \*\*L, while it

could theoretically occur, is ult. lost without affect, since the vocalic environment for its changes (viz, \*i\_, \*a\_, \*u\_) is lost in the crasis process. Tone for both types of diphthongs are:

Without initial C:

ÿ[\*wy] > H (1)      ÿ[wy<BD] and ÿ: < ÿÿ < ÿw, > F (2)  
 e/o[wy] from both sources > M (3)    e/o[ÿ] < [w] > L (4)  
 è/ò[\*wy] > R (5)      è/ò[wy<BD] and è/ò[ÿ] < [w], > L (6)

With initial C:

+Ton + (1, 2, 4, 6) > F; +Ton + (3) > M; but F if the diphthong < V[BD]; +Ton +(5) > L  
 0Ton + all diphthongs > M, except if /q+(5,6)/ which > L  
 -Ton + (1,5) > F; -Ton + (2,3,4,6) > L

**2.1a.2 (C)AhV(C).** The medial \*h is lost, and the resulting -AV does not undergo crasis, but rather simply diphthongization (or lengthening, when both V are the same). Thus, ái > ay, áu > aw, áa > a:; ía > iə (written "iÿ"), íu > iw, íi > i:; and úa > uÿ, úi > uy, úu > u: If there is no initial C, the a-diphthongs tend to have M tone, though /a:/ > L; the other diphthongs and long vowels have H tone.

If there is an initial C, tones will be as follows:

+Ton +ay/aw > H, +iÿ/uÿ or long V: > F (note that initial \*h survives due to the lost medial \*h).  
 0Ton +all diphthongs and long V > M, except /qa:/ > L  
 -Ton + all diphthongs and i:/u: > R, but -Ton +a: > L

With both initial and final C (excluding h and w,y,B,D,G,L), tones as follows:

+Ton + all diphthongs and V: +Ton > H; +Ton +all 0Ton also > H, except if final \*q, > M; +Ton + all -Ton > F  
 0Ton +all any final C > M, except final 0Ton +a:g/ŋ > L  
 -Ton + all diphthongs and V: +Ton > R; -Ton + all 0Ton > L, -Ton +all -Ton > L

==In the event the final C is \*h, it (1)lowers \*i/u (2) has no affect on \*a and (3) is dropped. This creates certain sequences not yet dealt with, which develop as follows--

\*í+uh > \*\*ío > ew      \*ú+ih > \*\*úe > oy      \*á+ih > \*\*áe > è  
 \*í+ih > \*\*íe > ey      \*ú+uh > \*\*úo > ow      \*á+uh > \*\*áo > ò

(while -ah does not effect í,ú,á, which > iă,uă,a: ult. > iÿ, uÿ, a: as in normal development). These are treated tonally as follows:

a) no initial C: ew/ow > M, ey/oy > H, è/ò > L  
 b) initial +Ton + ew/ow/ey,oy > H, +Ton + è/ò > F  
 initial 0Ton + all > M, except qè/qò which > L  
 initial -Ton + ew/ow/ey/oy > R, -Ton + è/ò > L

==If the final is \*w/y or B,D,G, they simply drop, since A+w/y diphthong and long V can be followed by a semivowel. \*L could occur, but as was mentioned above, its environments are lost, and it ult. simply drops.

**2.1a.3, Disyllabic (C)ACV.** A number of sound changes affect these forms before they receive tonality. Ultimately, the final unstressed vowel is dropped, but before that happens--

3a. If the medial C is a nasal, \*l or \*r, and the vowels are identical, the stressed vowel is lengthened. Both CACV# and ACV# forms are affected. (Then the final V regularly drops) Note that V: / \_r is based on comparative evidence; in Baw Da, later developments change all V(:)r sequences > vocalic /r/. Tones develop as for regular (C)VC, but to repeat:

Without initial C:

i:/u:[nlmr] > H; i:η > F; a:[ln] > R, a:[mr] > M; a:η > L

With initial C:

+Ton-i:/u:[nl] > H; +Ton-i:/u:[mr] > M; +Ton-i:/u-[η] and +Ton-a:[nmηlr] > F  
 0Ton-V:[nmηlr] > M, except /qa:η/ > L  
 -Ton-i:/u:[nl] > R; -Ton-V:-0Ton/-Ton > L

(It so happens that in CA[nlr]VC forms with identical V, the same lengthening will take place, but is due to a different rule. See below §2.3.)

3b In all cases of (C)A[wy]V#, where the vowels are identical (and excluding medial B,D,G,L), when the final V drops the A[wy] sequences undergoes crasis, with already familiar results-- áw/áy > ò,è, íw/úy > ÿ. If there is a final True Consonant (pbtdkqg,mnŋ,lrs) the resulting vowels are long. Tones in this case will be:

Without final C:

è,ò : L                      ÿ : H  
 +Ton-è,ò : F                0Ton-è,ò : M                -Ton-è,ò : L

With final C:

è,ò +Ton : R                è,ò 0Ton : M                è,ò -Ton : L  
 ÿ +Ton : H                    ÿ 0Ton : M                    ÿ -Ton : F

With initial and final C (low vowels):

+Ton-è/ò-+Ton : H    +Ton-è,ò-0Ton : M    +Ton-è,ò--Ton : F  
 0Ton-è,ò-+Ton : M    0Ton-è,ò-0Ton : M    0Ton-è,ò -Ton : L  
 -Ton-è,ò +Ton : R    -Ton-è,ò 0Ton : L    -Ton-è,ò -Ton : L

With initial and final C (high V /ÿ(L)):

+Ton ÿ +Ton : H        +Ton ÿ 0Ton : M        +Ton ÿ -Ton : F  
 0Ton ÿ +Ton : M        0Ton ÿ 0Ton : M        0Ton ÿ -Ton : M or L if final [bgŋ]  
 -Ton ÿ +Ton : R        -Ton ÿ 0Ton : L        -Ton ÿ -Ton : L

3c. In certain *sporadic* cases, stressed \*a in the sequence -á[p,b,m]u# undergoes anticipatory diphthongization, > áwCu. (Then the final \*u drops.)

Tones: +Ton\_\_[pm] : F        0Ton\_\_[m]: M        -Ton\_\_p: R        -Ton\_\_[bm] : L

3d. Also sporadically, in the sequence -A[tkŋ]i#, the consonants undergo palatalization > [ts,c,š], then anticipatory diphthongization takes place leading to áyCi, úyCi, íyCi > i: Ci. Again, only CACV, not ACV, forms are affected. (Then the final V drops.) Since +Ton medials are involved, tones will be:

+Ton\_\_+Ton: H        0Ton\_\_+Ton: M        -Ton\_\_+Ton: R

Note: 3c and 3d are more likely to take place if there is an initial C.

3e. Forms with medial L (l+len): We have already mentioned that L > palatalized [ʎ] /i\_\_i, and > velarized [ɫ] / [au]\_\_ [au] (those vowels in any order, thus a-a, u-u, a-u, u-a)<sup>4</sup>. Now [ʎ] and [ɫ] > /y/ and /w/ resp. when they follow a *high vowel*, thus > íyi, úwu, úwa, úwi. The identical-V forms coalesce to long í:, ú: {the unlike-V forms undergo diphthongization, to be discussed later). Recall that \*t,d,s,k,g palatalize before /i/ > new ts,dz,sh,c,j. Tones:

+Ton-i:/u: > F            0Ton-i:/u: > M            -Ton-i:/u: > R

But [ɫ] > /w/ only at a later stage. With respect to the CACV forms under discussion here, that means in particular that forms like \*/páʎa, páʎu/ are still present at this stage, but only forms with identical vowels are relevant now. Thus in the case of -áʎa, the final V drops, and then ʎ > w, leaving -aw#. (In the case of -áʎu, when its [ɫ] later > w, it will undergo diphthongization > òw). Tones:

+Ton-aw > F            0Ton-aw > M            -Ton-aw > L

3f. An irreg. change involves \*pApV, which sporadically > pAfV before final V loss, leaving \*\*pAf.

3g. Forms with medial \*h have already been dealt with; thus at this point the rules apply to the above plus (C)ACV forms with other medial consonants.

3h. If the medial C is \*\*B,D,G, some L, in any A\_\_V environment, and \*w/y between unlike vowels, the forms undergo the diphthongization rules, to be discussed separately.

**2.2. Regular (C)ACV developments.** First of all, note that the medial C now consist of the class of "True Consonants", i.e. \*pb,td,kg,q,mnɲ,lr,s, and sporadic \*\*ts,c,š,f. (Excluded are medial \*w,y,B,D,G,L and h.) Final vowels are now lost, leaving CAC forms. These develop the same tones as the CAC forms in §§1c,1d. Keep in mind that the sequences \*k--k, q--k, change > x--k (H) and x--q (M) while \*q--q > h--q (M), and \*tdskg palatalize /\_\_í.

It might be well to mention at this point, that all surviving consonants in final position undergo the very late rules of neutralization, whereby vd.stops devoice and then all stops > [ʔ] (written "q"), all nasals and \*l > /ŋ/, and all continuants (all voiceless) > /h/. Further, all V, V:/V[wyÿ] + r sequences reduce to vocalic /r/ [ʒ]. The tones are not affected by these changes.

**2.3. (C)ACVC.** Here, the medial C will be a True Consonant [pbtdkgq,mnɲ,lr,s]-- [wyh] and leniting [BDGL] have either already been discussed (in part), but mostly proceed to Diphthongization Rules. However, the final C can be *any* C, thus including [wyh] and BDGL. The general development is as follows: the unstressed V preceding a final True Cons. metathesizes with the medial C, producing -A[iua]CC# sequences; then unstressed [ĩũǎ] reduce to semivowels \*\*y,w,ÿ and diphthongize or lengthen the stressed V. (This is the basic V2 Remnant Rule discussed in the Sound Changes document).

However, before that happens, a number of factors can affect the unstressed V, depending on the consonants of the final -CVC syllable.

2.3a. If the final C is \*wyh or \*\*wyÿ < BDGL, the sequences undergo the Weak wy Rule, i.e.

a[wL] > o, a[yD] > e, aG > a: (-ah is not affected)  
uB via uw > u:, u[yD] > ÿ, uG > u:, uh > oh  
i[wB] < ÿ, i[DL] > i:, iG > i:, ih > eh

<sup>4</sup> Similar changes take place in final position, but that is not relevant here.

The new vowels < a[BDG] all have L tonality; those < i/u[BDG] and a[wy] have R tonality; those < iL and uy have H tonality. The final glides and \*h are lost later. After metathesis, the structure is (C)A+{new V/V:}+C#.

2.3b. If the final C is \*q, pre-final \*i/u lower to /e,o/ (\*a is not affected); New structure is (C)A(e,o)Cq#.

2.3c. If the final is a voiced stop or a nasal, the pre-final V may *sporadically* undergo breaking, whereby a -w- glide develops after the vowel preceding labial \*b,m; a -y- glide develops preceding \*d,n, while a -ÿ- glide develops preceding \*g,ŋ (-uw-, -iy-, -aÿ- > u:, i:, a:, others are unchanged). The sequences of V{wy} then undergo Weak wy Rule > o(w), e(y) and ÿ(w,y)-- final w,y,ÿ vanish in the process giving a temporary structure (C)AC[oeÿ,i:u:a:]C, then by metathesis > (C)A[oeÿ, i:u:a:]CC

2.4 Now certain changes affect the final -C2C3# sequences.

==identical nasals are rare, but can occur, in which case the second (final) nasal > voiced stop homorganic with the first nasal, i.e. -mm > mb, -nn > nd, ŋŋ > ŋg, then the nasal element drops, leaving only the new voiced stops (0Ton).

==certain sequences of stop+h change, viz. -ph > f, -kh > x, -sh > š (these retain +Ton); -qh > x (0Ton); -bh, -dh, -gh > p, t, k (-Ton). \*h is lost in the process, but all final \*h drop, in any case.

==in all other cases of -C2C3#, C3 drops.

In all cases the remaining structure is (C)A[eoÿ,i:a:u:]C

2.5. We will now show the changes to the vowel sequences that have been created by metathesis; these can be stressed i,a,u followed by: unstressed o,e,ÿ,i:,u:,a:. Keep in mind that e/o < V[BDG] have L tonality, e/o < V[wy] and Vh behave as H, since they ult. > w/y; and similarly for the other new vowels, as mentioned above. In tabular form:

Stressed V	Following unstressed V					
	e	o	ÿ	i:	u:	a:
i	> iy > í:	iw	iÿ	i:	= iuu > ÿw	=iaa > eÿ
u	> uy > ý	> uw > u:	uÿ	=uii > ÿy	u:	=uaa > oÿ
a	ay	aw	a:	=aai > èy	=auu > òw	a:

The diphthongs with initial a-, and long a: < áÿ: have R tonality; a: < á:a is L, the i-/u- diphthongs with a: are F; all other i-/u- initial diphthongs and i:/u: are H.

2.6. The resulting tones will be:

0 initial forms (with final C)

H,M +Ton > H; L,R +Ton > R; F +Ton > M  
 all V/diphths 0Ton > 0Ton except /L+q#/ > L  
 H,F -Ton > F; all others -Ton > L

With initial and final C:

+Ton all +Ton > H; +Ton all 0Ton > M; +Ton all -Ton > F  
 0Ton all +Ton > M, 0Ton all 0Ton > M, except /q-L-q/ > >; 0Ton all -Ton > L  
 -Ton R,H +Ton > R; -Ton all 0Ton > M; -Ton all -Ton > L

**3. Diphthoning forms: \*-A[wy]V- and \*\*-A[BDGL]V.** There is a great variety of outcomes, depending on presence/absence of a final C, and the nature of that C if present. We have already seen that (1) like-vowel -A[wy]V- lose the unstressed V and the remaining -A[wy]- undergoes crasis; (2) like-vowel -ALV- reduce to /i:/, u:/ in the case of -iLi/-uLu-, and /aw/ in the case of -aLa. Thus, these forms no longer qualify for the Diphthoning Rules.

Another factor, not yet mentioned in every case, is the presence of final \*w,y,h after \*-A(wyBDGL)V- sequences. Final \*h, as we have seen, lowers \*i/u > e,o (no affect on \*a), then drops. Final \*w,y also change a preceding unstressed V-- -\*aw > o, \*-ay > e, \*-iw/-uy > y<sup>5</sup>. These changes thus produce sequences of -A[wyBDGL][e,o,y] and often result in different outcomes than ordinary -A[wyBDGL] sequences.

By MS Rules, only one C[+Len] is allowed per CVCVC morpheme. Thus -A[BDG]VC (whre -C=wyh, or true cons.) and -V[wy]A[wyBDGL] are permitted, but not -A[BDGL]V[BDGL]

3.1a. Regular \*-A[wy]V- changes. In these, the -A[wy] undergoes crasis, the unstressed V reduces > ĩ,ũ,ã which ult. > y,w,ə(y̆). In tabular form (starred forms do not occur due to previous rules):

*iwi	*uyu	*awa	*aya
iwa > y̆y̆ > y̆:	uya > y̆y̆ > y̆:	awi > òy	ayu > èw

Tones will be:

a) without initial/final C

y̆: (from both sources) : F      òy, èw : R

b) with initial C:

+Ton y̆ : F                      0Ton y̆: M                      -Ton y̆ : R  
 +Ton èw, òy : F              0Ton èw., òy: M              -Ton èw,òy : R

c) with final True Consonants (excluding BDGL, why):

y̆ +Ton : H                      y̆ 0Ton : M                      y̆ -Ton : F  
 èw,òy +Ton R                  èw,òy 0Ton : M                  èw,òy -Ton : L

d) with both initial/final True Consonants::

+Ton (all) +Ton : H    +Ton (all) 0Ton : M    +Ton (all) -Ton : F  
 0Ton (all) +Ton : M    0Ton (all) 0Ton : M    0Ton (all) -Ton : L  
 -Ton (all) +Ton : R    -Ton (all) 0Ton : M    -Ton (all) -Ton : L

3.1b. A handful of forms with medial L also survive to this stage-- viz. \*aLu(C) and \*uLa(C) (because ĩLi, uLu, aLa have been modified by earlier rules). These of course > -awu(C) and \*uwa(C) resp. The

<sup>5</sup> This is known as "Weak w/y rule", in contrast with the "Strong w/y rule" that affects \*-A[wy]# (to be dealt with later) and result in crasis, i.e. new è < ay, ò < aw, y̆ < iw/uy.



final C may be any [-Len] C, or \*wyh. There are also a few irreg. \*iL[ua], \*uLi and \*aLi, with or without the same final C, these > iy[ua], uwi and awi resp. (marked with \*\*). They develop as follows:

awu > òw awuh > awo > òw	uwa(h), **uwiw > uwÿ > uÿ	uwaw > uwo > u	** iya(h), **iyuy > iÿ	**iyu(h), **iyaw > iyo > iw	**awi(h) > awe > òy
awuy, **awiw > awÿ > òÿ	**uwi > uy uway, **uwih > uwe > uy		**iyay > iye > i:		

Tones develop according to the original structure of the diphthongs. Thus, with no initial C, (1) all ò[wÿ] > R; while (2) uÿ/iÿ < uwa(h)/iya(h) > F, while (3) uÿ/iÿ < uwiw/iyuy, and i:/u: > H.

With initial C:

- +Ton +(1) > M, +Ton +(2) > F, +Ton +(3) > H
- 0Ton + all > M, except /q+(1)/ > L (irreg.: q- may sporadically lower initial i/u-, but not i:/u:)
- Ton +(1,3) > R, -Ton +(2) > M

Only the 6 diphthongs with original -u#, -i#, -a#--viz. awu (òw), \*\*awi (òy), uwa (uÿ), uwi (uy), \*\*iya (iÿ) and \*\*iyu (iw) can have a final (true) C--

- òw/òy (<aw[ui])+Ton > R; iÿ/iw/uy/uÿ +Ton > H
- all 6 0Ton > M
- òw/òy -Ton > L, iÿ/uÿ/uy/iw -Ton > F

These 6, with both initial and final (true) C--

- +Ton òw/òy +Ton > M; +Ton all others +Ton > H; +Ton all 0Ton > M; +Ton all -Ton > F
- 0Ton all +Ton > M, 0Ton all 0Ton > M, except /qò[wÿ]q/ > L; 0Ton all -Ton > L
- Ton all +Ton > R; -Ton all 0Ton > M; -Ton all -Ton > L

3.1c. Regular -A[wÿ]V[wÿh]#- whereby final V, by Weak wy Rule are changed > e,o,ÿ (and \*a remains < -ah#-- thus new -awa# and -aya# ult. result). Final /e,o/ undergo raising > [w,y], while -a reduces to schwa, written "ÿ". In tabular form:

iwih, iway > iwe > ÿy	uyay > uye > ÿy	ayay > aye > èy	awih, away > awe > òy
iwaw > iwo > ÿw	uyaw, uyuh > uyo > ÿw	ayuh, ayaw > ayo > èw	awaw > awo > òw:
iwiw, iwah > iwÿ > ÿ:	uyuy, uyah > uyÿ > ÿ:	ayah, ayuy > ayÿ > è:	awah, awiw > awÿ > ò:

The few forms with -L# change as follows (note that \*a > o/\_L via the special change L > ł > w): -íwiL via -íwiy > ÿy; iwaL > iwo > ÿw; uyuL > uyu > ÿw; uyaL > uyo > ÿw; awiL > awiy > òy; ayuL > ayuw > èw; awaL > awo > òw, and ayaL > ayo > èw. These diphthongs have the same tonality as identical diphthongs in the above table.

The tonal outcomes are complex, and depend on the original shape of the diphthong:

Without initial C:

- ÿy < iwi[hL], ÿ: < iwiw : H;
- ÿ: < iwah, ÿw < iwaw, ÿy < iway : F
- ÿ: < uyuy, ÿw < uyuh : H
- ÿ: < uyah, ÿw < uyaw, ÿy < uyay : F

è: < ayuy, èw < ayuh : R                      all other è forms : L  
 ò: < awiw, òy < awih : R                      all other ò forms : L

With initial C:

- +Ton -- H remains H, F remains F, R > M, L > F
- 0Ton -- all > M, except L remains L
- Ton -- H > R, F > M, R and L remain R, L

(Since these diphthongs derive < original -(C)VCVC, there can be no final C forms)

3.1d. Regular \*-A[wy]V[BD]#. Diphthongs of this shape with final B,D (which > w,y) develop the same as \*-A[wy]V[wy] above, but since the final was originally [+voi], hence -Ton, the tones tend to be different:

Without initial C-- all i/u/ÿ+[wy] forms and ÿ: have F tone; all è/ò forms > L

With initial C:

- +Ton +all diphthongs/V: > F
- 0Ton + all diphthongs/V: > M except \*q + those with è/ò, which > L
- Ton + all diphthongs/V: > L

3.2. -A[BDG]V- changes (leaving aside -ALV- and -AGV- for the moment). The leniting stops, via [β,ð,ɣ] shift to semivowels [w,y,u]--note that \*\*w,y will create otherwise impermissible -uwV-, -Vwu-, -iyV- and -Vyi-. The glide uɥ is classified as *high-centralizing* despite its IPA character, but in some sequences of -[V+hi +str]uɥV- it tends to lower the preceding V-- this structure will be dealt with separately.

3.2a, -A[BD]V- with unlike V, develop the same as the -A[wy]V diphthongs in §3.1. Adding in the new iyV/Vyi, uwV/Vwu, and a[wy]a, forms, we have--

*iBV	*iDV	*uDv	*uBV	*aBV	*aDV
iwi > ÿy	iyi > i:	uyu > ÿw	uwu > u:	awa > òÿ	*aya > èÿ
iwa > ÿÿ > ÿ:	iya > iÿ :	uya > ÿÿ > ÿ:	uwa > uÿ	awi > òy	ayu > èw
iwu > ÿw	iyu > iw	uyi > :ÿy	uwi > uy	awu > òw	ayi > èy

3.2a. The only -ALV- diphthongs that can undergo these rules are: \*úLa > uwa, \*aLa > awa, and \*aLu > awu (-iLi- and -uLu- having previously > long vowels). They develop the same as their counterparts in the table, viz. uÿ, òy, òw resp. Tonally they behave the same as their counterparts in the chart. See the discussion at §3.1b above.

Tones, however, usually differ from those of the A[wy]V diphthongs. Without initial/final C they fall into three groups--

- (1) all new diphthongs with initial i-, u- or ÿ-, plus i:, u: and ÿ:, > F
- (2) new è/ò[wy] > R
- (3) è/ò+:ÿ > L

With final C (true cons., no \*wyh,BDG)

+Ton after all group (1) diphthongs > H; +Ton after all è/ò diphthongs > R  
 0Ton after all diphthongs > M  
 -Ton after group (1) F; -Ton after all others > L

With initial C:

+Ton + all of the above > F  
 0Ton depends on the C: q- + (1,2) > M, lowering of i/u/i:/u: is sporadic, not regular; q+(3) > L;  
 the other 0Ton consonants (m,n,w,r) + all three groups > M  
 -Ton + (1,2) all > R, while -Ton + (3) > L

With initial and final (true) C:

+Ton +group (1) +Ton/0Ton > H (except -q > M); +Ton +group (2,3) +Ton > F; +Ton + all  
 groups 0Ton > M; +Ton + all groups -Ton > F  
 0Ton + all groups +Ton > M; 0Ton + all groups 0Ton > M (except q--[mn] > L; 0Ton + group  
 (1) -Ton > M; 0Ton +groups (2,3) -Ton > L  
 -Ton + all groups +Ton > R; -Ton + all groups 0Ton/-Ton > L

3.2b. -A[BD]V[wyh] diphthongs develop the same as -A[wy]V[wyh]- (§3.3a), but the original voiced  
 medial [BD], plus the finals, changes the tones-- in particular, the stressed V, < [i,u,a][B,D] now has  
 low tonality..

*iBV(wyh)	*iDV(wyh)	*uDv(wyh)	*uBV*wyh)	*aBV(wyh)	*aDV(wyh)
iwih, iway > iwe > ÿy	iyih, iyay > iye > i:	uyuh, uyaw > uyo > ÿw	uwuh, uwaw > uwo > u::	awah, awiw, awuy > òÿ	ayah, ayiw, ayuy > èÿ
iwah, iwiw, iwuy > ÿÿ > ÿ:	iyah, iyiw, iyuy > iÿ :	uyah, uyuy, uyiw > ÿÿ > ÿ:	uwah, uwuy > uÿ	awih away > òe > òy	ayuh, ayaw > èw
iwuh, iwaw > iwo > ÿw	iyuh, iyaw > iyo > iw	uyih, uyay > uye >:ÿÿ	uwih, uway > uwe > uy	awuh, awiw, awaw > òw	ayih, ayay > èy

Without initial C:

diphthongs with with i/u and final /y,w/ (or length) derive from -ih and -uh, OR final /ÿ/ < -iw/-  
 uy; plus /ÿ:/ < \*iwiw/uyuy --.all these diphthongs > R (call this group A)  
 EXCEPT diphthongs with initial i/u + final /y,w/ < -ay/-aw, and all diphthongs with final /ÿ/ <  
 \*ah all > L. (Call these group B)

With initial consonant--

+Ton + group A > M, +Ton + group B > F  
 0Ton + group A > M, 0Ton + group B > L  
 -Ton + group A > R, +Ton + group B > L

3.3c. We are now ready to examine -AGV- diphthongs. The [uɣ] that develops (via [ɣ]) < G not only has  
 low tonality, but also causes the stressed high V \*i,u to lower > /e,o/ in certain cases. Both like- and

unlike-V environments are possible. We will include diphthongs with final /e,o,ÿ/ from original final \*wyh. Note that AGÿ results < both AGiw and AGuy. In tabular form:

iųi > i: iųe > ey	uųi > uy uųe > oy	auųi, auųe > a:ųe > èy
iųu > iw iųo > ew	uųu > u: uųo > ow	auųu, auųo > a ųo > òw
iųa > eÿ	uųa > oÿ	auųa > a:
iųÿ > i:	uųÿ > u:	auųÿ < a:

Without initial/final C, the tones are:

- (1) iw/i, and uy/u: > R;
- (2) e[wy] and o[wy] > M
- (3a) è/ò[wy] < \*auųi/auųu > R, while (3b) other è/ò[wy] and a: > L

With final C (true consonant)--

- (1, 3)+Ton > R; (2)+Ton > M
- (1,2,3)+ 0Ton > M
- (1,2,3)+ -Ton > L

With initial C--

- +Ton +(1,3) > F, while +Ton +(2) > M
- 0Ton +(1,2,3) > M, except /q+(3)/ > L
- Ton +(1,3a) > R, -Ton+all others > L

With initial and final (true) C--

- +Ton\_\_+Ton: with all (1,2,3) > M; +Ton\_\_0Ton: all > M; +Ton\_\_-Ton: all > F
- 0Ton\_\_+Ton: all > M; 0Ton\_\_0Ton: all > M except /q(3)q/ > L; 0Ton\_\_-Ton: all > L
- Ton\_\_+Ton: with (1,3a) > R; -Ton\_\_0Ton: all > L; -Ton\_\_-Ton: all > L

#### 4. Forms with final sttess.

**4.1. Vowels in hiatus, -VA-, and #VhA-.** Medial \*h drops in the \*hVhA(C) environment, and in both resutling -VA- sequences the unstressed initial vowel reduces to a semivowel [ĩũă]; the first two > y,w and form rising diphthongs (or long V) with the following stressed V. But \*\*ă vanishes after lowering high V, and lengthening all following V. Thus, without an initial C--

- i(h)á, i(h)u > ya, yu > R, ihí > íí > yi > i: > H
- u(h)á, u(h)i > wa, wi > R, uhú > uu > wu > u: > H
- ahá > ăa > a:, while ă(h)í > ăi > e:, a(h)ú > ău > o: --all have R

With initial C (keep in mind that \*\_VhA- can have /h-/, original \*VA- cannot have /h-/-):--

With initial and final true C: :

+Ton +all diphthongs +Ton > H; +Ton all 0Ton > M; +Ton all -Ton > F  
 0Ton +all diphthongs + any final > M  
 -Ton +H,R +Ton > R; -Ton all 0Ton > M; -Ton all -Ton > L

4.1a. With 0 initial and final \*h, stressed i/u > e/o (no affect on final \*a); the \*h ult. drops and the outcome with 0 initial is

ihíh > ihé > ye > H, uhúh > uhó > wo > H  
 ahíh > áé > e: > R, ahúh > áó > o: > R

Since there is no change to the tonal outcome, C\_# forms have the same tones as those just above in §4.1; there can be no final-C forms since these are < original \*CVCVh.

4.1b With final \*wy, the stressed vowels are subject to Strong w/y Rule, and undergo crasis. With 0 initial the development and tones are--

i(h)ay > iè > yè, i(h)aw > iò > yò both > F, ihíw > iÿ > yÿ > H  
 u(h)ay > uè > wè, u(h)aw > uò > wò both > F, uhúy > uÿ > wÿ > H  
 ahay > äè > è:, ahaw > äò > ò: both > L; a(h)iw and a(h)uy > äÿ > ÿ: > R

With initial C (h- if \*hVhA)--

+Ton +F,L diphthongs > F, +Ton +H diphthongs > H; +Ton +R diphthongs > M  
 0Ton + all > M, except /q[è:/ò:]/ which > L  
 -Ton + H,R diphthongs > R; -Ton +F,L diphthongs > L

(Since these derive < \*CVCVC, there are no final-C forms.)

4.1c. However, with final leniting BDGL, the stressed V is only subject to Weak w/y Rule, and triphthongs are formed in some cases, in others, following a long V, the final has no affect and ult. drops. Thus--

i(h)á[BL] > iáw > yaw, i(h)áD > iáy > yay; i(h)áG > iaÿ > eÿ  
 ihíB > iiw > iÿ > yÿ; ihí[DL] > iiy > i:; ihíG > \*ii:ÿ > i:  
 u(h)á[BL] > uáw > waw; u(h)áD > uáy > way; u(h)háG > uaÿ > ua: > wa:  
 uhú[BL] > uuw > u:; uhú[D] > uúy > wÿ, uhúG > uuÿ > \*u:ÿ > u:  
 ahá[BL] > ááw > a:, aháD > ááy > a:, a(h)íB > áiw > ew, ahí[DL] > áiy > ey  
 a(h)uBL > áuw > ow, a(h)uD > áuy > oy  
 aháG > ááÿ > a:, a(h)íG > áiy > eÿ, a(h)úG > áuy > oÿ

Without initial C, all original i- and u- sequences with (1) final BDG > F tone, (2) with final L, > H, while all (3) a- + final BDG forms > L, while (4) a- +final L > R.

With initial C:

+Ton +(1,3) > F; +Ton +(2) > H; +Ton +(4) > M  
 0Ton +all > M; except 0Ton[mnq] +(3) > L while 0Ton[r] remains M  
 -Ton +(1,3) > L, -Ton +(2,4) > R

(Final-C forms cannot occur, as already stated.)

**4.2. Regular \*(C)VCA#.** The medial C cannot be [wyh, BDGL] because such forms diphthongize and have already been discussed. \*VCA# forms develop differently than \*CVCA#.

**4.2a. \*VCA#.** These forms undergo the Weak Remnant Rule, whereby the initial unstressed [iau] reduces to semivocalic [ywǎ] and metathesizes with the now-initial (ex-medial) C (which cannot be \*h in this case), yielding a structure of \*\*C[ywǎ]A#. The glide-V sequences (or new vowels) then develop the same as those in §4.1 and have the same tones. However, there are some changes in the old-medial now-initial C--

- ==t/d > ts/dz / \_\_y[a,u] (the -y- then drops), and / \_\_i: (which remains long)
- ==s > š (written "sh") in those same envs., and in / \_\_w[ai] but NOT / \_\_u:
- ==k/g > [tʃ ,dʒ] (written "ch,j") in both yV and i: environments, as with t/d above.

These new C retain the tonality of their sources, and do not affect the tonal outcome.

**4.2b. \*CVCA#.** (Medial is True Cons. only, never \*BDGL and only rarely \*w/y (in borrowed dialect forms) These forms drop the unstressed first-syllable V in all but two cases-- (1) when both C1/C2 are voiced (bdg,mnŋ,wy,lr in their possible sequences), and (2) in the special case of \*tití-- these undergo V1 Metathesis. (These same change affect \*CVCAC forms.) The result in all cases is a new structure \*\*CC(ywǎ)A. The reader should refer to Ch. 6.5 of the Sound Change document for a complete discussion of the development of the CC clusters. Note especially the initial \*wyrl and some \*s metathesize with C2. In tabular form, for ease of reference--

**Summary of CC changes (initial C<sub>1</sub> in the left column, C<sub>2</sub> across the top)**

	<i>-p</i>	<i>-b</i>	<i>-t</i>	<i>-d</i>	<i>-k</i>	<i>-g</i>	<i>-q</i>	<i>-m</i>	<i>-n</i>	<i>-ŋ</i>	<i>-s</i>	<i>-r</i>	<i>-l</i>	<i>-w</i>	<i>-y</i>	<i>-h</i>
<i>p-</i>	f	p	t	t	k	k	q	m	n	ŋ	f	t	t	pw	py	f
<i>b-</i>	f/b	b	d	d	g	g	k	m	n	ŋ	f	d	d	bw	by	p/f
<i>t-</i>	p	p	ts	ts	k	k	q	m	n	ŋ	ts	tr	tr	tw	ts	th*
<i>d-</i>	b	b	dz	dz	g	g	k	m	n	ŋ	dz	ll	ll	dw	dz	t**
<i>k-</i>	p	p	t	t	x	k	x	m	n	ŋ	x	ch	ch	kw	c	x
<i>g-</i>	b	b	d	d	g	g	k	m	n	ŋ	x	j	j	gw	j	k***
<i>q-</i>	f	p	t	t	x	x	h	m	n	ŋ	š	xy	xy	qw****	qy****	h
<i>m-</i>	b	b	d	d	g	g	k	b	d	g	f	d	d	mw	my	mh*
<i>n-</i>	b	b	d	d	g	g	k	b	d	g	ts	ll	ll	nw	ny	nh*
<i>ŋ-</i>	b	b	d	d	g	g	k	b	d	g	x	j	j	ŋw	ŋy	ŋh*
<i>s-</i>	f	f	ts	dz	x	x	š	m	n	ŋ	ts	š	š	šw	š	š
<i>r-</i>												-	ll	f	š	
<i>l-</i>												ll	ll	w	y	
<i>w-</i>												f	f	fw	fy	
<i>y-</i>												j	š	šw	j	
<i>h-</i>	f	p/f	(t)	t	x	g	h	(m)	(n)	(ŋ)	š	(l)	(l)	hw/f	hy/š	(h)

\* In these sequences, the following V lengthens, then the -h- drops.

\*\*In these cases, because of the lost /h/, palatalization does not take place; likewise for th-

\*\*\* Also, sporadic xw, xy; in other cells, a sporadic development follows the /, e.g. f/b

Note that w,y,r,l cannot precede True Cons. due to metathesis; but sequences of rl, lr, ll, wr, rw, wl, lw are possible, along with rare ww, wy, yw, yy (rr is not a permissible sequence).

Note also that h deletes before t, nasals, r,l,h, leaving those consonant unchanged.

It should be noted that in those cases where CC > new C, it is the voicing of the old initial that determines the tonality of the new C, even though the old initial is lost or creates a new phoneme; in summary:

(1) all v/l+C > +Ton; (2) all qmnr+C > 0Ton; (3) all vd+C > -Ton.

Thus, for example, while pp > f +Ton, f < bp is -Ton or generally, all [ptksh]C > +Ton, all [bdgn]C > -Ton, all [qmnr]C > 0Ton, except qŋ > ŋ -Ton. Note too that some of the new consonants can have H, M or L tonality depending on their origin--e.g. f > pp is H, f < bp is L, f < qp is M, while x < kk/ks/sg is H, x < qq is M, x < gs is L, and so on.

Effects of V1 metathesis when both C1/C2 are [+voi}, also special \*titi: unstressed initial-syllable V, as [ywā] metathesizes to follow C2, and the semivowel+A sequence develops as in §4.1 above. The sequences ddyA, ttyi (the clusters < various sources) would ordinarily > dzA-L and tsi:-H, but in just these cases, the ddy- and tty- clusters instead > j/c resp. If the stressed V is /i:/, it remains long. Note that while dt- also > dz, because of the divergent voicing of the original sequence, there will be no following semivowel, thus \*diti simply > dti > dzi-L.

In cases where there is no Remnant/Metathesis (specifically when C1/C2 are both [-voi] (except \*titi) or when they differ in voicing, the final stressed vowel simply remains, and tones will be (with initial C): +Ton > H, 0Ton > M, -Ton L.

When there is Remnant/Metathesis (both C1/V2 voiced), recall that the diphthongs/long V given in §4.1 have variously H or R tonality. Thus with the new initial C, tones will be the same as in those cases, viz.--

+Ton +H diphthongs > H; +Ton +R diphthongs > M  
0Ton + all diphthongs > M  
-Ton +all diphthongs > R

**4.3 (C)VCAC.** Initial C may be any C (of course, not BDGL); \*h ordinarily drops, but does survive if there is also a medial \*q/h/s. The medial C may be any C except BDGL and rare \*w/y (ordinarily medial w/y and BDGL lead to diphthongization). The final may be all C including \*w/y/h and BDGL.

As with CVCA#, if both initial and medial C are voiceless, or of differing voicing, the unstressed V1 simply drops (except in the special case of \*tit-). If there is 0 initial, or both C1/C2 are voiced, V1 Remnant/Metathesis takes place, leading to intermediate \*(C)C[ywā]AC.

If the final C is \*wy, or \*\*wyuŋ < BDG and L in certain environments, two distinct developments take place. (1) stressed V +[wy] is subject to Strong wy Rule, i.e. there is crasis, resulting in è, ò (low tonality) and ÿ (high tonality); but (2) stressed V + \*\*wyuŋ is subject to the Weak wy Rule, and the result is simply new V + semivowel diphthongs, viz. -ów < a[B,L], -éy < aD., ú: < úw < u[BL], -úy < uD, iw < iB, i: < iy < ID, IL; final -uŋ produces iÿ/uÿ diphthongs and ä < aÿ. The new vowels < V+BD all have low tonality, iuG has falling; while -ow < aL is *rising*, and [u,i]L have high tonality.

If the final C is \*q or \*h, preceding í/ú are lowered > é/ó (mid tonality); \*h is ult. lost. Otherwise, other final (true) C have no effect on vowel quality and survive without change.

We now have \*\*CC[ywǎ] + [original \*i,a,u or new e,o,è,ò,ÿ,i:,u:,a:] + C (any C or w/y/ÿ in certain cases) or 0 final from earlier \*-h. Recall that [ywǎ]V produced a variety of diphthongs/long V with H, F or R tonality. Additionally, some of the new vowels mentioned in the two paragraphs above variously have L and M tonality, as well as H or R. In some, there are now V, V: and diphthongs with all 5 tonalities-- H, F, M, L, R

Finally, the initial CC- clusters develop as per the table above (§4.2b). All forms will ultimately be of the shape C(yw)VC#, CV:C#, C(yw)V[wÿ]#, CV:# or CV#

We can now indicate the tonal outcomes. .

CV(:) and CV[wÿ] forms--

+Ton H,M,R > H; +Ton F,L > F

0Ton all > M, except /q+F/ and /q+L/ > L

-Ton H,T > R; -Ton F,M,L > L

C--C forms--

+Ton H,M,R +Ton > H; +Ton F,L 0Ton > M; +Ton H,F,L -Ton > F; +Ton M,R -Ton > M

0Ton all > M, except /qFq, qLq/ > L

-Ton H,L,R +Ton > R; -Ton F,M +Ton > M; -Ton H,R 0Ton > M; -Ton F,L,M 0Ton > L;

-Ton all -Ton > L

## 5. We should reiterate here the neutralization rules that affect all C-final forms.

These are:

==vd.stops devoiced, then all final stops > /ʔ/ considered an allophone of /-q/ and so written in the native script and our Romanization.

==all final nasals merge > /ŋ/. In both final-C and final-N cases there were, no doubt, intermediate stages, since a few dialects retain some, though never all, finals; but these need not concern us here.

==final \*l, evidently via merger with \*-n, also > /ŋ/.

as well as some other rules affecting certain consonants--

==all sequences of -V(:)/diphth.+r# reduce to new vocalic /r/ [ɜ]. In cases of \*\*(C)[wy]+the same, the (C)y- survive. Thus in a hypothetical case like \*\*(C)yawr# the outcome is /(C)yr/.

==all cases of surviving initial \*r- > /r/, retaining 0Ton.

We have already mentioned palatalization, whereby initial \*t,d,s > /ts, dz, sh/ before /i/ or /y/, plus \*s > /sh/ before /w/; and \*k,g > /c, j/ before /i,y/.

**6. General Summary.** The proto-BDG sound system has been expanded to the modern one (original proto-sounds are in **bold**, but of course many new instances of those sounds are due to sound changes and as a result no longer have the original tonality)--



Consonants (note that \*r has in many cases vanished by merger with \*l):

	Labial	Dental	Alveolar	Alv-Retro	Palatal	Velar	Uvular	Glottal
Vl.stops, affricates	<b>p</b>	<b>t</b>	ts	tr [tɹ]	ch [tʃ]	<b>k</b>	<b>q</b>	
Vd.stops, affricates	<b>b</b>	<b>d</b>	dz	ll [dɹ]	j [dʒ]	<b>g</b>		
Nasals	<b>m</b>	<b>n</b>				<b>ŋ</b>		
Vl.fricatives	f	s			sh [ʃ]	x		<b>h</b>
Resonants	<b>w</b>	<b>l</b>			<b>y</b>			

Vowels (all but /r/ may be short or long):

	Front	Central	Back
High	<b>i</b>	ý	<b>u</b>
Mid	e	r	o
Low	è	<b>a</b>	ò

plus many diphthongs and triphthongs: V(except /r/)+w/y/ÿ, w/y+those same sequences, and w/y+V(including /r/).

We have seen that the new vowel/diphthong nuclei can have any of the five possible tonalities-- H, F, M, L, R. The original three vowels \*i,a (resp. H,L) and \*u (M in isolation but otherwise H) determine or affect the final tone only in #\_\_(C)# and C\_\_(C)# monosyllables. The new vowels-- e, o, è, ò, ÿ (short or long) and i:, a:, u:, ÿ:-- and diphthongs that develop in the course of sound changes, however, can have any of the 5 tonalities depending on their origin-- e/o < lowering by final \*q/h, and all via diphthongization due to \*w/y or [BDGL].

Similarly, most of the consonants can now be +, 0, or -Ton, depending not only on their original tonality but also from sound changes that modified the many derived clusters, or other developments.

Thus it seems likely that we can give some very general rules for the development of tones on the final derived monosyllabic forms. (NB "-q" in these forms means original \*q, not the /-q/ that results from neutralization)

1. Monosyllables.

#\_\_[wyÿ]# will have the tone of the V/V:/diphth.-- all 5 tones are possible

#\_\_C# will have tones as follows:

L,R +Ton > R; H,M +Ton > H; F +Ton > M  
 all 0Ton > M except /L q/ > L  
 H,F -Ton > F; M,L,R -Ton > L

#C\_\_[wyÿ] will have tones as follows:

+Ton H > H, +Ton F,L > F, +Ton M,R > M  
 0Ton all > M, except /q L/ > L  
 -Ton H,R > R, -Ton F > M, -Ton L,F > L

#C\_\_C# will have tones:

+Ton H,M +Ton > H; +Ton F,L,R +Ton > M. +Ton all 0Ton > M; +Ton all -Ton > F  
0Ton all +Ton > M; 0Ton all 0Ton > M except /q Lq/ > L; 0Ton all -Ton > L  
-Ton R,H +Ton > R; -Ton H,F,R 0Ton > M; -Ton L,M 0Ton > L; -Ton all -Ton > L

A final word or two:

It should be noted that tonal developments in this §6. Summary may not agree in toto with some of the derivations given in the main discussion, probably due to oversight of haste. However, the tonal results given in the main discussion should be regarded as the correct ones. Furthermore, in modern usage and somewhat unpredictably, the tone of a word can be changed in order to change its part of speech, or to derive a related meaning.

Finally, in preparing this document, I found it necessary to make some revisions to the Sound Change document (.pdf.), which have not yet been incorporated there. It is also possible that through oversight there may be inconsistencies with respect to that document; these will no doubt be discovered and corrected in due time.