

## Changes in the verbal stem in the subjunctive mood in Cornish

by

**Dr Ken George**  
Cornish Language Board

### A B S T R A C T

*The Brittonic subjunctive marker /h/ coalesced with the consonant(s) at the end of the verbal stems, where appropriate causing provection and doubling in Cornish. Nevertheless, establishing subjunctive forms for verbs in Revived Cornish is difficult, because relatively few examples are found in the traditional texts. Doubts have been expressed about some of the forms proposed by Edwards (1995), not least by Edwards himself. A new examination of almost all subjunctive forms in traditional Cornish has clarified that provection affects any voiced obstruent, alone or in a cluster; and that doubling affects any single obstruent not preceded by a resonant, and any single resonant, alone or followed by /j/. These rules have enabled a revised list of subjunctive forms to be drawn up.*

## INTRODUCTION

### The subjunctive marker in Brittonic

The subjunctive tenses in Brittonic were marked by /h/ between the stem and the ending, and this /h/ came from /s/ (Lewis and Pedersen 1974, §453; Simon Evans 1970, §137). Where appropriate, the /h/ was assimilated by a preceding consonant; this assimilation took the form of devoicing or provection.

In Middle Breton, according to Pennaod (1977, §117):

“An **-h-** ne veze merket dalc’hmat e brezhoneg-krenn, met anat e oa e levezon diwar arver ur gensonenn amglev dirak an dibennoù.” (The <h> was not always shown in Middle Breton, but its effect is clear from the use of an unvoiced consonant before the endings).

In Modern Breton, the <h> disappeared, and was replaced by <f>, which arose by analogy from compounds of *bout* ‘to be’ (Hemon 1975, §132); the proected consonants at the end of the verbal stems were replaced by the root forms. The function of the tenses also changed, the original present subjunctive becoming a future tense, and the imperfect subjunctive a conditional tense.

For Middle Welsh, Simon Evans (1970, §137) noted that:

“Subjunctive forms are characterized by *-h-* ..... This *h* coalesces with a preceding consonant, causing provection. After vowels and sonants the post-tonic *h* disappears, but is written in the early period. In ModW it has completely disappeared, and provection is rare.”

In Middle Cornish, <h> was very rarely shown, but the effect of its assimilation is fairly well attested. The sound-changes [-ε] > [-a] and [-ɔ] > [-a] meant that in the third person singular (the commonest person), the present and the imperfect subjunctive became indistinguishable. Dunbar and George (1997, p.90) estimated the central date of these changes as *c.*1475 and *c.*1525 respectively; but it is evident that the two tenses were being confused before these dates, because examples of the confusion, labelled C in the tables in this paper, are to be found in *Pascon agan Arluth* and the Ordinalia. This confusion spread to monosyllables for which there was no phonological justification: e.g.

RD.1047 *me ny fynnaf y grygy* 'I will not believe it

RD.1048 *bew hedre ven* so long as I live'

Here one would expect the present subjunctive *vyf* instead of the imperfect subjunctive *ven*; but of course *vyf* would not have rhymed with *ken* 'otherwise' at *RD.1045*.

### The analogy of the superlative of adjectives

Lewis and Pedersen (1974, §§203, 453) pointed out that this process of assimilation is phonetically the same as that in the formation of the superlative of adjectives. It may therefore be useful to examine such superlatives in cases where the subjunctive is not attested, especially since provection still occurs in both Breton and Welsh, even though it has practically disappeared in the subjunctive (or equivalent) tenses. The most obvious cases of provection are the occlusives /b, d g/ > /p, t, k/:

#### MODERN BRETON

#### MODERN WELSH

<i>gleb</i> >	<i>glepañ</i>	<i>gwlyb</i> >	<i>gwlypa(f)</i>	'wettest'
<i>kaled</i> >	<i>kaletañ</i>	<i>caled</i> >	<i>caleta(f)</i>	'hardest'
<i>droug</i> >	<i>droukañ</i>	<i>drwg</i> >	<i>drwca(f)</i>	'wickedest'

N.B. In Breton "zedachek" spelling, *droug* is used for the noun, and *drouk* for the adjective. Phonemically the ending is /-g/. I have used <g> here to emphasize the provection.

Additional cases in Modern Welsh include those where an occlusive precedes /r/ or /n/:

<i>budr</i> >	<i>butraf</i>	'dirtiest'	/dr/ > /tr/	(Morris Jones 1913, §147)
<i>hagr</i> >	<i>hacraf</i>	'ugliest'	/gr/ > /kr/	(Jones 1976, §26)
<i>gwydn</i> >	<i>gwytnaf</i>	'toughest'	/dn/ > /tn/	(Morris Jones 1913, §147)

Lewis and Pedersen (1974, §§203) suggested that in Welsh provection occurs even when [w], [r], [l] or [n] intervenes between the voiced consonant and the original /h/.

In Modern Breton, the following changes in adjectival stems are recognized in writing (Kervella 1947, §552):

<*b, d, g; z, zh*> > <*p, t, k; s, sh*>.

### Forming the subjunctive in Revived Cornish

Nance (1938, p.200) described the effect of the /h/ as causing the voiced single obstruent consonants [b, d, g, v, ð] “to double as well as to harden”. This doubling was also a feature of Breton (Jackson 1967, §447) and of Welsh (Morris-Jones 1913, §54), though it is not reflected in the modern spelling. As discussed below, the doubling is shown in the spelling of Revived Cornish. Gendall (1972) gave tables for numerous verbs, which included the third person singular of both subjunctive tenses. Smith (1974) gave full paradigms of 25 verbs. These two sources do not always agree.

The introduction of *Kernewek Kemmyn* in the 1980s (George, 1986) represented an improvement in the spelling of Revived Cornish, and provided an opportunity for further investigation of the assimilation caused by /h/. Brown (1993, §182) gave a table showing the following 24 changes to the end of the verbal stem, arranged alphabetically:

<i>b</i>	>	<i>pp</i>	<i>gh</i>	>	<i>ggh</i>	<i>p</i>	>	<i>pp</i>
<i>bl</i>	>	<i>ppl</i>	<i>gl</i>	>	<i>kkł</i>	<i>r</i>	>	<i>rr</i>
<i>br</i>	>	<i>ppr</i>	<i>gr</i>	>	<i>kkř</i>	<i>s</i>	>	<i>ss</i>
<i>ch</i>	>	<i>cch</i>	<i>he</i>	>	<i>haha</i>	<i>t</i>	>	<i>tt</i>
<i>d</i>	>	<i>tt</i>	<i>j</i>	>	<i>ch</i>	<i>th</i>	>	<i>tth</i>
<i>dh</i>	>	<i>th</i>	<i>k</i>	>	<i>kk</i>	<i>v</i>	>	<i>ff</i>
<i>dr</i>	>	<i>ttr</i>	<i>l</i>	>	<i>ll</i>			
<i>f</i>	>	<i>ff</i>	<i>m</i>	>	<i>mm</i>			
<i>g</i>	>	<i>kk</i>	<i>n</i>	>	<i>nn</i>			

It is helpful to rearrange this table taking into account the phonetics:

#### VOICED OBSTRUENTS

Voiced occlusives: *b* > *pp*; *d* > *tt*; *g* > *kk*;

Voiced spirants: *v* > *ff*; *dh* > *tth*

Voiced sibilant: *s* > *ss*

Voiced affricate: *j* > *ch* (should be *cch*)

[b, d, g] > [pp, tt, kk]

[v, ð] > [ff, θθ]

[z > ss]

[dʒ] > [tʃtʃ]

#### VOICELESS OBSTRUENTS

Voiceless occlusives: *p* > *pp*; *t* > *tt*; *k* > *kk*;

Voiceless spirants: *f* > *ff*; *th* > *tth*; *s* > *ss*

Voiceless sibilant *s* > *ss*

Voiceless affricate: *ch* > *cch*

[p, t, k] > [pp, tt, kk]

[f, θ, s] > [ff, θθ, ss]

[s > ss]

[tʃ] > [tʃtʃ]

#### SONORANTS

Nasals: *m* > *mm*, *n* > *nn*;

Liquids: *l* > *ll*; *r* > *rr*

[m, n] > [mm, nn]

[l, r] > [ll, rr]

#### CONSONANTAL CLUSTERS

Voiced occlusives *bl* > *ppl*; *gl* > *kkł*;

+ liquids: *br* > *ppr*; *dr* > *ttr*; *gr* > *kkř*

[bl, gl] > [ppl, kkł]

[br, dr, gr] > [ppr, ttr, kkř]

Verbs in *-he* may be treated separately.

### Verbal paradigms

In 1995, Ray Edwards published a useful book which contained the paradigms, full or implied, of all verbs in the *Gerlyver Meur* (George, 1993). In compiling these paradigms, he had to consider many more cases than had been listed by Brown, and he extended Brown's list to 112 cases (shown in the Appendix 1). Later he presented the evidence on which he based the extended list (Edwards, 1997), and the following conclusions:

	<i>JUSTIFIED</i>		<i>UNJUSTIFIED</i>
Voiced occlusives	<i>g</i> > <i>kk</i>		<i>d</i> > <i>tt*</i>
Voiced spirants:	<i>v</i> > <i>ff</i>		
	<i>dh</i> > <i>th</i> ( <i>ttth?</i> )		
Voiceless occlusives:			<i>p</i> > <i>pp*</i>
Nasals:	<i>n</i> > <i>nn</i>		
Liquids:	<i>l</i> > <i>ll</i>		
	<i>r</i> > <i>rr</i>		
Special case	<i>he</i> > <i>hah</i>		
Clusters	<i>br</i> > <i>ppr</i>	<i>mbr</i> > <i>mppr</i>	
		<i>dl</i> > <i>ttl*</i>	
		<i>ns</i> > <i>nss</i>	
		<i>nt</i> > <i>ntt</i>	
	<i>rdh</i> > <i>rth</i> ( <i>rtth?</i> )	<i>rv</i> > <i>rff</i>	
		<i>sk</i> > <i>skk</i>	
		<i>st</i> > <i>stt</i>	

This was a useful step forward; but unfortunately the conclusions are in two cases undecided, and in the three starred cases, the change may be unjustified by the evidence, but is probably correct. Above all they are incomplete (only 18 cases out of 112). For the few of the remaining cases for which there is limited textual evidence, Edwards (1997) wrote: "the evidence is mixed and it is not clear whether the change is justified or not".

The problem of what constitutes the best forms arose again when I began to program my computer to conjugate Cornish verbs (by synthesis, not just using a look-up table). It became evident that in order to determine the best forms, a firmer theoretical background is required. Double consonants such as /mm/ are treated as clusters in this analysis.

The following cases are considered in turn:

- 1) a single obstruent not in a cluster;
- 2) a single obstruent followed by a sonorant;
- 3) single resonants;
- 4) clusters of consonants.

## IDENTIFYING EXAMPLES OF THE SUBJUNCTIVE MOOD

In order to investigate the subjunctive in Cornish, an attempt was made to identify all examples in the traditional texts. This task was greatly facilitated by the use of a double text-file, with the original text on the left and the text in *Kernewek Kemmyn* on the right. At the time of writing, this file includes all the miracle plays in traditional Cornish, as part of the exercise known as *Nessa Tremen* (George 2000). A computer program was written to identify all instances of a specified string of characters in the *Kernewek Kemmyn* version. For those texts not yet in the double file, notably the Tregear homilies, similar search methods were used.

The following table (after Brown 1993, §§180-181) gives the verbal suffixes of the various tenses and persons, in *Kernewek Kemmyn*, together with a numerical code.

MOOD	TENSE	S 1	S 2	S 3	P 1	P 2	P 3
INDICATIVE	Present	11 -av	12 -ydh	13 -	15 -yn	16 -owgh	17 -ons
	Imperfect	21 -en (-yn)	22 -es (-ys)	23 -a (-i)	25 -en (-yn)	26 -ewgh	27 -ens
	Preterite	31 -is	32 -sys	33 -as (-is)	35 -syn	36 -sowgh	37 -sons
	Pluperfect	41 -sen	42 -ses	43 -sa	45 -sen	46 -sewgh	47 -sens
SUBJUNCTIVE	Present	51 -iv	52 -i	53 -o	55 -yn	56 -owgh	57 -ons
	Imperfect	61 -en	62 -es	63 -a	65 -en	66 -ewgh	67 -ens
IMPERATIVE			72 -	73 -es	75 -yn	76 -ewgh	77 -ens

Wella Brown (1993, §181) noted that “with the exception of the singular persons of the present/future, the personal endings are identical with those of the corresponding tenses of the indicative”. Thus the only verbal endings which distinctively mark the subjunctive mood are:

- 51 1<sup>st</sup> singular present **-iv**
- 52 2<sup>nd</sup> singular present **-i**
- 53 3<sup>rd</sup> singular present **-o**

For all other verbal suffixes, the subjunctive mood may be positively identified only in those verbs whose stems are altered by provection and doubling, or in some cases by the presence of absence of vowel affection.

### 1) ASSIMILATION OF A SINGLE OBSTRUENT NOT IN A CLUSTER

#### Voiced obstruents

The consonants considered here are the occlusives /b, d, g/, the fricatives /v, ð, z/ and the affricate /dʒ/, all of them single. Of these seven, five have attested forms in the subjunctive mood. For each of these five cases, lists are given below of the examples found in the texts. These lists are arranged under separate headings for each verbal noun; the subsequent lines contain the following information:

- (a) number of line in the texts;
- (b) line spelled as in the manuscript;
- (c) a numerical code indicating the tense and person (as in Table 1);

- (d) the verb spelled in *Kernewek Kemmyn*;  
 optionally:  
 (e) the letter E is the example was listed by Edwards (1997);  
 (f) the letter C if there was confusion between the present and the imperfect subjunctive.

(i) Changes to /g/

BENNIGA				
BM.4541	arluth neff ren benyga /	53	re'n bennikko	E
DEGI				
OM.0583	ffrut da byner re~thokko /	53	na dhokko	E
PC.0942	saw gueytyens pup may tokco /	53	may tokko	E
RD.2189	an ioul ren dogo thy plath /	53	re'n dokko	E
BM.3746	mal myscheff regis dogo /	53	re'gas dokko	E
CW.1159	frute da bydnar re thocka /	53	re dhokko	E
CW.0096	may tockans vnna pur splan /	57	may tokkons	E
RD.1381	hythew a tryckes yn tre /	62	a trikkes	E

Of the eight examples, five have graphemes which suggest provection and doubling to[*kk*]; viz. <*kk*> or <*ck*>.

(ii) Changes to /v/

Here there are far more examples, especially when those from *TH.* and *SA.* are added to those recorded by Edwards.

A'M BEUS				
MC.0512a	an geffo pows as gwyr3yns /	53	a'n jeffo	E
MC.1502a	ma~nan geffo ef sor bras /	53	na'n jeffo	
MC.2161b	res~teffo mur vylyny /	53	re's teffo	
OM.0551	venytha nan geffo tam /	53	na'n jeffo	E
PC.0919	lemman lorgh nep an geffo /	53	a'n jeffo	E
PC.0921	ha nep nan geffo na+nyl /	53	na'n jeffo	E
PC.0986	kettyl yn geffo an bay /	53	y'n jeffo	E
PC.1875	a+thysempys may geffo /	53	ma'n jeffo	E
PC.2092	man geffo pup ol bysne /	53	ma'n jeffo	E
RD.0160	hep ioy prest mays teffo cas /	53	may's teffo	E
RD.0384	nan geffo clout /	53	na'n jeffo	E
RD.1585	in ow gulascor may teffo /	53	may's teffo	E
RD.1621	thyworthyf gras man geffo /	53	na'n jeffo	E
RD.1973	man ieffo ef /	53	ma'n jeffo	E
RD.1987	cales peynys may geffo /	53	ma'n jeffo	E
RD.2012	par man geffo mur a pyn /	53	ma'n jeffo	E
RD.2020	nan geffo drok /	53	na'n jeffo	E
RD.2049	man geffo peyn mar ahas /	53	ma'n jeffo	E
RD.2085	vyngens ren geffo amen /	53	re'n jeffo	E
BM.1022	ren~geffo moleth y vam /	53	re'n jeffo	
BM.1248	peys men~geffo saluasconn /	53	ma'n jeffo	E
BM.1277	neb na vo ren~geffo crok /	53	re'n jeffo	E
BM.2270	kyn geffo eff myllyov cans /	53	ky'n jeffo	E
BM.4027	an dragon nan~geffo ovn /	53	na'n jeffo	E
TH.20	nan geffo den vith	53	na'n jeffo	
TH.21a	cause an geffa den	53	a'n jeffo	

BM 4287	mays~teffons y y luen 3eheys /	57	ma's @teffons	E L
BM.4291	susten mays~teffons kefrys /	57	ma's @teffons	E L
MC.1904b	oll an bows pyv an gyffe /	63	a'n jeffa	
MC.2132b	man geffo tregva yn nef /	63	ma'n jeffa	C
OM.0422	thy wythe an geffo graas /	63	a'n jeffa	E C
BM.0020	grammer an~geffa deffry /	63	a'n jeffa	E
BM.1935	then guesyon as~tefe peth /	63	a's teffa	
TH.04a	inclynacion an geffa den	63	a'n jeffa	
TH.25	han re an jeffa cure	63	a'n jeffa	
CW.0680	mes y bart ef an geffa /	63	a'n jeffa	E

N.B. Label L refers to forms where *a'm beus* was conjugated similarly to other verbs.

DOS

PC.0973	mar scon del thyffyf thotho /	51	dell dhyffiv	E
BM.0906	rag pan deffen ha moys fol /	51	pan dhyffiv	E C
MC.1932a	arluth pan dyffy 3eth pow /	52	pan dhyffi	
TH.06	bys may tyffy arta	52	may tyffi	
OM.0406	hag ahanes a theffo /	53	a dheffo	E
OM.1076	na theffo glaw aberveth /	53	na dheffo	E
OM.1577	na theffo onan yn beys /	53	na dheffo	E
OM.2488	na theffo glaw then stylllyow /	53	na dheffo	E
OM.2835	a theffo anethe y /	53	a dheffo	E
PC.0964	pan dyffo yn ow goloc /	53	pan dheffo	E
PC.1089	na theffo thym an mernans /	53	na dheffo	E
RD.0239	antecrist bys may teffo /	53	may teffo	E
RD.0386	ha dreheuel kyn teffo /	53	kyn teffo	E
RD.1349	goef termyn a theffo /	53	a dheffo	E
RD.1861	ken teffo y+ges goloc /	53	kyn teffo	E
RD.2176	na theffo na+moy yn pow /	53	na dheffo	E
RD.2393	na theffo den+vyth gynen /	53	na dheffo	E
BM.0251	kyn~teff~ov 3as am denes /	53	kyn teff'	E
BM.0415	na thefo dis benytha /	53	na dheffo	E
BM.1274	may teffo y ompynnen /	53	may teffo	E
BM.1712	may teffo eff theth gueras /	53	may teffo	E
TH.07	pan deffa an welsan	53	pan dheffo	
TH.18	bys may teffa an jeth	53	may teffo	
TH.33a	may teffa effa inna	53	may teffo	
TH.57	pan deffan then sacrament	53	pan dheffo	
SA.61	neb a theffa dib ow kig	53	a dheffo	
SA.64a	ne theffa ha e worthia	53	ny dheffo	
SA.66	na theff a leverall	53	na dheffo	
CW.1893	pan defa an termyn playne /	53	pan dheffo	E
CW.2523	y woose a theff~a scullya /	53	a dheff'	E
RD.0565	pan theffyn ny yn teffry /	55	pan dhyffyn	E
RD.0773	theth wlasor pan deffyn ny /	55	pan dhyffyn	E
TH.13a	may teffan pleylnly vnderstondia	55	may tyffyn	
TH.51a	pan deffan thyn vois a crist	55	pan dhyffyn	
TH.53a	may teffan ha cresy	55	may tyffyn	
TH.57	pan deffan then sacrament	55	pan dhyffyn	
RD.2388	may tyffough ol the sylwyans /	56	may teffowgh	E
RD.0392	kyn teffons y vyth mar clor /	57	kyn teffons	E
OM.2279	may tyffons vmma myttyn /	57	may teffons	E
OM.2408	may teffons omma whare /	57	may teffons	E
OM.2417	avorow thys may teffens /	57	may teffons	E
BM.1738	may teffons dymmo omma /	57	may teffons	E
BM.3290	may teffons thymo pur schaff /	57	may teffons	E
TH.52a	may teffans dybry ha eva	57	may teffons	
SA.66	an bara a theffan ry	61	a dheffen	
BM.3827	a tefes dym nebes neys /	62	a teffes	E
CW.1751	ha pan deffasta than plas /	62	pan dheffesta	E
MC.0274a	mar teffa tus ha gwe3e /	63	mar teffa	E

MC.1624a	3e ihesus crist may teffe /	63	may teffa	E
MC.2494a	may teffe tus gans nerth bras /	63	may teffa	E
RD.0273	pan deffe thy wlascor ef /	63	pan dheffa	E
RD.2330	gynen may teffo then lur /	63	may teffa	E C
TH.13a	mar teffa crist ha dos	63	mar teffa	
TH.13a	mar teffa du aga suffra	63	mar teffa	
TH.17	pan deffa an spuris na	63	pan dheffa	
TH.19	fattla mar teffa	63	mar teffa	
TH.19	mar teffa den vith	63	mar teffa	
TH.20	mar teva ha folya henna	63	mar teffa	
TH.22a	may teffa pub den ha benyn	63	may teffa	
TH.25	pan deffa ha gull amys	63	pan dheffa	
TH.36	may teffa ha gurtas genowgh	63	may teffa	
TH.39	Mar teffa an epscobow	63	mar teffa	
TH.41	han re a theffa war aga lyrth	63	a dheffa	
TH.42a	mar teffa an holl brodereth	63	mar teffa	
TH.47a	may teffa ena growetha	63	may teffa	
TH.54a	may teffa pub naturall mam	63	may teffa	
SA.59	heb ne theffa regardya	63	pan dheffa	
CW.0468	na thefa then nef nevera /	63	na dheffa	E
CW.2076	pan deffa an oyle a vercy /	63	pan dheffa	E
TH.06a	may teffan ha tenna	65	may teffen	
TH.24	may teffen hay folya eff	65	may teffen	
TH.24a	may teffan ha gava	65	may teffen	
TH.26a	may teffan ny ha passia	65	may teffen	
TH.42	may teffan ny oll ha dos	65	may teffen	
TH.25a	may teffans ha tenna	67	may teffens	
TH.35a	may teffens y haga thowllell	67	may teffens	
TH.46a	may teffans ha receva	67	may teffens	
DREHEVEL				
RD.0415	den marow na threhavo /	53	na dhrehaffo	E
BM.4227	re~trehava the+war lur /	53	re'th trehaffo	E
EVA				
PC.1620	uynytha na effo coul /	53	na effo	E
GAVA				
OM.1866	may affo an peghosow /	53	may affo	E
GODHEVEL				
MC.0242a	hag a wo3affo yn whar /	53	a wodhaffo	E
KAVOES				
RD.1777	marow vyth pan yn kyffyf /	51	y'n kyffiv	E
PC.0992	pan gyffy dalhen ynno /	52	pan gyffi	E
BM.1020	bener re~gyffy the con /	52	re gyffi	E
PC.1839	ma na gaffo gorthyp vyth /	53	ma na gaffo	E
MC.2403b	gans y dus nan caffan ny /	55	na'n kyffyn	E C
PC.0244	branchys olyf pan kyffyn /	55	pan kyffyn	E
PC.1551	py le penag ys kyffyn /	55	y's kyffyn	E
BM.2740	y gras genen may keffen /	55	may kyffyn	E
OM.2576	ny gaffen war ov loute /	61	ny gaffen	E
RD.0289	rum fay lemmyn an caffan /	61	a'n kaffen	E
RD.0850a	may caffan wheth /	61	may kaffen	E
BM.0110	vnwyth a caffan hansell /	61	a kaffen	E
BM.0661	corff bo gvyn a cafen vy /	61	a kaffen	E
MC.0673b	ihesus yw an caffans ny /	63	a'n kaffen	E
BM.1425	a caffogh sur benewen /	66	a kaffewgh	E
MC.1144a	may caffons y aga gwayn /	67	may kaffens	E C
MC.1542b	mar caffons goff yredy /	67	mar kaffens	E C



## SEVEL

PC.0345 then dor quyt na safe man / 63 na saffa E

## TEVI

OM.0028 may tefo gveyth ha losow / 53 may teffo E

OM.2104 py+gymmys hys may teffo / 53 may teffo E

N.B. In *TH.* and *SA.*, the 3rd singular of the present and imperfect subjunctive had fallen together. Some examples here assigned to the present may be better presented as the imperfect, and *vice versa*.

There are 125 examples of <ff>, 10 of <f> and 3 of <v>, a clear indication of provection and doubling.

(iii) Changes to /ð/

## DREHEDHES

PC.2758 na fors kyn na threhetho / 53 na dhrehettho E

## HEDHES

PC.2764 bys may hetho hy then tol / 53 may hettho E

PC.2768 may hetho then tol yn hast / 53 may hettho E

## KOEDHA

OM.2718 bys may cothe hy then dor / 53 may koettho E

PC.2502 warnan ny ef re gotho / 53 re goettho E

PC.2652 may coththo an mynythyow / 53 may koettho E

TH.03 ny a gottha thyn 53 a goettho

TH.08 kepar dell gottha 53 dell goettho

TH.09a dell gottha thyn 53 dell goettho

TH.21 ny a gottha thyn 53 a goettho

TH.21a ny a gottha thyn 53 a goettho

TH.21a a gottha thyn ny 53 a goettho

TH.22 fatell gotha thyn ny pub den 53 fatell goettho

TH.24a y a gotha bos executys 53 a goettho

TH.26a a gotha thotha bos in pub onyn 53 y koettho

TH.37a ny a gotha thyn omma consyddra 53 a goettho

TH.45 a gotha persuadya colonow 53 a goettho

TH.55 eff a gotha thotha bos 53 a goettho

CW.0050 3eso gy par del gotha / 53 dell goettho

CW.2526 mar+am kerowgh dell gotha / 53 dell goettho

## KUDHA

OM.0982 a gutho ol an nor+beys / 53 a guttho E

PC.1401 may cutho hanter y fath / 53 may kuttho E

## LADHA

OM.0603 yn bys den vyth nath latho / 53 na'th lattho E

PC.2457 nep an latho dev goef / 53 a'n lattho E

BM.3967 ny gas nan lathe heb wov / 53 ma'n lattho E

RD.1836 scon war ow brevth yn latthen /61 y'n latthen E

BM.1666 mar lathen oll an re ma / 61 mar latthen E

MC.1224b y to ihesus mar la3e / 63 mar lattha

Edwards (1997) concluded from the examples marked E that *dh* > *th* is justified, and that there is no evidence for *dh* > *tth*. This is reasonable if only the spelling is considered, but we need to look at the sounds as well. Analogy with the previous two cases (/g/ > [kk] and /v/ > [ff]) would lead us to expect /ð/ > [θθ]. This voiceless double consonant is spelled <tth> in *Kernewek Kemmyn*, but there seems to have been no distinctive way to spell it in the Ordinalia. The grapheme <th>, which was used in every example except one, usually meant either [ð] or [θ], but it may well have been used to represent [θθ] in addition. The one important exception is:

PC.2652 *may coththo an mynythyow* ‘that the mounatins may fall’

where the grapheme <thth>, already noted in George (1986), is strongly suggestive of the sound [θθ]. Also significant are no fewer than six instances of <tth> in the Tregear Homilies.

(iv) Changes to [z]

No examples were found of native verbal stems ending in <d>, because Old Cornish [d] between vowels in most environments had become assibilated. The unchanged stem in the indicative mood was most commonly spelled <s> in Middle Cornish, but before high vowels it was sometimes spelled <g> or <i>, indicating palatalization to [dʒ]. The fact that the result of the palatalization was voiced implies that the <s> also represented a voiced consonant, viz. [z]. *Kernewek Kemmyn* would be improved if this [z] were recognized in the orthography. Examples of subjunctive endings and such verbal stems include the following:

GASA			
OM.0377	mam gasso kyns ys myrwel /	53	ma'm gasso E
GWERES			
BM.1331	pup vr regen gueresa /	53	re'gan gweresso E
BM.1758	regen guerese pup deth /	53	re'gan gweresso E C
BM.2536	arluth neff rum gueresa /	53	re'm gweresso E
BM.2539	pup vr~ol rum gueresa /	53	re'm gweresso E
BM.3822	re werese creff ha guan /	53	re weresso E
BM.4037	arluth neff rum gueresa /	53	re'm gweresso E
BM.4228	maria reth weresa /	53	re'th weresso E
KRYSI			
RD.0176	kemmys na greysa goef /	53	na gryssso
RD.1348	ha kekemmys nan cresso /	53	na'n kryssso E
RD.1555	hag yn perfyth an cresso /	53	a'n kryssso E
RD.1707	hag ynno ef a gryssso /	53	a gryssso E
RD.2466	pyv+penagh a len+gryssso /	53	a len-gryssso E
RD.2478	den na gressso dyougel /	53	na gryssso E
BM.1213	neb na cresse in+della /	53	na gryssso C
TH.53	neb a crisse ynna ve	53	a gryssso E C
PYSI			
PC.1890	may pysso ef atta last /	53	may pysso E
RD.2378	warnos a pysse mercy /	53	a byssso E

Of the eighteen examples, ten have <ss>; of the eight which have <s>, all but one are from *Beunans Meriasek*, and refer to the same verb.

It is reasonable to generalize from the four clear cases (shown in bold in the following table) to the other three where the verbal stem ends in a voiced consonant.

SOUNDS	GRAPHEMES	EXAMPLE OF CHANGE	
		Verbal noun	Ending 53
[b] > [pp]	<i>b</i> > <i>pp</i>	<i>gorthybi</i>	<i>gorthyppo</i>
[d] > [tt]	<i>d</i> > <i>tt</i>	<i>redya</i>	<i>rettyo</i>
<b>[g] &gt; [kk]</b>	<b><i>g</i> &gt; <i>kk</i></b>	<b><i>degi</i></b>	<b><i>dokko</i></b>
[v] > [ff]	<i>v</i> > <i>ff</i>	<i>kavoes</i>	<i>kaffo</i>
<b>[ð] &gt; [θθ]</b>	<b><i>dh</i> &gt; <i>tth</i></b>	<b><i>koedha</i></b>	<b><i>koettho</i></b>
[z] > [ss]	<i>s</i> > <i>ss</i>	<i>krysi</i>	<i>kryssso</i>
[dʒ] > [tʃtʃ]	<i>j</i> > <i>cch</i>	<i>hwyja</i>	<i>hwyccho</i>

**Single voiceless obstruents**

Assimilation of /h/ by these consonants is clearly analogous to that by the single voiced obstruents, the difference being that since the obstruent is already voiceless, provection cannot take place. One would expect doubling to take place, however, viz. [p, t, k; s, f, θ; tʃ, ʃ] > [pp, tt, kk; ss, ff, θθ; tʃtʃ, ʃʃ]. There are far fewer examples, however, and it is convenient to consider them all together.

GWITHA /θ/

OM.1724	hag ef prest ragas gvytho /	53	re'gas gwittho	E
RD.2642	rak+as guytho yn pup le /	53	re'gas gwittho	
BM.1077	du re wythe orth damach /	53	re wittho	E
MC.2224b	nas gwe3e an spyrys sans /	63	na's gwittha	E

HWYTHA /θ/

PC.1243	neb na whytho grens fannye /	53	na hwyttho	E
PC.2711	a whytho guel /	53	a hwyttho	E
PC.2713	a whytho gans mygenow /	53	a hwyttho	

PEGHA /x/

CW.0991	adam na eva pegha /	63	peggha	E
---------	---------------------	----	--------	---

The following three words contain in their root the reflex of Old Cornish /s/, and are treated here; at the time of the Ordinalia, however, this reflex might have been [z], in which case it could have been treated with the single voiced obstruents above.

KEWSEL

PC.0820	erbyn a pyth a gevsy /	52	a gewssi	
PC.1658	na gouse moy ys margh dal /	53	na gowssso	E
PC.1826	yn certan kyn na gowso /	53	kyn na gowssso	E
PC.2398	kyn na~gouse bos marow /	53	kyn na gowssso	E
RD.0398	kyn couse vyth mar huhel /	63	kyn kowssa	E
RD.1034	awos a gousa denvyth /	53	a gowssso	E
BM.3985	er+na govsen orth y ganov /	51	erna gowssiv	E C

N.B. Edwards included also *BM.2555 kyn cowseff orthys der reff*, interpreting *cowseff* as the present subjunctive *kewssiv*. I think it more likely to be the present indicative *kowsav*.

KOSA				
PC.2084	may cosso y tynwennow /	53	may kosso	E
LAVASOS				
RD.1835	my a grys a lauassen /	61	a lavassen	E

There is little evidence here of doubling, but that does not mean that it did not occur; it does not appear in cases of /θ/ and /x/ because of the difficulty of doubling <th> and <gh>. It is surprising that no cases of <ss> are found with the verb *kewsel*, but at least they are found with *kosa* and *lavasos*. A little more light is thrown upon this case by verbs in *-ya*, which are considered below.

### Summary of changes to single obstruents not in a cluster

- Voiced obstruents (necessarily single) are subject to provection and doubling.
- Voiceless obstruents are subject to doubling only.

## 2) ASSIMILATION OF A SINGLE OBSTRUENT + SONORANT

### Voiced obstruent followed by /r/

Combining the seven possible voiced obstruents with /r/ gives the following seven possible combinations: [br], [dr], [gr], [vr], [ðr], [zr], [dʒr]. Only two of these (/br/ and /dr/) have attested examples in the subjunctive:

DYBRI				
MC.0444a	an deppro gans cregyans da /	53	a'n deppro	E
OM.0187	ay frut hy nep a theppro /	53	a dheppro	E
OM.0200	may tebro ef annotho /	53	may teppro	E
PC.0795	ha nep a theppro kensa /	53	a dheppro	E
PC.0800	a nyn+s~yv nep a theppro /	53	a dheppro	E
RD.0541	vynytha na theppro bous /	53	na dheppro	E
TH 03a	peskytter may tepprow anythy	56	may tepprowgh	E
OM.0175	a tebres ty hath worty /	62	a teppres	E
LADRA				
OM.2232	mar as ladtref theworto /	63	a's lattrra	E
RD.0058	ha me a wyth nan lyttry /	52	na lyttri	E
RD.0365	nan laddro an crystenyon /	53	na'n lattro	E
RD.0380	thy-worthyn den nan laddro /	53	na'n lattro	E
RD.0624	nan laddro den /	53	na'n lattro	E
PEDRI				
PC.3200	na potre bys vynary /	53	na bottro	E
RD.2022	bys pan pottro ol the gyk /	53	pan bottro	

It is clear that the voiced consonant preceding the /r/ is subject to doubling and provection, almost as if the /r/ were not there. It is considered reasonable to generalize this rule to the other five consonants, as shown in this table:

SOUNDS	GRAPHEMES	EXAMPLE OF CHANGE
		Verbal noun Ending 53
[br] > [ppr]	<i>br</i> > <i>ppr</i>	<i>dybri</i> <i>deppro</i>
[dr] > [ttr]	<i>dr</i> > <i>ttr</i>	<i>ladra</i> <i>lattro</i>
[gr] > [kr]	<i>gr</i> > <i>kkr</i>	(no examples known)
[vr] > [ffr]	<i>vr</i> > <i>ffr</i>	<i>delivra</i> <i>deliffro</i>
[ðr] > [θθr]	<i>dhr</i> > <i>tthr</i>	<i>gwedhra</i> <i>gwetthro</i>
[zr] > [ssr]	<i>sr</i> > <i>ssr</i>	(no examples known)
[dʒr] > [tʃtʃr]	<i>jr</i> > <i>cchr</i>	(no examples known)

Curiously, Smith (1972) did not generalize; in the present subjunctive, he showed both provection and doubling in all persons in the verb *ladra*, but only in the third persons in the verbs *dybri* and *pedri*.

**Voiced obstruents followed by /l/**

Given the rule just established for (obstruent + /r/), it would not be surprising if a similar rule obtained for (obstruent + /l/). No examples of this in the subjunctive mood have been found; however, the comparative adjective *appla* ‘abler’ in *TH.41* (Tregear actually wrote *moy appla*) supports the assimilation [bl] > [ppl]. From this, and from Lewis and Pedersen (1974, §203), it is reasonable to extend the principle of provection and doubling to any obstruent followed by /l/.

**Single obstruent followed by /j/**

This cluster occurs in verbs having *-ya* in the verbal noun, very many of these being loan-words. The <y> is part of the ending, not part of the stem. The <y> is retained with some endings but not with others, as shown in this table (after Brown, 1993, §188):

TENSE	S 1	S 2	S 3	P 1	P 2	P 3
<i>Present subjunctive</i>	51 -iv	52 -i	53 -yo	55 -yn	56 -yowgh	57 -yons
<i>Imperfect subjunctive</i>	61 -yen	62 -yes	63 -ya	65 -yen	66 -yewgh	67 -yens

(i) Voiced obstruent followed by /j/

Since Old Cornish /d/ became assimilated in most environments, it is not surprising to find no examples of native verbs whose stems end in /d/. There are, however, examples of loan-words in *-ya* whose stems do end in /d/, e.g. *redya* ‘to read’. I have found only three examples of the subjunctive in such verbs:

## GEDYA

BM.0629	the teller da rum gedya /	53	re'm gedyo	E
BM.1099	rum gedya in forth wella /	53	re'm gedyo	E
BM.3015	reth gedya del vo plesijs /	53	re'th gedyo	E

Edwards concluded from these that  $d > tt$  is not justified. This is evidently valid if these three examples are examined in isolation. It is unfortunate that we do not have more examples, especially of other endings where the <y> would be absent. We are faced with a dilemma:

- (a) either we take this evidence at its face-value, and suppose that because these loan-words came into Cornish at a later date than the assimilation of consonant + /h/, then the /d/ remains;
- (b) or we over-rule the evidence of these three examples, and make verbal stems ending in /d/ conform to the general rule of doubling and provection.

Smith (1972) seems to have chosen (a), writing *rēdyo* for ‘may read’ {53}, but as shown below, some of his paradigms are inconsistent. Gendall (1972) wrote *retyo* for the same verb. Brown (1984, 1993) chose (b), writing *rettyo*; Edwards (1995) did likewise, though his subsequent investigation must have caused him to reflect. I am also inclined to choose (b), noting that the three examples come from *Beunans Meriasek*, a text which tends more than the others not to conform (see *degi*, *drehevel*, *gweres* above).

## REMOVYA

RD.0396	in certan mar remvfe /	63	mar remoffya
---------	------------------------	----	--------------

The <f> here tends to support provection, but the expected <y> is not found.

(ii) Single voiceless obstruent followed by /j/

## SKAPYA

PC.0990	gueyt an harlot na scapyo /	53	na skappyo	E
PC.1888	byth na scapye /	53	na skappyo	E C
RD.2270	byth na schapye /	53	na skappyo	E C
BM.1559	na schappya benen in beys /	53	na skappyo	E

Here only one out of the four examples shows doubling, and Edwards concluded that  $p > pp$  is “not justified”. I believe that the one example of <pp> is correct, however, and that it adds weight to the tentative conclusion about single voiceless obstruents already made for verbs without /j/.

## PROFYA

OM.2164	hag a perfo ov meystry /	53	a broffo
---------	--------------------------	----	----------

Here metathesis has changed the expected form.

Conclusion

The evidence is disappointingly weak, but I believe that the results for obstruent + /j/ are the same as those for an obstruent not in a cluster. (The case of resonant + /j/, considered below, adds a little weight to this). So far as the examination of changes to the stem is concerned, verbs in **-ya** may be treated in the same way as other verbs, as did Edwards (1995, 1997), and evidence in the various cases may be combined with that for verbs without /j/; this is done henceforth in this paper.

**Summary of assimilation of a single obstruent followed by a sonorant**

- Voiced obstruents followed by /r/ are subject to provection and doubling.
- Voiced obstruents followed by /l/ are subject to provection and doubling.
- Voiced obstruents followed by /j/ may be subject to provection and doubling.
- Single voiceless obstruents followed by /j/ are subject to doubling only.

These statements may be combined and generalized into the following:

*For a single obstruent followed by a sonorant,  
doubling occurs, and voiced obstruents are subject to provection.*

**Obstruent followed by /w/**

This case needs to be considered in order to deal with verbs like *dedhwi* ‘to lay eggs’, *aswa* ‘to make a gap’. Unfortunately no examples have been found in the texts; if the superlative of an adjective such as *medhow* ‘drunk’ were found, it would help, but a search proved fruitless. If Cornish behaved like Welsh, then we would expect provection to occur (Lewis and Pedersen, 1974, §203), and the previous cases would suggest doubling as well.

**3) ASSIMILATION OF SINGLE RESONANTS****Single resonants not in a cluster**

Because resonant consonants (nasals and liquids) still remained voiced after assimilating a following /h/, there is no question of provection, just doubling. This case is therefore similar to that of single voiceless obstruents, but there are far more examples.

Verbs with /n/

## DANNVON

RD.1630	thotho gueyt may tanfenny /	52	may tannvenni	E
OM.0669	y grath thyn may tanvonno /	53	may tannvonno	
OM.1187	y gras re thanvonno thyn /	53	re dhanvonno	E
PC.2631	re thanfono vngeans cref /	53	re dhannvonno	
RD.1596	may tanfonno thyugh yn scon /	53	may tannvonno	
RD.1620	pys~e thym man danfonno /	53	ma'n dannvonno	

## EWNA

OM.2527	an jawl reth ewno thy glas /	53	re'th ewnno	
---------	------------------------------	----	-------------	--

## KANA

PC.1810	ow+tyweth na ganno tru /	53	na ganno	
---------	--------------------------	----	----------	--

## KRENA

BM.2257	may kerna pur~guir y dyns /	53	may krenno	
---------	-----------------------------	----	------------	--

## ORDENA

PC.0685	reth ordene ty hath wreth /	53	re'th ordenno	
---------	-----------------------------	----	---------------	--

GEORGE

VERBAL STEMS IN THE SUBJUNCTIVE

PRENA

OM.2152	er+nan prenne an guas~na /	53	erna'n prenno	
OM.2653	er+nan prenny yn felen /	52	erna'n prenni	E

SEWENI

OM.0539	venytha na sowyny /	52	na sewynni	
PC.1133	na sowenno /	53	na sewenno	

SOENA

BM.0587	marners dorsona dywy /	53	dursoenno	
BM.1076	dorsona dyugh mester flor /	53	dursoenno	
BM.3107	meryasek dursona dys /	53	dursoenno	
BM.4194	dorsona thys a thremays /	53	dursoenno	

TREMENA

OM.0875	pan dremenna an bys~ma /	53	pan dremenno	
---------	--------------------------	----	--------------	--

Verbs in /l/

DEHWELES

RD.0879a	may tewhylllyf /	51	may tehwelliv	E
OM.2196	sav byner re thewhylly /	52	re dhehwelli	E
BM.3439	rag bener re thewellen /	61	re dhehwellen	E

GWELES

RD.1776	drewh e thymmo man guyllyf /	51	ma'n gwylliv	
OM.0717	kyn wylly mur wolowys /	52	hwylly	
OM.0745	pepenag~ol a wylly /	52	a wylli	
OM.0801	myr pandra wylly ynny /	52	a wylli	
PC.2101	may whylly guryghon ha mok /	52	may hwylly	
RD.0057	na wylly deyth /	52	na wylli	
RD.0071	na wylly golow yn bys /	52	na wylli	
RD.1694	ha mar scon del yn guylly /	52	y'n gwylli	
OM.1849	may whello an debeles /	53	may hwello	E
RD.1554	the kekemmys nam guello /	53	na'm gwello	
RD.1706	ha kekemmys an guello /	53	a'n gwello	
RD.1895	sav nep an guello an car /	53	a'n gwello	
RD.2003	golow na wella deffry /	53	na wello	
RD.2383	pyv+penagh am gwellha vy /	53	a'm gwello	
BM.4006	may welle myns us in rome /	53	may hwello	E
CW.0485	mar uthicke pan wella hy /	53	pan wello	
OM.1013	guyn+veys ha quellen an gyth /	61	a kwellen	E
PC.1944	mar+a quellan yn certan /	61	mara kwellen	E
PC.3023a	hag a quellen /	61	a kwellen	E

KOELA

CW.0192	myns a golha ortha vee /	53	a goello	
---------	--------------------------	----	----------	--

OMHWELES

RD.0388	may ron+mayle war an dor /	53	mayth omhwello	
---------	----------------------------	----	----------------	--

TYLI

BM.0558	cryst ihesu dys ren tala /	53	re'n tallo	
BM.0755	in neff thywhy ren tala /	53	re'n tallo	
BM.1097	du ren tala thyugh tus vays /	53	re'n tallo	
BM.3082	ren tala dis meryasek /	53	re'n tallo	
BM.4248	thyugh ren tala /	53	re'n tallo	



Verbs in /r/

## DARBARI

BM.1681	du re tharbara 3ehas /	53	re dharbarro	E
BM.2686	re tharbarre /	53	re dharbarro	E C
BM.4221	re therbara dis 3ehes /	53	re dharbarro	E

## DEVERA

BM.2419	may teverre an brehy /	53	may teverro	E C
BM.2608	may tevera /	63	may teverra	E

## KARA

OM.0537	ke yn+rak del ym kyrry /	52	dell y'm kyrri	E
OM.0890	belsebuc del ym kyrry /	52	dell y'm kyrri	E
OM.1370	del ym kerry me ad peys /	52	dell y'm kyrri	E
OM.2142	the omlath del ym kerry /	52	dell y'm kyrri	E
OM.2218	lauar thym del ym kerry /	52	dell y'm kyrri	E
OM.2403	dus yn+rag del ym kyrry /	52	dell y'm kyrri	E
PC.0991	drok handle del om kyry /	52	dell y'm kyrri	E
PC.1289	lauar thym del ym kyry /	52	dell y'm kyrri	E
PC.1736	then mester del ym kyry /	52	dell y'm kyrri	E
PC.2240	saf yn+ban del ym kerry /	52	dell y'm kyrri	E
PC.2671	lauar thym del ym kerry /	52	dell y'm kyrri	E
RD.1726	dus nes thym del ym kerry /	52	dell y'm kyrri	E
RD.1859	del ym kerry yn tor~ma /	52	dell y'm kyrri	E
RD.2045	vernona del ym kerry /	52	dell y'm kyrri	E
BM.0269	lauer 3ym del om kerry /	52	dell y'm kyrri	E
PC.1847	synt iouyn whek ren carro /	53	re'n karro	E
PC.3016	synt iouyn whek reth caro /	53	re'th karro	E
BM.1191	na garra sevel in cres /	53	na garro	E
TH.20a	neb na garra y gyscristian	53	na garro	E
TH.21a	neb a garro y das	53	a garro	E
TH.23a	na garra y brother	53	na garro	E
OM.0543	del ym kyrreugh ages dew /	56	dell y'm kyrrowgh	E C
RD.1897	kyn yn carra vyth mar veur /	63	kyn y'n karra	E
TH.20a	mas ny a carra	63	a garra	
TH.20a	mas ny a garra du	63	a garra	
TH.23a	mas ef a garra y yskar	63	a garra	

## KEMMERES

OM.1024	guet copel may kemery /	52	may kemmerri	
BM.1842	mercy neb a gemerre /	53	a gemmerro	E
BM.0405	na gemerre denv#t# greff /	53	na gemmerro	E C
MC.2412b	nan kemerre y yskerans /	63	na'n kemmerra	E
TH.04	mas eff a gemera weth	63	a gemmerra	E

## LEVEREL

PC.1323	thymmo vy may leuerry /	51	may leverri	E
PC.1481	kyn leuerryf guyr denfyth /	51	kyn leverriv	E
OM.1528	may leuerry ogh ellas /	52	may leverri	E
RD.0029	may leuerry me a grys /	52	may leverri	E
RD.2046	me ath pys may leuery /	52	may leverri	E
RD.0422	a lauarre /	53	a lavarro	E C
TH.28a	neb a lavarra thy brothar	53	a lavarro	
CW.0178	pennagel ew na lavara /	53	na lavarro	E
CW.0611	mes te thym a lavara /	53	a lavarro	
TH.17a	avell pan lavarra eff	63	pan lavarra	
TH.20	mas ny a lauarra	63	a lavarra	

N.B. In TH., the 3rd singular of the present and imperfect subjunctive had fallen together. Some examples here assigned to the present may be better presented as the imperfect, and *vice versa*.

The counts of the various graphemes are as follows:

						<i>TOTAL</i>	
<i>SINGLE</i>	<n>	8	<l>	5	<r>	11	24
<i>DOUBLE</i>	<nn>	9	<ll>	21	<rr>	35	65
<i>OTHER</i>		1		3		0	4

These figures confirm that single resonants are doubled.

### Single resonants followed by /j/

SKONYA	/nj/					
OM.2388	pypenag~ol a sconyo /	53	a skonnyo			
DURYA	/rj/					
TH.17	dell thurrya an bys na	53	dell dhurryo			
SPARYA	/rj/					
PC.2078	vengyans the nep an sparryo /	53	a'n sparryo			
TREYLYA	/lj/					
PC.1070	may treylyo mernens the+ves /	53	may treyllyo			

There are very few examples, but two of the four show doubling. This is considered sufficient to generalize: as with the single obstruents, a following /j/ has no effect on the assimilation. It might be expected that a following /w/ would behave in the same way, but the slight evidence does not support this; the case (single resonant + /w/) is treated below.

## 4) ASSIMILATION IN CLUSTERS

Although the cases of (single obstruent + sonorant) and (single resonant + /j/) dealt with above would normally be described as clusters, it is clear that these cases behave as if they are not clusters; i.e. the single consonants are subject to doubling. We now consider all the cases which do function as clusters; these already contain two elements, and therefore doubling does not occur. Clusters containing voiced obstruents are considered first; in theory, these voiced obstruents should suffer protection, but there is no clear evidence to support this.

### Clusters including a voiced obstruent

#### (i) Clusters comprising a voiced obstruent preceded by a resonant

As indicated above, cases with /j/ are combined with those without /j/.

GORDHYA	/rðj/					
OM.1938	nep an gorthye guyn y veys /	53	a'n gorthyo			
PC.0215	nep nan gorthyo del thegouth /	53	na'n gorthyo			
PC.1848	ha dres pup ol ren gorthyo /	53	re'n gorthyo			
PC.1917	kemmys na worthyo iouyn /	53	na worthyo			
RD.1222	ha kemmys an gorthyo ef /	53	a'n gorthyo			
BM.0764	penag a worthya ken du /	53	a worthyo			
SA.64a	ha e worthia bara	53	a worthyo			
BM.4427	the kenever an gorthya /	63	a'n gorthya			

KERDHES	/rð/			
OM.0313	a gertho war an nor+veis /	53	a gertho	
PC.1197	ma kertho garwo y cam /	53	may kertho	
RD.0249	in pup le may kertho ef /	53	may kertho	

For /rð/ and /rðj/, Edwards (1997) commented that provection is justified but doubling is not. I agree with him, though the evidence is inconclusive, because <rth> was used to represent both [rð] and [rθ]. We have to fall back on theoretical considerations. One would expect [rð] + [h] to give [rθ], rather than [rθθ]; i.e. provection but not doubling. The presence of the [r] makes the end of the stem a cluster rather than an isolated consonant, with the effect that the preceding vowel was short.

SERVYA	/rvj/			
OM.0665	thyn a seruyo /	53	a serfyo	E
PC.0796	kepar ha nep a seruyo /	53	a serfyo	

These two examples show neither provection (which is expected) nor doubling.

SYNSI	/nz/			
RD.0614	nep nan synso y sylwyas /	53	na'n synso	E
BM.2675	cris re sensa the gallos /	53	re synso	E

(ii) Clusters comprising resonant + voiced obstruent + sonorant

ANKOMBRA	/mbr/			
BM.2112	an iovle mur ren ancumbra /	53	re'n ankompro	E
BM.3951	mahom reges ancumbra /	53	re'gas ankompro	E

HANDLA	/ndl/			
RD.1531	er+na hyndlyf y golon /	51	erna hyntliv	

As in the case of (voiced obstruent + sonorant), the final sonorant has no effect on the assimilation. In theory the result is the same as for (resonant + obstruent) alone, viz. provection but no doubling, but these three examples do not show the expected provection.

### Clusters including single voiceless obstruents

These clusters suffer neither provection nor doubling.

(i) Double voiceless obstruents (optionally followed by /j/)

In theory, verbal stems ending in the following should show no change in the subjunctive: /pp, tt, kk/; /ff, ss, θθ, tʃtʃ, ʃʃ/. Only one example has been found:

SETTYA				
BM.2314	neb a settya er~the~byn /	53	a settyo	

There is no change to the end of the stem, since it is already double and voiceless.

(ii) Clusters comprising two voiceless obstruents (or two voiceless obstruents + /j/)

This case is very similar to the previous one.

DIWISKA	/sk/				
RD.1941	arluth lemmyn as dysken /	61	a's di'sken	E	
FASTYA	/stj/				
PC.1526	may fastyo an colm wharre /	53	may fastyo	E	
GWESKEL	/sk/				
PC.2725	a wasko certan mar tha /	53	a wasko	E	
LESKI	/sk/				
RD.0130	quyt an losco /	53	a'n losko	E	

Doubling does not occur. Neither does provection, because all the obstruents concerned are voiceless already.

(iii) Single voiceless obstruent preceded by a resonant

DASSERGHI	/rx/				
RD.0379	me an guyth kyn tassorgho /	53	kyn tassorgho	E	
GRONTYA	/ntj/				
MC.0012a	re wronte 3eugh gras ha whans /	53	re wrontyo		
OM.1726	hay gras theug~why re wronntyo /	53	re wrontyo	E	
BM.0701	yehes dywy re grontya /	53	re wrontyo	E	
BM.2537	ha yehes thym re grontya /	53	re wrontyo	E	
BM.3073	ihesu re grontya 3ehes /	53	re wrontyo	E	
BM.3141	dywhy re wrontya 3ehays /	53	re wrontyo	E	
BM.4229	ha re grontya /	53	re wrontyo	E	
BM.4385	thy ena re grontya ioy /	53	re wrontyo	E	

Edwards (1997) noted that *nt* > *ntt* is “not justified”. At *OM.1726* it appears that the *n* rather than the *t* is doubled, giving *nnt*; but as Toorians (1993) pointed out, the grapheme <nn> is either a misreading for <un>, or a means of representing a nasal vowel.

KYRGHES	/rx/				
OM.2370	ren kyrho thotho thy wleth /	53	re'n kyrgho	E	
PC.3050	na gergho alemma chet /	53	na gyrgho	E	
RD.2277	ren kergho an dewolow /	53	re'n kyrgho	E	
PERTHI	/rθ/				
CE.0025c	oun ma por3o /	53	ma portho		
RD.0272	ahanaf may portho cof /	63	may portha	E C	

(iv) Clusters comprising resonant + voiceless obstruent + sonorant

ENTRA	/ntr/				
PC.2140	may+th~entre an spikys serth /	53	mayth entro	E	

**Other clusters including resonants****(i) Clusters including double resonants**

These were not unvoiced, and being already double, could not suffer doubling. This means that in verbal stems ending in /mm, ll, nn, rr/, most of the personal endings of the subjunctive are formally indistinguishable from those of the corresponding tense in the indicative. For example, in the line

BM.0113 pan vynnogh eugh 3e lyvya / 56 pan vynnogh

the phrase *pan vynnogh* ‘when you wish’ has been taken to be the present subjunctive, but the form of the present indicative is identical. Only in the singular endings of the present are the two moods distinguished; about 100 examples of these were identified, but have not been listed here, because they show no changes to the verbal stem.

**(ii) Clusters comprising two resonants (or two resonants + /j/)**

This case is very similar to the previous one; neither provection nor doubling occur. No examples have been found in the texts, but there are several verbs in this category in the *Gerlyver Meur* (George, 1993); examples are given in Appendix 1. Among these is *bernya* ‘to heap’, which perplexed Edwards: he could not decide whether the 1st sg. pres. subj. was *bernniv* or *berrniv*. In fact it is neither, doubling does not occur, and the recommended form is *berniv*.

**(iii) Resonant followed by /w/**

Analogy with (resonant + /j/) would suggest that a resonant followed by /w/ might be doubled.

GELWEL	/lw/			
TH.28a	neb a alwa y kyscristyan foole	53	a alwo	C
TH.28a	eff a gylwe y gentrevak	53	a alwo	C
MERWEL	/rw/			
PC.0227	pan vyrwyf thagas enef /	51	pan vyrwiv	
OM.0825	pan varwo gorr~y hep fal /	53	pan varwo	
OM.2678	er+na varwa eredy /	53	erna varwo	
PC.2827	may farwe an thew vylen /	53	may farwo	
RD.2226	ny thue dresto na varwo /	53	na varwo	
TH.03a	mar a ten ny a verwe	63	a varwa	

None of the examples shows doubling. If this evidence is correct, then it appears that (resonant + /w/) behaved like (resonant + obstruent) rather than (resonant + /j/).

## CONCLUSION

A detailed examination of examples has enabled Brown's (1993) list of changes to verbal stems in the subjunctive mood to be extended (as Appendix 1). The changes may be summarized as:

- (a) provection affects any voiced obstruent, alone or in a cluster;
- (b) doubling affects:
  - (i) any single obstruent not preceded by a resonant;
  - (ii) any single resonant, alone or followed by /j/.

Evidence for provection of voiced obstruents preceded by a resonant is lacking, but there are few examples, and it may well have occurred nevertheless; one would expect it theoretically.

## REFERENCES

- BROWN, W. (1993) *Grammar of modern Cornish*.  
Cornish Language Board, Saltash.
- BROWN, W. (1997) "Py par rewl yw an gwella rag gwruthyl ... furvow an verb y'n amseryow islavarek?" Unpublished discussion paper.
- DUNBAR, P. and GEORGE, K.J. (1997) *Kernewek Kemmyn: Cornish for the 21<sup>st</sup> century*. Cornish Language Board, Saltash.
- EDWARDS, R. (1995) *Verbow Kernewek*. Kernewek dre Lyther, Sutton Coldfield.
- EDWARDS, R. (1997) "Extended version of *Grammar of Modern Cornish*, §182."  
Unpublished list of the changes which the various stems of verbs undergo in the subjunctive mood.
- GENDALL, R.R.M. (1972) *Kernewek Bew*. Cornish Language Board.
- GEORGE, K.J. (1986) *The pronunciation and spelling of Revived Cornish*.  
Cornish Language Board, Saltash.
- GEORGE, K.J. (1993) *Gerlyver Kernewek Kemmyn – An Gerlyver Meur*.  
Cornish Language Board, Saltash.
- GEORGE, K.J. (2000) "On simplifying the lexical tagging of Cornish texts". In *Proceedings of the 6<sup>th</sup> annual conference of the North American Association for Celtic Language Teachers*. Limerick.
- HEMON, R. (1975) *A historical morphology and syntax of Breton*.  
Dublin Institute for Advanced Studies.
- JACKSON, K.H. (1967) *A historical phonology of Breton*.  
Dublin Institute for Advanced Studies.

LEWIS, H. and PEDERSEN, H. (1974) *A concise comparative Celtic grammar*.  
3<sup>rd</sup> edn. Vandenhoeck and Ruprecht, Göttingen.

MORRIS-JONES, J. (1913) *A Welsh grammar*. Clarendon Press, Oxford.

PENNAOD, G. (1977) *Dornlevr krennvrezhoneg*. 2<sup>nd</sup> edn. Preder.

SMITH, A.S.D., (1972) *Cornish simplified*. 2<sup>nd</sup> edn. by HOOPER, E.G.R.  
An Lef Kernewek, Camborne.

TOORIANS, L. (1993) 'French loan-words containing nasal vowels in Middle  
Cornish'. In *Sound law and analogy*, ed. A. Lubotsky, pp. 327-332.

## APPENDIX 1 Full alphabetical list of changes to the verbal stem

The list has been modified from that by Edwards (1995), in the light of the  
researches made for this paper.

GRAPHEMES	SOUND CHANGE	EXAMPLE OF CHANGE Verbal noun Ending 53	TYPE
<i>b</i> > <i>pp</i>	[b] > [pp]	<i>gorthybi</i> <i>gorthyppo</i>	V              PD
<i>bl</i> > <i>ppl</i>	[bl] > [ppl]	<i>pobla</i> <i>popplo</i>	V+S          PD
<i>br</i> > <i>ppr</i>	[br] > [ppr]	<i>dybri</i> <i>deppro</i>	V+S          PD
<i>ch</i> > <i>cch</i>	[tʃ] > [tʃtʃ]	<i>kachya</i> <i>kacchyo</i>	U+S          -D
<i>d</i> > <i>tt</i>	[d] > [tt]	<i>redya</i> <i>rettyo</i>	V+S          PD
<i>dh</i> > <i>tth</i>	[ð] > [θθ]	<i>koedha</i> <i>koettho</i>	V+S          PD
<i>dh1</i> > <i>tth1</i>	[ðl] > [θθl]	<i>hwedhla</i> <i>hwetthlo</i>	V+S          PD
<i>dhr</i> > <i>tthr</i>	[ðr] > [θθr]	<i>gwedhra</i> <i>gwetthro</i>	V+S          PD
<i>dhw</i> > <i>dhw</i>	[ðw] > [θθw]	<i>dedhwi</i> <i>dotthwo</i>	V+S          PD
<i>dr</i> > <i>ttr</i>	[dr] > [ttr]	<i>ladra</i> <i>lattro</i>	V+S          PD
<i>f</i> > <i>ff</i>	[f] > [ff]	<i>skriffa</i> <i>skriffyo</i>	U              -D
<i>ff</i> > <i>ff</i>	no change	<i>graffya</i> <i>graffyo</i>	U+U          --
<i>ffr</i> > <i>ffr</i>	no change	<i>offra</i> <i>offro</i>	U+U+S       --
<i>fl</i> > <i>ffl</i>	[fl] > [ffl]	<i>trufla</i> <i>trufflo</i>	U+S          -D
<i>g</i> > <i>kk</i>	[g] > [kk]	<i>degi</i> <i>dokko</i>	V              PD
<i>gh</i> > <i>ggh</i>	[x] > [xx]	<i>pegha</i> <i>peggho</i>	U              -D
<i>ght</i> > <i>ght</i>	no change	<i>dyghtya</i> <i>dyghtyo</i>	U+U+/j/      --
<i>gl</i> > <i>kk1</i>	[gl] > [kk1]	<i>magla</i> <i>makklo</i>	V+S          PD
<i>gn</i> > <i>kkn</i>	[gn] > [kkn]	<i>sugna</i> <i>sukkno</i>	V+S          PD
<i>he</i> > <i>hah</i>		<i>berrhe</i> <i>berrhaho</i>	special case
<i>j</i> > <i>cch</i>	[dʒ] > [tʃtʃ]	<i>hwyja</i> <i>hwyccho</i>	V              PD
<i>k</i> > <i>kk</i>	[k] > [kk]	<i>knoukya</i> <i>knoukkyo</i>	U+S          -D
<i>kk</i> > <i>kk</i>	no change	<i>hakya</i> <i>hakkyo</i>	U+U+S       --
<i>kl</i> > <i>kk1</i>	[kl] > [kk1]	<i>bokla</i> <i>bokklo</i>	U+S          -D
<i>kn</i> > <i>kkn</i>	[kn] > [kkn]	<i>rekna</i> <i>rekknno</i>	U+S          -D

<i>kr</i>	>	<i>kkr</i>	[kr] > [kkr]	<i>sokra</i>	<i>sokkro</i>	U+S	-D
<i>ks</i>	>	<i>ks</i>	no change	<i>veksya</i>	<i>veksyo</i>	U+U+S	--
<i>kt</i>	>	<i>kt</i>	no change	<i>subjektya</i>	<i>subjektyo</i>	U+U+S	--
<i>l</i>	>	<i>ll</i>	[l] > [ll]	<i>gweles</i>	<i>gwello</i>	R	-D
<i>ld</i>	>	<i>lt</i>	[ld] > [lt]	<i>skaldya</i>	<i>skaltyo</i>	R+V	P-
<i>ldr</i>	>	<i>ltr</i>	[ldr] > [ltr]	<i>moldra</i>	<i>moltro</i>	R+V+S	P-
<i>lgh</i>	>	<i>lgh</i>	no change	<i>golghi</i>	<i>golgho</i>	R+U	--
<i>lk</i>	>	<i>lk</i>	no change	<i>kalkya</i>	<i>kalkyo</i>	R+U+S	--
<i>ll</i>	>	<i>ll</i>	no change	<i>anella</i>	<i>anello</i>	R+R	--
<i>lm</i>	>	<i>lm</i>	no change	<i>kelmi</i>	<i>kolmo</i>	R+S	--
<i>ls</i>	>	<i>ls</i>	no change	<i>digevelsi</i>	<i>digevalso</i>	R+U	--
<i>lt</i>	>	<i>lt</i>	no change	<i>pyltya</i>	<i>pyltyo</i>	R+U+S	--
<i>lv</i>	>	<i>lf</i>	[lv] > [lf]	<i>palva</i>	<i>palfo</i>	R+V	P-
<i>lw</i>	>	<i>lw</i>	no change	<i>gelwel</i>	<i>galwo</i>	R+/w/	--
<i>m</i>	>	<i>mm</i>	[m] > [mm]	<i>blamya</i>	<i>blammyo</i>	N+S	-D
<i>mb</i>	>	<i>mpl</i>	[mb] > [mpl]	<i>krambla</i>	<i>kramplo</i>	R+V+S	P-
<i>mbr</i>	>	<i>mpr</i>	[mbr] > [mpr]	<i>ankombra</i>	<i>ankompro</i>	R+V+S	P-
<i>mm</i>	>	<i>mm</i>	no change	<i>amma</i>	<i>ammo</i>	R+R	--
<i>mn</i>	>	<i>mn</i>	no change	<i>lymna</i>	<i>lymno</i>	R+R	--
<i>mp</i>	>	<i>mp</i>	no change	<i>stampya</i>	<i>stampyo</i>	R+U+S	--
<i>mpn</i>	>	<i>mpn</i>	no change	<i>dampnya</i>	<i>dampnyo</i>	R+U+S+S	--
<i>mpr</i>	>	<i>mpr</i>	no change	<i>temptra</i>	<i>tempbro</i>	R+U+S	--
<i>mpt</i>	>	<i>mpt</i>	no change	<i>temptya</i>	<i>temptyo</i>	R+U+U+S	--
<i>n</i>	>	<i>nn</i>	[n] > [nn]	<i>krena</i>	<i>krenno</i>	R	-D
<i>nch</i>	>	<i>nch</i>	no change	<i>mynchya</i>	<i>mynchyoy</i>	R+U+S	--
<i>nd</i>	>	<i>nt</i>	[nd] > [nt]	<i>kommendya</i>	<i>kommentyo</i>	R+V+S	P-
<i>ndl</i>	>	<i>ntl</i>	[ndl] > [ntl]	<i>handla</i>	<i>hantlo</i>	R+V+S	P-
<i>ndr</i>	>	<i>ntr</i>	[ndr] > [ntr]	<i>gwandra</i>	<i>gwanbro</i>	R+V+S	P-
<i>ng</i>	>	<i>nk</i>	[ng] > [nk]	<i>spongya</i>	<i>sponkyoy</i>	R+V+S	P-
<i>ngr</i>	>	<i>nkr</i>	[ngr] > [nkr]	<i>angra</i>	<i>ankro</i>	R+V+S	P-
<i>nj</i>	>	<i>nch</i>	[ndʒ] > [ntʃ]	<i>fanja</i>	<i>fancho</i>	R+V	P-
<i>nk</i>	>	<i>nk</i>	no change	<i>renki</i>	<i>ronko</i>	R+U	--
<i>nn</i>	>	<i>nn</i>	no change	<i>mynnes</i>	<i>mynno</i>	R+R	--
<i>ns</i>	>	<i>ns</i>	no change	<i>avonsya</i>	<i>avonsyo</i>	R+U+S	--
<i>nt</i>	>	<i>nt</i>	no change	<i>akontya</i>	<i>akontyo</i>	R+U+S	--
<i>ntr</i>	>	<i>ntr</i>	no change	<i>entra</i>	<i>entro</i>	R+U+S	--
<i>nw</i>	>	<i>nw</i>	no change	<i>henwel</i>	<i>hanwo</i>	R+/w/	--
<i>p</i>	>	<i>pp</i>	[p] > [pp]	<i>skapya</i>	<i>skappyoy</i>	U+S	-D
<i>pp</i>	>	<i>pp</i>	no change	<i>hwyppya</i>	<i>hwyppyo</i>	U+U+S	--
<i>pt</i>	>	<i>pt</i>	no change	<i>ekseptya</i>	<i>ekseptyo</i>	U+U+S	--
<i>r</i>	>	<i>rr</i>	[r] > [rr]	<i>kara</i>	<i>karro</i>	R	-D
<i>rd</i>	>	<i>rt</i>	[rd] > [rt]	<i>sordya</i>	<i>sortyo</i>	R+V	P-
<i>rdr</i>	>	<i>rdr</i>	[rdr] > [rtr]	<i>tardra</i>	<i>tartro</i>	R+V+S	P-
<i>rdh</i>	>	<i>rth</i>	[rð] > [rθ]	<i>herdhya</i>	<i>horthyoy</i>	R+V+S	P-
<i>rf</i>	>	<i>rf</i>	no change	<i>skarfa</i>	<i>skarfo</i>	R+U	--
<i>rg</i>	>	<i>rk</i>	[rg] > [rk]	<i>argya</i>	<i>arkyo</i>	R+V+S	P-



<i>rg</i>	>	<i>rg</i>	no change	<i>erghi</i>	<i>argho</i>	R+U	--
<i>rj</i>	>	<i>rch</i>	[rdʒ] > [rtʃ]	<i>charjya</i>	<i>charchyo</i>	R+V+S	P-
<i>rl</i>	>	<i>rl</i>	no change	<i>byrla</i>	<i>byrlo</i>	R+S	--
<i>rm</i>	>	<i>rm</i>	no change	<i>garma</i>	<i>garmo</i>	R+S	--
<i>rn</i>	>	<i>rn</i>	no change	<i>bernya</i>	<i>bernyo</i>	R+S+S	--
<i>rr</i>	>	<i>rr</i>	no change	<i>gorra</i>	<i>gorro</i>	R+S	--
<i>rs</i>	>	<i>rs</i>	no change	<i>dispersya</i>	<i>dispersyo</i>	R+U+S	--
<i>rsh</i>	>	<i>rsh</i>	no change	<i>chershya</i>	<i>chershyo</i>	R+U+S	--
<i>rt</i>	>	<i>rt</i>	no change	<i>konfortya</i>	<i>konfortyo</i>	R+U+S	--
<i>rth</i>	>	<i>rth</i>	no change	<i>diberth</i>	<i>dibartho</i>	R+U	--
<i>rv</i>	>	<i>rf</i>	[rv] > [rf]	<i>arva</i>	<i>arfo</i>	R+V	P-
<i>rw</i>	>	<i>rw</i>	no change	<i>merwel</i>	<i>marwo</i>	R+/w/	--
<i>s</i>	>	<i>ss</i>	[s] > [ss]	<i>kasa</i>	<i>kasso</i>	U	-D
<i>s</i>	>	<i>ss</i>	[z] > [ss]	<i>krysi</i>	<i>kryssyo</i>	V	PD
<i>sh</i>	>	<i>ssh</i>	[ʃ] > [ʃʃ]	<i>leshya</i>	<i>lesshyo</i>	U+S	-D
<i>sk</i>	>	<i>sk</i>	no change	<i>gwaska</i>	<i>gwasko</i>	U+U	--
<i>sl</i>	>	<i>ssl</i>	[zl] > [ssl]	<i>grysla</i>	<i>grysslo</i>	V+S	PD
<i>sn</i>	>	<i>ssn</i>	[zn] > [ssn]	<i>resna</i>	<i>ressno</i>	V	PD
<i>ss</i>	>	<i>ss</i>	no change	<i>troessa</i>	<i>troesso</i>	U+U	--
<i>st</i>	>	<i>st</i>	no change	<i>lesta</i>	<i>lesto</i>	U+U	--
<i>stn</i>	>	<i>stn</i>	no change	<i>destna</i>	<i>destno</i>	U+U+S	--
<i>str</i>	>	<i>str</i>	no change	<i>hwystra</i>	<i>hwystro</i>	U+U+S	--
<i>sw</i>	>	<i>sw</i>	[zw] > [ssw]	<i>aswa</i>	<i>asswo</i>	V+S	PD
<i>t</i>	>	<i>tt</i>	[t] > [tt]	<i>rutya</i>	<i>ruttyo</i>	U+S	-D
<i>th</i>	>	<i>tth</i>	[θ] > [θθ]	<i>pletha</i>	<i>plettho</i>	U	-D
<i>thl</i>	>	<i>tthl</i>	[θl] > [θθl]	<i>tavethli</i>	<i>tavethlo</i>	U+S	-D
<i>thr</i>	>	<i>tthr</i>	[θr] > [θθr]	<i>hwithra</i>	<i>hwiththro</i>	U+S	-D
<i>tl</i>	>	<i>ttl</i>	[tl] > [ttl]	<i>sotla</i>	<i>sottlo</i>	U+S	-D
<i>tt</i>	>	<i>tt</i>	no change	<i>lettya</i>	<i>lettyo</i>	U+U+S	--
<i>tth</i>	>	<i>tth</i>	no change	<i>latthya</i>	<i>latthyo</i>	U+U+S	--
<i>ttr</i>	>	<i>ttr</i>	no change	<i>klattra</i>	<i>klattro</i>	U+U+S	--
<i>v</i>	>	<i>ff</i>	[v] > [ff]	<i>kavoos</i>	<i>kaffo</i>	V	PD
<i>vn</i>	>	<i>ffn</i>	[vn] > [ffn]	<i>ravna</i>	<i>raffno</i>	V+S	PD
<i>vr</i>	>	<i>ffr</i>	[vr] > [ffr]	<i>delivra</i>	<i>deliffro</i>	V+S	PD
<i>w</i>	>	<i>w</i>	no change	<i>bywa</i>	<i>bywo</i>	/w/	--

**Key to types**

U = unvoiced obstruent	[p, t, k; f, θ, x, s; tʃ, ʃ]
V = voiced obstruent	[b, d, g; v, ð, z; dʒ]
S = sonorant consonant	[m, l, n, r; j, w]
R = resonant	[m, n, l, r]

**APPENDIX 2 Assimilation of consonants not in clusters**

OBSTRUENTS (and obstruents followed by sonorants)

<i>provection</i>		<i>doubling</i>		
<u>Voiced single</u>		<u>Unvoiced single</u>		<u>Unvoiced double</u>
[b, d, g]	<b, d, g>	[p, t, k]	<p, t, k>	[pp, tt, kk] <pp, tt, kk>
[v, ð]	<v, dh>	[f, θ]	<f, th>	[ff, θθ] <ff, tth>
[z, dʒ]	<s, j>	[s, tʃ]	<s, ch>	[ss, tʃtʃ] <ss, cch>

Consonants in the right-hand column are unchanged by the /h/; those in the middle column undergo doubling, and those in the left-hand column suffer both devoicing and doubling.

RESONANTS (and resonants followed by /j/)

		<i>doubling</i>	
<u>Voiced single</u>		<u>Voiced double</u>	
[m, n]	<m, n>	[mm, nn]	<mm, nn>
[l, r]	<l, r>	[ll, rr]	<ll, rr>

ASSIMILATION IN TERMS OF DISTINCTIVE FEATURES

CONSONANTAL FEATURES			RESULT OF ASSIMILATION	
Sonorant	Voice	Double	<i>Provection</i>	<i>Doubling</i>
-	+	-	yes	yes
-	+	+	yes	no
-	-	+	no	no
-	-	-	no	yes
+	+	+	no	no
+	+	-	no	yes

### APPENDIX 3      Phonetic rules for the assimilation of /h/ with consonants

1) The following are subject to both provection and doubling:

(a) a single voiced obstruent;

<i>Occlusives</i>	[b, d, g] > [pp, tt, kk]	<i>b, d, g</i> > <i>pp, tt, kk</i>
<i>Fricatives</i>	[v, ð, z] > [ff, θθ, ss]	<i>v, dh, s</i> > <i>ff, tth, ss</i>
<i>Affricates</i>	[dʒ] > [tʃtʃ]	<i>j</i> > <i>cch</i>

(b) a single voiced obstruent followed by a sonorant.

<i>Occlusives</i>	[ɹ, ɹ, gn] > [ɹɹ, kn]	<i>gn</i> > <i>kkn</i>
	[bl, ɹ, gl] > [ppl, ɹ, kkl]	<i>bl, gl</i> > <i>ppl, kkl</i>
	[br, dr, ɹ] > [ppr, ttr, ɹ]	<i>br, dr</i> > <i>ppr, ttr</i>
<i>Fricatives</i>	[vn, ɹ, zn] > [ffn, ɹ, ssn]	<i>vn, sn</i> > <i>ffn, ssn</i>
	[ɹ, ðl, zl] > [ɹ, θθl, ssl]	<i>dhl, sl</i> > <i>tthl, ssl</i>
	[vr, ðr, ɹ] > [ffr, θθr, ɹ]	<i>vr, dhr</i> > <i>ffr, tthr</i>
	[ɹ, ðw, zw] > [ɹ, θθw, ssw]	<i>dhw, sw</i> > <i>tthw, ssw</i>

2) The following are subject to doubling only:

(a) a single voiceless obstruent;

<i>Occlusives</i>	[p, t, k] > [pp, tt, kk]	<i>p, t, k</i> > <i>pp, tt, kk</i>
<i>Fricatives</i>	[f, θ, s] > [ff, θθ, ss]	<i>f, th, s</i> > <i>ff, tth, ss</i>
<i>Affricates</i>	[tʃ, ʃ] > [tʃtʃ, ʃʃ]	<i>ch, sh</i> > <i>cch, ssh</i>

(b) a single voiceless obstruent followed by a sonorant;

<i>Occlusives</i>	[ɹ, ɹ, kn] > [ɹɹ, kn]	<i>kn</i> > <i>kkn</i>
	[pl, ɹ, kl] > [ppl, ɹ, kkl]	<i>pl, kl</i> > <i>ppl, kkl</i>
	[br, dr, kr] > [ppr, ttr, kkr]	<i>br, dr, kr</i> > <i>ppr, ttr, kkr</i>
<i>Fricatives</i>	[vn, ɹ, zn] > [ffn, ɹ, ssn]	<i>vn, sn</i> > <i>ffn, ssn</i>
	[ɹ, ðl, zl] > [ɹ, θθl, ssl]	<i>dhl, sl</i> > <i>tthl, ssl</i>
	[vr, ðr, ɹ] > [ffr, θθr, ɹ]	<i>vr, dhr</i> > <i>ffr, tthr</i>
	[ɹ, ðw, zw] > [ɹ, θθw, ssw]	<i>dhw, sw</i> > <i>tthw, ssw</i>

(c) a single resonant;

[m, n, l, r] > [mm, nn, ll, rr]	<i>m, n, l, r</i> > <i>mm, nn, ll, rr</i>
---------------------------------	---

(d) a cluster comprising single resonant + /j/;

3) The following are subject to provection only:

(a) a single voiced obstruent preceded by a sonorant;

[ld, ɹ, lv, ɹ, ɹ] > [lt, ɹ, lf, ɹ, ɹ]	<i>ld, lv</i> > <i>lt, lf</i>
[rd, rg, rv, rð, ɹ] > [rt, rk, rf, rθ, ɹ]	<i>rd, rg, rv, rdh</i> > <i>rt, rk, rf, rth</i>
[nd, ng, ɹ, ɹ, ndʒ] > [nt, nk, ɹ, ɹ, ntʃ]	<i>nd, ng, nj</i> > <i>nt, nk, nch</i>

4) The following are subject to neither provection nor doubling:

(a) a double unvoiced obstruent;

<i>Occlusives</i>	[pp, tt, kk]	<i>pp, tt, kk</i>
-------------------	--------------	-------------------

<i>Fricatives</i>	[ff, θθ, ss]	<i>ff, tth, ss</i>
-------------------	--------------	--------------------

<i>Affricates</i>	[tʃtʃ]	<i>cch</i>
-------------------	--------	------------

(b) a cluster of two voiceless obstruents;

(c) a cluster comprising (sonorant + single voiceless obstruent);

(d) a cluster comprising (sonorant + single voiceless obstruent + sonorant)

(e) a double resonant; [mm, nn, ll, rr] *mm, nn, ll, rr*

(e) a cluster comprising two resonants + /j/;

(f) a cluster comprising a resonant + /w/.