
 CHAPTER TWO

From Proto-Indo-European to Proto-Celtic

1.1. STOPS. The following is the phonemic inventory that most present-day scholars would ascribe to the Proto-Indo-European parent language on the strength of the comparative evidence.

	p	t	k̂	[k]	k^w
Stops:	[b]	d	ĝ	[g]	g^w
	b^h	d^h	ĝ^h	[g ^h]	g^{wh}
Fricatives:	s	[p]			
Laryngeals:	h₁	h₂	h₃		
Sonants:	y/i	w/u	r/r̥	l/l̥	m/m̥ n/n̥
Vowels:	[a]	e	o	[ā]	ē ō

The status of each of the statistically infrequent phonemes bracketed above has been questioned at one time or another and some scholars have argued for recognition of an additional series of voiceless aspirate stops (p^h , t^h , k^h , $[k^h]$, k^{wh}). More recent attempts to render the reconstructed stop system more typologically acceptable have centred upon reinterpreting the voiced as glottalic stops (ejective p' , t' , k' , k' , $k^{w'}$ or even preglottalised $'p$, $'t$, $'k$, $'k$, $'k^w$ for b , d , $ĝ$, g , g^w) and denying the phonemic relevance of voice or alternatively aspiration. However, none of these issues is of great moment for Celtic. Thus voiceless aspirate stops (if they existed) will have fallen together with plain voiceless stops there and, as in other so-called 'Centum' languages, the palatals ($k̂$, $ĝ$, $ĝ^h$) and velars (k , g , g^h) will have merged into a single guttural series most conveniently denoted without diacritic (k , g , g^h) henceforth. Since it does not affect the number of phonemes posited, the issue of the traditional stop system versus glottalic alternatives, which are highly inefficient where Celtic is concerned, is essentially one of notation only. Although the long running controversy about the need to posit laryngeals now seems to be over, there are a few dissenters from the current consensus that no more and no less than three such phonemes are required. This is not the place to delve further into these issues, well referenced discussions of which from various standpoints can be found in Mayrhofer (1986), Szemerényi (1989, 37-72), Vennemann

(1989) and Beekes (1995, 109-13, 132-4, 138-9 and 142-8).

1.2 With the above inventory as a starting point and due allowance made for the single guttural series, the question of what happened next in the stop system revolves around the outcome of PIE g^{wh} in Celtic. According to Schmidt 'there is no general agreement regarding the Celtic reflexes of PIE $*g^{wh}$. Osthoff's theory of delabialisation of the voiced aspirate labiovelar with passage of $*g^{wh}$ to g ... is opposed by Morris Jones' thesis that $/g^{wh}/$ "remained a rounded guttural in Pr. Kelt., and gave g in Ir. with loss of rounding; but rounding was retained in Brit., and we have in W. initially gw , medially $f (= v)$ between vowels" (p.30). There ensued an attempt by Cowgill to extend this hypothesis to Irish. Without being able to enter into a more detailed discussion of these problems here, I would like to draw attention to the probable sequence of sound changes affecting the voiced aspirates in general and the voiced aspirate labiovelar in particular: 1) $*/g^{wh}/ > /g^h/$; 2) $/b^h, d^h, g^h/ > /b, d, g/$; 3) $g^w > b'$ (1988, 4-5).

Nevertheless, due consideration of the details shows quite clearly that the 'standard' doctrine of PIE $g^{wh} > \text{Proto-Celtic } g^h > g$ (VKG I 31 and 107-9; GOI 115 and 138) cannot be maintained in the face of the evidence accumulated by Morris Jones (1931, 130), Binchy (1956), Sims-Williams (1982) and, above all, Cowgill (1980). What follows essentially recapitulates a previous discussion (McCone, 1991, 38-45).

To begin with, the support for PIE $g^{wh} > \text{PC } g$ apparently provided by W *gori* = OIr. *guirid* 'warm(s)' < causative $*g^{wh}or-eye-$ is undermined by an equation such as W *golchi* (< $*g^{wh}olchi$, cf. MW 3sg. *gwylch*) = OIr. *folcaid* < PC $*wolk-$. The latter obviously raises the logical possibility of PIE $*g^{wh}or- > \text{PC } *g^w or- > \text{Brit. } *wor-$ (whence regularly $*g^{wh}or-$, later *gor-*) but Ir. *gor-* by a change $g^w > g$ precisely parallel and presumably contemporary with late prehistoric Irish $k^w > k$. It would, of course, be equally conceivable that PC g^w remained virtually unchanged in British, eventually falling together with $gw < w$ and sharing the latter's subsequent fate.

Certainly all the indubitable British reflexes of PIE g^{wh} - are $gw-$ or a trivial secondary development thereof (Schrijver, 1995, 116-28), as in the case of *gori* above. Indeed, according to Binchy (1956) this very root also evinces MW *gwar*, *anwar* and *gward* corresponding precisely to OIr. *gor* 'dutiful' (lit. 'warming'), *ingor* 'undutiful' and *goire* '(filial) duty, maintenance (of parents)' (lit. 'warming, cherishing'; cf. *guirit* 'they cherish' glossing Lat. *fovent* at MI.39^c24). The purely formal side of these equations is not affected by an interesting alternative etymology proposed by Schrijver (forthcoming), since it too entails $*g^{wh}$ -. The other PIE roots certainly involved are $*g^{wh}ed^h$ 'pray, beseech' seen in MW *gvedi* 'prayer', *gvediaw* 'pray' as well as OIr. *guide* 'prayer', *guidid* 'prays, beseeches' and $*g^{wh}en$ 'smite, slay' underlying MW

gwanu 'pierce, wound' and OIr. *gonaid* 'wounds, slays' or *guin* 'wound(ing), slay(ing)'. Pace Pedersen (*VKG* I 96), Morris Jones (1931, 131) is probably right to add W *gwyllt*, OIr. *geilt* 'madman' < PC **g^veltis* cognate with Germanic forms like Gothic *wilpeis* 'wild' < **welþiyaz* on the reasonable assumption of original **g^{wh}el-ti-* or **g^hwel-ti-*.

Supporters of PIE *g^{wh}* > PC *g* (e.g. Schmidt as reported by Ködde-ritzsch, 1993, 144, n.19) have sought to evade these uncomfortable facts with the help of some apparent sporadic British occurrences of *gw-* rather than normal *g-* < PC *g* < PIE *ǵ^(h)* or *g^(h)*. However, in the absence of a single convincing example pointing to *g-* rather than *gw-* as the primary British outcome of PIE *g^{wh}*-, it is a strange methodology indeed that seeks to explain away *lucidum per obscurum*. In any case, Cowgill (1980, 71-4) has shown that most of the instances claimed by Pedersen are based upon false or dubious etymologies, alternatives entailing *g^{wh}*- even being available in a couple of cases. Schrijver (1995, 131 and 384) has neatly disposed of one apparent exception by equating W *gwaew* 'spear' with OIr. *fogae* 'small spear' < **wo-gaisu-* rather than directly with OIr. *gáe*, Gaulish *gaiso-* plus Old Norse *geirr* implying original **g^hais-*. That leaves MW *adwaen* 'knows (someone)' = OIr. *ad: géuin* < perfect **ge-gn-e* (PIE root **ǵneh₃*), which presumably could have acquired its *w* from the semantically close *gwybot* 'know (something)' ultimately reflecting PIE **wid*. In short, there is no remotely adequate support for a sound change *g-* > *gw-* in British, even if this was no more than 'meist nicht-lautgesetzlich' as Pedersen (*VKG* I 96) was rather desperately forced to admit.

Certain or at least probable British reflexes of PIE *g^{wh}* in medial position are equally damaging to the thesis that this phoneme became *g* in Proto-Celtic either unconditionally or, as Sims-Williams suggests (1982, 216-21), in medial position only as opposed to initial *g^w*. The latter position entails rejection of the otherwise obvious connection of MW *deifio* 'burn' with OIr. *daig*, gen. *dego* 'flame', Lith. *deg-*, Skt. *dah-* 'burn' etc. < PIE **d^heg^{wh}* and of MW *nyf* 'snow' with OIr. *snig-* 'pours, drips' (*snechtae* 'snow'), Gk. *νιφάδες* 'snowflakes', Lat. *nix*, gen. *nivis* etc. < PIE **snig^{wh}*. The true Welsh cognate of OIr. *daig*, it is argued, is *de* 'burn', both then necessarily deriving from PIE **d^heg^{wh}*- via Proto-Celtic **deg-*. That being so, *deifio* must be linked with OIr. *doid* 'burns' < PIE **daw-* (see also Schrijver, 1995, 316-7) seen also in W *cynnau* 'kindle' and its original *w* justified with reference to Cornish *dewy* 'burn' and the MW variant *difiau* of *dyw iau* 'Thursday'. As for *nyf*, it is taken to be a loanword based on the Latin oblique stem *niv-*. Either of these special pleadings might just about be accepted on its own but, notwithstanding Schmidt's opinion to the contrary (Ködderitzsch, 1993, 144, n.19), they lack credibility in tandem.

Sims-Williams' position entails the argument that, whereas there is no evidence for different treatment of originally monophonemic *k^w* and biphonemic

kw in Celtic, the comparable reflexes of g^{wh} and $g^h w$ did, *pace* Morris Jones (1931, 131) and Cowgill (1980, 74), diverge in British at least. The indisputable labial reflexes seen in MW *tauawt* (*u* probably = /v/, Mod. *tafod*) 'tongue' = OIr. *tengae* and OW *eguin* later *ewin* 'nail' = OIr. *ingen* mean that medial $g^{wh} > PC\ g$ can only be sustained by deriving them from PC **tangwāt-* (PIE **d̥ŋgʰ-weh₂-*, cf. OLat. *dingua* later *lingua*, Goth. *tuggo* 'tongue') and **angwīn-* (PIE **h₃ŋgʰ-w-*, cf. Lat. *unguis*; Rix, 1970) respectively rather than the other-wise equally viable **tangwāt-* (PIE **d̥ŋgʰ-eh₂-*) and **angwīn-* (PIE **h₃ŋgʰ-*).

Although the former alternative may well be correct in the case of *tauawt*, *tafod* 'tongue', only the latter seems possible for *eguin*, *ewin*. The contrast between the zero grade generalised in Latin and Celtic with the full grade underlying ON *nagl*, Lith. *nāgas* and Gk. ὄνυξ, gen. ὄνυχοϝ points clearly to a PIE root noun with amphikinetic accentuation and corresponding ablaut alternation between full-grade strong (e.g. nom. sg. **h₃nógʰ-s*) and zero-grade weak (e.g. gen. sg. **h₃ŋgʰ-és*) stems. Allowing for generalisation of the former, Greek has essentially preserved this paradigm, whereas else-where one or other of these stems has been extended by various suffixes. Not only is there no place for suffixal *-u/w-* in the Greek paradigm or its PIE precursor but, as Cowgill (1980, 74) points out, the *u*-vocalism of Greek ὄνυχ- points unambiguously to PIE **h₃nogʰ-* rather than **h₃nogʰ-*. *Ewin* thus supplies proof positive that the Celtic reflex of PIE **gʰ* preserved its labial component right down into the recorded history of Welsh medially as well as initially and is most unlikely to have behaved any differently from **gʰw*. Consequently *deifio* and *nyf* can be taken to continue PIE **dʰegʰ-* and **snigʰ-*.

It seems clear, then, that the reflexes of PC g^w and w (< PIE g^{wh} and w) fell together in initial position in British either through a relatively early simplification of g^w to w , as suspected by Cowgill on attractive structural grounds to be presented below, or because of the considerably later strengthening of w to gw in unlenited contexts at least (*LHEB* 385-94). Considerations of economy favour Cowgill's postulate of similar behaviour in internal position that normally resulted in w , whether by simplification or the later lenitional loss of g . In that case the /v/ seen in (*tauawt*?) *deifio* and *nyf* must be ascribed to an undeniable but as yet ill understood tendency to change /w/ to /v/ in some cases (Morris Jones, 1931, 104-5). Sims-Williams' protest about 'the extraordinary coincidence that two-thirds of this alleged evidence for medial **gʰh* should show Welsh *f*, which is not the regular reflex of British **u*' (1982, 228) seems a trifle disingenuous in view of his own derivation of *deifio* from **daw-* and of *nyf* from a Lat. *niv-*, given that 'Latin *v* is always treated as *u* in Brittonic' (*LHEB* 364).

If, however, the undesirability of positing *-w- > -v-* here is insisted upon, one might argue that g^w was simplified to w in initial position but retained

its double articulation postvocally in the first instance (cf. Lat. *natus* vs. *cognatus* etc.), this $-g^w$ - later becoming $-b$ - (cf. PIE $g^w > PC b$), quite likely in tandem with British $k^w > p$. Hence $*g^{wh}\eta-$ $> *g^wan-$ $> *wan-$ $>$ (unlenited) *gwan-u* but $*snig^{wh}-$ $> *snig^w-$ $> *nib-$ $> nyf$. That makes *deifio* and *nyf* quite unproblematical, and *ewin* can be accounted for in terms of the preceding nasal along lines suggested by Hamp (1975): $*a\eta gw\bar{w}n-$ $> *a\eta w\bar{w}n-$, whence *ewin* by simplification of $\eta w > w$ and i -affection. If so, *tauawt*, *tafod* can be covered by positing ($\eta w >$) $w > v$ before Brit. *o* (VKG I 107).

Whatever the precise later developments, the British evidence clearly shows that the Proto-Celtic reflex of PIE g^{wh} retained its labial component in both initial and medial position, at least prevocally. Since Irish *g* proves preservation of the stop component as well, there is no reasonable alternative to positing PC $g^w < PIE g^{wh}$. Indeed, this reconstruction is now doubly inevitable in the wake of Cowgill's brilliant demonstration that simplification of g^w to g must have occurred concurrently with that of the precisely comparable late prehistoric change of k^w to k in Irish if a number of otherwise intractable phonological and morphological problems were to be solved.

To begin with, OIr. *goire* 'filial duty' can hardly be from $*gor-iy\bar{a} < *g^{wh}or-(i)y\bar{a}$ since this would have produced OIr. $*guire$ through the standard raising of o to u before i/y seen in *suide* 'seat, sitting' $< *sod-(i)yo-m$ etc. and required by the traditional derivation of *guide* 'prayer' $< *god-iy\bar{a} < *g^{wh}od^h-(i)y\bar{a}$. If, however, g^w survived long enough to round a following a and i to o and u respectively like k^w (e.g. OIr. *coire* 'cauldron' = MW *peir*, both $< *k^war-yo-s < *k^w_r-yo-s$; $a > o$ here after raising and so no further development to u by IV.2.1b), a derivation from $*g^war-(i)y\bar{a}$ along with MW *gward* 'mercy, love' is utterly straightforward. The correspondence between Hitt. 3sg. *kuen-zi*, 3pl. *kun-anzi* and Skt. 3sg. *hán-ti*, 3pl. *g^hn-ánti* 'kill(s)' shows that $*g^{wh}en$ formed an amphikinetic root athematic present in PIE with 3 (1,2) sg. $*g^{wh}én-ti$ ($-mi$, $-si$) vs. 3 (1,2) pl. $*g^{wh}n-énti$ ($*g^{wh}\eta-més$, $-té$). Whereas MW *gwan-u* is easily explained in terms of generalized $*g^wan- < *g^{wh}\eta-$ (McCone, 1986, 228), the traditional derivation of OIr. *gonaid* $< *gon-$ $< *g^{wh}on-$ entails a morphologically inexplicable o -grade. However, *gon-* $< *g^wan-$ by rounding resolves this problem at a stroke.

If OIr. *guide* 'prayer' is from $*god-iy\bar{a} < *g^{wh}od^h-y\bar{a}$, its vocalism could be squared with that of MW *gvedi* by assuming internal i -affection of $*gwođi\tilde{v} < *g^wod-īmā$. However, the latter can be derived equally straightforwardly from $*g^wed-īmā$ ($< *g^{wh}ed^h-$) and the late survival of g^w with rounding in prehistoric Irish raises the distinct possibility of *guide* $< *guđ'eya < *g^wiđiy\bar{a} < *g^ved-(i)y\bar{a} < *g^{wh}ed^h-(i)y\bar{a}$ with the same e -vocalism. More importantly, OIr. *guidid*, $-guid$ 'prays' cannot possibly be an old iterative-causative $*god-ī-ti < *g^{wh}od^h-eye-ti$, as customarily claimed, because this formation otherwise

yielded weak *i*-verbs like *do:lugai* '(makes to lie down,) forgives', *ad:suidi* '(makes to sit,) stops' < **log^h-eye-ti*, **sod-eye-ti* respectively, whereas *-guid* is unmitigatedly strong in all its stems (i.e. pres. 3sg. conj. -Ø not *-i*, *s-* not *a*-subj., *s-* not *f*-fut., suffixless not *s*-pret. act., pret. pass. *-gess* not *-ed* type). Since Old Iranian in particular (1sg. Av. *jaiðiiemi*, OP *jadiyāmi*) provides good evidence for a PIE pres. **g^{wh}ed^h-ye-ti* 'prays, beseeches' compatible with the vocalism of MW *gwediaw*, the form, semantics, BII/S2 (*GOI* 353-7; *EIV* 26-7) present and strong inflection of the OIr. verb can all be clarified simultaneously by positing *-guid* < **guð'ih* < **g^wið-i-p* < **g^wed-i-ti* < **g^{wh}ed^h-ye-ti*. Arguably PC *g^w* survived unchanged in Celtiberian (I.3.4) and the as yet uncontradicted postulate of PC *g^w* > Gaulish *w* yields by far the most morpho-logically and semantically satisfactory interpretation of *uediiumi* on the first line of the Chamalières inscription as 'I pray (to), beseech' < **g^wed-yū*, the Proto-Celtic form underlying OIr. *guidiu* 'I pray (to), beseech', plus *-mi* (Cowgill, 1980, 68; McCone, 1991, 118-20; see Koch, 1992, on Gaul. *-uanos* < PC **-g^wonos* < PIE **-g^{wh}onos*).

Taken together, these encouragingly diverse considerations leave no doubt whatever about the change PIE *g^{wh}* > PC *g^w*, which then underwent no further modification until considerably later in the separate prehistories of Irish, British and probably Gaulish.

1.3 As both Sims-Williams (1982, 221-2) and Cowgill (1980, 64-8) point out, recognition of this undeniable fact revolutionises our view of the evolution of the Proto-Celtic stop system because it obliges us to place the generally acknowledged change of PIE *g^w* to PC *b* before the deaspiration of *g^{wh}* etc. and not after it as Schmidt and others have maintained or implied.

The reason is obvious: had PIE **g^{wh}ed^h-*, **g^{wh}ŋ-* or **g^{wh}r-* become PC **g^wed-*, **g^wan-* or **g^war-* before PIE **g^wihwo-* 'alive' (Skt. *jīva-s*, Lat. *vīvu-s*, Lith. *gyva-s*, OE. *cwic*), **g^wow-* 'cow' (Skt. *gau-s*, Gk. βοῦ-ς etc.) became PC **biwos* (Lepontic *Piuo-* (?), OIr. *béo*, MW *byw*; cf. OIr. *biuth*, MW *byt* 'world', Gaul. *Bitu-riges* 'kings of the world' < **g^wi-tu-*), **bow-* (Celtib. **bou-** (?), OIr. *bó*, MW *bu-*) etc., they would have been bound to share the latter development and yield **bed-*, **ban-*, **bar-* etc. Since this patently did not hap-pen, *g^w* > *b* must have preceded *g^{wh}* > *g^w*, but both *g^w* and *g^{wh}* had probably been delabialised to *g* and *g^h* directly in front of a consonant such as *y* before either of these shifts took place (Sims-Williams, 1982, 206-16) on the evidence of OIr. *nigid* 'washes' < PC **nig-ye-ti* < **nig^w-ye-ti* (Skt. *ne-nek-ti*, Gk. χέρ-νυψ 'hand water', gen. χέρ-νιβ-ος), MW *gi-eu* 'sinews' (sg. *giewyn*) < PC **gy-o/ā-* < **g^wy-o/ā-* (Skt. *gyā*, Gk. βιός 'bowstring') and MW *de* 'burning' < PC **deg-yā* < **d^heg^h-yā* < **d^heg^{wh}-yā* (Schrijver, 1995, 316-7). Notwith-standing Ködderitzsch's strange claim that `*/g^{wh}/ is more marked than */g^w/ and so was probably also simplified first' (1993, 144, n. 19), more than

adequate motivation for early PC $g^v > b$ is provided by a combination of the labiovelars' liability to simplification with the virtual gap in an otherwise sym-metrical stop system resulting from the rarity of PIE b (Cowgill, 1980, 65-6). The upshot was a shift from a typically 'Centum' stage I to a nascent Proto-Celtic stage II.

I	II
p t k k ^w	p t k k ^w
[b] d g g ^w	b d g [-]
b ^h d ^h g ^h g ^{wh}	b ^h d ^h g ^h g ^{wh}

1.4 Symmetry was restored by deaspiration of the voiced aspirates. This development can easily be ascribed (unless one adopts a glottalic interpretation of the PIE stop system) to lack of support from a corresponding set of voiceless aspirates and is seen independently in Balto-Slavic, Iranian and Albanian. In Celtic g^{wh} may well have led the way by moving into the gap left by $g^w > b$. Be that as it may, the upshot was stage III below, in which b^h , d^h , g^h had fallen together with b (mostly $< g^w$), d and g . Typical examples are OIr. *beith*, Gaul. *bueti(d)* 'may be' (subj.) $< *b(u)weti < *b^huH-e-t(i)$ (Skt. b^huvat , Lat. *-bit*), OIr. *boi* $< *bow- < *b^huh-$ (Skt. $b^hū-$, Gk. $φū-$, Lat. *fu-*); OIr. *ruad*, MW *rud*, Gaul. *Roud-* 'red' $< *roud^h- < *h_1rowd^h-$ (Lith. *raūdas*, OE *rēad*; Skt. *rud^h-iras*, Gk. $ῥουθ-ρός$, L *rub-er* $< *h_1rud^h-$) like OIr. *cride* 'heart' $< *krid- < *krd-$ (Gk. $κρᾶδ-ίη$, Lat. *cord-*), W *craidd* (if not a ghost as Schrijver, 1995, 319-21 suggests) $< *kred-$ in place of $*kerd-$ (Goth. *hairtō*); OIr. *bri* (g. *breg*), MW *bre* (OBrit. *Brig-antes*), Gaul. *-briga*, Celtib. *-bri(x)s* 'hill' $< *brig- < *b^hrg^h-$ (Skt. *brh-*, OE *burg* 'fort') like OIr. *agid* 'drives', OW *agit*, *hegit*, MW *eyt* 'goes' $< *ageti < *h_2eĝ-e-ti$ (Skt. *ajati*, Gk. $ἄγει$, Lat. *agit*). However, the well known loss of PIE p brought renewed asymmetry by the end of Proto-Celtic (stage IV). Since similar lack of a p phoneme has been inferred for Iberian, Aquitanian and Proto-Basque (see Michelena, 1995, 112-3), sub- or ad-stratum influence from a pre-Indo-European language or languages may perhaps have played a role here.

III	IV
p t k k ^w	[-] t k k ^w
b d g g ^w	b d g g ^w

1.5 Had PIE p been lost prior to stage II above, the systematic pressures favouring $g^w > b$ might have been expected to produce a parallel Proto-Celtic $k^w > p$. In any case, the relative lateness of the general Proto-Celtic loss of p is clearly indicated by a number of developments that must have preceded it, notably (cf. Hoenigswald, 1973, 324-9):

- (a) The change of non-dental stops to a guttural fricative x before s or t ,

e.g. OIr. *ochtmad*, MW *wythuet*, Gaul. *oxtumetos* 'eighth' (Lat. *octavus* etc.), OIr. *sechtmad*, MW *seithuet*, Gaul. *sextametos* 'seventh' (Lat. *septimus*, Skt. *saptamas* etc.), OIr. *úasal*, MW *uchel*, Gaul. *uxello-* 'high', MW *uchaf*, Gaul. *Uxisama*, Celtib. *Uxama* or ethnic **Usamuz** 'highest' < **owxs-/uxs-* < *(*o*)*ups-* (Gk. ὕψι, ὑψηλός 'high').

(b) Assimilation of **p...k^w*(-) > **k^w...k^w*(-), e.g. OIr. *cóiced*, OW *pimphet*, Gaul. *pinpetos* 'fifth' < **k^wink^wetos* < **penk^w*- (Skt. *pañca*, Gk. πέντε etc.). If taken to be Celtic, the name *Hercynia* of a great northern Euro-pean forest could be explained by placing this change after the Proto-Celtic dissimilation of *k^w* > *k* in the immediate vicinity of *u/w* seen in MW *bugeil*, OIr. *búachail* 'herdsman' < **bow-kol-* < **g^wow-k^wol-* (Gk. βουκόλος) or OIr. *Olc(án)*, (Ogam gen. sg. ULCCAGNI), Lep. ULKOS 'Wolf', Gaul. *Catu-vulkos* 'Battle-wolf' < *(*w*)*ulkos* < **wl^kos* (McCone, 1985). If so, **perk^wunyā* (Lat. *quercus* 'oak', Goth. *faírguni* 'mountain', Lith. god *Perkúnas*) > **perkunyā* > **erkunyā*. This derivation, however, runs up against good evidence for non-dissimilation of *k^w* before *u*, notably OIr. *fliuch*, OW *gulip*, MW *gwlyb* 'wet' < **wlik^w-u-* (Lat. *liqu-or* etc.) and OIr. *co*, MW *py* 'to' < **k^wut-s* (Lat. *us-que*; McCone, 1993c). It thus seems necessary to restrict the dissimilation of *k^w* > *k* to position after *u/w* (cf. Meillet, 1937, 93 for a claim that a similar rule had operated in PIE itself) and ascribe the **kū* (for **k^wū*) underlying MW *ci* 'dog' (OIr. *cú*) to analogical pressure from the oblique case **kun-* (McCone, 1993c, 174). That being so, the Celtic origin of *Hercynia* must be regarded as doubtful and we are left with no firm criterion for dating assimilation of **p...k^w*(-) in relation to dissimilation of **u/wk^w*, unless perhaps postconsonantal *k^w* was dissimilated in front of *u* to *k* give PC **perkunyā* (> **φerkunyā* > **erkunyā*) before assimilation of **p...k^w*(-) to **k^w...k^w*(-) could apply.

(c) The change *p* > *b* between vowel and liquid, e.g. OIr. fut. *ebraid* 'will give', *eblaid* 'will drive' < **ibrāseti*, **iblāseti* < **pibrāseti*, **pihlāseti* < **piprāseti*, **piplāseti* < **pi-prh_{2/3}-se-ti*, **pi-plh₂-se-ti* (McCone, 1991, 31-2).

(d) It is most likely that loss of *p* was preceded by a change to a bilabial fricative φ that can hardly have happened before (b) or, unless it is reformulated as φ > β/ν (see III.4.1-2), (c) but probably makes (e) more natural. Schrijver notes 'that *φ in PIE **sp-* (> PCl. **sφ-* > OIr. *s-*, lenited *f-* (*ph-*); W *ff-*) must have been retained as an independent phoneme up until the separation of Irish and British (Kortlandt 1982: 74). An example of this development is seen in PIE **sperH-* > PCl. Nsg. **sperH-et-s* > OIr. *seir* 'heel', dual *di pherid*, MW *ffer* 'ankle', OC *fer* gl. *crus* (cf. Lat. *spernere*)' (1995, 348). The etymology is attractive but hardly justifies the breathtakingly uneconomical inference that φ was not lost until well after Proto-Celtic in the separate histories of Celtiberian, Gaulish, British and Irish (Kortlandt, 1982,

74-6). In the virtually certain event that $\varphi > \emptyset$ occurred everywhere else before the end of Proto-Celtic, it would be strange indeed if φ survived as a separate phoneme after *s-* in a mere handful of words for centuries longer until after the separation of British and Irish. The obvious solution is to postulate that *s* impeded the change of a following *p* to φ rather as the shift $p > f$ did not take place after *s* in Germanic (e.g. Goth. *fadar* 'father' < **patēr* but *speiwan* 'spit', cf. Lat. *spuere*), whence PC **patēr* > * φ *atīr* but unchanged **sper-et-s* 'heel', which was consequently unaffected by $\varphi > \emptyset$ in (f). The general loss of φ would thus not have affected *sp-* and survival of this cluster until after the end of Insular Celtic is unproblematical, since lack of a voiced/voiceless opposition in stops after *s-* in Celtic would entail analysis of [p] in this environment as an allophone of /b/ (cf. Michelena, 1995, 112 for a similar phenomenon in Iberian). Thereafter we simply need to posit *sp-* > *sw-* in Irish and > *f-* in British.

(e) The change $p > w$ between a back vowel and *n*, e.g. OIr. *súan*, MW *hun* 'sleep' < **sōnos* < **sownos* < **sownos* < **suφnos* < **supnos* (Gk. ὑπνος; Skt. *svapnas*, ON *svefn* < **swepnos*; Schindler, 1966, 70-1) or OIr. *cúan* 'harbour, haven' < **kōnah* < **kawnos* < **kap-no-s* (OE *hæfen*), *dúan* 'poem' < **dōnā* < **dawnā* < **daφnā* < **dap-nā* (Watkins, 1976). This development must be placed after the change of *w* to *b* before *n* (3.1).

(f) The final stage $\varphi > \emptyset$, e.g. OIr. *fō* 'under', MW *gwa-* or *go-*, < PC **wo* < **uφo* < *(*s*)*upo* (Skt. *upa-*, Gk. ὑπό, L *sub*); OIr. *for* 'over', MW *gwar-* or *gor-* (< **wor*, an analogical reformation of **wer* under the influence of **wo*), Gaul. *ver-* (Lep. UVAMO- 'topmost' < **up-mHo-*; Lej. 416-7), Celtib. **uer-** and *veramos* 'chief' < PC **wer(-)* < **uφer* < *(*s*)*uper(-)* (Skt. *upari*, Gk. ὑπέρ, Lat. *super*); OIr. *athair* 'father', Gaul. *atrebo* 'to the fathers' < PC **at(e)r-* < * φ *at(e)r-* < **pat(e)r-* < **ph₂t(e)r-* (Lat. *pater*, Gk. πατήρ, Skt. *pitar-* etc.).

The sum of the preceding changes in the stop system from the relatively early $g^w > b$ (stage I) to the relatively late ($p >$) $\varphi > \emptyset$ (stage IV) constitutes a clear-cut characterisation of the Celtic group within the larger Indo-European family, particular significance attaching to the latter precisely because it demonstrably postdates several other key developments and is attested in all known Celtic languages.

2.1. FRICATIVES. It appears that neither *s* nor its voiced allophone *z* before a voiced stop underwent any major change in Proto-Celtic. Whereas initial *sm-*, *sn-*, *sr-* and *sl-* are still well preserved in Old Irish, assimilation of intervocalic *-sm-* to *-mm-* is attested in all known branches of Celtic: e.g., Celtib. **iomui** 'to whom' < **yosmōi* (Skt. *yasmai*), OIr. *am*, Gaul. *immi*, *imi* 'I am' < **emmi* < **h₁es-mi* (Skt. *as-mi* etc.), OC *toim*, W *twym* 'warm' <

**tēmno-* < **tepes-mo-* (Skt. *tapas* 'heat'). There is thus no obstacle to the most economical hypothesis that this was a Proto-Celtic development, although the possibility that this common type of assimilation occurred separately in the various branches cannot be ruled out completely. OIr. *uinn-ius*, MW *onn-en*, Gaul *onno* 'ash' < **os-no-* (Lat. *ornus* < **os-ino-*) suggest a similar Proto-Celtic date for parallel *-sn-* > *-nn-*. In OIr., however, there is a hitherto unnoticed difference between *-nn-* < PIE **-nn-*, **-ndn-* and *-nn-* < PIE **-sn-*. The vowel **-a-* before the former becomes OIr. *-e-*, whereas before the latter it remains *-a-* (Schrijver, 1995, 456): e.g., *ro:geinn* 'has room (for)' < **gænn-e-t* < **gann-d* < **g^hŋ-n-d-* (Gk. nas. pres. *χαῖνδ-άγει* vs. aor. *ἔ-χαῖνδ-ε* < **g^hŋd-*) but OIr./MW *rann* 'share' < **rannā* < **rasnā* (< **rāsñā?*) < **pr^h_{2/3}-sneh₂*. Nevertheless, this does not necessarily preclude a Proto-Celtic date for the assimilation. In view of the almost certainly Proto-Celtic raising and fronting of *e* to *i* before nasal plus obstruent, it seems reasonable to posit comparable fronting of *a* to *æ* in the same context (see 5.1) before Proto-Celtic assimilation of *-sn-* to *-nn-* with the result that back *a* remained before the latter. If so, there will have been a limited phonemic opposition between /a/ and /æ/ after assimilation of *-sn-* > *-nn-* in Proto-Celtic. The development *an/m* > *ænm* before an obstruent or homorganic nasal not only provides the sole plausible explanation for certain Old Irish alternations between *en* or *in/m* and *an/m* but helps with some otherwise awkward fluctuations along similar lines in Gaulish and British (see 3.3 below and III.2.1-7). That being so, it is best ascribed to Proto-Celtic.

In the absence of firm evidence to the contrary, the most natural assumption is that intervocalic *-sr-* and *-sl-* were likewise assimilated to *-rr-* and *-ll-* in Proto-Celtic, a proposition supported by OIr. *coll*, OW *coll* 'hazel(s)' < **kos-lo-* (Lat. *corulus*, OE *hæsel* < **kos-olo-*). However, the parallel *-sr-* > *-rr-* thus clearly implied for Insular Celtic at least has been disputed by Schrijver (1995, 444-52) in an elaboration of Cowgill's (1957) suggestion that *-sr-* paradoxically became *-ðr-*, whence the fem. nom. pl. numerals OIr. *téoir*, *cethéoir*, MW *teir*, *pedeir* 'three, four' < **teðres*, **k^veteðres* (< **tesres*, **k^vetesres* comparable with Skt. *tisras*, *catasras*) due to historically regular loss of *ð* before *r* accompanied by compensatory lengthening and/or diphthongisation. However, although there is no phonological objection to this derivation of the British forms, it is utterly impossible as applied to the Irish ones. To begin with, Schrijver's claim that 'in Irish, *-euir*, *-eoir* normally reflects **-exr-*, **-eyr-* or *-eðr-*' (1995, 451) omits the crucial constraint that this only applied when the *r* was palatal, *-ér(-)* resulting when it was not (IV.5.1): e.g. MW *gueir*, OIr. nom. *fér* 'grass' < **weyrah* < **weg-ro-s* vs. gen. sg. *féuir* < **wey'r ĩ* < **wegrī*. Since paradigmatic alternations of the *fér*, *féuir* type were completely stable in Old Irish, there can be no question of analogical introduction of *-éo/u-*

from a nom. like alleged **téoir* into an oblique case like **téra* to produce actually attested *téora* (McCone, 1993b, 63). In any case, the starting point is false, since a disyllabic value /te-ur'/ for *teuir* is proved by the syllable count in a faint but clearly legible line (the beginning of which is unambiguously marked by a raised dot `) of a poem in the ninth-century Milan codex and strongly implied by a consideration of the variant readings of a line in the *Félire Óengusso* of c. 800 surviving in later manuscripts (McCone, 1993b, 61-2). The metre of the Milan poem is *deibide scailte* with a completely regular seven syllables to the line. 'At times, the editors have added syllables to a line in order to arrive at the required seven (lines 5, 11, 16)' (Schrijver, 1995, 451) but only at the odd point where the MS. is illegible and not as emendations of the text as transmitted in what is, after all, a contemporary manuscript and quite possibly an autograph to boot. Thus out of the mere handful of attestations of old *teuir*, which had been largely replaced by originally acc. *téora* even in Old Irish, we have one certain and a further probable disyllabic example to set against no instance of demonstrably monosyllabic pronunciation. This is quite conclusive and Schrijver's (1995, 451, esp. n. 1) desperate attempts to evade a fact fatal to his theory are singularly unconvincing.

As has been argued at length elsewhere (McCone, 1993b), the only stems capable of generating the attested OIr. forms are morphologically justifiable **tēsūr-* and **k^wetesūr-* or rather, in view of the failure of *es > is* in III.5.3 to apply, analogically lengthened **k^wetēsūr-*. MW *teir*, *pedeir* are then best derived quite regularly via Brit. **teīr*, **pedeīr* (with shortening of the vowel in hiatus) < **tēhīr(eh)*, **petēhīr(eh)* from an old collective/nom. pl. **tēsūr(es)*, **k^wetēsūr-(es)* reflecting PIE **teysōr*, **k^wetesōr*. The obvious comparison is with the development seen in MW *nei* 'cousin' < **neīh* < PC **neūs* < **nepōs*. Since Schrijver admits with reference to hiatus *-e-o-* resulting from British loss of *h < s* and the earlier PC loss of *p* that 'the development seems to be the same' (1995, 386), it looks like a case of wanting to have his cake and eat it to go on to claim that 'the conclusions regarding **e* in hiatus caused by the loss of **s* cannot be applied to hiatus caused by the loss of **p*, at least if MW *nei* 'cousin' < PIE **nepōts* is a reliable indicator' (*ibid.*, 389). This position and the further objection (*loc. cit.*) that the outcome of 'three' should have been **tēhīr > *tēr > MW *twyr* both follow from Schrijver's (1995, 388) derivation of MW *chwaer* 'sister' < **hwoer* < **hwēr* < **hwēīr* < **hweīr* < **hwehīr* < PC **swesūr* (OIr. *siur*) < PIE **swesōr*. However, it seems no more *ad hoc* simply to posit *ei > oi* (cf. *LHEB* 357-8) between *hw* and *r*, whence **hweīr > *hweir* (as with *nei*, *teir*, *pedeir*) > **hwoir* and then > **hwaer*, MW *chwaer*. Schrijver's (1995, 386-7) argument for vowel lengthening in hiatus in British on the strength of a derivation like MW pl. *chwioryd* 'sisters' < **hwīor-* < **hwior-* < **hweor-* < **swesor-* is hardly compelling since all that is required

in such a case is failure of British *i* to become *ɪ* in hiatus (or before *h*) with the result that it fell together with *i* < *ī* (VI.3.2c & 4.2-5).

In short, there is no convincing evidence against the natural assumption that intervocalic *-sr-* was assimilated to *-rr-* (McCone, 1994, 283) in tandem with *-sl-* > *-ll-* in Insular Celtic at latest and quite likely (along with *-sm-* > *-mm-*, *-sn-* > *-nn-*) in Proto-Celtic.

2.2 It is generally recognised that a non-phonemic *s* arose between two unaspirated dental stops in Proto-Indo-European. The reflex of this T^sT was TT in Sanskrit, sT in a number of other IE languages such as Greek and Iranian, and ss in Italic and Germanic. Insular Celtic displays ss too but it seems unlikely that Gaulish *ḍḍ* had this value: e.g., OIr. *nessam* 'nearest', MW *nessaf*, Gaul. *nedḍamon* < **ne(s)ḥ-tamo/ā-* (cf. Osc. *nessimas*) < **nezd-tamo/ā-* (cf. Av. *nazd-išta-*). Above all, OIr. *fo:cress* 'was thrown/put' < **krisso-* < **krits(t)o-* < **kr̥ts(t)o-* (*fo:ceird* 'throws, puts' < **kerd-e-t(i)*) proves that *ts(t)* had not yet been assimilated to *ss* when *r̥* became *ri* before a stop only in Proto-Celtic (3.2). Probably, then, Gaulish *ḍḍ* represented this /ʈ/ and assimilation to *ss* first occurred in Insular Celtic (III. 5.3).

2.3 Both *ḥ* ([ʈ]) and its voiced allophone *ḍ* ([ɖ]) only occurred after *k̄, k, k^w* and *g^h, g^h, g^{wh}* respectively in Proto-Indo-European and seem to have arisen by metathesis of *tḥ/k̄* ([tʰk̄/k̄]) > *k̄/kḥ* and *d^hg̃/g^h* ([d^hg̃/g^h]) > *g̃/g^hḍ* (Schindler, 1977) after the separation of Anatolian and Tocharian. The reflex of *ḥ/ḍ* was *s* or the like in the other groups except Greek and Celtic, where they yielded the dental stops *t^h* and *t/d* respectively: e.g., OIr. *dú*, acc./gen./dat. *don* 'land, place' < **g^hḍōm*, **g^hḍom-* (Gk. *χθών*, Skt. *kṣām* 'earth'; unmeta-thesised Hitt. *tekan*, Toch. A *tkam* < **d^h(e)g^hōm*); Gaul. *-κτονι(ο)ν* 'human', OIr. *duine*, MW *dyn* 'man' < **g^hḍom-yo-* (Gk. *χθόνιος* 'of the earth'); OIr. *art*, MW *arth* 'bear', Gaul. *Art-* < **arxto-* < **arkto-* < **h₂r̥k̄ḥo-* (Gk. *ἄρκτος*, Skt. *r̥kṣas*, Lat. *ursus*). Simplification of *rxt* > *rt* probably occurred in Proto-Celtic and that of *gd* > *d* in Insular Celtic.

3.1. SONANTS. The PIE sonants were realised as consonants (*y, w, r, l, n, m* - cover symbol R) when next to a vowel (E) but were syllabic (*i, u, r̥, l̥, ŋ, m̥* - R̥) when flanked by consonants (C): ER, RE, CR̥C, ERR̥(C) and (C)R̥RE. However, the basic interconsonantal pattern for two sonants was CR̥RC and in the case of CR the sonant was non-syllabic after a light syllable (CE-CRE; e.g., Skt. *mad^hyam* 'middle') but syllabic after a heavy syllable (CĒ-CR̥E or CEC-CR̥E; e.g., Skt. *vīriam* 'prowess') in accordance with the 'Sievers-Edgerton' rule (see Schindler, 1977b).

The non-syllabic allophones *y, w, r, l, n, m* remained largely unchanged in Proto-Celtic but a number of developments are worth mentioning here. An early dissimilatory loss of *m* before *w* is clearly indicated by OIr. *coir*, MW

kyweir 'right' < **ko(m)-war-i-/yo-* (see Uhlich, 1993, 353), MW *kywir* 'true', Gaul. *Couiro-* < **ko(m)-wīro-*, not to mention the likes of OIr. *do:coid* 'has gone' < **de ko(m)-wāde* (root **wed* seen in OIr. *feidid* 'leads'). De Bernardo Stempel's (1990, 31-2) rejection of this on account of OIr. *cubus* 'conscience' is remarkable since this is a rather obvious early Christian (i.e. probably fifth century A.D.) calque **koŵ-wissuh* (OIr. *fī(u)s* 'knowledge' < **wissuh* = Lat. *scientia*) on Lat. *con-scientia* and so is the reflex of a much later juxtaposition. A Proto-Celtic (see 2.1d) change *w > b* ([v]?: III.4.2) before *n* is supported by OIr. *amn-air* 'maternal uncle' < **abn-* < **awn-* or OIr. *omun* 'fear', MW *ouyn*, Gaul. *-obnos* < **ob-no-s* < **ow-no-s* in relation to OIr. *úath* 'terror' < PC **ow-t-* (McCone, 1992b, 103-6). This development must have occurred before *pn > wn* in 1.5(e). Assimilation of *ln > ll* may well have been a Proto-Celtic phenomenon: e.g., OIr. *-cella* 'goes round', MW *pall-u* 'comes full circle, ceases' < **k^ve/al-na-* (McCone, 1991b, 27-8) or Gaul. *ollon*, OIr. *oll* 'much' < **pol-no-*. See 3.3 on final *-ns > *-s*.

It also seems necessary to recognise *-ye- > -i-* (cf. Lat. *capis* < **kap-ye-s(i)*) and **-eye-* (> **-ē-*) > **-ī-* as Proto-Celtic sound changes: e.g., Gaul. *gabi*, OIr. *gaib* 'take!' < **gabi* < **gab-ye*; Celtib. *uer-zoniti* < **sonh-eye-ti* (Eska, 1989, 116-7); MW *ceidw* 'preserves' < **kadw-īd*; OIr. (Cambrai) 3sg. *ad:rímther* 'is reckoned' < **-rīŵīθor* < **-rīmeyer* but pl. *ad:rimiter* (in place of *-etar*; *EIV* 86-7) < **Rīŵe(y)odor* < **Rīŵiyontor* < **-eyontor*.

3.2 Syllabic *i* and *u* were basically stable in Proto-Celtic as in many other Indo-European languages, whereas the syllabic liquids *r̥* and *l̥* were transformed into sequences of vowel plus consonantal *r/l* or consonantal *r/l* plus vowel in every known IE group apart from Indo-Iranian (Skt. *l, r > r* and *l̥, r̥ > r̥*). There is general agreement that *r̥* and *l̥* became *ri* and *li* respectively before a stop but otherwise *ar* and *al* in Proto-Celtic (see McCone, 1985, on arguable **wl̥-* > *(*w*)*ul-*; Joseph, 1982, 45-9 and McCone, 1991b, 15-21 on *ar/l* before *n*). The former reflex is seen in OIr. *lethan*, MW *llydan*, Gaul. *litano-* 'broad' < **p^{l̥}th₂no-* (Gk. *πλάτανος*; cf. Gk. *πλατός*, Skt. *pr̥^hus* < **p^{l̥}th₂-u-*); OIr. *críde* 'heart' < **k^{r̥}d-* (1.4); OIr. *ri(u)th* 'running' < **r̥t-u-*); OW *rit* (later *rhyd* 'ford') < **pr̥₂-tu-* (OHG *furt*, Lat. *portus*), Gaul. *Ritu-* < **r̥tu-* or **pr̥₂-tu-*; OIr. *brí* 'hill', Celtib. *-BRIS* < **brix-s* < **b^hr̥g^h-* (Celtib. *-birikea* < **-brige/ia*), MW *bre* 'hill', Gaul. *-briga* < **b^hr̥g^h-ā*; OIr. *Brigit*, MW *bryeint* < **brigantī* (Skt. *br̥hatī*), Gaul. *Briganti-*, MW *breenhin* 'king' (cf. Celtib. **Birikantin**) < **brigantīnos* < **b^hr̥g^h-nt-*. The latter is found in OIr. *arbar* 'grain' < **r̥-wr̥* (see below); OIr. *carr*, MW *car(r)*, Gallolat. *carrus* 'wagon', Gaul. *Carro-* < **karso-* < **k^{r̥}so-* (Lat. *currus*); OIr. *arc-*, MW *arch-* 'ask' < **ar-ske/o-* < **pr̥(̥)-ske/o-* (Lat. *poscit*, Skt. *pr̥chati*); OIr. *a-t:baill* 'dies' < **balnit(i)* < **g^wl̥n(e)h₁-* (cf. Gk. *βάλλει*); W *sarn-* 'strew' < **sarnat(i)* <

**strnh₃*- (Skt. *strnāti*); OIr. *marb*, MW *marw* 'dead' < **mṛ-wo-* (cf. Lat. *mor-tuus*, Skt. *mṛ-tas* etc.).

3.3 Karl Horst Schmidt (e.g. 1980 and 1988) and Patrizia de Bernardo Stempel (1987) have erroneously inferred from apparent differences between the reflexes of the syllabic nasals *ŋ* and *m̥* in Old Irish on the one hand and the rest of Celtic on the other that, unlike the corresponding liquids, these sounds remained unchanged in Proto-Celtic in most environments at least and for the most part first developed to *an*, *am* after Proto-Goedelic had split off from the rest of Celtic, whence the often different outcome (*en*, *em*) in Old Irish. Since the treatment of the syllabic nasals is crucial to various theories about early divergences within the Celtic family, a detailed examination will be reserved for III.2.1-7, which should establish that the proximate Old Irish *en*, *em* reflexes before most stops, *n*, *x* or (historically non-final) *s* are due to demonstrably late prehistoric modifications of *æn*, *æm* < *an*, *am*. That being so, *ŋ*, *m̥* > *an*, *am* must be ascribed to a stage prior to Proto-Celtic simplification of *-ns* to *-s* with compensatory lengthening of a preceding vowel (5.4), as is proved by acc. pl. OIr. *rīga*, Gaul. *-rīgas* 'kings' < PC **rīg-ās* < **rīg-ans* < **rēg-ŋs*. Further straightforward correspondences are OIr. *ainm*, OW *anu* 'name', Gaul. *anuana* 'names' < PC **anm-* < **m̥-* (4.4); OIr. *-gainethar*, MW *gan-* 'is born' < PC **gan-ye/o-* < **gŋ-ye/o-* < PIE **gŋh₁-ye/o-* (Skt. *jāyate*; 4.4); OIr. *ainb* 'ignorant' < **an-wiss* < **ŋ-wid-s*; OIr. *land*, OW *lann*, MW *llan* '(church) land' < **land-ā* < **lŋd^h*- (ON *lundr* < **lŋd^h*-, OE *land* < **lond^h*-), OIr. gen. pl. *ban*, Gaul. *bnanom* (with *bn-* from gen. sg., nom./acc. pl. *bnās*) < PC **ban-om* < PIE **g^wŋh₂-om*.

In essence, then, what we find in Old Irish is invariable *an/m* before PC *m*, *w*, *y* (*r*, *l*?) or a vowel, regulated fluctuation between *an/m* and *in/m* or *en/m* before PC *b*, *d* or *s* and a proximate *en/m* reflex elsewhere including auslaut. Alternations between *an/m* and *en/m* or even *in/m* are also attested sporadically in Gaulish and British: e.g., acc. sg. Gaul. (*m*)*ater-em* (Larzac), OIr. *máthair* (< **māter-em*) 'mother' < **māter-m̥* vs. *ambi-* 'around', MW *am(-)* or *ym-*, OIr. *imm(-)* (Ellis Evans, 1967, 134-6) < **h₂m̥b^hi*; Gaul. *Brigind-oni* vs. *Brigant-* (Ellis Evans, 1967, 314-6) < **b^hr̥g^hŋt-* in 3.2; Gaul. *and(e)-* 'in', MW *an-* or *en-*, OIr. *ind-* 'in' (Ellis Evans, 1967, 136-41) < **h₁ŋ-d^hi* (but OIr. *and* 'in it' < **h₁ŋ-dom*); Gaul. *Iovinc-illus*, OC *iouenc* vs. MW *ieuanc* < **yuwŋk-* (5.1); MW *ban*, Gaul. *banno-* or *benno-* (de Bernardo Stempel, 1987, 84), OIr. *benn* 'peak' < **bŋd-no-*. It will be argued in 5.1 below (cf. 2.1) that such fluctuations reflect a late Proto-Celtic fronting of /a/ to [æ] before a nasal in auslaut as well as before a consonant other than *w*, *y* (*r*, *l*?) or a non-homorganic nasal (basically *nm* as opposed to *nn*).

Be that as it may, it is clear that we are dealing with a global Proto-Celtic *ŋ*, *m̥* > *an*, *am* in the first instance and that the doctrine of an early split

between the precursor of Irish on the one hand and the rest of Celtic on the other regarding the treatment of η , η is entirely without foundation.

4.1. LARYNGEALS. Whatever their precise phonetic realisation, the comparative and structural reasons for ascribing three typologically unobjectionable 'laryngeal' phonemes h_1 , h_2 , h_3 to Proto-Indo-European are compelling (see 1.1 and the works cited there). Since the main criterion for distinguishing them is their colouring effect on a flanking e (unchanged next to h_1 , $> a$ next to h_2 , $> o$ next to h_3) in the parent language it is not always possible to determine which of the three was involved, in which case the cover symbol H will be employed.

It is clear that the laryngeal loss next to a vowel (including i, u) observed in non-Anatolian Indo-European languages and the associated compensatory lengthening EHC $>$ ĒC occurred sufficiently early for the resultant lengthened vowels to be treated just like inherited long vowels in Proto-Celtic: e.g., OIr. *síl*, MW *hil* 'seed' $<$ PC $*s\bar{i}-lo-$ $<$ $*s\bar{e}-lo-$ $<$ $*seh_1-lo-$ (Lat. *sēmen* $<$ $*seh_1-m\eta$; OE *sāwan* $<$ $*s\bar{e}-$ $<$ $*seh_1-$); OIr. *dán*, MW *dawn* 'gift, ability etc.' $<$ $*d\bar{o}-n-$ $<$ $*doh_3-n-$ $<$ $*deh_3-n-$ (Lat. *dōnum*, Skt. *dānam*); OIr. *críth* 'purchase', W *prid* $<$ $*k^wrih_2-t-$ (Skt. *krī-ta-*; Gk. *πρία-το* 'purchased'). Typical examples of colouring in non-lengthening contexts are OIr. *agid* etc. (1.4) $<$ PIE $*h_2ag\hat{e}-e-ti$ $<$ $*h_2e\hat{g}-e-ti$ or OIr. *orgid* 'kills', Gaul. *Orge-* $<$ $*h_3org-e-ti$ $<$ $*h_3erg-e-ti$ (Hitt. *hark-* ?; same vocalism as OIr. *berid* $<$ $*b^her-e-ti$ etc.). After laryngeal loss a glide (y, w) was inserted between i or u and a following syllabic sound: e.g., OIr. *oac*, MW *ieuanc* 'young', Gaul. *Iovinc-* $<$ $*yuwanko-$ $<$ $*h_2yu-h_3\eta-\bar{k}o-$ (Skt. *yuvaśas*, Lat. *iuvencus*, OSax. *jung*; cf. Skt. *yuvan-/yūn-*, Lat. *iuvenis*, *iūnior* $<$ $*h_2yuh_3(e)n-$).

As in the other IE language families except Anatolian, Greek (h_1- , h_2- , h_3- $>$ $e-$, $a-$, $o-$ respectively) and Armenian, an initial laryngeal disappeared without trace before a consonant in Proto-Celtic: e.g., OIr. *riúad* 'red' etc. $<$ $*h_1rowd^h-$ (1.4); OIr. *nert*, MW *nerth*, Gaul. *Nerto-* 'strength' ('manliness') $<$ $*h_2ner-to-$ (Lat. *Nero*, Umbr. *nerf* (acc. pl.), Gk. *ἀνήρ*, Arm. *ayr*, Skt. *nar-* 'man' $<$ $*h_2ner-$ but *sūnaras* 'manly' $<$ $*h_1su-h_2ner-o-$); OIr. *ser* (Thurneysen, 1933, 199-200), MW *ser-en* 'star', Gaul. *Sir-ona* $<$ $*h_2ster-$ (Hitt. *hasterza* /*hster-ts*/, Gk. *ἀστήρ*, Arm. *astł*, Av. *stārō* (pl.), OE *steorro*).

4.2 In the non-Anatolian IE languages a vowel mostly resulted from an interconsonantal laryngeal. This was i in Indo-Iranian and e, a, o ($<$ h_1, h_2, h_3 respectively) in Greek but otherwise a : e.g., OIr. *aná*, MW *anadyl* 'breath' $<$ $*anat\bar{l}\bar{a}$ $<$ $*h_2enh_1-tleh_2$ (Skt. *aniti* 'breathes' $<$ $*h_2enh_1-ti$; Gk. *ἄνεμος* 'wind' $<$ $*h_2enh_1-mos$); OIr. *arathar*, MW *aradyr* 'plough' $<$ $*h_2erh_3-trom$ (Lat. *aratrum*, Gk. *ἄροτρον*, Arm. *arawr*); OIr. *loathar* 'vessel', MB *louazr* $<$ $*lew\bar{h}_3-tro-$ (Gk. Myc. *re-wo-to-ro* and Hom. *λοετρόν* by metathesis); OIr.

riathar 'torrent', *W rhaeadr* 'waterfall' < **reyatro-* < **h₃reyH-tro-* (Skt. *rināti* 'release (water)', Gk. ὀρίνει 'stir up (water)' < **h₃ri-n-H-*). OIr. *athair* 'father' etc. < **paūr* < **ph₂tēr* (1.5) demonstrates H > a between two stops in an initial syllable before loss of *p* (given H- > Ø in 4.1). The development between non-initial stops is problematical on account of the striking divergence between lack of a laryngeal reflex in Gaulish *duxtir* 'daughter' < PIE **d^hugh₂tēr* (Skt. *duhitar-*, Toch. B *tkācer*, Gk. θυγάτηρ, OE *dohtor*) on the Larzac inscription and the *a* < *h₂* combined with puzzling absence of *g* (III.4.2) in Celtiberian nom. pl. **tuate[r]es**, gen. sg. **tuateros** /du(w)ater-/ on the recently discovered Botorrita II bronze (Villar, 1995, 41). The Celtiberian form obviously reflects a normal Proto-Celtic vocalisation of the laryngeal in this context, the problem then being to account for absence of *a* in its Gaulish counterpart. This might perhaps be due to the existence of a byform **duktēr* without *h₂* in Proto-Indo-European (cf. Armenian *dustr*; Godel, 1975, 76-7).

4.3 Positioning *h_{2/3}r̥/l̥-* > *ar/l-* even before a stop in Proto-Celtic (Joseph, 1982, 50-1) provides the best morphological solution to OIr. *art* 'bear' etc. < **arkto-* < **h₂r̥k̥po-* (2.3) and OIr. *argat*, OW *argant*, MW *aryant* 'silver', Gaul. ARKATO-, Celtib. **arkato-** < **arganto-* < **h₂r̥g̥-nt-o-* (Lat. *argentum*, Av. *θrəzata-*; Skt. *rajata-* < **h₂reg̥-nt-o-*). If so, this development would have to be placed before otherwise general *r̥, l̥* > *ri, li* before a stop (3.2) and after the loss of *h₁-* on the evidence of OIr. *regaid* 'will go' < **rig-* < **rg-* < **h₁r̥g^h-* (McCone, 1991b, 174-6). The chronological sequence would thus be (1) *h₁* > Ø, (2) *h_{2/3}r̥/l̥* > *ar/l* even before a stop, (3) *r̥, l̥* > *ri, li* before a stop.

A change *r̥h, l̥h, m̥h, ŋh* > *rā, lā, mā, nā* before a nasal is securely established on the strength of examples such as the following: OIr. *lám*, MW *llaw* 'hand' < **plāmā* < **pl̥h₂-meh₂* (Lat. *palma*, OE *folm*, Gk. παλάμη 'palm'); OIr. *lán* 'full', MW *llawn* < **pl̥h₁-no-* (Skt. *pūr̥nas*, Lith. *pilnas*, OE *full*); OIr. *grán*, MW *grawn* 'grain' < **gr̥H-nom* (Lat. *grānum*, OE *corn*); OIr. *cnáim* 'bone', MW *knaw* < **k̥nh₂-mis* (Gk. κνήμη). A similar development before a stop would account straightforwardly for OIr. *gnáth*, MW *gnawd* '(known,) usual', Gaul. *-gnati* < **gnā-to-* < **g̥nh₃-to-* (Gk. γνωτός, Toch. B *-knātsa*, Goth. *-kunþs*); OIr. *tláith* 'weak', *W tlawd* 'wretched' < **tl̥h₂-tis* (cf. OIr. *-tlen* 'removes'); Gaul. *(g)nata* 'daughter' etc. < **g̥nh₁-teh₂* (Lat. *nata*); OIr. *mláith* 'soft', MW *blawt* 'meal' < **m̥lh₁-tis* (if **melh₁-* 'grind') or < **m̥lh₂-tis* (if cf. Gk. μαλακός 'soft'); OIr. *bráth*, MW *brawt* 'judgement' < **g^wr̥H-tus*; *rá(i)th* 'surety' < **pr̥h_{2/3}-to/eh₂-*; Gaul. acc. RATIN, OIr. *rá(i)th* 'earthen rampart', if < **h₂r̥h₃-tis* '(ploughing,) throwing up earth'. However, there are also examples of short *a* in this environment, notably OIr. *flaith* 'lord(ship)', MW *gwlat* 'dominion, country' < **w̥l̥H-tis* (Toch. B *walo* 'king' < **w̥l̥H-ont-s*, Lat. *val-ēre* 'be strong'), OIr. *mrath*, MW *brat* 'treachery' < **mr̥h₂-tom*, OIr. *rath* 'grace' or *-rath* 'was bestowed' < **pr̥h_{2/3}-to-*, OIr. *srath*,

W *ystrad* 'valley' < **strh₃-to-*.

Since there is no obvious factor capable of generating both the *Rā* and the *Ra* reflex regularly, only one of these developments can be regarded as the direct outcome of *ṚH* before a consonant other than *y* in Proto-Celtic. One possible approach is to posit general *Rā* and ascribe *Ra* to analogical pressure. Thus the erstwhile verbal adjectives **mra-to-*, **ra-to-*, **stra-to-* might have shortened their vowel in Insular Celtic, if not earlier, under the influence of the corresponding present stems (McCone, 1991b, 106-7) **mar-na-*, **er-na-* (plural stem **ar-na-*), **ster-na-* (plural stem **star-na-*) and **wla-ti-* might be similarly explained if it once functioned as a verbal noun of **wal-na-* 'rule' (surviving with some modification as OIr. *-foll(n)athar*; McCone, 1991b, 15-6), patterns of the type pres. **ber-e-* vs. verbal adjective **bri-to-* and verbal noun **bri-ti-* (MW *-bryt*) presumably playing a part. Alternatively Schrijver (1995, 168-91) argues that *ṚH* regularly yielded *Ra* before stops (and perhaps *s*) but *Rā* before any other consonant except *y* (4.4). On this view, one could regard the *a* of Gaul. (*g*)*nata* as short, take OIr. *gnáth* etc. to reflect PC **gnāto-* < **gnō-to-* with a secondarily introduced full grade comparable with that seen in Lat. (*-g*)*nōtus*, Skt. *jñātas* 'known', ascribe *mláith*, *tláith* etc. to full-grade **mleh₂-ti-*, **tleh₂-ti-*, equate MW *blawt* 'flour' with OIr. *bláth*, MW *blawt* 'flower' < PC **blā-tu-* < **blō-tu-* < **b^hleh₃-tu-* (Lat. *flō-s*, Goth. *bloma*) and so on. Neither account is without its difficulties but the one entailing general *ṚHC* > *RāC* and a single strategy of paradigmatically triggered remodelling to *Ra* in some instances is perhaps the more economical of the two. OIr. *rann*, MW *ran* 'part' might owe its *a* to a special development of *ṚH* before *s* plus nasal or, as tentatively suggested in 2.1 above, to rather late Proto-Celtic Osthoff-style shortening of the vowel (5.5) before the cluster *sn*.

4.4. It is clear that the laryngeal had already been lost between *Ṛ/R* and *y* prior to *ṚH* > *Rā* above with the result that the 'non-laryngeal' development *r̥, l̥, m̥, n̥* > *ar, al, am, an* took place in this environment: e.g., OIr. *-gainethar* 'is born', MW *gan-* < **ganyetor* < **gnyetor* < **ḡnh₁-ye-tor* (Skt. *jāyate*); OIr. *airid* 'ploughs', MW *ardd-* < **ar-ye/o-* < **h₂erh₃-ye/o-* (Goth. *arjan*, Lith. *ariù*, Lat. *arat*); OIr. *dairid* 'bulls' < **dar-ye-ti* < **d̥r̥-ye-ti* < **d^hr̥h₃-ye-ti* (Gk. *θρόσκει* 'jumps, mates' < **d^hr̥h₃-ske-ti*).

OIr. *arbar* 'grain' < **ar-war*, whether from **r̥-wr̥* < **h₂r̥h₃-wr̥* with generalised zero grade or from **ar-wr̥* < **h₂erh₃-wr̥* with generalised full grade of the root (cf. Lat. *arv-um* 'field', Arm. (pl.) *harav-unk*, Gk. *ἄρουρα*; the same root as OIr. *airid* 'ploughs', *arathar* 'plough' etc. above), might be accounted for by invoking a similar early loss of the laryngeal between *Ṛ/R* and *w*. In that case OIr. *bráú*, OC *brou* 'quern' < PC **brāwū* would reflect **g^wreh₂-wō* with generalised full (cf. Skt. *grāvā*, *grāvan-*) and not **g^wr̥h-wō* with generalised zero grade of the root. Alternatively Joseph's (1982, 50-1)

hypothesis of Proto-Celtic dissimilation of the second of two laryngeals in a sequence HRHC might be invoked to derive $*r_2-wr_2 < *h_2r_2-wr_2 < *h_2r_2h_3-wr_2$ and OIr. *ainm*, OW *anu* 'name', Gaul. *anuana* 'names' < PC $*anm- < *n_2m- < *h_1n_2m- < (\text{zero grade}) *h_1n_2h_3-m-$ (Skt. *nāma*, Lat. *nomen* < $*h_1neh_3-mn_2$). However, the second laryngeal seems doubtful in the case of the latter and of *ard* 'high'. Beekes (1987) offers a thorough and lucid discussion of the notorious problems besetting the reconstruction of the PIE 'name' word. The lengthened grade implied by Middle Dutch in contradistinction to other Germanic forms is crucial to Beekes' final decision in favour of the proterokinetic paradigm with nom.-acc. sg. $*h_1neh_3-mn_2$ and gen. sg. $*h_1n_2h_3-mén-s$ now favoured by many scholars over the currently less popular alternative $*h_{1/3}nóm-n_2$, $*h_{1/3}n_2m-én-s$ (cf. $*dór-u$, $*dr-éw-s$). However, he concedes that the latter can account for all the other relevant forms at a pinch and is more straightforward in Celtic by virtue of obviating the *ad hoc* postulate of an early Celtic dissimilation of the second laryngeal, without which the most likely outcome of $*h_1n_2h_3-m-$ in Old Irish would presumably have been $*náim$ or $*anaim$. As far as OIr. *ard*, MW *ard*, Gaul. *ardu-enna* are concerned, only Skt. $ūrā^h vá-$ points to $*h_2r_2Hd^hwo-$ and Av. $əṛəδva-$ rather indicates a preform $*h_2r_2^hwo-$ easier to square with the Celtic forms by means of Joseph's postulate of HR̥C- > HaRC- in Celtic (4.3) and the 'Lex Rix' in Latin (Rix, 1970). The derivation of OIr. *rá(i)th* 'earthen rampart' from $*rā-ti- < *h_2r_2h_3-ti-$ tentatively proposed in 4.3, while incompatible with dissimilation of the second of two laryngeals, hardly suffices to disprove it. Unfortunately, the evidence for and against Joseph's dissimilatory rule seems to be too meagre and ambiguous to be conclusive either way.

5.1. VOWELS. Although the short vowels inherited from PIE underwent no significant change, a new system nevertheless arose in Proto-Celtic. The system of sonants was dislocated when *l*, *r*, *n*, *m* became invariably consonantal by 3.2-3. In consequence *i*, *u* were cut adrift from *y*, *w* and gravitated toward the vowels. The frequency of the phoneme *a* (*a* in contact with *h*₂ was a mere allophone of *e*) increased dramatically as a result of the loss of *h*₂, *ChC* > *CaC* and $n_2, m_2, r_2, l_2 > an, am, ar, al$. Proto-Celtic thus acquired the following symmetrical five-vowel system (see 2.1 on the possibility that a restricted phonemic opposition between low front /æ/ and back /a/ arose before the end of the Proto-Celtic period):

i	u
e	o
a	

It would seem that *uw* became *ow* before a vowel other than *i* prior to 1.5(e) above, as in OIr. *oac* 'young', MB *iouanc*, MW *ieuanc*, Gaul. *Iouinc-* < PC **yowænk-* < **yuwank-* (< PIE **h₂yu-h₃n̥-ko-*; Lat. *iuvencus*, Goth. *juggs*, Skt. *yuvaśas*) vs. OIr. *druí* 'druid', MW *dryw*, Gaul. *druwid-* < PC **dru-wid-*.

One allophonic development in the essentially stable Proto-Celtic inventory of short vowels merits attention here because of subsequent developments, namely the fronting and/or raising of vowels before a nasal in certain environments.

According to Jackson 'IE *e* before a nasal plus stop became *i* in CC., though there are a few apparent exceptions in Romano-British names, as *Venta* (Ptol., AI.); *Gabrosentum* (ND.), *Gabrocentio* (Rav.); COVENTINA in a number of inscriptions beside one COVINTINA' (*LHEB* 278). Pedersen (*VKG* I 37) had already made a similar claim with the rather illogical restriction that this development had only taken place before a front vowel or *u* in Irish. This encouraged Binchy in a review of Jackson's work to deny *enT* > *inT* in Irish 'apart from the general rule that stressed *e* is raised to *i* before *i* or *u* in the following syllable when separated from it by a single (voiced) consonant or certain consonant groups which include *nd* and *mb* (Thurneysen, *Gr. O. Ir.* §75f.); thus *rind* (< *rendu-*), but *sét* 'path' (< *sentu-*) - not **sit* - beside W *hynt*, etc., *cét-* (< *kentu-* 'first' - not **cit-* beside Gaul. *cintu-*, W *cynt-*, etc.; so also *do-éci* (< *di-en-kwis-*) as opposed to *do-ic'* (1958, 291).

The Irish evidence adduced by Binchy certainly rules out Jackson's implication that *e* had simply fallen together with *i* in this position before *é* arose here by compensated loss of the nasal before a voiceless stop - one might further contrast *sét*, *cét-* etc. with OIr. *fet* 'whistle' < **widā* < **wintā* (MW *gwynt* 'wind' < **wintos*) < PC **wīnt-* < **wēnt-* < PIE **h₂weh₁-nt-* (Lat. *ventus*, Goth. *winds*, Toch. A *want*, B *yente* etc.; McCone, 1991b, 45-52). Moreover, the vowel of *rind* can hardly have been the same as that of *find* 'white' (MW *gwyn*, Gaul. *-uindos*) < PC **windos*, since the latter resisted lowering by a following *o* or *a* whereas the former with its gen. sg. *rendo* < **ri/endōs* did not (Schrijver, 1991, 21). On the other hand, the stressed vowel of a 3sg. OIr. verbal form like *cingid* 'steps' < **keng-e-ti* (Gaul. *Cingeto-rix*, MW *ry-gyng* 'trot') or *lingid* 'leaps' cannot be derived from *e* by raising before the high vowels *i/u* à la Binchy, whereas the reflex in 3pl. *cengait* etc. < **keng-o-nti* can be straightforwardly ascribed to lowering of an *i*-like sound before the low vowels *o/a*.

The Primitive Irish reflex of *e* before nasal plus obstruent was thus neither mid front *e* nor high front *i* but some intermediate sound. This differed from *e* in yielding OIr. *i* where the following syllable had contained *e* and from *i* proper in being lengthened to *é* before nasal plus voiceless obstruent and

lowered to *e* across nasal plus voiced stop before *o/a*. Where not affected by either of these developments, this intermediate sound before nasal plus voiced stop had apparently merged with inherited short *i* by the seventh century, as had the product of raised *e*. At any rate, there is no observable distinction between them either in Old, Middle and Modern Irish orthography or in present-day Gaelic speech, the dialects of Ireland tending towards an English-style mid high front [ɪ] and those of Scotland towards a French-style high front [i].

A Proto-Celtic fronting and/or raising of *e* before *n* plus obstruent that fell short of a complete merger with *i* (McCone, 1991b, 47-52 and Schrijver, 1991, 20, n.8 on the problem of *léicid*) is indicated not only by these Goedelic phenomena but also by spelling fluctuations between *e* and *i* in Jackson's Romano-British examples above and Gaulish onomastic elements like *Vinti-* or *Venti-*, *Escingo-* or *Εσκεγγο-* (Watkins, 1954, 516-7). Moreover, the Botorrita inscription has now provided probable Celtiberian examples in **bintis** /bindis/ < **b^hendth*- 'bind' and **-tink-** < **-tenk-* 'make solid' (III.4.2).

As to the phonetic realisation of this allophone of /e/, the Irish data and the orthographical *e/i* fluctuations in Romano-British and Gaulish material point to a sound similar to the normal short Modern English [ɪ] about half-way between high front [i] and mid low front [ɛ]. Alternatively the high central vowel [ɨ] of Modern North Welsh *hynt* 'way' etc. might continue the Proto-Celtic sound here more or less directly. If, however, Jackson is right in arguing on the basis of occasional *e* spellings alongside *i* that the Old Cornish and Breton equivalent of this Welsh sound was an English-style mid high front [ɪ] that then became [e] in Middle Cornish and Breton (*LHEB* 284; 1967, 89-90), considerations of economy clearly favour ascribing the value [ɪ] to the Proto-Celtic allophone of /e/ before nasal plus obstruent (VI.3.4). OIr. *i*, MW *y(n)* 'in(to)' presumably both derive from **m* < **en* due to raising and fronting of /e/ before *-n* in auslaut, perhaps as a generalised sandhi variant that first arose when the following word began with an obstruent.

A comparable Proto-Celtic fronting plus raising of /a/ to [æ] in the same environments would help to explain the otherwise problematical Gaulish and British fluctuations between *a* and *e/i* before a nasal in 3.3 (cf. Schrijver, 1993, 34-5). If an [ɪ] sound roughly equidistant between /e/ and /i/ could be spelt *i* or sometimes *e*, comparable orthographical hesitation between *a* and occasion-ally *e/i* as a means of representing an [æ] more or less intermediate between /a/ and /e/ should present no difficulty. Likely examples are Gaul. *brigant-* or *brigind-* [brigænt/d-]; acc. sg. *materem* [māteræm], Gaul. *iovinc-*, OC *iouenc* [yowænk] vs. MW *ieuanc*; Gaul. *banno-* or *benno-* [bænno-] < **bæn(d)-no-* < **band-no-*. Furthermore, if this development is located after the shortening of long vowels before a word-final nasal in 5.3 or taken to include /ā/ > [æ] before that shortening, there is no obstacle to the morphologically obvious

interpretation of Gaul. acc. sg. δεκάντεν/μ as [dekəntæn/m] < PC *ā*-stem **dekəntəm* < **dekantam* or **dekəntām* < **dekntām*. Nevertheless, the consistency with which the vowel of the middle syllable is written *a* and that of the final syllable *e* in some seven attestations may well indicate that final [-æn/m] was then fronted further to /-en/m/ in (Transalpine?) Gaulish so that *materem* and δεκάντεν/μ are rather to be analysed as /māterem/ and /dekanten/m/ [dekənten/m] with **-en/m* < **æn/m* < **-m̥* or **-ām*. If so, Cisalpine LOKAN (Todi) still reflects [-æn], as probably does the obscure Transalpine ματικάν. This approach entails a neat blanket development $\eta, \eta > an, am$ in Proto-Celtic and renders unnecessary the uneconomical postulate (McCone, 1992, 27-8) of PC $\eta, \eta > -em, -en$ in absolute auslaut only but $> an, am$ in all other environments.

This scenario implies that [æ] remained an (at most very marginally phonemic; 2.1) allophone of /a/ and very likely merged with it as [a] again in Celtiberian with its consistent *an/m* spellings. In Gaulish, [æ] seems to have undergone a split, basically remaining an allophone of /a/ except before a final nasal, where it merged with /e/. The British evidence is compatible with [æ] as a mere allophone of /a/ in all positions and, indeed, with its probable reversion to [a] again for the most part, although a development to /e/ before a nasal in auslaut cannot be definitely ruled out. In Irish, as we shall see (III.2.2-7), there was a phonemic split in front of a nasal between [a], which was retained as /a/, and [æ], which generally underwent further raising and fronting to /e/ ([e] or [I], the latter then going on to merge with /i/).

A related raising of /ō/ to [ō] roughly equidistant between it and /ū/ (and of arguably more open /o/[ɔ] to [o]; cf. Schrijver, 1993, 33) before nasal plus obstruent or a final nasal would explain the otherwise intractable *u*-vocalism of OIr. *do:ucc(a)i* '(makes to come, can bring' etc. on the assumption that a long-vowel causative (Klingenschmitt, 1978) **ōnk-(e)ye-ti* matching the 'Narten' present **ēnk-* > **īnk-* underlying OIr. *do:ic* 'comes' (McCone, 1991b, 50-1) would then become **ōnk-ī-ti* with a vowel closer to /ū/ than to /ā/ and so likely to merge with the former even in a non-final syllable when the Proto-Celtic split of /ō/ into /ū/ and /ā/ took place to give PC **ūnkīti* > **unkīti* (by 'Osthoff' shortening; 5.5) > Prim. Ir. **ugīh* directly responsible for OIr. *-ucc(a)i* (McCone, forthcoming). As long as it is dated earlier than Proto-Celtic shortening of a long vowel before a final nasal that in turn (and unlike 'Osthoff' shortening) predated the change $\bar{o} > \bar{u}$ in final syllables, a further consequence of this process would be *o*-stem acc. sg. **-om* vs. gen. pl. **-om* < **-ōm* < **-ōm*. This difference between a mid and a mid-high *o* would seem to have been neutralised to give both acc. sg. and gen. pl. **-om* in Gaulish and Irish (and quite likely British as well) but to have been continued and even enhanced by further raising of **-om* in Celtiberian to produce a dichotomy between acc.

sg. **-om** and gen. pl. **-um** there (5.3).

5.2 Joseph's (1982) argument for a Proto-Celtic assimilation of *CeRa* to *CaRa* can be profitably applied to a number of otherwise difficult correspondences such as OIr. *talam* '(supporter,) earth' < PC **talamū* < PIE **telh₂-mō* (Gk. τελαμών '(supporter,) strap') or OIr. *tarathar*, W *taradr* 'auger' < PC **taratrom* < PIE **terh₁-tro-m* (Gk. τέρετρον 'auger'). However, forms such as OIr. *do:cer* 'fell' < **-kerat* < **kerH-t* (McCone, 1991b, 18) and the traditional derivation of subjunctives like OIr. *-mera* 'may betray' or *at:bela* 'may die' < **-merāt*, **-belāt*, called for the rather strange restriction of this assimilation of *e* to *a* across a liquid or nasal to where a following non-final syllable contained short *a*. Schrijver (1995, 73-93) accepts Joseph's rule with the requirement of following *Rǎ* as opposed to *Rā* and points out (1995, 90) that it can be squared with more recent analyses of the subjunctives in question as < **meraset*, **belaset* < **merh₂-se-t(i)*, **g^velh₁-se-t(i)* (Rix, 1977, 151-4; McCone, 1991b, 85-113) by insisting upon an early analogical lengthening of the *a* (cf. Rix, 1977, 152; McCone, 1991b, 112) that generated PC **merāset(i)*, **belāset(i)* prior to Joseph's assimilation before *Rǎ* only.

On the other hand, he questions the restriction to non-final *Rǎ(C)* by suggesting OIr. *ben* < **benā* (adaptation of nom. sg. **bena* < **g^venh₂* to the normal *ā*-stem type) and OIr. *do:cer* < **kere(t)* on the following grounds. 'Compare the 3sg. pres. conjunct 'beir' 'carries' etc. < **beret(i)*. There is no doubt that palatal *-r* in this form is original, and we do indeed find numerous OIr. forms where the palatal *-r* is unambiguously written. However, the form 'ber, which lacks a palatal marker, is far from rare in the language of the Glosses. In a random and inexhaustive search I noted the following instances: *do:ber* instead of *do:beir*: Wb 14b15, Ml. 51d5, 74d13, 101c6, 126b4a; *as:ber* instead of *as:beir*: Wb 10b13, Ml. 40a15, 53c14, 67c2, 74d9, 77d11, 127d14. It seems unlikely that the lack of a palatal marker in these forms is merely orthographical... Therefore the form 'ber most likely contains a depalatalized *-r*/... The form 'beir, which is the commonest form in OIr. and later, may simply have restored the palatalization under the pressure of the 3sg. pres. conj. forms of the BI verbs that did not end in an *-r*. In view of the fate of 'ber, 'beir in OIr. I submit that *do:cer* may reflect a regular 3sg. of the suffixless preterite in **-e(t)* whose *-r* was depalatalised. It may well be that 'cer ultimately reflects a root aorist **-kera-t* but there is no solid evidence that this form survived up until OIr. The replacement of **kera(t)* by "regular" *-kere(t)* could have taken place at any time. If one favours Joseph's rule, this replacement must have occurred prior to the operation of Joseph's rule' (Schrijver, 1995, 89).

This special pleading for an extraordinary depalatalisation of *r*' after *e* cannot be accepted, entailing as it does the supremely uneconomical assumption

that *-beir* and its compounds, which probably occurred more frequently than all other S1 verbs combined, then analogically restored palatalisation from the latter in the overwhelming majority of instances (particularly in Wb.). This becomes even more unlikely when it is realised that a fair number of S1 presents with *e* vocalism and root-final dental were actually engaged in analogically spreading a 3sg. conj. with non-palatal *-t* that originated in unstressed syllables, whence *ad:fét* or *in:fét* 'relates', prot. *-indet* etc. (IV.1.2). There can be no serious doubt that spellings such as *-ber* are due to less regular use of *i* between front *e* than between back *a* or *u* and a palatal consonant (I.6.7) and that *-ber* was indeed a purely orthographical variant of *-beir* /ber'/. That being so, one might argue that *do:cer* (twice in the Turin Glosses) simply represented /do ker'/, a spelling **do:ceir* happening not to be attested in Old Irish sources. However, the existence of non-palatal *-r* in this verb is guaranteed by Ml. 34^c14 *-torchar* /torxər/ alongside Tur. 19 and Sg. 29^a8 *do:rochair* /do roxər'/. This surely clinches matters for this form's original non-palatal *-r*, the palatal by-forms being a demonstrably later rising pattern owing to well motivated assimilation to normal suffixless preterite inflection within the Old and Middle Irish periods (McCone, 1991b, 131).

It seems, then, that the second of Joseph's constraints must also be retained if his rule is to work, although a possible way out might be to reformulate it as an assimilatory lowering $eR\tilde{a} > \text{æ}R\tilde{a}$ in Proto-Celtic, $\text{æ}Ra(-)$ then becoming $aRa(-)$ whereas final $\text{æ}R$ became eR in post-apocope Primitive Irish. **5.3** Notwithstanding the fact that the only PIE long vowels of any frequency were \bar{e} and \bar{o} , by early Proto-Celtic, if not before, a system of five long vowel phonemes corresponding to the five short ones in 5.1 had come into being as a result of $eh_1, ah_2, oh_3, ih,$ $uh > \bar{e}, \bar{a}, \bar{o}, \bar{i}, \bar{u}$ respectively before a consonant:

\bar{i}	\bar{u}
\bar{e}	\bar{o}
\bar{a}	

Unlike its short vowel counterpart, the system of long vowel phonemes underwent appreciable alteration before the end of Proto-Celtic through the general merger of \bar{e} with \bar{i} along with the split of \bar{o} into \bar{a} in non-final and \bar{u} in final syllables. Typical examples of $\bar{e} > \bar{i}$ are OIr. *rí*, *ríg(-)* 'king', W *rhi* (*Duorig Habren* 'id est duo reges Sabrinæ' Nennius, *Historia Brittonum* §68 presumably for OW *dou rig* 'two kings'), Gaul. *-rix*, Celtib. **-reikis** /rīxs/ < PC **rīx-s*, **rīg-* < PIE **rēk-s*, **rēĝ-* (Lat. *rex*, *reg-*; Skt. *rāj-*); OIr. *síl*, MW *hil* 'seed' < PC **sīlom* < **sē-lo-m* < PIE **seh₁-* (Lat. *se-men* etc.). The regular Celtic reflexes of \bar{o} are seen in OIr. *már*, MW *mawr* 'great', Gaul.

-maros < PC *māros < *mō-ro-s < PIE *moh₁-ro-s (Gk. -μωροϛ) vs. OIr. *cú*, MW *ki* 'hound' < PC *kū for *kwū (1.5b) < PIE *kwō (Skt. *śvā*, Gk. κύων etc.), the nom. sg. -ū < PC *-ū < PIE *-ō of other *n*-stems seen in personal names such as Gaul. (Lepontic) *NAMU* and Celtib. **Melmu** (gen. **Melmunos** with analogical *ū* from the nom.) or *o*-stem dat. sg. -*ui* (< PC *-ūi < PIE *-ōy) seen in Gaulish and Celtiberian as well as underlying OIr. *fiur* (< *wirū < *wirūi) etc. There is little to recommend de Bernardo Stempel's (1993) uneconomical assertion, based upon what have now been shown by Villar (1995 and 1995b) to be false assumptions about the gen. sg., nom. and acc. pl. of Celtiberian *o*-stems (see below), that Proto-Celtic had a threeway treatment with *ō* > *ā* in non-final syllables, > *ū* in absolute auslaut but otherwise no change in final syllables, where the change to *ū* before a consonant allegedly first occurred in the separate histories of the various Celtic languages.

Despite its origin, albeit unacknowledged, in a tentative suggestion of Thurneysen's (*GOI* 284 and 295), de Bernardo Stempel's (1993, 42) assertion that acc./gen. pl. *inna* of the OIr. article derives from PC *sind-ās/-ām < *-ōs/-ōm on the grounds that *ō* became *ā* and not *ū* in the final syllables of proclitics is fatuous as an argument against shortening of a vowel before a final nasal prior to Proto-Celtic *-ō(C) > *-ū(C) in the absence of a plausible derivation of the OIr. nominal *o*-stem gen. pl. *fer* from unshortened PC *wirūm (see below). This speculation is not only based on the highly questionable assumption that *sind-ōs/-ōm would have been proclitic in Proto-Celtic but also ignores the morphologically obvious and phonologically straightforward explanation that the gen. pl. here owes its extra syllable to the PIE pronominal endings m./n. -oi-sōm, f. *-eh₂-sōm. Long securely reconstructed for PIE on the strength of forms such as Skt. m./n. *teṣām*, f. *tāsām* (cf. ON *þeira*, OE *þāra* < Gmc. *þaizō(n), Lat. *ill-orum*, *ill-arum* < *-ōsōm with analogical -ōs-, *-āsōm etc.), one of these has now almost certainly turned up in Celtiberian (Botorrita II; Villar, 1995, 93) **soisum** (probably a mistake for *soizum expected in accordance with I.3.5) matching Skt. *teṣām* < PIE *toisōm once due allowance has been made for the generalisation of nom. sg. m./f. *s-* also seen in Celtiberian (all *Bot.* I) sg. dat. **somui** = Skt. *tasmāi* < PIE *tosmōi, loc. **somei** (Skt. *sasmin*, *tasmin*), nom./acc. n. **soz** = Skt. *tad* < PIE *tod. OIr. fem. pl. nom.-acc. and gen. *inna* clearly derive quite straightforwardly from *sindās and *sindāsom respectively and the spread of originally fem. *inna* to the neut. nom.-acc. pl. was the first part of the process of endowing various neuter plural noun phrases with a badly needed distinctive plur. -a on article, adjective or, failing that, noun (Greene, 1974, 191-3). The regular development of m./n. gen. pl. *sindoisom will have been (V.2.3) > *indoya > *indoy > *indē > *inde (V.2.4) > *inna* (V.4.2), and identity between masc., fem. and neut. here no doubt triggered the spread of f./n. *inna* at the cost of similarly shaped m. acc.

pl. **inno* (< **indu* by V.2.4; cf. the OIr. tendency to replace *-u* with *-a* in non-substantivised adjectives; *GOI* 223).

Proto-Celtic shortening of a long vowel before *-m* prior to $\bar{o} > \bar{u}$ in final syllables is strongly indicated by an OIr. gen. plur. like *fer* 'of men' < **wiran* < **wirom* < **wirōm* (not **fiur* < **wirun* < **wirūm* < **wirōm*), not to mention probably gen. pl. Gaulish *anderson* (Chamalières; not **-un*). It is true that Villar (1995, 109-19) has demonstrated that **-um** was the only *o*-stem genitive plural in Celtiberian, which thus did not have the hitherto generally acknowledged byform **-om** once considered the older by the present writer (McCone, 1992, 17 and n. 29). Nevertheless, it is difficult to see how the derivation of Celtiberian **-um** < **-ūm* < **-ōm* by Villar and others can be squared with the patent **-om* reflexes in Irish and Gaulish. As argued in the final paragraph of 5.1 above, the **-om* underlying the OIr. and Gaul. *o*-stem gen. pl. as well as the **-um** of Celtiberian can be derived quite regularly from PC **-om* < **-ōm* while the acc. sg. **-om* reflected in all three simply continues unchanged PC **-om*. Otherwise it would be necessary to view Celtiberian **-um** as an innovatory replacement of **-om* and look for a plausible trigger such as pressure from *o*-stem dat. pl. **-ubos** (which probably owes its *u* in place of original *o* to dat. sg. **-ui**; McCone, 1992, 17) and acc. pl. *-ūs* (arguably attested in *Bot. I matus* but anyway now confidently inferrable on the basis of Villar's demonstration of consistent \bar{u} for \bar{o} in Celtiberian final syllables; 5.4 below) with a view to differentiating it from acc. sg. **-om**.

5.4 As a result of the developments sketched in 5.3 short *e* and *o* lost their long counterparts and a lack of symmetry arose between five short (5.1) and only three corresponding long vowel phonemes, namely:

\bar{i}

\bar{u}

\bar{a}

It has already been seen (3.3) that the acc. pl. ending *-a* of Old Irish masc./fem. consonant stems can only be explained by positing a Proto-Celtic sequence **-ŋs* > **-ans* > **-ās*. Probable accusative plurals such as Gaul. *ARTUAS* (Todi), *sos* (Chamalières) or Celtiberian **tekametinas**, **tiris matus**, **arznas** (*Bot. I*; Meid, 1993, 119, 121, 99 and 87) corroborate this argument for a Proto-Celtic simplification of **-ns* > **-s* and various Old Irish reflexes such as acc. plur. *súili* 'eyes' < **sūl-īs* < **-ins*, *cruthu* 'shapes' < **kʷri-tūs* < **-tuns* of non-neuter *i*- and *u*-stems respectively prove that this simplification was regularly accompanied by compensatory lengthening of a preceding vowel. The gen. sg. of neut. *n*-stems such as OIr. *anmae* 'of a name' < PC **anmēs* < **anmens* < **ŋmens* (4.4) further proves that Proto-Celtic *-Vns* > ∇s took

place later than the change $\bar{e} > \bar{i}$, since this patently failed to affect the new \bar{e} by compensatory lengthening.

This obviously raises the possibility that $*-ons > *-ōs$ likewise occurred after $\bar{o} > \bar{u}$ in final syllables had applied, a hypothesis that would account for the probable Gaulish acc. plur. *sos* < $*sons$ and more doubtful ATOS (Vercelli) quite straightforwardly. It would also provide a solution to the problem of the alleged nom. pl. *-os* (beside rarer *-us*) of Celtiberian *o*-stems on the reasonable assumption that a dichotomy nom. pl. $-\bar{u}s$ (< PIE $*-\bar{o}s$), acc. pl. $-\bar{o}s$ (< $*-ons$) was tending to be levelled there in favour of the latter on the model of nom.-acc. pl. $-\bar{a}s$ in the \bar{a} -stems. If so, the voc.-acc. pl. $-u$ < $*-\bar{u}s$ of the Old Irish *o*-stems would have to be ascribed to a similarly triggered generalisation of originally nom.-voc. plur. $*-\bar{u}s$ before pronominal $*-oi$ (> $*-\bar{i}$) spread to the nom. pl. Since the spread of $*-oi$ from pronouns to adjectives and nouns was sufficiently well motivated to have occurred separately in Greek and Latin, the OIr. reflex and Gaulish nom. pl. *-oi* in TANOTALIKNOI might then be ascribed to independent developments. The traditional view that forms such as MW pl. *beird* and OIr. nom. pl. *baird* 'bards' both derive from monophthongised $*bard-\bar{i}$ < $*bard-oi$ would imply the following three stages before the end of the Insular Celtic period: (1) spread of $*-\bar{u}s$ from nom./voc. to acc. pl., (2) replacement of nom. pl. $*-\bar{u}s$ by $*-oi$ and (3) $*-oi > *-\bar{i}$. Since, however, an *i*-inflected plural such as MW *beird* would also be the regular outcome of a British nom. pl. $*bard\bar{i}h$ < PC $*bard\bar{u}s$, stages (1) or (2) onwards might have been confined to Proto-Irish.

However, the hitherto generally held view of the salient Celtiberian forms has recently been demolished by Villar's (1995, 83-107) demonstration that in the absence of a context (most of the examples being from coins) the **-os** forms in question can perfectly well be nom. sg. and that the form with *u* is **-uz** not **-us**, the corollary being that it cannot continue $*-\bar{u}s$ but could well be an *o*-stem abl. sg. $-\bar{u}z$ < $*-\bar{u}d$ < $*-\bar{o}d$ (see I.3.5). Consequently the derivation of the Celtiberian *o*-stem gen. sg. **-o** from abl. $*-\bar{o}d$ still insisted upon by Schmidt (e.g. 1977, 11-12) and de Bernardo Stempel (e.g. 1993, 47-9) despite being rendered virtually impossible by clear examples of **-u(i)** < $*-\bar{o}(y)$ from Botorrita I (McCone, 1992, 17-8) can now be declared definitively dead (Villar, 1995, 89; 1995b, 16) and one might reasonably speculate that a pronominal opposition of the type gen. sg. $*soizo$ vs. gen. pl. *soizum* (**soisum**) triggered a new nominal gen. sg. $-o$ on the basis of pl. $-um$ (cf. Eska, 1995, and III.1.3). Moreover, there is no longer any evidence whatever in Celtiberian for an *o*-stem nom. or acc. pl. $*-\bar{o}s$ but there is a possible instance of nom. pl. **-oi** and acc.pl. **-us** that would accord fully with the Old Irish pattern. Unless or until further evidence from Celtiberian comes to light, it seems simplest to assume an originally pronominal nom. pl. $*-oi$ in Proto-Celtic (and to derive the British

beird type from this too) alongside acc. pl. **-ūs* (probably < **-ōs* < **-ons*). If they are acc. pl., the Gaulish forms could have been influenced by *-o-* in the rest of the plural paradigm (nom. *-oi*, gen. *-on/-om*, dat. *-obo(s)*). The relative chronology implied by this would be (1) $\bar{e} > \bar{i}$, (2) $-Vns > -Vs$, (3) $\bar{o} > \bar{u}$ in final syllables.

5.5 It follows from the above that by the end of the Proto-Celtic period the three long vowels in 5.4 had been augmented to four as a result of **-ens* > **-ēs* (or even five in the less likely event of **-ons* > **-ōs*). Confined as they were to final syllables, where they had arisen in one very specific context only, \bar{e} (and possibly \bar{o}) will have been of very limited occurrence. An obvious way of filling out its range was to monophthongise the diphthong *ei* to \bar{e} . This had probably occurred before the end of Proto-Celtic, whereas a shift (*eu* >) *ou* > \bar{o} certainly did not take place until the main branches had begun to separate out.

The separation of these phenomena is necessitated by Gaulish, which presents obvious instances of $\bar{e} < ei$ in numerous occurrences of *Devo-* 'god' (OIr. *día*, gen. *dé*, OW *duiu-* < **dēwo-*) < PIE **deiwo-* 'divine' (Lat. *divus*, Skt. *devas*, Osc. *deív-* etc.) but does not monophthongise *ou* (including < *eu*) as a rule, to judge from spellings like $\tau\omicron\upsilon\tau\iota\omicron\varsigma$, $-\tau\omicron\upsilon\upsilon\tau\alpha$ ($\omicron\upsilon$ /*ou*/ vs. $\omicron\upsilon$ /*u*/ or / \bar{u} /; I.2.3) in the Greek, *TOUTAS* in the Lugano and *touti-* in the Roman alphabet (OIr. *túath*, MW *tut* 'people' < **tōtā* < **toutā* < **teutā*; cf. Osc. *touto*, Goth. *þiuda*, Lith. *tautà* etc.). As argued in I.3.6, the digraph *ei* almost certainly represented a monophthong (first / \bar{e} / and then probably / \bar{i} /) in Celtiberian and there is no reason to suppose that the Celtiberians still had a preconsonantal diphthong *ei* when they adopted the Iberian alphabet. Lepontic dat. sg. *PIUONEI* seems to be similarly inconclusive (III.1.3) as evidence against the economical postulate of late Proto-Celtic *ei* > \bar{e} before consonants, which implies the following system of long vowels.

\bar{i}	\bar{u}
\bar{e}	
	\bar{a}

Vowels were subject to 'Osthoff' shortening before certain consonant groups, especially those containing a liquid, after the Proto-Celtic changes $\bar{o} > \bar{a}$ and $\bar{e} > \bar{i}$: e.g., OIr. *fet* 'whistle' < **winto/ā-* < **wīnto/ā-* < **wēnto/ā-* (McCone, 1991b, 48-9); OIr. *fo:caird* 'threw, put' < **kard-* < **kārd-* < **kōrd-* (McCone, 1986, 236-8); OIr. *Sadb* 'Sweet' < **swadwā* < **swādhwā* < IE **sweh₂du-* (Gaul. *Suadu-*, Skt. *svādus*, Lat. *svāvis*, OE *swēte* 'sweet'); perhaps (with Schrijver, 1995, 421-2) OIr. *sell* 'iris (of the eye)' < **stīrlo-* < **h₂stēr-lo-*. If **rāsnā* was shortened to **rasnā* by this rule prior to an arguably Proto-Celtic assimilation of *-sn-* > *-nn-* (whence OIr./MW *rann*; 2.1 and 4.3),

it would follow that these shortenings belong within the Proto-Celtic period but this inference is far from certain.

5.6 As far as diphthongs are concerned, the change *eu* > *ou* can be ascribed to Proto-Celtic by virtue of being attested in or inferred from all known Celtic languages as in the case of the derivatives of probably PC **toutā* in 5.4 (see I.2.4 on sporadic instances of the spelling EV in later Gaulish inscriptions in the Roman alphabet). As a result of this and of *ei* > *ē* the only short diphthongs remaining before consonants in late Proto-Celtic would have been *ou* (< *ow*, *h₃ew*, *ew*), *au* (< *h₂ew* for the most part), *oi* (< *oy*, *h₃ey*) and *ai* (< *h₂ey* for the most part). On the other hand, as is clear from Oscan *touto* etc., *eu* > *ou* is a natural enough development that could conceivably have taken place independently in various branches of Celtic after the Proto-Celtic period.

The long diphthongs *ēy*, *āy*, *ōy* and *ēw*, *āw*, *ōw* were rather uncommon in PIE. Although compensatory lengthening of *e*, *a*, *o* associated with the loss of a following laryngeal in front of *y* or *w* produced further examples, there are not enough of these to establish the development of long diphthongs in Celtic firmly. It is obvious that final *-ōy* became *-ūi* (5.3): e.g., Celtib. **-ui**, Gaul. *-u(i)*, OIr. *ciunn* '(to a) head', MW *er-byñ* (< **are pennī*) 'against' < **k^vennū* < **-ūi* < **-ōy*. As early as Proto-Celtic, *ā* may have been shortened before *y* or *w* (Bergin, 1946, 147-8): e.g., *ā*-stem dat. sg. Celtib. **-ai**, Gaul. *-ai*, OIr. *mnaí* '(to a) woman' < **(bn)-ai* < **-āy* < **(g^vn)-eh₂ey*; OIr. *náu* 'ship' < **naw-ā* replacing **naw-s* < **nāws* < **neh₂-u-s* (Skt. *naus*, Lat. *navis*). Finally, *ēy* > *ī(y)* in line with 5.3 would provide the most straightforward explanation of an *i*-stem dat. sg. like *mil* '(to) honey' < **mel-ī(y)* < PIE **-ēy*.

5.7 It seems appropriate to round this chapter off with a brief summary of the relative chronology implied by the foregoing considerations, some more tentative than others, centring upon Proto-Celtic vowels.

- (a) *ē* > *ī* (5.3)
- (b) *-Vns* > *-V̄s* (5.4)
- (c) raising/fronting of *e*, *ā/a*, *ō/ɔ* > *i*, *ā/æ*, *ō/o* before nasal plus obstruent and, probably, a nasal in auslaut (5.1)
- (d) shortening of long vowels before a final nasal (5.3)
- (e) *ō* > *ū* in final and > *ā* (but *ō* > *ū*) in non-final syllables (5.3)
- (f) 'Osthoff' shortening (5.5)
- (g) assimilation of *-sm-*, *-sn-*, *-sr-*, *-sl-* > *-mm-*, *-nn-*, *-rr-*, *-ll-* (2.1)

In the likely event that OIr. *léic* 'leaves' is the regular reflex of **link^v-e/o-*, OIr. *-ic* 'comes (to)' must ultimately be from **īnk* < **h₁ēnk-* or the like (McCone, 1991b, 47-52). These distinct reflexes are easy enough to generate

from the above sequence by positing merger of *i* and *ɪ* before [ŋ] plus guttural prior to the `Osthoff shortening in (f), whence **link^w* -> **link^v* -> **lēg^w* - but **īnk* -> **ink* -> **ig* - (IV.1.3-4).

